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Economic Stabilization in Developing Countries

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There is growing consensus that orthodox IMF-style stabilization policies do not work well when administered to semi-industrialized countries, the usual victims of inflationary balance-of-payments disease. Assessments of past stabilization efforts point to this conclusion, and new macrotheory is being developed to explain why. This chapter expounds that theory in terms of familiar IS/LM (investment-saving, money demand—money supply) graphs. The ideas are deformed by the routine formulation, but enough should come through to show what they are about. The thrust is "structuralist" in the classic sense, that is, inflation and balance-of-payments problems are part and parcel of underdevelopment and do not easily melt away. As discussed at the end of the chapter, ameliorative policies may exist but must be applied within the existing economic structure. First, one must be clear about structure; thereafter, one can ponder interventions for improvement.

In outline form, the argument begins with a review of financial, production, and commodity market arrangements in the economy whose characteristics are to be worked out. The next section is devoted to algebraic formulations of the key relationships, and the third and fourth sections to derivation of IS and LM curves, respectively, describing the economy in the short term. Then comparative statics of the standard stabilization policies—devaluation, monetary contraction, and fiscal restraint—are presented. As it turns out, under many circumstances these policies are stagflationary, leading to output contraction and inflationary spurts, and a taxonomy of macroresponse patterns is presented to indicate when the bite from each policy is likely to be worst. In a digression,
the IS side of the analysis is extended from a one-sector to a two-sector framework to deal with food price inflation problems characteristic of many poor economies. Growth and inflation are described over the medium term in the basic model, and various monetarist modifications are discussed, with suggestions why they lead policy astray. Finally, viable policy options are examined.¹

Economic Structure

Successful macroeconomics requires clear assumptions about institutions, since policy conclusions flow therefrom. We deal with a semi-industrialized economy, open to foreign trade but without financial breadth. Since comparative statics is the main theoretical tool, we also assume that the economy is not dramatically removed from equilibrium (that is, no hyperinflations, extreme foreign trade shocks, or egregious past economic mismanagement can be considered). The “short term” used here is a period of a quarter or so, during which the money wage and the stock of capital are fixed, but prices have time to clear markets and adjust to changes in other variables. Major areas of economic activity differ in their characteristics from those that Northern economists usually assume.

1. With fixed capital stocks, commodity production in the short term requires labor and raw materials. Labor use is determined from demand, with adjustments in the money wage to inflation and growth reflecting labor supply response (or worker-capitalist conflict) in periods of a year or more. The cost of raw materials (treated for simplicity as reducible to imports) is determined by world prices and exchange rate, which vary in the same time frame as the money wage. There is ongoing inflation, and the nominal interest rate is high. Moreover, interest rate changes affect prices and output in the short term, since firms are dependent on borrowing to finance working capital (wage and raw material bills) and to pass along

their financial costs. The nominal rate, rather than the real interest rate, pushes prices, precisely because of the fixed exchange rate and money wage.

2. The only primary assets in the financial system are central bank monetary liabilities (the money base) and the physical capital stock, there being no market for government bonds. Private wealth can be held as money or loans to firms. Together with bank loans (regulated by the authorities), the private loans add up to the total capital supply. Demand and supply schedules for capital determine the interest rate, which varies to clear the loan market in the short term. Private loan supply may rise with the interest rate, from the usual substitution response. But private loan supply also may fall if interest rate increases bid up the price level and the nominal value of capital stock enough to increase money demand and “squeeze out” private loans. This wrong-signed wealth effect can cause macroinstability and is most likely to create problems when the interest elasticity for money demand is low and the ratio of physical capital stock to wealth is high. The latter condition is symptomatic of semi-industrialized countries, where primary wealth in the form of government securities does not exist and a long history of inflation has taught people to keep their money balances down.

3. Because of the weak financial markets, firms are highly dependent on retained earnings for savings supply. The institutions that channel short-term private saving into long-term investment finance (insurance companies, the stock market, pension funds) are not active, because in an inflationary environment with imperfect market information, it is very risky to lend for long periods. Banks concentrate on financing working capital and leave investment finance to companies already there. On the supply side, most people are poor and have scant reason to trust the few savings institutions that exist. As a consequence, personal savings are low, both on average and at the margin. Government and foreign savings supplies fluctuate with the conjuncture, perhaps in unexpected ways (the balance-of-payments deficit—or foreign savings—may rise with devaluation, to take one common case). Retained earnings are the only flexible, secure savings supply, and for that reason the savings share from capital income will be high.

4. Investment response to changes in output and the real interest rate will differ from country to country. In some economies (Brazil and South Korea, perhaps), investment may respond rapidly enough to financial signals to give a positively sloped IS curve in the output/interest rate plane.
Under such an investment regime, contractionary monetary policies will follow the IS curve down, causing reductions in both production and the interest rate. Since interest costs are a component of price, inflation may drop off as well. In another, perhaps more likely case, investment responses to output change will be weak, leading to a downward-sloping IS curve. Monetary contraction now reduces output and raises interest rates. Price increases follow, and the policy is stagflationary in the short term. Such differences in investment response can be expected in any kind of economy, but their significance is magnified by the impact of interest rates on prices in many developing countries.

5. Imports are mostly noncompetitive intermediates and, as such, enter into prime cost. An increase in the import price (from devaluation or the world market) is inflationary because it will be passed along in final output price. At the same time, the increased import outlay may lead to an increase in the trade deficit measured in domestic currency, and potential savings will go up. The resultant output contraction coupled with rising prices marks another instance in which orthodox policy can go awry.

6. Available savings depend on the income distribution, rising with the profit share. As a consequence, pro-growth and anti-inflation policies may be founded on a slow increase (relative to the rate of price inflation) of the money wage. Such slowdowns in money wage growth are usually possible only under sufficiently repressive regimes. Respect for institutional reality requires that a macromodel include a theory of wage dynamics, which can deal with changes in the political rules from time to time. One such approach is adopted later in this chapter.

7. Finally, inflation is often sparked by sectoral imbalances—a price-wage spiral kicked off by lagging agricultural supply is a classic case in point. We will discuss briefly how the macromodel can be extended to take this possibility into account.

To summarize, these institutional considerations suggest a Keynesian model, but one that differs from the textbook models in several ways. The most important are

—The impact of interest rate changes on the aggregate price level, with further repercussions throughout the macrosystem;
—differences in how stabilization policy works under stable (“Keynesian”) and output-responsive (“Fisharian”) investment demand;
—explicit consideration of whether devaluation stimulates economic activity, depending on import intensity and export response;
IS/LM in the Tropics

—consideration of whether the sensitivity of the price level to the interest rate may reverse the usual dampening effect of interest rate increases on money demand;

—recognition that the rapidity of money wage responses to inflation is determined politically and strongly influences possibilities for medium-term growth; and

—consideration of the possibility that inflation may be touched off by lagging supply in some sectors, especially nontraded goods and food.

The details of these revisions to the usual macromodel appear naturally in the formal structure, which follows.

Structure in Equation Form

Production Sector

Recent formulations of production theory typically begin with a cost function, as is done here. The three inputs are labor, capital, and intermediates, with the last consolidated through the interindustry structure into imports. (The intermediate import share of GNP typically amounts to 25 percent or so in semi-industrialized developing countries.) Their respective unit costs are: labor, \((1 + i)w\); imports, \((1 + i)eP_o\); and capital, \(rP\); where \(w\) is the wage rate, \(e\) is the exchange rate, \(P_o\) is the border price of imports, \(r\) is the profit rate, and \(P\) is the price of output. The costs of the current inputs—labor and imports—are multiplied by an interest factor \((1 + i)\) since they are used in the production process well before the final sale. Especially in an inflationary environment where interest rates are high, the financial cost of this working capital has to be taken into account. If most processes are completed within the short term, the nominal interest rate \(i\) measures working capital costs. Producers lay out \((1 + i) \times \text{ (working advances) }\) at the beginning of the short period and collect back only the equivalent of the advances in sales at the end. The interest rate \(i\) thus measures financial costs. If input prices were indexed over the short term to the price level, they would go up by time of sale, making the real interest rate the appropriate cost indicator. But the assumption of fixed short-term money wages and import costs is correct un-

Under an institutionalized inflation in which adjustments are widely spaced (typically once a year).3

Under constant returns and competitive assumptions (maintained here for simplicity) the short-term cost function will take the form

\[ P = F[(1 + i)w, (1 + i)eP_0, rP], \]

so that any changes in cost are assumed to be passed along rapidly into the output price \( P \).

Besides this cost function, competition means that the usual marginal productivity conditions apply. By a result known as “Shephard’s lemma,” these conditions can be derived by differentiation of cost function 1. For example, demand for capital is given by

\[ K/X = \frac{\partial F}{\partial (rP)}, \]

where \( K \) is the capital stock and \( X \) is the level of output (calculated gross of intermediate inputs as in equation 4 below). But if capital is fixed and fully utilized subject to substitution possibilities in the short term, equation 2 states capital costs \( rP \) are determined as a quasi-rent on \( K \) by output \( X \). Hence substituting equation 2 into equation 1 gives a new cost function:

\[ P = F[(1 + i)w, (1 + i)eP_0, (X/K)]. \]

Here, costs and the price level will rise with output under decreasing returns to capacity in the short term. In other words, a rising aggregate supply curve can be postulated, with price level determined by output and variable input costs.

These equations have two corollaries, used later. First, equation 2 says

3. For more on these points, see Andre Lara-Resende, “Inflation, Growth and Oligopolistic Pricing in a Semi-Industrialized Economy: The Case of Brazil” (Ph.D. dissertation, Massachusetts Institute of Technology, 1979). Lara-Resende also presents evidence to the effect that working capital costs may run as high as 10 percent of industrial sales in Brazil, as opposed to 1 or 2 percent in the United States. Similar estimates for Argentina are presented by Domingo F. Cavallo, “Stagflationary Effects of Monetarist Stabilization Policies” (Ph.D. dissertation, Harvard University, 1977). Cavallo’s work stimulated the recent emphasis on importance of working capital costs. However, as Lara-Resende points out, the insight is an old one, although largely confined to the “underworld” of North Atlantic macroeconomic thought except in very recent work such as Ray C. Fair, “Inflation and Unemployment in a Macroeconometric Model,” in After the Phillips Curve: Persistence of High Inflation and High Unemployment, Conference Series, 19 (Boston, Mass.: Federal Reserve Bank, June 1978).
that the profit rate (as well as the price level) rises with output, a result used in discussing investment demand. Second, the interest factor \((1 + i)\) in equation 3 multiplies all variable costs. As a consequence, an increase in \(i\) will have no effect on resource allocation but will simply be passed along in price. The elasticity of \(P\) with respect to \(i\) is \((1 + i)\) from the functional form of the financial cost markup. This result is used in discussing the shape of the LM curve later in this chapter.

With constant returns, the cost of output is exhausted by input costs (including imports) according to the equation

\[
PX = (1 + i)(wN + eP_0mX) + rPK,
\]

in which \(N\) is the level of employment and \(m\) is the intermediate import/output coefficient, assumed constant for simplicity. This equation describes factor payments in the economy. To trace these around to determine demand, the first step is determination of disposable income by an equation such as

\[
PY = (1 - s_F)rPK + wN + i(wN + eP_0mX) - PT.
\]

Here, firms retain a fraction \(s_F\) of total profits \(rPK\) to finance investment. Other-income flows are the wage bill \(wN\) and interest payments that accrue to the owners of banks. A lump sum tax (value \(PT\)) is taken by the government from income flows.

Assume that personal consumption is given by

\[
PC = (1 - s)PY.
\]

Substitution of equations 5 and 6 into the commodity market balance equation,

\[
PX = PC + PI + PG + PE,
\]

\((I\) being investment, \(G\) government consumption, and \(E\) exports) and some algebra give the saving-investment balance as

\[
PI = [s_F + s(1 - s_F)]rPK + s[wN + i(wN + eP_0mX)] - rPX + (r - \gamma)PX + [eP_0mX - H(eP_E/P)X],
\]

4. The independence of output from financial charges depends on our competitive, constant returns assumptions. With decreasing returns and/or monopoly power on the part of firms, rising interest rates would reduce output as well as drive up prices. For more on this supply effect, see Bruno, “Stabilization and Stagflation.”
where $\tau = T/X$, the tax rate relative to output; $\gamma = G/X$, government consumption relative to output and the function $H(eP_B/P)$ shows how the export share $E/X$ rises in response to a fall in the price of domestic commodities abroad ($P/e$) relative to the price of foreign similars ($P_B$). The right-hand side of equation 8 states that investment is financed by corporate saving, private saving, government fiscal surplus, and the balance-of-payments deficit, respectively.

**Investment Theory**

As discussed more fully below, firms face a nominal borrowing cost $i$, or a real cost $j$ given by

$$j = i - \pi,$$

where $\pi$ is the expected inflation rate. On the other hand, the real return to capital is the marginal product $r$. Investors presumably weigh returns versus cost in determining how much to spend. Along lines suggested by Tobin, a plausible investment function will have capital formation increasing with the profit rate $r$ and declining with the real interest rate $j$. But, as already noted, $r$ will rise along with output $X$. Hence write investment demand as

$$PI = \phi[r(X), j]PK.$$

Rapidly responding investors might even make the Irving Fisher arbitrage condition $r(X) = j$ apply, but such agility in an underdeveloped financial market seems unlikely to be displayed. If it were, the Fisher condition (a positively sloped line in the $(X, i)$ plane) would replace the savings-investment identity 8. This more Keynesian formulation adheres to reality and, with substitution from 10, can be restated as

$$\phi(X, j) = s_h r + \mu(X/K),$$

with

$$s_h = s_r (1 - s),$$

and

$$\mu = s[1 - (eP_0/P)m - \tau] + (\tau - \gamma) + [(eP_0/P)m - H(eP_B/P)].$$

From equation 10, \( \phi(r, j) \) is the rate of growth of capital stock. Equation 11 shows that the growth rate is the sum of savings per unit profits \( (s_K r) \) and other savings flows per unit of capital stock \( (\mu(X/K)) \).

To focus on determination of equilibrium, restate 11 as an excess demand equation for output, \( ED_X \):

\[
ED_X(X, i) = \phi(X, i - \pi) - s_K r(X) - \mu(X/K).
\]

The level of production is supposed to vary rapidly in the short term to assure \( ED_X = 0 \). Stability will be more readily attained if the partial derivative of \( ED_X \) with respect to \( X \) is negative. Perusal of equation 12 shows that this condition holds when an increase in \( X \) generates more additional real saving than investment, a response pattern usually postulated in the short term. However, both recent theory and empirical evidence suggest that savings effects do not always dominate investment effects. As is discussed below, the macroeconomy reacts differently to stabilization attempts, depending on whether or not the usual hypothesis applies.

6. Since \( \partial ED_X / \partial i < 0 \), the condition \( ED_X = 0 \) defines a negatively sloped line in the \((X, i)\) plane if \( \partial ED_X / \partial X < 0 \). This is the usual downward sloping IS curve in which an increase in \( X \) generates an excess of saving over investment and \( i \) must fall to stimulate investment and bring commodity market equilibrium back. However, as shown above, rapid investment arbitrage gives the condition \( r(X) = i - \pi \), a positively sloped relationship between \( X \) and \( i \). One need not be a fanatical Fisherian to believe that IS may sometimes slope up. See, for example, the econometrics in Nathaniel H. Leff and Kazuo Sato, "LDC Macroeconomics: Short-Run Growth, Instability and External Dependency" (Columbia Business School and the State University of New York at Buffalo, 1979). The fact that savings versus investment behavior crucially affects macroresponse is noted sporadically in the literature but not emphasized enough. Useful reminders are given by Amartya K. Sen, "Neo-Classical and Neo-Keynesian Theories of Distribution," Economic Record, vol. 39 (March 1963), pp. 54–64, and William Darity, Jr., "Essays on Growth, Distribution and Development" (Ph.D. dissertation, Massachusetts Institute of Technology, 1978).

7. The following discussion is based squarely on Sweder van Wijnbergen, "Credit Policy, Inflation, and Growth in LDC's" (Ph.D. dissertation, Massachusetts Institute of Technology, 1980), which gives an elegant analytical treatment of many of the issues discussed informally here. The work of van Wijnbergen in turn follows from the papers of Bruno and Cavallo cited above.
of firms. The latter presumably finance their holdings of fixed and working capital by borrowing from the public and from banks. Bank lending to firms \((L_B)\) is regulated by the monetary authorities, through either credit limits or reserve requirements (which amount to the same thing if free reserves are negligible in an inflationary environment).

Loans from the public to firms depend on the interest rate, assumed to vary rapidly to clear the market for loans. Since there is no serious market for equity and prudent investors find government bonds too unreliable, the public's only options for holding wealth are loans to firms and money. Again for simplicity, money is assumed to be held only as deposits; the demand function is

\[
Q_P = \psi(i)(q + PK).
\]

A fraction of \(\psi\) of total wealth \(R\),

\[
R = q + PK,
\]

is held by the public in the form of money. That fraction declines as the rate of interest paid by firms goes up.

8. Authors such as Bruno, "Stabilization and Stagflation," assume that regulated bank loans carry a controlled interest rate \(i_o\), while a freely varying curb rate clears the nonbank money market. Mostly to keep the disposable income accounts simple, assume that bank loans are issued at the market rate as well. In effect, banks vary compensating balance requirements and similar hidden charges to keep up with what other lenders charge at any time.
Firms demand loans to finance their physical capital $PK$ and also working balances. As discussed above, the latter are advance payments for current production inputs. But since one firm's input is another's product (and payments to workers turn immediately into some firm's sales), in totality the money required for advance payments has to be held as net balances of firms throughout the system. That is why working capital is treated as deposits held with commercial banks in the quantity $Q_F$. Needless to say, these balances can always be put to other uses. They serve, for example, as liquid assets when the political situation makes firm managers see a need to indulge in capital flight. But under normal circumstances, firm deposits will correspond to aggregate working capital requirements for the wage bill and intermediate import costs,

$$Q_F = wN + eP_0mX.$$  

Equation 15 is a demand function for working capital. But since $Q_F$ is held with commercial banks, the banks' consolidated balance sheet sets the supply of working capital equal to $q + L_B - Q_F$, bank assets less deposit liabilities to the public. After substitution from equations 13 and 14, the excess demand function for working capital becomes

$$ED_t = wN + eP_0mX - (1 - \psi)q + \psi PK - L_B.$$  

The interest rate varies to regulate the public's demand for money. But since an increase in money demand can come only with a fall in loans to firms, changes in $i$ also drive $ED_t$ to zero (under stability assumptions) in the short term.  

Savings-Investment Balance: Keynesian and Fisherian Investment Demand, and Contractionary Devaluation Effects

The usual story about the IS curve makes excess demand for commodities independent of the price level, and the latter unresponsive to the interest rate. One diagrammatic presentation appears in figure 13-1. The horizontal line gives the level of the interest rate $i$ at which (for a given

9. If working capital is suppressed for the moment, equation 16 becomes $ED_t = \psi(i)(q + PK) - q$, that is, excess demand for money is the public's demand less the money supply. The story about working capital puts transaction demands together with the public's portfolio balance monetary tastes.
level of output $X$) excess demand for commodities $ED_x$ in equation 12 is equal to zero. The vertical line gives the price level $P$ corresponding to the given output $X$ along the aggregate supply curve.

Now consider the effect of an increase in $X$. The price level will go up if there are increasing costs in the short term, shifting the price line to the right. However, the savings-investment balance may shift either way, as shown in the following two cases.

1. In a Keynesian analysis, investment demand is not very responsive to an increase in output. On the other hand, savings will go up if the aggregate marginal propensity to consume from current income is less than one. As discussed in footnote 6, potential savings will rise more than investment, and the interest rate must fall to stimulate investment and restore savings-investment balance overall. As figure 13-1 shows, the increase in output is accompanied at the new equilibrium $K$ by a lower interest rate and a higher price level.

2. The other possibility, of course, is that investment demand responds
strongly to an increase in the profit rate and (with decreasing returns) to output as well. An increase in $X$ will lead to a potential excess of investment over savings, and the interest rate must rise to choke the former off. This is the Fisherian shift shown in figure 13-1. At the new equilibrium $F$, both interest rate and price level rise as output goes up.

To extend this reasoning to a semi-industrialized economy, two additional complications must be brought into play. First, since finance of working capital enters into cost, the price level rises with the interest rate, or the price line is not vertical, but angled up. Figure 13-2 shows the impacts of an output increase when this dependence of price on interest rate is taken into account. As before, a Fisherian investment response leads to an increase in both the interest rate and the price level at point $F$. With a Keynesian response, the interest rate falls, but the price level can shift either way. In particular, the price may fall because interest charges have gone down or may rise when output goes up.
The second complication is a dependence of the savings-investment balance on the price level. One source of savings in a semi-industrialized country (in practice, usually a large one) is the trade deficit on current account. From the definition of parameter $\mu$ in equation 11, the real deficit in domestic prices depends on price level $P$. For a given output level $X$ and exchange rate $e$, an increase in $P$ will reduce real imports $(eP_e/P)mX$. If the foreign export price $P_e$ is fixed, a rising $P$ will also reduce exports $H(eP_e/P)X$. Which of these two trade responses dominates is unclear.

A clue is provided by the usual supposition that devaluation (an increase in the exchange rate $e$) will cause the real trade deficit in terms of domestic product, $(eP_e/P)mX - H(eP_e/P)X$, to fall. Contrariwise, an increase in $P$ will cause the real deficit to go up. But since an increasing deficit is a source of savings, the interest rate must fall as $P$ rises to stim-
ulate investment demand and restore macroequilibrium. Hence the savings-investment line in the \((P, i)\) plane will slope down. In figure 13-3 an output increase generates a rising price level in the Fisherian case. However, the interest rate may shift either way. The interest rate always falls with the Keynesian savings-investment response, but the price change can be of either sign. Prices will go up if the response of net saving to trade balance effects is relatively weak.

The final case to be considered is one in which exports do not respond strongly to devaluation, or the real trade gap widens when the exchange rate is adjusted up.\footnote{This nonstandard result from exchange rate increases was labelled “contractionary devaluation” by Paul Krugman and Lance Taylor, “Contractionary Effects of Devaluation,” \textit{Journal of International Economics}, vol. 8 (November 1978), pp. 445–56. The name comes from the observation that if the interest rate is pegged, then the widening trade gap accompanying devaluation will stimulate potential savings and lead via Keynesian mechanisms to a production drop. Carlos Diaz-Alejandro, \textit{Exchange Rate Devaluation in a Semi-Industrialized Economy: The Experience of Argentina} (MIT Press, 1965), is an early English-language source in which empirical support of this phenomenon appears. Diaz-Alejandro’s study, Krugman and Taylor’s “Contractionary Effects,” and Schydowsky’s “Containing the Costs” cite other empirical studies as well. A well-known study is Richard N. Cooper, “An Assessment of Currency Devaluation in Developing Countries,” in Gustav Ranis, ed., \textit{Government and Economic Development} (Yale University Press, 1971).} A price increase has the opposite-signed impact, namely, a reduction in the deficit and a fall in ex ante savings. Since investment must fall in equilibrium, the savings-investment line in the \((P, i)\) plane slopes up. A Fisherian investment response would lead to both interest rate and price increases when output rises and to a potentially unstable system. The Keynesian case (in figure 13-4) is potentially stable, but even here a price increase seems likely to accompany growing output, especially if the wrong-signed savings response is relatively weak. All in all, there is a strong inflationary bias in the semi-industrialized macro-scheme.

In summary, an increase in output has differing effects on the interest rate and price level, depending on which configuration of savings-investment and devaluation responses occurs. Some order can be imposed by transferring all this information to a single graph relating output \(X\) with the interest rate \(i\) or the price level \(P\). Either of the latter variables can be used in the graphical analysis, since they are related monotonically through the cost function \(3\). The traditional IS/LM story, of course, is told in the \((X, i)\) plane. But since the main interest here is inflation, in a break with tradition, these diagrams illustrate trade-offs between \(X\) and \(P\).
Figure 13-4. The Effects on Price Level and Interest Rate of an Output Increase in the Contractionary Devaluation Case

The corresponding interest rate movements can easily be recovered from equation 3.

The "normal" case is a negative relationship between output and price, such as occurs in figure 13-3, when there are no price effects on saving through the trade balance and Keynesian demand effects (perhaps reinforced by supply effects as in footnote 4) are strong. However, with more responsive Fisherian investors, a positive relationship can easily emerge. This possibility is indicated by the counterclockwise rotation of the IS curve in figure 13-5. Monetary contraction generates a leftward move along IS, as shown below. Output will fall, but the price response will differ depending on which investment specification applies. Orthodoxy is Fisherian if it assumes that monetary contraction immediately cuts prices. The higher wisdom is to recognize that monetary restraint will cut back on output and may make the price level shift either way.

Finally, considering contractionary devaluation, the stronger the contractionary effects are, the steeper the savings-investment line in figure
13-4 will be. Ignore the shifting price line in the figure for a moment and assume that "effects become stronger" so that the savings-investment line rises in slope. A given output increase will be associated with more negative price changes until the slopes of the two lines coincide, with price increases declining from positive infinity thereafter. Including the shift in the price line complicates this story but does not change its general lines. For that reason, stronger contractionary devaluation effects can be viewed as rotating that IS schedule in figure 13-5 clockwise, until it finally assumes a steep positive slope.

The Market for Loans: Substitution and Wealth Effects in Interest Rate Response

In this section, diagrams in the \((P, i)\) plane are used to derive an LM curve. The cost function 3 still applies (giving a positively sloped rela-
a. In the upper panel the portfolio response to interest rate changes is relatively strong; in the lower panel the response is weak.
tionship between $P$ and $i$), but now the excess demand function for loans (equation 16) must be taken into account. Note there that a price increase will drive up excess demand via the term $\psi PK$ on the right-hand side—a wealth effect in loan demand. To compensate, the interest rate must rise, inducing a portfolio substitution response against money and in favor of loans. As a consequence, equation 16 generates a positively sloped line in the $(P, i)$ plane. For a given $P$ the line shifts upward in response to an increase in working capital demand.

The diagrammatic analysis appears in figure 13-6. Two cases are possible—the price line is steeper (upper figure) or shallower (lower figure) than the loan market balance line. In the first case, an increase in output generates a rise in the price level and interest rate, while in the second case price level and interest rate fall.

The economics behind these responses becomes clear when one recalls that the elasticity of price with respect to interest rate from the cost function 3 is $i/(l + i)$. The elasticity along the loan market excess demand function 16 is $-\psi^*/(PK/R)$, where $\psi^*$ stands for the elasticity of the money demand function $\psi(i)$. In the excess demand elasticity the term $PK/R$ will be close to one and nearly constant, since in an economy with poorly elaborated financial markets, physical capital is by far the dominant component of nominal wealth $R = q + PK$. \(^{11}\) Comparison of the two elasticities shows that the loan market response of price to interest rate will be less than the cost function response when $-\psi^*$ is less than $i/(l + i)$. Such is the situation shown in the lower diagram of figure 13-6.

It is difficult to say a priori how the elasticity $-\psi^*$ changes with respect to $i/(l + i)$ as the interest rate varies over a range. The answer depends on the functional form of the money demand function $\psi(i)$, a bit of knowledge that is difficult to obtain. The widely used semilog function $\psi(i) = ae^{-bi}$ can give rise to the LM curve shown in figure 13-7.

When the interest rate and price level are low (relative to the money wage and exchange rate), LM, derived from the lower diagram in figure 13-6, has a negative slope. At higher prices and interest rates, the curve takes on its more familiar upward cant. And when the price level is independent of the interest rate, LM always slopes up.

\(^{11}\) The importance of a high "real asset ratio" (taxa de imobilização) such as $PK/R$ in leading to an inflationary bias in financial markets was pointed out by the Brazilian author Ignacio Rangel, *A Inflação Brasileira* (Rio de Janeiro: Tempo Brasileiro, 1963). His model has been neatly formalized by Francisco L. Lopes, "Teoria e Política de Inflação Brasileira: Uma Revisão Crítica da Literatura" (Rio de Janeiro: Pontifical Catholic University, 1978).
Comparative Statics

The IS and LM curves can illustrate a number of structuralist findings about the impact of policy moves. The analysis in this section is short term in the usual Keynesian sense, that is, the capital stock and the main elements in prime cost (the money wage and import prices) stay fixed. Also this section will not deal with rates of inflation or output growth but rather with how much the level of prices or output may shift. In terms of calendar time, such an approach is relevant for assessing policy impacts over the first few quarters—longer-term perspectives are developed below.

Routine stability analysis shows that the economy will maintain short-term equilibrium if the IS curve cuts the LM curve from the left on either its positively or negatively sloped branch. Since monetary expansion shifts the LM curve to the right, as was shown previously, its impact is unambiguous: output goes up and prices fall (see figure 13-8A). An in-
stagflation—the price level rises and output falls off. The next section will show that the lower profit rate associated with reduced output leads to lower growth and in the long term to reduced demand for money, or excess demand for loans. As a consequence, a lower growth rate of money will ultimately lead to a rightward shift of LM and a downward shift in IS due to more slowly growing wage demands and lower inflationary expectations. Permanent monetary restraint causes both the growth rate and the inflation rate to fall, but the inflation rate has to have an upward excursion en route.

Figure 13-8B shows what happens with fiscal stimulus. An increase in the government deficit reduces potential savings, raises excess demand for investment, and, to maintain equilibrium output, rises while IS shifts up. On the upward-sloping branch of LM, fiscal expansion then leads to both price and output increases, the standard case. However, when the interest rate elasticity of money demand is weak (or when the real asset ratio \( \frac{PK}{R} \) is high), the fiscal stimulus will lead to high prices and reduced profit rates and growth. Because of the special characteristics of underdeveloped financial markets, a standard policy fails to have the expected effects.

Finally, figure 13-8C illustrates the short-term impacts of devaluation. Both IS and LM shifts lead to price increases. The LM shift (along IS) would also reduce output, but the effect on \( X \) of the IS shift depends on which branch of the LM curve applies. If, however, LM is rather steep, a reduced output level from the overall maneuver seems likely to result. Devaluation is another policy that is stagflationary in the short term. Whether an increase in the nominal exchange rate improves the current account is unclear—imports will decrease because of reduced output, but price increases will dampen the improvement in the real exchange rate \( \frac{e}{P} \), and the export response may even be perverse.

The conclusion is that the stabilization tools normally applied—monetary restraint, fiscal control, and devaluation—all have stagflationary impacts to a greater or lesser extent. Moreover, their efficacy in improving the balance of payments may also be small. The other configurations of the IS curve will show if prospects are any more favorable there.

First, take the Fisherian case, in which investment demand responds strongly to profit and interest rate shifts. In effect, savings determines investment in this specification, and purely Keynesian economic responses are suppressed. The model properly refers to a buoyant economy in full
capacity growth and, not surprisingly, has been adopted by a number of Brazilian economists over the years.\footnote{Fisherian models in which investment responds strongly to shifts in available savings and aggregate demand are used by Rangel, \textit{A Inflação Brasileira}, and Lopes, \textit{Teoria e Politica.} The same assumption is used in a growth model discussed more thoroughly below by Eliana A. Cardoso, \textit{"Inflation, Growth and the Real Exchange Rate: Essays on Economic History in Brazil"} (Ph.D. dissertation, Massachusetts Institute of Technology, 1979). Perhaps not surprisingly, the stagflation model of figure 13-8 is more properly of Argentines and Chileans, or Brazilians when their growth rate is down.}

For stability, the upward-sloping IS curve has to cut LM from the
left—investment response cannot be “too strong” and lead to a more shallow LM than IS. Moreover, any intersection of IS with the negatively sloped branch of LM is not stable. The unstable lower branch when there is elastic investment demand shows how Rangel’s suggestion—that a high real asset ratio leads to inflation and high interest rates—works itself out.

Figure 13-9A illustrates the comparative statics of monetary expansion. Both prices and output go up. Monetary restraint will lower the price level but will bring down output as well. Moreover, as the LM curve slides down the IS curve during the deflation, prices and interest rates might fall far enough to weaken substitution effects and to bring the wrong-signed wealth effect on money demand into play. In this case, the economy would become unstable, and further policies aimed at reducing inflation would abort. Again, responsive investors and a high real asset ratio put a lower bound on how far inflation can be reduced.

Figure 13-9B shows that fiscal expansion leads to higher prices and output—the same result as before. Finally, with a steep LM curve, devaluation is likely to be stagflationary in figure 13-9C. All in all, the policy prospects under Fisherian conditions are more favorable than in the normal case (with its sluggish investment response), but how widely they apply is a moot point.

The final case is contractionary devaluation, illustrated in figure 13-10. Recall from figure 13-5 that the IS curve here is likely to be quite steep, since it results from a clockwise rotation from the normal case. Indeed, the stability condition is that IS cuts the upward-sloping branch of the LM curve from below. Any intersection with the negatively sloped branch is unstable.

Figure 13-10A shows that monetary expansion reduces prices, by easing off on interest rate pressures, but slightly reduces output and the rate of growth. Monetary restraint, on the other hand, would lead to sharp price increases. Output would also rise, pushed up by reduced potential savings resulting from the improvement in the balance of payments caused by the lower value of the real exchange rate \((e/P)\).

Fiscal stimulus raises prices and the profit rate in figure 13-10B, while devaluation will be stagflationary (higher price level, lower output) with a steep IS curve in figure 13-10C. On the other hand, devaluation would improve the balance of payments in this case. The export response to shifts in the real exchange rate is weak by hypothesis, but the reduction in output will make raw material imports fall. With near constant exports and falling imports, the trade balance in world prices should improve.
However, because $P$ goes up, the trade balance change in terms of domestic prices is of uncertain sign. The longer-term impacts through changes in the growth rate of money base would also differ from case to case. Finally, note that in the short term there is merit in coupling devaluation with monetary ease. The inflationary impact of the exchange rate increase would be offset by monetary policy, and appropriate juxta-
Table 13-2. Impacts of Stabilization Policies Under Various Regimes

<table>
<thead>
<tr>
<th>Policy</th>
<th>Keynesian</th>
<th></th>
<th>Fisherian</th>
<th></th>
<th>Contractionary devaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Output</td>
<td>Price</td>
<td>Output</td>
<td>Price</td>
<td>Output</td>
</tr>
<tr>
<td>Monetary restraint</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Fiscal restraint</td>
<td>- (?)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Devaluation</td>
<td>- (?)</td>
<td>+</td>
<td>- (?)</td>
<td>+ (?)</td>
<td>- (?)</td>
</tr>
</tbody>
</table>

a. Question marks indicate the most probable signs, given the configuration of the curves.

position of the instruments could, within limits, lead to improvements in both the current account and growth.

Table 13-2 summarizes this section, showing how the usual stabilization policies affect output and price in the short term (question marks indicate the most probable signs, given the configuration of the curves). Fiscal restraint will reduce both variables under all policy regimes—a leftward shift along the positively sloped branch of the LM curve gives this result. The effects of monetary restriction are harder to predict. Monetary restriction is stagflationary under Keynesian investment demand conditions and can give both inflation and output expansion when devaluation has contractionary IS effects. Only under Fisherian investment conditions do the normally expected price and output decreases ensue.

Finally, depending on the shape of the LM curve, devaluation may be stagflationary in all cases. Devaluation's impact on the balance of payments (in either world or domestic prices) is unclear. However, even if export response is weak, the output contraction might usually be expected to make the world price balance-of-payments deficit improve.

A Complication: Inflationary Pressures from Nontraded Goods

Further comparative statics exercises could be pursued, for example, policy mix questions of the type mentioned above. But to extend the analysis, it is more appropriate to ask how the model can deal with issues of inflation and growth. Preparatory to that, however, we look briefly at the comparative statics of price pressures from sectors whose products are not fully open to international trade. Agriculture is a classic case,
if only because developing countries lack adequate port facilities and transport infrastructure to handle even hundreds of thousands of tons of imported wheat. Other nontradables (or near nontradables) such as cement can also cause inflationary bottlenecks in the short term. Price varies (perhaps illegally) to clear markets for such commodities, and that is presumably the case here. By contrast, Keynesian adjustments apply in the rest of the economy, with supply varying to meet demand. To keep life tolerably simple, Fisherian investment responses and contractionary devaluations are assumed totally away.

Figure 13-11 gives a four-quadrant diagram for the sort of model we have in mind. Price in the A-sector ("agriculture") is measured on the horizontal axis running left from the origin. For given supply conditions, income in the sector will be a rising function of its price \( Z \). Consequently, demand for N-sector ("industrial") products from the A-sector will rise with \( Z \), as shown in the northwest quadrant. At the same time, real savings generated by the A-sector will also increase in the southwest.

The northeast quadrant is a standard Keynesian cross for the N-sector. Demand comes from autonomous expenditures and the A-sector (both are lumped on the upper vertical axis) and also from N-sector output \( X \) according to the marginal propensity to consume. The intersection with the forty-five degree line determines \( X \) for a given A-sector price \( Z \).

The model is closed in the southeast quadrant, which shows savings "required" from the A-sector, that is, autonomous expenditure less savings generated from the N-sector. The required A-sector saving is a declining function of \( X \) and must equal savings produced by that sector in the southwest.

An initial equilibrium is shown at \( Z_0 \) and \( X_0 \). Assume a bad harvest so that agricultural supply drops. For a given \( Z \), both consumption demand and savings from the A-sector will be less, and the curves in the northwest quadrant shift down. Comparative statics of figure 13-11 are developed by Graciela Chichilnisky and Lance Taylor, "Agriculture and the Rest of the Economy: Macro Connections and Policy Restraints," *American Journal of Agricultural Economics*, vol. 62 (May 1980), pp. 303–09. The same model is independently extended in the direction of Sunkel by incorporating an inflation theory (along the same lines as in this chapter's section on long-term trade-offs) by Eliana A. Cardoso, "Food Supply and Inflation," *Journal of Development Economics*, forthcoming.

14. Models similar to the present one have been worked out by a number of authors, although the diagram seems to be new. The classic structuralist paper is by Osvaldo Sunkel, "Inflation in Chile: An Unorthodox Approach," *International Economic Papers*, no. 10 (1960), pp. 107–31. Comparative statics of figure 13-11 are developed by Graciela Chichilnisky and Lance Taylor, "Agriculture and the Rest of the Economy: Macro Connections and Policy Restraints," *American Journal of Agricultural Economics*, vol. 62 (May 1980), pp. 303–09. The same model is independently extended in the direction of Sunkel by incorporating an inflation theory (along the same lines as in this chapter's section on long-term trade-offs) by Eliana A. Cardoso, "Food Supply and Inflation," *Journal of Development Economics*, forthcoming.
and the southwest will shift out. N-sector consumption demand will fall, leading to a decrease in $X$ and an increment in agricultural savings required. The price will rise from $Z_0$ to $Z_1$ to determine a new equilibrium, and N-sector output will fall from $X_0$ to $X_1$. The adjustment mechanism is a shift down in the consumption function in the northeast.

The sort of supply shock shown in figure 13-11 can easily set off a burst of inflation, if money wages respond to the rising agricultural price, and drive up N-sector costs in turn. A sequence of shocks can keep inflation going if, for example, population growth runs ahead of the growth rate of agricultural supply. One can deal with such stories formally, but in this chapter they would take us too far afield. Rather, this study looks at wage-price dynamics in the N-sector only, but bear in mind that the sorts of complications discussed in this section often arise. Even if sharp sectoral price increases are not observed, they may be latent just because policy makers are holding down aggregate demand.
Long-Term Trade-offs among Inflation, Income Distribution, and Growth

To analyze growth in the long term, it is necessary to add hypotheses about dynamics to the IS/LM system described earlier. There are three main equations restated here for convenience. The cost function, given in equation 3, is

\[ P = P[(1 + i)w, (1 + i)eP_0, (X/K)]. \]

The IS equation for commodity market clearing is

\[ \phi[r(X), i - \pi] - sP'(X) - [s[1 - (eP_0/P)m - r] + (r - \gamma) + [(eP_0/P)m - H(eP_0/P)]/(X/K) = 0, \]

and finally, the LM equation for the loan market is

\[ wN + eP_0mX - [1 - iK^0ta] + WPK - L_B = 0. \]

These equations are supposed to hold in the short term, with equalities assured by rapid variation of employment (the cost function), output (IS) and interest rate (LM). They act as constraints on all variables entering the growth of the system. The formal discussion here concentrates on growth in a closed economy (although some thoughts about how the system behaves when it is opened to trade appear at the end of this section).

The key dynamic variables are the expected inflation rate (\( \pi \)), the growth rate of the money wage (\( w' \)), and the capital stock growth rate (\( K' \)).\(^{15}\) It seems most realistic to assume adaptive expectation for inflation,

\[ d\pi/dt = \epsilon(P' - \pi). \]

The expected rate \( \pi \) is adjusted for discrepancies from the actual inflation rate \( P' \) according to a response coefficient \( \epsilon \) (which usually takes a value of around one-half when estimated from annual data).

Two hypotheses naturally present themselves regarding wage growth. The first is that because of surplus labor conditions, the expected real wage stays constant, or \( w' = \pi \). However, one should recognize that income distribution mechanisms in a semi-industrialized, inflationary economy are complex. Inflation is the outcome of conflicting claims to product, with different social classes having the upper hand at different times.

\(^{15}\) The “prime” notation just introduced signifies growth rates, for example, \( w' = (dw/dt)/w \).
Such conflict is most realistically modeled in disequilibrium terms, as by Lara-Resende.\textsuperscript{16} For present purposes, however, it is better to stick with a simple differential equation version of wage response. This equation follows Cardoso\textsuperscript{17} in postulating that changes in the growth rate of the money wage \((dw'/dt)\) are given by

\begin{equation}
\frac{dw'}{dt} = \lambda \pi + \eta (K' - K'_0) - w'.
\end{equation}

According to this specification, the bargaining process limits money wage increases to a fraction \((\lambda)\) of expected inflation in the short term. The parameter \(\lambda\) has substantial political content and will be lower as the state is able or willing to take the side of profit recipients and hold down wage increases by bringing its police-military apparatus to bear. (Think of the different political situations in Brazil in 1964 and 1979, or perhaps in Chile in 1973 and fifteen years thence.) Higher wage growth will be permitted when the capital stock growth rate (and, as will be seen shortly, the profit rate) is high relative to some standard level \(K'_0\). Under these hypotheses, what might be called "warranted" wage growth is \(\lambda \pi + \eta (K' - K'_0)\). Equation 20 states that if the actual growth of money wages falls below the warranted rate, that growth will speed up. A politically naive argument often advanced by monetarist economists is that \(\lambda = 1\). In this case, money wages will grow at a constant rate \((dw'/dt = 0)\) only when the capital stock is growing at \(K'_0\), its "natural rate."

Capital stock growth is limited by savings, from the IS equation. Dropping foreign trade variables from equation 17 allows the capital growth rate to be written as

\begin{equation}
K' = s_k r + s(1 - \tau) + (\tau - \gamma)(X/K).
\end{equation}

Growth is higher as the profit rate goes up and also depends, from the terms in brackets, on personal and government savings shares.

Global stability analysis of differential equations 19 through 21 subject to equations 3, 17, and 18 is too daunting a task to undertake here. Even verification of local stability around a steady growth path requires a fair bit of bashing away with Routh-Hurwitz conditions. From these, one set of sufficient conditions for local stability around a steady state is that (1) the IS/LM short-term system is stable with respect to changes in the interest rate, output, and employment; (2) the wage response parameter \(\lambda\) in equation 20 is not greater than one, so that money wages do not overreact to price increases; and (3) the parameters of the IS/LM system are

16. Lara-Resende, "Inflation, Growth and Pricing."
17. Cardoso, "Inflation, Growth and Exchange Rate."
such that money wage increases do not lead to output increases in the short term.

These are only illustrative conditions; in particular, the second and/or third conditions can be relaxed if parameters for adaptive expectations (ε in equation 19) or wage responses to growth (η in 20) are small. What one has to rule out is an explosive price-wage-employment spiral, which could lead to a cumulative inflationary process. Hyperinflation (or its near misses) is of substantial policy interest, but it is not analyzed here. Rather, the focus is on steady states, to point out the conflicts among growth, distribution, and inflation that arise even when the economy is well behaved.

In steady state, the conditions \( \frac{dK'}{dt} = \frac{dw'}{dt} = \frac{d\pi}{dt} = 0 \) will apply. How the variables in the IS/LM system are determined along a steady growth path is the next problem to be solved.

First, from equation 21, note that if capital stock growth \( K' \) is constant, then the profit rate \( r \) and the output-capital ratio \( X/K \) must be constant also. Also from equation 19, expectations are realized, or \( P' = \pi \). But since the growth rate is also equal to investment demand, \( K' = \phi(r, i - \pi) \), the interest rate \( i \) must also be constant. With all these constants inserted into the cost function 3, there can only be price inflation if the wage is growing equally fast, \( w' = P' \). Hence the real wage stays constant along a steady state.

Now consider the LM curve. Growth in money supply will influence the inflation rate here. To keep to essentials, assume that the government fixes the ratio of bank loans to base money,

\[
L_B = \xi q;
\]

thus the credit multiplier is set. Also observe that without foreign trade, money growth is given by

\[
dq/dt = (\gamma - \tau)PX,
\]
or the fiscal deficit is completely monetized. If one puts these conditions into a differential version of the LM equation 18 to get a money growth versus inflation equation, the result turns out to be

\[
P' = M' - K',
\]
in which

\[
M' = r(1 + i)(1 - \psi)(1 + \xi)(\gamma - \tau),
\]

and \( \alpha_N \) and \( \alpha_K \) are the wage and profit shares, respectively, in value added.
In equation 24, parameter $M'$ stands for the effect of money growth on price inflation through the LM equation. Parameter $M'$ is displayed in full to show that to a degree, monetary expansion can be regulated by the authorities who control spending and tax parameters ($\gamma$ and $\tau$) and also the credit multiplier through the loan-base money ratio $\xi$. But $M'$ is also endogenous insofar as the profit rate $r$, the interest rate $i$, and the variables they affect can adjust. Without entering into details, it serves the purpose here to assume that the authorities do have enough control to determine $M'$. If that is the case, then equation 24 shows that for a given rate of monetary expansion, higher capital stock growth is associated with lower inflation, with a trade-off parameter equal to one.\(^{18}\)

To get another relationship between growth and inflation in steady state, consider wage response. When money wage growth $w'$ is constant, equation 20 shows that $w' = \lambda P' + \eta(K' - K'_0)$. Combining the condition with a constant real wage $(w' = P')$ gives

\begin{equation}
(1 - \lambda)P' = \eta(K' - K'_0).
\end{equation}

Assume that there is some wage control, so that $\lambda < 1$. Then the steady state equilibrium is determined as in figure 13-12.

The first thing to note about this figure is that the wage equation imposes a positive long-term relationship between inflation and growth. An increase in money supply growth $M'$ will shift up the IS/LM line, leading to increases in both $K'$ and $P'$. During the transition, inflation will accelerate above its new long-term value, causing a falling real wage from equation 20. The real wage reduction shifts income toward profits, generating the saving required to support the new higher rate of growth. The long-term trade-off will not exist when $\lambda = 1$ and the economy grows at its natural rate $K'_0$. The politics of recent stabilization efforts in a number of semi-industrialized countries belies the likelihood of immediate wage response to the inflation rate.

The other major point to observe is that a reduction in the parameter $\lambda$, which represents workers' ability to protect their income claims against inflation, will reduce the slope of the wage line in figure 13-12. As a consequence, a given rate of money supply growth will be consistent with lower inflation and faster output growth. Stabilization programs in de-

\(^{18}\) The unitary long-term price and quantity elasticities for money demand arise from the $\varphi(i)PK$ term in equation 18, which states that equal percentage increments in $P$ and $K$ generate the same percentage growth in demand. Dependence of the demand function $\varphi$ on $X$ would change the size but not the sign of the inflation versus growth trade-off in equation 24.
Developing countries often feature both monetary contraction and wage restraint. Figure 13-12 illustrates why. Both inflation and growth targets are easier to achieve as long as $\lambda$ is reduced. Only the workers and the poor have to pay for the "miracles" that orthodox policy occasionally engineers.

Finally, note that much of this reasoning carries over into open economy models, where the price level, wage, and exchange rate must all grow equally rapidly in steady state, $P' = w' = e'$. With the addition of a dynamic equation like equation 20 to describe how policy makers set the exchange rate, a number of stories about inflation and the balance of payments can be told. For details, Cardoso’s work is the best source.  

Monetarist Approaches

The purpose of this chapter is to sketch a version of the Keynesian model that applies to semi-industrialized countries. The task is straightforward (though tedious) because Keynes and the structuralists claim

much common ground. Trying to bring monetarism into the picture is more difficult because fewer common assumptions are shared between the rival camps. Nonetheless, the effort is worth making, since monetarist arguments often buttress orthodox policy prescriptions in developing countries.

Insofar as policy is concerned, monetarist recommendations follow from zealous application of Walras’ law that the sum of excess demands in all markets should be zero at all times. Suppose that this is true, and suppose further that the cost function and IS and LM curves exhaust all existing markets. Then the implicit approach here of permitting potential excess demands (for labor, commodities, and loans) in all three markets is wrong. That is, if one knows two of the excess demands, one should know the third from Walras’ law. More narrowly, if prices equal costs, then an excess demand in, say, the money market “determines” as its mirror image an excess supply for commodities. Only the money market need be considered to understand everything that is going on.

The Keynesians’ traditional escape from this problem is to postulate some background adjustment process that enables Walras’ law to be satisfied while there are simultaneous, independent excess demands in IS and LM. Numerous possibilities exist. An extra “market” can be imagined to clear the sum of excess demands, for example, unintended inventory change in the multiplier story or the traditional “bonds.” Or extra agents may enter—foreigners who buy and sell in the export commodity market and the monetary authorities who clear the exchange market against them. The Keynesian view is that it is perfectly possible for an asset market (for example, money) to clear while a flow market (for example, commodities) does not. By contrast, monetarists think that stock excess demands call forth corresponding flow excess supplies by Walras’ law. This approach to policy amounts to postulating an excess demand or supply of money and asking where its spillovers to the rest of the economy will land. The usual targets are the commodity market and the balance of payments, both of which are taken up in turn.20

The commodity market spillover was emphasized in the “gradualist versus shock treatment” debate in Brazil in the 1960s. A closed economy was correctly assumed in which an excess demand for money was to lead via Walras’ law to an excess supply of goods. Moreover, the public would allegedly respond only slowly to excess money demand, gradually increasing their liquidity by buying less. As a consequence, prices would decelerate slowly, even though “goods chased money” in an active way.

The creation via monetary restriction of a large excess money demand is a shock treatment. By the Walras’ law story there will be unintended stock accumulation, and output will rapidly drop off. Slowly declining inflation means that the recession lasts a long time. For that reason, a “gradualist” policy of less abrupt monetary restraint amounts to a better cure.

That gradualism embodies a “good deal of common sense cannot be denied. Nonetheless, gradualism will be reinterpreted here in a Keynesian frame where responses along IS as well as LM determine outcome. The simultaneous decline-of price and output that the gradualists postulate clearly labels them as Fisherians in the scheme presented here—figure 13-9A captures their mechanism quite well. But then questions arise: Is the economy really Fisherian so that both prices and production immediately drop off? If the economy is Keynesian (in the sense of this presentation) and if monetary restraint will cause stagflation instead, the whole gradualist approach to stabilization gets off on the wrong foot.

How does the cost function enter the story? If money wages continue to grow fast, then so will prices unless output quite brusquely falls. Contrariwise, the postulated price reduction requires a smaller output recession if money wage growth slows down. This employment versus income distribution conflict comes up in any stabilization effort, but monetarists ignore it by concentrating only on the politically immaculate market for funds.

Are there other stabilization policies? Quite clearly, fiscal and expenditure-switching policies of the type mentioned earlier have been left out.

What about the balance of payments? In most countries, spillovers of excess money demand to foreign trade may be substantial. This topic is taken up next.

The introduction of balance of payments into the monetarist schema makes the Walras’ law game harder to play—it is now necessary to trace through the impacts of demand for money on price, domestic commodi-
ties, and foreign trade. The science of detecting spillovers underlies the "financial programming" exercises routinely undertaken by the IMF.  

Typically, financial programming starts from an unvarying output projection, called "full employment" when monetarists write models down. Then a price projection is made, based on a cost function more or less like equation 3. In an inflationary situation, a stabilization program wants a slower rate of price increase from this year to next than has been the case in the past. If profit rates are maintained (to keep up savings), inflation control requires a reduction in the real wage. In wage cutting, financial programmers have learned the lesson of figure 13-12 all too well.

With price and output projections (and some assumptions about credit multipliers), one can calculate demand for money base. Of course, the two sources of base are a fiscal deficit and a balance-of-payments surplus. If the former is cut, then by the accounting logic underlying the whole system, the foreign surplus has to go up. If need be, the increase will be helped along by simultaneous devaluation and dismantlement of trade barriers, to reap efficiency gains by "getting the prices right."

From a structuralist point of view, this procedure has a number of weak points. Certainly, a list would include the following points (some already mentioned above).

1. The whole exercise leaves out the IS curve. The interest rate is implicitly fixed in the money demand projection, and commodity production is determined ad hoc. Whether the output level is consistent with savings and investment propensities of different functional economic classes (with changing real incomes) is never spelled out. In this sense, financial programming does not embody a consistent macroprojection, so that it often fails.

2. This lack of consistency shows up in the kinds of policies chosen. An earlier section explained that it is quite likely that both devaluation and monetary contraction will cause stagflation under semi-industrialized

21. There are no succinct references explaining what financial programming is all about. The model is essentially that of J. J. Polak, "Monetary Analysis of Income Formation and Payments Problems," *IMF Staff Papers*, vol. 6 (November 1957), pp. 1-50, or Alexander K. Swoboda, "Monetary Approaches to Balance-of-Payments Theory," in E. Claassen and P. Salin, eds., *Recent Issues in International Monetary Economics* (Amsterdam: North-Holland, 1976), but there is no denying that in some IMF stabilization exercises a good deal of non-model-based economic sophistication is brought to bear. Some feel for the approach appears in E. Walter Robichek, "Financial Programming Exercises of the International Monetary Fund in Latin America" (Washington, D.C.: IMF Institute, International Monetary Fund, 1975).
macroconstraints. By leaving the possibility of an output reduction out of their models, financial programmers cannot deal with this natural consequence of the policies they commend. They implicitly tax the poor twice, by real wage reductions and employment declines. In fact, figure 13-12 shows that financial programmers may even tax the poor again, if the wage repression/monetary restraint policy reduces the long-term rate of growth.

3. Finally, the brusque short-term stabilizations administered by international agencies leave out even the monetarist wisdom of gradualism, not to mention prospects for long-term institutional change. The macro-situation in poor countries is difficult; the narrow limits to acceptable policy make any conjuncture terribly tight. Policies that may loosen some of the restrictions are taken up next.

Possibilities for the Medium Term

How can the bottlenecks be widened? There are no magic wands in economics, and sensible policy begins by recognizing that fact. Gradualism in a general sense has much to recommend it, since one gains little by pushing hard. Moreover, the results described in earlier sections on short-term policy and on the long term serve as reminders that orthodoxy runs a severe risk of making a bad situation worse.

What options are there, then? One favored by many authors is export promotion. The benefits are clear—generation of foreign exchange and reduction of the potential contractionary impact of a glut of foreign savings through the trade gap. Export promotion can most easily be achieved through targeted policies—drawbacks, special credit provisions, crawling pegs, and dual exchange rates. These policies run afoul of international organization ideologies, and potential exporting countries have suffered therefrom. More institutional tolerance from the IMF and GATT would be a fine thing. But such tolerance would require an improbable degree of acquiescence from the developed countries, which to a large extent manipulate the international agencies to further the new, soft imperialism of the North.

Even if Northern jobs and capital were not threatened by developing country exports, they may not always be the best policy for the South. Special export promotion policies pursued too far can lead to efficiency losses—a little understood trade-off exists between growth benefits and
productivity costs of such programs. More seriously, it is clear that export promotion can only add to growth in the long term if exports add to national savings. But that achievement may require income concentration in the export sector of a most visible and unpleasant kind. Extreme social inequality stands out in some of the "success cases." Is that the way other countries want to go?

The export promotion option is one of a larger class of programs concentrating on the side of supply. Another is modernization of the agricultural and other nontraded sectors, to reduce the severity of inflationary shocks of the type illustrated in figure 13-11. These policies have to be designed to fit the situation at hand—not just economic in terms of factor intensities and interindustry linkages, but social problems as well. This is not wholly an ideological matter; serious planners may contemplate land reform in one valley and subsidize the landlords in the next. The point is that social relationships within the mode of production condition patterns of economic response. The patterns will not change unless their structural correlates also change.

A third, set of policies focuses on income distribution and savings within the country. The growth-inflation synergy of figure 13-12 is dampened, for example, if workers and, by extension, the poor save more. Creation of appropriate financial institutions may further this end, as well as perhaps reduce the impact of interest rate changes on price by making working capital easier to obtain. More generally, the goal is to widen control over the means of production, to make subordinate capitalism's income inequalities less capitalistic. One route to this end is social democratic—open the economy, promote exports, use economic incentives to push or pull people into sectors where their productivity will be high. Another route is more leftist and directed—close the economy, run production from the center, and force the income distribution toward equality via supply control and rationing.

There are countries now following both paths, and by their own standards they are doing reasonably well. Stabilization policies enter their schemes in various fashions, but in one way or another these countries avoid the fiscal stringency/credit contraction/devaluation/wage repression packages so beloved of orthodoxy and the IMF. A reformist would hope that Northern economic practitioners such as those at the IMF could be taught to enforce less draconian measures when internal mismanagement or external mischance brings them down upon some developing economy. If they do not learn soon, then well-justified political resentment on the part of Southern countries which find their growth and in-
ternal equity sacrificed to Northern economic conceits could lead to the end of the present international economic system. Even reformists might not regret that end.

Comments by Kemal Dervis

In my view, the basic message of Lance Taylor's paper is that the short term cannot and should not be ignored and that in the short term, things may not be as they seem. The argument has a strong traditional Keynesian flavor: in the short term, one can get something for nothing, and implicitly, in the long term, we are all dead. Thus "an increase in the money supply reduces interest rates and costs—hence the price (level) decrease. To maintain equilibrium in the commodity market with dominant savings effects, output must rise." Not only is monetary restraint bad for inflation but the argument also holds in reverse—monetary expansion can beat inflation—in the short term! The key relationship that leads to this perverse link between quantity of money and price level is the cost function that includes nominal interest as part of prime cost. In fact, there are other factors in semi-industrialized as well as industrialized countries that can lead to such a perverse relationship, including monopolistic price formation rules in the urban industrial sector or the direct impact of credit on output through its effect on bankruptcies and strikes. The basic point is that supply and demand both determine price. A policy that tries to restrict demand, and ends up reducing supply by even more than it reduces demand, will be inflationary. And in the short term, supply may depend rather critically on the volume of credit, more so in developing countries than in advanced industrialized economies.

While these points are quite true and while IMF-type stabilization packages are built on an underlying model that minimizes the role of the supply side of the economy, one cannot argue, and indeed Taylor does not argue, that the kind of perverse relationships stressed within a short-term framework are still relevant and important in a longer-term perspective. The problem is that while one cannot ignore the short term, one cannot ignore the long term either. As many countries have found, some at the cost of great violence and tragedy, populist policies that do not recognize the link between money growth and price growth, or between the real exchange rate and trade performance, result in total economic and political collapse. The reverse is, of course, also true: governments that embark on orthodox stabilization programs that might well reestab-
lish equilibrium after two years of extreme hardship may not survive the first year. Indeed, the whole effort may break down because the short-term costs are simply too high. These political considerations explain why there appears to be such a distasteful link between “successful” stabilization and political repression.

Clearly, the aim should be to generate a feasible (politically and economically) transition from an unsustainable disequilibrium to some kind of sustainable and desirable new configuration of key magnitudes.

Methodologically, the analysis of transition path requires a dynamic model that can focus explicitly on the relative speeds of adjustments of the important policy and target variables. The problem is illustrated in figure 13-13.

The objective in figure 13-13 is to get from $A$ to the vicinity of $T$. Point $F$ on the horizontal axis measures magnitude of net foreign resources, and point $P$ on the vertical axis measures inflation rate. One can think of a dynamic model of the form

$$\frac{\dot{P}}{P} = f(M, R, X),$$
$$\frac{\dot{F}}{F} = g(M, R, X),$$

and $M \in S_M$, $R \in S_R$, $X \in S_X$, where $M$, $R$, and $X$ stand for monetary policy, exchange rate policy, and fiscal policy (public sector price policy, for
example) and $S_M$, $S_R$, and $S_X$ restrict the paths of various policy variables to feasible sets determined not only by strictly economic considerations but also by the political and institutional context. The problem, then, is to choose the time paths of $M$, $R$, and $X$ to get from $A$ to $T$ and minimize a cost function with arguments such as unemployment, social unrest, and foreign debt. An optimal path could be of the form $AT$ in figure 13-13. But by miscalculating either the short-term economic mechanisms at work or the feasible sets constraining policy choice, one may well end up at point $B$, having for example, triggered off a series of monopolistic wage and price increases and exacerbated the struggle for relative shares by a large devaluation at the time, say, of a bad harvest or a few months before a crucial election. To build such a dynamic framework of analysis is, of course, much easier said than done. But the real problems are dynamic and concern relative adjustment speeds and political constraints. Current dissatisfaction with the theory and practice of stabilization programs will persist until more knowledge is gained about dynamic adjustment processes and until economic analysis is integrated with a constructive analysis of political constraints and feasibilities. This achievement is impossible within the comparative static IS/LM format.

I would like to conclude with two more specific comments. The distinction between devaluation from a position of open (foreign financed) deficit and a devaluation from a suppressed deficit managed by across-the-board import rationing is crucial in evaluating any particular stabilization package. There is, for example, no import cost-push effect from a devaluation that is premium absorbing. On the contrary, the user cost of imports and close substitutes may actually fall after such a devaluation, particularly if it is accompanied by increased foreign resource transfers. In this context it is worth stressing that resistance to devaluation may not always, or only, come from the working class or the left but may come even more strongly from the interest groups that benefit from large import premia and quantity rationing. Turkey in 1978 and 1979 provided the spectacle of a left-of-center populist government fiercely resisting exchange rate adjustments while huge rents were earned by a small group of traders and the distribution of income deteriorated rapidly. At no time were there bigger fortunes made overnight.

Finally, specific supply bottlenecks and constraints from the non-tradable sectors may indeed be very important and cause continuous stagflationary problems, making efforts at stabilization policy and balance-of-payments management even more difficult. But here the answer may lie not in macroeconomic policy but in action at the microeconomic and/or
institutional level. When macroeconomic policy is made difficult or im-
possible by microeconomic structure and institutional constraints, it may
be time to widen "the narrow limits of the possible" by actions other than
macroeconomic policy. Of course, these actions should encompass much
more than the perennial "get the prices right." It is not a coincidence, for
example, that some of the success stories of the last decades occurred in
countries that had benefited from quite radical land reforms. I am thus in
agreement with what I take to be Taylor's basic argument that there is
much more to successful policy than cutting credit and devaluing and that
the state of the art should not allow overconfidence by the IMF or others
in any particular prescription. Every case is different and requires in-
depth, specific analysis. Simple rules applied indiscriminately on the basis
of minimal analysis will not do.

Discussion

Peter Clark (Federal Reserve Board) argued that Taylor's study failed
to demonstrate its central hypothesis that standard policies should be
discarded and that gradualism is preferable to shock treatment. The
model is one of comparative statics, yet a dynamic model showing ad-
justment over time is essential to knowing the effects of policies over the
longer term, the proper time horizon for a stabilization program. Thus
Taylor's conclusion that monetary restraint raises inflation is a short-term
result that would probably be reversed over a period of, say, two years.
Clark pointed out that Taylor's study can have the absurd policy impli-
cations that in the face of inflation and balance-of-payments deficit, the
country should expand the money supply rapidly and revalue. Clark
called for additional research into the best time path for stabilization, and
into the key parameters and economic relations relevant for stabilization
programs. David Overton (Central Intelligence Agency) stated that the
model's characteristics and data requirements made it applicable to only
a few countries.

Lance Taylor accepted that the model was not necessarily generally
applicable. He expressed concern about the emphasis in the comments
on the longer term, arguing that policy is made quarter by quarter. He
agreed on the need to pursue the time path analysis Dervis suggested.
Defending the use of comparative statics and the steady state, he averred
that these are the tools available and that in between is a wasteland.