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Macroeconomic Adjustment and Exchange Rate Policy in Middle Income Countries: Greece, Portugal and Spain in the 1970's

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CENTER DISCUSSION PAPER NO. 374

MACROECONOMIC ADJUSTMENT AND EXCHANGE-RATE POLICY

IN MIDDLE-INCOME COUNTRIES: GREECE, PORTUGAL AND SPAIN IN THE 1970's

Louka T. Katseli

April 1981

Note: Center Discussion Papers are preliminary materials circulated to stimulate discussion and critical comment. References in publications to Discussion Papers should be cleared with the author to protect the tentative character of these papers.

1. Southern Europe: Differences and Similarities

A paper on comparative economic behavior always runs the risk of oversimplifying complex internal processes for the sake of comparisons, of overlooking important country-specific developments or of assuming away social and historical determinants of economic actions.

It is all too frequent for countries which are quite dissimilar in their traditional structures and social characteristics to be lumped together under such elusive titles as Less Developed or Newly Industrialized Countries (LDC's or NICS), or within the context of this conference, Southern Europe. In most of these cases, the emphasis on a few common characteristics such as income per capita, level of industrialization or even geographical location creates the misleading impression that a group of countries is in fact homogeneous.

In past discussions and memoranda over the second enlargement of the European Community (EC) for example, all three Southern European countries were portrayed as essentially agricultural producers and exporters of food and labor whose continuous internal development would be a drain for the Community as a whole. It is by now well documented that this characterization does not apply equally well to all three candidates and that the net benefits of entry into the EC both for the Community and the new members are quite different across countries (Seers and Vaitzos, 1981). Spain is a large country of approximately 37 million where agriculture contributes less than 10 percent of GDP and around 20 percent of civilian employment;¹ industry

and construction's share is over 30 percent in GDP and around 36 percent in employment. Portugal and Greece, smaller and more open to trade,² depend more than Spain does on their agricultural sectors as a source of income and employment and have substantially more limited industrial bases and financial markets. Despite these similarities, Greece's per capita income in 1979 was over \$4,000 while Portugal's was under \$2,000. In all three cases but especially in Portugal and Greece "development" and "underdevelopment" coexist on any number of definitions. These are growing dual economies where the state has been traditionally powerful both politically and economically and which have in the past (especially Greece and Portugal) looked upon Europe and/or the United States as arbitrators of internal political developments and guarantors of export markets.

In the 1970s all three countries underwent important, political transformations overthrowing long established dictatorships surprisingly around the same time: April 25, 1974 in Portugal, July 1974 in Greece and November 1975 in Spain. All three new governments had to meet rapidly rising expectations and to deal with rather similar internal pressures: a push for real wage increases, general uncertainty with negative repercussions on investment and international capital flows and last but not least growing demands for expansionary policies on the part of the government that would correct long-standing injustices. This transition period coincided with a period of grave external shocks. The four-fold increase in the price of oil and other intermediate goods in 1973-74 caused a dramatic worsening of the terms of trade and increased the internal stagflationary pressures not only in the Southern European countries but in all of their major trading partners. Furthermore

the instability in the international monetary system and the growing volatility of the major currencies imposed additional costs on these countries and required a careful exercise of exchange-rate policy.

The 1970s therefore represent an exceedingly interesting juncture in the economic and political evolution of these countries which lends itself to comparative analysis. It is the exposure to similar internal and external shocks rather than geographical proximity or common structural characteristics that makes such an undertaking worthwhile however difficult. The following two sections of this paper represent only a start in that direction.

2. Transmission of Internal and External Disturbances

Despite important differences in their economic structure, all three Southern European countries were confronted in the past decade with a number of common disturbances both of internal and external origin. In the middle of the 1970's these included a substantial increase in real wages (Table 1) largely as a result of internal pressures towards income redistribution, and a dramatic worsening of the terms of trade that was induced by the increase in the price of imported intermediate goods. As can be seen in Table 2 the deterioration of the terms of trade in all three countries during 1974-1975 was significantly worse than the average for industrial countries or for that matter the non-oil developing countries. Furthermore, the combination of internal political and economic uncertainty and the adverse effects of the oil crisis on most OECD countries resulted in a precipitous fall in tourism and emigrant remittances (Table 3).

Table 1: Change in Real Wage
(Annual Percentage Change)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Greece ^a	3.1	5.7	5.0	0.7	-0.5	11.3	15.3	8.6	11.1	1.6
Portugal ^b	5.4	-1.2	-2.1	1.1	7.0	3.4	-9.2	-12.4	-11.5	-9.0
Spain ^c	14.0	7.3	6.7	5.7	17.7	13.7	15.2	5.8	6.3	8.0

Source: IMF Yearbook, 1980.

^aHourly payments for workers in industry and handicraft deflated by the consumer price index.

^bSource S index of average daily wages of industry and transportation employees in Lisbon deflated by the consumer price index.

^cSource B index of hourly wages deflated by the consumer price index.

Table 2: Terms of Trade

(Annual Percentage Change Based on Unit Values)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Greece ^a	-1.7	-3.9	-4.3	7.1	-13.2	-6.8	-0.1	3.5	-4.9	-9.4
Portugal ^b	7.3	60.2	-0.8	0.9	-7.3	-29.6	58.0	-41.6		
Spain ^a	-7.1	-2.8	5.6	-7.8	-29.3	-1.3	1.8	6.5	7.4	
Industrial Countries ^c				-1.0	11.0	2.5	-1.0	-1.0	3.0	-2.5
Oil Exporting Countries				15.0	137.0	-5.0	4.5	1.0	10.5	28.0
Non-Oil Developing Countries				7.5	-8.0	-9.5	3.5	3.0	-4.0	-2.5

^aIMF, International Financial Statistics, Yearbook, 1980.

^bUN Yearbook of International Trade Statistics, 1978.

^cIMF, Annual Report 1980.

Table 3: Selected Current Account Balance Developments

(Annual Percentage Change)

In millions of SDR

	1972	1973	1974	1975	1976	1977	1978
<u>Greece</u>							
Travel (credit)	18.7	19.3	-16.0	42.1	38.5	17.3	25.6
Emigrants & Workers Remittances	13.2	16.3	-13.4	13.5	14.2	14.2	-1.5
<u>Portugal</u>							
Travel (credit)		19.7	-7.4	-31.0	-4.4	21.9	35.6
Emigrants & Workers Remittances		13.4	0.3	-4.8	-4.8	16.0	33.8
<u>Spain</u>							
Travel (credit)	12.5	18.4	-3.1	8.3	-6.9	27.9	28.2
Emigrants & Workers Remittances	5.1	46.8	-19.4	0.3	4.8	-1.8	17.4

Sources: IMF, Balance of Payments Yearbook, Vol. 30, December 1979.

On the policy side all three countries experienced faster than average growth of government consumption expenditures during most of the period and increases in the government budget deficit which were largely monetized. Thus government consumption expenditures rose to an increasingly larger fraction of GDP (Table 4) while with few exceptions money supply grew at an average annual rate of 20 percent (Table 5). In terms of exchange rate policy by the end of 1975 all countries abandoned their previous practices and devalued their currencies vis-a-vis most trading partners.

These developments will be put in proper historical perspective and analyzed in more detail in the country papers. The aim of this section is simply to suggest a consistent framework of analysis that captures the essential features of these economies and which highlights the likely effects of particular disturbances on the domestic-price component, the income level and the balance of payments.

The complete specification of the model that is used for this purpose is provided in Appendix 1. It is basically an extension of earlier work by the author (Katseli-Papaefstratiou 1979, 1980) which itself built upon a rapidly growing literature on the responsiveness of small and open economies to external disturbances. The main underlying assumptions are that the country in question is (a) a price taker in export and import markets, (b) an importer of intermediate goods³ for which there is no domestic production but which are used in fixed proportions to domestic factors in the production of non-traded goods and services, (c) that nominal wages and exchange rates are exogeneously determined but variable depending

Table 4 Ratio of Government Consumption Expenditures to GDP

	Greece	Portugal	Spain
1970	12.6	14.2	8.5
1971	12.5	13.9	8.7
1972	12.2	13.8	8.6
1973	11.4	13.2	8.6
1974	13.8	14.5	8.8
1975	15.2	15.4	9.2
1976	15.1	14.1	9.8
1977	16.0	14.2	10.1
1978	16.0	14.3	10.5
1979	16.2		11.0

Source: IMF, International Financial Statistics, 1980.

Table 5: Money Supply
(Annual Percentage Change)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Greece										
M ₁	11.7	16.6	19.2	23.4	19.8	16.4	22.4	16.9	22.3	17.4
M ₂	18.8	22.1	23.1	15.8	20.5	25.0	24.5	22.7	24.0	17.5
Portugal										
M ₁	7.0	4.9	16.6	35.4	10.2	24.5	12.7	11.7	14.2	36.2
M ₂	14.9	13.5	24.2	28.3	13.6	12.6	20.9	16.9	20.6	38.0
Spain										
M ₁	6.0	23.8	24.1	23.5	17.3	18.7	21.9	18.6	17.3	8.5
M ₂	15.1	24.1	23.1	24.1	18.9	18.9	19.7	18.7	20.3	17.8

Source: IMF, International Financial Statistics, Yearbook 1980.

on the overall targets of unions or monetary authorities and (d) that domestic financial markets are not adequately developed so that excess demand for money holdings⁴ translates into a reduction of demand for goods.

Some indirect evidence on degrees of market power seems to suggest that in fact Southern European countries could be characterized as price takers in international markets especially on the import side (Branson and Katseli-Papaefstratiou, 1980).⁵ Similarly, Tables 6 and 7 on the commodity composition of trade support the argument that these countries can be characterized effectively as importers of intermediate goods and exporters of labor and land-intensive final goods despite growing diversification of their export sectors.

Finally, in the absence, of careful econometric studies, a casual look at the workings of the financial markets seems to validate their assumed interdependence with commodity markets.⁶ These links are made even stronger in the context of Greece and Portugal because of the presence of strict exchange controls.

Table 8 presents in summary form the qualitative solutions of the model; these include the responsiveness of home-good prices (\hat{P}_h), value-added (dV) and the current account, eR^* , to a number of exogenous or policy-induced disturbances such as changes in real wages (\hat{w}), changes in the foreign prices of imported inputs (\hat{P}_r^*) or exported final goods (\hat{P}_x^*), changes in the exchange rate (\hat{e}) and emigrant remittances (\hat{F}^*) or finally changes in autonomous expenditures such as government expenditures on non-traded (dG_h) or imported commodities (dG_m).

Table 6: Imports by Broad Economic Category
(Percentage of Total Value)

	Greece			Portugal			Spain		
	1973	1975	1979	1973	1975	1979	1973	1975	1979
M/GNP or M/GDP			25.9 ^a			32.1 ^b			14.0 ^b
1. Food, Beverages	10.7	6.5	8.1	11.9	16.7	11.3	9.4	11.3	10.6
2. Industrial Supplies	35.0	31.3	26.9	42.7	36.8	39.3	44.1	35.6	34.5
3. Fuels	12.0	21.8	21.0	6.1	15.1	19.3	12.8	25.7	29.6
4. Machinery	20.8	15.3	13.6	17.2	14.4	16.8	21.8	18.8	13.8
5. Transport	16.0	20.4	24.9	13.1	8.8	8.8	6.1	3.8	5.2
6. Consumer Goods	5.6	4.6	5.5	9.0	8.2	4.5	5.8	4.7	6.3
7. Goods NES	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0
Intermediate Goods (111+121+2+3+4+521 +53)	83.7	88.1	84.7	81.3	82.9	90.5	88.6	90.4	88.2

Source: UN Yearbook of Trade Statistics, 1979.

Table 7: Exports by Industrial Origin
(Percentage of Total Value)

	Greece			Portugal			Spain		
	1973	1975	1979	1973	1975	1979	1973	1975	1979
X/GNP or X/GDP			20.1 ^a			20.3 ^b			15.00 ^b
1. Agriculture	23.6	22.6	17.4	3.9	2.7	2.5	14.1	12.6	11.4
2. Mining, Quarry	5.0	5.3	4.8	6.7	4.8	2.7	0.9	1.2	0.8
3. Manufacturing	71.4	72.1	77.8	89.4	92.5	94.8	85.0	86.2	87.8
31 Food Bev. Tob.	15.2	13.1	15.3	16.3	15.1	12.7	16.1	10.5	9.6
32 Textiles	17.1	17.7	21.9	29.8	29.3	34.2	13.1	12.8	10.7
33 Woods	0.6	0.5	0.5	8.1	7.5	9.6	1.4	1.1	1.1
34 Paper & Products	0.4	0.5	1.0	5.3	7.4	5.9	3.3	3.7	3.8
35 Chemicals	19.8	17.4	16.8	7.9	9.5	6.8	12.0	12.4	12.9
36 Non Metal Min.	1.1	5.0	5.5	2.6	2.6	2.7	2.2	3.6	4.0
37 Basic Metals	12.8	10.6	11.0	1.1	2.0	3.5	7.1	7.9	11.4
38 Metal Manuf.	3.7	6.8	5.6	16.9	17.8	18.3	27.6	32.7	32.9
39 Other Manuf.	0.7	0.4	0.3	1.4	1.3	1.0	2.1	1.5	1.5

Source: UN Yearbook of Trade Statistics, 1979.

^a Imports (exports) of Goods and Invisible Payments

^b Imports (exports) of Goods and Services as Percentage of GDP, 1978 figure

Table 8: Effects of Selected Disturbances on Non-Traded Good Prices, Income and the Balance of Payments

Disturbance	\hat{P}_h	dV	\hat{eR}^*
$\hat{W} = \hat{w}^1$? ²	-	-
\hat{P}_r^*	? ³	-	-
\hat{P}_x^*	+	+	+
\hat{F}^*	+	+	+
dG_h	+	+	-
dG_m	0	0	-
\hat{e}	? ⁴	? ⁴	? ⁴

Notes to Table 8:

1. A $\hat{\quad}$ above a variable indicates percentage change.

2. For this to be positive (or negative):

$$E_h P_h H^S \begin{matrix} > \\ < \end{matrix} [(P_h - P_r) R^d E_h + P_x X^S E_x] m_h (1-t)(1-\lambda k).$$

3. For this to be positive (or negative):

$$E_h P_h H^S \begin{matrix} > \\ < \end{matrix} (P_h - P_r) R^d (1 + E_h) m_h (1-t)(1-\lambda k).$$

4. For this to be positive, the equivalent of the Marshall-Lerner conditions must be holding, namely that

$$P_x X^S (1 + E_x) + eF^* \begin{matrix} > \\ < \end{matrix} P_r R^d (1 + E_h).$$

Increases in real wages or in the price of imported goods have similar effects on the economy. Under both circumstances the net real wage in the non-traded good sector rises and the supply of home goods decreases. An increase in the real wage will also reduce output in the export-good sector. In either case value added or income is reduced while the effect on the price of non-traded goods is ambiguous. The stronger the contractionary supply-side effect, the more inflationary the outcome. Given a decrease in value added and saving and in the absence of autonomous changes in domestic absorption, the balance of payments deteriorates.

Improvements in the terms of trade or increases in emigrant remittances produce, as might be expected, markedly different results. Value added increases either directly through the foreign exchange inflow, or, in the case of a terms-of-trade improvement, indirectly through the supply response of the exportable sector. In either case demand for the non-traded good increases through both substitution and income effects and the price of the non-traded commodity unambiguously rises. The increase in value added and saving improves the balance of payments.

On the policy side an increase in government spending on non-traded goods has the normal expansionary effects on output and prices and deteriorates the balance of payments as the ratio of non-traded to traded good prices rises.⁷ Increased spending on imported goods on the other hand, has a zero multiplier effect.

A nominal devaluation of the currency has both substitution and income effects since the increase in the domestic price of traded commodities induces both a shift in consumption towards non-traded goods, as well as

expansion of domestic supply. Imports of intermediate goods also rise. The net effect on value added is positive so long as the increase in the value of exports and transfers from abroad exceeds the increase in the value of imports. These conditions are in fact identical to the Marshall-Lerner conditions.

The analytical framework presented can be used as a reference point to understand the historical experience of the Southern European countries in the 1970s. The abrupt increase in the cost of production due to increases in the real price of imported intermediate goods and domestic labor resulted as expected in a substantial decline in the growth rate of output in 1974-1975 (Table 9). It is interesting to note that in the latter part of the decade Greece and Portugal grew faster than most industrial or European countries; Spain's economy on the other hand continued to stagnate. This differential performance could be probably attributed to the substantial drop in investment demand which, as can be seen in Table 11, occurred right after 1974 in Greece and Portugal but three years later in Spain (1977). The drop in net transfers from abroad in the latter part of the decade rather than in the middle might also have contributed to these differences.

The inflation rate measured by the annual percentage change in the CPI was 25% in 1974 in Greece and Portugal but reached that level only in 1977 in Spain. (Table 10) Thus the stagflationary effects of the 1974-1975 disturbances were felt right away in the two smaller countries but only with a lag in Spain. This could be partially attributed to greater degrees of openness to trade in Greece and Portugal relative to Spain (Tables 6 and 7) as well as to their markedly less competitive industrial structures. Increases in the real cost of production are thus passed

Table 9: Growth of Real GDP
(Annual Percentage Change; 1975 Prices)

	1971	1972	1973	1974	1975	1976	1977	1978	1979
Greece	7.1	8.9	7.3	-3.6	6.1	6.4	3.4	6.2	3.8
Portugal	6.6	8.0	11.2	1.1	-4.3	6.2	5.4	3.2	4.1
Spain	5.0	8.1	7.9	5.7	1.1	3.0	2.6	2.5	1.5
Total OECD ¹	3.6	5.5	6.3	0.6	-0.5	5.3	3.8	4.0 ²	3.4 ²
Total OECD Europe ¹	3.6	4.3	5.9	2.2	-0.9	4.6	2.3		
EEC ¹	3.5	4.0	6.0	1.7	-1.4	5.0	2.4		

Notes:

¹GDP weights: Centered 3-year moving average

²These are real GNP growth rates for all industrial countries from IMF, Annual Report, 1980.

Sources: OECD Economic Outlook, Vol, 27, July 1980.
IMF, Annual Report, 1980.

Table 10: Change in Consumer Prices
(Annual Percentage Change)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Greece	2.9	3.0	4.2	15.6	26.9	13.4	13.3	12.2	12.5	19.0
Portugal	6.4	11.9	10.6	12.9	25.3	15.2	21.1	24.4	22.5	23.8
Spain	5.8	8.1	8.3	11.4	15.7	16.8	15.1	24.5	19.8	15.6
Europe	6.6	11.7	10.9	16.0	22.2	18.3	15.1	19.7	25.1	
Industrial Countries	5.5	5.2	4.7	7.6	13.3	11.1	8.3	8.5	7.1	9.4

Sources: IMF, International Financial Statistics Yearbook, 1980
OECD Economic Outlook, July 1980, Vol. 27.

Table 11: Shares of Expenditures in National Income

	1973	1974	1975	1977
<u>GREECE</u>				
C/GNP	61.524	65.298	65.548	64.175
I ^a /GNP	34.835	28.414	26.222	26.569
GC/GNP	11.142	13.417	14.753	15.473
X/GNP	13.858	15.100	15.881	15.594
M/GNP	24.557	24.858	26.121	24.477
TR/GNP	2.635	3.075	2.777	3.048
X-M-TR/GNP	-8.065	-6.683	-7.579	-5.835
<u>PORTUGAL</u>				
C/GNP	67.4	75.3	81.8	76.4
I ^a /GNP	26.1	24.7	16.4	25.7
GC/GNP	13.1	14.4	15.4	14.3
X/GNP	25.6	25.7	19.7	18.0
M/GNP	32.9	41.0	32.2	33.3
TR/GNP	0.7	1.0	-0.08	-1.1
X-M-TR/GNP	-6.5	-14.4	-12.6	-16.4
<u>SPAIN</u>				
C/GNP	67.7	67.8	68.3	69.9
I ^a /GNP	24.8	28.1	26.6	22.6
GC/GNP	8.6	8.8	9.3	10.2
X/GNP	14.4	14.4	13.3	14.6
M/GNP	15.5	19.2	17.3	16.8
TR/GNP	-0.05	+0.2	-0.1	-0.5
X-M-TR/GNP	-1.1	-4.6	-4.1	-2.7

^aIncludes gross fixed capital formation and change in inventories.

Source: IMF, International Financial Statistics Yearbook, 1980.

faster to the consumer than would be the case in a more competitive setting.

These hypotheses seem to be validated by some preliminary empirical results that are presented in Table 12. The complexity and interdependence of an economy especially at a time of structural change hampers the unambiguous specification of cause-effect relationships. Thus, these are only tentative estimates of the CPI elasticities with respect to current and lagged values of the money supply (M1), money wages (W), and import prices (P_m) for Greece and Spain.⁸

In both countries expansion of the money supply affects the CPI with a two to three-quarter lag but has a stronger cumulative effect on prices in Spain than in Greece. A 10 percent increase in M1 will raise the CPI by 8 percent within a year in Spain and about 6 percent in Greece. On an annual basis, the responsiveness of the CPI to a given increase in nominal wages is similarly higher in Spain than in Greece (8 percent versus 5 percent respectively for a 10 percent increase in wages); their maximum effect however is only after three to four quarters whereas in Greece increases in the cost of labor are passed on to prices within the same quarter.

The same can be said for changes in import prices: whereas on an annual basis the contribution to inflation of a 10 percent increase in import prices is about the same in both countries (roughly 2 percent), the transmission process is markedly faster in the case of Greece than in Spain.

Exchange rate policies have also played a role in the transmission of external disturbances. Thus inflation rates would probably have been higher in 1974 in Spain had monetary authorities not allowed the Spanish peseta to appreciate substantially relative to the U.S. dollar up to the middle of

Table 12: Estimated Elasticities of the Consumer Price Index with Respect to Selected Variables

Variables	<u>Greece</u>	<u>Spain</u>
	1971:I - 1980:I	1971:2 - 1979:I
C	-.024 (1.5) ¹	-.060 (1.5)
M1 (t)	.134 (1.6)	.163 (0.6)
M1 (t-1)	.165 (1.9)	.173 (1.0)
M1 (t-2)	.299 (3.2)	.277 (2.1)
M1 (t-3)	.016 (0.2)	.235 (1.6)
M1 (t-4)		-.016 (1.0)
W (t)	.471 (3.2)	.148 (1.2)
W (t-1)	.045 (0.3)	.148 (1.2)
W (t-2)		.390 (3.6)
W (t-3)		.194 (2.2)
W (t-4)		-.026 (0.4)
Pm(t)	.086 (1.8)	.060 (1.2)
Pm(t-1)	.068 (1.5)	.012 (.25)
Pm(t-2)		-.002 (.05)
Pm(t-3)		-.005 (.09)
Pm(t-4)		.086 (1.4)
R ²	.67	.65
D-W	1.51	1.8

Notes

1 t - statistics in parentheses

1975. The reversal of policies at the end of that year and the depreciation of the peseta relative to all major trading partners probably contributed to the adverse developments in the second-half of the decade. Section 3 presents a more careful interpretation of these developments.

3. Exchange Rate Policy

Following the breakdown of the Bretton-Woods system of fixed parities, all three countries sought to pursue a more flexible exchange rate policy.

Given the fact that the major currencies exhibited substantial fluctuations vis-a-vis each other, pegging the exchange rate to any single one of them meant substantial and continuous realignments vis-a-vis the others. Since all three countries have geographically diversified trade sectors (Table 13), this implied analogous movements in the home-currency price of traded commodities if not of the terms of trade.⁹

Charts 1 and 2 illustrate the bilateral exchange-rate movements of the Greek drachma (DR), the Portuguese escudo (E) and the Spanish peseta (P) vis-a-vis two of the major currencies, namely the U.S. dollar and the Deutsche mark (DM).

As early as the third quarter of 1971, Spain and to a lesser extent Portugal abandoned the dollar currency area and followed the DM in its upward trend against the dollar. This continued until the middle of 1975 at which time both countries, hit by rising prices and appreciating effective real exchange rates, started devaluing in nominal terms vis-a-vis both hard currencies. The escudo's devaluation against the dollar continued ever since; the devaluation against the DM was halted around the end of 1979. Spanish authorities, probably sensitive to the inflationary consequences of further nominal devaluations against as major a trading partner as Germany, reversed that trend at the third quarter of 1977 and attempted to stabilize the Peseta-DM price around 36 Pesetas/DM. This lasted approximately until the end of 1979. Greece followed the dollar in its downward movement vis-a-vis

Table 13: Direction of Trade: Percentage of Country's Total Exports to (Imports from) Selected Countries

	Greece						Portugal						Spain					
	Exports			Imports			Exports			Imports			Exports			Imports		
	1973	1975	1979	1973	1975	1979	1973	1975	1979	1973	1975	1979	1973	1975	1979	1973	1975	1979
Industrial Countries	70.6	62.9	59.4	76.3	70.5	67.3	78.6	78.8	81.8	76.3	70.0	71.1	70.2	63.2	62.3	70.4	60.4	56.7
United States	6.5	5.1	5.5	8.3	7.4	4.8	9.8	7.2	6.0	8.2	12.4	11.8	13.9	10.5	7.2	16.1	15.9	12.5
Japan	1.2	1.6	1.1	7.0	8.3	9.5	1.7	0.9	1.1	4.3	3.4	2.6	1.5	1.2	2.0	2.6	2.4	2.3
EC(9)	54.9	49.7	49.1	50.1	42.5	44.3	48.6	50.1	56.9	45.4	40.3	41.6	47.8	44.7	48.0	42.9	34.7	35.9
France	6.6	7.3	6.1	7.6	5.9	6.3	5.1	6.6	10.0	6.9	7.6	8.3	12.7	13.6	16.1	10.3	8.3	9.7
Germany	21.5	21.1	19.3	19.5	15.9	15.9	7.6	10.2	12.7	14.5	11.4	12.4	11.7	10.7	10.3	13.6	10.3	9.6
Italy	9.5	8.3	9.8	9.1	8.2	9.3	3.2	3.3	6.0	5.2	5.0	5.1	5.3	3.4	6.5	6.0	5.1	5.6
United Kingdom	7.1	4.9	5.2	5.6	4.8	5.7	23.7	21.2	18.1	11.8	8.7	9.1	8.0	7.6	7.2	6.3	5.3	5.1
Oil Exporting Countries	3.3	12.6	14.7	6.7	10.7	11.7	0.6	1.9	1.6	3.2	10.8	15.0	6.2	10.5	10.9	11.8	21.7	24.9
Non-Oil Developing Countries	16.3	14.5	17.3	12.5	14.1	15.2	19.7	16.6	13.9	19.0	13.7	10.5	20.5	20.4	22.0	15.3	13.6	15.5

Source: IMF, Direction of Trade Yearbook, 1980.

Chart 1: Home-Currency Price of the Dollar

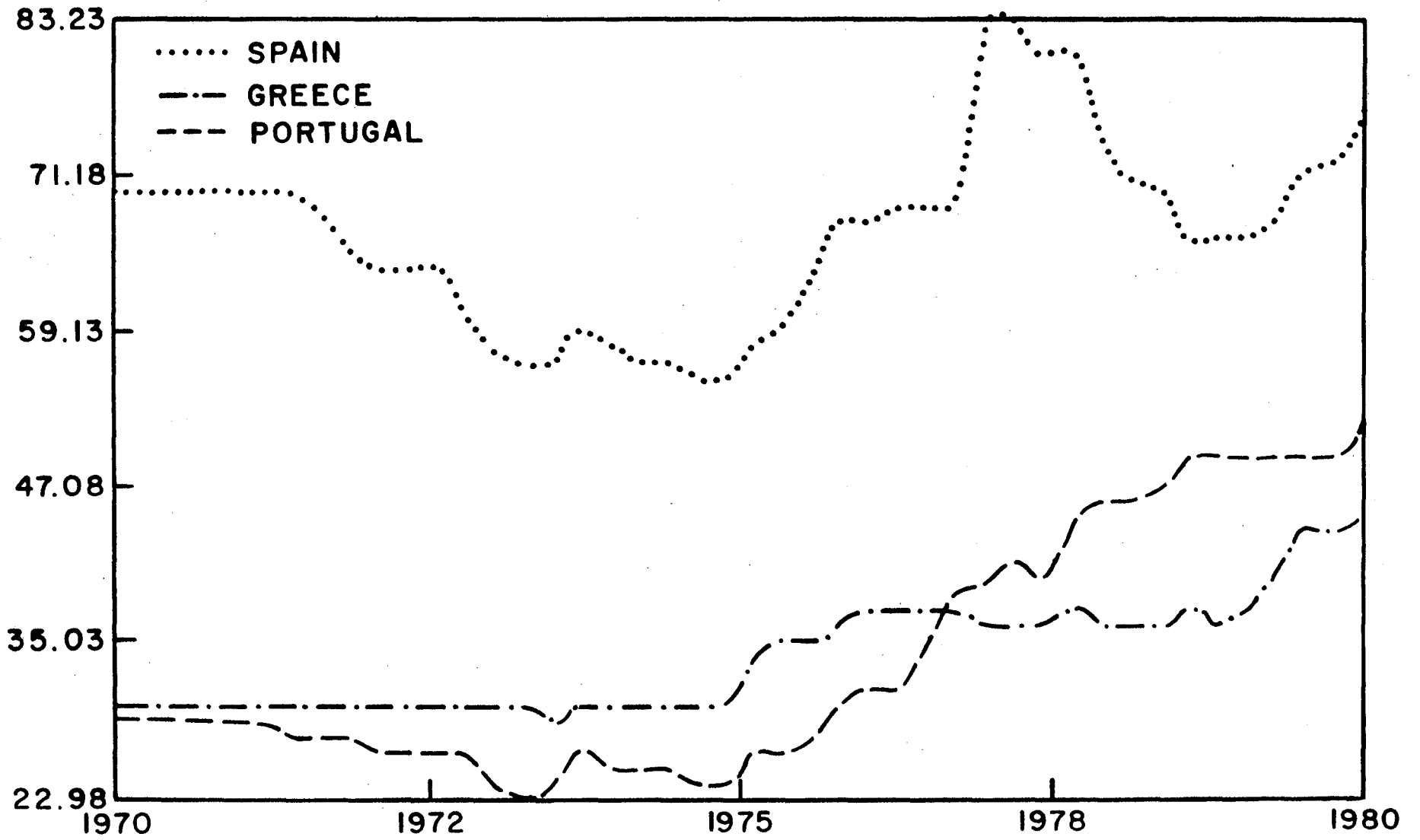
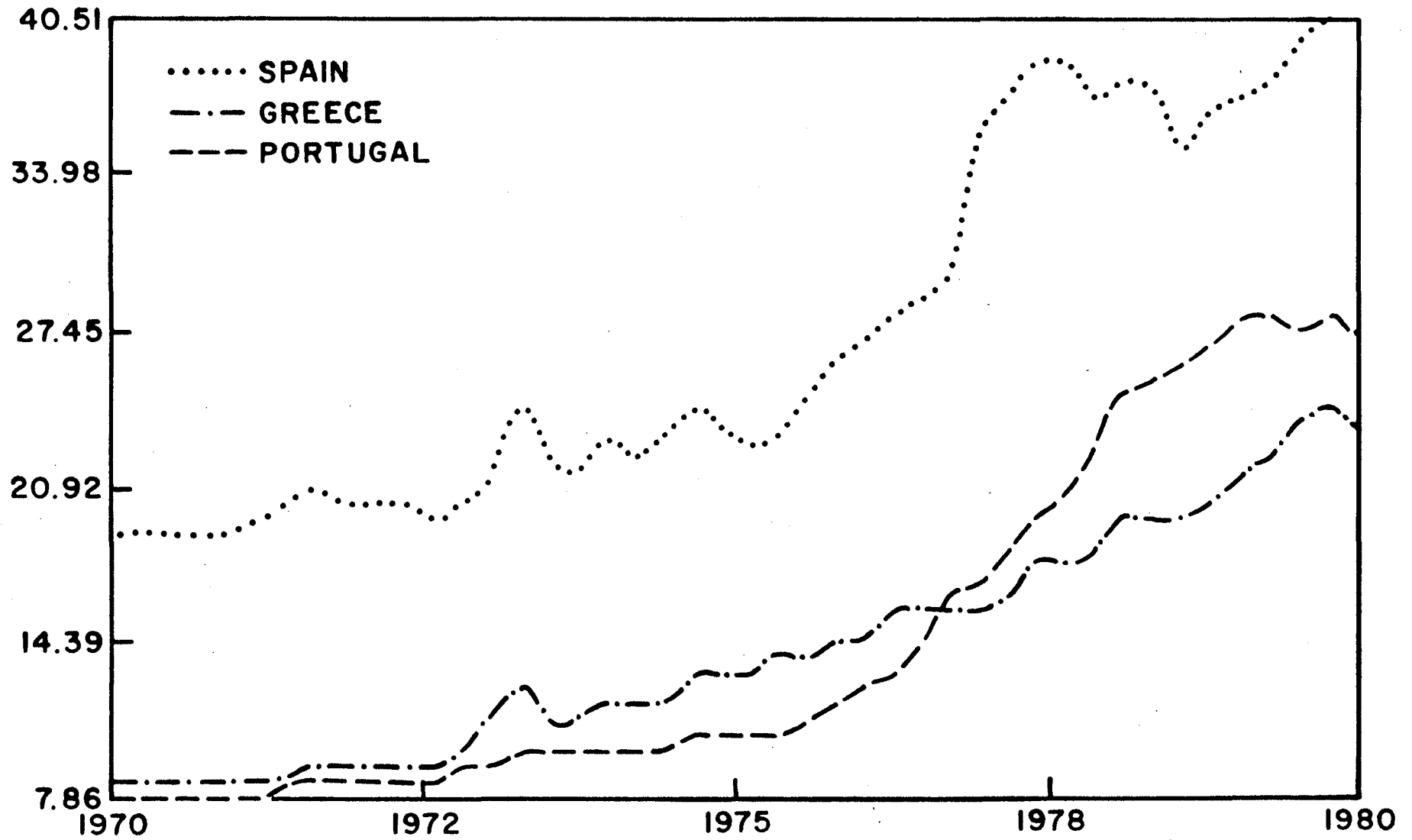


Chart 2: Home-Currency Price of the Deutsche mark



the other hard currencies for a much longer period than either Spain or Portugal. The drachma price of the dollar continued to be 30 drchs until the middle of 1975 at which time and probably for the same reasons as in the other two cases, a basket peg was adopted and the drachma started devaluing vis-a-vis the basket. It is only towards the end of the decade and in view of the large increase in the price of imports and the CPI, that the rapid depreciation vis-a-vis the European currencies was mitigated. This policy shift was also prompted by increased trade prospects with the European Community (EC) in light of the imminent entry into the EC and the expected movement towards harmonization of monetary and exchange rate policies.

The experience of the three countries during the 1970's can be thus subdivided into three roughly comparable periods. In the first period, which lasted from the middle of 1971 to the middle of 1975, Spain and Portugal maintained rough parities vis-a-vis the DM and appreciated substantially vis-a-vis the dollar; in the case of Greece the opposite held true. In the second period which lasts from 1975II to 1977III in the case of Spain, and until the end of 1979 in the other two countries, all three countries experience substantial effective nominal devaluations vis-a-vis all major trading partners. Since that time, monetary authorities have attempted to maintain rough parities with the European currencies and move accordingly with the dollar.

A clearer picture as to the similarities and differences across countries in the exercise of exchange rate policy is provided in Tables 14, 15, and 16 which present estimates of the relevant weights of each of the

major currencies in the effective currency basket to which the Southern European countries pegged.

Pegging to a currency basket means stabilizing the own nominal or real currency price of an arbitrarily chosen numeraire (here the DM) to an average of other currencies relative to the numeraire. The basket peg can be either fixed or variable in which case the own currency price of the numeraire is adjusted relative to the average in a more or less systematic manner. In the case where the adjustment is based on such indicators as the current account balance, or the stock of reserves, the basket peg can be rigorously defined as

$$\dot{r}_j = F(B) - \sum_i w_i \dot{J}_i; F' < 0; F(0) = 0, \quad (1)$$

If authorities are in fact defining the basket over real exchange rates,

$$\dot{r}_j + \dot{q}_N - \dot{p}_j = F(B) - \sum_i w_i (\dot{J}_i + \dot{q}_i - \dot{q}_N) \quad (2)$$

In equations 1 and 2 above,

j = home country.

$i \neq j$ = all other countries including the numeraire.

N = the numeraire country, here the U.S.

r_j = j currency units per dollar.

J_i = \$ per unit of i currency.

w_i = weight to be assigned to the i 'th currency.

q_N = the appropriate U.S. price index in dollars, here the CPI.

q_i = country i's CPI.

P_j = j country's CPI in home currency.

B = the current account or basic balance.

$\frac{\dot{x}}{x} = \frac{dx}{x}$, the proportional change in x, for any variable x.

Tables 14 and 15 respectively, present estimated elasticities of each country's nominal and real home-currency price of the DM with respect to the nominal and real DM price of a number of currencies. As one would expect the choice of the numeraire is completely arbitrary and does not influence the estimated coefficients. Thus when the dollar was chosen as the numeraire the coefficients remained unchanged. The only difference was in the estimated R^2 i.e. in the explained variation of the dependent variable.

Given the direction of trade data (Table 13) the currencies chosen include the Deutsche mark, the yen, the pound, the Italian lira, and the French franc. Despite the high collinearity between the Deutsche mark and the yen,¹⁰ the estimated elasticities do not vary significantly when the latter is excluded.

In the absence of any well-formulated hypothesis as to the process by which the home-currency price of the dollar is adjusted relative to the basket, a constant is included in the regression equations. In Table 16 two alternative hypotheses are tested, namely that the adjustment relative to the basket is based on the current account balance (CA) as well as on the stock of net foreign assets (F). This latter term captures past current-account developments that affect current exchange rate policy. For each

Table 14: Movements of Home-Currency Price of the Deutsche mark (DM) Relative to the DM Price of Selected Currencies

(Quarterly Data)

	C	$w_{\$}$	w_Y	$w_{\mathcal{L}}$	w_L	w_F	$w_{DM} = - [1 + \sum w_i]$	R ²	D-W
GREECE ($\frac{DR}{DM}$)									
1970II-1974IV	-.003 (0.6) ²	-.778 (4.9)	.025 (0.1)	.120 (0.6)	-.391 (1.8)	-.097 (0.6)	.121 (1.0)	.932	2.7
1975I-1980IV	.024 (4.4)	-.288 (1.9)	-.045 (0.5)	-.154 (1.3)	.026 (0.2)	-.014 (0.07)	-.525 (3.1)	.420	1.7
PORTUGAL ($\frac{E}{DM}$)									
1970II-1974IV	.006 (1.7)	-.287 (2.3)	-.087 (0.6)	.096 (0.6)	-.022 (0.1)	-.131 (1.0)	-.569 (5.8)	.722	2.9
1975I-1980IV	.028 (3.3)	-.549 (2.3)	.187 (1.2)	-.151 (0.8)	-.176 (0.7)	-.065 (0.2)	-.246 (0.9)	.416	1.4
SPAIN ($\frac{P}{DM}$)									
1970II-1974IV	-.005 (2.7)	-.667 (11.0)	-.289 (4.5)	.116 (1.7)	.157 (1.9)	-.362 (6.0)	.045 (0.9)	.984	1.4
1975I-1980IV	.008 (0.6)	-.366 (1.1)	.125 (0.6)	-.157 (0.6)	-.393 (1.1)	.011 (0.02)	-.220 (0.6)	.269	1.7

Notes

- 1) This is the weight in the basket assigned to nominal movements in the numeraire-price of each currency i, here the DM price of the dollar.
- 2) t - statistics are in parentheses.

Table 15: Movements of Real Home-Currency Price of the Deutsche mark Relative to Real-DM Price of Selected Currencies

(Quarterly Data)

	C	$w_{\$}$	w_Y	w_{fr}	w_L	w_F	$w_{DM} = -[1 + \Delta w_1]$	R^2	D-W
GREECE ($\frac{DR}{DM} \frac{CPIG}{CPIGR}$)									
1970II-1974IV	-.010 (0.8) ²	-1.07 (1.9)	-.288 (0.6)	.118 (0.2)	-.020 (0.2)	.063 (0.1)	.197 (0.5)	.69	2.3
1975I-1979IV	.003 (0.5)	-.305 (1.4)	.129 (1.0)	-.087 (0.5)	.077 (0.3)	-.169 (0.6)	-.645 (2.8)	.25	2.6
PORTUGAL ($\frac{E}{DM} \frac{CPIG}{CPIPO}$)									
1970II-1974IV	-.012 (2.5)	-.453 (2.1)	-.195 (1.1)	-.014 (0.8)	.036 (0.1)	.146 (0.7)	-.520 (3.3)	.74	2.3
1975I-1980I	.006 (0.5)	-.271 (0.7)	.204 (0.8)	.116 (0.4)	-.661 (1.5)	.224 (0.4)	-.612 (1.5)	.25	2.7
SPAIN ($\frac{P}{DM} \frac{CPIG}{CPISP}$)									
1970II-1974IV	-.011 (3.9)	-.352 (2.8)	-.340 (3.4)	.225 (2.2)	-.222 (1.3)	-.365 (3.2)	.054 (0.6)	.95	2.7
1975I-1980II	-.005 (0.5)	-.239 (0.7)	-.051 (0.2)	-.167 (0.7)	-.526 (1.3)	.198 (0.4)	-.215 (0.6)	.32	1.6

- Notes** 1) This is the weight in the basket assigned to real movements in the numeraire-price of each currency 1, here the DM price of the dollar.
2) t - statistics are in parentheses.

Table 16: Movements of Real Home-Currency Price of the Deutsche Mark Relative to the Basket

(Quarterly Data)

	C	CA ¹	F ²	w _{\$} ³	w _Y	w _£	w _L	w _P	w _{DM} = -[1+Ew ₁]	R ²	D-W
GREECE ($\frac{DR \text{ CPIUS}}{DM \text{ CPIGR}}$)											
1970II-1974IV	.030 (0.9) ⁴	.083 (1.3)	-.003 (1.4)	-.822 (1.5)	-.156 (0.4)	-.102 (0.2)	-.439 (0.6)	.251 (0.5)	-.268 (1.5)	.77	2.3
1975I-1979 IV	.010 (0.9)	-.0002 (0.7)	.0003 (1.0)	-.336 (1.5)	.073 (0.5)	-.055 (0.3)	.139 (0.5)	-.185 (0.5)	-.636 (2.7)	.31	2.8
PORTUGAL ($\frac{E \text{ CPIG}}{DM \text{ CPIPO}}$)											
1970II-1974IV	.044 (1.2)	-.130 (1.0)	-.001 (1.6)	-.454 (2.1)	-.074 (0.4)	-.298 (1.1)	.129 (0.4)	.141 (0.7)	-.444 (2.7)	.79	2.8
1975I-1980I	-.004 (0.3)	-.023 (1.4)	-.0003 (1.6)	-.214 (0.6)	.255 (1.1)	-.062 (0.2)	-.720 (1.6)	.389 (0.8)	-.648 (1.6)	.40	2.5
SPAIN ($\frac{P \text{ CPIG}}{DM \text{ CPI SP}}$)											
1970II-1974IV	.004 (0.4)	-.020 (0.9)	-.0001 (1.5)	-.305 (2.4)	-.304 (2.9)	.117 (0.9)	-.248 (1.4)	-.350 (3.1)	.090 (0.9)	.96	2.9
1975I-1980II	.017 (1.1)	-.0001 (0.7)	-.0002 (1.7)	-.103 (0.3)	-.312 (1.2)	-.167 (0.6)	-.566 (1.5)	.735 (1.4)	-.587 (1.5)	.46	1.9

Notes

- 1) Percentage change of net foreign assets.
- 2) In billions of home-currency units.
- 3) This is the weight in the basket assigned to real movements in the numeraire-price of each currency i, here the DM price of the dollar.
- 4) t - statistics are in parentheses.

country, the weight of the DM in the basket is derived by subtracting the sum of the reported weights from unity.¹¹ The t ratios reported under the DM weight come from the regressions that involved the dollar as the numeraire currency.

A number of tentative but interesting conclusions can be drawn from the results:

a) Over the whole period of the 1970s the weight of the dollar in the basket is remarkably high in all three countries. This is hard to explain in terms of relative trade shares (Table 13) but has to be understood in light of the inertia of the early period and possibly a misplaced emphasis on currency of denomination weights rather than actual trade shares.¹²

b) Between the first and second period the weight of the dollar declines in the Greek and Spanish case both in nominal and real terms; in Portugal the nominal/real distinction seems to be important.

c) In the first period the weight of the DM is highest in the case of Portugal while in the second it is highest in the case of Greece (over .50 in both cases). This is consistent with trade shares if the DM weight represents trade with the European Community as a whole. Maintaining a relatively stable rather than declining home-currency value of emigrant remittances might also be an important aspect of that choice.

d) In all three cases the share of the Italian lira is quite high. This probably reflects the preoccupation with competitive export positions in third markets.

e) It is unclear from the data whether or not the basket in these three countries was determined over nominal or real exchange rates. The

results are generally better in Table 14 and this tends to confirm our intuition that inexperience with managing a basket and lack of an analytical framework resulted in nominal rather than real basket formulations.

f) With the exception of Portugal, the first period was characterized by nominal and real appreciation of the currencies relative to the basket. In the second period all currencies were nominally devalued. The nominal devaluation was strongest in Portugal (12 percent on an annual basis) compared to Greece (approximately 8 percent) and Spain (around 4 percent). This resulted in a real devaluation relative to the basket in the two smaller countries but a real appreciation in Spain (around 4 percent).

g) Inclusion of the current account balance and the level of net foreign assets as potential determinants of the adjustment vis-a-vis the basket seems to improve the overall results. The new variables have in general the expected signs (there are two exceptions) and the stock of foreign assets seems to be an important determinant of the authorities' reaction to third-country exchange rate movements.

The above results suggest a general pattern: confronted with inflationary pressures in the mid 1970's of both domestic and foreign origins the monetary authorities in all three countries attempted to safeguard their competitive position internationally through a process of nominal effective devaluations. In the face of domestic inflation rates which at least in Spain and Portugal exceeded 20 percent by 1977 the policy of nominal devaluations resulted in small real devaluations in the case of Greece and Portugal and a small real appreciation in the case of Spain (Table 15). As we have shown in Section 2, however, nominal effective exchange-rate devaluations are partly responsible for domestic inflationary

pressures. Thus by the end of the 1970s these countries found themselves caught in the classic dilemma associated with exchange-rate policy, namely the dilemma between balance-of-trade vs. domestic inflation targets. The econometric evidence however sparse, seems to suggest that in small-open economies the effects of exchange rate movements on the price ratio of non-traded to traded goods is higher than the effect on the terms of trade; hence exchange rate policies need to be evaluated in that light. The experience of these countries in the 1970s and the switch in policies in the early 1980s seem to substantiate that claim.

The decision of Greece and the potential new members of the EC to join the European Monetary System (EMS) has to be judged accordingly. Joining the EMS would limit the potential flexibility of these countries in the exercise of exchange-rate policy. This would be especially true if they continue to maintain a geographically diversified trade.

Given the historical experience of the 1970s, the necessary adjustment will be relatively bigger in the case of Greece which followed the dollar for most of the past decade. It is clear that participation of the new members in the EMS is in the interest of the traditional members. A policy of nominal devaluations vis-a-vis the DM-currency area by the Southern-European countries provided in the past some competitive advantage over France and Italy in the export market of agricultural goods, and caused some redirection of trade on the import side towards non-community members. It will be up to the new members to decide whether or not having given up the flexibility of commercial policy by joining the EC, they should also give up the flexibility of exchange-rate policy.¹³

Appendix 1

A full description of the model which provides the basis for the results of Table 8 can be found in Katseli (1980). The main addition here is the inclusion of the government sector following the modelling specification in some earlier work (Katseli, 1979), as well as the inclusion of net transfers from abroad in the balance-of-payments equation and the national income identity.

The following set of nine equations provides a simple framework that can be used to analyze the effects of various external disturbances on the prices of non-traded goods, on income and the balance of payments in a small and open economy:

Non-Traded Goods

$$H^S \left(\frac{W}{P_h - P_r} \right) - H^d (P_h, P_x, P_m, C) - \frac{G_h}{P_h} = 0. \quad (1)$$

Balance of Payments

$$X^S \left(\frac{W}{P_x} \right) - X^d (P_x, P_h, P_m, C) - \frac{P_m M^d}{P_x} (P_x, P_m, P_h, C) - \frac{P_r}{P_x} R^d \left(\frac{W}{P_h - P_r} \right) - \frac{G_m}{P_x} + \frac{eF^*}{P_x} = \frac{eR^*}{P_x} \quad (2)$$

where $(eR^*) = S - (G_h + G_m - T).$ (2a)

National Income

$$V = (P_h - P_r)H^S + P_x X^S + eF^*. \quad (3)$$

Disposable Income

$$D = V - T \quad (4)$$

Income Identity

$$V = C + S + T \quad (5)$$

$$(5a) \quad S = \lambda[kD - M] = eR^* + H$$

$$(5b) \quad C = D - S = D - S = (1 - \lambda k) (1 - t) V + \lambda M$$

$$(5c) \quad T = tV.$$

Money Market

$$\dot{M} - e\dot{R} - \dot{H} = 0. \quad (6)$$

$$\text{Prices} \quad P_x = e \cdot P_x^* \quad (7)$$

$$P_m = e \cdot P_m^* \quad (8)$$

$$P_r = e \cdot P_r^* \quad (9)$$

Superscripts denote quantities supplied or demanded; an asterisk indicates a foreign exchange denominated variable. Table A.1 presents a complete alphabetical list of definitions for the variables used in the specification and solutions of the model.

Table A.1: Symbols and Definitions

B_h = own-price elasticity of demand ($B_h \geq 0$).

$B_{h,j}$, $j = x, m$ = cross-price elasticity of demand ($B_{h,j} \geq 0$).

C = nominal consumption expenditures.

D = nominal disposable income.

e = home-country price of foreign exchange.

- E_h = elasticity of supply of non-traded goods with respect to the net real wage ($E_h \geq 0$).
- E_x = elasticity of supply of exportables with respect to the own real wage ($E_x \geq 0$).
- F^* = net transfers from foreigners denominated in foreign exchange.
- G_h = public sector's nominal expenditures on non-traded goods.
- G_m = public sector's nominal expenditures on imported goods.
- \dot{H} = accumulation of high-powered reserves.
- H^d = domestic demand for non-traded goods by private sector.
- H^s = domestic supply of non-traded goods.
- M^d = home country's demand for imported consumed goods.
- m_h = marginal propensity to consume non-traded goods.
- P_h = price of non-traded goods.
- P_i^* , $i = x, m$ = foreign exchange price of home country's exports and imports.
- P_r = home country price of imported intermediate goods.
- P_x, P_m = home country prices of exported and imported consumer goods.
- \dot{R}^* = net accumulation of foreign-exchange reserves.
- R^d = home country's demand for imported intermediate goods.
- S = total nominal saving.

- T = nominal taxes.
- t = average (= marginal) tax rate.
- V = nominal income or value added.
- W = nominal wages exogeneously determined.
- X^d = home country's demand for exportables.
- X^s = domestic supply of exportables.

The crucial assumptions behind the above specification are the following:

- a. All final goods are gross substitutes in consumption and the indifference curves are assumed to be homothetic; demand functions are homogeneous of degree zero in all prices and expenditures.
- b. The imported intermediate good is used exclusively in the production of non-traded commodities under a fixed-coefficient production function. For simplicity it is assumed that it takes one unit of imported input to produce one unit of output. Profit maximizing behavior in that sector would imply that entrepreneurs would equate the nominal wage to the net value of labor's marginal product.
- c. Supply of the exportable commodity is simply a function of the own real wage.
- d. Nominal wages are assumed rigid and exogeneously determined through the bargaining process. This assumption simplifies the analytics but does not affect the results qualitatively, so long as there exists an intermediate good and entrepreneurs watch their own prices while workers watch the CPI (Katseli and Marion, 1980, p. 10f).

- e. Saving in the economy is equal to the difference between desired and actual money holdings (the only asset in the system), where λ reflects the speed of adjustment.

Finally,

- f. The country is assumed to be a price taker i.e. "small" in both export and import markets.

The comparative statics of the short-run equilibrium of the system described above, can be obtained by total differentiation of equations (1') and (3') with (5b') written in for C and appropriate substitution of equations (7'), (8') and (9') for the home-currency price variables.

In matrix form:

$$\begin{array}{ccc}
 [\alpha_{ij}] & \begin{pmatrix} \frac{dP_h}{P_h} \\ dV \end{pmatrix} & = [b_{ij}] \begin{pmatrix} dW/W \\ dP_x^*/P_x^* \\ dP_m^*/P_m^* \\ dP_r^*/P_r^* \\ de/e \\ dG_h \\ dt \\ dF^*/F^* \end{pmatrix} \\
 (2 \times 2) & (2 \times 1) & (2 \times 8) \quad (8 \times 1)
 \end{array}$$

where,

$$a_{11} = E_h \frac{P_h H^s}{P_h H^d} \frac{P_h}{P_h - P_r} + B_h + \frac{G_h}{P_h H^d}$$

$$a_{12} = -m_h \frac{1}{P_h H^d} (1 - t) (1 - \lambda k)$$

$$a_{21} = -P_h H^s (1 + E_H)$$

$$a_{22} = 1$$

and,

$$b_{11} = E_h \frac{P_h H^s}{P_h H^d}$$

$$b_{12} = B_{h,x}$$

$$b_{13} = B_{h,m}$$

$$b_{14} = E_h \frac{P_h H^s}{P_h H^d} \frac{P_r}{P_h - P_r}$$

$$b_{15} = B_{h,x} + B_{h,m} + \frac{E_h P_r}{P_h - P_r} \cdot \frac{P_h H^s}{P_h H^d}$$

$$b_{16} = \frac{1}{P_h H^d}$$

$$b_{17} = \frac{m_h (1 - \lambda k)}{P_h H^d} \cdot V$$

$$b_{18} = 0$$

$$b_{21} = - \left(\frac{P_h - P_r}{P_h} P_h H^S E_h + P_x X^S E_x \right)$$

$$b_{22} = P_x X^S (1 + E_x)$$

$$b_{23} = 0$$

$$b_{24} = - \frac{P_r}{P_h} P_h H^S (1 + E_h)$$

$$b_{25} = P_x X^S (1 + E_x) - \frac{P_r}{P_h} P_h H^S (1 + E_h) + eF^*$$

$$b_{26} = 0$$

$$b_{27} = 0$$

$$b_{28} = eF^*$$

It should be noted that given equation (2a), the effects of a given disturbance on the balance of payments can be easily deduced from the effects on value added. Specifically,

$$d(eR^*) = (\lambda k(1-t) + t)dV - \lambda dM + (1 - \lambda k)Vdt - dG_h - dG_m.$$

Footnotes

¹The source of these data is OECD, Economic Surveys, 1980.

²See Tables 6 and 7.

³The model allows for imports of final goods which are substitutes in demand to home goods.

⁴These include high-powered reserves and foreign exchange reserves, The adjustment described is specified in equation (5') where saving equals the flow excess demand for money.

⁵For a proxy of world market power, a weighted average of the country's export shares in total world exports for four main exportables was used. The same was done on the import side. The following are the numbers pertinent to the three countries and the average for the EC countries.

Indices of Market Power (1974)

	<u>Export Side</u>	<u>Import Side</u>
Greece	.0091	.0027
Portugal	.0337	.0019
Spain	.0144	.0140
Agerage EC (8)	.0331	.0169

⁶The weakest part of the model is the treatment of international capital movements and the role of speculation in the foreign exchange market. For an interesting analysis of the workings of "parallel" foreign exchange market and its implications, see Macedo, J. (1979).

⁷The government expenditure multiplier is equivalent to the open economy multiplier (Katseli 1979).

⁸All data are quarterly data and are derived from the IMF, International Financial Statistics. Money supply data refer to M1 (line 34 in IFS); wages are hourly earnings (line 65); import prices are unit value indices in domestic currency units (line 75). Government expenditures were excluded as they are highly correlated with the growth of money supply (for Greece, p. 82; for Spain p. 84).

⁹For a detailed analysis of the effects of third-country exchange rate movements on a country's terms of trade or the price of traded goods, see Branson and Katseli (1981a, 1981b).

¹⁰Correlation coefficient is .92.

¹¹This procedure might overestimate slightly the weight of the DM since other currencies might be included in the basket.

¹²For a detailed analysis of this problem see Branson and Katseli, 1981b.

¹³This is precisely Corden's (1972) argument against monetary integration of countries which have formed a customs union.

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