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Imports Under a Foreign Exchange Constraint: The Case of the Islamic Republic of Iran

Prepared by Adnan Mazarei 1/

Approved for distribution by Zubair Iqbal

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Abstract

This paper examines the role of foreign exchange receipts in determining Iran's imports during 1961/62-1992/93. It provides evidence of the existence of long-term relationship between imports and foreign exchange receipts, as well as the traditional price and output variables.

JEL Classification Numbers:

F10, F14, 053

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Contents

Summary

This paper is an empirical study of the determination of imports under a regime of foreign exchange rationing. Several previous studies have suggested that the inadequacy of foreign exchange reserves induces many developing countries to compress imports through a system of import licensing and official foreign exchange allocation. In addition to the usual variables, such as relative prices and income, the availability of foreign exchange is a key determinant of the level of imports in these countries. In the case of oil exporting countries, such a relationship should be particularly close, given that sizable portions of both foreign exchange receipts and national income are determined by petroleum exports.

This paper provides an empirical examination of the relationship between foreign exchange receipts and imports for the Islamic Republic of Iran during 1961/62-1992/93. The results verify the key role played by petroleum export earnings in the determination of Iran's imports. This paper also explores some of the consequences of the very significant dependence of Iran's imports on foreign exchange receipts.

I. Introduction

Policy makers in developing countries often need to balance the demand for foreign exchange for imports against the desire to maintain adequate foreign exchange reserves. As a result of these conflicting objectives, their limited foreign exchange reserves, restricted access to international capital markets, many developing countries limit imports through rationing foreign exchange, as well as through tariff and other nontariff barriers. In view of the above, one should observe a tight empirical relationship between imports and the availability of foreign exchange. In recognition of this, a number of studies of imports in developing countries have posited and/or empirically verified that aggregate imports by developing countries are determined largely by the amount of foreign exchange available to them. 1/

The relationship between imports and the availability of foreign exchange should be particularly close in the case of oil exporting economies where sizable portions of both foreign exchange receipts and national income are determined by petroleum exports. In other words, in the case of oil exporters, an increase in foreign exchange receipts represents both a significant income effect, especially for the governments of these countries, and a relaxation of the foreign exchange constraint, thus allowing for an increase in imports.

This paper provides some evidence for the existence of a long-term relationship between imports and foreign exchange earnings in the case of Iran during the period 1961/62 to 1992/93. 2/ Unlike previous works that measure the foreign exchange constraint in terms of official foreign exchange reserves, given that official data on Iran's foreign exchange reserves are not available for the period since 1983, the availability of foreign exchange is measured here in terms of foreign exchange earnings in the form of exports. 3/

We begin our analysis in 1961/62, shortly after the rise of systematic and reliable national income accounting in Iran. 4/ Chart 1 illustrates the close relationship between imports and foreign exchange receipts, as represented by total exports, for Iran. It is evident that during the period under study, Iran's imports have been moving closely in line with its foreign exchange earnings. Following the balance of payments problems in

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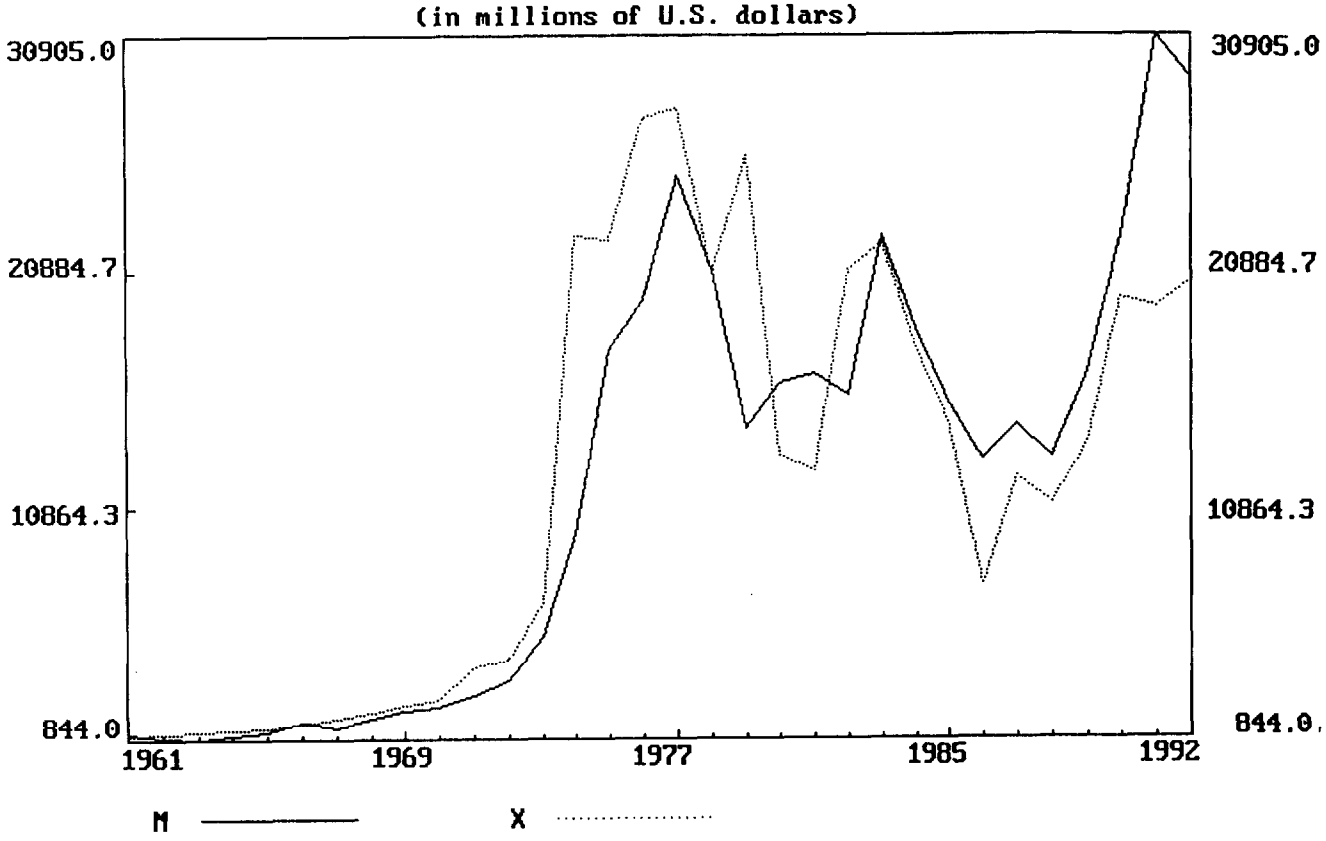
1/ These include Faini, Pritchett and Clavijo (1988), Hemphill (1974), Khan and Knight (1987), Lipschitz (1984), Moran (1988), Saracoglu and Zaidi (1985), and Sundararajan (1986).

2/ Iranian years begin March 21 and end March 20.

3/ See IMF, International Financial Statistics.

4/ Data from the IMF's International Financial Statistics on Iran's total imports and exports are available starting in 1961/62.

Chart 1: Iran - Total Imports and Exports
(in millions of U.S. dollars)



1961/62-1963/64, both imports and export receipts rose steadily until the surge in oil revenues and the consequent relaxation of the foreign exchange constraint in the early 1970s. Indeed, imports rose less than exports in the period of the rapid increase in oil exports, which may be attributed to a number of factors. In the period prior to the oil boom, the notional demand of imports was restricted by the availability of foreign exchange. Hence, imports could rise only commensurately with the increase in foreign exchange earnings. With the sharp rise in oil income in the early 1970s, however, imports were less constrained by the availability of foreign exchange, and the notional level of import demand might not have increased in step with foreign exchange earnings, especially given that Iran did not have the absorptive capacity, such as port facilities, for higher import levels. 1/

However, the oil boom, which allowed for a significant rise in imports, dissipated in the late 1970s. The close relationship between imports and exports was interrupted during 1979, the year of the Iranian revolution; while oil exports surged on account of higher prices, imports were curtailed due partly to a decline in industrial activity and government restrictions. Since 1979, overall, Iran's export revenues diminished sharply on account of economic sanctions, the war with Iraq, and the decline in oil revenues. As a result, Iran suffered a serious balance of payments crisis to which the Iranian authorities responded by imposing trade and foreign exchange restrictions. Imports were particularly restricted following the negative shock to petroleum revenues in 1986, 2/ but rose steadily thereafter on account of improved oil export earnings and the end of the war with Iraq in 1988. Imports rose significantly after 1990 as a result of increased foreign exchange earnings and the partial liberalization of Iran's foreign trade regime, which entailed the removal of a number of restrictions on imports. For purposes of comparison, Chart 2 and Chart 3 show the same close relationship between imports and exports for Algeria and Venezuela, two oil-exporters which are structurally similar to Iran.

The remainder of this paper focuses on the empirical examination of the impact of foreign exchange receipts on imports in Iran. Section II provides an empirical examination of the determinants of aggregate imports in Iran, and section III considers some of the economic consequences of the effect of the dependence of imports on foreign exchange receipts.

1/ There is much anecdotal evidence about ships waiting for several months at Iranian ports to unload their cargo during this period.

2/ Indeed, in addition to constraints on the supply of imports due to official restrictions, in the mid-1980s, the demand for imports declined on account of the slowdown in the domestic manufacturing sector.

Chart 2: Algeria - Total Imports and Exports
(in millions of U.S. dollars)

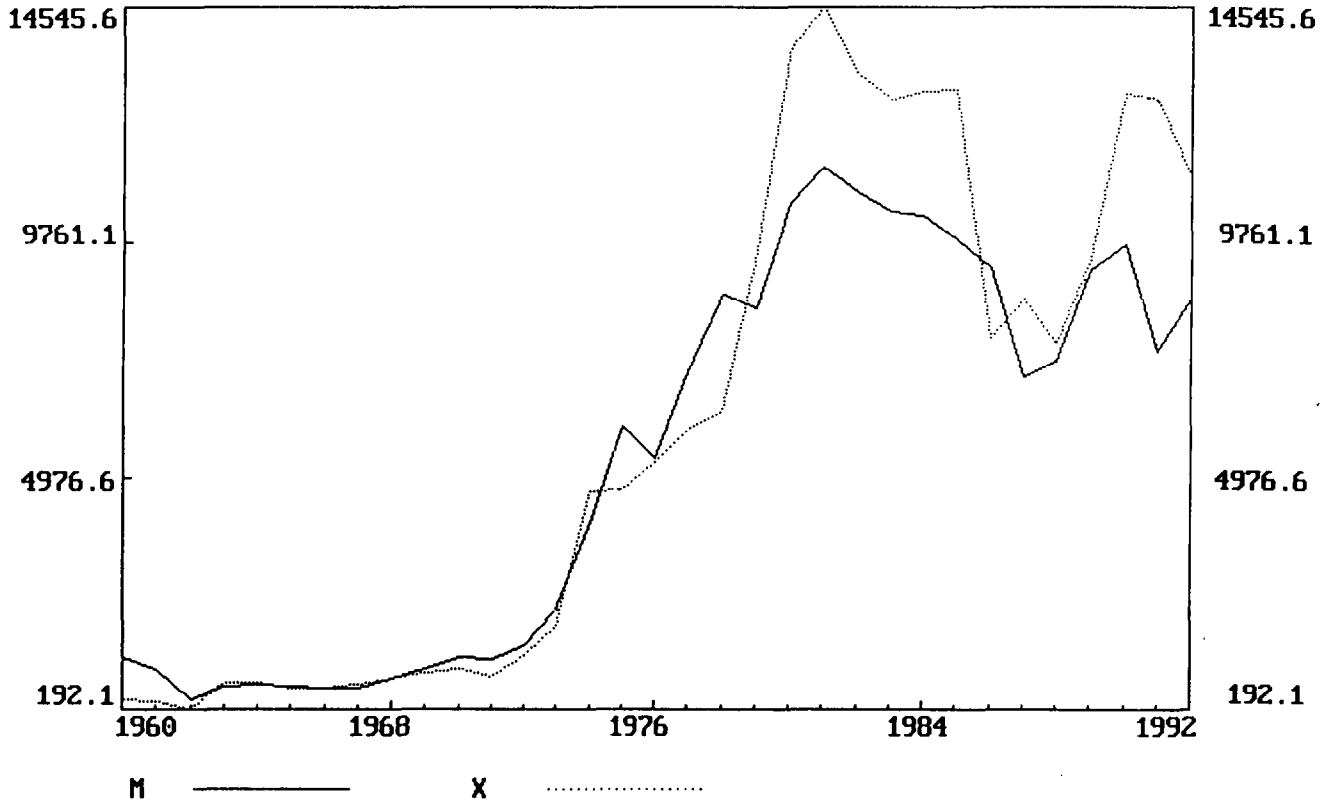
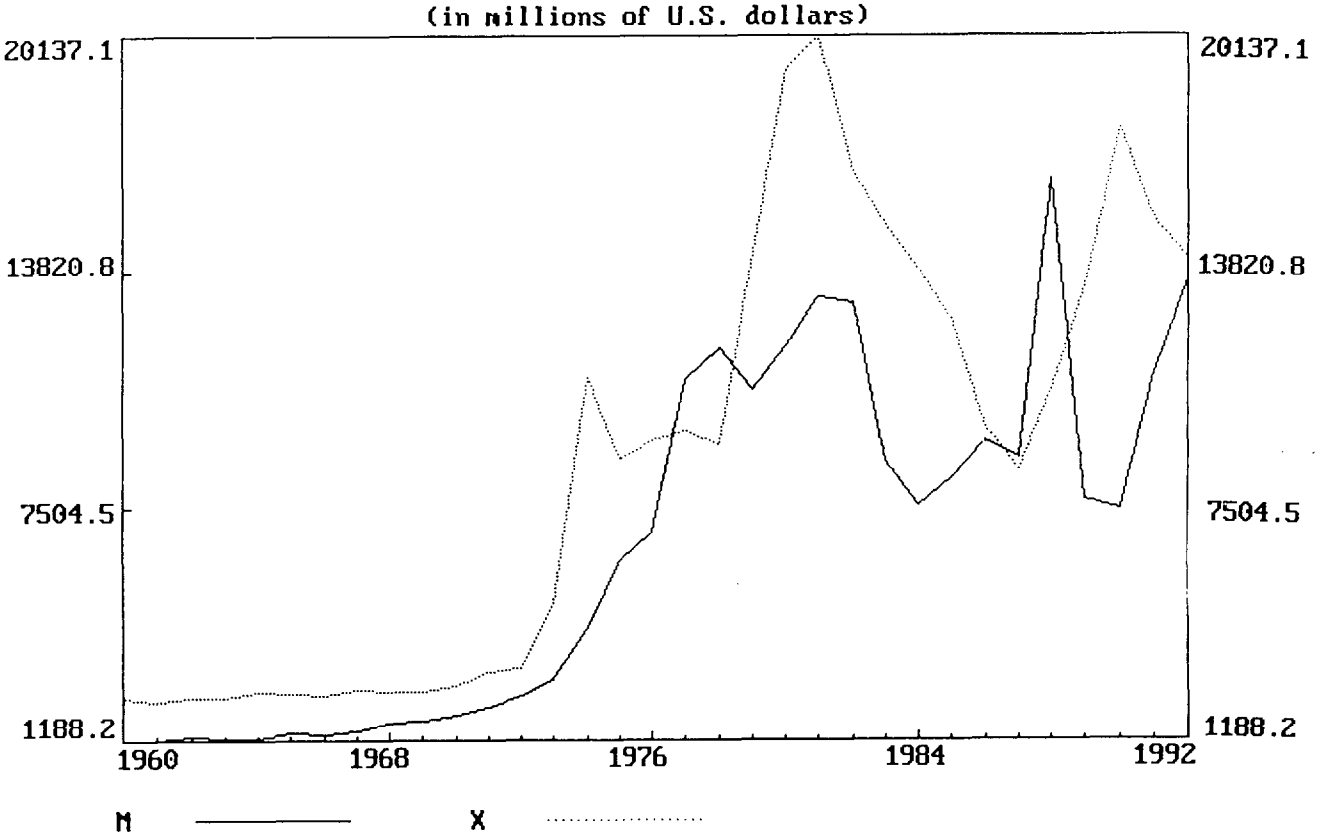


Chart 3: Venezuela - Total Imports and Exports
(in millions of U.S. dollars)



II. Empirical Results

In order to examine the impact of foreign exchange receipts on imports in Iran, we estimated an aggregate import function that relates imports to economic activity, the relative price of imported goods, and receipts of foreign exchange. The estimated import equation takes the following form:

$$M1: \quad M_t = M(A_t, RP_t, X_t, D), \qquad M_1>0, \quad M_2<0, \quad M_3>0, \quad M_4<0, \tag{1}$$

where M_t is real imports of goods and services (deflated by import prices); X_t is real receipts from exports of goods and services (also deflated by import prices); RP_t is relative price of imported goods; A_t is real absorption; and D is a dummy variable set equal to 1 for 1979, the year of the Iranian revolution.

It is expected that in the above model *(M1)*, imports are affected positively by increases in export earnings, absorption, and the proxy for import dependence, and inversely by an increase in the relative price of imports and the revolution dummy variable. 1/ Given that oil export earnings comprise the dominant share of Iran's foreign exchange receipts, the above import equation was also estimated using real oil export proceeds, H, instead of total foreign exchange receipts, which is presented below as Model 2 *(M2)*.

$$M2: \quad M_t = M(A_t, RP_t, H_t, D), \qquad M_1>0, \quad M_2<0, \quad M_3>0, \quad M_4<0, \tag{2}$$

In the above framework, the small country assumption was invoked whereby foreign exchange receipts and the relative price of imported goods are treated as exogenous variables.

1. Preliminary data analysis

As a first step, unit root tests were conducted on all the variables in Model 1 in order to determine whether they were stationary or not. This was done by applying the Dickey-Fuller and the augmented Dickey-Fuller tests,

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1/ Details of the computation of these variables and data sources are available in the Appendix.

the results of which are reported in Table 1. 1/ All of the variables were found to be integrated of the first order, *I(1)*. Table 1 also reports unit root tests for real oil exports series, H, which was used as an alternative explanatory variable in the empirical analysis under Model 2; this variable was also found to be stationary.

2. Regression results

Equations 1 and 2 suggest that there exists a stable long-run relationship between imports and absorption, the relative price of imports, and exports. Given that the null hypothesis of a unit root could not be rejected for the variables entering in the regression equation, the possibility of cointegration among them was tested using Johansen's method. 2/ The Johansen procedure is a method of testing the presence of a long-term relationship (cointegration) among a set of variables. Consider the following general vector autoregression (VAR):

$$Y_t = \Pi_1 Y_{t-1} + \ldots + \Pi_k Y_{t-k} + \mu + \epsilon_t, \tag{3}$$

where Y_t is an mx1 vector of nonstationary variables, μ is a mx1 vector of constants, and ϵ_t is a mx1 vector of Gaussian errors. Equation 3 could be rewritten in the first difference form as follows:

$$\Delta X_t = \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + \ldots + \Gamma_{k-1} \Delta X_{t-(k-1)} + \Pi X_{t-k} + \mu + \epsilon_t, \tag{4}$$

where Γ_i (mxm) is defined as $-I + \Pi_1 + \ldots + \Pi_i$ *(i=1,...,k-1)*, Π is defined as $-I + \Pi_1 + \ldots + \Pi_k$, and Δ is the difference operator. The Johansen procedure involves the maximum likelihood estimation of Equation 4, and the testing of hypotheses about the rank of matrix Π, which captures the long-term relationships among the variables. There are three possible outcomes with respect to the rank of Π. First, it can have full rank (r=m) which implies that the variables in Y_t are stationary. Second, it can have rank equal to zero, in which case the variables are nonstationary but not cointegrated. Third, if it has rank *r* less than m (r<m), then there exist *r* cointegration relationships among the variables. In the latter case, the matrix Π can be decomposed into two mxr matrices α and β such that $\Pi = \alpha\beta'$. Matrix α contains the adjustment coefficients, and matrix β contains the coefficients of the cointegration vector, representing the long-term relationship among the variables under study. The Johansen procedure

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1/ Cf. Dickey and Fuller (1979, 1981). As Table 1 indicates, the choice of lag length (1,2, or 3) in the augmented Dickey-Fuller tests did not affect the results.

2/ See Johansen (1988), and Johansen and Juselius (1990).

Table 1. Dickey-Fuller and Augmented Dickey-Fuller Tests for the Presence of a Unit Root in the Variables in the Import Equations, 1961/62-1992/93

Variable 1/	DF 2/	ADF(1) 3/	ADF(2)	ADF(3)
M	-0.56	-0.41	-0.83	-0.65
X	-0.64	-0.64	-0.81	-0.92
RP	-1.91	-1.65	-1.83	-1.61
A	-1.57	-1.82	-2.04	-1.96
H	-0.69	-0.65	-0.78	-0.93
Critical Values (α=0.05):	-3.56	-3.56	-3.57	-3.57

1/ All variables are in logarithms.
M = real imports of goods and services.
X = real exports of goods and services.
RP = relative price of imported goods.
A = real absorption.
H = real earnings from oil exports.

2/ DF is the Dickey-Fuller Statistic.

3/ ADF(j) is the Augmented Dickey-Fuller test statistic with lag j.

involves two tests for determining the number of cointegration relationships (the rank of matrix Π) among the variables in Y_t, the trace test and the maximum eigenvalue test.

The results of the cointegration test are provided in Table 2 under Model 1 *(M1)*. Using Johansen's maximal eigenvalue test, the null hypothesis of nonexistence of any cointegration vectors was rejected in favor of the existence of one cointegration vector at the 95 percent confidence level. 1/ The long-term relationship obtained from the cointegration test was as follows: 2/

$$M_t = - 0.39\ RP_t + 0.12\ A_t + 0.82\ X_t.$$

The results indicate that in addition to the traditional variables (relative prices and aggregate output), foreign exchange earnings have a significant impact on the level of imports. 3/ The overriding significance of export earnings in the determination of imports suggests that such earnings acted as a binding constraint on imports in Iran.

Given that oil revenues have, on average, comprised over 90 percent of Iran's total exports in the period under study, the above tests were conducted using oil, *H*, in place of total exports, *X*. Again, the presence

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1/ The cointegration test was done using a maximum lag value of one period in the VAR.

2/ The cointegration relationship included a dummy variable for 1979, the year of the revolution.

3/ One of the important features of economic development in Iran has been the policy of import-substituting industrialization, which has led to the significant dependence of Iranian industries on imported inputs [See Karshenas (1990), Katouzian (1981), and Pesaran (1985)]. For example, in 1979/80, 57 percent of Iranian manufacturing output comprised imported inputs. This dependence amounted to about 85 percent in heavy industry [See Central Bank of Iran (1985), page 162]. Moreover, the oil windfalls of the early 1970s led to increased demand for imported consumer goods. As a consequence of the above two tendencies, both the manufacturing sector and average consumers became more dependent on imports. It is reasonable to anticipate that this dependence would not be easily reversed with periodic downward movements in aggregate income or in the availability of foreign exchange. In other words, dependence on imports may be treated as a constraint under which the economy has to operate. In order to test for the strength of this constraint, a ratchet variable, defined as the maximum real level of imports to date, was included in the estimated import relationship. However, preliminary tests indicated that this ratchet variable was not statistically significant.

Table 2. Johansen Test Statistics for Cointegration, 1961/62-1992/93

	Maximum Eigenvalue Test Statistics			
Hypothesis: 1/				
H_0	r=0	r≤1	r≤2	r≤3
H_1	r=1	r=2	r=3	r=4
Model:				
M1 2/	51.56	12.24	8.33	0.41
M2 3/	50.39	11.62	9.48	1.29
Critical values (α=0.05):	27.07	20.97	14.07	3.76
	Trace Test Statistic			
Hypothesis:				
H_0	r=0	r≤1	r≤2	r≤3
H_1	r≥1	r≥2	r≥3	r≥4
Model:				
M1 2/	72.54	20.97	8.74	0.41
M2 3/	72.78	22.39	10.77	1.29
Critical values (α=0.05):	47.21	29.68	15.41	3.76

1/ r is the number of cointegration vectors.

2/ M1: $M_t = \alpha_0 + \alpha_1 RP_t + \alpha_2 A_t + \alpha_3 X_t + \alpha_4 D$.

3/ M2: $M_t = \alpha_0 + \alpha_1 RP_t + \alpha_2 A_t + \alpha_3 H_t + \alpha_4 D$.

of cointegration was verified; the results of the cointegration test are reported in Table 2 under Model 2 *(M2)*. The long-term relationship obtained from the cointegration test was as follows:

$$M_t = -\ 0.00\ RP_t + 0.20\ A_t + 0.80\ H_t,$$

which is very similar to the results obtained under Model 1, except for the zero coefficient for relative prices under Model 2. 1/ The presence of a cointegrating relationship among the variables in Equation 1 implies that the short-term relationship among the variables in the import function can be represented by an error-correction model. Hence, an error-correction import function of the following form was estimated:

$$\begin{aligned} \Delta M_t &= \beta_1 \Delta RP_t + \beta_2 \Delta A_t + \beta_3 \Delta X_t \\ &+ \delta(M_{t-1} - \beta_4 - \beta_5 RP_{t-1} - \beta_6 A_{t-1} - \beta_7 X_{t-1} - \beta_8 D) + \epsilon_t, \end{aligned} \tag{5}$$

where ϵ is a white-noise error term. The error-correction term in parentheses represents the difference between actual imports and the level predicted from the long-term import function. The above equation was estimated using nonlinear least squares, and the results are reported in Table 3. Several aspects of the results are worth noting. Export revenues and relative prices play significant roles in the equation. However, absorption did not have a statistically significant effect. 2/

The above analysis relies on the assumption that foreign exchange receipts, the relative price of imported goods, and absorption are exogenous, and that there exists no feedback from imports to these variables. However, the results of the Johansen cointegration test pointed to the possibility that the variables entering the estimated import equation

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1/ This cointegration relationship also included a dummy variable for 1979.

2/ In order to examine the sensitivity of the results to the choice of proxy for aggregate economic activity, Equation 5 was estimated using real GDP instead of absorption. However, the results did not improve. In addition, Equation 5 was also estimated using imports of goods only, instead of imports of goods and services. This led to a statistically significant coefficient for absorption in the error-correction import equation.

Table 3. Estimation Results of the Error-Correction Import Equation, 1961/62-1992/93 1/

Coefficients	Estimates
β_1	-0.98 (-2.84) 2/
β_2	0.09 (0.41)
β_3	0.44 (6.83)
β_4	1.40 (0.98)
β_5	-0.37 (-2.37)
β_6	0.12 (1.78)
β_7	0.83 (23.07)
β_8	-0.34 (-2.40)
δ	-0.98 (-7.40)
Adj. R^2	0.86
Maximum Log-likelihood	30.57
LM test for serial correlation	0.47

1/ The estimated equation was:

$$M_t = \beta_1 \Delta RP_t + \beta_2 \Delta A_t + \beta_3 \Delta X_t + \delta (M_{t-1} - \beta_4 - \beta_5 RP_{t-1} - \beta_6 A_{t-1} - \beta_7 X_{t-1} - \beta_8 D).$$

2/ The numbers in parentheses are t-statistics.

might not be exogenous. 1/ In order to further examine the exogeneity of the regressors in the import equation, the exogeneity test developed by Wu and Hausman was used. 2/ This test entails estimating the following equation:

$$M_t = \beta_0 + \beta_1 RP_t + \beta_2 A_t + \beta_3 X_t + \beta_4 z_t^{RP} + \beta_5 z_t^{A} + \beta_6 z_t^{X} + \mu_t, \quad (6)$$

where z^{RP}, z^{A}, and z^{X} are the residuals of regressions of RP_t, A_t, and X_t on an intercept, and lagged values of M, X, RP, and A. μ is a white-noise error term. The Wu-Hausman test evaluates the exogeneity of RP, A, and X by testing the null hypothesis $\beta_4 = \beta_5 = \beta_6 = 0$, using the F-test. This test yielded the following results:

$$\begin{aligned} M_t = {} & \underset{(0.68)}{1.11} - \underset{(-4.16)}{0.74}\, RP_t + \underset{(1.17)}{0.10}\, A_t + \underset{(22.90)}{0.85}\, X_t \\ & - \underset{(-0.75)}{0.34}\, z^{RP}{}_t + \underset{(0.25)}{0.07}\, z^{A}{}_t - \underset{(-4.76)}{0.41}\, z^{X}{}_t. \end{aligned}$$

All variables are in logarithms, and the numbers in parentheses are t-statistics. The above results indicate that the variable z^X is statistically significant and that, therefore, X is not an exogenous variable in the import equation. The F-statistic obtained was 7.86, which leads to a rejection of the null hypothesis of the joint exogeneity of RP, A, and X.

1/ The presence of statistically significant α coefficients in the estimated Johansen equation suggests that the dependent variables in the cointegration relationship are not weakly exogenous with respect to imports. Estimation of the α matrix for our import equation (Model 1) indicated that the coefficients for absorption and exports were sizable (0.22 and -0.16, respectively), indicating the absence of weak exogeneity of these variables in the import equation. Similar results were obtained under Model 2. For discussions of the relationship between cointegration and exogeneity, see Banerjee, et al. (1993), and Ericsson (1991).

2/ See Hausman (1978), Pesaran and Smith (1990), and Wu (1973, 1974).

In order to examine further the existence of a feedback between imports and foreign exchange receipts, the Granger test was used. 1/ Given that the series for imports and exports were nonstationary, the first difference of these variables were used in the Granger test:

$$\Delta M_t = \sum_{i=1}^{m} \alpha_i \Delta M_{t-i} + \sum_{i=1}^{m} \beta_i \Delta X_{t-i} + u_t \qquad (7)$$

and

$$\Delta X_t = \sum_{i=1}^{m} \lambda_i \Delta M_{t-i} + \sum_{i=1}^{m} \gamma_i \Delta X_{t-i} + w_t. \qquad (8)$$

Unless the coefficients λ_i in equation 8 are equal to zero, the possibility of imports Granger-causing exports can not be rejected. Ordinary least squares estimation of equations 7 and 8 with two lags yielded the following results:

1/ It should be noted that the Granger causality test in the context of cointegrated variables is not devoid of problems. In principle, for purposes of drawing inference and model formulation, the appropriate concept of causality is weak exogeneity and not strict exogeneity (Granger noncausality); see McDermott and Wong (1990). On the limitations of the Granger causality tests in the context of cointegration, see Toda and Phillips (1993).

$$\Delta M_t = \underset{(0.10)}{0.00} - \underset{(-0.52)}{0.12}\ \Delta M_{t-1} - \underset{(-0.71)}{0.13}\ \Delta M_{t-2} + \underset{(3.12)}{0.47}\ \Delta X_{t-1} + \underset{(1.91)}{0.31}\ \Delta X_{t-2}$$

$$\text{Adj.-}R^2 = 0.32,\ \text{D.W.} = 1.93,\ \hat{\sigma} = 0.23$$

$$\Delta X_t = \underset{(-0.47)}{-0.03} + \underset{(1.90)}{0.73}\ \Delta M_{t-1} + \underset{(1.31)}{0.40}\ \Delta M_{t-2} - \underset{(-1.09)}{0.27}\ \Delta X_{t-1} - \underset{(-0.95)}{0.25}\ \Delta X_{t-2}$$

$$\text{Adj. } R^2 = 0.05,\ \text{D.W.} = 1.86,\ \hat{\sigma} = 0.37$$

As the above results indicate, the evidence for feedback between imports and export receipts, as measured by the estimates of the coefficients λ_1 and λ_2, was not statistically significant. The existence of significant feedback from imports to exports would have suggested that it is necessary to estimate import functions in the context of a simultaneous equation framework. Indeed, it is difficult to interpret the feedback from imports to exports since Iran's oil exports have been determined somewhat exogenously in the context of the international oil industry. Prior to the ascendancy of OPEC in the early 1970s, Iran's oil output was determined almost entirely by an international oil consortium. 1/ Changes in the structure of the international oil industry since the early 1970s have, however, allowed for more independence for the individual oil-producing countries such as Iran with regard to oil production and exports. Although the turbulent decade of the 1980s witnessed occasional unilateral oil supply decisions, Iran's oil output has been set largely within the OPEC framework. In view of this discussion, empirical results suggesting the endogeneity of foreign exchange receipts should be interpreted cautiously.

III. Some of the Consequences of Dependence of Imports on Foreign Exchange Receipts

The empirical results reported above confirm the central role played by foreign exchange receipts in the determination of Iran's imports, as well as providing support for the view that the Iranian authorities have often compressed imports whenever oil exports have contracted during 1961/62-1992/93. One implication of the above results is that attempts at estimating an import demand function for Iran without due attention to the role of the foreign exchange constraint will lead to incorrect econometric estimates for income and price elasticities of imports. Thus, attempts at

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1/ See Fesharaki (1976).

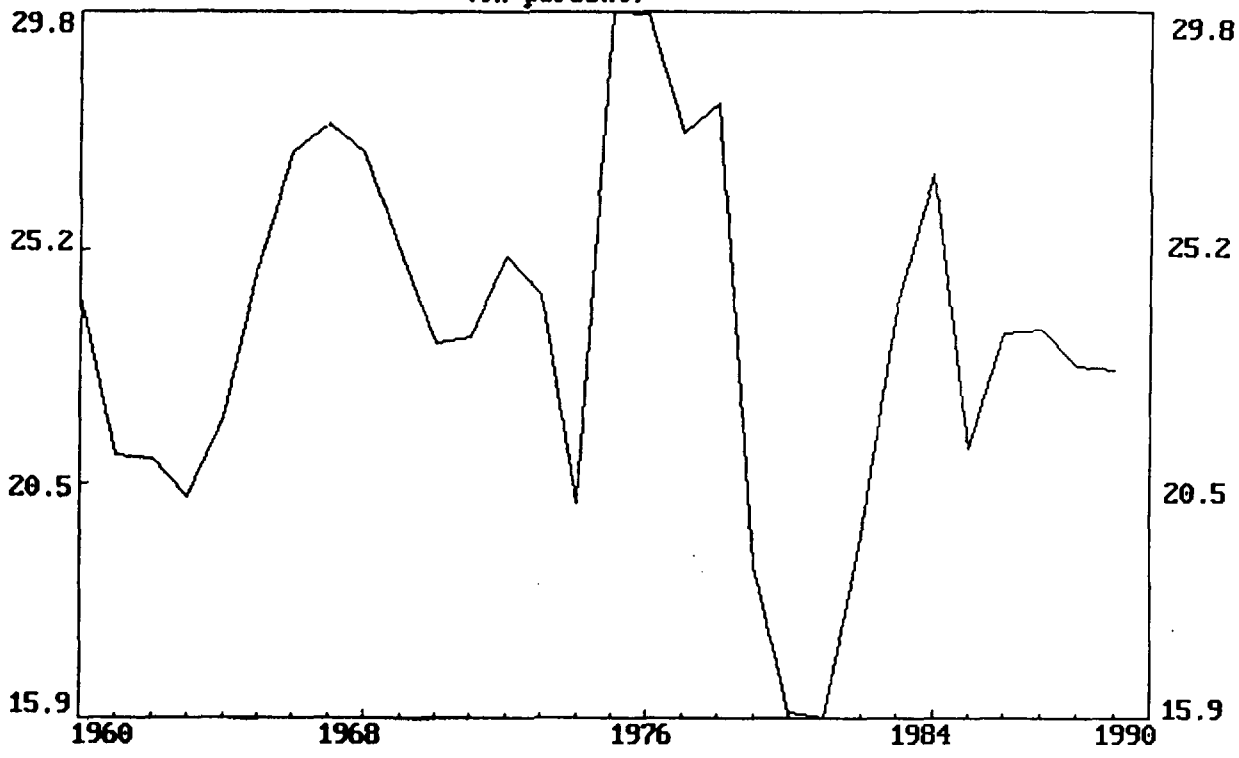
gauging the impact of economic stabilization and exchange rate devaluation on aggregate imports may therefore be statistically biased. Indeed, these results should be viewed cautiously in light of the small sample used.

The presence of a close relationship between imports and foreign exchange receipts also poses important implications for the assessment of the industrialization process in Iran. Paramount among these is the issue of foreign exchange requirements of domestic industry. As indicated above, during the period under study, Iran systematically pursued a policy of import substituting industrialization. 1/ The pronounced rise in oil revenues in the early 1970s allowed for the intensification of the import substitution strategy by significantly relaxing the foreign exchange constraint facing the Iranian manufacturing sector, and for the increased importation of intermediate goods and raw materials.

The overall decline in oil revenues, as well as various other economic adversities in the 1980s, compounded by the inability to borrow adequately on the international capital markets, led to a situation whereby Iran's manufacturing sector, which had previously been operating under a regime of soft foreign exchange constraints, was unexpectedly forced to adapt to a system of very stringent foreign exchange controls and to a notable decrease in the importation of capital goods and raw materials. Chart 4 illustrates the decline in the share of capital goods in Iran's total imports. This points to several issues. First, it is vital for planners to save an adequate portion of the proceeds from oil exports in the form of foreign exchange reserves in order to reduce the impact of both anticipated and unanticipated fluctuations in oil revenues. Second, the heavy reliance of domestic industry on imported intermediate goods and their foreign exchange requirements impose serious externalities on the rest of the economy. Heavy foreign exchange requirements by any sector deprives other sectors of access to scarce foreign exchange. Thus, the social cost of foreign exchange would be higher than its private cost. This problem has to be explicitly allowed for in the choice of production techniques, and the extent of the dependency of domestic industry on imported intermediate goods. The fact that Iran's imports were sharply compressed during periods of low foreign exchange earnings, and the adverse impact of this on manufacturing sector output, points to the necessity of undertaking both near- and medium-term measures to ease the foreign exchange constraint. These include corrections in the incentive system to encourage further non-oil exports, as well as steps to gain adequate access to the international capital markets in order to smooth the fluctuations in imports during periods of decline in exports.

1/ Since the adoption of the First Five-Year Plan of the Islamic Republic of Iran in 1989/90, the Iranian authorities have made some efforts to shift emphasis away from import substitution policies toward export promotion.

Chart 4: The Share of Capital Goods Imports in Total Imports
(in percent)



APPENDIX

Variable Definitions and Data Sources

M = imports of goods and services, deflated by the import price index (Central Bank of Iran, IFS);

X = exports of goods and services, deflated by the import price index (Central Bank of Iran, IFS);

H = oil exports deflated by the import price index (Central Bank of Iran, IFS);

RP = relative price of imports, defined as the ratio of the imported goods price index to the home goods price index (Central Bank of Iran);

A = real absorption, defined as the sum of total consumption and gross domestic fixed capital formation (Central Bank of Iran, IFS).

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