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STERLING AND THE EXTERNAL BALANCE

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Summary

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This paper analyzes the behavior of the current account and the exchange rate in the British economy during the 1970's, and discusses the outlook, as influenced by the availability of oil revenues, for exchange rate developments during the 1980's.

Both trade and exchange rate behavior are affected by, and in turn affect, general macroeconomic developments and policy problems. In the short term, the major macroeconomic problems of the British economy are its high rates of inflation and unemployment. Over the long term, the underlying problem for the British economy is its slow productivity growth relative to the major OECD economies (except that of the United States).

Two major themes permeate this paper. First, the accepted laws of economics continue to work in the United Kingdom; for example, low domestic demand and increased British competitiveness improve the balance of payments and slow the fall of the exchange rate. Second, Britain's achievement of macroeconomic goals depends upon the behavior of both nominal and real wages. The inflation rate will remain low only if the rate of change of nominal wages does; full employment with stable prices and current account balance will be achieved only if real wage growth is restrained or productivity growth increases.

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STERLING AND THE EXTERNAL BALANCE.*

This paper analyzes the behavior of the current account and the exchange rate in the British economy during the 1970's, and discusses the outlook, as influenced by the availability of oil revenues, for exchange rate developments during the 1980's.

Trade and exchange rate behavior are affected by and in turn affect general macroeconomic developments and policy problems. In the short term, the major macroeconomic problems of the British economy are its high rates of inflation and unemployment. These can be traced to the combination of domestic expansionary monetary and fiscal policy in 1972-3 and the concurrent worldwide boom, which fueled the inflation of 1974 and 1975. The subsequent reduction of the inflation rate has been accompanied by an increase in the unemployment rate and, especially in 1976/77, a decline in the real wage. It is quite likely that attempts to restore the real wage during the next few years will lead to a resurgence of high inflation.

Over the long term, the underlying problem for the British economy remains its slow productivity growth relative to the major OECD economies (except that of the United States). The question of the causes of low productivity growth is beyond the scope of this paper but, at least to non-specialist observers, the state of labor relations appears to be both symptomatic of the problem and the major barrier to improving performance.

Against this macroeconomic background, sterling has depreciated in both nominal and real terms in the 1970's, while the current account was in substantial deficit from 1973 to 1976. Movements in the current account can be attributed to relative income growth, changes in UK competitiveness, and the impact of North Sea oil. Exchange rate movements have been far from regular but can, over long periods, be attributed to differential inflation rates and productivity movements. North Sea oil exploitation may be thought

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* A paper prepared for the Brookings-NIESR Conference on the U.K. Economy, May 1979.

of in this context as a productivity increase.

Part I of the paper reviews the macroeconomic developments of the 1970's, as essential background for understanding the behavior of the current account and the exchange rate. Part II then discusses the current account, emphasizing the role of manufactures and semi-manufactures in UK trade. The behavior of indices of competitiveness, and the role of relative income growth, are reviewed. Part II concludes with an examination of the relationship between the current account and public sector deficits.

Part III studies the behavior of the exchange rate. The role of capital flows and the determinants of government intervention are examined, as is the effect of depreciation of the exchange rate on domestic inflation. Part IV of the paper presents concluding remarks, including a discussion of alternative exchange rate policies for exploiting the availability of North Sea oil.

Two major themes underlie the detailed examination of trade-related issues contained in the paper. First, the laws of economics continue to work in the United Kingdom: low domestic demand and improved British competitiveness improve the balance of payments, improvements in British competitiveness cause the exchange rate to fall less rapidly, and so on. And second, the achievement of Britain's macroeconomic goals depends on the behavior of both nominal and real wages. The inflation rate will not remain low unless the rate of change of nominal wages does; full employment with stable prices and current account balance will not be achieved unless real wage growth is restrained or productivity growth increases.

I. An Overview of Macro Developments.

In this part we present a review of macroeconomic developments and policy issues in the 1970's. These developments are essential for understanding the behavior of the exchange rate and the external balance. But they are also of independent interest: in this decade the UK has experienced its highest inflation and unemployment rates of the post-World War II period, and has been IMFed. Although the economic performance of all the major OECD countries has been worse in the seventies than it was in the sixties, these have been especially bad years for Britain.

1. Inflation, Unemployment and the Output Gap.

Chart 1 shows the combinations of inflation (of the retail price index) and of unemployment for the years 1970-78. The data are shown for the UK and for the group of eight major OECD countries.[1] As can be seen from the Chart the UK and the OECD countries start from quite similar initial conditions in 1970, but soon experience vastly different macroeconomic performance

By 1971 and 1972 the UK was already experiencing inflation and unemployment rates above those of the other OECD countries. Britain appeared to weather the commodity and oil-price increases relatively well in 1973 and 1974, with British unemployment remaining low. But in 1975 the UK unemployment rate rose substantially as the inflation rate reached 24%, compared with under 10% in the other OECD countries; by 1976 the UK had a higher unemployment rate and a substantially higher inflation rate than the other OECD countries.

Only in 1978 does the British inflation rate fall below 10%, but the unemployment rate is still close to its postwar high. The key features of

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[1] The eight countries are the US, Japan, Germany, France, UK, Italy, Canada, and Sweden. Data are from the OECD Main Economic Indicators, and Economic Outlook.

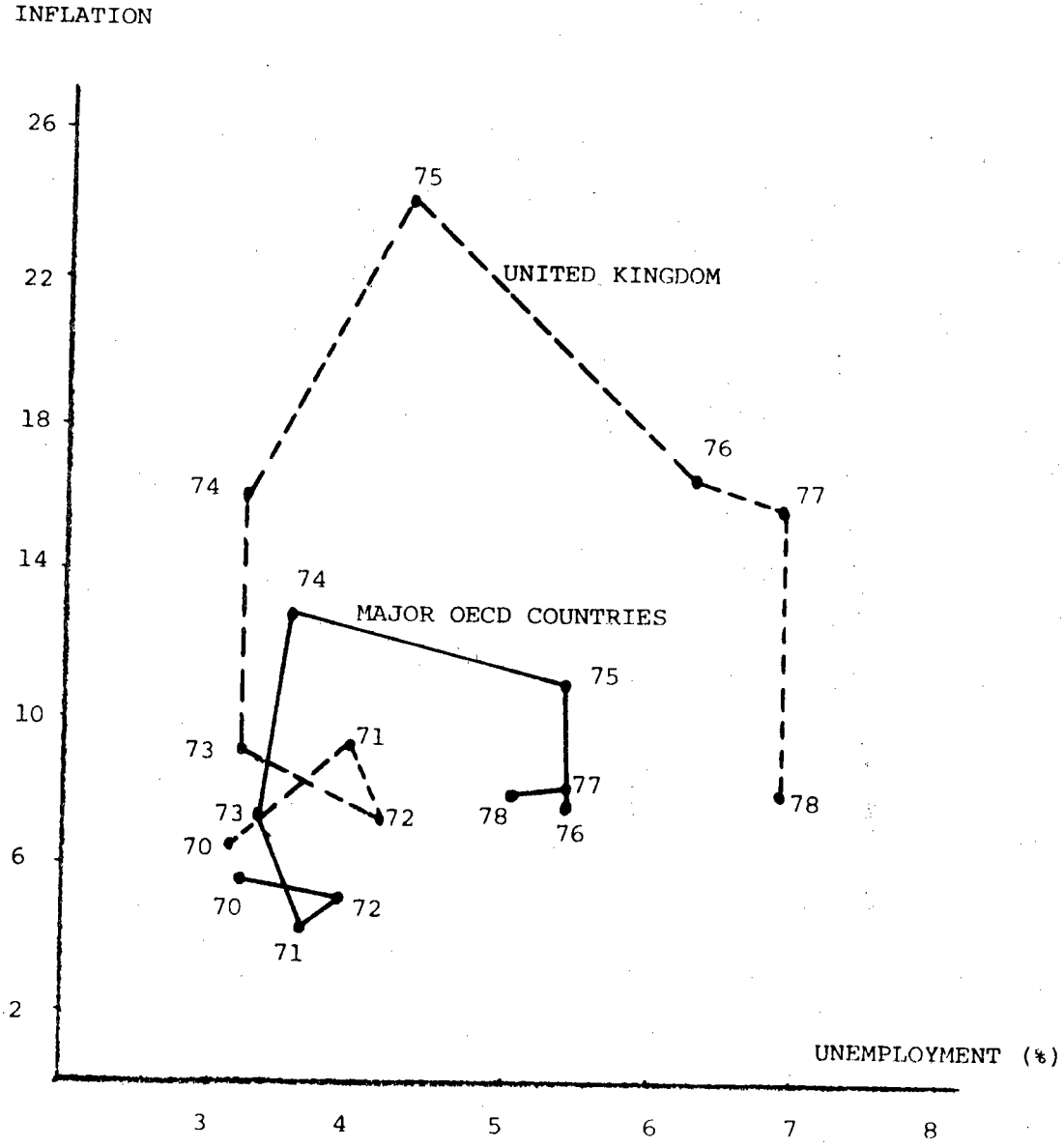

CHART 1 INFLATION AND UNEMPLOYMENT

Note: Inflation rates calculated on a CPI basis,unemployment rates on the US definition. Major OECD countries are the US,Canada,Japan, Germany,Italy,France,UK and Sweden.Weights in the inflation index are 1970 shares in consumption,for unemployment shares are those in the 1970 labor force.

British macroeconomic performance in the 1970's, then, are an inflation rate that on average is much higher than that of other OECD countries, and a long period of high unemployment, which continues even in 1978.

Table 1 presents measures of the output gap, together with the unemployment and inflation rates. Column a shows the output gap derived by assuming that 1973 represents a year of full employment and that trend growth of potential output is 2.5% for the seventies. Column b shows estimates of the output gap, in manufacturing only, derived from production function estimates that take into account measures of actual factor accumulation. The estimates coincide in pointing to the early 70's as a period of economic slack; 1972/74 is a period of high resource utilization; and thereafter economic activity declines through 1977.

TABLE 1 - INFLATION, UNEMPLOYMENT AND OUTPUT GAP IN THE UK
(Percent)

	Inflation	Unemployment	Output Gap		GDP Growth
			(a)	(b)	
1970	6.3	2.6	2.8	3.5	1.8
1971	9.4	3.4	3.7	6.5	1.7
1972	7.3	3.7	1.1	6.4	2.3
1973	9.1	2.6	0	0.4	6.5
1974	16.0	2.6	3.4	1.8	-1.5
1975	24.2	3.9	7.7	11.2	-1.6
1976	16.6	5.3	8.8	12.9	2.3
1977	15.8	5.8	9.6	14.8	1.0

Notes: (a) Using a 2.5% growth rate of potential output and a zero gap for 1973.
(b) Output gap in manufacturing from Artus and Turner (1978) Inflation rate measured by consumer price index. GDP growth is derived from the "average" estimate of GDP at 1970 factor cost, Economic Trends, Sept. 1978, p. 6.

The growth rate of GDP shown in the last column of Table 1, tells much the same story as the measures of economic slack. Against an

estimated growth rate of potential output of about 2.5 percent, we note growth rates for 1970-72 that fall short of the trend rate. Growth in 1973 exceeds that of potential output, and the gap is accordingly eliminated. However, growth is negative in 1974 and 1975 and even in 1976-77 remains below potential, thus building up a sizeable output gap.

Recovery is under way in 1978, but the unemployment rate and the output gap remain very high. Output would have to grow at a rate of nearly five percent for four years to restore the economy to full employment.[1] The record of the last ten years suggests that such growth is most unlikely. An obviously important current policy issue concerns methods for dealing with present levels of unemployment.

2. The Current Account and the Exchange Rate.

Table 3 presents the current account surplus of the UK as a percentage of GDP, and, for comparison, the US current account as a percentage of GNP. The dollar and effective exchange rates for the UK are also presented: the effective exchange rate is a multilateral trade-weighted average exchange rate against foreign currencies. The massive current account deficits of 1974 and 1975 and the rapid depreciation of sterling require explanation, which is deferred to Sections II and III of the paper. The substantial improvement of the current account from 1977 to 1978 is likewise worthy of note.

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[1] Of course, if the natural unemployment rate now exceeds 2.5%, growth would have to be less for full employment to be restored. While U.S. studies have shown an increase in the natural rate of unemployment in the seventies, we are unaware of such studies for the U.K.

TABLE 2 - THE CURRENT ACCOUNT AND THE EXCHANGE RATE

	Current Account Surplus as % of Income		Sterling Exchange Rate	
	UK	US	$ Exchange Rate May 1970 = 100	Effective Rate May 1970 = 100
1970	1.7	0.2	99.8	99.8
1971	2.2	-0.1	101.8	100.0
1972	0.2	-0.5	104.2	96.7
1973	-1.6	0.5	102.2	87.5
1974	-4.9	0.1	97.5	84.8
1975	-2.0	1.2	92.6	78.3
1976	-1.0	0.3	75.3	66.3
1977	0.2	-0.8	72.7	63.0
1978	n.a.	n.a.	n.a.	n.a.

Sources: Main Economic Indicators, Economic Trends, International Financial Statistics.

3. Fiscal, Monetary, and Incomes Policy.

Fiscal and monetary policy related variables for the seventies are presented in Table 3. The most striking feature of the table is the very large public sector deficit (PSBR) particularly for the 1973/76 period. The change in the deficit from 1976 to 1977 is associated with the IMF loan of December 1976, the terms of which we discuss below. The public sector deficit or borrowing requirement includes borrowing to finance investment by public corporations, and is thus not directly comparable with the deficit of the government sector in the US national income accounts.

The share of current (non-investment) government spending on goods and services hovers around 21% of GDP to 1973 and rises thereafter; total government expenditure is of course a much larger share of GDP, and one that increases over the period. Table 3 presents two OECD calculated measures of fiscal impulse.[1] Positive numbers indicate an expansionary effect. In 1970 fiscal policy was tight, but it loosened up progressively from that year through 1974. Only in 1975 and 1976 does fiscal policy turn mildly contractionary. The fiscal impulse measures thus confirm the impression given by the PSBR/GDP measure, that fiscal policy was expansionary through at least 1974, from 1971 on. Note also that the largest fiscal impulse came in 1972, a year of worldwide expansion.

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[1] The basic impact attempts to measure the first round (i.e. without multiplier effects) of changes in government tax take and spending on GNP. The "discretionary" measure calculates the first round impact of changes in government spending and changes in tax rates, interpreting inflation-induced changes in tax brackets as policy changes. Note that the fiscal impact variables attempt to measure the effects of changes in fiscal policy; they are thus akin to changes in the full employment budget deficit, rather than the level of the deficit.

TABLE 4 - FISCAL AND MONETARY POLICY VARIABLES

	(b) PSBR / GDP	(c) "Fiscal Impulse" as % of GDP		(d) General Government Consumption / GDP	(e) Government Investment / GDP	(f) General Government Expenditure / GDP	(g) Growth Rate of M_3	(h) Short Interest Rate	(j) Long Interest Rate
		Basic Impact	"Discre-tionary"						
1970		-2.2	0.3	20.6	9.4	45.2	6.1	7.3	9.2
1971	2.8	1.2	1.3	20.7	9.0	44.1	12.6	4.6	8.8
1972	3.7	2.9	2.5	21.2	8.2	45.0	23.9	8.8	8.8
1973	6.6	1.3	1.7	20.8	9.0	45.2	26.9	16.1	10.7
1974	8.6	0.6	1.1	22.5	9.8	50.0	18.9	13.3	14.7
1975	11.4	-0.4	-.04	24.8	9.7	51.5	9.6	11.3	14.6
1976	8.4	0.1	-1.0	24.3	9.2	51.0	10.4	14.9	14.4
1977	4.8	-0.7		23.6	7.7	50.0	8.9	6.8	12.7

Sources: Economic Trends, October 1978, (ET)
Economic Trends Annual Supplement, 1976 (ETAS)
Monthly Digest of Statistics, September 1978 (MD)
Financial Statistics, July 1978 (FS)
Bank of England Quarterly Bulletin (QB)

(a) GDP: ET, p. 6, column 1.

(b) Public Sector Borrowing Requirement (PSBR): ET, p. 52, sum of columns 1 and 2, for 1972-77; ETAS p. 112, column 2 for 1970 and 1971.

(c) "Fiscal Impulse" from OECD Economic Outlook, Occasional Studies, Budget Indicators, Paris, July 1978.

(d) General Government Consumption: MD, p. 4, column 5, for 1972-77; ET, p. 14, upper table, column 1 x column 3 ÷ 100, for 1970 and 1971.

(e) Government Investment: ET, p. 14, upper table, column 1 x (columns 4 + 5) ÷ 100.

(f) General Government Expenditure: FS, p. 13, column 8 plus p. 14, column 4.

(g) ET

(h) Local authority deposits, 3 month rate (QB)

(j) Redemption yield on 20 yr. government bonds (QB)

On the monetary policy side, we look at the growth rate of M3 as the basic policy measure.[1] As Chart 2 shows, the behavior of domestic credit is very similar to that of M3, thus demonstrating that other sources, specifically the balance of payments, account for only a small portion of money creation. The policy picture is similar to that for fiscal policy; through 1971 M3 is growing at less than 10% per annum; the growth rate then averages above 20% for 1972 through 1974; and then from 1975 the growth rate of M3 is kept below the Bank of England internal target level of 10%. Part of the increase in the growth rate of M3 has been attributed to the adoption of the "Competition and Credit Control" monetary policy in 1971[2], which removed quantitative restrictions on bank credit, permitting banks to compete vigorously for funds. While interest rates rose in the face of accelerating inflation, they by no means kept pace; ex post real interest rates were negative from 1974 through 1977. The ex post short term real rate rises substantially from 1975 to 1976.

Chart 2 shows that the growth rate of money and the rate of inflation have no simple relationship to each other during this period. The acceleration of money and credit growth starts in 1972, and deceleration begins in 1974. The period of very high inflation (and also the largest budget deficits) starts only in 1974. The lag between money and inflation is thus substantial.

Some form of incomes policy has been in effect in Britain for most of the last twenty years. Table 4 gives details of the incomes policies pursued since 1970.[3] The indexation cum threshold agreements have received

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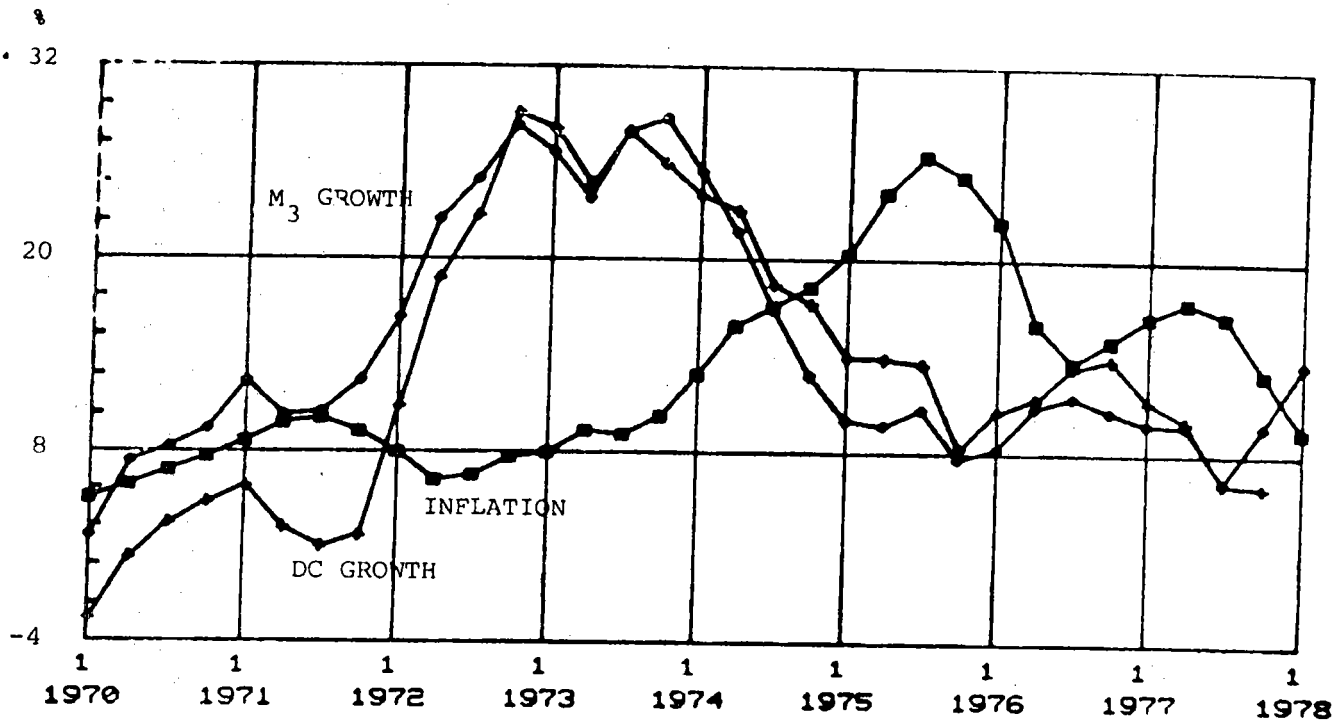
[1] M3 is perhaps best described for Americans as being basically American M4, but also includes holdings by UK residents of non-sterling deposits. "Sterling M3" excludes the latter deposits. One serious problem in interpreting UK monetary policy is the divergent behavior of M_1 and M_3 in the important years 1972 and 1973.

[2] See "Competition and Credit Control", Bank of England Quarterly Bulletin, May 1971, 189-93.

[3] The National Institute Economic Review for August 1978 contains three articles on incomes policy. Table 4 is adapted from a table in Henry and Ormerod, in turn adapted from a table in Tarling and Wilkinson.



Source: Economic Trends

CHART 2 MONEY GROWTH, INFLATION AND CREDIT CREATION

TABLE 4 - INCOMES POLICY AND EARNINGS INCREASES

Policy period	Pay restrictions	Implementation	Exceptions	Rate of Increase of Average Earnings	Year
1969-70	2 1/2 - 4 1/2%	Voluntary but with powers of delay	No ceiling on productivity bargaining; wage differentials and low paid workers	12.8	1970
1971-72	(n-1) policy	Voluntary, Government example-public sector	None	11.1	1971
1972-73	Freeze	Compulsory	None	12.9	1972
1973	£ 1 + 4% (12 months rule)	Compulsory	Settlements deferred by freeze	12.9	1973
1973-74	7% or £ 2.25 + threshold payments	Compulsory	1% margin to deal with pay structures. 'Genuine' productivity schemes. Premiums for 'unsocial' hours	17.2	1974
Social Contract 1974-75	Compensation for price changes between main settlements	Volumtary	Low pay Elimination of discrimination, particularly against women.	26.1	1975
1975-76	£ 6 maximum (12 month rule)	Voluntary	Equal pay	16.5	1976
1976-77	5% with min.= £ 2.40 max.= £ 4.00	Voluntary	None	10.2	1977
				15.5	1978*

Note: The rate for 1978 represents the growth rate of earnings for 77 III - 78 III.

Sources: Henry and Ormerod, op cit; and Economic Trends.

blame for a substantial part (10%) of the 1974 wage explosion (Posner, 1978, p. 6). The 1976 and 1977 decelerations of wage inflation were accompanied by high levels of unemployment; it is thus difficult to disentangle the effects of unemployment and the social contract on wages. Nonetheless, there is a prima facie case that the deceleration of wage increases in 1977 was related to the social contract.

Of special interest in the discussion of policy during the seventies is the package of measures adopted in December 1976 as part of the conditions for obtaining the IMF loan to support sterling. An absorbing account of the maneuvering during the negotiations for both the June 1976 $5 billion stand-by credits (the bait) and the December $3.9 billion IMF loan is presented in Fay and Young (1978). The need for the loans arose from the behavior of the exchange rate, to be discussed below. But the proximate causes of the behavior of the exchange rate were the high rates of inflation and wage increase, together with the very large public sector deficit. Although monetary policy had already become relatively restrictive before the end of 1976, and fiscal policy had begun to turn restrictive, there seemed little prospect of a quick reduction in inflation without stronger fiscal measures. The conditions of the IMF loan included increases in taxes and cuts in spending designed to get the public sector borrowing requirement below 5 1/4% by 1978--a target that has been met.[1] The end of 1976 marks the turning point for both the exchange rate and the inflation rate; however (perhaps temporary) success on those fronts has been bought at the expense of continued unemployment.

4. Summary.

We summarize briefly: the economic history of the 1970's can so far be divided into four phases. The first is the phase of slow growth, increasing inflation and policy restraint from 1969 to 1971. That period is one in which the budget actually showed a surplus (1971) and the unemployment rate was relatively low. Policy restraint reduced real growth below the rate of

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[1] The OECD Economic Survey for the United Kingdom, March 1977, pp. 57-8 contains a summary of the IMF loan conditions.

increase in potential output and unemployment accordingly rose.

The next period is that of rapid monetary and fiscal expansion in 1972/73. Real growth rates rose substantially and, during the world boom year of 1973, reached an extraordinary six percent. The budget deficit as a ratio of GDP increased to the four to five percent range. Inflation remained high under the impact of the expansion and accelerated in 1973. Unemployment declined to a level near full employment.

The 1974-76 period saw the dislocation of the economy under the impact of the external supply shock, the decline in world demand and the explosion of domestic inflation. Unemployment increased sharply, to more than twice the normal level. Inflation soared to nearly 25 percent in 1975. Real growth was negative and the economic slack and measures of fiscal expansion widened the PSBR to more than ten percent of GDP. Thus 1974-76 are extraordinary years by the standards of the postwar period.

The utter dislocation of the economy, including the serious external problems of a large deficit, low and falling reserves, and a sharply depreciating exchange rate, moved the authorities to accept the need for monetary and fiscal stabilization despite the high rate of unemployment. Starting in 1976 the budget deficit was reduced sharply and monetary growth was kept low. Along with growing unemployment the rate of inflation fell dramatically to below ten percent in 1978. On the external front the stabilization led not only to a current account surplus but also to an appreciating currency.

II. The Current Account.

In this part we discuss the development of the current account of the balance of payments. Our aim is to explain fluctuations in the external balance, and to discern any trends and their implications. Section 1 presents an overview of the facts, examining the behavior of the components of the current account, the increasing importance of international trade, changing

The last two serve as indicators of speculative pressure on sterling and on the dollar. The former leads sterling to depreciate in terms of the effective rate, the latter leads to a depreciation of sterling that is proportionately less than the change in the dollar-mark rate. A gain in reserves leads to an appreciation as does a gain in competitiveness.

4. Intervention:

Our intervention equation is estimated on quarterly data for the period 1969:4 to 1978:2. It uses as dependent variable the change in net reserves; that is the change in reserves less official borrowing:

(4) $$RN = \underset{(-.2)}{-119.3} \quad \underset{(-1.6)}{-93.0DP} \quad \underset{(-1.4)}{-34.0\ AP} \quad + \underset{(-2.3)}{.24\ RN_{-1}}$$

$$R^2 = .29 \qquad DW = 2.03 \qquad Rho_1 = .6 \qquad F(3/31) = 4.18$$

where

RN	net reserves
DP	the change in the effective exchange rate, when that change is positive (i.e. sterling depreciates). zero otherwise
AP	the change in the exchange rate when sterling appreciates.

The equation, while not spectacularly successful, shows a tendency for intervention in defence of a depreciating exchange rate and a significant effect of an appreciating exchange rate on the extent of intervention. The authorities appear to intervene more strongly to prevent depreciation than appreciation, although the difference between the coefficients on the increasing and depreciating exchange rate is not statistically significant. The magnitude of the lagged stock of net reserves exerts a statistically significant influence

TABLE 5 - THE CURRENT ACCOUNT
(£ Million)

	Visible balance	Services		Balance of goods and services	Interest, profits and dividends		Transfers		Invisible balance	Current Balance
		General government	Private sector and public corporations		General government	Private sector and public corporations	General government	Private		
1913	-134								+340	206
1927-29	-373								+480	107
1937-39	-388								+355	-33
1952-60	-168								+273	105
1961-66	-220								+166	-54
1967	-567								+273	-294
1968	-682								+396	-286
1969	-172								+635	463
1970	-42	-309	+720	+369	-269	+825	-177	-17	+773	+731
1971	+261	-315	+850	+796	-204	+709	-205	-6	+829	+1,090
1972	-722	-351	+937	-136	-142	+676	-210	-53	+857	+135
1973	-2,383	-409	+1,031	-1,761	-199	+1,419	-359	-99	+1,384	-999
1974	-5,235	-538	+1,341	-4,432	-352	+1,634	-320	-121	+1,644	-3,591
1975	-3,236	-620	+1,771	-2,085	-514	+1,277	-379	-154	+1,381	-1,855
1976	-3,589	-757	+2,739	-1,607	-648	+1,963	-792	-53	+2,452	-1,137
1977	-1,709	-788	+3,589	+1,092	-685	+1,123	-1,127	-114	+1,998	+289
1978	-	-	-	-	-	-	-	-	-	-

Sources: 1913-66: pp. 149 and 151 of Caves, et al., Britain's Economic Prospects, Brookings Institution 1968 (Chap. 4 by Richard Cooper, "The Balance of Payments"). Data for periods longer than a year, e.g. 1927-29, are averages at an annual rate.

1967-77: Economic Trends, Sept. 1978.

Table 6 places the balance on goods and services in perspective by reporting it as a share of GDP; comparative data for the US and several other countries are also reported. Table 6 further includes the ratio of exports

TABLE 6 - CURRENT ACCOUNT PATTERNS

	as a Share of Income						UK Visible Exports as a share of GDP
	UK	US	GERMANY	ITALY	FRANCE	JAPAN	
1970	1.7	.2	.5	1.2	.3	1.0	18.7
1971	2.2	-.1	.4	1.9	.4	2.3	18.4
1972	.2	-.5	.3	1.9	.2	2.2	19.2
1973	-1.6	.5	1.2	-1.8	-.5	-.0	18.9
1974	-4.9	.1	2.6	-5.1	-4.2	-1.0	22.4
1975	-2.0	1.2	.9	-.3	-.0	-.1	21.0
1976	-1.0	.3	.9	-1.6	-1.7	.6	23.2
1977	.2	-.8	.7	1.2	n.a.	1.3	26.1
1978	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Source: OECD Main Economic Indicators and Economic Outlook, Economic Trends and International Financial Statistics.

to GDP, which has grown rapidly since 1970, particularly after 1973. The table reveals that the deficit/surplus experience has been quite uneven between major industrialized countries in this period, especially in 1974. The data in Table 6 also show, at least superficially, no evidence of a trend deterioration in the UK external balance.

The seventies have seen significant changes in the pattern of British trade. In geographical terms, UK exports to the EEC and OPEC have increased substantially between 1970 and 1977, as can be seen in Table 7; the

TABLE 7 - THE UK REGIONAL TRADE PATTERN
(% of Total)

	EEC	Rest of W. Europe	N.America	Other D.C.	OPEC	Rest
UK EXPORTS:						
1970	30.0	17.1	15.0	12.0	5.8	21.1
1974	33.7	16.7	13.7	10.4	7.4	9.3
1977	36.9	15.1	11.7	6.5	13.4	16.3
UK IMPORTS:						
1970	28.2	14.9	20.9	10.1	7.2	18.5
1974	35.0	14.3	13.6	7.5	15.8	13.8
1977	40.2	13.6	13.3	7.3	10.1	15.4

Source: Trade and Industry, September 1978.

corresponding reductions are in exports to North America and other developed countries, and to a considerable extent also to developing countries. There has been a very large increase in the proportion of imports from the EEC, and a large decline in the proportion of imports from North America. Note that the share of EEC in imports has risen more than its share in exports.

The composition of UK external trade shows a heavy concentration in manufactures on the export side. Semi and finished manufactures constitute between eighty and eighty five percent of exports. On the import side Britain is a substantial importer of food, fuels and raw materials. Industrial materials (excluding fuels) and finished manufactures account for sixty five percent of imports.[1]

British exports of manufactures have long constituted a declining proportion of total world trade in manufactures[2], and the seventies are no exception to that trend. Table 8 presents volume indices for the manufacturing exports of industrialized countries and the UK, as well as the UK's value share in manufactures' trade. The table shows that UK export growth has fallen short of the 8.5% growth of exports by the industrialized countries as a group in the 1960-77 period. UK exports over the period, by comparison, grew by less than five percent. The relative price of UK exports, as measured by the ratio of UK to industrialized countries' export unit values in a common currency, showed a decline from 1970 to 1976 but has since, with the combination of appreciation and high inflation, increased.

Changes in the share of UK exports in industrialized countries' exports reflect changes in both the volume of trade flows and relative prices. Thus the gain in 1977 may well be interpreted as the consequence of the slow adjustment

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[1] For a more detailed account of the commodity composition of trade see Trade and Industry, November 24, 1978.

[2] See the analysis by Laurence Krause in Caves et al., (1968) Chapter 5.

TABLE 8 - WORLD AND UK EXPORTS OF MANUFACTURES

	Volume		Relative Unit Value[a]	UK Value Share
	Industralized Countries	UK		
1960	41	65	97.6	15.0
1965	60	76	103.3	12.6
1970	100	100	100.0	9.7
1974	148	128	94.4	7.9
1975	141	126	97.3	8.4
1976	157	133	96.2	7.9
1977	164	142	101.0	8.5

Source: UN Monthly Bulletin of Statistics Sept. 1978.

(a) Unit value of UK manufactured exports relative to unit value of manufactured exports of other industrialized countries.

to a decline in the relative price over the preceding years, leading to a relative increase in volume and at the same time an increase in the relative price. These minor fluctuations apart, there is little doubt that since the early 1960's--and of course earlier--Britain has suffered a major decline in her world trade position. We will discuss the causes of this decline in Section III below.

Table 9 casts an interesting light on the growth of trade. It shows, for a number of important sectors, the ratio of imports to home demand and the ratio of exports to manufacturers' sales. While there are some problems of interpretation, arising mainly from re-exports, the data reveal a striking increase in the share of trade on both the import and export sides.[1] This development is not, of course, peculiar to Britain; it reflects the growing importance of intra-industry trade that becomes more pronounced as product differentiation increases, and accounts for the increase of the ratio of trade

[1] Table 9 helps explain the evolution of the ratio of exports to GDP in the last column of Table 6.

TABLE 9 - HOME AND EXPORT PERFORMANCE OF UK MANUFACTURES

	Vehicles		Engineering Products				Chemicals & Allied Products	
			Mechanical		Electrical			
1968	14	34	20	32	14	20	18	24
1970	12	33	20	34	17	21	18	25
1972	19	34	23	38	21	23	19	27
1974	25	41	29	40	29	29	27	34
1976	31	44	30	46	32	37	26	34
1977	36	45	30	45	35	40	27	37

Note: Under each heading the two columns represent respectively ratios of imports to home demand and exports to manufacturer's sales.

Source: Economic Trends, August 1977 and Trade and Industry, Aug. 18, 1978.

in manufactures to income.

Finally, in our review of the facts relating to the current account, we examine trade in oil, and domestic oil production. The immediate effects of the oil price increase of late 1973 are quite visible in Table 10. Indeed, there is a coincidental similarity between the deficits on oil account in 1973 and 1974 and the overall current accounts for those years seen in Table 5. With the near quadrupling of oil prices from 1973 to 1974, the deficit on oil account also quadruples; the recession of 1974 and 1975 combined with substantial inventory decumulation reduced the value of oil imports in 1975, but only in 1977 is there substantial North Sea oil production, producing a large (nearly one billion pounds sterling) reduction in the current account deficit.[1] Note that investment activities associated with North Sea oil contributed to a current account deficit in the years before 1977; at the same time, however, they also led to a capital inflow that more than balanced

[1] The estimate is from "The Contribution of the UK Continental Shelf Oil and Gas Programme to the Balance of Payments", UK Balance of Payments, 1976-77, Central Statistical Office, 1978, pp. 64-66.

the contribution of North Sea oil to the current account deficit.[1]

TABLE 10 - TRADE IN OIL
(£ Million)

	Exports	Imports	Balance	Balance as % of Imports of Goods	Average value £/tonne	Value of Sales of North Sea Oil & Gas	"Deficit Contribution to Current Account"
1972	222	882	-660	6.5	6.4		
1973	344	1292	-948	6.5	8.3	134	-36
1974	711	4136	-3425	15.7	30.2	168	-194
1975	731	3842	-3111	13.7	35.3	248	-616
1976	1172	5145	-3973	13.7	47.0	903	-323
1977	1965	4769	-2804	8.3	53.7	2543	+958
1978							

Sources: Trade and Industry, Sept. 8, 1978; OECD Economic Survey, United Kingdom, 1978; UK Balance of Payments 1976-77, p. 66.

The major facts outlined in this section are (i) The visible balance has, as historically usual, been in deficit in the seventies, while there has been a surplus on invisible account. (ii) The government has run a deficit in the invisible account that has been more than offset by a private sector surplus. (iii) The current account was in surplus at the beginning of this decade, went into large deficit from 1973 to 1976, and has been improving since 1974. (iv) The geographical composition of British trade has moved towards the EEC and OPEC and away from North America and the sterling area. (v) The commodity composition of British exports has changed little at the aggregate level; fuel imports have transitorily risen and manufactures have remained the chief export. (vi) The British share of manufactured exports in world trade has continued to fall in this, as in earlier, periods,

[1] Ibid.

even though exports now constitute a larger share of GDP than they did in 1970. (vii) And finally, the oil price increase raised the value of British oil imports from 1973 to 1974 by about 4% of 1973 GDP; only in 1977 did North Sea oil production begin to contribute significantly to improving the current account.

In brief, the mixture contains much that is old, and some new features--oil, and membership in the EEC.

2. Competitiveness.

The competitiveness of British exports and domestic production play a role in explaining the behavior of the current account. Table 11 reports a variety of measures of competitiveness for the UK.[1] All are exchange rate adjusted indices of relative (to the rest of the world) price or cost.[2]

Columns 1 and 2 are measures of relative wholesale and consumer prices respectively; column 3 is a relative average value for manufactured exports; and column 4 measures relative unit current costs. All the measures show that the UK has become more competitive since 1970, though the extent of the improvement differs among the indices.

Chart 3 shows the price of traded goods relative to domestic goods. It presents the unit values of manufactures, exports and imports, relative to the domestic wholesale price of manufactured goods. There has clearly been a substantial increase in the prices of traded goods, relative to domestic

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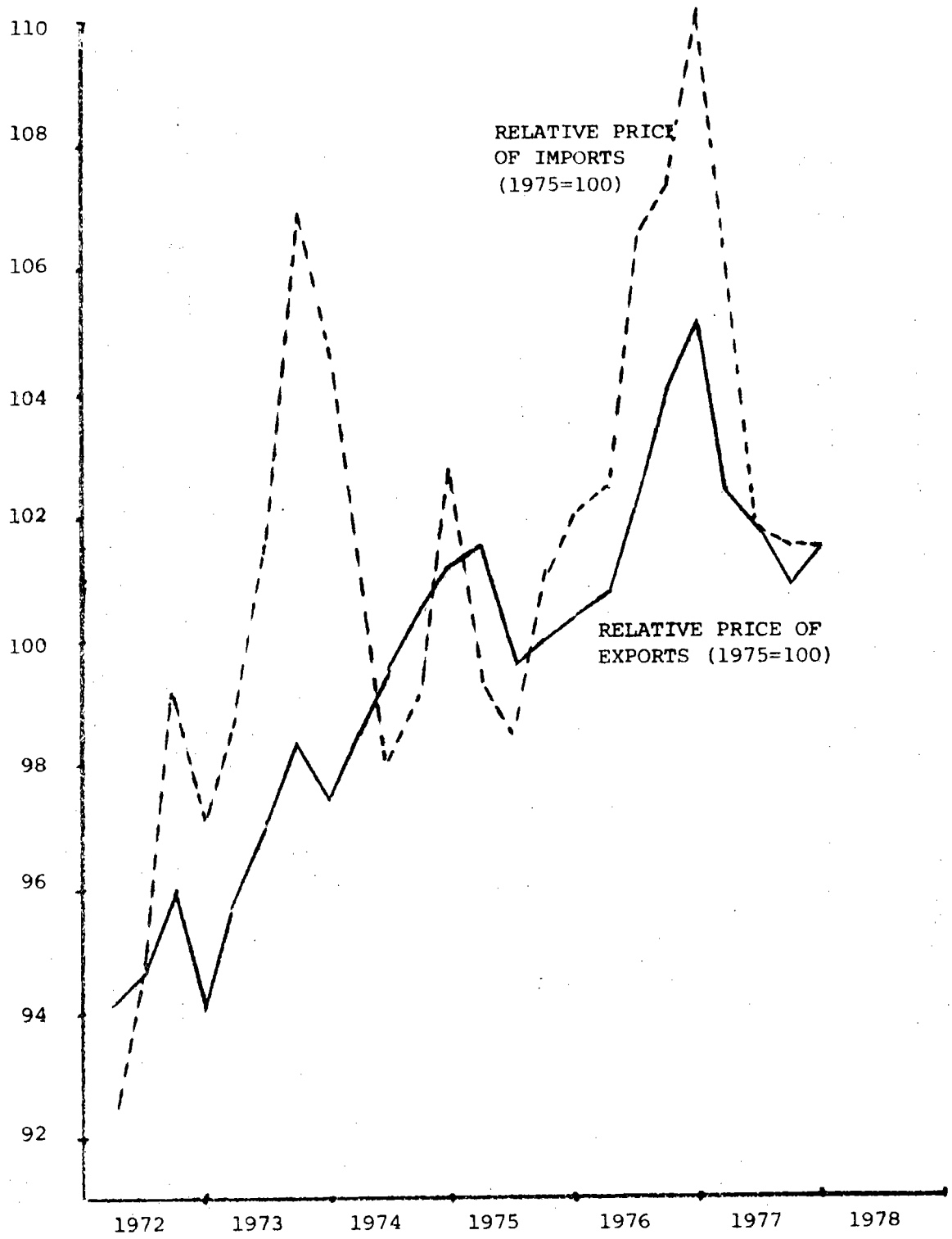
[1] See C.A. Enoch, "Measures of Competitiveness in International Trade", Bank of England Quarterly Bulletin, September 1978, for a discussion of the measures.

[2] Prices or costs are measured relative to equivalent foreign variables weighted by their trade shares and expressed in the same currency.



Note: Ratio of unit value of exports and imports of manufactures to the domestic wholesale price of manufactures.
Source: Economic Trends and Trade and Industry

CHART 3 IMPORT AND EXPORT PRICES RELATIVE TO DOMESTIC PRICES

prices, although the shift since 1972 has by no means been smooth.

TABLE 11 – UK INTERNATIONAL COMPETITIVENESS MEASURES

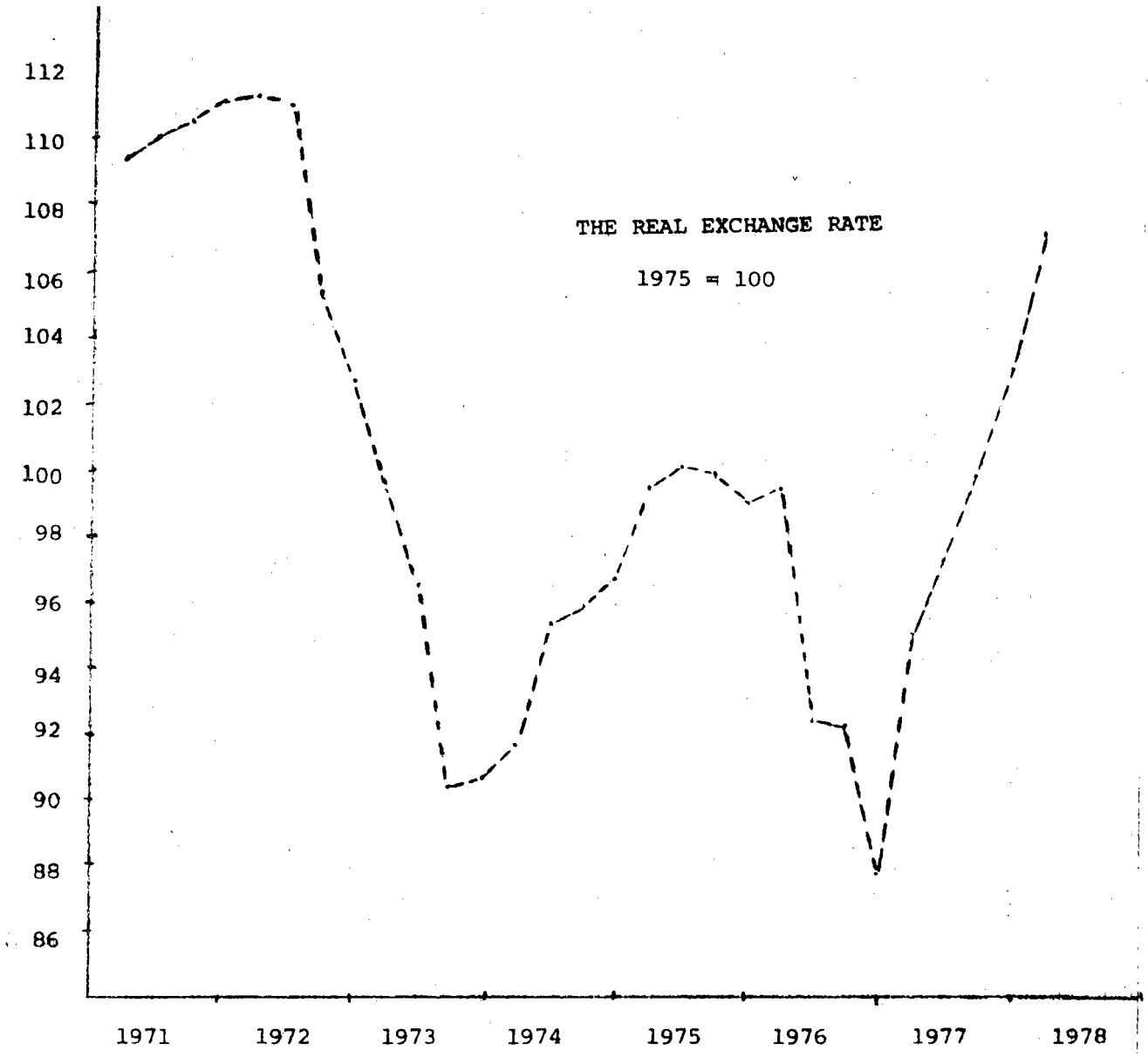
	1	2	3	4	5
1963-67		112.6	102.5	107.2	
1968		98.1	98.1	94.6	
1969		99.4	98.2	94.6	100.0
1970	105.2	100.0	100.0	100.0	99.0
1971	110.4	103.8	102.4	103.0	100.0
1972	107.7	101.6	102.1	100.0	95.2
1973	94.3	92.0	94.6	92.9	86.3
1974	95.0	91.5	93.3	95.5	83.6
1975	100.0	94.1	94.6	97.5	77.2
1976	93.1	86.2	92.1	94.3	65.4
1977	99.0	88.2	97.2	93.4	62.1
1978					

Note: (1) UK relative wholesale price, (2) relative consumer prices, (3) relative average value of manufactured exports, (4) relative unit current costs, (5) effective exchange rate.

Sources: (1) IMF, International Financial Statistics;
(2)-(4) OECD, The International Competitiveness of Selected Countries, July 1978;
(5) Economic Trends.

Chart 4 shows the ratio of the unit value of manufactured exports to the unit value of manufactured imports, which is a measure of the manufactures terms of trade.[1] We note, just as in Chart 3, the large fluctuations in relative price that are due in part to exchange rate movements and in part, given exchange

[1] Chart 4 can be derived directly from Chart 3.



Source: Trade and Industry

CHART 4 RATIO OF UNIT VALUES OF MANUFACTURES EXPORTS TO IMPORTS . (MANUFACTURES TERMS OF TRADE)

rates, to the large difference between UK and foreign rates of inflation. Chart 4 is of particular interest because it shows that the movements in relative prices, while large, have been short-lived. The sustained gain in competitiveness is relatively small.

Chart 4 is consistent with the argument that, perhaps because of real wage resistance,[1] the UK cannot achieve a sustained improvement in competitiveness or change in the terms of trade. However Chart 3 does seem to show a sustained change in the price of traded relative to domestic goods -- and such a change would move resources into the export industry. There is nonetheless a question as to whether the sustained change in the relative price of traded goods shown in Chart 3 is due to the currently depressed state of domestic demand. It is quite possible that the traded goods sectors have been able to pay higher real wages and take profits as a result of depreciation, while the demand squeeze has meant lower profitability and real wages in the goods sectors as a whole. If so, a return to full employment would imply a fall in the relative price of traded goods and a worsening in the current account as a result of both reduced competitiveness and expanded demand.

We have so far shown that there have been short run changes in the terms of trade, and an apparently longer term shift in the relative price of traded goods -- though we leave open the question of whether this latter shift would persist at full employment. There remains the issue of whether changes in relative prices affect trade flows. Here the evidence is quite unambiguous. Many studies, including the recent work by Enoch (1978), Odling-Smee and Hartley (1978), Deppler and Ripley (1978), and Artus (1975) find evidence for a relative price response of UK trade flows. The precise estimates of elasticities differ depending on commodity groups and measures of relative price, but the overwhelming evidence is that there is a substantial long-run response

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[1] We sketch the theoretical argument in the Appendix

to relative price changes and that in the shortrun there is a J-curve effect.

The critical issue, then, is whether the domestic wage-price mechanism is sufficiently flexible to allow for changes in relative prices. This question is particularly emphasized in a recent Treasury study by Odling-Smee and Hartley (1978) who note that the answer depends critically on the unemployment rates accompanying any induced (e.g. by devaluation) changes in competitiveness. The experience of the last few years, as summarized in Chart 8 below, has to leave one with considerable scepticism about the extent of real wage flexibility at full employment

3. Relative Income Growth.

Table 12 shows the current account as a fraction of GDP and comparative real growth rates for the UK and OECD countries. On average in the 1970-78 period growth in other OECD countries has been higher and recessions have been more moderate. This fact would lead us to expect, other things equal, that the UK current account should have been improving over the period as exports rise in quantity and/or value terms relative to imports as a consequence of the differential pattern of growth.

Recent evidence on the income elasticities of imports and exports may be dated to the work by Houthakker and Magee (1969), who report income elasticities of import demand of 1.5 and income elasticities of export demand of about 1.0. Artus (1975) allows for separate trend and cyclical income responses and distinguishes between finished and semi-finished manufactures. His results support those of the Houthakker-Magee study.

Deppler and Ripley (1978) have elaborated on this disaggregated approach. They too attempt to distinguish between time trends and income effects, with results shown in Table 13. Table 13 is of interest in showing

TABLE 12 - GROWTH AND THE CURRENT ACCOUNT

	70	71	72	73	74	75	76	77	78
				Real Growth Rates					
UK	1.8	1.7	2.3	6.5	-1.5	-1.6	2.3	1.0	n.a.
Major OECD Countries	2.5	3.9	5.6	6.2	-.1	-.7	5.6	4.0	3.8
Other OECD Countries	5.8	4.4	5.2	5.7	3.6	0	3.5	1.8	2.3
				UK Current Account as Percent of Income					
	1.7	2.2	.2	-1.6	-4.9	-2.0	-1.0	.2	n.a.

Note: Major OECD countries includes the U.S., Japan, Germany, France, Canada, Italy and the UK. The UK real growth rate is derived from the "average" estimate of GDP at 1970 factor cost, Economic Trends, Sept 1978, p. 6.

Source: OECD Economic Outlook, Economic Trends

that the problem of income elasticities of imports above those of exports are common to Germany and Japan as well as Britain. The substantial difference is, of course, in the time trends. The UK has a significant positive time

TABLE 13 - INCOME ELASTICITIES OF IMPORT AND EXPORT DEMAND

	Imports		Exports	
	Demand	Time	World Demand	Time
UK	1.32	.034	.9	0
US	1.27	.035	1.32	-.024
Germany	1.89	.016*	1.11	-.003*
Japan	2.04	-.004*	1.45	-.038
France	1.38	.026	0.70	.013

* Statistically insignificant

Source: Deppler and Ripley (1978)

trend for imports and a zero trend in exports. Comparison of the Deppler-Ripley results with those of previous studies will show that differences in export and import income elasticities found by others are here attributed chiefly to time trends. We will discuss the British time trends further in Section 5 below.

The material presented in Sections 2 and 3 points to the importance of changes in competitiveness and relative incomes in explaining the current account. And Chart 4, showing an increase in the relative price of traded goods, and Table 12, showing declining British relative income, suggest an explanation for the fact that the adverse time trends and income elasticities shown in Table 13 have not worsened the current account.

We now turn to an econometric analysis that emphasizes relative income and competitiveness as determinants of the behavior of the current account.

4. An Econometric Analysis of the Current Account.

Our econometric analysis of the current account, reported in appendix II, broadly matches the evidence we have so far reviewed. The dependent variable is the ratio of the current account to GDP; explanatory variables are the UK unemployment rate, UK competitiveness in manufacturing, OECD income, the real price of raw materials and a time trend.

The analysis starts with the role of cyclical factors. Higher unemployment implies reduced income and spending, and therefore should lead to a current account improvement. Such an effect is strongly evident. A one percentage point rise in the unemployment rate reduces the current account surplus (as a percentage of GDP) by about .25 percentage points. Demand expansion abroad also works in the expected direction: a one percentage point increase in OECD industrial production improves the current account ratio by about .17 percent. The equation thus confirms the effects of strong domestic and foreign cyclical factors on the current account.

We consider next the role of relative prices. Here we use two measures: UK competitiveness in manufacturing, and the price of industrial materials relative to the GDP deflator. Both variables are significant in explaining the current account ratio. An increase in UK competitiveness--a rise in foreign relative to UK prices of manufactured goods--will improve the current account ratio over two years. There is an initial adverse effect, thus confirming the J-curve, that is more than compensated as time passes. However, the dynamics of this adjustment cannot be tied down with confidence. The

combined effect is estimated with more precission: a one percent gain in competitiveness will eventually improve the current account ratio by about a quarter percentage point.

The real price of raw materials affects the UK current account ratio adversely since this is predominantly an import item with inelastic demand. Our estimate is that a one percent increase in the real price of raw materials worsens the current account ratio by .1 percent. The effect is thus quite sizeable and it is also quite precisely estimated.

Finally, we note the role of a time trend. There is evidence of a very strong adverse time trend, at the rate of 1.6 percent of GDP per annum. However, it should be appreciated that (the log of) the level of OECD production, which enters the equation, is growing at a trend rate. If the equation were to include deviations of OECD production from trend, rather than the level, the coefficient on the time trend itself would be reduced by about half. Nonetheless, the time trend remains powerful and significant for the period of the 1970's; we turn to the factors underlying it in the next section.

5. Current Account Trends and the Government Budget.

We take up two issues in this section. The first is the trend behavior of the current account, and the second is the relationship between the current account and the bedget deficit.

Our current account equation contains three variables that can change in trend fashion. The first is of course time itself--which is present also in the import equation for the UK estimated by Deppler and Ripley summarized in Table 13. The presence of an explicit time trend in an equation is a sign of the omission of other relevant variables, usually variables that are difficult to quantify. In this case, the plausible omitted factors are non-price competition, and shifts in the pattern of competitive advantage.[1] Non price competition includes factors such as delivery lags and the availability of servicing for manufactured exports.[2] Shifts in the pattern of competitive advantage hurt the UK in its role as domestic producer and exporter of manufactured goods: such shifts may be taking place as technology and industrial capacity spread not only to Japan and Europe, but also to non-industrialized countries.[3] Quantitative measures of the importance of these two factors are not available but we do not doubt their importance.

A particular change in the pattern of competitive advantage that could well affect the adverse time-trend for the UK is the exploitation of North Sea oil. This is certainly a relatively long-run phenomenon that may be expected to have a favorable impact on the current account at least through the next decade and probably beyond. We discuss in the concluding section the policy choices made possible by British oil production

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[1] By competitive advantage we mean costs of production at a given real wage.

[2] See Stout et al (1977)

[3] Shifts in the pattern of comparative advantage might also be expected to have effects on UK competitiveness.

The relatively lower growth of the UK economy, and the increase in the price of traded relative to home goods, are also factors that can affect the behavior of the current account over long periods. Current account balance has been maintained in part because British growth has been relatively slow, and in part because the price of traded goods has risen relative to that of home goods.

The key issue in determining the future behavior of these trend terms in the current account equation is the rate of productivity growth. If productivity growth were higher, real output could grow more rapidly with less adverse effects on the current account; in addition, British exports would tend to become more competitive. Measures of productivity growth for the UK and other economies for the period 1960-77 are shown in Table 14. For the period, UK productivity growth was below that of the other economies in the table, and substantially so for the 1960-70 period.

To point to the rate of productivity growth as an important issue for the future behavior of the current account--and indeed for the behavior of the economy as a whole--is hardly novel. Nor, unfortunately, do we feel qualified to add to the many discussions of the reasons for the poor UK productivity performance.[1] But that poor performance to date is a fact, and its continuance would imply a continued adverse trend for the current account. Such a trend would in part be self-stabilizing through the reduced growth that lower procuctivity growth implies for the economy as a whole. However part of the adverse trend would have to be offset by a depreciating real exchange rate.

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[1] For a readable summary, see Posner (1978), Section III.

TABLE 14 - Productivity Growth in the UK and EEC, 1960-77.

	1960-65	1965-70	1970-75	1976	1977
F.R. Germany	4.5	4.7	2.7	6.5	4.6
France	5.0	4.9	3.2	5.7	3.8
Italy	6.1	5.9	2.1	4.9	2.5
Community of Nine	4.3	4.5	2.6	5.1	3.0
U.K.	2.4	2.7	1.8	2.6	1.1

Source: EEC Bulletin, Supplement 1978.

The second topic in this section is that of the connection between the current account deficit and the budget deficit. One of the two major planks of the "New Cambridge" manifesto for the British economy is that there is a close, almost one-for-one link between the budget deficit and the current account deficit. One implication is that the private sector as a whole keeps its financial surplus balanced at the margin: changes in the budget do not lead to changes in the private sector's acquisition of assets.

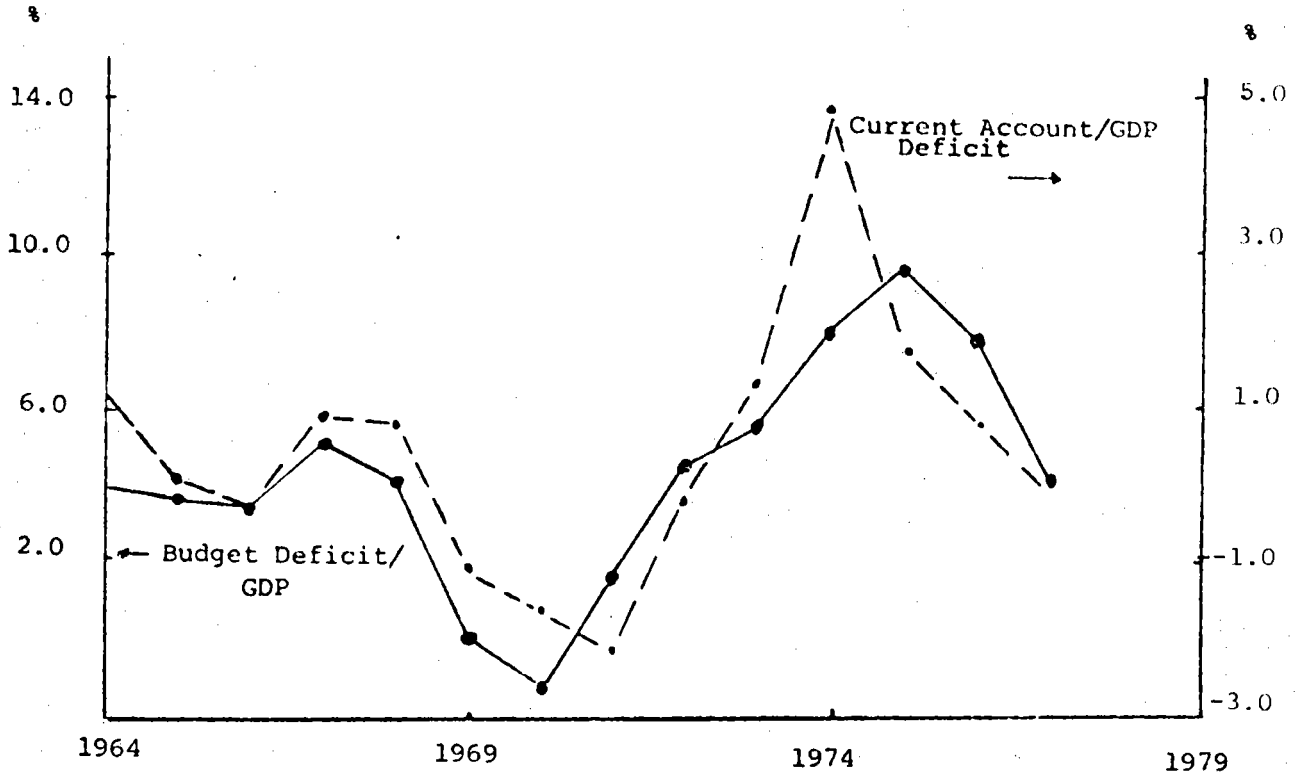
There are of course good macroeconomic grounds for expecting links between the budget deficit and the current account. The actual budget reflects to a significant extent the operation of automatic

stabilizers. If an external shock worsens the current account, thereby reducing the level of income, the budget will also go into deficit. However, this is only one possibility, since other disturbances, such as a reduction in domestic demand, would improve the current account as the budget deficit worsened. Second, expansionary fiscal policy that raises income will worsen the current account. Here again the link will not be certain: the tightness of the link would depend on the particular policies being followed. For instance, a reduction in tariffs would have very different effects on the current account than an increase in road construction.

The third point concerns the effects of changes in the budget on competitiveness. An expansionary fiscal policy would raise aggregate demand and thereby worsen competitiveness. The deterioration would arise in part from the behavior of domestic wages, but could also arise from anticipatory exchange rate movements combined with the J-curve. This mechanism too is not certain to operate in the direction necessary to validate the New Cambridge view.

It is apparent, therefore, that whether there is a close relationship between the budget and current account deficits is an empirical matter. It is also the same question as that of whether the private sector runs a marginally balanced budget, i.e. whether the private sector has a marginal propensity to spend, on consumption and investment together, of unity. The New Cambridge view on the relationship between the budget and current account is based on an empirical finding by Cripps, Fetherston and Godley (1974) and Fetherston (1975) that private expenditure does exhibit a unitary marginal propensity to spend.

Rather than examine the latter evidence directly, we consider the relationship between the budget and the current account. Chart 5 shows that relationship for the period 1964-78; the two series certainly appear remarkably closely linked. However, the scales on the two axes



Source: Economic Trends

Chart 5: The UK Current Account and Public Sector Budget Deficits.

are different, and in fact the current account deficit does not increase one-for-one, over the period, with the budget deficit. The simple regression of the annual current account deficit against the budget deficit for the longer period 1956-77 yields the following estimate:[1] A one pound increase in the budget deficit worsens the current account by about one quarter to a third of a pound sterling.

It is clear from both Chart 5 and our discussion to that the budget deficit does not change one for one with the current account deficit. There is nonetheless a correlation between the two series. In terms of the policy implications, there is good reason to think on other grounds than Chart 5 that tight fiscal policy will improve the current account. Equally, it should not be assumed that the link is automatic and independent of the causes of the budget deficit. We believe the observed correlation is consistent with the operation of the three forces we have outlined above rather than the reflection of a tight structural relationship.

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[1] See Appendix 2

III. THE EXCHANGE RATE

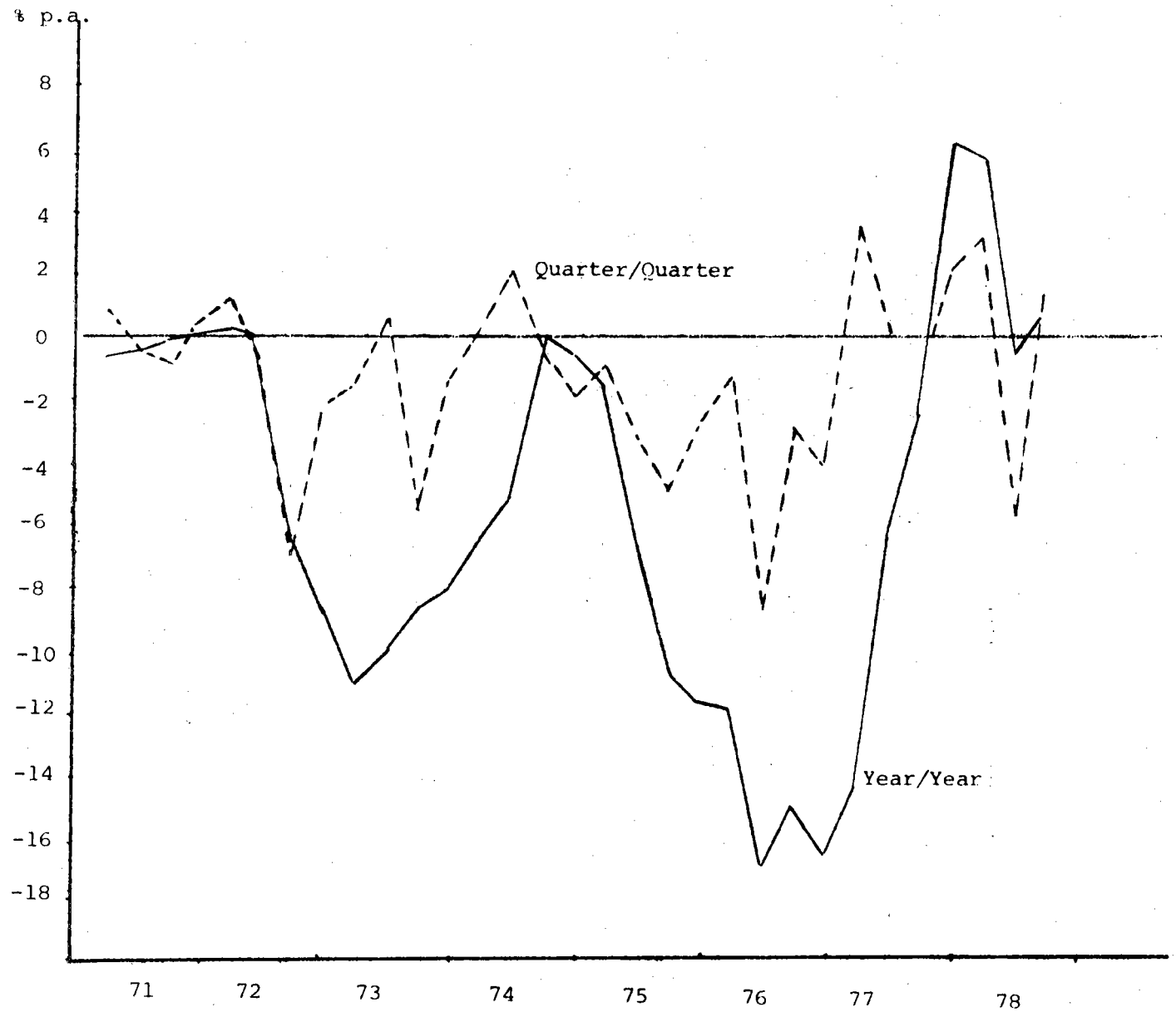
Our discussion of the exchange rate starts in section 1 with a review of its behavior and analysis of factors responsible for that behavior. In section 2 we study capital flows and intervention. In section 3 we discuss the extent to which domestic inflation has been affected by exchange depreciation. The topics of sections 2 and 3 are interdependent since exchange rate movements are both caused by and cause changes in the inflation rate.

1. A Review of Exchange Rate Behavior

The depreciation of sterling in terms of the currencies of major industrialized countries in the 70s has been far from even and the extent of changes in the exchange rate are hard to associate with only a few explanatory variables. Table 15 shows the $-exchange rate and the IMF version of the effective exchange rate that takes into account multilateral trade patterns. Relative to the dollar, sterling has depreciated by 20 percent since 1970.

On an effective exchange rate basis the depreciation has, of course, been greater -- more than 35 percent. The divergence reflects the appreciation of the snake currencies in terms of the dollar since these currencies play an important role in UK trade relations. Table 15 shows for comparison the effective exchange rate of the dollar, with a depreciation of 25 percent, and the $ and effective rates of the Deutsch Mark, which show appreciations of 82 and 50 percent over the period. The timing of the depreciation is shown in Chart 6, which exhibits both the depreciation or appreciation from quarter to quarter at an annual rate, indicated by a dashed line, and the depreciation relative to the same quarter of the previous year.

The latter series shows a relatively smooth trend of depreciation, while the former points to the timing of large exchange rate movements, which



Source: Economic Trends

CHART 6 CHANGES IN THE EFFECTIVE EXCHANGE RATE

TABLE 15 EXCHANGE RATES
(May 1970 = 100)

	UK		US	GERMANY	
	$-Rate	E-Rate	E-Rate	$-Rate	E-Rate
1971	101.8	100.0	98.8	105.3	103.6
1972	104.2	96.7	89.8	114.8	107.1
1973	102.2	87.5	82.3	138.2	119.3
1974	97.5	84.8	84.2	141.5	125.5
1975	92.6	78.3	83.5	149.1	127.6
1976	75.3	66.3	87.7	145.5	132.3
1977	72.7	63.0	86.7	157.8	143.1
1978*	80.5	63.3	76.6	182.3	150.5

Note: E-rate denotes the IMF effective exchange rate index. *1978/III.

Source: IMF International Financial Statistics

can be associated with major events or policy decisions. Among the latter we might note, for example, the brief presence of sterling in the tunnel in May-June 1973, the oil shock of late 1973, the peaking of inflation in mid 1975, the policy of keeping sterling competitive in early 1976, the stabilizing impact of the IMF program at the turn of 1976/77, and renewed floating in the fall of 1977. There is no particular interest from the viewpoint of this paper in detailing these episodes, so we turn rather to a broader interpretation of the time path of the exchange rate.

There are three simple views of exchange rate behavior, each of which provides part of the explanation of the behavior of sterling exchange rates seen in Chart 6 and Table 15. The first would explain depreciation by excess money creation. The second would, on purchasing power grounds, link depreciation directly to differential inflation.[1] The third would link depreciation to external imbalance as measured by the current account or the basic balance. None of these three views is by itself adequate as an explanation of exchange rate behavior. Money

[1] Presumably proponents of the first view would incorporate the second in any explanation of the effects of money on the exchange rate.

growth, for example, was running particularly high in 1972-74 and inflation peaked in 1975. Depreciation, however, peaked in 1976. Of course, allowance must be made for the rest of the world where, money growth was also high in 72/73 and where inflation was high in 73/74,but even with such an allowance these simple theories do not go very far in explaining the magnitude and timing of depreciation by themselves.

To judge whether the external balance by itself provides an explanation for the sterling depreciation we look at Table 16:

TABLE 16 EXTERNAL BALANCE
(Billion £)

	Current Balance	Basic Balance[a]	Official Financing	% Change in UK E-Rate
1970	.7	.6	1.3	n.a.
1971	1.1	1.1	3.1	.2%
1972	.1	-.6	-1.3	-3.3%
1973	-1.0	-1.2	-.7	-9.5%
1974	-3.6	-2.4	-1.6	-3.1%
1975	-1.9	-1.7	-1.5	-7.7%
1976	-1.1	-1.2	-3.6	-15.3%
1977	.3	2.9	7.4	-4.8%
1978				

Note: a. Includes overseas investment by the UK public sector, private investment and official longterm capital flows.

Source: Economic Trends and Table 15

Neither current account nor basic balance provides a full explanation for the development of the exchange rate. The largest deficits were recorded in 1974 when sterling moved very little. By contrast 1976, the year of peak depreciation, showed a relatively smaller deficit.

This brief review thus suggests that a broader approach is required that takes into account not only the trend behavior of prices and the current account but also macroeconomic variables that affect the speculative outlook.

These would include interest rates, the adequacy of reserves and reserve use.

Broader perspectives on exchange rate developments have been adopted in studies with quite different orientations inclusing in particular the work of Batchelor (1977), Bilson (1978a, 1978b) and Burns, Lobban and Warburton (1977). The latter study emphasizes medium term exchange rate developments based on sectoral price level trends due to differential productivity growth together with price arbitrage for traded goods. The Bilson studies take a relatively monetarist approach in studying the £/DM exchange rate. The explanatory variables include lagged exchange rates, relative money supplies, the forward premium and a time trend. Batchelor's work is desirably eclectic. It includes as explanatory variables short and longterm interest rates, the trade balance, the lagged rate and a time trend. The dependent variable is the deviation of the exchange rate from its purchasing power parity adjusted level, using either consumer or export prices.

The recent empirical work on exchange rates has not settled down on any unique specification of the determination of exchange rates. We present in the appendix our formulation of the determinants of the behavior of the sterling exchange rate over the period.

The equation explains the current effective exchange rate, on a quarterly basis. The explanatory variables are the lagged exchange rate, the lagged level of reserves, UK competitiveness lagged one quarter, the covered interest differential, and the current dollar/deutsch mark exchange rate. Estimated for the period 1971:4 to 1978:3 the explanation performs quite well in explaining changes in the exchange rate.

The equation shows that a higher level of lagged reserves leads to an appreciation. The role of the reserve level in the equation can be interpreted both as a measure of cumulative balance of payments performance and as a measure of the authorities ability to intervene.

The covered differential appears as an indicator of speculative pressure. An increase in the covered differential in favor of the US leads to a depreciation. The extent of the depreciation, however, is very imprecisely estimated. UK competitiveness affects the exchange rate in that a gain in competitiveness leads to an appreciation. A one point change in the competitiveness index leads to a half a point change in the effective rate index. Finally the dollar deutsch-mark rate appears as significant variable. An appreciation of the mark leads to a depreciation of the effective sterling rate with an elasticity of about .2.

The role of the dollar-deutsch mark rate in this context reflects the side effects on sterling of shifts in confidence in the dollar. The evidence suggests that the pound in the context assumes an intermediate position since the depreciation of the effective rate is substantially smaller than the change in the dollar-deutsch mark rate.

2. Capital Flows and Official Financing

In this section we consider movements of shortterm capital and the financing of the external imbalance. Since sterling was effectively floating during most of the period, the item "official" reflects exchange market intervention in each period and thus reflects a policy choice of the authorities. Under flexible rates neither the basic balance nor shortterm capital flows are

exogeneous or predetermined, but are determined jointly with the exchange rate. In the absence of intervention an autonomous demand disturbance might generate an increase in the basic balance deficit and bring about a depreciation relative to anticipated exchange rates of sufficient magnitude to call forth shortterm financing at prevailing interest rates. The depreciation would, in turn, affect the basic balance through price and substitution effects.

TABLE 17 CAPITAL TRANSACTIONS AND OFFICIAL FINANCING

(Billion ₤)

	Basic Balance	Shortterm Capital	Official Financing[a]	Reserves[a]	External Borrowing
1970	.6	.7	1.3	-.1	-1.3
1971	1.1	2.0	3.1	-1.5	-1.7
1972	-.6	-.7	-1.3	.7	.4
1973	-1.2	.4	-.8	-.2	1.8
1974	-2.4	.8	-1.6	-.1	1.8
1975	-1.7	.2	-1.5	.7	.8
1976	-1.2	-2.2	-3.6	.9	2.8
1977	2.9	4.4	7.4	-9.6	2.2
1978					

Note: a minus sign indicates a surplus and reserve accumulation.

Source: Economic Trends

With these qualifications we turn to Table 17 which shows the basic balance, shortterm capital flows and official financing. It also reports the breakdown of external financing between changes in official reserves and official (short and mediumterm) borrowing. The table shows that official financing has been an important part of external financing. One way of looking at the external accounts is to ask whether shortterm capital flows have financed the basic balance or

whether they have added to the imbalance, the latter of course, being possible only if official intervention is sufficiently substantial. By this test, only in 1973, 1974 and 1975 have capital flows contributed toward financing the basic balance deficit. For the remaining years, particularly 1971, 1976 and 1977 capital flows and the basic balance were of the same sign.

What determines the extent to which the authorities choose to finance the external imbalance rather than force self-financing through capital flows or adjustment? To a large extent the financing is determined by an attempt to mitigate the rate of depreciation or appreciation of the exchange rate. Disregarding problems of simultaneity, we have estimated the change in reserves, on a quarterly basis, as a function of the percentage change in the exchange rate. Results are reported in Appendix 2. We use as a measure of intervention the change in official net reserves and as explanatory variables the actual rate of change of the effective exchange rate and the lagged net stock of reserves. Our equation, while certainly not performing spectacularly, nevertheless reveals systematic "leaning against the wind". The authorities resist appreciation or depreciation. There is some, though not strong, evidence that resistance to depreciation is more forceful than resistance to appreciation. There is also evidence that a higher stock of net reserves exerts a significant positive influence on the extent of intervention. The extent of intervention, as estimated in our equation, amounts to £ 93 million per quarter as the exchange rate depreciates at a rate of 4% per year.

A natural question to ask is why the authorities should have invested so substantially in attempts to stabilize sterling. Table 18 shows the net official external position and confirms that external borrowing has been used on an extensive basis to finance the foreign exchange intervention of the last few years. There are essentially three considerations involved in exchange rate stabilization. The first is concern with financial stability. This,

in much the same way as the concern that leads to stabilizing interest rates, is at best an argument for smoothing the path of exchange rates. Of course, the ability to distinguish temporary disturbances from trends is not widespread.

The second consideration in exchange rate policy is inflation. Exchange rate movements brought about by financial disturbances affect import prices and thereby, as we shall see below, affect domestic inflation. Attempts to stabilize inflation would thus benefit from an accompanying policy of exchange rate stability.

The third argument for exchange rate intervention concerns the competitiveness of industry. Excess depreciation, compared to differential underlying inflation trends, enhances competitiveness and thereby increases employment and improves the current account. British commentators have remarked optimistically on the role of under valued German and Japanese exchange rates in promoting exports in the 1950's and 1960's.[1] Initially, such overdepreciation comes at the expense of price stability

The relative importance of the three factors has varied. In early 1976, for example, sterling was depreciated deliberately to promote competitiveness.[2] In 1977, by contrast, exchange stability and slight appreciation helped stabilize inflation. By early 1979 continuing high unemployment, and a worsening of the competitive position in manufacturing make a real depreciation appear desirable, though perhaps hard to get.

The scope for exchange rate intervention as an independent policy instrument should not be exaggerated. Intervention can only successfully control the exchange rate to the extent that there are compatible domestic monetary and fiscal policies. Exchange rate intervention is sometimes necessary to demonstrate the intent to follow particular domestic policies, but it cannot function long without their backing.

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[1] For example, Posner (1978)

[2] See Fay and Young (1978)

Table 18: UK OUTSTANDING OFFICIAL SHORT AND MEDIUM TERM BORROWING AND OFFICIAL RESERVES
(Billion $)

	BORROWING			RESERVES
		Other Borrowing by HMG	Other Public Sector Borrowing	Total	
1971	1.1	-	.4	1.4	6.6
1972	-	-	.4	.4	5.6
1973	-	-	3.0	3.0	6.5
1974	-	1.5	5.6	7.1	6.8
1975	-	2.5	6.4	8.9	5.4
1976	2.1	2.5	9.6	14.2	4.1
1977	4.0	4.0	10.0	18.0	20.6
1978*	3.1	4.4	9.2	16.7	16.5

*1978 end of second quarter.

Source: Bank of England, Quarterly Bulletin.

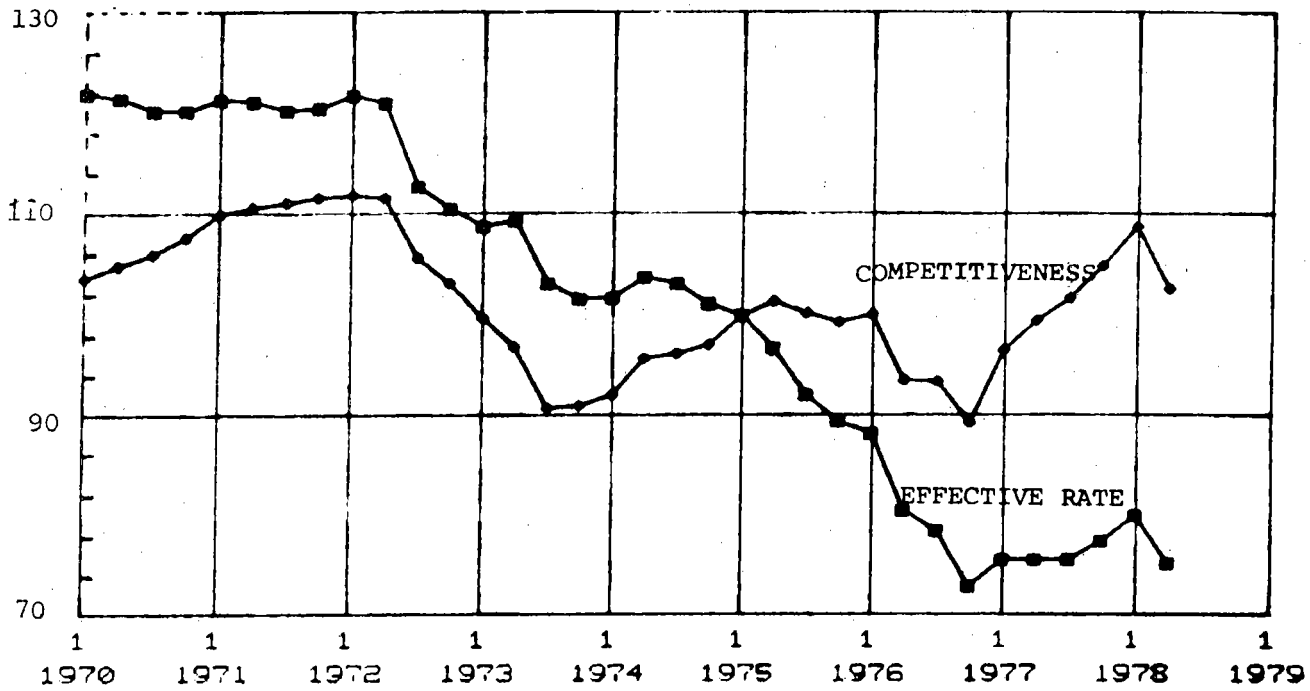
3. The Exchange Rate and Inflation

In this section we return to questions of inflation and exchange rates. Specifically we address two related questions: Do exchange rate movements provide an exogeneous source of domestic inflationary pressure? Are exchange rate changes an effective tool for payments adjustment? The latter question is equivalent to asking whether exchange rate movements are or are not offset by domestic inflation

One view is that monetary and fiscal policies are largely exogeneous (or that they can or should be?) and that they determine the rate of domestic inflation,with the exchange rate following on average a purchasing power parity path. The alternative view, which commands more widespread support, is that exchange rate movements frequently arise for reasons unrelated to current monetary or fiscal policies, that these exchange rate movements affect domestic inflation through import prices, and that this induced inflation invites at least partial accomodation by the authorities in an attempt to stave off the (shortrun) deflationary effect of increased inflation for given growth of money and a given tax structure. The accommodation validates the exchange rate movement.

The question then is whether there are exchange rate movements independent of domestic monetary and fiscal policy actions and whether there is accommodation. There is little doubt on either of these scores. We may simply note the case where a foreign tightening of policies causes an immediate change in exchange rates and increased domestic import prices. Further, monetary and fiscal policies will to some extent be conducted with real targets in view and therefore will automatically adjust to "exogenous" exchange rate movements.

We now look at the relation between exchange rate movements and changes in inflation and competitiveness in the seventies. Chart 7 shows the relation between movements in the nominal effective rate and the real (wholesale price adjusted) exchange rate, or competitiveness. The chart indicates that in the short run movements in nominal rates bring about changes in the real rate in the



Source: Economic Trends and International Monetary Fund

CHART 7 NOMINAL AND REAL EXCHANGE RATE
(1975/I=100)

same direction, although of a smaller magnitude. Over time, though, real rates do not show a trend, so that the changes in real rates are not large and persistent. The extent and persistence of measured real exchange rate movements depend on the particular price index used in defining the real rate.

Movements of the real rate appear most significant for measures based on value added, unit labor costs or consumer prices (as is implied by Table 11 above).

Whether nominal exchange rate changes can move longrun real exchange rates is not a theoretical puzzle but largely a question of the circumstances. If exchange rate movements, arising because say of a financial disturbance, are fully matched by monetary changes so that unemployment remains constant then we would expect a full adjustment of domestic prices, more or less rapidly. This example represents only the "pure" inflation part of exchange rate movements and leaves out movements that could serve to bring about real adjustments in relative prices and thereby in the current balance. In the latter case, the essential question is whether there is flexibility in real wages to achieve a movement in relative prices. If the flexibility exists, there are further questions about how much unemployment over how long a period, and how large a nominal exchange rate movement, it takes to achieve a given relative price change. In the appendix we have sketched a model of real wage rigidity that suggests that adjustment to a current account disturbance requires a decline in employment and a depreciation.

The adjustment to the external imbalance of 1973/75 is brought out in Table 19 where we look at the real wage index and inflation rates. The full employment condition of 1973 combined with the sharp gain in real wages implied a lack of competitiveness and the need for a <u>real</u> depreciation to reverse the current account. In the ensuing period nominal depreciation and restrictive aggregate demand policies together reduced real wages.

The question at the time of writing is whether exchange rates have merely run ahead of wages, which will soon catch up, or whether the real wage has been permanently reduced relative to trend. One indication of the answer is the pressure now (early 1979) occurring for wage settlements in the range of 12-15%. The further

question is whether, even if at present unemployment levels there were no pressure for gains in real wages (make up and trend ?), it would be possible to maintain the present real wage level if full employment were restored. There must be considerable scepticism on that score; accordingly, the hope of rising productivity or the use of fiscal policy to make available noninflationary real wage gains seem the only possibilities for maintaining real wages as unemployment falls.

How important have exchange rate movements and the induced changes in import prices been in the inflationary process? Table 20 provides an account of the sources of consumer price inflation for the 1972-77 period. The accounting is based on 1972 input-output tables. The interesting aspect of this table

Table [19]: Inflation and Depreciation, and Real Earnings
(Annual % Rates)

	INFLATION			EFFECTIVE RATE	REAL EARNINGS INDEX	
	WPI	RPI	AVERAGE EARNINGS		WPI	RPI
1970	7.1	6.4	12.8	1.3	107.0	107.0
1971	9.1	9.4	11.1	.9	109.1	108.7
1972	5.3	7.1	12.9	3.4	116.9	114.5
1973	7.4	9.2	12.9	10,7	122.9	118.4
1974	22.6	16.1	17.2	4.2	116.7	119.5
1975	22.2	24.2	26.1	7.7	118.7	121.4
1976	17.3	16.5	16.5	15.4	118.8	121.3
1977	19.7	15.8	10.2	5.5	109.9	115.5
1978*	8.1	7.7	15.5	-1.0	107.8	114.5

Note: The rates for 1978 represent the inflation rates 77/II-78/II and appreciation 77/III-78/III. The last two columns show the average earnings index deflated by wholesale and retail prices respectively.

Source: Economic Trends and International Financial Statistics.

is the very uneven contribution of import price inflation. Only in 1974 do import price increases stand out as the single most important source of inflation. In 1975-77 wage inflation dominates with only a minor contribution from import prices. In these years taxes account for as much inflation as do import prices.

An alternative procedure to determine the importance of exchange rates and import prices for the domestic inflationary process is to assume that import prices can be taken as an exogenous explanatory variable in a price equation.

In an equation reported in Appendix 2 we relate the quarterly rate of inflation of retail prices to current and lagged inflation rates of wages (average earnings) and import prices. The equation is estimated for the period 1967-77. The equation explains nearly seventy percent of the variation in quarterly retail price inflation. The cumulative effect of a one percentage point increase in wage inflation is to raise retail price inflation by .79 percent. A one percent increase in import price inflation, cumulatively, raises retail price inflation by .18 percent. The combined effect of increased wage and import price inflation is thus to generate an equal increase in retail price inflation. The lag structure with which wages and import prices affect retail prices is not very sturdy, except that the mean lag for import prices appears shorter (1.6 quarters) than that for wages (2.7 quarters). This is quite sensible since the effect of wages on retail prices arises to a large extent after an intermediate passthrough into wholesale prices.

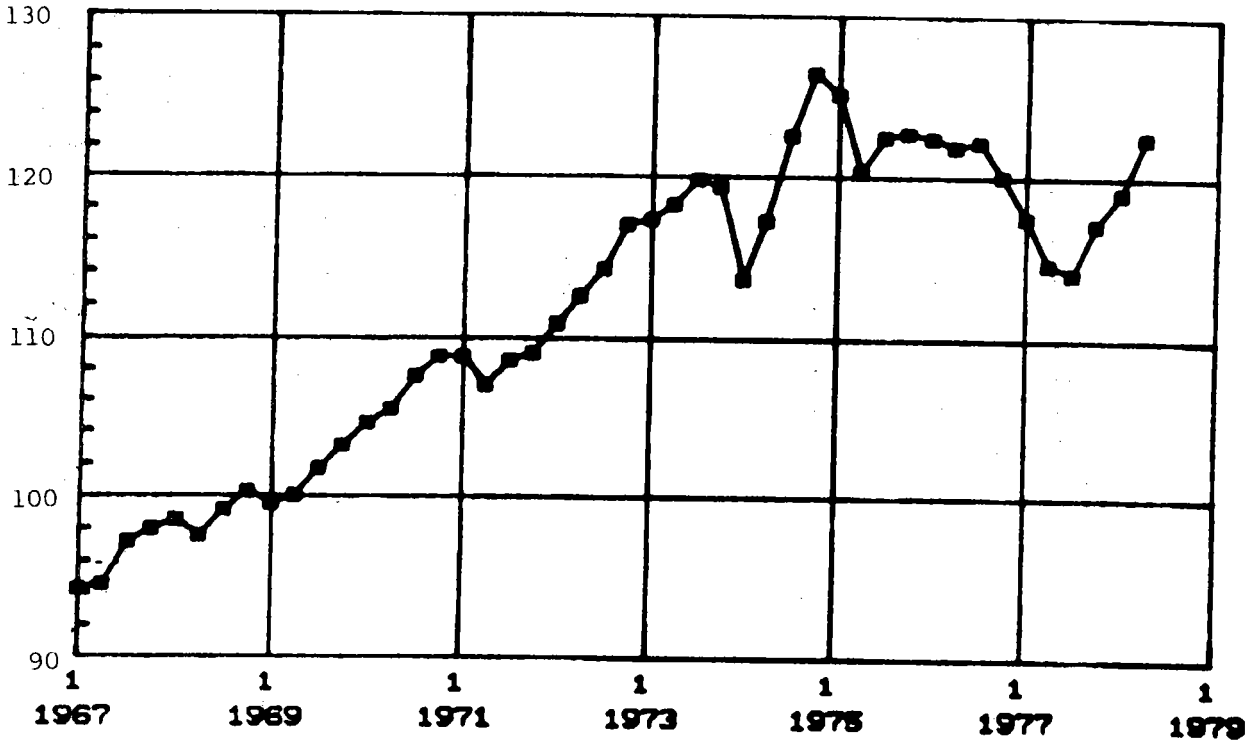
We thus see a clear linkage between cost variables--import prices and wages--and the resulting domestic inflation. We now have to move a step further and try to explain wage inflation. In particular we would want to establish evidence for the propositions that inflationary expectations, the level of real wages or the rate of unemployment affect the rate of increase in

Table 20 CONTRIBUTIONS TO CONSUMER PRICE CHANGES
(% per year)

	1972	1973	1974	1975	1976	1977[b]
Income from employment:[a]	2.9	3.6	7.0	15.5	7.0	5.25
Other costs:[a]	3.6	4.1	3.1	2.75	4.0	3.25
Taxes less subsidies:[a]	0.2	0.1	-0.6	3.25	3.25	3.5
Price of imports:	0.2	3.3	8.6	3.5	3.75	3.0
Residual:	-0.2	-2.6	-2.0	-1.5	-2.75	-0.5
Consumer expenditure deflator:	6.7	8.5	16.1	23.5	15.25	14.5

a · Per unit of output, b. Based on data to 1977/III.

Source: OECD Economic Surveys, United Kingdom, various issues.



Note: Average earnings deflated by the retail price index, excluding seasonal foods.

Source: Economic Trends

CHART 8 REAL AVERAGE EARNINGS

money wages. In Chart 8 we show the level of real wages--average earnings deflated by the retail price index (See also Table). An important fact is the substantial variability in the real wage since 1973 that has become possible because of high and variable inflation. We also note the decline in real wages from 1975 to mid-1977.

There is widespread agreement among researchers of this question that at present there is no known stable wage equation for the U.K. To quote from a recent memorandum of the NIESR

> "Even so, there is no wage equation which fits the experience of the last seven years at all adequately in this country; indeed, given the form which wage bargaining has taken in recent years and is likely to take, it is open to question whether there is a sensible wage equation at all." (NIESR, 1979)

This quote diverges from an earlier view (Henry, Sawyer and Smith, 1976) that equations estimated through 1974, using as explanatory variables a time trend, the level of net real earnings and lagged inflation, performed well and were stable over subperiods. In particular they noted that a high level of net real earnings tended to reduce wage inflation and that there was no evidence of an effect of unemployment on wage inflation as the earlier Phillips curve model had maintained.

British wage behavior has been affected by a number of factors whose relative importance has varied over time. First, there are inflationary expectations. Standard representations that rely on lagged inflation as a measure of expectations of course run into trouble because of the sharp acceleration of inflation in 1974/5 and the subsequent equally sharp deceleration. Second, unemployment rates have more than doubled since the late sixties and should thus

exert a substantial dampening effect on wage inflation. To the extent that this is not the case one must ask whether important changes in benefits have raised the "natural rate of unemployment".[1] Third, relative wages have traditionally been taken as an important element in the wage formation process. This suggests that there is a great difficulty in changing the wage structure between manufacturing that is trade oriented and services. To the extent that manufacturing wages rise with traded goods prices they may exert pressure on the general wage structure through a relative wage effect. Fourth, real net earnings have been taken as an important element in the wage bargain. Labor has a target real wage and real wage resistance implies that a decline

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[1] On this point see Flemming (1976).

in real wages will in subsequent bargaining rounds lead to a catch-up. There is some question of the extent to which fiscal policies have to be taken into account in measuring the target real wage. Finally there is incomes policy that certainly exerts an important effect on the timing of wage and price changes and may even exert a durable effect on real wages.

In appendix II we report on some of our own estimates of wage equations. The absence of a good wage equation is all the more regrettable since we view the behavior of wages, relative to productivity, as central to the British stabilization problem. Wage inflation is central to domestic inflation and the external value of sterling, to the competitiveness of manufacturing and thereby to the full employment current account. The resurgence of high wage inflation in 1979 and 1980 would indicate that it is as yet impossible to depreciate the exchange rate in real terms to any significant extent or for any length of time, and that accordingly none of the basic problems of the 70s have found a permanent solution, even though oil revenues could finance a temporary solution.

IV. THE OUTLOOK

What is the outlook for the UK economy, and in particular for the external sector? At the end of 1978, unemployment remained very high; inflation had declined substantially but was still around 8 percent. The budget deficit had declined under the auspices of the IMF to about £ 4 billion and the current account showed a surplus reflecting adjustment of relative prices, the effects of oil development and the substantial slack in economic activity. In the wake of the dollar weakness, sterling had fully stabilized in terms of the effective exchange rate. Thus everything except unemployment seemed well under control.

However none of the fundamental problems has been resolved.[1]

[1] As this is written, at the beginning of 1979, there are signs of trouble ahead, in the form of increased wage inflation and an increased budget deficit.

At present, the major issue that faces policy makers is how to make the transition, aided by the temporary availability of oil revenues, toward self-financing non-inflationary growth at full employment. Current account balance can be maintained in the 1980's if domestic demand is kept low and the unemployment rate high. The difficult decisions turn on the questions of how and when--and if possible--to expand employment without increasing inflation and driving the current account into deficit.

Two possible scenarios mark the range of opportunities. The first has been strongly espoused by the Cambridge Group. (See Kaldor, 1978, Godley and Mann, 1978, Cripps, 1977.) This school of thought advocates protectionism or trade planning to solve the longstanding problem of manufacturing industry and employment.[1] The argument is that exchange rate adjustment, because of the pass through of inflation into wages and costs, is not an effective means of changing competitiveness and employment. This view has been strongly put by Cripps who concludes:

> "...Although international trade has certainly assisted the development and dissemination of productive technology, further increases in interdependence will not necessarily be beneficial, because tendencies to structural imbalance make it very difficult to maintain trade at a sufficiently high level. There must therefore come a point at which the ability to regulate trade propensities is at least as important as that they should be high. For many countries and from a point of view of the trading system as a whole that point may now have been reached." (Cripps, 1977, p. 43)

The view has rightly been challenged (See, for example, Corbet 1977): it does not explain why reducing the real wage through protectionism does not affect workers in the same way as reducing real wages through depreciation.

At the other end of the policy spectrum is a trade-based policy that

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[1] Of course, minor forms of protectionism and pervasive exchange controls have long been in force in the U.K.

views oil revenue as the source for an upgrading of industrial structure and adopts a trade oriented strategy. That approach would typically go hand in hand with increased EEC participation and membership in the EMS. Such a policy has in the shortterm to face up to the issue of whether exchange rate policy should be managed to allow the oil revenue to float sterling up and inflation down, or whether, in the interest of manufacturing, the real exchange rate should be kept pegged or better yet undervalued.

The question of manufacturing and how to make or keep that sector competitive is central to short and medium term policy making. The choice of a real exchange rate is important, as is the question of investment and growth in industrial productivity. The shortterm factor of the low level of domestic demand, including in particular the low level of (non-oil related) investment, operates against the policy target of a strong manufacturing sector. The other factor operating against an increasingly vigorous manufacturing sector is the failure to achieve a fall in the real exchange rate. The under-valuation which was a factor in growth in Germany in the 1960's has been impossible because of the combination of persisting relatively high inflation and appreciation, the latter being due to slack in domestic demand and prospects of a substantial current account improvement due to oil. These factors have caused sterling to keep from depreciating in real terms on a significant scale and therefore have failed to give rise to an export boom that might be the foundation of a take-off for manufacturing. Moreover, based on the performance of the seventies, there is really little prospect that such a depreciation will be forthcoming under circumstances that will not at the same time involve sharply rising real labor costs and domestic expansion. This is suggested by the external balance prospect laid out in Table 21.

The table shows the official liabilities, capital and interest, that fall due over the next few years. These peak in 1980 at about £ 5 billion. Against these external charges we have the impact of oil exploitation on the current account. Estimates of the current account impact are reported in the second column. It is quite apparent that the order of magnitude of the impact of oil substantially dominates the external debt service and repayments and that accordingly there is leeway in the current account either

Table 21: Basic Balance Prospects
(£ billion)

	Interest and Capital Repayment on Official Borrowing	Current Account Oil Impact*
1978	2.1	4.5
1980	5.0	7.5
1982	3.7	8.5
1985	1.5	9.5

Note: * at 1977 prices

Source: Bank of England Quarterly Bulletin, Sept. 1978. Table 23.2-3, and OECD Economic Surveys, United Kingdom, 1978, 1978, p. 56.

for demand expansion--consumption or investment--or else for appreciation. Given the pervasive concern with inflation there is reason to believe that a path involving both (real) appreciation and increased investment will be chosen, but that substantial demand expansion is not really in sight.

The elimination of exchange control would clearly be another option in offsetting the effect of North Sea Oil on sterling and manufacturing competitiveness. If elimination of exchange control led to stability of

the real exchange rate or even to some depreciation, without at the same time lowering assets prices relative to replacement cost in manufacturing, then one might see in this policy both a means toward increased employment and at the same time a move toward more efficient resource allocation. There is really no presumption that this is not a good time to open up the economy, although this flies, of course, in the face of the "New Cambridge" cave-strategy.

Can increased investment together with real appreciation solve the employment problem? Investment may well make labor more productive and thereby create external demand; at the same time, though, investment is likely to be labor saving and to that extent there is an offsetting reduction in employment. And real appreciation reduces the expansion of exports. On balance therefore it is not apparent that the employment problem will be fully answered by an investment oriented strategy; but if demand is (as it should be) to be expanded, policies that shift the output mix to investment--and thus tend to increase productivity--should be preferred.

APPENDIX I

This appendix lays out a simple framework in which to investigate the relationship between real wages, competitiveness, employment and external balance. The discussion centers around real wage demands and firms' pricing behavior that imply a relationship on the supply side of the economy between employment and the terms of trade.

We start with the real wage demanded by labor, W/P which we take for the present as exogenous at the level w:

$$W = wP \tag{1}$$

where W, P and w denote money wages, the general price level and the real wage rate. The general price level is a function of domestic prices and import prices:

$$P = P_d^a P_m^{1-a} \tag{2}$$

where a denotes the expenditure share of domestic goods. The price index in (2) implies that an equiproportionate rise in import prices and domestic prices will raise the price level in that proportion and, by (1) will increase money wages in that proportion. Next we consider pricing behavior by firms. We assume markup pricing, with a markup that depends on the GNP gap, $y/\bar{y}$:

$$P_d = W^{\phi} P_m^{1-\phi} (1+z(y/\bar{y}))/A \tag{3}$$

where z denotes the markup and A is a measure of productivity. Combining equations (1) to (3) gives us an equation for the relative price of domestic goods in terms of imports, $P_d/P_m=p$:

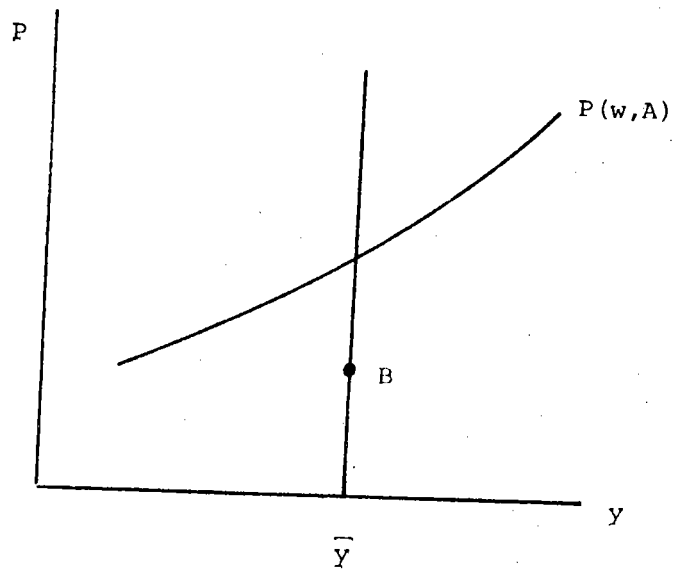
$$P_d/P_m = p = w^{\phi x} ((1+z(y/\bar{y})/A)^x \qquad x = 1/(1-a\phi) \tag{4}$$

This equation describes the supply side of the economy and shows that the terms

of trade compatible with real wage demands and firms' desired markup depend on productivity, A, real wages, w and the GNP gap.

It is immediately apparent that an economy characterized by this supply side may not possess enough flexibility to achieve internal and external balance. The flexibility in the terms of trade required to achieve full employment and external balance may conflict with the terms of trade set in the labor market.

This point is illustrated in Figure 1 where we show the terms of trade defined in equation (4) for a given level of real wages, w, and productivity. Suppose the full employment terms of trade compatible with internal and external balance were at point B. Under these circumstances adjustment may either require protracted high unemployment to reduce real wages, w, or a policy that seeks to increase productivity, A, without offsetting gains in real wages. Either outcome would lead to a decline in the full employment terms of trade.



APPENDIX 2

This appendix brings together the empirical work discussed in the text. Many of these equations parallel work reported in the many British sources referred to above.

1. The Budget and the Current Account

Using annual data for the period 1956 to 1977 we estimated an equation with the current account, CA, as the left hand side variable and the budget deficit, BD, as the explanatory variable:

(1) $$CA = \underset{(2.13)}{340.5} \; \underset{(-5.14)}{-.28BD}$$

$R^2 = .57$ DW = 2.35 $Rho_1 = .34$, $Rho_2 = -.47$

t-statistics in parenthesis.

where Rho_1 and Rho_2 are the estimated coefficients in the correction for second order serial correlation.

The equation thus confirms strongly the effect of the budget deficit on the current account, but the coefficient is less than one third.

2. Current Account Equation

Our equation for the current account, reported below, was estimated on quarterly data for the period 1968:1-1977:4:

(2) $$CA/GDP = \underset{}{.29} + \underset{(5.9)}{.24U} + \underset{(2.5)}{.17Y^*} \underset{(-3.8)}{-.004TIME} \underset{(-3.2)}{-.10P_M} \underset{(-3.9)}{-.24COMP}$$

$R^2 = .75$ DW=2.1 $Rho_1 = .66$ $Rho_2 = -.33$

where

U	unemployment rate
Y*	the log of the OECD index of industrial production
TIME	a time trend
P_M	the log of the price of materials relative to the GDP deflator
COMP	log of the IMF index of UK competitiveness in manufacturing entered as a second order polynomial with seven lags.

3. Exchange Rate Equation:

Our exchange rate equation is estimated on quarterly data for the period 1971:4 to 1978:3 :

$$(3) \quad EER = \underset{(2.5)}{2.87} + \underset{(15.6)}{1.00}EER_{-1} + \underset{(2.6)}{(7.3E\text{-}6)}R + \underset{(1.2)}{.009}D - \underset{(-2.5)}{.47}COMP_{-1} \underset{(-1.9)}{-.21}(\$/DM)$$

$R^2 = .97$ DW=2.01 SER=.03

where

EER	log of the effective exchange rate
R	the level of reserves
D	the covered differential against sterling (interbank/Euro-$s.)
$/DM	the dollar-deutsch mark rate

The equation explains changes in the effective rate in terms of the lagged rate, lagged official reserves, the covered differential against sterling, competitiveness and the dollar-deutsch mark rate.

The last two serve as indicators of speculative pressure on sterling and on the dollar. The former leads sterling to depreciate in terms of the effective rate, the latter leads to a depreciation of sterling that is proportionately less than the change in the dollar-mark rate. A gain in reserves leads to an appreciation as does a gain in competitiveness.

4. Intervention:

Our intervention equation is estimated on quarterly data for the period 1969:4 to 1978:2. It uses as dependent variable the change in net reserves; that is the change in reserves less official borrowing:

(4) $$RN = \underset{(-.2)}{-119.3} \quad \underset{(-1.6)}{-93.0DP} \quad \underset{(-1.4)}{-34.0\ AP} \quad + \underset{(-2.3)}{.24\ RN_{-1}}$$

$$R^2 = .29 \qquad DW = 2.03 \qquad Rho_1 = .6 \qquad F(3/31) = 4.18$$

where

RN	net reserves
DP	the change in the effective exchange rate, when that change is positive (i.e. sterling depreciates). zero otherwise
AP	the change in the exchange rate when sterling appreciates.

The equation, while not spectacularly successful, shows a tendency for intervention in defence of a depreciating exchange rate and a significant effect of an appreciating exchange rate on the extent of intervention. The authorities appear to intervene more strongly to prevent depreciation than appreciation, although the difference between the coefficients on the increasing and depreciating exchange rate is not statistically significant. The magnitude of the lagged stock of net reserves exerts a statistically significant influence

on the extent of intervention though it should be realized that on average the net stock of reserves is small: its mean value over the period is £141 million. The equation suggests that the authorities will intervene within a quarter at the rate of £93 million as the exchange rate falls at the rate of 1% per quarter).

5. The Price Equation:

Our price equation is estimated over the period 1967:1 to 1977:4. The dependent variable is the quarterly inflation rate of the retail price index. The explanatory variables are distributed lags on wages and import prices:

$$\dot{RPI} = \underset{(.03)}{.0} + \underset{(5.0)}{.79\dot{W}} + \underset{(2.8)}{.18\,\dot{IP}} \qquad (5)$$

$$R^2 = 0.66, \quad DW = 1.89.$$

where $\dot{RPI}$ the quarterly inflation rate of retail prices

$\dot{W}$ wage inflation

$\dot{PI}$ inflation of import prices

wage and import price inflation are entered as second order distributed lags with respectively five and four lags. The sum of coefficients and their t-statistics are reported above. The equation supports the notion that exchange rate management through the resulting influence on import price inflation exerts a strong, systematic and rapid effect on domestic inflation. Reducing the rate of import price inflation by five percentage points reduces domestic price inflation directly by one percentage point. There will be further deceleration of inflation to the extent that money wage inflation declines.

6. Wage Equations

Equations for quarterly average earnings inflation were estimated for the period 1970:1 to 1978:1. We report here only one typical equation:

$$(6) \qquad \dot{W} = \underset{(2.8)}{-.81} \; \underset{(-3.0)}{-.16\,U} \; \underset{(-2.3)}{-.37(W/RPI)_{-1}} \; \underset{(2.6)}{+.005\text{Time}} \; \underset{(-4.3)}{-.34\Delta U} \; \underset{(.9)}{+.12\,\dot{RPI}}$$

$$R^2 = .68 \qquad DW = 1.94 \qquad Rho_1 = .28$$

where

U is the log of the unemployment rate, second degree polynominal with seven lags.

ΔU quarter to quarter change in U.

W/RPI log of real average earnings

$\dot{RPI}$ annual RPI inflation

The equation reflects both the impact of protracted unemployment and of current changes in unemployment as dampening factors in wage inflation. A higher level of the real wage exerts a dampening effect while higher inflation raises the rate of wage increase. All coefficients, with the exception of the inflation term, are significant. They all have the expected sign. The equation is surprising, given the discussion in the literature, in that it shows a substantial effect of unemployment on wage inflation. It is also surprising in that inflation does not appear to be significant explanatory variable. The most serious problem, however, with an equation such as (6) is that it possesses very little stability when estimated over a longer sample period.

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