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TRADE LIBERALIZATION AND MACROECONOMIC  
STABILIZATION IN PORTUGAL: IMPLICATIONS  
FOR THE PATTERN OF COMPETITIVENESS

1970 - 1985

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Trade Liberalization and Macroeconomic Stabilization in Portugal:  
Implications for the Pattern of Competitiveness 1970-1985\*.

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\* This is a special study to supplement the country manuscript on Portugal for the project on The Timing and Sequencing of Trade Liberalization Policies, CPDTA, The World Bank, herein referred to as Macedo, Corado and Porto (1987). An earlier version was presented by Corado at the Southern European Congress on Economic Theory and Econometrics in Toledo, Spain in December 1987. The Annex draws on research conducted by Macedo at the National Bureau of Economic Research.

## 1. Introduction

The Portuguese economy began to dismantle trade barriers in the framework of the European Payments Union in 1948, and continued after joining the European Free Trade Association in 1960. In the process, the ratio of merchandise exports and imports to gross domestic product - a crude but convenient measure of average openness - increased gradually from 32% in 1953 to 43% in 1973.

After 1973, average openness followed a more oscillatory pattern: it reached 52% in 1974, then reversed the trend in 1975-76, falling to 40%, and rose irregularly after the application for membership in the European Community (EC) in 1977, to reach a maximum of 69% in 1984.

Portuguese entry into the EC in 1986 has implied a process of economic liberalization whose success hinges, as it did over the past forty years, on policies affecting the level and the composition of domestic demand, that is to say on monetary and fiscal restraint and on competitiveness.

Our aim is thus to supplement the analysis of the long-run trade liberalization policy pattern from 1948 to 1985 described in Macedo, Corado and Porto (1987) by investigating its relationship with stabilization efforts, especially after the change in the political regime.

We seek to determine whether there is a common pattern in the policy packages agreed upon with the International Monetary Fund (IMF) in 1977-79 and in 1983-85. Since these stabilization packages coincided with the negotiations for EC membership, we will refer to them as packages of trade liberalization and macroeconomic stabilization, or liberalization cum stabilization packages (LCSP) for short. Once this

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background of the policies concerning competitiveness is understood, it is easier to evaluate the sustainability of the liberalization episode now under way, without having to resort to another LCSP sometime before 1992.

To assess whether policy shifts - taking place on average every two years during the last twelve years - have affected competitiveness, we divide the whole 1953-85 period for which most of the required data is available as follows. Until 1970, a long and gradual process of trade liberalization in the framework of two overlapping free-trade areas, with Europe and with the colonies. After 1970, successive phases of policy responses to external shocks, two of which involved LCSPs. In defining these phases we recognize the ambiguity of the year 1980, which belongs both to the second and to the third phases of macroeconomic adjustment. We thus have:

- 1) 1970-74, the most liberalizing and expansionary phase before entry in the EC;
- 2) 1975-76, the revolutionary reversal, accompanied by fiscal expansion and international recession;
- 3) 1977-80, the first LCSP, implied by the application for membership in the EC and a stand-by agreement with the IMF;
- 4) 1980-82, an expansionary phase, preceded by a successful anti-inflationary program in 1980;
- 5) 1983-85, a contractionary phase under the second LCSP.

The analysis is carried out in two Sections. Section 2 describes briefly four basic indicators of competitiveness. These are the relative price of traded and non-traded goods (E), and three measures of prices or costs relative to four major trading partners, using the current account weights derived in Macedo (1982). Aside from relative consumer prices (ECPI) and unit labor costs (RULC), we also report some results for a more satisfactory measure of competitiveness when real interest rates change, namely relative unit labor and capital costs (RUC). This measure is discussed in Branson (1985) and Macedo (1985a). Clearly, each indicator of competitiveness is appropriate for a different story, and others were used, as discussed in the Annex.

The determinants of competitiveness for different indicators are estimated in Section 3 using a simple model where competitiveness depends positively on trade openness, and negatively on the overall balance of payments position and on government expenditures. Despite a poor overall fit, the results differ for the two measures reported, E and RULC. The results are worse for the relative unit labor costs measure than for the relative price of traded and non-traded goods. We nevertheless use this model to test whether - for each one of the indicators - the determinants of competitiveness change across the five different phases. These tests bring out that - across several benchmarks - the 1977-80 LCSP involved a structural change, whereas this was less clear for the 1983-85 LCSP.

Other implicit policy patterns are described, together with some concluding remarks, in Section 4. The need to improve the model for the determinants of competitiveness should be kept in mind in interpreting our results, which we regard as tentative. Nevertheless, the approach seems quite a promising complement to the assessment of adjustment

policies in open economies.

## 2. Aggregate Indicators of Competitiveness

It is of course easier to determine the evolution of competitiveness in an environment of gradual and uniform opening to trade, such as the 1948-70 period, than when there are swings in the trade to output ratios, as happened subsequently. Swings in average openness also suggest that aggregate indicators will hide changes in relative prices at the sectoral or even good-specific level, due to shifts in government intervention, and may therefore be misleading for the assessment of competitiveness.

This is all the more serious as investment licensing, trading in agricultural staples by state-owned monopolies and investment programs of state-owned enterprises, together with price, wage and foreign exchange controls have been present during most of the 1948-85 period, as described in Macedo, Corado and Porto (1987). Some of these forms of intervention only create a temporary wedge between world and domestic prices. However, other forms of intervention, such as investment licensing before 1972 and import licensing between 1975 and 1985, are more resilient. Since there are no systematic empirical studies on divergences between the world and domestic prices, however, we assume that changes in foreign prices and trade policy are fully reflected in the domestic market as is customary for a small open economy.

A rough idea of competitiveness, thus, uses the indicators of table 1, namely E, ECPI, RULC and RUC already described. Table 1 lists the averages for the 1953-70 period as well as for the five phases.

Table 1

In this table, the two phases with LCSPs involve strong real depreciations. As mentioned, both were conducted in agreement with the IMF and included policies to restore competitiveness. The first involved the change of the exchange rate regime in 1977 (introduction of the crawling peg) and a discrete devaluation, demand management, as well as a change in monetary and (less) fiscal policy.

Stabilization packages sponsored by the IMF followed difficulties in the access to foreign loans in 1976 and 1982 and considerable resistance on the part of the authorities to the inevitable introduction of deflationary policies. However, the real depreciation was larger in the first phase than in the second, in part due to a larger wage adjustment accompanied by a similar nominal devaluation and in part due to heavier losses in competitiveness during the revolutionary phase (1975-76).

Relative unit labor costs increased by 28% in Portugal's favor during 1977-79 while they rose only by 7% during the second stabilization program. Relative unit costs which includes both labor and capital costs, had larger changes than RULC before 1976 than after. This seems to confirm the flexibility in wages after 1977 as compared with 1954-74 while accounting for capital costs introduced a dampening effect due to the rise in interest rates during the LCSPs.

Purchasing power parity (PPP) was thus used as a benchmark for indices calculated on the basis of consumer prices (ECPI) even though it

is a very broad measure of competitiveness, going beyond the international arbitrage of traded goods. Another indicator measures the parity of producer prices and uses wholesale price indexes instead. Because the weight of tradables is heavier in this measure than in the CPI, it is often preferred. However, Portuguese statistics on this index are unreliable so that we only report the ECPI in table 2, column (3).

Relative consumer prices typically show less variability than the other indexes of competitiveness. A decomposition of this index reported in Macedo (1985b) suggests that changes in the nominal effective exchange rate, while not fully transmitted to the real exchange rate based on consumer prices, are still much more relevant than changes in trade barriers or in the terms of trade. Aggregating imports and exports into a traded good composite, whose price in foreign currency is  $Pt^*$ , define the CPI at home (unstarred) and abroad (starred) and the two measures of relative prices, in percentage changes, as:

$$(1) \text{CPI} = a P_n + (1-a) (E_n + Pt^*)$$

$$(2) \text{CPI}^* = a^* P_n^* + (1-a^*) Pt^*$$

$$(3) \text{ECPI} = E_n + \text{CPI}^* - \text{CPI}$$

$$(4) E = E_n + Pt^* - P_n$$

In (1-4),  $E_n$  is the nominal exchange rate, and  $P_n$  ( $P_n^*$ ) is the price of non-traded goods at home (abroad):  $a$  stands for the weight of non-tradables and  $a^*$  is the weight of foreign non-tradables. After substitution, we see that  $E$  is related to ECPI by the following expression:

$$(5) E = (1/a) \text{ECPI} + (a^*/a) (Pt^* - P_n^*)$$

The real exchange rate ( $E$ ) differs from the ratio of the foreign to domestic consumer prices even when all foreign goods are traded ( $Pt^*=P_n^*$ ) unless there are only domestic goods in the consumer price index ( $a=1$ ). The relative movement of  $E$  and ECPI will be mainly determined by the variations of the relative foreign price of tradables ( $Pt^*$ ) with respect to non-tradables ( $P_n^*$ ).

An ordinary least squares regression on annual data from 1954 to 1985 gave the following results (t statistics are in parentheses below coefficients):

$$(6) E = 6.41 + 1.91 \text{ECPI} + 1.10 (Pt^* - P_n^*)$$

$$\quad \quad \quad (6.09) \quad (7.15) \quad (4.68)$$

$$R^2 = 0.64 \text{ and } DW = 1.91.$$

The Durbin-Watson indicates that there are no autocorrelated residuals at 1 percent level of significance. All coefficients are greater than one and are significant at 1% level. The weight of non-tradables is  $a=.52$  ( $1/1.91$ ) and the foreign weight of non-tradables is  $a^*=.57$ .

A rise in the foreign price of tradables is likely to increase ECPI and E will rise more than proportionally. As seen in table 1, E (deflated by nominal wages as a proxy for the price of non-tradables) and ECPI moved always in the same direction but E changes are larger than the ECPI's since the 1970s, due to the exchange rate fluctuations following the Smithsonian agreement.

This is consistent with expression (6), where the last term reflects changes in the foreign prices. Note, however, that the relative price of tradables with respect to non-tradables (E) does not have to move always in the same direction than the ECPI. For instance, if domestic inflation rises above world inflation (ECPI falls, an appreciation) and this is accompanied by a fall in the foreign relative prices, E and ECPI may move in opposite directions in spite of the positive sign on the ECPI term. This happened in 1980 (E=-3.3% and ECPI=1.4%) and in 1984 (E= 8.3% and ECPI=-2.6%).

Unlike Macedo (1985b), we use as the real effective exchange rate E, a relative price of traded and non-traded goods which excludes trade taxes in the numerator. The reason is that E is a less ambiguous indicator of price movements under liberalization, transfers, inflow of capital and factor price rigidities than the indicator including trade taxes.

Generally, a lowering of tariffs under liberalization is expected to lower the price of non-tradables and increase E (a depreciation). Adding a term on protection to (5) and reestimating equation (6) gave the following results:

$$(7) \quad E = 6.08 + 1.90 \text{ ECPI} + 0.99 (\text{Pt}^* - \text{Pn}^*) - 0.91 \text{ T}$$

$$(5.53) \quad (7.12) \quad (3.86) \quad (-1.03)$$

$$R2 = 0.67 \text{ and } DW = 1.91^{**}.$$

In this expression T is the change in percentages of 1 plus tariff. Its coefficient is not statistically significant. It has the expected negative sign according to which a liberalization (lowering T) will induce a depreciation (E rises).

This preference for E over indicators including trade taxes is shared by Edwards (1986). Using two models of a small open economy with no capital movements, he shows that the effects of trade liberalization and changes of terms of trade on the real exchange rate are ambiguous, and will depend on factors such as relative capital intensities of importables, exportables and non-tradables, sign and level of cross-elasticities of demand and supply and income effects.

Abstracting from factor intensities, in the factor-specific model for instance, a lowering of tariffs will lower the price of non-tradables and increase E, if goods are gross substitutes and the substitution effect dominates the income effect. This outcome is more likely if tariff changes are not very large. As shown by Edwards (1986), even in these circumstances, the changes in some of the different concepts of real exchange rates definitions result in ambiguous movements. In particular, E including trade taxes, as well as ECPI, may rise or fall even when gross substitutability dominates under liberalization.

Wages seem to have been more rigid before 1977 than after that.

Under wage rigidity the equilibrium price of non-tradables become less responsive to tariff changes so that unexpected movements of the indicators may occur even when goods are gross substitutes.

Finally, transfers and capital inflows which were particularly significant between 1970 and 1974, in general led to an increase in the price of non-tradables and a real appreciation. The appreciation of the escudo up to 1974 is consistent with this explanation. The effects of international borrowing, especially by stat-owned enterprises, which dominate capital movements after 1977, particularly in 1981-82, are not as clear in their effect. They may have contributed to the appreciation of the currency in this phase.

Measures based on factor costs, although not free from government intervention, are a better reflection of long-run competitiveness. Both relative unit labor costs (RULC) and relative unit labor and capital costs (RUC) are reported in table 1. We tend to prefer RUC on theoretical grounds, as explained in Macedo (1985a) and in the Annex, and note that, for the last phase, the two measures differ significantly.

### 3. Tests of structural change in a model of competitiveness

We now present a simple model of the determinants of the exchange rate, which involves international transactions on merchandise trade, changes in reserves and government expenditures. Representing a change in a variable by X, our hypothesis is of the form:

$$(8) E = b_0 + b_1 MPX + b_2 RES + b_3 GOV + u$$

The ratio of imports plus exports to GDP (XPM) measures the degree of openness. We expect that an increase in the degree of openness will lead to a rise in the real exchange rate (a depreciation) if goods are gross substitutes. In general, the coefficient is expected to be positive. This variable has the right sign and is significant when the dependent variable is E.

The inclusion of changes in reserves as percentage of GDP (RES), reflects the potential negative effect of invisibles and capital movements on competitiveness changes, perhaps due to the monetary consequences of reserve accumulation. In general, RES has the right negative sign but rather small and statistically insignificant.

Again government expenditures as percentage of GDP (GOV), is included following our contention that this variable influenced competitiveness due to the increase in government borrowing from the wholesale nationalizations of 1975 to date. Here again the sign is generally negative and it gains in significance after the revolution, as one would have expected.

The estimation of (8), using annual data covering 1953 to 1985, 1953 to 1974 and 1975 to 1985 led to the results reported in tables 2, 3 and 4 respectively. The series used for the dependent variables are discussed in the Annex.

Tables 2, 3, 4

The explanatory power of the regression is very low: the

TABLE 2

ESTIMATION OF (8) FOR 1954-85 (d.f. = 27) (1)  
 (t statistics in parenthesis below coefficients)

	Dependent Variables			
	E	ECPI	RULC	RUC
RHO	0.594** (4.116)	0.593** (4.101)	0.584** (4.010)	0.554* (2.820)
C	-0.021 (-1.155)	-0.005 (-0.333)	0.105 (1.582)	0.172 (1.640)
XPM	0.391* (2.354)	-0.179 (-1.400)	-0.270 (-0.444)	-1.447 (-1.652)
RES	-0.113 (-0.639)	-0.783 (-0.107)	-0.642 (-0.994)	-2.291 (-1.410)
GOV	-0.331 (-0.999)	-0.009 (-0.035)	-1.675 (-1.380)	-3.179 (-1.943)
DW	1.554**	1.506**	1.385	1.341
F	3.085*	0.697	0.928	2.137

\*Significant at 5% level; \*\* Significant at 1% level.

(1) Regression results and statistics based on the transformed variables for correction for first order serial correlation (method: Cochrane - Orcutt). Regression with RUC as dependent variable has 14 degrees of freedom.

TABLE 3

ESTIMATION OF (8) FOR 1954-74 (d.f. - 17) (1)  
 (t statistics in parenthesis below coefficients)

	Dependent Variables		
	E	ECPI	RULC
C	-0.051** (-7.408)	-0.018** (-2.667)	0.031 (2.050)
XPM	0.433 (1.537)	-0.201 (-0.728)	-0.855 (-1.402)
RES	-0.312 (-0.158)	0.124 (0.641)	-0.249 (-0.583)
GOV	-0.568 (-1.228)	0.572 (1.266)	-0.387 (-0.387)
R2	0.075	0.013	-0.036
DW	1.880**	1.001	1.752**
F	1.544	1.008	0.771

\* Significant at 5 %; \*\* Significant at 1% level.

(1) Method: OLSQ. Regression not available for RUC because of number of observations.

TABLE 4  
 ESTIMATION OF (8) FOR 1975-85 (d.f. = 7) (1)  
 (t statistics in parentheses below coefficients)

	Dependent Variables			
	E	ECPI	RULC	RUC
C	0.031 (1.570)	0.031* (2.213)	0.297** (3.370)	0.312** (4.255)
XPM	0.634* (2.271)	0.119 (0.602)	0.982 (0.796)	-0.325 (-0.317)
RES	-0.545 (-0.827)	-0.684 (-1.470)	-4.207 (-1.447)	-5.377 (-2.225)
GOV	-0.802 (-1.250)	-0.695 (-1.533)	-3.692 (-1.304)	-5.100 (-2.167)
R2	0.373	0.143	0.131	0.313
DW	1.335	1.700	1.622	1.512
F	2.982	1.558	1.502	2.518

\* Significant at 5% level; \*\* Significant at 1% level.  
 (1) Method OLSQ.

coefficients of RES and GOV are not significant and XPM is only significant for E. In the regression on E, GOV gains statistical significance and XPM loses it, if we cover the period before 1974, as done in the results presented in table 4 for the three dependent variables for which data is available. Tables 5 and 6 summarize the F tests on whether the changes in policy since 1970 led to statistically significant differences in the patterns of competitiveness across the five phases.

Two types of tests were performed. The first group of tests are conventional tests on structural change when the number of observations are too small to allow separate regressions. The second group of tests are more rigorous in the sense that the number of observations allow the estimation of different equations.

Each of the tests implies the estimation of a restricted form and an unrestricted form. For instance, in the first group of tests, if the null hypotheses assume the stability of 1977-79 with respect to previous years (1953-76), we run two regressions:

1) on the restricted form covering all observations (1953-79) with  $S_r$  as sum of square residuals and  $nr-k$  degrees of freedom (this is equation 8 of tables 5 and 6); and

2) on the unrestricted form in which we exclude the observations from 1977 to 79, with  $S_u$  as the sum of square residuals and  $nu-k$  degrees of freedom (this is equation 2 of tables 5 and 6).

tables 5 and 6

The test of the stability of 1977-79, is given by a F-test with 3 and 19 degrees of freedom respectively for the numerator and denominator (this is F test 6 in tables 5 and 6). In general, we have:

$$(9) F = \frac{(S_r - S_u)/(nr - nu)}{S_u/(nu - k)} F [(nr-nu), (nu-k)]$$

In the same way, the more traditional tests of structural change, hypothesize differences in the intercept, in the slopes and in the overall equations. These tests also imply the estimation of the restricted and unrestricted forms. For instance, testing for similar overall equations before and after 1974, implies the estimation of:

1) the restricted form forcing the same structure over the period 1953-85, with sum of square residuals  $S_r$  and 28 degree of freedom (table 2 and equation 1 in tables 5 and 6); and

2) the unrestricted form  $S_u$  resulting from the sum of the square residuals of the regressions on 1953-74 and on 1975-85 (tables 3 and 4 and equation 19 of tables 5 and 6).

The test is calculated according to (9). Each number in tables 5 and 6 identifies the estimation of an equation.

The similarity of the results for E and ECPI is noteworthy, given the problems with the data, but not unexpected given (5) above. Both indicators reflect prices in the market for goods. The change in

TABLE 5  
 KEY OF TESTS\*  
 (S<sub>i</sub> is the sum of square residuals of equation i, i=1,...23)

TESTS	RESTRICTED S <sub>r</sub>	UNRESTRICTED S <sub>u</sub>
TEST ON 1970-74		
1. Previous years	S4	S3
2. 1953 - 1976	S2	S6
3. All other years	S1	S5
TEST ON 1975-76		
4. Previous years	S2	S4
5. All other years	S1	S7
TEST ON 1977-79		
6. Previous years	S8	S2
7. All other Years	S1	S9
TEST ON 1977-80		
8. Previous years	S10	S2
9. All other years	S1	S11
TEST ON 1981-82		
10. Previous years	S12	S10
11. 1953 - 1976	S13	S2
12. All other years	S1	S14
TEST ON 1983-85		
13. Previous years	S1	S12
14. 1953 - 1976	S15	S2
CUT YEAR 1970		
15. Intercept	S1	S16
16. Slope	S16	S3+S17
17. Equations	S1	S3+S17
CUT YEAR 1974		
18. Intercept	S1	S18
19. Slope	S18	S4+S19
20. Equations	S1	S4+S19
CUT YEAR 1977		
21. Intercept	S1	S20
22. Slope	S20	S2+S21
23. Equations	S1	S2+S21

\* Equation (9) in the text.

TABLE 6  
SUMMARY OF RESULTS OF F TESTS

TESTS	E	ECPI	RULC	RUC
TEST ON 1970-74				
1. Previous years	0	0	*	n.a.
2. 1953 - 1976	0	0	*	n.a.
3. All other years	0	0	0	0
TEST ON 1975-76				
4. Previous years	0	0	0	n.a.
5. All other years	0	0	0	0
TEST ON 1977-79				
6. Previous years	**	*	**	*
7. All other Years	0	0	*	0
TEST ON 1977-80				
8. Previous years	**	*	**	*
9. All other years	0	0	*	0
TEST ON 1981-82				
10. Previous years	0	0	*	0
11. 1953 - 1976	0	0	**	0
12. All other years	0	0	*	0
TEST ON 1983-85				
13. Previous years	0	0	*	0
14. 1953 - 1976	*	0	**	*
CUT YEAR 1970				
15. Intercept	0	0	0	0
16. Slope	0	0	0	n.a.
17. Equations	0	0	0	n.a.
CUT YEAR 1974				
18. Intercept	0	0	0	
19. Slope	*	*	**	n.a.
20. Equations	*	*	**	n.a.
CUT YEAR 1977				
21. Intercept	**	*	*	0
22. Slope	0	0	0	0
23. Equations	*	*	**	0

\* Significant at 5% level.

\*\* Significant at 1% level.

0 Not significant.

Source: Annex Tables 1 through 4.

competitiveness was only significant in 1977-79 and still somewhat maintained in 1980, against previous years, if we measure competitiveness by E with the structure defined by expression (15) above.

This confirms our claim that 1977-79 was a LCSP, due to changes in the exchange rate policy (introduction of crawling peg and discretionary devaluation demand management, active monetary policy and lowering of trade barriers. No other phase saw such sizable unanticipated changes in pricing policy, especially exchange rate policy (see again table 1). Accordingly, tests on structural change for other phases were not significant.

The tests show more significant policy changes in competitiveness when RULC is used, reflecting a more active and flexible adjustment of relative unit labor costs. The phase of the highest trade liberalization, 1970-74, led already to changes in the competitiveness structure according to this indicator. In fact, there was a gain in competitiveness, due to lowering labor costs rather than to the price of tradables under a fixed exchange rate. The results for the LCSPs of 1977-79 or 1977-80 confirm the significance of the shifts in competitiveness.

However, the test for subsequent phases also show significant changes in competitiveness which are not supported by the other indicators. The results with respect to RUC are less reliable because of the small number of observations available.

Somewhat surprising is the lack of significance on the structural change of the LCSP of 1983-85, which included an inflationary burst at least until 1985. The explanation may be due to the anticipation of policy changes, which were being delayed in 1981 and 1982, as suggested by the inventory build-up observed during this phase and reported in Macedo, Corado and Porto (1987), contrasting with a milder, but unanticipated LCSP in 1977-79.

5. Conclusions

In spite of different patterns of competitiveness shown by different indicators, for any given indicator, changes in structure are reflected in shifts in competitiveness. The relative price of tradables with respect to non-tradables (E) produced results which were closer to the ones obtained using relative consumer prices (ECPI) than to the ones obtained using relative unit labor costs.

According to the first two indicators the only significant change in competitiveness took place in 1977-79 (and, somewhat less, in 1977-80), and therefore domestic relative prices as well as foreign to domestic relative prices changed significantly. This result contrasts with the lack of significance of the tests for 1983-85 because the milder LCSP in 1977-79 was unanticipated whereas the stronger package of 1983-85 was anticipated by economic agents.

The relative unit labor costs indicator (RULC) confirms previous results for 1977-79 and 1977-80 but gives different results for other phases. The RULC show changes in competitiveness for 1970-74, a liberalizing phase not accompanied by appropriate policies. This could question its sustainability had the military coup of 1974 not occurred.

Also for the phases after 1980, there were significant changes in the competitiveness structure as defined by RULC. In particular, it seems to indicate that the phase of 1983-85 is a significantly distinct phase from previous years. Unfortunately, the small number of observations did not allow similar conclusions when relative unit costs were used as dependent variable.

In general our results confirm the contention in Macedo, Corado and Porto (1987) that the most liberalizing phase after the 1974 revolution was the first LCSP from 1977 to 1979/80.

The results also seem to show that some of the difference between the first and second LCSPs has to do with the fact that the second was anticipated. This emphasis on the adjustment of expectations by economic agents was of course to become crucial in the successful disinflation of 1986, which can be seen as yet another LCSP, since it coincided with EC membership.

Nevertheless, it remains to be seen whether the inability of the last two governments to bring the public sector borrowing requirement under 10% of gdp will not undermine the sustainability of the current liberalization phase without another LCSP sometime before 1992.

To repeat what we said at the outset, the model of the determinants of competitiveness must be improved before the results can be safely used to interpret the experience of Portugal with LCSPs, and their effect on competitiveness. Despite its shortcomings, though, the approach seems quite a promising complement to the assessment of the timing and sequencing of trade liberalization policies.

## ANNEX

### Indicators of Price and Cost Competitiveness

Various indicators of price and cost competitiveness were used in the text. Their construction is explained in this Annex, which also contains the complete series. We can divide indicators into "supply" and "demand" indicators with the usual caveats. Beginning with the former:

-- Demand side --

1. Purchasing power parity (ECPI): the relative CPI of partners with respect to home CPI;
2. Real effective exchange rate (E): the relative price of tradables (cif or fob) with respect to non-tradables;
3. Real effective exchange rate including tariffs (Et): the relative price of tradables with respect to non-tradables -  $E_t = E(1 + \text{tariff})$  (indicator  $E_t$  is the weighted product of  $E_x$  and  $E_m$  below);
4. Real effective rate for exports ( $E_x$ ) and for imports ( $E_m$ );

-- Supply side --

5. Purchasing power parity (EWPI): the relative wholesale price index of partners with respect to home WPI;
6. Relative unit labor costs (RULC);
7. Relative unit (labor and capital) costs (RUC).
8. Indicators of profitability of imports (PROFM) and exports (PROFX).

The remainder of this Annex is as follows. After discussing the

weights (section 1) we focus on real effective exchange rates (sections 2 and 3) and relative unit costs in manufacturing (section 4). Nevertheless, we also use a cruder indicator of the relative price of exports and imports, obtained by dividing the unit values of exports and imports (the latter adjusted for the average tariff) - as a rough approximation to their domestic prices - by an index of nominal wages - as a rough approximation to the price of non-traded goods. These series come from the Statistical Annex to the country manuscript.

### 1. Weights

The indicators reflect the direction of trade, by taking into account the four main trading partners, United Kingdom, Germany, France and the United States. The weights attached to the trading partners attempt to capture the relative importance of their currencies in all current account transactions, rather than simply on merchandise imports and exports. The particular values are discussed at length in Macedo (1982). They are fairly close to each other, with France higher and US lower than one quarter.

The annual percentage changes in the resulting nominal effective exchange rate are compared with the official effective exchange rate (whose weights are not disclosed) in table A-1, which also provides the decomposition between discrete changes and the announced rate of crawl. The complete series are in table A-3, column (1).

Table A-1 here

### 2. Real Effective Exchange Rates

The real effective exchange rate for imports ( $E_m$ ) was obtained by first calculating import prices in escudos of imports from the same four countries as before (US, UK, FR, GE) and weighting them by the same weights, as shown in column (1) of table A-2. Inflating the result by the change in one plus the tariff rate, as shown in column (3), and deflating it by the nominal wage shown in column (4), gives the real exchange rate for imports reported in column (5). The real effective rate for exports in column (6) was obtained in the same fashion, except that no taxes on exports were included.

Table A-2 here

The real exchange rate excluding taxes ( $E$ ) is shown in column (2) of table A-3. The real effective exchange rate ( $E_t$ ), reported in column (3) was calculated by weighting the import price index by .60 and the export price index by .40 before deflating these by average nominal wages.

Table A-3 here

### 3. Relative Unit Costs in Manufacturing

Relative unit costs (RUC) are another indicator of competitiveness, which concentrates on costs rather than prices. Traditionally, these indicators focus on labor costs. However, changes in the user cost of

Table A - 1

Changes in the Rate of Crawl and Discrete Devaluations

	Rate of Crawl (p.mo.) (1)	Discrete (p.a.) Deval. (2)	Effective Deprec. (3)	(4)	(5)
1977		4.1		32.2	27.1
Feb. 25			15		
September	1				
1978		16.3		24.4	25.0
May	1.25		6.1		
1979		11.6		18.1	18.9
April 1	1				
June 1	0.75				
1980		7.8		3.5	5.2
Feb. 12			-6		
June 16	0.5				
1981		6.4		5.2	4.7
Dec. 2	0.75				
1982		9.4		13.6	15.8
January			1.3		
April 12	Weights changed				
June 16			9.4		
1983		12.7		26.7	27.6
March 23	1		2		
June 21			12		
1984		12.7		16.9	20.6
1985		10.5		11.3	14.1
November	0				

Notes: (4)=(2)+(3) except for rounding; (5) from table A-3.

Source: Bank of Portugal.

TABLE A - 2  
Real Effective Exchange Rate for Imports and Exports  
1953 - 1985 (1980 = 100)

	(1)	(2)	(3)	(4)	(5)	(6)
1953	87.7	99.6	102.7	57.4	156.7	173.4
1954	85.8	99.1	103.4	59.5	149.2	166.6
1955	86.9	102.2	102.9	61.0	146.6	167.6
1956	89.6	104.4	102.2	63.4	144.3	164.6
1957	93.6	107.4	101.1	66.6	142.2	161.3
1958	90.9	98.6	102.1	67.4	137.7	146.4
1959	87.9	95.1	103.3	70.1	129.4	135.6
1960	89.7	97.2	103.0	71.3	129.7	136.4
1961	91.1	95.7	102.6	74.4	125.7	128.7
1962	91.8	94.3	103.9	79.6	119.8	118.5
1963	93.7	95.6	103.0	83.6	115.6	114.4
1964	94.9	97.0	100.5	87.6	108.9	110.8
1965	97.2	98.8	100.7	92.6	105.8	106.7
1966	100.0	100.0	100.0	100.0	100.0	100.0
1967	100.4	100.0	100.3	108.5	92.7	92.1
1968	98.7	98.2	99.2	118.0	83.0	83.2
1969	101.8	101.0	99.6	131.4	77.1	76.8
1970	106.6	105.1	100.3	147.0	72.8	71.5
1971	111.7	109.0	98.5	162.8	67.6	66.9
1972	116.5	113.3	97.8	176.7	64.5	64.1
1973	126.5	127.6	96.0	201.3	60.3	63.4
1974	157.8	181.9	94.1	292.7	50.7	62.1
1975	183.2	198.7	96.3	389.1	45.3	51.1
1976	216.3	237.2	96.7	461.8	45.3	51.4
1977	298.9	331.1	96.3	537.4	53.6	61.6
1978	394.2	421.5	94.5	626.6	59.4	67.3
1979	514.1	558.0	92.3	727.3	65.3	76.7
1980	605.6	688.8	91.8	903.8	61.5	76.2
1981	693.7	805.3	91.9	1099.8	58.0	73.2
1982	859.6	980.7	91.7	1296.9	60.8	75.6
1983	1152.0	1287.9	94.6	1528.4	71.3	84.3
1984	1469.5	1651.9	92.1	1805.0	75.0	91.5
1985	1728.2	1907.4	91.6	2198.5	72.0	86.8

(1) Import prices in domestic currency: weighted product of four countries exchange rates (per unit of national currency) by their export prices. Weights are: US-21%, UK-26%, FR-28%, GE-25%. Source: IFS.

(2) Export prices in domestic currency: weighted product of exchange rates by their import prices.

(3) Index of one plus tariff, given in Statistical Annex table 6.1, except for 1983-1985 (which are guess numbers).

(4) Nominal wages from Statistical Annex table 1.2.

(5) Real effective exchange rate for imports:  $EM = (1) * (3) / (4)$ .

(6) Real effective exchange rate for exports:  $EX = (2) / (4)$ .

TABLE A - 3  
Nominal and Effective Exchange Rates: 1953-1985  
(1966 = 100)

	(1)	(2)	(3)
1953	108.8	161.1	163.5
1954	108.8	153.3	156.3
1955	108.8	152.5	155.1
1956	108.8	150.7	152.5
1957	107.8	149.0	149.9
1958	103.4	139.6	141.3
1959	98.8	129.5	132.0
1960	98.8	130.2	132.5
1961	99.8	125.1	126.9
1962	100.0	116.7	119.3
1963	100.0	113.1	115.1
1964	100.0	109.4	109.7
1965	100.0	105.7	106.2
1966	100.0	100.0	100.0
1967	99.7	92.3	92.5
1968	96.1	83.5	83.1
1969	95.1	77.2	77.0
1970	95.0	72.1	72.2
1971	95.1	67.9	67.3
1972	96.1	65.2	64.3
1973	94.4	63.1	61.6
1974	94.7	57.2	55.2
1975	98.3	48.7	47.7
1976	106.3	48.7	47.8
1977	135.1	58.1	56.8
1978	168.8	64.7	62.6
1979	200.6	73.2	69.9
1980	211.1	70.7	67.3
1981	221.0	67.2	63.9
1982	255.9	70.1	66.6
1983	325.5	79.0	76.5
1984	389.8	85.5	81.5
1985	442.9	81.9	77.9

- (1) Nominal rate with the same weights as in table A-2, column (1).  
(2) Real rate,  $E = [(1)^{.6} * (2)^{.4}] / (4)$  where numbers in parenthesis indicate columns in table A-2.  
(3) Real rate,  $ET = [((1) + (3))^{.6} * (2)^{.4}] / (4)$ , where numbers in parenthesis indicate columns in table A-2.

capital, both in Portugal and in its major trading partners, cannot safely be neglected because the measure of the user cost of capital varied substantially at home and abroad during the second episode period.

The data used in the construction of the index of unit labor costs in manufacturing in Portugal are reported in table A-4. Note that the series on nominal wages in manufacturing is very close to the average for the economy until 1974 but differs greatly thereafter. The series on industrial employment is obtained from linking several series reported by the Bank of Portugal and may not be too reliable. The steep increase of unit labor costs abroad relative to Portugal, apparent in table A-5, is consistent with the five phases discussed in the text.

From 1976 to 1981, <sup>tables A-4 and A-5</sup> the Bank of Portugal reported the index of the price of investment goods and a measure of the user cost of capital. Since it suffered from a severe error in computing capital gains on existing capital, we constructed a new index of the user cost of capital. To interpret its role in the construction of the index of unit costs, we provide the algebra here, from Macedo (1985).

Let  $P_t$  be the cost in period  $t$  of value-added in manufacturing,  $Q_t$ ,  $W_t$  the wage rate,  $L_t$  employment,  $K_t$  the capital stock and  $C_t$  the user cost of capital. Then:

$$(A-1) \quad P_t = W_t (L_t/Q_t) + C_t (K_t/Q_t) \\ = ULC_t A_t$$

where  $ULC_t$  = unit labor costs  
 $C_t = P_{kt} ((1+r)/(1+gt)) + (d-1)P_{kt}$   
 $P_{kt}$  = price of investment goods  
 $gt = (P_{kt} - P_{kt-1}) / P_{kt-1}$   
 $r$  = discount rate  
 $d$  = depreciation rate  
 and  $A_t = 1 + (C_t K_t / W_t L_t)$

For a CES production function, denoting exponential by \*\*, we have

$$(A-2) \quad A_t = 1 + ((a/(1+a)**s) ((C_t/W_t)**(1-s)))$$

where  $s$  is the elasticity of substitution  
 and  $a$  is the capital share in value-added.

Starring foreign variables, we get relative unit costs as:

$$(A-3) \quad e_t P^* / P_t = RULC_t R_t$$

where  $RULC_t = e_t (ULC^*) / ULC$   
 $e_t$  = the effective exchange rate  
 $R_t = A^*/A$  the relative adjustment factor.

When  $s = 1$ ,  $R$  is constant. When  $s = 0$ , as assumed in tables A-6 and A-7, the relative adjustment factor is simply one plus the ratio of factor prices in both countries:

$$(A-4) \quad R_t = (1 + (C^*t/W^*t)) / (1 + (C_t/W_t))$$

Tables A-6 and A-7

Table A - 4

## Unit Labor Costs in Manufacturing in Portugal (index 1966=100)

	Wages	Industrial Production	Employ- ment	Measured Producti- vity	Unit Labor Costs	Dollar ULC
	(1)	(2)	(3)	(4)	(5)	(6)
1953	60.5	37.8	69.9	54.1	111.8	108.0
1954	61.1	40.5	72.0	56.3	108.5	108.5
1955	62.6	45.9	78.6	58.4	107.2	107.2
1956	65.7	48.6	80.5	60.5	108.6	108.6
1957	66.6	51.4	81.6	63.0	105.7	105.7
1958	67.4	54.1	84.8	63.7	105.8	105.8
1959	70.1	59.5	89.2	66.6	105.3	105.3
1960	71.3	62.2	89.6	69.4	102.7	102.7
1961	74.4	70.3	93.4	75.2	98.9	98.9
1962	79.3	73.0	92.2	79.1	100.2	100.2
1963	83.5	81.1	96.9	83.7	99.8	99.8
1964	87.2	89.2	100.8	88.5	98.5	98.5
1965	92.1	94.6	98.8	95.8	96.1	96.1
1966	100.0	100.0	100.0	100.0	100.0	100.0
1967	108.5	105.4	97.7	107.9	100.6	100.6
1968	117.7	118.9	101.2	117.5	100.1	100.1
1969	131.1	129.7	87.4	148.4	88.3	88.3
1970	147.0	143.2	94.8	151.0	97.3	97.3
1971	162.2	155.4	95.9	162.1	100.1	101.6
1972	176.2	176.5	96.8	182.4	96.6	102.7
1973	200.6	197.6	97.7	202.4	99.1	115.5
1974	265.9	201.5	97.9	205.9	129.1	146.1
1975	315.2	191.9	97.1	197.7	159.5	179.4
1976	352.4	200.0	97.7	204.7	172.2	163.8
1977	395.1	224.3	98.5	227.8	173.5	130.3
1978	438.4	237.8	98.3	242.0	181.1	118.5
1979	503.7	256.8	98.7	260.1	193.6	113.8
1980	609.8	270.3	99.9	270.6	225.4	129.4
1981	741.5	270.3	99.5	271.7	272.9	127.5
1982	902.4	283.8	98.0	289.7	311.5	112.7
1983	1053.0	289.2	95.4	303.1	347.4	90.2
1984	1241.5	289.2	93.3	310.0	400.5	78.7
1985	NA	NA	NA	NA	471.5	NA

Sources: IFS, employment from Bank of Portugal.

Table A - 5

## Unit Labor Costs in Trading Partners (index 1966 = 100)

	France		Germany		U.K.	
	F	\$	M	\$	Pounds	\$
1953	76.0	107.2	64.5	61.5	75.0	75.0
1954	69.1	97.5	62.7	59.8	76.6	76.6
1955	69.8	98.4	62.4	59.4	77.4	77.4
1956	71.0	100.1	67.4	64.2	85.0	85.0
1957	74.6	101.8	70.1	66.8	87.9	87.9
1958	80.8	95.0	73.9	70.4	91.4	91.4
1959	82.7	82.7	71.0	67.6	84.0	84.0
1960	80.4	80.4	74.6	71.0	83.6	83.6
1961	85.6	85.6	79.7	79.1	87.0	87.0
1962	90.4	90.4	86.3	86.3	90.3	90.3
1963	94.9	94.9	88.7	88.7	89.2	89.2
1964	91.7	91.7	88.5	88.5	89.9	89.9
1965	100.1	100.1	94.5	94.5	94.4	94.4
1966	100.0	100.0	100.0	100.0	100.0	100.0
1967	105.1	105.1	99.6	99.6	100.4	99.2
1968	109.2	109.2	95.4	95.4	100.9	86.5
1969	110.6	105.1	95.6	97.0	105.6	90.5
1970	119.0	105.8	108.2	118.2	117.8	100.9
1971	125.2	111.5	116.4	133.3	131.4	114.2
1972	133.8	130.9	119.7	150.1	145.2	129.7
1973	142.8	158.3	126.8	189.8	157.2	137.7
1974	167.9	172.4	139.2	215.1	193.5	161.6
1975	215.7	248.5	150.5	244.1	256.7	203.7
1976	225.5	232.9	144.2	229.0	288.3	185.9
1977	251.6	252.8	149.8	258.0	300.2	187.1
1978	276.9	302.9	153.5	305.8	333.0	228.3
1979	301.1	349.4	154.7	337.6	374.2	283.5
1980	347.2	405.6	166.1	365.5	469.8	390.3
1981	395.6	359.4	175.0	309.8	528.9	383.0
1982	485.9	365.0	182.2	300.3	562.7	351.8
1983	531.3	344.2	180.2	282.3	585.3	317.1
1984	549.6	310.5	177.0	248.8	615.3	293.6
1985	564.7	310.2	176.6	240.3	652.2	303.5

Sources: IFS, Employment from Bank of Portugal.

Table A - 6

## User Cost of Capital in Portugal

	Long Term Interest Rate	Price of Investment Goods	Capital Gains	Depreciation	Real Interest Rate	User Cost of Capital	Adjustment Factor
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1966	5.5	100.0	1.9	7.6	11.1	11.1	100.0
1967	5.7	113.1	13.1	7.5	1.0	1.1	90.9
1968	6.0	114.9	1.7	7.8	12.1	13.9	100.6
1969	6.0	118.7	3.3	8.2	10.9	12.9	98.8
1970	6.5	122.0	2.8	8.5	12.1	14.7	99.0
1971	7.0	132.0	8.3	8.4	7.2	9.6	95.3
1972	7.0	147.8	11.9	8.1	3.8	5.5	92.8
1973	7.3	161.2	9.1	8.2	6.6	10.6	94.7
1974	8.6	200.4	24.3	8.1	-4.5	-9.1	86.9
1975	10.5	248.5	24.0	8.1	-2.8	-7.0	88.0
1976	11.0	294.8	18.6	8.1	1.7	4.9	91.2
1977	13.9	373.1	26.6	7.4	-2.6	-9.8	88.8
1978	19.3	461.6	23.7	7.4	3.8	17.7	93.6
1979	20.5	563.4	22.1	8.4	7.1	40.1	97.1
1980	20.5	687.7	22.1	9.0	7.7	53.1	97.8
1981	21.0	838.8	22.0	9.6	8.8	73.8	98.9
1982	23.5	1034.0	23.2	8.1	8.3	85.7	98.5
1983	28.5	1291.4	24.9	8.1	11.0	141.8	102.1
1984	31.0	1569.0	21.5	8.1	15.9	249.8	108.1
1985	29.0	NA	NA	NA	13.9	NA	105.8

Notes: Fall in real interest rate assumed to be the same as in nominal, implies capital gains of 21.2%, same rate assumed for wage growth

Sources: Bank of Portugal.

Table A - 7

## User Cost of Capital in Trading Partners

	France		Germany		U.K.		U.
	User Cost	Adjusted Factor	User Cost	Adjusted Factor	User Cost	Adjusted Factor	User Cost
1966	8.7	100.0	12.2	100.0	12.1	100.0	14.4
1967	12.7	102.9	14.0	101.3	13.6	100.9	16.9
1968	13.5	102.5	13.2	100.1	13.0	99.6	16.0
1969	3.1	94.2	10.6	97.2	14.0	99.6	16.6
1970	7.2	96.6	9.6	95.5	12.2	97.3	17.8
1971	13.5	99.7	10.5	95.4	10.2	95.3	18.1
1972	10.3	97.2	12.8	96.2	15.7	97.5	18.1
1973	-0.1	92.0	10.0	94.1	16.3	96.8	13.5
1974	-16.5	85.8	4.7	91.2	-3.4	87.9	8.7
1975	38.4	104.0	15.4	95.6	2.6	90.0	15.8
1976	14.6	95.9	14.7	94.9	16.5	93.7	26.5
1977	19.8	96.7	13.8	94.2	9.1	91.4	25.0
1978	22.8	96.7	16.3	94.8	33.8	96.4	26.0
1979	9.0	93.6	13.7	93.6	33.1	95.4	25.8
1980	26.5	96.1	13.0	93.1	27.4	93.5	29.2
1981	23.5	95.2	17.0	94.1	56.6	97.0	44.5
1982	35.3	95.9	16.8	93.8	52.0	95.6	54.3
1983	26.4	94.6	23.9	95.6	56.4	96.7	65.3
1984	14.8	93.4	19.7	94.3	66.7	96.4	64.8
1985	NA	NA	NA	NA	NA	NA	NA

Table A-8 gathers several indicators of competitiveness: the dollar rate, column (1), used to convert unit labor costs into the same currency, the effective exchange rate from table A-1 and A-3, the index of relative consumer prices, column (3), the index of relative unit labor costs, column (4), the relative adjustment factor, column (5), and the index of relative costs, column (6). This is the source for Table 1 in the text.

Table A-8

The pattern of the index of relative unit costs deserves some explanation. Except for 1977 and 1982, its changes are opposite to those of relative unit labor costs. Even in 1976, it rises while relative unit labor costs remain unchanged.

For the period 1978-81, it is appropriate to interpret the evolution of the variables making up the capital cost adjustment factor. They involve the ratio of one plus the capital to wage costs (this could in turn be divided into an effect relative to the U.S. and an effect of the other partners relative to the U.S.).

After a peak in 1967, the relative adjustment factor stays around the base value until 1973. It rises until 1977 and then falls to around 90 in 1984-85. This implies that the 1983 package may not have improved competitiveness in manufacturing despite the improvement in relative unit labor costs, as suggested in Branson (1985).

There is an asymmetry in the interpretation of increases and decreases in the index of relative unit costs. When the user cost of capital rises, it is clear that competitiveness decreases, but when it falls, it is not clear that competitiveness rises. Aside from quantity constraints in export markets, the role of credit rationing should be allowed for.

Private firms, especially export firms, are typically less favored by nationalized banks than state-owned enterprises, so that the low cost of capital in 1981-82 may have benefitted mostly the latter, which also encountered greater difficulty in borrowing abroad due to the Latin American debt crisis and the rising dollar.

This can be seen indirectly in the evolution of an alternative measure of export profitability which simply compares the price of exports in escudos to unit costs, as shown in table A-9, column (1).

Whereas this measure of the profitability of exports has the same movements as relative unit labor costs in the other periods, it falls by 4% in 1981-82, suggesting a deterioration in the profitability of exports which is hidden by the index of relative unit costs.

Notice the fall in the profitability of exports in 1976, the gentle decline from 1979 to 1980 and the sharp fall in 1981, mirroring what happened to relative unit labor costs. The deterioration of the terms of trade since the second oil shock is apparent from the higher value of the index computed with the unit value of imports, reported in table A-9, column (2).

Table A-9 here

TABLE A - 8  
Indicators of Competitiveness (1966=100)

	(1)	(2)	(3)	(4)	(5)	(6)
	Nominal Dollar Rate	Nominal Effect. Exch.R.	Relative Consumer Prices	Relative Unit Labor Costs	Relative Adjustmt Factor	Relative Unit Costs
1948	86.8	130.3	na	na	na	na
1949	90.1	103.3	na	na	na	na
1950	100.6	109.3	na	na	na	na
1951	100.6	109.3	na	na	na	na
1952	100.0	108.8	na	na	na	na
1953	100.0	108.8	110.0	73.3	na	na
1954	100.0	108.8	109.8	74.3	na	na
1955	100.0	108.8	111.4	74.7	na	na
1956	100.0	108.8	111.4	78.0	na	na
1957	100.0	107.8	107.0	82.9	na	na
1958	100.0	103.4	104.3	84.3	na	na
1959	100.0	98.8	100.0	78.3	na	na
1960	100.0	98.8	98.6	81.0	na	na
1961	100.0	99.8	100.6	89.1	na	na
1962	100.0	100.0	101.9	91.8	na	na
1963	100.0	100.0	102.6	93.5	na	na
1964	100.0	100.0	102.1	93.8	na	na
1965	100.0	100.0	101.7	101.0	na	na
1966	100.0	100.0	100.0	100.0	100.0	100.0
1967	100.0	99.7	96.3	101.5	111.9	113.5
1968	100.0	96.1	91.2	99.1	100.0	99.1
1969	100.0	95.1	87.7	114.1	98.6	112.6
1970	100.0	95.0	88.6	114.3	98.1	112.2
1971	98.5	95.1	87.6	119.3	102.2	122.0
1972	94.1	96.1	86.0	132.0	104.9	138.4
1973	85.8	94.4	82.1	134.1	99.7	133.6
1974	88.4	94.7	72.1	119.3	102.4	122.1
1975	88.9	98.3	70.1	122.1	109.4	133.6
1976	105.1	106.3	69.9	126.4	105.0	132.7
1977	133.1	135.1	76.2	170.1	108.1	184.0
1978	152.8	168.8	82.9	219.7	102.9	226.0
1979	170.2	200.6	87.7	262.4	97.5	255.8
1980	174.1	211.1	89.0	273.7	97.0	265.3
1981	214.1	221.0	85.8	260.6	97.5	254.2
1982	276.4	255.9	87.5	295.3	98.1	289.7
1983	385.3	325.5	93.7	346.7	95.5	331.0
1984	509.2	389.8	91.3	365.0	89.4	326.1
1985	592.7	442.9	90.6	361.4	91.3	330.0

Table A - 9

Indicators of Profitability  
Index 1966-100

	Unit Cost	profx	profm
1966	100.00	100.00	100.00
1967	91.45	112.62	110.91
1968	100.70	107.24	93.28
1969	87.24	127.35	105.83
1970	96.33	123.88	98.40
1971	95.40	128.84	101.65
1972	89.64	144.16	111.13
1973	93.85	150.55	120.39
1974	112.19	175.61	145.58
1975	140.36	141.90	127.43
1976	157.05	135.86	126.87
1977	154.07	187.59	167.10
1978	169.51	210.28	187.27
1979	187.99	242.68	228.31
1980	220.44	251.66	249.01
1981	269.90	232.48	246.68
1982	306.83	238.25	254.52
1983	354.70	263.09	284.28
1984	432.94	282.16	309.23
1985	498.85	284.93	312.17

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### References

Branson, W.H. (1985), "Portugal's Entry into the European Community: Challenges and Opportunities", draft, The World Bank.

Edwards, S. (1986), "Economic Liberalization and the Real Exchange Rate in Developing Countries", NBER Working Paper.

Macedo, J.B. (1982), Portfolio Diversification and Currency Inconvertibility: Three essays in International Monetary Economics. Lisbon: New University of Lisbon Press.

Macedo, J.B. (1985a), "Integracao Europeia: Fim do Principio ou Principio do Fim?", Economia.

Macedo, J.B. (1985b), "Políticas Anti-Inflacionistas no Processo de Ajustamento", in J. Silva Lopes (ed.), Crescimento e Ajustamento na Economia Mundial. Washington: FMI.

Macedo, J.B., C. Corado and M. Porto (1987), "The Timing and Sequencing of Trade Liberalization Policies: Portugal 1948-86", country manuscript, CPDIA, The World Bank.

ANNEX TABLE 1  
 TESTS ON STRUCTURAL CHANGE - F TESTS  
 Dependent variable: E

Periods	Against periods		
	Previous years	1953 - 1976	All other years
1970 - 1974	1.94	0.84	0.75
1975 - 1976	2.38	-	1.78
1977 - 1979	6.58**	-	2.33
1977 - 1980	5.64**	-	2.24
1981 - 1982	0.82	3.22	1.03
1983 - 1985	2.13	5.36*	-

Tests on slope, intercept and overall equation

Cut year	Intercept	Slope	Equation
1970	2.71	1.91	2.24
1974	1.91	3.85*	4.04*
1977	8.65**	0.92	3.48*

ANNEX TABLE 2  
 TESTS ON STRUCTURAL CHANGE - F TESTS  
 Dependent variable: ECPI

Periods	Against periods		
	Previous years	1953 - 1976	All other years
1970 - 1974	2.27	2.59	1.84
1975 - 1976	1.12	-	0.82
1977 - 1979	4.56*	-	2.54
1977 - 1980	3.64*	-	2.40
1981 - 1982	1.72	3.16	1.74
1983 - 1985	2.16	2.94	-

Tests on slope, intercept and overall equation

Cut year	Intercept	Slope	Equation
1970	1.64	0.03	0.38
1974	0.01	4.43*	3.33*
1977	5.64*	2.68	3.70*

ANNEX TABLE 3  
 TESTS ON STRUCTURAL CHANGE - F TESTS  
 Dependent variable: RULC

Periods	Against periods		
	Previous years	1953 - 1976	All other years
1970 - 1974	3.70*	4.29*	0.62
1975 - 1976	0.56	-	0.71
1977 - 1979	20.59**	-	4.67*
1977 - 1980	18.52**	-	3.08*
1981 - 1982	4.69*	14.70**	4.75*
1983 - 1985	4.55*	19.02**	-

Tests on slope, intercept and overall equation

Cut year	Intercept	Slope	Equation
1970	0.81	0.51	0.60
1974	0.59	6.86**	4.86**
1977	7.20*	3.06	4.82**

ANNEX TABLE 4  
 TESTS ON STRUCTURAL CHANGE - F TESTS  
 Dependent variable: RUC

Periods	Against periods		
	Previous years	1953 - 1976	All other years
1970 - 1974	n.a.	n.a.	0.683
1975 - 1976	n.a.	-	0.374
1977 - 1979	9.222*	-	2.904
1977 - 1980	7.390*	-	1.865
1981 - 1982	0.580	4.623	1.454
1983 - 1985	1.653	5.571*	-

Tests on slope, intercept and overall equation

Cut year	Intercept	Slope	Equation
1970	0.650	n.a.	n.a.
1974	0.195	n.a.	n.a.
1977	3.343	2.316	2.827