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A SHORT RUN BALANCE OF PAYMENTS MODEL: ARGENTINA

by

STEPHEN FRANK OVERTURF

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Introduction

The purpose of this thesis is to examine the relative efficacy of monetary and exchange rate policies in Argentina in recent years. The working hypotheses are that each economic policy is independently and measureably effective in altering the balance of trade in the short run, although there exists some a priori presumption against the ability of devaluation (alone) in affecting either the demand or supply of tradeable goods. This presumption stems from the fact that large Argentine devaluations which were not accompanied by fairly restrictive monetary policies have yielded little or no short run balance of payments improvement (i.e., 1955), while those that were accompanied by such restraint have yielded short run improvement (i.e., 1959 and 1962). In spite of these different experiences, official reaction to foreign exchange crises has always included devaluation--presumably with the expectation of at least some short run abatement of the loss of exchange. It is interesting that these quite often large devaluations have typically been paired with "austerity" programs to supplement, or validate, the devaluation, with apparently no question of the differential power of both policies on the balance of trade. In a similar vein, professional studies on Argentina include both those that assume a distinct efficacy of devaluation in producing short run balance of payments improvement, and those that do not. In spite of this clear
dichotomy in both professional thought and official action, there has been, to my knowledge, no explicit recognition of the independent roles changes in the supply of money and changes in the exchange rate play on the balance of payments in Argentina. This study attempts to fill that gap.

The analysis is presented in the following manner. The first chapter reviews the literature of the effects of devaluation and money supply changes on the balance of payments. The literature reviewed includes both theoretical and empirical examinations of these issues, in a general context as well as research relating specifically to Argentina. The second chapter presents the model utilized in examining the route and magnitude of the influence of both policy variables on the Argentine balance of trade. Specification of the model allows for estimation of the appropriate price and income elasticities, as well as allowing for direct testing of the hypotheses. The third chapter discusses the methodology used in the estimation which follows. Included in this chapter are examinations of the estimation procedures, sources and format of the data, and hypothesis testing. Chapter four presents the estimation results. The results include both structural and reduced form results. The former consist of the estimated price and income elasticities of the demand for tradeable products as well as the direct effects of monetary and exchange rate changes on real income and relative prices. The reduced form estimation allows for direct statistical testing of the significance of monetary and exchange rate changes in altering the balance of trade in the short run. Any use of these two
policies may be expected to have large inflationary implications, hence potentially limiting their efficiency. For this reason, the fifth chapter addresses the inflationary implications of monetary and exchange rate policies, and contains an empirical examination of the demand for real cash balances as a function of real income and "consistent" price expectations. The final chapter develops an institutional and historical survey in order to facilitate understanding and evaluation of past policy actions in view of the empirical results of the model. The thesis then closes with conclusions and policy implications, and an outline of areas for further research.
Chapter I

Review of Literature

In the past few years much effort has been applied towards a satisfactory theoretical and empirical explanation of the impact of a devaluation on a country's balance of payments position. The price elasticity effect provided an important starting point for this effort, including as it does the Marshall-Lerner conditions, which indicate the size of demand elasticities necessary to yield an improvement in a country's balance of trade. A change in emphasis, however, followed the introduction of the absorption approach by Alexander. By explicitly including the direct and indirect income effects of devaluation on an economy, Alexander emphasized that a country's balance of trade could be improved if and only if the total production of goods and services increased and/or the total level of domestic absorption declined. Later research efforts have attempted to synthesize the two approaches, the general view now being that the pure elasticity approach


may characterize an economy's reaction in the very short run, but the total effect must include a "reversal" due to income changes. Diaz Alejandro adopted this view in explaining how one of Alexander's "direct effects on absorption"—a redistribution of income—can be used to explain improvement in the balance of payments in Argentina. He did not, however, examine the possible influence of coincidental money supply changes on the trade balance.

Alexander, on the other hand, in his initial article recognizes that there are alternative means of reducing absorption, and therefore, improving the balance of payments. Monetary, fiscal or direct policies may all be employed to deflate an economy and produce the desired results, albeit at a cost in terms of reduced income and welfare. The relatively strong link between Argentine real income, total aggregate demand, and the volume of exports and imports has often been noted in the literature. Historically, balance of trade improvement has not come about through the increased supply of exportables and importables, but rather through changes in the demand for tradeables.

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3. "Importables" as such being no longer produced in Argentina, as will be explained in the next chapter.
The negligible supply response of producers of Argentine exportables—mainly grains and meat—has often been observed, and it seems to be both a long and short run phenomenon. The inelastic long run supply response to a large improvement in relative prices over the period does not bear directly on the issues dealt with here, although the importance of the problem is not intended to be minimized. Many feel that it has influenced Argentine economic and political difficulties more than any other single problem.  

Nevertheless, this paper has been limited to the short run reaction of producers and consumers to economic policy. Various empirical studies have shed some light on some of these short run responses. After separately examining supply responses of cereals, linseed, wool, and beef, Diaz Alejandro finds that "...the assumption...regarding the inelasticity of the short-run domestic supply response of F [foreign-market oriented] goods to an increase in its [sic] relative prices seems justified by the analysis of the likely supply response of rural exportable goods". With these results and the nature of the goods involved, this conclusion on short run exportable supply will be taken as given. In other words, in order to be effective on the balance of payments, policy must be able to affect the domestic demand of imports and/or exportables.

Various estimates of the Argentine import demand function have yielded quite similar results. Both Diaz Alejandro and Mallon, for example, have discovered significant national income (or national income related) coefficients in their import demand functions, with the former yielding a rather high income elasticity of 3.1. Significant price elasticities have not been found, however, with Mallon noting that "What is surprising is that no investigator has yet to my knowledge been able to discover a regression equation for import demand which turns up a coefficient for relative import prices that is statistically significant."\(^3\)

Exportable demand equations have yielded more statistically significant results. Maynard and Van Rijckeghem\(^4\) find a significant national income coefficient of consumption of agricultural commodities, with an associated income elasticity of .75. Unfortunately, another significant variable in the equation includes national income in its composition, bringing into question the independence of the elasticity measure. Curiously, Diaz Alejandro does not directly include income as an independent variable in the demand for per capita exportable

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3. *ibid.*, pp. 14-15. Diaz Alejandro has apparently not had much better luck in including measures of redistribution into the import demand equations. See Exchange Rate Devaluation, p. 58.
commodities and yet still "...emerges with the not unreasonable result that the income elasticity of the demand of wage earners for exportables is less than one." Relative price coefficients have been found to be both significant and small. Maynard and van Rijcheghem's relative price elasticity for these goods is .23, with a standard error of .06. The reported Durbin-Watson statistics for both import and exportable demand functions have been universally low—indicating potential serial correlation for many of these equations.

There have been relatively few empirical studies of the effects of policy variables on income and relative prices. Rates of change of both money supply and exchange rates have been regressed on various price measures, but nothing has yet appeared regressing rates of change of the exchange rate on relative prices, nor have there been any attempts to regress either real or nominal money supply on real national income. The statistical relationship between either money supply or exchange rate changes and the balance of payments also has yet to be estimated.

The purpose of this study, then, is to statistically determine the relationship between monetary and exchange rate policies and the balance of payments in the short run. This will be done in terms of a recursive balance of payments model which will specify the routes of influence of policy on final target variables. The first stage of the model will

1. Diaz Alejandro, p. 91
2. Ibid., pp. 91-92.
4. Unsuccessfully in the case of Maynard and van Rijcheghem, op. cit., p. 214, and quite successfully in the case of Diaz Alejandro op. cit., p. 120.
allow for estimation of the efficacy of both policies on income and relative price changes. The second stage will test the effect of these income and price changes on the balance of payments. The total process will yield consistent and unbiased measures of income and price elasticities, and is considered, along with the direct estimation of policy on target variables, a major contribution of this paper to the literature.
Chapter II

Model

Structural Form

Testing the effectiveness of money supply and exchange rate changes on the balance of payments requires a complete model in order to draw meaningful conclusions on the route of influence of policy variables. The model used in this study is, in exponential form:

\[ M = \alpha_1^{B_{11}} P_{x_1}^{B_{12}} e_1 \]  
\[ X = \alpha_2^{B_{21}} P_{x_2}^{B_{22}} e_2 \]  
\[ Y = \alpha_3^{B_{31}} e_3 \]  
\[ P = \alpha_4^{B_{41}} P_{x_4}^{B_{42}} (1 + t_m^{B_{43}} e_4) \]  
\[ P_x = \alpha_5^{B_{51}} P_{x_5}^{B_{52}} (1 - t_x^{B_{53}} e_5) \]

Endogenous variables include real import demand \( M \), real exportable demand \( X \), real income \( Y \), and relative exportable \( P_x \) and import prices \( P \). The exogenous variables are the real money supply \( m \), real import exchange rate \( k_m \), real export exchange rate \( k_x \), world (dollar) import \( P_{mw} \) and export \( P_{xw} \) prices, percentage import tariff rates \( t_m \) and percentage export taxes \( t_x \). The structural parameters include the income elasticities for import \( B_{11} \) and exportable \( B_{21} \) demand, relative price elasticities for import \( B_{12} \) and
exportable ($\beta_{22}$) demand as well as the policy elasticities of the
effects of money on income ($\beta_{31}$), the import exchange rate on relative
import prices ($\beta_{41}$), and the export exchange rate on relative exportable
prices ($\beta_{51}$). Additional elasticities are those of world import prices
($\beta_{42}$) and tariff rates ($\beta_{43}$) on relative import prices, and world export
prices ($\beta_{52}$) and export tax rates ($\beta_{53}$) on relative exportable prices.
These various elasticities in the model may be determined through linear
estimation techniques if the model is restated in log-linear form:

\begin{align*}
\log M &= \log \alpha_1 + \beta_{11} \log X + \beta_{12} \log Y + \log M + \log e_1 \quad 6) \\
\log X &= \log \alpha_2 + \beta_{21} \log Y + \beta_{22} \log P_X + \log e_2 \quad 7) \\
\log Y &= \log \alpha_3 + \beta_{31} \log m + \log e_3 \quad 8) \\
\log P_M &= \log \alpha_4 + \beta_{41} \log k + \beta_{42} \log P_{MW} + \beta_{43} \log t + \log e_4 \quad 9) \\
\log P_X &= \log \alpha_5 + \beta_{51} \log k + \beta_{52} \log P_{xw} - \beta_{53} \log t + \log e_5 \quad 10)
\end{align*}

Note that besides allowing for linear estimation, this form also
enables one to read the various elasticity measurements directly from
the regression equations. Although this form is used quite frequently,
it should be pointed out that it is not necessarily the only functional
form possible, in that the elasticities may not in fact be constant.
If there exists a relationship between two variables, in other words,
use of the log-linear form may indicate no relationship unless there is
a constant elasticity. As Leamer and Stern point out: "The use of the
linear or log-linear form might therefore be looked on as testing the
significance of a particular functional form rather than the
significance of the particular explanatory variable \(^{1}\). In this instance the multiplicative form seems acceptable, given that the various explanatory variables can be expected to directly and independently affect the dependent variables, although not in the same magnitude.

The model presented in equations 1) through 5), it will be noted, does not include any short run supply responses of tradeable goods. As indicated in the previous chapter this simplification is based as much on the nature of Argentine tradeables as it is on the statistical inelasticities indicated in the existent literature. Also, the capital account has been excluded from direct consideration, although foreign debt service has recently been a very important component of the country's net balance of payments position. Nevertheless, it would seem that if significant improvement of the balance of payments is to occur in the short run in response to changes in policy variables, it must come through the balance of trade. Estimation of import and exportable demand, therefore, has been considered necessary and sufficient to the estimation of short run Argentine balance of payments response.

The dependent variable in equations 1) and 6),

\[
\log M = \alpha_1 + \beta_{11} \log Y + \beta_{12} \log P + \log e_1
\]

is real import demand \((M)\) and not real importable demand. Import substitution during most of the period under review had progressed so far in the final goods stage (under the umbrella of heavy import surcharges) that by 1959-61 consumer goods imports comprised 8.9 per cent of all

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imports and less than 1 per cent of national income.\footnote{Diaz Alejandro, op. cit., p. 48. They consisted mainly of tropical food products. See also David Felix, "Import Substitution and Industrial Exporting: An Analysis of Recent Argentine Experience," Mss. p. 20.} Intermediate inputs and capital goods, on the other hand, given much less protection, were and are imported heavily.\footnote{Villanueva, p. 122.} There is, therefore, practically no domestic competition with imports at any stage of production or consumption. Thus, even though there is a major link through inputs, the industrial sector of Argentina could not be characterized as "importable" (in that the prices of final output are not influenced by foreign demand and supply conditions for the same goods).

The independent variables in equations 1) and 6) reflect demand theory in making demand a function of income ($Y$), the price of the product ($s$), and the prices of other commodities. Although specification of real income as an independent variable in a sense presupposes the absence of money illusion, such a presumption does not seem unacceptable in an economy quite used to the phenomenon of rapid price level changes. The coefficient $\beta_{11}$ is then the income elasticity of the demand for imports.

The price of the product and other commodities prices may be combined into one explanatory variable--relative import prices ($P_M$)--by deflating import prices by an appropriate price index. The coefficient $\beta_{12}$, therefore, may be read as the relative price elasticity of import demand, since the variable $P_M$ has been so constructed.
Orcutt in 1950¹ suggested that measured price elasticities may understate actual price elasticities, for five reasons:²

(1) Lack of independence between relative prices and random deviation in the import-demand function.
(2) The data may reflect errors of observation.
(3) The use of data aggregates may give undue weight to goods with relatively low elasticities.
(4) Short-run elasticities were measured and these are typically lower than long-run elasticities.
(5) Devaluation elasticities were larger than the estimated short period elasticities, which reflect adjustment to small price changes.

Points 2) and 3) will not be commented upon.

Point 1) is not a problem if the supply curve of imports is highly elastic. "Thus, in the case of a small country that imports only a relatively small fraction of total world exports, it may be quite realistic to assume an infinitely elastic supply schedule."³ Such an assumption seems viable for Argentina.

Point 4) is not a problem in that this study is short run.

Point 5), however, needs further elaboration. If the point is that large price changes (induced by devaluations) will produce greater percentage changes in demand than small price changes,⁴ it may be observed that the period under consideration was not one of minimum changes in relative prices, from which an unjustified extrapolation could be made. Devaluations and changes in relative prices were both frequent and large. Another problem that then arises, however, is whether it is reasonable to assume a relatively complete short run response period.

² Cited in Leamer and Stern, p. 29.
³ Ibid., p. 31.
⁴ i.e., elasticity is not constant.
If "...the adjustment of quantity depends on the past history of price changes and the sequence of price changes within the relevant period as well as the total price change within the period,"\(^1\) then the concept of short run price elasticity may be quite misleading. By assuming a short run response period of one year this analysis, in fact, remains open to such criticism.

The second equation in the functional form,

\[ \log X = \log \alpha_2 + \beta_{21} \log Y + \beta_{22} \log P_X + \log \varepsilon_2 \]

denotes the domestic demand for exportables.

The term "exportable", meaning goods that are both consumed domestically and exported, is used in its pure sense, because the main Argentine exports are agricultural products, "...basically meat, wool, leather, livestock by-products, cereals, and oils...",\(^2\) which are also consumed domestically in very large amounts.\(^3\) Given, then, the near constant supply of exportables (with regards to policy changes anyway), and the nature of exportable products in Argentina, changes in demand feed more or less directly into changes in exports, and therefore, the balance of payments.

Similar to the demand for imports the first independent variable is real income and \(\beta_{21}\) is the income elasticity. Real exportable

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1. Ibid., p. 21.
2. Aldo Ferrer, in Baer and Kerstenetzky, Inflation and Growth in Latin America, p. 518. More than 95 per cent of Argentine exports are made up of agricultural products.
3. Exports make up approximately 30 per cent of agricultural production. There is, therefore, a very significant link not only between exports and domestic consumption, but also between the price of exports and the cost of living of the average wage earner.
demand is also considered a function of relative exportable prices, with $\beta_{22}$ the relative price elasticity. Use of a single price variable (relative tradeable prices) was initially considered, and could be theoretically justified under the expectation that the rates of change of both import and exportable prices move in the same direction and magnitude as the rate of change of the exchange rate. A test of this proposition should yield both regression and correlation coefficients near one with regression of the rates of change of relative import on relative exportable prices. Use of data for these variables for Argentina (1950-1964) produced a regression coefficient of .778 and correlation coefficient of .476. Since the identity relationship posited was not readily apparent, it was decided not to use a composite relative price variable.

Equations 6) and 7) together, given the assumptions previously stated on supply reactions and treatments of the capital account, are considered sufficient to draw implications on short run balance of payments response to income and price changes.

The third equation relates real income ($Y$) with the real money supply ($m$):

$$\log Y = \log \alpha_3 + \beta_{31} \log m + \log e_3$$  \hspace{1cm} 8)

The exclusion of other policy variables which might influence real income does not deny their existence, but it does limit empirical tests to those that are of primary concern in this study. Real money supply has been used so as to be able to correctly distinguish relative constraint or ease in terms of concurrent rates of inflation. The
regression coefficient $\beta_{31}$ denotes the elasticity of income with respect to the real money supply. If this elasticity assumes a value of one then income velocity changes will equal zero. For values less than one there will be slippage between short run changes in the real money supply and real income, the difference being changes in velocity.

The real stock of money as an exogenous variable deserves some comment. Institutional, theoretical, and statistical considerations combine to yield a preference for this variable in the model.

Institutionally there is evidence that the monetary authorities regard real changes in money more as an instrument to induce desired alteration in the real economy than they do nominal money supply growth. The terms "constraint" or "ease" in money supply growth, that is to say, are increasingly being viewed as dependent upon concomitant rates of inflation. It is, of course, quite possible to have excess demand for money even though the rate of money creation is positive, as long as the determinants of money demand (including price expectations) are greater still. The Argentine authorities have frequently been faced with vehemently expressed fears of illiquidity on the basis of positive rates of nominal money creation.¹

It may well be the case, however, that although the monetary authorities have the desire to affect real money they do not have the

ability to do so. Changes in the nominal money supply may give rise to other changes which prevent any control over real cash balances. Those using a rather newer version of the quantity theory of money suggest that holders of money "...can make the real amount of money anything that in the aggregate they want to"\(^1\). An increase in real cash balances above the desired level through nominal money creation "...will raise the flow of expenditures and hence money income and prices and thereby reduce the real quantity of money to the desired level"\(^2\). Unless one accepts the neoclassical world as realistic, however, the possibility of short run unemployment breaks a proportional lock-step between money and prices. It is not even necessary to recognize the possibility of a long term under-full-employment equilibrium and still regard money as having some influence on real variables. As Rousseas points out, "...there is nothing in Friedman's formulation that posits a unique and stable equilibrium at full employment. Therefore, except by happenstance, the price level will not change in exact proportion to a change in the stock of money. More likely, both prices and real output will to some degree be affected"\(^3\). Laidler also feels that "...variation in the rate of monetary expansion can have impact effects on the level of real income and employment in a short-run that may well be long enough to be interesting to economic historians and policy

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2. Ibid.
makers\textsuperscript{1}. Even Friedman allows that if "...money-creating institutions expanded the nominal quantity of money, this could have effects, at least in the first instance, on rates of interest and so on the quantity of money demanded, and perhaps also on money income and real income"\textsuperscript{2}. If the real sector can be affected in the short run by nominal money growth then, even though velocity is constant, one may expect prices to rise by a smaller proportion than money--producing a change in real cash balance supply.

This is not intended to mean that money-creating institutions can exogenously change an economy's demand for real cash balances, but it does mean that the monetary authorities can exogenously control the growth of real cash balances as long as prices are not expected on average to rise sufficiently to offset the growth of nominal money balances. Nominal money growth, in other words, may give rise to changes within the economy which increase the demand for real cash balances.

Interestingly enough, there is in this proposition no necessity for the real sector to be altered upon a change in the real money supply. With a perfectly elastic demand curve for cash balances, for example, income velocity may merely change sufficiently to offset the increase in real cash balances. Under these circumstances real money could still be considered an exogenous variable--albeit a sterile one. Equation 8) will be empirically tested to statistically establish the hypothesized relationship between real money and real income.

\textsuperscript{1} David Laidler, "The Influence of Money on Real Income and Inflation," Manchester School of Economic and Social Studies, December, 1973, p. 372.
\textsuperscript{2} Op. cit., p. 5.
It would appear then, that there are some statistical requirements for consideration of real money changes as an exogenous variable. The first is an historical record of short run price level changes unequal in magnitude to simultaneous money supply changes. If prices responded in the same magnitude to accelerations or decelerations of nominal money growth the authorities could not expect to control the real money supply. In addition it would be important for prediction purposes if the relationship between nominal money growth and inflation were stable, statistically significant, and linear. Work in Chapter V provides an estimate of this relationship. Results from two measures of overall inflation indicate the posited significant linear correlation, with annual elasticity measures less than one. Hence one may proceed with some confidence in regarding real money changes as a causal exogenous variable in testing for the effects of relative ease or constraint of monetary policy on real income.  

A more explicit causal linkage between money and income is not specified in the model. The model does not indicate the channels through which money supply changes can be expected to affect the real economy, and therefore, the model cannot be used to indicate whether money acts through a credit constraint, as Maynard and van Rijckeghem posit, or in more traditional real cash balance or interest rate (implicit) channels.


Note that the other policy variable being examined, the exchange rate, is not included as a determinant of real income. The joint assumptions of no importable production and zero exportable supply response means that the ability of devaluation to change income in the short run has been removed. Interestingly, the Two-Stage Least Squares approach, by including all exogenous variables in the estimation, provides for a type of independent test of this presumption.

The fourth equation relates relative import prices \( P_M \) to the real import exchange rate \( k_m \), world import prices \( P_{mw} \), and import taxes \( t_m \):

\[
\log P_M = \log \alpha_4 + \beta_{41} \log k_m + \beta_{42} \log P_{mw} + \beta_{43} \log t_m + \log e_4
\]  

\( 9 \)

Money is not included here as an independent determinant of domestic import prices since real money supply changes cannot, in this model, affect relative import prices as long as both variables are properly deflated.\(^1\) The real import exchange rate, on the other hand can be expected to directly affect relative import prices. With both variables deflated the resultant relationship is a direct one—the influence of exchange rate changes on the domestic price of items whose dollar price is determined on the foreign market. That is, the domestic price of imports can be expected to bear any relationship to the foreign price, depending upon the exchange rate; and the value for \( \beta_{41} \) in equation 9) gives the elasticity of the relative price of imports with

\(^1\) Although nominal money supply changes could be considered a determinant of the denominator of relative import prices through their influence on aggregate demand and hence on overall price changes.
regards to real import exchange rate changes. The real exchange rate is considered the proper independent variable in that, like the nominal money supply, it is a monetary variable, and with large rates of domestic inflation (relative to the rest of the world) it best characterizes changes in the relative cost of foreign exchange.\footnote{1} Results from Chapter V on the overall price elasticity of the exchange rate lend credence to the ability of the authorities to control real changes in the exchange rate.

Another determinant of domestic import prices must be world, or dollar, import prices (with an elasticity of $\beta_{42}$). This variable is considered as exogenous, and zero reverse causality through the balance of payments, i.e., from the lowered amount demanded to the foreign price, is assumed. Again the small country assumption seems justified for Argentina.

A third potential determinant of domestic import prices is changes in the import protection structure, here denoted by changes in percentage import taxes, carrying an elasticity measure of $\beta_{43}$. As percentage tariffs are changed one may certainly expect a similar percentage increase in domestic import prices, especially where import demand is small in relation to world demand.

The final functional form equation relates relative exportable prices ($P_x$) to the export exchange rate ($k_x$), world export prices ($P_{xw}$)

\footnote{1. The National Development Plan prior to the 1966 Revolution explicitly included among its aims of exchange policy "maintenance of a flexible exchange rate adjusted in accord with changes in the domestic price level". Quoted in Mallon, "Exchange Policy," p. 177.}
and export taxes ($t_x$):

$$\log P_x = \log \alpha_5 + \beta_{51} \log k_x + \beta_{52} \log P_{xw} - \beta_{53} \log t_x + \log e_5 \quad (10)$$

The relative price elasticity of real export exchange rate changes is $\beta_{51}$, and the same general remarks on import prices also apply here. One exception is the small country assumption. Although the curve as faced by Argentina for its exports is not perfectly elastic, it is probably elastic enough to allow for the assumption that Argentina must consider herself a price-taker for the goods, and the world price is thus assumed to be exogenous. The case is not always clear, however, in that "...the experience of Argentina in trying to market the large 1964-65 wheat crop is another example where it was apparently necessary to take a severe beating on price in order to get rid of the stuff".

Export taxes are also included, at least in the basic model, as a determinant of domestic export prices--since their imposition does lower the effective rate of exchange. These taxes have occasionally been imposed along with large devaluations as a temporary measure to sop up windfall profits on existent stocks and avoid a discontinuous shift to private liquidity. In the revised model used in the estimation process (below), these taxes are ignored since it is not clear how exportable price-setters can be expected to behave with regard to the temporary nature of the lowered effective rate. The taxes have not been of great magnitude in any case, with most control of effective exchange rates

being exercised with the "aforo" method of exchanging currency. It must be stated, however, that some minimal downward bias on the estimation of equation 10) may result.

Revised Model

The model presented to this point will be altered prior to estimation in order to make the specification of the model somewhat more consistent with the stated hypotheses of the thesis. The exogenous variables will be limited to the money supply and the exchange rate as they are the policy variables of major concern in this study. In order to avoid specification error, the appropriate exchange rates will, nevertheless, be adjusted for world prices and import taxes, with the knowledge that the authorities can alter these effective exchange rates (including the protection structure and, if necessary, offsetting world price changes) to yield the desired stimulus or constraint on the foreign goods sector. The revised model, in log-linear form, is:

\[
\begin{align*}
\log M &= \log \alpha_1 + \beta_{11} \log Y + \beta_{12} \log P + \log e_1 \\
\log X &= \log \alpha_2 + \beta_{21} \log Y + \beta_{22} \log P + \log e_2 \\
\log Y &= \log \alpha_3 + \beta_{31} \log m + \log e_3 \\
\log P_M &= \log \alpha_4 + \beta_{41} \log k_{ma} + \log e_4 \\
\log P_X &= \log \alpha_5 + \beta_{51} \log k_{xa} + \log e_5
\end{align*}
\]

Equations 6) through 8) remained unaltered. Equation 9) includes as the only influence on relative import prices the real import exchange rate adjusted for world price changes and tariff rate changes \(k_{ma}\). The exchange rate itself is an effective one derived as a ratio of import figures in pesos and U.S. dollars. This is necessary as an
"aforo" system of multiple rates was used over much of the period, whereby varying proportions of foreign currency had to be secured at the official rate, the rest coming from the free market. Dollar import price changes further adjust the rate, although separate estimation experiments indicated little specification bias, undoubtedly because they have been quantitatively swamped by exchange rate changes. Finally, changes in percentage tariff rates are included in the adjusted rate. As opposed to temporary export surcharges, the effect of import taxes on domestic import prices is unambiguous, and has been quantitatively large (especially in one year--1960).

Another form of protection, import quotas (exercised through exchange licenses), is more difficult to incorporate. For this reason, the appropriate equations (in both structural and reduced forms) are tested and presented both including and excluding high import quota years.

Equation 10) is constructed in much the same way as equation 9), with the only influence on relative exportable prices being the real effective export exchange rate, k_xa , adjusted for world export prices.

1. "For Argentina, export and import data are presented in terms of both Pesos and Dollars. The peso values are calculated and published by the Argentine National Statistical Office. They are based on foreign currency values as declared to customs. The peso value is calculated for each shipment by applying the official and free market rates appropriate for each transaction. However, export surcharges are not deducted from, or import surcharges added to, the peso values so calculated." International Monetary Fund, "International Financial Statistics," January, 1962.

2. "...which serve as authority both to import and to obtain the necessary exchange for payment." IMF, "Report on Exchange Restrictions--1956," p. 345.
Reduced Form

The reduced form of the structural model presented above entails expressing the endogenous variables, real import and exportable demand, as functions of the exogenous real money supply and real exchange rates, as in equations 11) and 12):

\[ \log M = a_1 + b_{11} \log m + b_{12} \log k + b_{13} \log k_{\text{ma}} + u_1 \]  
\[ \log X = a_2 + b_{21} \log m + b_{22} \log k + b_{23} \log k_{\text{xa}} + u_2 \]

Inclusion of separate import and export exchange rate variables into this reduced form may be expected to result in some of the problems attendant with multicollinearity if there is a high degree of intercorrelation between the variables. Regression of \( \Delta \log k_{\text{xa}} \) on \( \Delta \log k_{\text{ma}} \) (for 1950-1964) yielded a correlation coefficient of .805. It is possible in these cases to select a subset of instrumental variables (or proxies) for the highly correlated variables. The average real exchange rate applied to merchandise imports and exports (k) was adopted as such a proxy in this instance, making the reduced form:

\[ \log M = a_1 + b_{11} \log m + b_{12} \log k + u_1 \]  
\[ \log X = a_2 + b_{21} \log m + b_{22} \log k + u_2 \]

A similar problem arises with estimation of the first stage of the Two Stage Least Squares method, where all of the predetermined variables are used in the first stage. Equation 8), for example, would also include both \( k_{\text{ma}} \) and \( k_{\text{xa}} \) in the estimation, as well as the real money supply. Once again, "...to avoid severe multicollinearity in the first stage, the variables Y* may each be represented in terms of their principal components or by a selected set of instruments which gives the
best forecasts of Y**. Testing on \( k_{ma} \) and \( k_{xa} \) again seemed appropriate.

In the same fashion \( k_{ma} \) and \( k_{xa} \) were used as the sole exchange rate variables in equations 9) and 10) respectively.

Requirements

Two requirements must be satisfied prior to parameter estimation of the equations in a model: mathematical completeness and identification. These are characteristics of the model and not the estimation procedure.

Mathematical completeness requires that the endogenous variables be uniquely determined. That is, the number of independent equations must equal the number of endogenous variables in the model. Both are equal to five, as is revealed by reference to the complete functional form in the revised model, equations 6) through 10).

Identification requires that the structural parameters be uniquely determined. The order conditions for equation identification indicate that the first two equations are overidentified. Thus, the requirements for estimating the demand for imports and exportables are satisfied by the model since there are at least enough instrumental variables.

3. The endogenous variables are, once again, real import demand (M), real exportable demand (X), real income (Y) and relative exportable \( P_X \) and import \( P_M \) prices.
4. See Wonnacott and Wonnacott, Chapter 18.
5. See J. Johnston, *Econometric Methods*, 1964, p. 239, for methods of dealing with overidentification, including Two Stage Least Squares.
In summary, use of the mathematically complete and identified model introduced in equations 6) through 10) will allow for two things. First, estimation of the structural form will allow for examination of the income and price elasticities of tradeable demand in order to be able to specify the route of the influence of policy. Secondly, estimation of the reduced form, equations 11) and 12), will allow for determination of the efficacy of monetary and exchange rate policy on the Argentine balance of payments.
Chapter III
Methodology

Estimation

The reduced form equations presented in equations 11) and 12) will be estimated by the method of Ordinary Least Squares. Although reduced form coefficients may presumably be derived from the structural form estimation, direct estimation may be used, and has the advantage of explicitly allowing for hypothesis testing of the predetermined variables.

Solution of the structural form equations will be derived by the method of Two-Stage Least Squares. The dependent variables in the last three equations will be estimated in the first step by OLS using all of the predetermined variables as regressors. The second stage is to regress the dependent variable in the first two equations on the predicted values of the independent variables.

It will be recalled that the model presented in Chapter II is recursive. Rearranging equations and variables, equations 6) through

2. Ibid., p. 236.
10) may be represented as:

<table>
<thead>
<tr>
<th>Exogenous Variables</th>
<th>Endogenous Variables</th>
<th>Disturbances</th>
</tr>
</thead>
<tbody>
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<td>( m ) k ( \beta_{i1} ) k ( \beta_{41} )</td>
<td>( Y ) ( P ) ( P ) ( M ) ( X ) ( e_3 ) ( e_4 ) ( e_5 ) ( e_1 ) ( e_2 )</td>
<td>( 1 ) ( 1 ) 8)</td>
</tr>
<tr>
<td>( -\beta_{31} )</td>
<td>( 0 ) ( 1 ) ( 1 ) 9)</td>
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</tr>
<tr>
<td>( -\beta_{41} )</td>
<td>( 0 ) ( 0 ) ( 1 ) ( 1 ) 10)</td>
<td></td>
</tr>
<tr>
<td>( -\beta_{51} )</td>
<td>( -\beta_{12} ) ( 0 ) ( 1 ) ( 1 ) 6)</td>
<td></td>
</tr>
<tr>
<td>( -\beta_{21} ) ( -\beta_{22} ) ( 0 ) ( 1 ) ( 1 ) 7)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Malinvaud states that the necessary condition for recursiveness is "...if there exists an ordering of the endogenous variables such that the [matrix of endogenous variable parameters] is triangular...".\(^1\) This requirement clearly holds and is interpretable as meaning that the "...endogenous variables are determined in a certain logical sequence or causal order which is reflected in the triangularity of the coefficient matrix".\(^2\) No endogenous variable, in other words, enters into the explanation of any endogenous variable below it in the causal chain. Equations 8), 9) and 10) are in the first causal order,\(^3\) and equations 6) and 7) in the second. If return influence from the balance of trade back to real income or relative prices were introduced into the model, with relaxation of the completely inelastic supply or small country assumptions, for example, it would become simultaneous and not recursive in nature.

---

3. "If any endogenous variable is a function only of exogenous variables, we assign it to causal order 1." Ibid.
Recursive models are often estimated by utilizing OLS on each separate equation in the structural and reduced form.\textsuperscript{1} This yields unbiased and consistent estimators, but only if there is independence in the errors, or more specifically here, if the errors show no serial correlation.\textsuperscript{2} Although there is no simultaneous equation bias in recursive models, there may still be bias introduced through the error terms. As noted in the first chapter, the practically universal reporting of low Durbin-Watson statistics in Argentine import and exportable demand functions gives rise to the suspicion of strong serial correlation.

A method of dealing with this problem of bias arising out of suspected errors in the variables is the instrumental variable approach in general\textsuperscript{3}, and 2SLS in particular\textsuperscript{4}. Use of this method can be expected to yield unbiased and consistent estimates of the structural coefficients in the model.

\textsuperscript{1} See C. E. V. Leser, \textit{Econometric Techniques and Problems}, 1966, p. 45.

\textsuperscript{2} Malinvaud, p. 513.

\textsuperscript{3} "The bias is removed if the endogenous variables are, in appropriate places, removed and replaced by predetermined instrumental variables; consistent estimates are then obtained." Leser, p. 58.

\textsuperscript{4} See Wonnacott and Wonnacott, p. 192. Instrumental variables, incidently, can be most helpful when there is significant multicollinearity between independent variables—as between real income and import prices. Unfortunately, real money supply and exchange rate changes are similarly correlated with the result that the estimation process is not particularly improved in this regard.
As Malinvaud points out:

To sum up, if we are sure that we have to deal with a recursive model in which the errors occurring in the two structural equations are mutually independent, we shall prefer the direct regressions on the structural equations. Even apart from the ease of computation, the corresponding estimators seem to enjoy the better statistical properties.

On the other hand, if we suspect that there is a substantial correlation between the errors affecting the different relations, we may prefer the indirect regressions in spite of the triangular form of the matrix of the coefficients, in order to avoid the effects of a 'specification error'.

These conditions apply generally. Indirect regressions, two-stage least squares and the other methods of the same kind can very well be used for estimating models in which the matrix of the coefficients is triangular. It is only when the errors affecting the various structural equations can be considered as mutually independent that the direct regressions on the different structural equations have a definite advantage.

Data

Annual data is used throughout. Data availability and the time dimension of the model in this case fortunately coincide, although as indicated above, it is only assumed that this is the appropriate reaction structure in regard to time.

All variables are expressed as first differences of common logarithms. In addition to providing the correct elasticity measures, this data form better isolates the short run response of the variables involved.

All data, unless otherwise noted, come from the Statistical Appendix of C. F. Diaz Alejandro, Essays on the Economic History

of the Argentine Republic, mimeo. Tables below refer to this source.

The real money supply variable \( (m) \) is nominal money, currency
and bills in the hands of the public plus private demand deposits,
in billions of current pesos at the end of the year, Table 65,
divided by the implicit price deflator of Gross Domestic Product
at factor cost \((1960 = 100)\), Table 35. The implicit price deflator
for 1949 was interpolated from Table 34.

The real exchange rate \((k)\) is the average exchange rate applied
to merchandise imports and exports, paper pesos per one U.S. dollar,
Table 62, also divided by the GDP implicit price deflator, Table 35.
In the estimation of equation 9), an adjusted average import exchange
rate \((k_{ma})\) is used. The import series (Table 62) was adjusted for world
import price changes, changes in the protection structure, and the rate
of inflation (Table 35). World price changes were computed from
Indices of Dollar Unit Values of Merchandise Imports by Main Categories,
1951-1965 (Table 48) and from Indexes \((1950 = 100)\) of Export and
Import Prices in U.S. Dollars (Villanueva, p. 89). Changes in the
protection structure were computed from changes in the average tariff
rate (from various issues of International Monetary Fund, "Report
on Exchange Restrictions," Washington, D. C.) weighted by the Value
of Merchandise Imports in Current Million Dollars by Main Categories,
1951-1965 (Table 45). For equation 10) estimation of the export rate
\((k_{xa})\) is similarly adjusted for changes in the Indices of Dollar Unit
Values of Merchandise Exports by Main Categories 1951-1965 \((1956 = 100)\),
using an average of Livestock and Agricultural Exports (Table 58 and
Villanueva, p. 89).
Real income \((Y)\) is real Gross Domestic Income, in billions of pesos at 1960 prices. Table 7-A.

Relative exportable prices \((P_{X})\) are rural wholesale goods prices divided by the overall wholesale price index, 1939 = 100, Table 39.

Relative import prices \((P_{M})\) are imported goods prices divided by overall wholesale prices, 1939 = 100, Table 39.

Real imports \((M)\) are all merchandise imports, in dollars (100 million) at 1955 prices, Table 48.

Real exportable demand \((X)\) consists of meat and other rural goods consumed, in billions of pesos at 1960 prices, from Table 7-B.

The data used in the model estimation is presented in Tables III-1 and III-2. Note that data availability will limit regressions involving real exportable demand to the period 1951-1961. Other variables are developed as needed.

Hypothesis Testing

The hypotheses of this study are that changes in both the real money supply and the real exchange rate are in some way "effective" on the balance of payments in the short run. A more precise statement of these hypotheses is needed for statistical testing.

The first hypothesis, that changing the real money supply is effective on the balance of payments in the short run, may be restated by establishing the null hypothesis that there is no statistical relationship between the real money supply and both (a) exportable demand and (b) import demand. The alternative hypothesis will be accepted if
### Table III-1

**Raw Data**

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<th>Year</th>
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<th>Nominal Exchange Rate</th>
<th>Nominal Import Exchange Rate</th>
<th>Nominal Export Exchange Rate</th>
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Table III-1 (continued)

Raw Data

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<th>Relative exportable prices</th>
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the null is rejected, with use of a t-test to insure minimization of the probability of incorrect rejection.¹

Likewise the second hypothesis will have a null hypothesis that there is no statistical relationship between the real exchange rate and exportable and import demand. This case is a bit different, a priori, than that of the money supply, for here there exists some presumption in favor of the null hypothesis. Even with this prior presumption, however, if there proves to be insufficient statistical evidence to reject the expected null hypothesis, there is also not sufficient evidence to accept it (in light of the possibility and costs of an invalid acceptance). It is true that this problem "...becomes less acute if there is some expectation that \( H_0 \) [the null hypothesis] is true..." and "...that classical statistical theory provides incomplete grounds for accepting \( H_0 \); acceptance must be based on extra-statistical judgment, with prior belief playing a key role"². Nevertheless, and in spite of high frequency of the practice in the literature, one is on unsure ground in accepting a possibly incorrect null hypothesis.

In this case it seems superior, given the prior presumption against the significance of the exchange rate and related price variables, to test these as to their significance as the last included regressors. With negative results they may then be dropped, since they do not add significantly to the explanatory power of the model. Moreover, a clear advantage may emerge from this process if there is strong

1. The structural parameters will be similarly treated.
2. Wonnacott and Wonnacott, p. 66.
multicollinearity among the explanatory variables. As Leamer and Stern emphasize, when "...two explanatory variables are statistically correlated, least squares regression divides the explanatory power between them and both may take on relatively large standard errors". Elimination of one of the variables may then improve the explanatory power of the model. They go on to point out, however, that when "...one variable is removed from the regression, the other will gain in significance but the coefficient becomes biased". This drawback would not seem to hold as long as, once again, the last regressor had little or no relationship to the dependent variable.

The test that will be used is an F-test comparing the variation explained by adding the last regressor to the total residual variation. The formula used is:

$$F = \frac{r^2(n - 1 - k)}{1 - r^2}$$

where $r$ is the partial correlation coefficient $r_{yx \cdot x_1}$\textsuperscript{4}. The last variable ($x_2$) adds more than a random amount to the explanation of the dependent variable ($y$) when $F$ is "large''.

\begin{itemize}
  \item[1.] Op. cit., p. 36.
  \item[2.] Ibid.
  \item[3.] In any case the coefficients prior and post elimination may be compared for the introduction of bias.
  \item[4.] See Wonnacott and Wonnacott, p. 309.
\end{itemize}
Chapter IV

Results

Results of the estimation procedure will be presented in what has become the customary format, with the standard error of the estimates beneath the regression coefficients. Coefficients (elasticities) significant at the 95% level are denoted with a single asterisk, those at the 99% level with a double asterisk. The Durbin-Watson statistics (d) and the coefficients of multiple determination ($R^2$) are also presented. Interesting partial and single correlation coefficients are given in the text rather than presenting their total matrices for each equation.

Reduced Form

Equations 11) and 12) were directly estimated by OLS in order to determine the effects of the policy variables on the demand for exportables and imports.

Regression of exportable demand for the years 1951-1961 yields the following:

$$\Delta \log X = .008 + **.625 \Delta \log m + .065 \Delta \log k \quad R^2 = .826$$

$$\quad (.108) \quad (.067) \quad d = 1.6052$$

As can be seen from the equation, the real money supply is significant at the 99% level, a result reinforced by a partial correlation coefficient of .853. The elasticity measure is rather high as well, meaning that a 10 per cent increase in the real money
supply can be expected to increase real exportable demand by about 6 per cent.

The exchange rate coefficient is not significantly different from zero, and is actually of the wrong expected sign. The simple correlation coefficient between the exchange rate and exportables is "small" (-.224) and of the right sign, but the partial, like the regression coefficient, evidences the wrong a priori sign (+.269). It should be noted that the regression coefficient is not only not significant, but is quite small in magnitude. Leamer and Stern indicate that some "...have argued that there are really two distinct reasons why an estimate is deemed not significant. In the one case, standard errors are small but the point estimate is near zero. In the other case, standard errors are large and the point estimate may be anywhere. The general feeling is that in the first case the value of the elasticity is truly near zero while in the second case its value is unknown."¹ The small exchange rate elasticity reported in this equation thus strongly suggests that there may be no relation between devaluation and exportable demand in the short run.

The coefficient of determination in the equation is quite high, explaining 83 per cent of the total variation in the dependent variable. The Durbin-Watson statistic allows one to reject the hypothesis of positive serial correlation. One other statistic, the simple correlation coefficient between the independent variables (-.416)

indicates the presence of some multicollinearity, which can, once again, cause the standard errors to expand.

The reduced form import demand function for the years 1950-1964 is:

\[ \Delta \log M = 0.0004 + 0.313 \Delta \log m - 0.015 \Delta \log k \quad R^2 = 0.074 \]

\[ (0.437) \quad (0.273) \quad d = 2.0588 \]

The real money supply coefficient is not significant, although the simple (.226) and the partial (.201) both evidence some minimal correlation.

The exchange rate coefficient is now of the right sign, but is still very close to zero, indicating very little relationship. The coefficient is nowhere near significant, the simple correlation coefficient is low (.106), and the partial is lower still (-.016).

The coefficient of determination indicates that most of the variation is left unexplained, although there is no autocorrelation.

Part of these very poor results could perhaps be explained by the existence of exchange controls during the postwar years. Eshag and Thorpe have pointed out that elimination of these controls was begun in the mid 50's, although some import controls remained in force throughout the decade. In order to test this hypothesis of a closer relationship between the policy variables and imports without controls, the same regression was repeated for the period 1954-1964:

\[ \Delta \log M = 0.022 + 0.820 \Delta \log m + 0.032 \Delta \log k \quad R^2 = 0.326 \]

\[ (0.506) \quad (0.265) \quad d = 1.9835 \]

Note the improvement in the money supply coefficient. The coefficient is high, indicating a large effect of real money supply change on real imports; and both the simple (.569) and partial (.499) correlation coefficients are quite respectable. The regression coefficient is still not significant at the 95% level (although it is at the 90% level), leading back once again to the suspicion of multicollinearity.

Elimination of these years does not seem to have altered the status of the exchange rate coefficient—it is still quite close to zero and is insignificant.

Improvement in the explanatory power of the money supply has also increased that for the entire equation—to about 33 per cent. The Durbin-Watson remains high.

Combining the results from both equations, it is apparent first that the money supply is a significant variable affecting the balance of payments—although the effect on imports remains somewhat in doubt. The exchange rate, on the other hand, does not appear to be an important variable in explaining the balance of trade. Besides the lack of significance, the quite low regression coefficients in both cases argue for a strong presumption of a zero balance of trade elasticity of the exchange rate, in the short run at least. This presumption is further supported by noting from Table IV-1 (A. and B.)

1. The simple correlation coefficient between the independent variables for these years is -.608.
that the F-tests indicate no significance for the exchange rate as the last regressor in either of the reduced form equations. Although all of this does not allow for outright acceptance of the null hypothesis, the evidence clearly suggests elimination of the exchange rate as an important determinant of short run balance of payments changes.

Structural Form

The structural parameters of the model were estimated by 2SLS, with the first stage indicating the effects of the two policy variables on income and relative prices.

Real income regressed on real money and the real exchange rate gives:

\[
\begin{align*}
\Delta \log Y &= 0.012 + **.335 \Delta \log m + .001 \Delta \log k \\
R^2 &= .593 \\
(0.086) &\quad (0.054) \\
d &= 2.0689
\end{align*}
\]

Real money is significantly related to real income, and at the 99% level of significance. The magnitude of the elasticity measure seems especially interesting, in that it indicates that a ten per cent increase in the real money supply can be expected to result in more than a three per cent increase in real income,\(^1\) and vice versa. As a corollary to this result, there appears to be a large change in velocity associated with changes in the money supply. There is quite a bit of slippage between the instrument and the target, in other words,

---

1. Presumably this magnitude would drop considerably as full employment is approached. In addition, price increases which accompany nominal money supply increases (see Chapter V) may mean that any given increase in real money and real income could be quite inflationary.
although the relationship remains strong—the partial correlation
between the variables being .748. Viewing these results from a slight-
ly different angle, the efficacy of monetary policy in Argentina is
limited somewhat due to changes in the demand for real cash balances
which are other than strictly proportional to changes in real income.
These changes in the demand for real cash balances will be explored
in some detail in the next chapter—with explicit attention being
paid to the role of price expectations in determining real money demand.

The exchange rate is not included in the model as being a major
influence on real income, but the 2SLS process allows for some sepa-
rage examination of this assumption (by including all of the exogenous
variables in the OLS first stage regression). The presumption appears
to have been justified, with (a) an extremely low regression coeffi-
cient which is (b) not significant, and (c) a partial correlation
with the dependent variable of -.010.

For the entire equation, the coefficient of determination signifies
that about 60 per cent of the variation in the dependent variable is
explained, and the d-statistic indicates no autocorrelation.

Using the same independent variables on relative exportable
prices gives:

\[ \Delta \log P_x = .005 + .096 \Delta \log m + **.191 \Delta \log k^{xa} \]
\[ R^2 = .427 \]
\[ (0.119) \quad (0.064) \quad d = 2.4444 \]

1. These results differ from Friedman's cyclical results for the
United States, where he finds that "...income velocity tends to rise
during cyclical expansions when real income is rising and to fall during
cyclical contractions when real income is falling—that is to perform
2. But substituting \( k^{xa} \) for \( k \) in the estimation.
In this equation the prior expectation is that real money does not influence relative exportable prices, and, once again, this presumption is borne out by a low regression coefficient, lack of significance, and a relatively low partial correlation coefficient (.224).

The real exchange rate, on the other hand, is significant at the 99% level, and has high simple (.630) and partial (.641) correlation. A priori one might expect an increase in domestic exportable prices to equal in magnitude a percentage devaluation. A coefficient less than one, in other words, indicates short run slippage due to the existence of controls on domestic export prices, export taxes, or the existence of a longer than one year lag structure. Probably all three have operated at one time or another.

The summary statistics for the entire equation indicate that 43 per cent of the total variation in exportable prices is explained, and also that there is no autocorrelation.

The final first stage equation, import prices, yields:

\[ \Delta \log P^M = -.007 - .231 \Delta \log m + **.221 \Delta \log k_{ma} \quad R^2 = .592 \]

\[ (.164) \quad (.078) \quad d = 2.0841 \]

As noted above, the real money supply is not expected to be an important explanatory variable for tradeable prices, and yet here it is significant at the 90% level, as well as yielding relatively high simple (-.576) and partial (-.373) correlations. Note, however, that the correlation and regression coefficients are negative. Recall that both of these variables, the money supply and import prices, have been deflated, eliminating a possible link of money supply changes with the denominator.
of relative prices. Given this it is difficult to imagine how such a relationship, especially a negative one, could develop. Examination of the innercorrelation (−.484) between the independent variables provides a possible answer. Since devaluations are often accompanied by restrictive monetary policies there may be a (negative) relationship between import relative prices and the real money supply without the relationship being causal. Multicollinearity in this case, although perhaps not expanding the standard errors, statistically yields what is an essentially artificial relationship.

The expected explanatory variable, the real import exchange rate, is significant at the 99% level. Both the partial (.624) and the simple (.725) correlations are high. The exchange rate elasticity of relative import prices is about as low as that for exportable prices, and indicates that a 10 per cent devaluation will increase import prices by only about 2 per cent. Once again the possibility of import controls severing the expected direct link during the early part of the period seems a real possibility.

The summary statistics indicate no autocorrelation in an equation which explains 59 per cent of the total variation in the dependent variable.

Viewing the first stage as a whole two things are readily apparent. First, the real money supply plays a major influence on real income; and second, the exchange rate has a major influence on tradeable goods prices. Both results were expected. Another related issue, the effects of the money supply and the exchange rate on some overall measure of inflation, is addressed in the next chapter.
The second stage of the 2SLS process can be expected to yield consistent and unbiased estimates of the structural parameters—in this case price and income elasticities.

The equation for exportable demand as a function of predicted real income and relative exportable prices (1951-1961) is:

$$\Delta \log X = - .017 + 1.931 \Delta \log \hat{Y} + .388 \Delta \log \hat{P}_X$$

$$R^2 = .747$$

$$(.411) \quad (.433) \quad \quad d = 1.4964$$

The income coefficient is significant at better than 99 per cent significance, a result borne out by high simple (.849) and partial correlations (.635). The coefficient as a measure of elasticity is most interesting—if for no other reason than that nothing comparable seems to exist in the literature.\(^1\) In spite of a universal expectation in favor of a low (less than one) elasticity, especially considering the nature of the goods involved, the coefficient evidences a rather high real income elasticity for the domestic demand for exportable products. Recalling that exportable demand in Argentina consists primarily of foodstuffs, one might infer a contradiction of Engel's Law from these results. Three considerations must temper such an inference. First, even though Argentina's per capita income is second highest in Latin America and is many times higher than the majority of LDC's it remains only a small percentage of that of the more developed countries.\(^2\)

---

1. See the Review of Literature to this paper.
2. "...the income elasticity of the demand for food in underdeveloped countries is considerably higher than in high income countries—probably on the order of .6 or higher in the low-income countries vs. .2 or .3 in Western Europe, the United States, and Canada." B. Johnston and J. Mellor, "The Role of Agriculture in Economic Development," American Economic Review, September, 1961.
Argentina is also in a rather special position in maintaining one of the highest per capita food consumption rates in the world—especially once again, considering its per capita income. A greater ability to restrain food demand is thereby implied. Both of these considerations, however, could hardly explain an income elasticity for food much greater than Kuznets .68 figure for United States data. The difference must surely lie in what the 1.9 figure above represents—the short run income elasticity for exportable products. Expectation of the maintenance of this elasticity measure for more than one year would be unjustified given the nature of these results. Nevertheless, the results are striking, especially in their implications for achieving short run balance of payments equilibrium.

A similar expectation of a low relative price elasticity of demand for exportables is, in this case, not contradicted by the equation—in fact the coefficient is positive. Without the coefficient being significant, however, no definitive conclusion may be drawn.

The income coefficient is significant enough, however, to allow for the equation to explain 75 per cent of the total variation in exportable demand. The Durbin-Watson statistic is inconclusive on the existence of serial correlation, but lies quite close to the upper bound.

Import demand for the years 1950-1964 is given by:

\[ \Delta \log M = -.013 + 1.196 \Delta \log \hat{Y} + .208 \Delta \log \frac{\hat{P}}{M} \]

\[ R^2 = .049 \]

(1.713) (1.964) \[ d = 2.0563 \]

---

1. Quoted in E. Hagen, *The Economics of Development*, 1968, p. 44.
Neither the real income nor relative price coefficients are significant--although the price coefficient, by being close to zero, gives some evidence for an extremely low or zero price elasticity for imports. Although there appears to be no autocorrelation, the equation is able to explain less than 5 per cent of the total variation.

Because of import controls being extensively utilized during the first part of this period, the equation was re-estimated for the years 1954 through 1964:

\[ \Delta \log M = -0.007 + 2.480 \Delta \log \hat{Y} + 0.059 \Delta \log \hat{P}_M \]

\[ R^2 = 0.318 \]

\[ (2.823) \quad (1.411) \]

The real income variable is still not significant, although improved somewhat in explanatory power. The simple correlation coefficient of .564 seems quite reasonable--suggestion that examination of the variable without the collinear influence of predicted relative import prices (the correlation between the independent variables here being -.899) might significantly improve its explanatory power. Although not nearly as exceptional as the exportable income elasticity, note the quite large magnitude of the income coefficient. The results imply that one can expect an increase of 25 per cent in real imports upon a 10 per cent increase in real income.

The relative price coefficient itself remain insignificant, with a low partial (.014), and a value close to zero.

\[ 1 \]

1. Imports were broken down into three components: consumer goods, intermediate imports, and capital goods; and each was regressed on predicted income and import prices for different periods. One income coefficient is significant and many were relatively close, while none of the price coefficients were significant.
Circumscribing the time period, mainly as a result of the increased significance of income, improves the coefficient of determination from less than .05 to about .32.

The estimation of the structural income and price parameters may be summarized by emphasizing that the income elasticities are high and significant (or nearly so), while the price elasticities are low and not significant. While multicollinearity may have reduced the significance of income related import demand, that of exportable demand is high, and more interestingly, carries a high elasticity. As to the price coefficients, the results here do not add a significant price elasticity for either imports or exportables to the literature. In fact, the results imply that there is no significance because there is no (or very little) relationship. Although the null hypothesis cannot be accepted categorically, it seems safe to suggest that for both import and exportable demand, relative prices do not have much influence.

Delimited Model

Given the low significance and small coefficients of exchange rate and exchange rate-related (i.e., relative price) variables in the results presented, and the evidence of some significant innercorrelations between these and the other independent variables, there exists some question as to the value of including these variables in the model. It is possible, as pointed out in the last chapter, to test the explanatory value of the last variable in a regression. Table IV-1 presents the results of the appropriate F-tests.
Table IV-1 is constructed in the following way. Columns 1 through 4 give the years and variables in the regression results of equations 6) through 12). Columns 5 and 6 give the numbers of observations and independent variables, respectively. Columns 7 and 8 present partial correlation coefficients for each independent variable on the dependent variable given the other independent variable. Columns 9 and 10 give the F-tests applicable to each variable with significant (5%) F-test represented by an asterisk. That is, those variables represented with an asterisk add more than a random amount to the explanation of the dependent variable.

Column 9 may be examined for the influence of exchange rate or exchange-rate-related variables on the various dependent variables. None of these variables adds significantly as a last regressor to the explanatory power of each respective equation, except for relative tradeable prices.

In light of this result, the model presented in the second chapter will be delimited, by removing all exchange rate and relative price variables. The new model will include only the effects of the real money supply on real income (equation 3a) and the effects of real income on import (equations 1a) and exportable (equation 2a demand:

1. \( F_{.05} \) for \( n - 1 - k = 8 \) is 5.32; for \( n - 1 - k = 12 \) is 4.75.
Table IV-1

F-Tests for Significance of Last Regressor

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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</thead>
<tbody>
<tr>
<td>Years</td>
<td>$z$</td>
<td>$x$</td>
<td>$y$</td>
<td>$n$</td>
<td>$k$</td>
<td>$r_{zy,x}$</td>
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<td>$F_{zx,y}$</td>
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<tr>
<td>A. 1951-1961</td>
<td>$\Delta \log X$</td>
<td>$\Delta \log m$</td>
<td>$\Delta \log k$</td>
<td>11</td>
<td>2</td>
<td>.269</td>
<td>.853</td>
<td>.620</td>
<td>21.351*</td>
</tr>
<tr>
<td>B. 1950-1964</td>
<td>$\Delta \log M$</td>
<td>$\Delta \log m$</td>
<td>$\Delta \log k$</td>
<td>15</td>
<td>2</td>
<td>-.016</td>
<td>.201</td>
<td>.012</td>
<td>.500</td>
</tr>
<tr>
<td>C. 1954-1964</td>
<td>$\Delta \log M$</td>
<td>$\Delta \log m$</td>
<td>$\Delta \log k$</td>
<td>11</td>
<td>2</td>
<td>.043</td>
<td>.499</td>
<td>.008</td>
<td>2.652</td>
</tr>
<tr>
<td>D. 1950-1964</td>
<td>$\Delta \log Y$</td>
<td>$\Delta \log m$</td>
<td>$\Delta \log k$</td>
<td>15</td>
<td>2</td>
<td>-.010</td>
<td>.748</td>
<td>.001</td>
<td>15.228*</td>
</tr>
<tr>
<td>E. 1950-1964</td>
<td>$\Delta \log P_{X}$</td>
<td>$\Delta \log m$</td>
<td>$\Delta \log k$</td>
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<td>2</td>
<td>.641</td>
<td>.224</td>
<td>8.369*</td>
<td>.664</td>
</tr>
<tr>
<td>F. 1950-1964</td>
<td>$\Delta \log P_{M}$</td>
<td>$\Delta \log m$</td>
<td>$\Delta \log k$</td>
<td>15</td>
<td>2</td>
<td>.624</td>
<td>-.373</td>
<td>7.652*</td>
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<tr>
<td>G. 1951-1961</td>
<td>$\Delta \log X$</td>
<td>$\Delta \log Y$</td>
<td>$\Delta \log P_{X}$</td>
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<td>2</td>
<td>.309</td>
<td>.635</td>
<td>.845</td>
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<tr>
<td>H. 1950-1964</td>
<td>$\Delta \log M$</td>
<td>$\Delta \log Y$</td>
<td>$\Delta \log P_{M}$</td>
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<td>2</td>
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<td>.198</td>
<td>.046</td>
<td>.649</td>
</tr>
<tr>
<td>I. 1954-1964</td>
<td>$\Delta \log M$</td>
<td>$\Delta \log Y$</td>
<td>$\Delta \log P_{M}$</td>
<td>11</td>
<td>2</td>
<td>.014</td>
<td>.298</td>
<td>.002</td>
<td>1.170</td>
</tr>
</tbody>
</table>
\[ M = \alpha_1 Y^{\beta_1} e_1 \]
\[ X = \alpha_2 Y^{\beta_2} e_2 \]
\[ Y = \alpha_3 m^{\beta_3} e_3 \]

1a)
2a)
3a)

The model may be restated in log-linear form as:

\[ \log M = \log \alpha_1 + \beta_1 \log Y + \log e_1 \] 6a)

\[ \log X = \log \alpha_2 + \beta_2 \log Y + \log e_2 \] 7a)

\[ \log Y = \log \alpha_3 + \beta_3 \log m + \log e_3 \] 8a)

Representing the endogenous variables (M and X) as function of the one exogenous variable (m) in reduced form (also log-linear):

\[ \log M = a_1 + b_1 \log m + u_1 \] 11a)

\[ \log X = a_2 + b_2 \log m + u_2 \] 12a)

Starting with the reduced form equations, estimation of 12a) for 1951 through 1961 yields:

\[ \Delta \log X = .009 + **.580 \Delta \log m \quad r = .849 \]
\[ \begin{array}{cc}
\quad \Delta \log m & \text{d} = 1.7560 \\
(.117) & \\
\end{array} \]

Dropping the real exchange rate from the equation does not improve the already quite significant relationship between the real money supply and real exportable demand. It is noteworthy that the value of the coefficient does not change measureably either (from .625 to .580), indicating that little or no bias is introduced by dropping the last regressor.
Using the years 1950 through 1964 for equation 11a) gives:

\[ \Delta \log M = .0003 + .324 \; \Delta \log m \quad r = .226 \]

\[ (0.388) \quad d = 2.0023 \]

As before the real money supply variable is insignificant, but, once again, the results may be improved by eliminating the years 1950-1953:

\[ \Delta \log M = .022 + * .782 \; \Delta \log m \quad r = .569 \]

\[ (0.379) \quad d = 2.1181 \]

Observe that the correlation coefficient is improved, but more importantly, real money is now a significant regressor at the 95% level on real import demand. Recalling that the inner correlation between the two independent variables was .608 when the exchange rate was included, and that neither variable was significant, elimination of the one variable appears to have removed the influence of multicollinearity on the standard error. The measure of elasticity now becomes more important—a 10 per cent increase in the real money supply can be expected to increase import demand by about 8 per cent. This elasticity measure also seems to have not suffered bias by dropping the last regressor.

The structural form equations 6a) through 8a) were also estimated. Real income is still very closely related to the real money supply, with the estimated elasticity remaining the same:

\[ \Delta \log Y = .012 + ** .335 \; \Delta \log m \quad r = .770 \]

\[ (0.077) \quad d = 2.0689 \]
Exportable demand as well continues to evidence the strong influence of predicted real income, with about the same magnitude (elasticity) as before:

\[ \Delta \log X = -0.012 + **1.776 \, \Delta \log \hat{Y} \quad r = 0.849 \]
\[ (0.371) \quad d = 1.6279 \]

Importable demand as a function of predicted income (1950-1964) shows some improvement by eliminating relative import prices as an explanatory variable, but the real income coefficient is still non-significant:

\[ \Delta \log M = -0.011 + 0.938 \, \Delta \log \hat{Y} \quad r = 0.214 \]
\[ (1.189) \quad d = 2.1563 \]

Elimination of the high import control years, however, yields:

\[ \Delta \log M = -0.006 + 2.374 \, \Delta \log \hat{Y} \quad r = 0.564 \]
\[ (1.166) \quad d = 2.0971 \]

As in the reduced form equation, there is now some proof that multicollinearity between predicted real income and relative import prices (-0.899) expanded the standard error of the income coefficient sufficiently to reduce its significance below the 95% level. The income elasticity measure can, then, be looked upon with more certainty. It is, moreover, high (an income elasticity of around 2.4) and not significantly different from that derived when relative prices are included in the equation.

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1. The values of \( \hat{Y} \) determined from the previous equation, using the regression coefficients and \( m \) values for each year.
Delimitation of the model in the manner indicated, and estimation of the smaller model, has yielded a structure which has more explanatory power than a larger, more complex model. The process is only considered justifiable, however, given the strong suggestion from the results of the larger model that exchange rate and relative price variables play little or no part in explaining changes in the balance of trade.
Chapter V
Money, Exchange Rates, and Inflation

The results just presented, since all of the variables are expressed in real or relative terms, give little indication of the effects of nominal money supply or exchange rate changes on inflation. Although the issue of overall price level change is not directly addressed in the short run balance of payments model presented above, the problem of the especially severe Argentine inflation is closely related to the policy issues considered in this thesis. Perhaps most important in this context is additional evidence on the influence of exchange rate changes on inflation and the effects of price expectations on the demand for real cash balances.

As Vogel\(^1\) notes, a "...decade after its publication, Arnold Harberger's study of Chilean inflation\(^2\) remains the best known empirical analysis of the causes of inflation in any Latin American country. Subsequent studies of Latin American inflation include only two major econometric analyses of its causes, and both are extensions of Harberger's Chilean model to inflation in Argentina". These studies are by Díaz-Alejandro\(^3\) and Adolfo Díaz.\(^4\) Although both

3. In Exchange-rate Devaluation, Chapter 5.
studies indicate the importance of the money supply to inflation, they come to contradictory conclusions on the effects of exchange rate changes on inflation. Causality does not appear to be an issue any longer. As Harberger has noted:

In Chile there has existed for many years a powerful school of thought which held that devaluation can be expected to have very serious consequences on the level of prices. I must confess that for a long time I tended to minimize this possibility. More recently I have come to modify my earlier views quite substantially. Part of the stimulus which led me to revise my views came from the experience of Argentina in the first half of 1962. During this period the internal price level rose by some 35 per cent or more, and the money supply rose by only about 15 per cent. It was thus difficult to explain the observed rise in the price level on the basis of the concurrent change in the money supply. It also proved difficult to explain the observed price inflation as being significantly influenced by a lagged response of prices to prior changes in the quantity of money. Casting about for an explanation of the rapid rate of price increase in the first half of 1962, it was hard to overlook the fact that a substantial devaluation had occurred in the early part of the year.

Thus, although direct short term causality is not usually questioned, magnitude is. The two studies mentioned however, come to reasonably similar econometric results on the exchange rate elasticity of overall inflation. Diaz Alejandro uses the annual

1. Diaz Alejandro takes almost a "structuralist" point of view on this—that is that money supply growth is endogenous; while Diaz is more "monetarist" in posture—i.e., inflation can be reduced if and only if money supply growth is limited. The largely sterile Monetarist-Structuralist controversy will not be dealt with further here.
percentage growth in the cost of living index as one dependent variable and rates of change of the money supply, hourly money wage rates, exchange rate and real available supplies (GDP plus merchandise imports) as independent variables. The resultant coefficient for the money supply is not significantly different from 1.00, indicating that the full effect of the money supply on the price level is felt in the same year. The exchange rate-inflation elasticity is .15, and Diaz Alejandro notes that this "...seems rather low..."\(^1\) although "...considering the size of the standard errors..." the actual elasticity might be higher.\(^2\) All of the variables enumerated above were significant in the equation, but just marginally (except for the money supply). Some internal relationship between these monetary variables may have resulted in elasticity measures which differ from their actual independent values.

Diz also finds a low elasticity measure in his study, which regresses rates of change of the cost of living and wholesale price indices on current and lagged semester relative rates of change of the money supply, current real income, nominal wages, exchange rate, and a variable of "exogenous" changes in price expectations. Not all of these variables produced significant results, once again suggesting possible multicollinearity, although the exchange rate and expectations variables are significant. The elasticity measures

\(^1\) Ibid.
\(^2\) Ibid.
are low for the exchange rate and high for the "expectations" variable. He says that the "...coefficients of the exchange rate variable show a positive value of about .10, indicating that the direct effect of a 10 per cent devaluation will be about 1 per cent on the wholesale and about .9 per cent on the cost of living indices. This is a surprising result in the light—or, should I say, the heat—of the discussion on the inflationary effects of devaluation in Argentina". The magnitude and construction of the expectation variable, however, brings into question its true "exogenous" nature. The variable is derived as a residual of the independent variables above, and then regressed on prices a quarter later. Surely much of the influence of a devaluation on overall inflation will be on expectations—and a case could in fact be made that this method of estimation quite accurately measures the influence on prices of an expected or imminent devaluation.

As noted above, in spite of quite close elasticity measures the two works come to different conclusions. Diz states that the "...role of devaluations...in the Argentine inflationary process was also analyzed, but the results show that their influence on the rate of inflation failed to achieve the levels and significance usually attributed to them". Diaz Alejandro, on the other hand concludes that "...since 1959 the cost-push features appear to have

1. Op. cit., p. 120.
2. Ibid., p. 121.
3. Ibid., p. 123.
become dominant in the Argentine inflation, and the highest rates of inflation have been observed in years when the exchange rate was devalued and relative prices turned in favor of the rural sector\(^1\).

Because of the questions left unresolved by these two studies, some further analysis seems in order. First, the two major policy variables of Argentine governments, the money supply and the exchange rate, will be statistically regressed on measures of overall inflation, for the years covered in this study, in order to provide further evidence on the influence of the exchange rate (alone) on the price level. Secondly, a method will be presented which attempts to capture the "expectations" component of this elasticity. That is, the actual inflation which results due to devaluation (accompanied by restrictive monetary policy) may be divided into direct (cost-push) and expectation components. The size of the latter may give (a) an indication of why the Diz measure of "direct" devaluation influence is so low, and (b) some sense of the behavioral pattern behind the previously noted coincidence of actual devaluations, restrictive monetary policies, and extraordinary rates of inflation. Finally a price expectations hypothesis will be developed and tested to explain the policy-related alterations in the demand for real cash balances noted in the previous chapter.

OLS was used to directly estimate the force of nominal monetary (M) and exchange rate (K) changes on overall inflation. The three measures of overall inflation utilized were the Consumer Price

\[\text{1. Exchange Rate Devaluation, p. 124.}\]
Index \( (P_C) \), Implicit Price Deflator \( (P_I) \), and the Wholesale Price Index \( (P_W) \). All measures were expressed in first differences of common logs, allowing for direct conclusions on elasticities. The time period covered was 1950 through 1964.

Results for the three measures of inflation are:

\[
\Delta \log P_C = 0.011 + * * .597 \Delta \log M + * * .337 \Delta \log K \quad R^2 = .505 \\
(0.205) \quad (0.122) \quad d = 1.9840
\]

\[
\Delta \log P_I = -0.005 + * * .738 \Delta \log M + * * .336 \Delta \log K \quad R^2 = .730 \\
(0.248) \quad (0.079) \quad d = 2.0254
\]

\[
\Delta \log P_W = 0.031 + .398 \Delta \log M + * * .499 \Delta \log K \quad R^2 = .473 \\
(0.522) \quad (0.167) \quad d = 2.6704
\]

The results are quite good. The money supply is significant in the first two equations at the 99 per cent level, although it is not significant at all in the third equation. In contrast to the Diaz Alejandro results, but supporting the Diz results, the elasticity coefficient of the money supply is in all cases less than one. There is evidence therefore, that the total adjustment period of the price level to inflation is greater than one year, although much of the adjustment does occur in the first year.\(^4\)

The exchange rate in all of these equations is significant at the 99% level. The coefficient is high in all of the equations---

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2. Implicit Price Deflator for Gross Domestic Product at Factor Cost, 1950-1964, 1960 = 100, Table 35. Extrapolated one year with Table 34.
3. Wholesale Price Index, Table 39, Overall Level.
4. Vogel, op. cit., p. 112, comes to very similar results for all of Latin America (using pooled data).
and for the two measures of overall final demand inflation (cost of living and implicit price deflator) they are quite close. According to these results a devaluation alone can be expected to increase the price level by more than 3 per cent for every 10 per cent of exchange rate depreciation. Although the coefficients of determination indicate that not all of the variation in inflation is explained by these two variables, more than half is for the first two measures. More importantly, there is little influence of multicollinearity on the coefficients or standard errors of the independent variables—the simple correlation between the variables being .187. Although still not entirely conclusive, these results do provide some empirical support for the often observed coincidence of devaluations and large rates of inflation. In addition, these results suggest that exchange rate devaluations may adversely shift the Phillips curve for Argentina. As Sweeney and Willett note, "...in a very flexible economy that is always at full employment, an increase in foreign tradeables prices will increase domestic tradeables prices, but cause non-tradeables prices to fall to maintain employment in the short run. However, [in] an economy with less flexibility, the foreign price increases lead to a less favorable short run inflation—employment tradeoff". An alteration in the domestic price of tradeables arising from devaluation may be presumed to have the same result.

The next question that may be addressed is what proportion of the approximately .33 elasticity is due to the direct effect of devaluation and how much is due to expectations. The direct effect would have to include the increase in the prices of imports, appropriately weighted in the overall price index, which results from a devaluation. In addition, the prices of domestically produced importables (none for Argentina) and exportables can be expected to increase as the result of an exchange rate change. Finally, a devaluation can be a form of cost inflation, as "...there will be an automatic and prompt increase in the cost of raw materials." ¹ There must be included in this cost-push element the effect of nontradeable input prices increasing since their input prices have increased—indeed there is an economy wide matrix of simultaneous price increases as all the separate price increases work their way through the outputs of various productive sectors.

Input-output analysis can be used to determine the total direct effect of a devaluation induced inflation. Certain restrictive assumptions must be made, some generally applicable to input-output analysis², and two in its application to price changes³.

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2. See H. Chenery and P. Clark, Interindustry Economics, pp. 33-34.
3. The latter two are: 1) that costs are, in fact, entirely passed on in a cost-push fashion, i.e., that no producer will "absorb" his cost increases by decreasing his profit per unit of output, and 2) that there are not long lags in adjustment to price and cost changes.
Given these the rate of change of an economy wide implicit price index \( P_I \) (i.e., say the implicit GDP deflator) may be broken down into the weighted influence of input prices on final product prices. Input price changes include those of tradeable inputs \( (P_f) \), profits \( (P_{\pi}) \) and wages \( (P_w) \):

\[
P_I = \frac{TP_f}{E} + \frac{R'AP_f}{E} + \frac{R'AP_{\pi}}{E} + \frac{R'AP_w}{E}
\]

Tradeable price increases are weighted by the proportion of tradeable products \( (T) \) in final domestic expenditures \( (E) \). Nontradeable prices will increase with the increase in their input prices (including all tradeable inputs, \( A_fP_f \), profit increases, \( A_{\pi}P_{\pi} \), and wage increases \( A_wP_w \) both directly and as these price increases are passed forward to them in their nontradeable inputs by other producers \( (A'P_n) \):

\[
P_n = A'P_n + A_fP_f + A_{\pi}P_{\pi} + A_wP_w
\]

This equation yields:

\[
P_n = (I - A')^{-1}A_fP_f + (I - A')^{-1}A_{\pi}P_{\pi} + (I - A')^{-1}A_wP_w
\]

Weighting the column of nontradeable prices by the proportion that each nontradeable product has in final demand, and then expressing the final demand vector as the row vector of total nontradeable 

---

1. \( A_f, A_{\pi}, \) and \( A_w \) are column vectors of respective input coefficients, \( P_n \) is a column vector of nontradeable price increases; and \( A' \) is a matrix of nontradeable input coefficients for the entire nontradeable sector. The equation then represents the full effect of input price increases on every nontradeable price.
demand \((R')\) times \((I - A')\) gives the change in the implicit price
index due to nontradeable price increases as:

\[
\frac{R'(I - A')(I - A')^{-1}A_P}{E} + \frac{R'(I - A')(I - A')^{-1}A_P}{E} + \frac{R'(I - A')(I - A')^{-1}A_P}{E} 
\]

and the total change in the price index as equation 13) above.

Use of equation 13) and Argentine data\(^1\), holding wages and profits
constant, gives an implied devaluation-inflation elasticity of .37.\(^2\)
This result is based upon the assumption that tradeable prices increase
by the same per cent as the exchange rate. The actual tradeable price
elasticity of devaluation, as reported in the text of this chapter,
is closer to .25 than 1.00.\(^3\) Consideration of this fact lowers the
"direct" or cost push devaluation-inflation elasticity to about .09--
strikingly close to Diz' direct measure. Presumably then, the rest
of the observed .33 elasticity--or .24--must be due to profit or wage
per unit increases. When devaluations are accompanied by deflationary
monetary policies, most or all of this must be expectationary in nature.

---

1. The amount of direct (cost push) inflation implied by a deval-
uation is dependent in this calculation on the definition of which
sectors are included in the tradeable category. Besides imports, the
industries used here as exportable include (1) agricultural goods,
(2) livestock, (3) forestry, fishing and hunting, and (4) meats.
Food and beverages were not treated as exportables in that there is
not the same direct relationship between foreign and domestic prices
characteristic of the others.

2. Computer inversion of a 21 × 21 Argentine \((I - A)\) matrix
yielded similar results, although for a slightly different definition
of "tradeable".

3. See the results on equation 9) and 10).
Such a large expectation component of devaluation-induced inflation implies that devaluations may be viewed as a current measure of expected inflation. This suggests an approach to account for the variability in income velocity upon money supply changes noted in the results chapter—a variability which affects the magnitude of efficacy of monetary policy on the real economy in the short run.

The demand for real cash balances invariably includes real income as a major determinant of desired balances.¹ Even though early studies artificially imposed an assumed unitary income elasticity, recognition of the possibility of other than unitary income elasticities has meant that changes in income can usually be counted on to explain much of the change in the demand for real cash balances.

The residual demand for money which cannot be accounted for by real income (or wealth) has often been considered to be a function of the cost of holding money. The actual cost of holding money "...is equal to the real rate of return on alternative forms of holding wealth plus the rate at which money holdings depreciate in purchasing power, that is, the rate of change in prices minus any interest paid on money"². Decisions on how much money to hold, however are based on the expected cost of holding money rather than the actual cost, since "...neither the ex post yield on the investment made, nor that on other alternatives

---

1. Although Friedman and others have occasionally substituted permanent for measured income in attempts to explain some incongruous results in measured income elasticities.
2. Diz, p. 93.
can be known in advance. The first of the two components of the cost of holding money, expected real alternative yields, is often ignored in empirical studies of developing countries since it is frequently true that "...the level and variability of the rate of inflation [is] so high that this component probably dominates changes in the total cost of holding money." This procedure has been found to be viable for hyperinflation as well as cases of less rapid rates of change of prices. Disregarding real interest returns leaves the expected rate of change of prices as the major determinant of the residual demand for real cash balances. A problem soon arises, however, in measuring the expected rate of change of prices—an essentially subjective phenomenon. After its introduction by Cagan, much use has been made of an adaptive expectations model to measure price expectations. In lieu of regarding present rates of inflation as a proxy for expected inflation, a practice that had yielded poor statistical results, Cagan felt that the "...expected rate of change in prices seems to depend in some way on what the actual rates of change were in the past." His method of incorporating this proposition into his empirical analysis was to assume that

2. Diz, p. 93.
4. See the previously noted studies by Deaver for Chile and Diz for Argentina.
6. Ibid., p. 37.
the "...expected rate of change in prices is revised per period of time in proportion to the difference between the actual rate of change in prices and the rate of change that was expected". Cagan found that the model performed rather well, but most subsequent "...empirical studies on the demand for money in individual countries conclude that inflation does not have a significant impact on velocity".

These results appear to be open to question, however, in the light of several statistical and conceptual concerns over the distributed lag technique of measuring expected prices. One problem arises over the practice of determining the "true" implicit speed of adjustment for price expectations by running numerous weighting coefficients until one achieves a maximum coefficient of multiple determination—and then declaring that as the appropriate weighting pattern. Such a procedure is tantamount to assuming the hypothesis to be tested and then deriving historical values which best fit the assumption. In addition, since the distributed lag process includes both the weighting coefficient and the to-be-estimated elasticity of price expectations in the same equation,

1. Ibid.
2. James Hanson and Robert Vogel, "Inflation and Monetary Velocity in Latin America," in Review of Economics and Statistics, August, 1973, p. 365. Deaver, on the other hand, found for Chile that "Velocity is even more closely related to the expected inflation cost, as estimated by a simple distributed lag model". Op. cit., p. 30.
3. "In order to discover what weighting system is most appropriate—how far into the past it is relevant to consider actual changes in the rate of inflation—several such time series are derived, using different values of B. Each is fitted by least squares to the other variables in the demand equation, and the one which yields the highest correlation is regarded as most nearly reflecting aggregate expectations of how rapidly prices will rise." Deaver, p. 26.
and since they "...enter the relation symmetrically, it is impossible to obtain separate estimates of their values from the regression coefficients"\(^1\). The resultant inability to place much confidence in either estimate is compounded by the likelihood of autocorrelated error terms in distributed lag models.\(^2\) In this regard, the widespread nonreporting of Durbin-Watson statistics fails to reinsert much confidence.

Besides these statistical problems, recent articles have raised some conceptual difficulties with the adapted expectations hypothesis. Walters suggests that "If expected prices are determined by history, there is no separate role to be played by current economic events. Yet it is well known that such events do indeed affect current expectations. There is no waiting for history"\(^3\). He would substitute a "consistent" expectations model based on the current actions of the monetary authorities—and his arguments seem especially persuasive under conditions of rapid changes in economic variables and policy. Goldfeld points out that "Also relevant here is the notion that people will pay more attention to current and less to past events the more rapidly the

2. "...it is well known that the application of the least-squares method to estimate distributed lag models leads to inconsistent estimates in the presence of autocorrelated disturbances. As noted by Griliches, there are several possible sources of serial correlation in such models." V. K. Chetty, "On the Long-Run and Short-Run Demand for Money: Some Further Evidence," *Journal of Political Economy*, Nov./Dec. 1969, p. 921.
current situation is changing. This suggests that one needs more than a simple distributed lag of past rates of inflation to measure expected inflation\(^1\).

These comments are important in view of a study by Diz of the components of the demand for real cash balances in Argentina\(^2\). Using a distributed lag model, he finds that "...holdings of real \(M_1\) per capita do not respond significantly (at the 5 per cent significance level) to changes in the current or expected cost of holding money when current measured income is used in the regressions..."\(^3\). Although he does have more success with permanent income these results are discomfiting—unless one makes a reappraisal of his procedure. That is, it may not be necessary to discard the hypothesis that expected inflation influences the demand for real cash balances if one uses a perhaps more acceptable measure of expected inflation.

The rather large increases is value added per unit which occur simultaneously upon exchange rate devaluations in Argentina suggests the use of exchange rate devaluations as a "consistent" measure of price expectations. Sweeney and Willett posit a major international transmission mechanism of inflation as being the "...international expectations of inflation, where the rise of foreign prices create[s] the domestic expectation of inflation"\(^4\). Certainly a devaluation, by

2. Included in the previously cited "Money and Prices in Argentina": Ibid., p. 97.
3. Ibid., p. 97.
producing the same effects on tradeable (and nontradeable) prices domestically as a rise in foreign prices, would yield a similar result. Harberger, in fact, explicitly includes a "...change in the demand for cash holdings which would be induced by devaluation" in his devaluation-inflation elasticity model for Argentina.  

A test of this hypothesis requires some assumptions. First partial adjustment is ruled out. There are assumed to be no "...temporary departures from the [demand for money] schedule, that is, frictions that make the actual stock of money depart from the desired stock of money". Cagan's arguments on this point seem defensible in that once "...a person decides on the desired level of his balances, he can easily adjust his actual balances by spending them or by selling other assets for cash. The time required is negligible, because he adjusts his balances not so much by changing the level of his consumption over a period of time as by altering the form in which he holds his wealth". A second (really a sufficient) assumption is that historical data reflect points on a stable demand function.

Given these assumptions it is possible to regress changes in the real stock of money (Δlog m) as the dependent variable on changes in real income (Δlog Y) and changes in the nominal exchange rate (Δlog K) as a measure of the expected rate of inflation. Data include the

1. Inflation and Growth, p. 340.
2. Friedman, op. cit., p. 6.
4. Walters, p. 274, allows that "In principle one should consider a model of continuous expectations over all future periods with associated costs...". The work here follows his lead, and "...with the usual excuses, we have simplified to a one period problem".
years 1950 through 1964 as contained in Table III-1 and III-2 of the Methodology chapter. The resultant least-squares equation is

\[ \Delta \log m = -0.0001 + **1.311 \Delta \log Y - *0.189 \Delta \log K \quad R^2 = 0.737 \]

\[ (0.382) \quad (0.073) \quad d = 2.2201 \]

It may be concluded from these results first that real income is, as expected, a significant determinant (at the 99 per cent level) of the demand for real cash balances—with the partial correlation coefficient being quite high at .702. The income elasticity measure is greater than one, although it does not differ significantly from a unitary income elasticity. These results may be compared with Friedman's United States findings that "Secular changes in the real stock of money per-capita are highly correlated with secular changes in real income per capita," with a computed elasticity of 1.8.  

A second result is that exchange rate changes do rather well in explaining a large proportion of the variance in real cash balances. The coefficient is significant at the 95 per cent level, and lies very close to the 99 per cent level. The partial correlation coefficient for real balances on the exchange rate (as distinct from the influence of real income) is quite acceptable at .595. This would tend to provide some strong evidence that the hypothesized relationship between the demand for real cash balances and the expected cost of holding money as represented by exchange rate changes seems to hold. Interestingly enough, the elasticity coefficient is rather low, a result which

corresponds to the findings of Hanson and Vogel using pooled cross-section data for Latin America.

Together the two variables explain almost three quarters of the variance in real cash balances. The d-statistic indicates no autocorrelation in the error terms—a result of some importance given the presumption against previous (distributed lag) measures of expected inflation. The equation as a whole may be viewed as empirical support for theoretical conjecture over the determinants of the demand for money.

In summary to this chapter, it may first be noted that devaluations appear to be significantly inflationary in Argentina—a 10 per cent devaluation can be expected by itself to increase the overall price level by around 3 per cent. A large portion of this increase, however, is due to expectations (concurrent wage and profit per unit increases) rather than the influence of a cost-push mechanism on intermediate input prices. Utilization of exchange rate changes as a measure of expected inflation is suggested by this finding and, besides being superior on statistical and conceptual grounds, yields significant results on the demand for real cash balances. These results in turn suggest that the variations in velocity (and efficacy of policy) which

1. "Although inflation is significant in explaining variations in velocity, the elasticity of velocity with respect to inflation is quite low. For the pooled regression with country dummy variables in Table 7, the estimates of elasticity at the mean range from 0.07 to 0.12, depending on which definition of money is used to calculate velocity." Op. cit., p. 369.
occur upon changes in the money supply may be explained largely through policy-induced alterations in the expected cost of holding money. Devaluations, in other words, are not only inflationary, but may in addition reduce the power of monetary policy to influence the real economy.
Chapter VI

Institutional and Historical Background

This chapter will examine the use of economic policy in Argentina from a broader institutional and historical perspective, placing particular emphasis on the form of sectoral economic warfare which has plagued the country since Peron's first regime. In fact, the utilization of economic policy variables and the inelasticity of supply and demand responses examined above can only be fully understood in light of the political and institutional background of the Argentine state since the Second World War.

Cyclical Background

Internal economic warfare in Argentina has evidenced itself in great cyclical swings in the economy, which have been correlated with an incessant redistribution of a stagnant or barely growing real national income. The cycles, breaking into their continuous structure, "begin" with a stage of reasonable rates of increase in real income, moderate rates of inflation (by Latin American standards), high rates of employment, and continuously deteriorating balances of payments. A balance of payments crisis, resulting from rapidly shrinking or non-existent reserves, soon appears. Primarily in response to this, but also in reaction to the inflation, the governments in power have typically introduced "stabilization" plans—those in 1952, 1955, 1959, 1962
and 1967 are examples with strikingly similar characteristics. Following "monetarist" thought, the real money supply is usually contracted—not only to curtail inflation but also to limit the demand for foreign exchange. The exchange rate is simultaneously devalued in order to provide both some improvement in the balance of payments in the short run and also to provide inducement to tradeable producers in the long run. There occurs a redistribution of income away from the nontradeable-industrial sector in general, and wage earners in particular, and towards the agricultural sector with a simultaneously imposed wage freeze. The wage freeze is considered essential in that without it industrial-nontradeable prices could rise to offset any improvement in relative price inducement to agricultural-exportable production. As it is, the overall rate of inflation that occurs after the devaluation is quite large—resulting in a significant reduction of real wage earner income. Unemployment quickly increases as the recession progresses, placing further pressure upon wage earners as a factor and industry as a sector. The balance of payments, however, usually responds favorably to these conditions, entirely as the result of decreased demand for exportables and imports.

This stage of the cycle soon becomes untenable to the often weak government in power. The unemployment and reduced nontradeable real

income allows political pressure to mount until the authorities feel they must acquiesce to relaxation of the stabilization policy—which primarily entails relaxation of the restrictive monetary policy and the wage freeze. What then follows is a movement back towards full employment, a moderate rate of inflation, and a deteriorating balance of payments. The cycle then "starts" again.

The rationale is clear why so many governments have felt the need to impose these types of policy measures. Basic to the numerous stabilization plans has been the insufficiency of export earnings. The Argentine economy is, in spite of singular success in the elimination of final good imports, still heavily dependent on imports of capital goods and intermediate and raw material inputs. It is contended as well that further lowering of the import coefficient through import substitution into the earlier stages of production is "...progressively harder to sustain...". In addition, foreign loans are highly unstable, while non-agricultural export growth has not been overwhelmingly promising. In this type of situation agriculture has been deemed the only major source of foreign exchange earnings, providing some 95 percent of Argentine exports, thereby placing a structural limit to the

3. Only increasing significantly during periods of insufficient domestic demand.
capacity of the economy to import and, hence, grow. The most apparent manifestation of this limit to growth has been the repetition of periodic and cyclical foreign exchange shortages.¹

Given this, and especially in view of agriculture's historical role as the Argentine leading sector, all governments since the Second World War (even Peron's) have had to acknowledge that the encouragement of this sector was necessary for stable overall growth.² To this end economic policy has typically included as objectives, since 1952, attempts to (1) increase the real remuneration of the agricultural sector, (2) limit the share of labor so as to both redistribute income and limit inflation, and (3) limit credit to the private and public sectors to achieve the "stability" necessary for development.³ The tools utilized to achieve these objectives have included devaluations, wage freezes, and restrictive monetary policies. The devaluation of the peso increases the relative price of agricultural products and thereby achieves the desired income transfer to that sector. The freeze on wages not only limits industrial cost and price increases, thereby presumably limiting inflation and its consequences on the climate for investment, but also reduces the chances of an offsetting redistribution of income. As pointed out in the ECLA study on income distribution in Argentina⁴:

1. "Economists now began to point to acute shortages of foreign exchange as the cause of these crises which seemed to repeat themselves every three or four years." Scobie, p. 241.
2. The Argentine case would appear to hold some lessons for the continuing Nurkse-Hirschman (balanced vs unbalanced growth) debates as well as for the Chenery constraint or "gap" concept.
These devaluations produce their effects on income distribution in two stages. First with the shift of relative prices to favor agriculture, there is a horizontal redistribution with income being transferred from urban activities to agriculture, or, more specifically, to agricultural producers. But when the effect of devaluation on relative prices is combined with that of a wage freeze or overt unemployment policy, this horizontal redistribution becomes up to a point, a vertical redistribution, thus, in the last analysis, the main transfers of income are to the detriment of urban wages earners and to the benefit of agricultural producers.¹

Finally, the restrictive monetary policy is an attempt to reduce inflation by limiting aggregate demand, only occasionally with explicit recognition of the possibility of a Phillips-curve tradeoff.

The results of these attempts at stabilizing and fostering the external sector have, as noted above, included substantial overall inflation. It appears as though the relative price structure may be changed through the process described, but, with downward industrial price inflexibility, only at the cost of general price increases.

Implicit also in the policy combination is the reduction in real income of the wage earner. It should be emphasized that not only are overall prices rising while wages are being held constant, but also that the prices of those goods which loom quite large in an average

¹ Or, as noted by Ferrer, "If income from a sector in which the remuneration of labor is a small part [25%] of total income generated is transferred to another sector in which the share of income is higher [55%], there must be an increase in the aggregate share of labor. If the transfer is reversed, it has the opposite effect." Argentine Economy, p. 171.
wage earner's market basket are increasing fastest,¹ placing even
greater pressure on real income. Such pressure almost immediately
gives rise to claims from labor as the losing sector to redress its
losses. However this condition is viewed,² the inability of post-Peron
governments to withstand the pressure has meant the thwarting—examples
stabilization. Granting of wage increases by governments in power has
resulted in further inflation (as a cost push "...inflationary spiral
can be generated easily by these forces...")³, positive business re-
response to revived demand,⁴ reversal of the sectoral income redistribu-
tion, and renewed crisis over the paucity of foreign exchange.

This periodic policy reversal of devaluation followed by wage and
monetary relaxation has become almost coreregphered into a schema for
cyclical redistribution of a stagnant national income. Devaluations of
the currency and relative price changes have ceased to be signals for
resource allocation or consumption response and have become instead

1. "In the cost-of-living index for Buenos Aires, based on a 1960
survey of working-class budgets, bread, cereals, meat, and fresh fruit—
whose prices are extremely responsive to changes in world market prices
or the exchange rate—have a combined weight of over 30 per cent. If to
these are added goods that have a high component of exported or imported
materials—wool and cotton clothing, leather goods, paper and tabacco
products—the combined weight rises to well over 50 per cent." Mallon
in Papanek, p. 185.
2. "What is certain is that a stabilization programme is incompa-
tible with an actual improvement in the distribution situation." ECLA,
p. 268.
3. Diaz Alejandro, Essays, p. 121.
4. ECLA, p. 268
tools in the incessant urban-rural struggle over income shares. Whereas short run crises can be dealt with in this context, long run growth either of the foreign exchange generating sector or the entire economy has not been achieved. As Mallon indicates

Under these circumstances, it is exceedingly difficult for devaluation to bring about a significant change in relative prices lasting long enough to help induce the shifts in demand and in allocation of resources between domestic and internationally traded goods necessary to solve the balance-of-payments problem.

Whether due to the Peron heritage or not, austerity is not a popular word in Argentina. Refusal of any sector to assume the degree of austerity necessary for movement back to stable long term growth has contributed to continuation of sectoral economic warfare and further socio-political fragmentation and polarization of the country.

In order to facilitate exposition of this variety of sectoral economic warfare, or what Mamanakis terms "sectoral clashes," an examination will be made of each significant socio-economic sector in terms of its economic viewpoint, power base, method of exercising power, and historical background in Argentine society. Included in the examination will be labor, the landed interests, the military, as well as the middle class and industrial entrepreneurs.

Labor

The economic viewpoint of labor as a group in Argentina rather closely approximates what will later be called "integral-nationalism".

1. In Papanek, 176.
An innate desire for authoritarian rule from a powerful strongman or "caudillo", or at least a desire for the state to exercise authority over sensitive but important economic variables (such as wages and social security), characterizes this viewpoint. This tendency has been considered a function of the general Latin American inclination towards "personalismo" or "caudillismo" in politics, with the particularly virulent Argentine strain represented by "Peronismo". Coupled with authoritarianism, and a major platform of Peron and peronist philosophy, is a stress on economic nationalism and the industrial protection that is its corollary. For labor as a sector, protectionism and controls are especially satisfactory if they favor labor.

Labor unions in Argentina are well organized and quite strong, although their power lies in a sphere other than that of unions in the United States and the Western European nations. Whereas in the latter collective bargaining has been the major source of income and job improvement, "...very few employers or trade unionists in Argentina have had any experience of wage bargaining as a central fact of labor relations in plants and factories..."². Nevertheless, the unions can exert significant force to achieve their ends and the union leaders in particular wield much of that force. As Ferns points out³:

1. See Guide to the Political Parties of South America, p. 22.
2. H. S. Ferns, Argentina, p. 239.
Out of the wreckage of the Peronista regime there emerged a trade union elite equipped with manipulative techniques, organizations, and financial resources comparable with the military elite, the ecclesiastical elite, the business elite, and the landed elite. In many respects they were better equipped to exercise influence and affect decision making than the business and landed elites.

The establishment of such a strongly organized trade union leadership came about through the influence and aggressive policy of the Peron government—especially in the rapidly growing public sector enterprises (which absorbed otherwise unemployed or unemployable workers). Whether or not this powerful organization could have been formed without personal leadership from the state, it is true that its establishment had come about through political means, and "...helped to perpetuate among the trade union leaders a faith in political solutions of their problems...".

Argentine labor unions appear much more amenable to the use of political pressure than collective bargaining or other means to achieve their goals. This political pressure comes about mainly through use of the strike, and often the use of threat of a general strike, which is reflective of the fact that wage decisions are in the government purview, are made for entire industries, and are many times linked directly to stabilization policy. It is difficult to overestimate the

2. See Fillol, op. cit., pp. 81 and 90 for somewhat contradictory opinions within the same source.
3. Ferns, p. 239.
4. Fillol, p. 89, observed a negative labor response to a proposed production incentive system, and noted that "This resistance was no doubt reinforced by their being accustomed to obtaining higher remuneration by means of massive, government-decreed wage and salary increases".
general strike as a major tool in exercising labor power. With it labor can easily bring the entire country to its knees and induce rapid reversal of restrictive-redistributive economic policy. No government since 1955--either politically elected or military--has been strong enough to withstand a homogeneous union assault.

Formation of the workers into such an effective power bloc came soon after the end of World War II. The group broadly classified as urban workers had been growing rapidly in numbers (with the growth of industry, the public sector and immigration from the interior) without a commensurate increase in voice. Whether due to the appeal of "personalismo" or dissatisfaction with previous attempts at democratic government, the workers were open to a leader who could speak to and for them. Juan Peron recognized this untapped source of power and utilized labor as one pillar in his rise to absolute control with the enactment of his basic tenets: (1) the organization and recognition of labor power, (2) a shift in development priority from agriculture to industry, and (3) heavy state participation in the economy. Specific measures aimed at labor included the expansion of the social security system, a significant increase in real wages, and, perhaps

2. Ibid., p. 97.
3. "During 1944-45 he built up a National Institute of Social Security, thereby converting Argentina from one of the most backward countries in South America in social insurance matters to one of the most advanced." Ibid., p. 97.
4. "...the general increase in wages, the fixing of ceiling prices on staple commodities, and the freezing of urban and rural rents, all contributed to raise the share of labor in domestic income." Ferrer, Argentine Economy, p. 185.
most important, explicit recognition of the importance of the wage
earner¹. Simultaneously, Peron "...thoroughly politicized the labor
movement, making its gains dependent upon governmental decree rather
than upon collective bargaining"². The format was syndicalism,³ but
in reality Peron was very much in control, using labor as the major
pillar of his power and causing enemies, especially the military later
on, to pause in their plans for removing him from office.

Eventually, however, the forces behind removal proved overwhelming,
and Peron was ousted by a military coup in September of 1955 (after an
abortive attempt earlier in the year). Reasons given for his ouster
traditionally include growing distaste for his "dictatorial apparatus,"⁴
"...dismay at the opportunism and immorality of [his] personal life
and his administration"⁵ and fear that "...his social and political acts
were arousing a class conscious, revolutionary proletariat."⁶ Undoubtedly
just as influential was the, at that time, extraordinary inflation
and balance of payments crisis. These had combined to force Peron from
1952 on to reverse his discriminatory policy against agriculture,
which had been suffering from set prices (through a state agency), over-
valued exchange rates and increasing costs. The turnabout was too late

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¹ "He felt important, someone to be catered to, someone whose
wishes the government apparently respected." Fillol, p. 85
² McGann, Argentina--The Divided Land, 1966, p. 53.
³ Peron, quoted in Pendle, p. 133: "We are moving towards the
Syndicalist State, the ancient aspiration of the human community, in
which all will be represented in the Legislature and in the Administra-
tion by their own people."
⁴ McGann, p. 56.
⁵ Ibid.
⁶ Ibid.
to stimulate much response from the landed sector, but was sufficient to make labor slightly ambivalent when anti-Peron forces combined for the coup.

After 1955 there was a distinct alteration of stated policy, in reality a continuation of the type of policy enstated by Peron during the last years of his first regime. Primary consideration was given to redistribution of income away from labor and toward the entrepreneur--especially the agricultural entrepreneur in an attempt to stimulate the capacity to import. However, it was not at that time, and apparently no longer is, possible to practice this variety of sectoral discrimination and attempt a return to prewar conditions. The strong peronist-oriented labor movement could not be ignored--either in the political or the economic process. On the political front, any freely elected government must either include heavy peronist representation, or else face essentially valid charges of illegitimacy if the peronist vote is not allowed.\footnote{Peronists "...represented Argentina's largest political organization," consisting of about a third of the electorate. Blank ballots in restricted elections have in the past represented about 25 per cent of all ballots cast. \textit{Guide to the Political Parties of South America}, pp. 54 and 49.} Economically the force of labor is, as described above, overwhelmingly felt in its ability to understand and effectively resist attempts at redistribution--resulting in seemingly interminable cyclical instability. Whereas it is probably valid to note that "...the aspirations and desires of the lower classes have been stimulated without simultaneous growth of the country's capacity to support
such ambitions\textsuperscript{1}, perhaps the more important legacy of Peron is the reliance of many in the country on the state to extricate them from essentially market-created conditions. The Argentine government has become much more adept at reallocating incomes (at least in the short run) than the Argentine economy has at reallocating resources.

Landed Interests

The economic viewpoint of the agricultural interests in Argentina correlates well with a relatively pure laissez-faire model. The sector is certainly world-oriented philosophically, if for no other reason than a good measure of its return is directly linked to the international markets for grain and beef. Since, under free trade, the distribution of income is skewed towards the owners of the more abundant factor (in a Hecksher-Ohlin fashion), the attitude of the large landholders is understandable. This is especially so given the large size and great concentration of land holdings: an ECLA study on income distribution notes that "...this 1.2 per cent of all farms [which were greater than 5,000 hectares apiece] included 46.7 per cent of all the land"\textsuperscript{2}. The original colonial distribution of land was based on extremely large land grants, and, like other former colonies, the same pattern of land ownership has persisted down to the present day--maintaining a very wealthy class of large landowners. This landed elite directly ruled Argentina as a type of oligarchy until early in the Twentieth Century, and some

\begin{itemize}
\item\textsuperscript{1} Scobie, p. 250.
\item\textsuperscript{2} Op. cit., p. 33.
\end{itemize}
would even say until Peron. The "oligarchy," as they are still called, tended to view the country somewhat as a huge grain and cattle ranch--with distaste if not "outright hostility" towards industry. Restrictive import duties were placed upon raw material imports as a kind of "protectionism in reverse" since "...the landowners and exporters, who traditionally dominated Argentine politics, tended to favor imports of manufactures rather than imports of raw materials that could be used to produce those manufactures in Argentina"\(^1\). To this day "...most of the aristocracy still looks down--consciously or unconsciously--upon industry and business..."\(^2\).

If it is difficult to therefore draw a strong correlation with the English landowner of the Eighteenth Century in willingly providing (in a sense) the fodder for capital accumulation and industrialization, it is still possible to envision a profit motivated Argentine entrepreneur responding favorably to market signals. This viewpoint has, however, also come under scrutiny following the almost incredible rigidity in output (in spite of significant relative price improvement) after 1952. As noted above, the sluggishness in growth of the capacity to import has spelled real stagnation and continued cyclical instability for the economy. Rationales that have become standard in the literature include possibilities that land is held as an inflation-hedge or source

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2. Fillol, p. 31.
of prestige rather than as a productive investment, \(^1\) or that landowners are generally lazy brutes who make enough to live well off the farms and productivity is beyond their concern. Others have noted the paradox of a rather prompt response to intra-sector relative crop price alteration. \(^2\) It is true the "...agricultural sector experiences the greatest variation in its share of monetary income" \(^3\), and it may be true that the constant fluctuation in relative prices (which was itself a function of cyclical instability and gave rise to the high variance of agricultural income) created an uncertainty which "...made the farm producer reluctant to expand his activities." \(^4\)

The fact remains that the grain and livestock producers retain almost exclusive control over foreign exchange earnings, and that if an adverse redistribution of income is attempted the landed gentry can make their small numbers heard either politically or through economic constriction. Their political power has increased immeasurably in recent years through alignment with what used to be considered an extra-political force--the Army. Since military policies "...frequently coincide with the conservatives' interest" \(^5\), and since the military

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1. "Frequently land is held for prestige or social status and as a hedge against inflation, rather than as capital that should be turned to yielding a...profit through the use of manpower and investment." Ferrer, Argentine Economy, p. 161.
2. Remy Freire, Price Incentives in Argentine Agriculture, DAS\textsuperscript{m}.
3. ECLA, p. 223.
5. Guide to the Political Parties of South America, p. 64.
frequently assumes power in difficult economic conditions, the old oligarchy has retained a significant portion of its old control. But "...the main reason why they are influential in politics at all is because of their economic strength", and they have clearly evidenced the ability to react powerfully to negative stimuli.

Peron, during the early years of his regime, established a state organization (IAPI) which had at least one stated objective of stabilizing farm prices, but which in reality bought farm products cheap, sold them dear, and used the proceeds for "investment" (including nationalization of the British-held railways). In coupling this anti-agricultural economic policy with anti-oligarch rhetoric, Peron induced a perhaps predictable response:

The prices given to Argentine farmers cut farm profits. In addition, the higher wages of farm workers resulting from Peronist unionization further squeezed profits. In the end, farm owners moved into the cities, herds were not replenished, and the migration of farm workers into the already overcrowded cities increased.

Or as Ferns points out, Peron:

...attacked the landed interest ideologically while he milked them dry economically by his system of differential payments and exchange control. The agricultural and ranching interests, being the largest and richest interests in Argentina, were one of the best potential sources of investment capital,

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1. Guide to the Political Parties of South America, p. 64.
2. Ibid.
but the attack on them not only ended the possibility of their investing in industry, but destroyed their inclinations to invest in their own business. Their surpluses began clan-desately to flow abroad or into static assets like more land and urban home property.

The flow of investment abroad, the failure to apply modern techniques, a cutback on production combined with deteriorating terms of trade, increased domestic consumption of food products, and a 1952 drought to drastically reduce exports and export earnings. Peron soon ran out of the huge stock of foreign exchange amassed during the war, and was forced to alter his policies to placate the farm and ranch owners. But, as pointed out above, it was both too late and the wrong political move.

From 1955 on, few governments have willfully engaged in policies which ignore the expansion of the agricultural sector. The Central Bank in its Memorias in 1955 saw increased agricultural production as "...important for the security and progress of industry, which depends more than ever on accelerated and vigorous recovery of agricultural production". The measures they proposed have become familiar in their repetition: "...better prices and exchange rates favorable to exports".

The landed interests have thus been able to insure the long run continuity of their wealth and income through a capacity to import

1. Pendle, p. 147.
3. Ibid.
stranglehold, but the process has not been stable. Crucial to this instability is the fact that income redistribution from the urban to the rural sector is also a regressive redistribution of income. Land ownership is concentrated "...in the hands of a relatively small number of persons, was established at the outset of the colonial period, and has tended to remain the same". In addition, there is great inequality within the agricultural sector, since "...incomes of the agricultural workers are low, and they are concentrated at the bottom of the distribution; while a varying, but large, proportion of agricultural proprietors have incomes which place them in the highest decile, and so the sector is important at that extreme as well". These conditions, combined with the heavy proportion of labor in the urban sector, means that relative price policies aimed at export stimulus also create a highly unequal and regressive form of income distribution. As Scobie notes:

Unequal land distribution set the stage for a conflict between economically efficient policies and what most Argentines regarded as a fair distribution of income and wealth. If land tenure had been such that the term agropecuario had been associated with visions of Jeffersonian farmers rather than of cattle barons, it is doubtful that Peron could have got away with his rural policies. Instead, the many who left rural zonas after 1930 and migrated to the cities received his philippics against rural oligarchs enthusiastically.

1. ECLA, p. 32.
2. Ibid., p. 47. The average wage in agriculture is about half of that in the non-agricultural sector. See p. 12.
Although by no means all who are in the upper income brackets belong to the rural elite, many in the country still feel the same way about what is considered the core of the "old patrician class", and see little reason, except perhaps the exercise of political power, behind what is now recognized as regressive economic policy. A continuing struggle for income shares between labor and the landed interests, both possessing significant but different forms of power, has been the inevitable result.

The Military

Caught in the middle of these sectoral clashes has often been, frequently in spite of itself, the Argentine military. Whereas it is convenient to view the military organizations in LDC's as monolithic and homogeneous institutions with well defined goals and objectives, such a characterization does not fit well the Argentine experience. The military more commonly reflects many of the forces which are current in the civilian population, and that often means a distinct ambivalence.

One major source of ambivalence within the military, and the country as a whole, is that between libertarian and authoritarian economic viewpoints. Goldwert, in the preface to his work on Argentine militarism, presents this contrast in some detail by defining the concepts "integral" and "liberal" nationalism. "Integral"

2. "Argentines have a long tradition of libertarian-authoritarian ambivalence." McGann, p. 117.
nationalism, which may be identified with totalitarianism or authoritarianism, emphasizes authoritarian rule, control (often military control) over civil liberties, economic nationalism and protectionism, state intervention into economic activities, and occasionally expansionism. "Liberal" nationalism, on the other hand, emphasizes cooperation among nations, a free flow of ideas and goods worldwide, the free interplay of economic forces within the state and between nations, close cooperation of western democracies, and the format of representative government. Due to the historical background of the country as well as traditions developed within the services, the military has felt the force of both of these viewpoints at various times in the past—one or the other momentarily ascendent into official viewpoint and overt action.

Other, contrapuntal strains of ambivalence have developed to influence thought and action in the armed forces. The traditional image of the army officer (patriot, gentleman, Catholic, proponent of social order) has had to confront the image of the modern manager of a strong war machine (technologist, industrialist). Even the forces themselves are split. The navy in unabashedly liberal in viewpoint. Naval officers evidence a strong identification with liberal-minded civilian elites (especially the landed interests), feel more cosmopolitan and less purely nationalistic than their peers in the army (it has been suggested as the result of travel and awareness of other nations).

1. Ibid., p. xix.
and favor democratic forms of government. The army, although less homogeneous than the naval elite, tends to be more authoritarian, xenophobic, and even fascist in viewpoint. Although occasionally dismissed as superficial, one factor in this particular split may well be the British training of the navy and the German model for the army. Goldwert suggests "...that Germanization contributed significantly to the development of integral nationalism in the Argentine army. Four decades of German military training [1901-1940] carried with it a spiritual conditioning that inclined many Army officers towards authoritarianism as opposed to the democratic principles of their nation"¹.

Be that as it may, the Argentine military often finds itself split on basic principles as well as current major issues. This is important in that they often hold the key to the balance of power between the previously noted warring sectors—in fact, some of their power arises from their peculiar state of ambivalence and their traditional separation from politics. That is, they are viewed (although sometimes only by themselves) as the disinterested arbiters in the national debate.

Much of this tradition arose early on in this century and had the objective of producing a purely professional military subservient to a freely elected civilian government. Even though this was the case for a few years, the more virulent product of the process proved to be a corps of officer elitists with "...a feeling of superiority over the politicians"². The hierarchical and conservative values are none

¹. Ibid., p. 61.
². Scobie, p. 220.
the less real for being induced into the basically middle class recruits for the officer corps, and the elitism extends beyond the distaste for politicians to distaste for the "illiterate" masses as well.\(^1\) This feeling of superiority, often latent in the support of liberal-democratic traditions, occasionally asserts itself in a rejection of democracy when the outcome of the democratic process is not satisfactory to the military hierarchy. Thus one finds frequent military takeovers in cases of "emergency"—ranging from excessive union wage gains to excessive peronist election gains.

Military intervention has, therefore, become an important force in Argentine politics, and the armed forces have become an important power base. Exercise of their power has often had the result of improving the position of certain economic sectors within the country—most especially the landed interests. Even though it could hardly be said that the armed forces are "...allies and/or tools of the economic elite"\(^2\), especially given their heterogeneous ambivalence, it is fair to say that the exercise of their power "...gave these social groups political influence out of proportion to their number of members"\(^3\). The stabilization and exchange rate policies instituted by military (or military dominated) governments during adverse economic conditions had the effect of significantly improving the income and wealth of sectors which otherwise could not have achieved those gains.\(^4\)

\(^1\) Goldwert, p. 220.  
\(^2\) Ferns, p. 195.  
\(^3\) Goldwert, p. 144.  
\(^4\) The landed interests have "...always found themselves in a favorable position to reap the fruits of any intervention by the Army". Guide to the Political Parties of South America, p. 65.
To briefly reiterate, military coups typically occur during periods of acute economic stress. Balance of payments difficulties combined with rapidly growing wage rates, budget deficits and rates of inflation spell the need for quick reversal of the negative trends and movement back to a stable rate of monetary expansion and, hopefully, real growth. Liberal nationalist economic viewpoints, as described above, are quite strong in the Argentine military and correlate well with the views of those in essential control of the capacity to import as well as those in the world community. Therefore, another stabilization program, this one to be the last, is appealing—and the result is often a huge devaluation accompanied by extraordinary monetary and wage constraint. With the obvious implication of these policies on the distribution of income, the armed forces is soon viewed as being in league with the oligarchy, against a disadvantaged labor.\footnote{Examples of the use of military power to achieve economic ends in this way must include 1) the General Aramburu policies of 1955 after the ouster of Peron; 2) the Frondizi stabilization program of 1959;\footnote{Frondizi, although popularly elected, enjoyed no military support after clandestine deals with Peron for his support, and probably could not have stayed in office had it not been for this program.} 3) the policies under the civilian puppet Guido in 1962-63;\footnote{Synoposes of these three programs are contained in ECLA, pp. 252-258.} and 4) the extremely restrictive program of Kreiger Vesena and General Ongania in 1967.}

1. A labor leader's response to the 1968 wage freeze imposed by General Ongania's government was: "...we now know who really controls the country: the monopolies, the oligarchs, the old heads of the governing class". Quoted in Goldwert, p. 206.
It should not be assumed, however, that the military possessed or possesses absolute power in Argentina. The armed forces find it most difficult to continue under united labor resistance to a de facto military government. Even General Ongania, perhaps the most autocratic of post-Peron military presidents, recognized after his takeover in 1966 that "...a successful golpe had not extinguished the capacity of the heterogeneous opposition, if goaded, to come together and employ the one weapon which they possessed: a general strike and mass demonstration of the kind which had defeated the attempt of the soldiers to remove Colonel Peron from the Vice-Presidency in October 1945"¹. The Argentine army does not (yet) rest its power base on mass violence. The officers will attempt to insure peace and order, sometimes with startling alacrity, but when it comes to direct confrontation with coalesced labor "...the prospect of bloodshed in the streets of the federal capital [has] led several senior officers to say privately that if that were the cost of monetary stability, it was not worth it"².

On the other hand it has only been recently that the military felt it could stand by and allow the results of a completely free election. A combination of distrust of a strong industrial proletariat, concern for the effects of populist economic measures, and fear of retribution against staunch anti-peronists in the ranks, has

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¹. Ferns, p. 228.
led to years of paradox for a large part of the military: open avowal of "...democracy and a return to civilian rule...", but strong opposition to "...the group most likely to win in a free election--the Peronists". This internal division within both the armed forces and individual officers has had the effect of contributing to the institutional basis for cyclical instability, although in the final analysis military power has been able to alter conditions and events only temporarily.

Other Groups

If the military has been "...a divided power factor in a divided nation...", much the same could be said of the middle class--except that the group is even more fragmented.

The middle class makes up approximately 50 per cent of the total population, and is composed largely of industrial workers, government employees, and transportation and communications workers. Further examination, however, reveals anything but uniformity. The upper middle group is composed of some highly skilled workers and middle administrative and professional personnel. The lower middle class consists of some skilled labor, better paid workers, and lower eschelon white collar elements. The dichotomy and lack of common background in the group is noted by Fillol:

2. Ibid., p. 143.
3. "They account for one half of the middle income families and for nearly half of the upper middle families." ECLA, p. 9.
4. Ibid.; p. 5.
Rapidly growing white collar groups of shop-helpers, clerks, and bureaucrats coexist with professionals, industrialists, and property owners. Some are members of the middle sector because of their education and intellectual attainments; others, more because of their wealth than because of their learning. Some have only recently risen from lower levels of society; others having inherited a traditional contempt for labor and the labor movement; still others have only a paternalistic interest in the working elements.

The middle class is split over a number of issues, not the least of which has been the future of peronism. Certain groups within the middle class (those in the professions, some businessmen, and most independent farmers) are clearly aligned with the oligarchy in staunch opposition. Others among the "new" middle class (bureaucrats, technicians, artisans, white collar workers) are divided among themselves as to whether to take a hard or soft stand towards peronism. In terms of political representation, the Radical Party, which has attempted to speak for the center middle groups, has never been particularly effective since it could not speak from consensus. Before the inevitable splintering of the party in 1956, practically the only basis for agreement was the call for free elections. On economic issues (government intervention, nationalization of key industries, etc.) there is a similar disparity of views, depending upon background, source of income, place in the middle class, and so on. "In fact, they do not constitute a united, coherent class, but rather an aggregation of disparate groups and individuals who have little in common beyond the

fact that they occupy a middle position between the oligarchy above and the [working class] beneath."¹

In these conditions the Argentine middle class has neither been a major, compact political force nor the stabilizing influence one would expect from their numbers. Without the influence of a concerted voice from the center, free play has been given to other, destabilizing, interest groups.

Another economic sector one might expect to wield some stabilizing influence, especially in response to the enormous inflationary pressures inherent in the cyclical behavior of the economy, has in actuality been little more than a passive conduit for those pressures. Argentine urban entrepreneurs are rich, being well represented at the top of the income scale,² and carry on their activities in highly concentrated industries. This concentration has been achieved largely through the aegis of the government in the form of heavy protection from any foreign competition.³ Over the years this protectionist climate has, in a most similar analogy to labor, developed into a dependence on government to provide a tranquil atmosphere for the reaping of monopoly profits. Although the government "...has been conspicuously unable to manage the nation's industrialization process"⁴,

¹ Whitaker quoted in Fillol, p. 30.
² Ecla p. 5.
³ "In the case of large industrial employers they could and did protect their position by insisting on and getting high tariff protection to ensure non-competitive, captive markets for their products." Ferns, p. 204.
⁴ Fillol, p. 75.
it has at least continued to prove amenable to the tariff structure necessary to maintain oligopolistic behavior. This behavior is most noticeable in the sphere of wage demands. A combination of great concentration and few mass markets has meant that wage increases allowed by government decree are shifted quickly into product prices. As Fillol notes: "Argentine industry has been able to pass on to the consumer the increased costs of governmental labor policies and has adapted itself comfortably to producing large profits in the smallest possible volume"\(^1\).

The foregoing is important not only to illuminate the rapid course of the cost push spiral in Argentina, but also to help explain the insular character of the Argentine entrepreneur. Further characteristics include a suspicious nature, an extreme loyalty to family ("...even at the expense of honest and profitable operation..."\(^2\)), and a paternalistic and autocratic attitude in employee relations. Perhaps most important is the lack of risk taking and innovation characteristic of the ideal Schumpeterian entrepreneur. Argentine businessmen are hardly in the optimal condition to provide the vigor, initiative, and leadership out of a static urban-rural struggle.

In review of this brief historical survey of Argentine institutions one would have to conclude that the society and the economy are splintered into vying interest groups--the two most powerful being labor

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1. Ibid., p. 58.
and the conservative landed interests. There is little cooperation between the major power factors in any sphere, and indeed, the polarization seems to be accelerating. The scene of the sectoral clashes that has occurred since the war has been both political and economic, with each group possessing weapons that enable it to thwart the ability of the other to maintain short term gains. The economy has been caught in the center of the struggle, and, as a result, has yielded nearly two and a half decades of stop-go cycles and long run stagnation. Other groups, notably the middle class and urban entrepreneurs, have been unwilling or unable to measurably affect the outcome of those events. The military, although a key power factor, is itself as divided as the nation it represents, and in the final analysis is constrained to alter circumstances only temporarily.

In this milieu economic policy has been utilized as a politico-economic tool to redistribute income between sectors, either towards the goal of stabilizing the economy or compensating a disadvantaged factor. Instead of dampening cycles, one continues to find the ever greater exchange rate devaluations and monetary contractions matched only by the size of subsequent wage increases. With no group in Argentina either willing to undergo austerity or respond measurably to relative price changes, no real gains are achieved through these spectacular economic policies, and the economy is destined to shift to and fro. 1

1. In spite of the return to power of Juan Peron and the subsequent presidency of his wife, recent events (at this writing) only reinforce these conclusions.
Conclusions and Policy Implications

Implications for the utilization of Argentine economic policy instruments follow directly from the results presented in previous chapters. Addressing first the role of monetary policy, it seems quite certain that changes in the supply of money are a most powerful tool in altering the balance of payments in the short run. Large and significant income elasticities of the demand for imports and exportables ensure that recessions induced by restrictive monetary policies will result in a decrease in imports and an increase in exports—even though no change in the domestic supply of tradeable products occurs.

Results of this thesis, on the other hand, suggest that exchange rate changes are not effective on the balance of payments in the short run. Although outright acceptance of an hypothesis of "no influence" cannot be made, previous presumption based on historical precedent, and exchange rate and relative price regression coefficients near zero (although insignificant), both speak to the inefficacy of devaluation in improving the balance of payments. Exchange rate changes are not, thereby, unimportant. They are clearly effective (although not entirely) in altering the relative prices of tradeable products vis-a-vis prices in the entire economy, which may have implications for long run balance of payments stability. In addition, in light of the evidence from Chapter V, it seems reasonable to say that devaluations matter
significantly in their influence on overall rates of inflation, and, by altering the demand for real cash balances, on the ability of monetary policy to affect the real economy.

Examination of past policy actions of various Argentine governments reveals behavior evidently based on assumptions contrary to these conclusions. As noted in Chapter VI, governments, especially military or military-influenced governments, have responded to balance of payments crises and growing rates of inflation by instituting so-called stabilization programs. Essential ingredients in these programs have typically been huge devaluations of the exchange rate, presumably with an eye on the balance of payments, and monetary constraint coupled with a wage freeze, presumably to limit inflation and maintain relative price inducement to agricultural expansion. The untenability of the redistributive aspects of these programs soon becomes apparent in the wake of large rates of overall inflation coupled with frozen nominal wages. Disadvantaged labor responds with severe and often violent political and economic pressure to reverse the policy, and there is established a schema for continuous cyclical redistribution.

Certain things stand out in viewing these cycles in light of the results of this thesis. First, it appears that the short run balance of payments improvement that occurs after the institution of a stabilization program may be almost exclusively due to the restrictive monetary policy, and very little or not at all to the devaluation. Secondly, given the restrictive monetary policy, there is some evidence
to implicate the devaluation as the major cause of the high rates of inflation which typically occur at these times. The inflation, by further lowering the real income of a large sector of the economy, already suffering from unemployment, adds to the political pressures on the authorities for relaxation.

The implications of these points for policy entail mainly a change in emphasis by the authorities in their policy actions. Monetary policy, instead of being viewed as somehow seconding, validating, or insuring that the devaluation will "work", must be looked upon as a major tool in dealing with short run balance of payments crises. The exchange rate, on the other hand, must be altered only with some trepidation. Surely alteration in line with the overall rate of inflation, that is, keeping a constant real exchange rate in order to provide consistent long run inducement to tradeable producers, is appropriate. Any rate of depreciation greater than this, however, will probably not improve the balance of payments, is primarily inflationary, and may well reduce the efficacy of monetary policy. Argentine governments must become convinced that extremely large devaluations simply do not work--in any sense. It seems much wiser to substitute, difficult as it may seem in the midst of a severe exchange crisis, many judiciously spaced small devaluations (that maintain a given real exchange rate) for one mammoth one that cannot achieve its stated purpose. Moderate real income loss (for short run balance of payments equilibrium) accompanied by stable inducement for exportable production may achieve
results where grandiose policy changes in the past have not. It will perhaps be difficult to convince labor to assume this moderate amount of real income loss, but it must be clear by now that it is impossible to persuade the workers to undergo the degree of austerity implicit in stabilization plans of the past. It is probably not true that the price mechanism is as delicate as it has occasionally been portrayed, but violent swings in key economic variables can hardly encourage long run stability and growth. What is needed is time for relative prices to cease being a tool to periodically redistribute income, and become once again signals to efficiently reallocate resources. As Harberger has suggested, "...the effects of small devaluations on the price level are undoubtedly easier to cope with than effects of large devaluations."\(^1\)

This thesis provides much support for his contention that

In resource allocation, it is, by and large, relative prices that count. A policy which attempted to keep the relative price of foreign exchange stable in the face of an internal price inflation would undoubtedly be wiser, from the standpoint of resource allocation, than a policy which tended to keep the nominal rates of exchange constant for long periods of time, and which was periodically forced by the cumulative rise of internal prices to take the step of massive devaluation.\(^2\)

If, in spite of this evidence, large devaluations continue to be considered a necessary and viable tool, perhaps an examination is in order of the possibility of limiting the "expectations" component of devaluation-induced inflation. One suggestion for policy which follows

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1. Inflation and Growth, p. 351.
2. Ibid.
directly from the results of Chapter V, must be limitation of all value-added per unit increases following a devaluation. Once again, however, this conclusion may be tempered by the often overriding consideration of political reality.

The suggestions above do not pretend to solve all the problems of Argentine inflation and stagnation. The problems of long term supply response, the political implications of recessions, high rates of inflation, and sectoral polarization seem to have become permanent fixtures. Nevertheless, a more secure knowledge of the short run effects of economic policy tools can perhaps temper somewhat the huge loss in welfare implicit in the Argentine cyclical stagnation.

Much remains to be done in terms of further research in this area. The short run balance of payments model presented here is by no means exhaustive. Other structural forms, for example, could include detailed examination of the route of effectiveness of monetary policy and the ability of redistribution of income in explaining actual balance of payments changes. Explicit consideration of other policy variables could surely include fiscal and income policies. A model including an adequate incorporation of the time dimension would be most desirable. Long run responses, especially of tradeable producers to relative price changes, is another relatively open area for further research, as is the comparison of differing exchange rate structures. The shortage of quantitative research in this area is great, and this list is merely suggestive.
Bibliography


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