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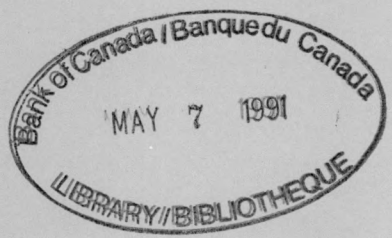

Terms of Trade Movements in Major Industrial Countries, 1969-89

by
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April 1991

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Abstract

This paper examines **absolute** and **relative** terms of trade movements in twelve major industrial countries over the 1969-89 period. The results suggest that simple correlations between movements in a country's absolute terms of trade and those of world oil and non-oil commodity prices may at times give a very misleading impression of the magnitude, and even the direction, of exchange rate pressures exerted by such commodity price changes. Simple measures of the variability of a country's absolute terms of trade may also give a biased impression of the costs associated with entering a fixed exchange rate or common currency arrangement.

The relative terms of trade measures presented in this paper are designed to overcome these difficulties. The quantitative results and variance/covariance relationships that are obtained from the analysis have considerable intuitive appeal and suggest that the relative terms of trade measures may prove more useful than their absolute counterparts for certain analytic purposes.

Résumé

La présente étude porte sur les variations des termes de l'échange **absolus** ou **relatifs** de douze grands pays industriels pour la période 1969-1989. À en juger par les résultats obtenus, les corrélations simples entre les mouvements des termes de l'échange absolus d'un pays et les modifications des prix mondiaux du pétrole et des autres produits de base donnent parfois une fausse impression de l'ordre de grandeur et même de la direction des pressions que ces modifications de prix exercent sur le taux de change. De même, les mesures simples de la variabilité des terms de l'échange absolus peuvent offrir une vue déformée des coûts rattachés à la conclusion d'un accord portant sur des taux de change fixes ou sur une monnaie commune.

Les mesures des termes de l'échange relatifs décrites dans cette étude ont été conçues en vue de surmonter les difficultés signalées. Les résultats d'ordre quantitatif et les relations variance-covariance dégagées de l'étude présentent un très grand intérêt sur le plan de l'intuition et laissent croire que ces mesures peuvent éclairer davantage certains types d'analyses que ne peuvent le faire les mesures des termes de l'échange absolus.

Terms of Trade Movements In Major Industrial Countries 1969 - 89

I. Introduction

Over the past couple of years the merits of fixed versus flexible exchange rates have become a subject of increasing interest and frequently vigorous debate. The revival of this issue has been spurred by the move towards monetary union in Western Europe and, to some extent, by the need to consider the kind of exchange rate regime that might be most appropriate for the emerging market economies of Eastern Europe.

The optimum currency area literature of the early 1960s sought to identify the principal economic factors that should influence the choice between fixed and flexible exchange rates between any two areas.[1] From this literature emerged a view that a country might well prefer a flexible exchange rate regime if it were prone to important disturbances to its terms of trade; that is, to the price of its exports relative to the price of its imports. The gist of the argument is that movements in the nominal exchange rate could serve to insulate a country's domestic economic performance -- including aggregate output, employment and inflation -- from movements in its terms of trade arising from shifts in the relative world prices of its major imports and exports. This implies that adoption of a fixed exchange rate regime versus any country that does not experience identical terms of trade movements will involve a cost in terms of greater variability of overall economic performance than could be attained under a flexible exchange rate regime.

Against this cost, and the loss of monetary policy freedom to respond to other kinds of shocks, would need to be weighed various advantages of a fixed exchange rate regime or the formation of a common or single currency area.[2] These include the reduction or elimination of currency risk, reduced transactions costs and,

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1 See, e.g., R. Mundell (1961), "A Theory of Optimum Currency Areas", *American Economic Review* 60, and R. McKinnon (1963), "Optimum Currency Areas", *American Economic Review 53.*

2 These advantages are discussed in the context of European economic and monetary union in Commission of the European Communities (1990), "One market, one money", *European Economy* no.44

in some cases, the potential benefit of "imported" monetary policy credibility. In addition, it can be argued that, to the extent that a country is able to influence the world prices of its imports or exports, adoption of a fixed exchange rate may reduce the variability of its terms of trade. Usually, however, the countries that do consider fixing their exchange rates are unlikely to be in such a position.

II. Absolute versus Relative Terms of Trade Movements

Abstracting from the various other economic, as well as non-economic considerations influencing a country's choice of exchange rate regime, it might be argued that countries with fairly stable terms of trade would be good candidates for adopting fixed exchange rates. In this context it has been observed[3] that Canada's terms of trade are much less volatile than those of most industrial countries, including several European countries that have already opted in favour of semi-fixed exchange rate arrangements.

Movements in the conventional terms of trade, referred to in this paper as the absolute terms of trade, may well act as a guide to pressures exerted on a country's real or nominal exchange rate vis-à-vis the rest of the world. However, the exchange rate measures which are normally used, particularly in discussions of optimum currency areas, tend to focus on a much narrower group of countries. The contention in this article is that, in order to gauge properly the pressure exerted by terms of trade movements on a country's exchange rate against a particular group of countries, it is important to take into account the simultaneous movements in the terms of trade of those countries. A country's absolute terms of trade, and its terms of trade relative to those of its major trading partners (hereafter referred to as its relative terms of trade) may in fact move quite differently.[4] As a result, movements in the absolute

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3 R. Mundell (1990), "The Overvalued Canadian Dollar", mimeo

4 Clearly this issue would not arise in a two-country model or, equivalently, in a model in which the trade partners of the country in question were homogenous or typical of the world at large. In practice this is unlikely to be the case.

terms of trade may give a misleading impression of the kinds of pressures exerted by world price movements on exchange rates and of which countries might be suitable candidates for adopting fixed exchange rate regimes.

For example, consider the impact of a rise in the world price of oil on the French franc. Given France's dependence on imported oil, its overall terms of trade would deteriorate. It does not immediately follow that the franc would come under downward pressure (at least in real terms) versus the currencies of its major trade partners, since, as substantial net oil importers, they also would be experiencing important deteriorations in their terms of trade. Indeed, if France's major trade partners were even more adversely affected, the franc might strengthen. In other words, whether a country's real exchange rate rises or falls in response to a terms of trade disturbance will depend very much on whether its terms of trade rise or fall relative to those of its major trading partners.

In this light an optimum currency area is much more likely to exist between two countries whose terms of trade movements relative to one another are small, even if their terms of trade move substantially vis-à-vis other countries, than between countries that experience large relative movements in their terms of trade. Taking this into consideration, the main findings in this paper are that:

* Most European countries' absolute terms of trade movements are highly correlated, resulting in fairly small movements in their relative terms of trade. This tends to support the view of the European Community as an optimum currency area. A notable exception is the United Kingdom.
* Neither Canada nor Australia are obvious candidates for adopting fixed exchange rates versus any other major country. As important exporters of raw materials, their absolute terms of trade tend to move in the opposite direction of most other industrial countries, resulting in large relative terms of trade movements.
* For the United States, Japan and Germany, the range of movement in their terms of trade versus one another argues against the setting of

bilateral exchange rate targets. Nonetheless, it should be noted that these countries in particular are likely to have some ability to set or influence prices in world markets, with the result that movements in their exchange rates will affect their terms of trade. Reducing the extent of exchange rate movement between these currencies could, therefore, also have the effect of reducing the volatility of their terms of trade movements.

This paper examines the absolute and relative terms of trade movements of a group of twelve major industrial countries over the 1969-89 period. In sections IV and V, the variability of various industrial countries' absolute terms of trade is examined, together with the correlation between such terms of trade movements and the movements of oil and non-oil commodity prices. In section VI, the co-variability of these countries' terms of trade and the variability of their relative terms of trade are considered. Section VII examines the correlation between each country's relative terms of trade and oil and non-oil commodity prices.

III. The Sample

The countries covered in this investigation include the members of the G-10 (Canada, the United States, Japan, Germany, France, Italy, the United Kingdom, the Netherlands, Belgium and Sweden) plus Switzerland and Australia. The G-10 plus Switzerland are included because they account for a large proportion of world trade and economic activity and because data for these countries are relatively accessible. Australia is added partly because of its economic size (about the same as the Netherlands) but mainly because, like Canada, its exports are exceptionally concentrated in primary commodities. Altogether, the countries examined account for about ninety per cent of the GNP of OECD countries.

The choice of sample period for the analysis also deserves a word of explanation. The 1979-89 subperiod was selected mainly because its beginning corresponds to the inception of the European Monetary System (EMS), while the 1969-

79 subperiod was chosen so that it would be equal in length to the later period. It might be noted that the statistical results did not differ significantly whether quarterly or annual data were used, so only the latter are presented. Annual data were preferred because quarterly data might have produced spurious correlations as a consequence of some data being seasonally adjusted while others were not. The sources and definitions of the variables used are given in the appendix.

IV. The Absolute Terms of Trade of Industrial Countries and Commodity Prices

The absolute terms of trade are defined as the ratio of a country's export prices to its import prices. Changes in the terms of trade can come about in two basic ways. The first is through movement in the country's exchange rate. If the country is a price-setter for at least some if its exports (or, possibly, for some of its imports) then movements in its exchange rate will not lead to proportional changes in its import and export prices, with the result that its terms of trade will be affected. Most countries, even among the industrial group of countries, are generally regarded as being price-takers for most goods. In consequence, movements in their exchange rates would leave relative world prices and their own absolute terms of trade largely unaffected.

Exogenous movements in the world prices of a country's imports and exports are the second way of affecting its absolute terms of trade. Most industrial countries are thought of as net importers of oil and non-oil commodities. In this case, a rise in oil or non-oil commodity prices would tend to raise the price of imports relative to export prices, leading to a fall in the terms of trade. There is, therefore, a strong presumption that most industrial countries' absolute terms of trade are negatively correlated[5] with oil and non-oil commodity price movements.

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5 The correlation between two variables is a measure of whether they tend to move in the same or in opposite directions. For example, a correlation of -1.0 between the U.S. terms of trade and oil prices would indicate that the U.S. terms of trade always rise above average when oil prices fall below average. A correlation of +1.0 would indicate that the terms of trade and oil prices always moved in the same direction.

The correlations shown in Table I are, indeed, negative for most industrial countries, but there are considerable differences from country to country and from subperiod to subperiod. It should also be noted (see the bottom of Table I) that in the 1969-79 subperiod, oil and non-oil commodity prices were very highly correlated, which may largely account for the fairly strong negative correlation between most industrial countries' terms of trade and non-oil commodity prices in the 1969-79 subperiod (as well as for the entire 1969-89 period). In contrast, in the later 1979-89 subperiod, during which there was virtually no correlation between oil and non-oil prices, most industrial countries' absolute terms of trade and non-oil commodity prices were quite weakly correlated.

Some of the decline in terms of trade correlation with non-oil commodity prices in the latter subperiod may also reflect a decline in European Economic Community (EEC) and other western industrial countries' relative trade dependence on imports of agricultural products and on exports of manufactured goods. In part this is because the Common Agricultural Policy of the EEC, for example, has tended to draw resources in member countries away from manufacturing and into agriculture. Another factor has been the emergence of a number of developing countries as important competitors in international markets for manufactured goods.

The average sensitivity of industrial countries' terms of trade to oil price movements also decreased over the 1969-89 period, reflecting a generalized increase in the efficiency of energy use and a diversification away from oil in particular as a source of energy. In addition, the United Kingdom has gone from being a major oil importer to being a net exporter. The development of offshore oil and gas deposits in the Netherlands and Australia has also had a noticeable effect on the sensitivity of their absolute terms of trade to oil price movements.

In the case of the United States, the reduction in the correlation between the terms of trade and oil prices reflects both the development of Alaskan North Slope oil deposits and the effects of deregulation of domestic oil and gas prices. In contrast,

the positive correlation between Canada's absolute terms of trade and oil prices has weakened sharply over the past twenty years, perhaps reflecting the decline in Canada's position as a net oil exporter, even though Canada's net exports of other forms of energy (gas and electricity, whose prices do not move very closely with that of oil) have increased.

V. Variability of the Terms of Trade of Industrial Countries

Table II indicates that very large movements occurred in oil and non-oil commodity prices over the 1969-89 period. Comparing the 1969-79 and 1979-89 subperiods, however, prices were about three times more volatile in the earlier period than in the later one. Moreover, although oil prices were more than twice as volatile as non-oil commodity prices over the full 1969-89 period, oil prices were slightly more volatile relative to non-oil commodity prices in the 1979-89 subperiod than in the 1969-79 subperiod.

The decline in the volatility of oil and non-oil commodity prices between the 1970s and 1980s suggests that the variability of most countries' absolute terms of trade also declined. Table III shows that this was indeed the case; on average, the standard deviation[6] of industrial countries' terms of trade fell by about one third while the range[7] of terms of trade movements fell by about one-quarter. In addition, given the dominance of oil price volatility in both subperiods, it might be expected that the countries with the most volatile terms of trade through the 1970s and 80s would be those whose terms of trade were most strongly correlated with oil prices. As seen from Table I, these would include, in the 1969-79 subperiod, the United States, Italy, Japan and the Low Countries (Netherlands and Belgium). In the more recent

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6 The standard deviation is a measure of the dispersion of observed values of a variable about their average value. The figure in Table III of 22.6 given for Japan for 1969-89, for example, indicates that about two-thirds of the observed values of Japan's terms of trade during the period fell within 22.6 per cent of the average for the period.

7 The range is the difference between the highest and lowest observed values.

subperiod, Japan, Germany, France and Italy showed the strongest terms of trade correlations with oil prices.

The ranking of countries in Table III, according to the variability of their terms of trade, does roughly conform to expectations, with the striking exception of Australia. One reason behind the very high ranking for Australia in both subperiods could be that the commodity prices relevant to Australia's terms of trade may be much more volatile than suggested by the commodity price index used in this analysis, which is a global index including a very wide range of products. This might also help explain the surprisingly low correlation between Australia's terms of trade and non-oil commodity prices, particularly during the 1969-79 subperiod.

Whatever the factors accounting for the differences in measured terms of trade variability, it is evident from Table III that, over the 1969-89 period, Japan and Australia had by far the most variable absolute terms of trade (though Australia's were much more muted over the past ten years). By comparison, Canada's absolute terms of trade were not particularly volatile. Indeed, during the 1979-89 subperiod, Canada's terms of trade variability, like that of the United Kingdom, fell to among the lowest of the G-10 countries. It may also be noted that, during this period, Canada's terms of trade variability was roughly on a par with those experienced by the smaller European countries that entered the EMS in 1979.

VI. Variability of the Relative Terms of Trade of Industrial Countries

As discussed at the beginning of this paper, pressures on a country's exchange rate and the case for maintaining a flexible exchange rate regime are likely to depend importantly on how closely movements in the country's absolute terms of trade correspond to those of its major trading partners.

Table I showed that for most countries, absolute terms of trade movements were quite strongly negatively correlated with those of oil prices over the 1969-89 period. Important exceptions during the 1969-79 subperiod were Canada,

Switzerland and the United Kingdom. During the 1979-89 subperiod the major exceptions were the United Kingdom, Canada and Australia. This suggests that in most cases, the terms of trade of industrial countries were strongly positively correlated with one another. In other cases, particularly those of Canada and the United Kingdom, the correlation is likely to have been quite weak.

It is apparent from Table IV that the terms of trade of nearly all the major industrial countries were indeed strongly correlated with those of their G-10 trading partners over the two decades. The notable exceptions are Canada throughout the 1969-89 period, Switzerland during the 1969-79 subperiod, and the United Kingdom and Australia during the 1979-89 subperiod.

Table V indicates the variability in the movements in each country's absolute terms of trade relative to a weighted average of the terms of trade of its major trading partners. A comparison of the rankings in this table with the rankings in Table III reveals some striking differences. Particularly noteworthy are the changes in ranking for Canada, the United Kingdom and Italy. In the case of Italy, although its terms of trade were amongst the most variable over the 1969-89 period, its relative terms of trade were far less variable (particularly in the 1979-89 subperiod) reflecting the close correlation between its absolute terms of trade movements and those of its major trading partners, as well as the similar magnitudes of these movements. The reverse is true for Canada throughout the 1969-89 period and for the United Kingdom during the 1979-89 subperiod, in which it became a major oil exporter. In Canada's case in particular, the striking change in its ranking across the two tables stems from the fact that although its own terms of trade were not very volatile, they generally moved in the opposite direction from those of its major trading partner, the United States. Since the U.S. terms of trade were fairly volatile in the 1969-79 subperiod in particular, large movements occured in Canada's terms of trade relative to those of the United States.

The results in Tables IV and V taken together suggests a useful way of grouping countries. We can think of the typical industrial country as a net exporter of manufactured goods, heavily dependent on oil imports and, to much lesser degree, on non-oil commodities (importing raw materials but exporting food). Most European countries fit this description and, consequently, experience terms of trade movements of similar magnitudes and in the same direction. As a result, there is little relative movement in their terms of trade, largely removing terms of trade considerations as an obstacle to the formation of a fixed exchange rate zone among them.

Compared with this typical industrial country, Japan can be viewed as "super industrial," with even more pronounced trade imbalances for manufactures and non-oil commodities than the typical industrial country. In consequence, although Japan's terms of trade movements are in the same direction as those of the typical (European) industrial country, they are much more pronounced, resulting in large movements in its relative terms of trade.

Somewhat in the other direction would lie countries such as the Netherlands and (at least in the 1979-89 subperiod) the United States, which have a higher degree of self-sufficiency in the production of oil or non-oil commodities, and a correspondingly lower concentration of net exports in manufactured goods.

Much further in this direction are countries such as Canada, Australia and the United Kingdom, with trade structures quite dissimilar to that of the typical industrial country. These countries therefore experience large movements in their terms of trade relative to the terms of trade of other developed countries.

The calculations in Table V provide a useful perspective on the differing degrees to which the effective exchange rates of various industrial countries may be exposed to pressures from terms of trade movements. The optimum currency area literature, however, tends to focus on bilateral exchange rates. In addition, within the EMS, the bilateral exchange rates of member currencies versus the deutschemark tend

to be accorded greater importance than are more broadly based measures of exchange rates. For these reasons, bilateral measures of relative terms of trade variability were calculated, as shown in Table VI.

As can be seen by comparing Tables V and VI, the difference between the multilateral (G-10) measure of Canada's relative terms of trade variability and the bilateral measure versus the U.S. terms of trade is marginal, given the preponderance of the U.S. terms of trade in the multilateral calculation for Canada. For many other countries, however, with much more diversified import and export markets, the bilateral and multilateral calculations are noticeably different.

It can be seen from Table VI that although movements in Canada's terms of trade relative to those of the United States were less pronounced in the 1980s than during the 1970s, they nonetheless remained several times larger than the movements of most European countries' terms of trade relative to Germany's. Exceptions were the United Kingdom and the Netherlands. In the case of the Netherlands, it may also be noted that its terms of trade declined by over 15 per cent relative to Germany's over the 1981-89 period. Given the limited scope for adjustment within the EMS in the guilder/deutschemark nominal exchange rate, this relative decline in the Netherlands' terms of trade probably contributed to the slow growth of the Dutch economy through the 1980s and to the fall in the Netherlands' inflation rate relative to Germany's.[8]

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8. Over the 1979-89 period, real GDP growth in the Netherlands averaged 1.6% compared with an average of 3.7% over the 1969-79 period. Inflation, as measured by the GDP deflator, fell from an average rate of 4.1% (compared with 3.7% in Germany) in the 1979-84 period to an average rate of 1.0% (compared with 2-3% in Germany) in the 1984-89 period. See also DeGrauwe and Vanhaverbeke, "Exchange Rate Experiences of Small EMS Countries: Belgium, Denmark and the Netherlands" in Argy, Vanhaverbeke, and P. DeGrauwe, eds., (1990), *Choosing an Exchange Rate Regime: The Challenge for Smaller Industrial Countries*, IMF.

VII. The Relative Terms of Trade of Industrial Countries and Commodity Prices

Exchange rates, by definition, are relative prices. As such, exchange rate movements should be more closely related to changes in the relative circumstances of different countries than to changes in their absolute circumstances. This suggests that the exchange rates of industrial countries vis-à-vis other industrial countries are more likely to be influenced by the relative terms of trade effects of oil or non-oil commodity price movements than by the effects on absolute terms of trade.

The correlations between relative terms of trade movements and those of oil and non-oil commodity prices, shown in Table VII, also suggest that, for many of the countries included, an oil or non-oil price disturbance might very well exert pressure on the country's effective exchange rate opposite to the movement in its terms of trade. During the 1979-89 subperiod, for example, although the terms of trade of the United States and all the small European countries were negatively correlated with oil prices, their relative terms of trade tended to improve as oil prices increased.

It is also interesting to note that even though Canada's terms of trade were positively correlated with oil prices in the 1979-89 subperiod, while those of the Netherlands were negatively correlated, the Netherlands' relative terms of trade were more strongly correlated with oil prices than were Canada's. This seeming anomaly simply reflects the differences in the two countries' trading partners. The terms of trade of the Netherlands' major trading partners (Germany, Belgium and France) tend to be more negatively correlated with oil prices than are the terms of trade of Canada's principal trading partner, the United States.

VIII. Concluding Comments

The examination of terms of trade movements in this paper suggests that simple correlations between movements in a country's terms of trade and those of world oil and non-oil commodity prices may at times prove misleading as to the magnitude and even the direction of exchange rate pressures exerted by such price

movements. Similarly, simple measures of a country's terms of trade variability may give a misleading impression of the costs associated with entering a fixed exchange rate or common currency arrangement.

These problems arise because the movements in a country's terms of trade versus the world - its absolute terms of trade - do not necessarily give a very clear picture of the movements in a country's terms of trade relative to a much narrower group of countries or, in the extreme case, relative to a single country. The relative terms of trade measures presented in this article are aimed at avoiding such difficulties.

Finally, the correlations and measures of variability calculated in this paper have shown very substantial movements over the past two decades. In part this reflects the differences in magnitudes, frequency and sources of shocks to world trade prices in the 1970s and 1980s. It also reflects, however, the structural shifts that have occurred within the major industrial economies over the past twenty years. A conclusion that can be drawn from this is that the past is likely to be a very imperfect guide to the future with respect to both the exchange rate consequences of world price movements and the evaluation of what may or may not constitute natural zones for fixed exchange rate or common currency areas.

A P P E N D I X

Data Definitions and Sources:

1. * The absolute terms of trade for each country is defined as the unit value of exports divided by the unit value of imports, on a national accounts basis, and were obtained from IMF, *International Financial Statistics (IFS)*, DRI and national sources.
   * The relative terms of trade for each country is defined as the terms of trade for that country divided by a trade-weighted average of the terms of trade of its G-10 (plus Switzerland) trade partners.
   * The bilateral relative terms of trade for each country is defined as the terms of trade for that country divided by the terms of trade of a single other country.

2. * Trade weights used in the calculation of a given country's relative terms of trade were based on the average shares of that country's imports and exports, over the 1981-86 period, accounted for by the G-10 countries plus Switzerland, as reported in IMF, *Direction of Trade Statistics*.

3. * The oil price index used is the unit export price index of the oil-exporting countries as reported in IMF, *IFS*.
   * The non-oil commodity price index used is the World Index, based on the 1979-81 export earnings-weighted average of 44 primary commodity prices, as reported in IMF, *IFS*. Weights for various categories of primary commodities are: food (42.9%), beverages (11.8%), metals (22%), agricultural raw materials (23.3%). For comparison, the Bank of Canada's production-weighted commodity price index for Canada has the following weights: food (34.6%), beverages (0%), metals (22.1%), forest products and minerals (43.3%).

Table I

Correlation of Industrial Countries' Terms of Trade with Oil and Non-Oil Commodity Prices 1969-89

	1969-89		1969-79		1979-89	
	oil	non-oil	oil	non-oil	oil	non-oil
Canada	.85	.87	.76	.82	.29	.36
United States	-.89	-.92	-.95	-.94	-.75	-.35
Japan	-.88	-.70	-.89	-.79	-.94	-.02
Germany	-.83	-.49	-.56	-.48	-.95	-.10
France	-.62	-.29	-.66	-.59	-.96	.03
Italy	-.83	-.75	-.89	-.90	-.95	.10
United Kingdom	.30	-.05	-.52	-.62	.89	.24
Netherlands	-.78	-.87	-.87	-.87	-.56	-.59
Belgium	-.94	-.67	-.89	-.81	-.87	.26
Sweden	-.66	-.44	-.62	-.69	-.78	.00
Switzerland	.28	.47	.44	.31	-.77	-.02
Australia	-.73	-.60	-.60	-.32	.28	.69
AVERAGE[1]	-.70	-.62	-.75	-.72	-.68	-.11
Correlation of oil prices with non-oil commodity prices		.77		.94		-.09

1. Arithmetic average using 1987 GNP/GDP weights: Canada (.036), USA (.388), Japan (.205), Germany (.096), France (.075), Italy (.065), UK (.058), Netherlands (.018), Belgium (.012), Sweden (.014), Switzerland (.015), Australia (.017)

Table II

Commodity Price Volatility 1969-89

		1969-89		1969-79		1979-89	
		Standard deviation as % of mean (S.D.%)	Range as % of mean (Range %)	S.D.%	Range %	S.D.%	Range %
(1)	oil prices	66.7	201.5	75.0	212.5	28.3	78.8
(2)	non-oil commodity prices	28.5	88.5	34.2	97.5	10.7	30.7
ratio (1)/(2)		2.4	2.3	2.2	2.2	2.6	2.6

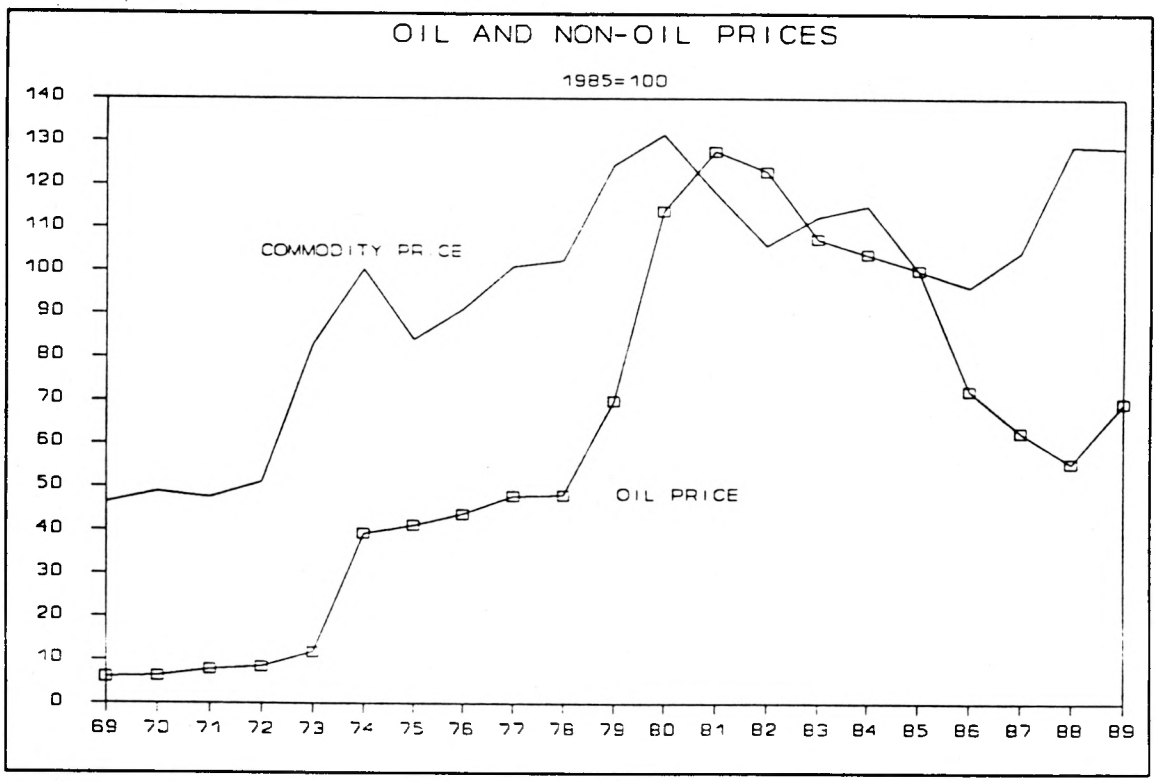

OIL AND NON-OIL PRICES
1985=100
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
COMMODITY PRICE
OIL PRICE
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89

Table III

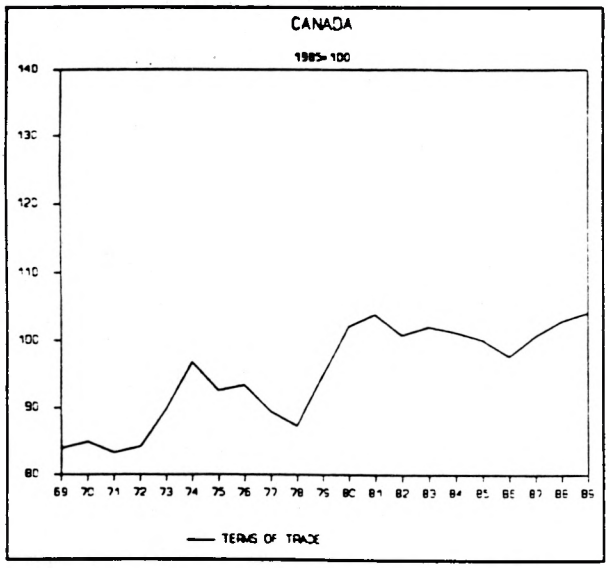
Absolute Terms of Trade Variability 1969-89

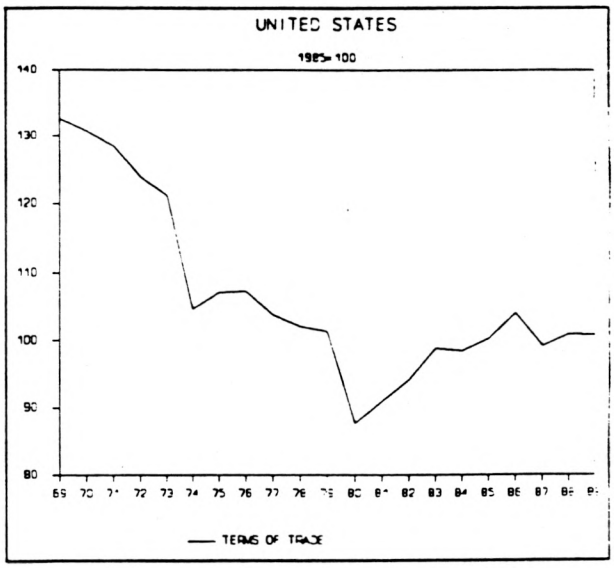
G-10 Country Rankings

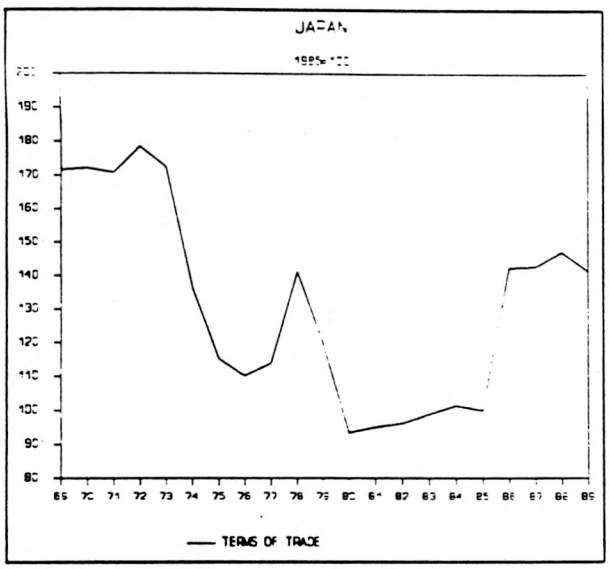
1969-89			1969-79			1979-89		
Country	S.D.%	Range%	Country	S.D.%	Range%	Country	S.D.%	Range%
Japan	22.6	64.8	Japan	19.1	46.9	Japan	19.5	46.3
Australia	21.1	83.1	Australia	14.8	50.2	Italy	8.8	22.1
United States	12.1	42.1	Italy	12.4	29.1	Australia	8.5	29.8
Italy	12.2	35.6	United States	10.8	27.1	Germany	8.5	22.2
Germany	8.3	27.8	United Kingdom	7.6	22.7	France	8.0	20.4
Canada	7.7	21.9	Germany	5.5	16.6	Switzerland	6.9	23.0
Switzerland	7.1	26.3	Canada	5.3	15.2	Sweden	5.2	14.4
France	6.5	20.2	France	4.4	15.2	United States	5.0	16.8
United Kingdom	6.2	22.1	Switzerland	4.1	14.9	Belgium	4.4	10.1
Belgium	5.2	15.8	Netherlands	3.9	12.1	Canada	2.7	9.3
Sweden	4.6	14.2	Sweden	3.8	10.3	United Kingdom	2.3	7.4
Netherlands	3.6	14.5	Belgium	2.9	7.6	Netherlands	1.9	6.6
AVERAGE[1]	11.4	37.2		9.7	25.8		6.9	20.2

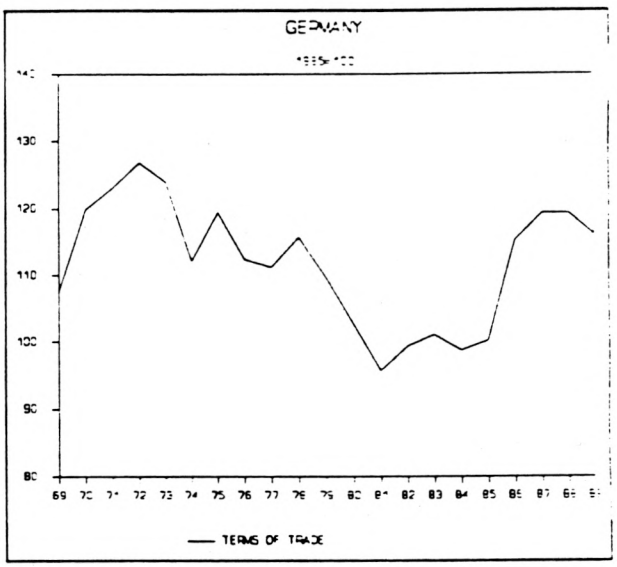
1. Geometric average calculated using 1987 GNP/GDP weights.

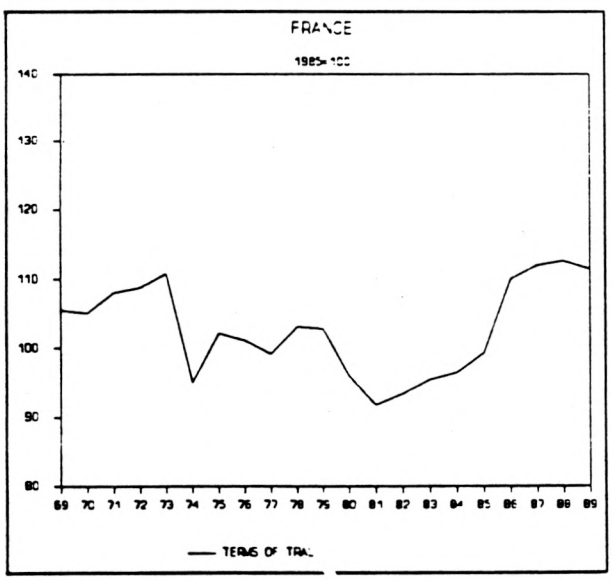
Terms of Trade of Industrial Countries
1969 - 89

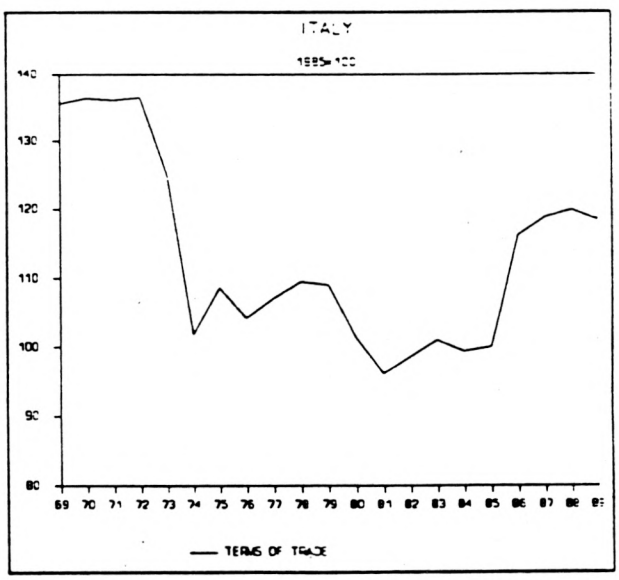


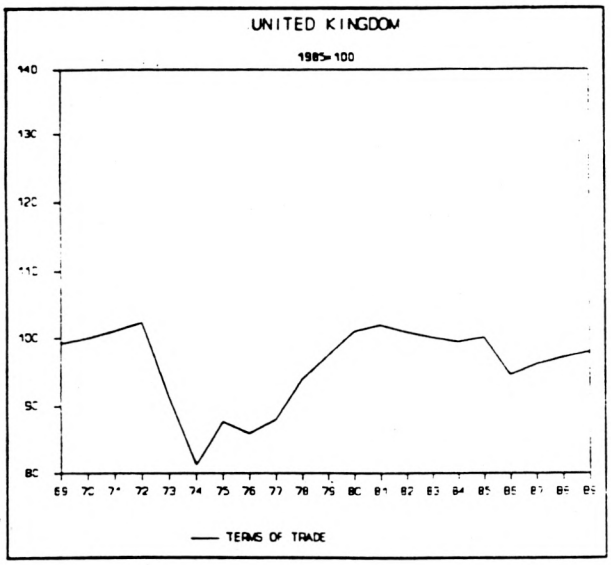








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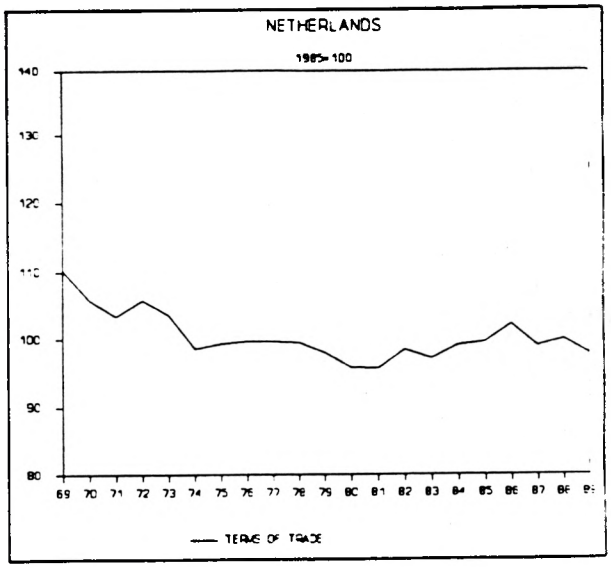
TERMS OF TRADE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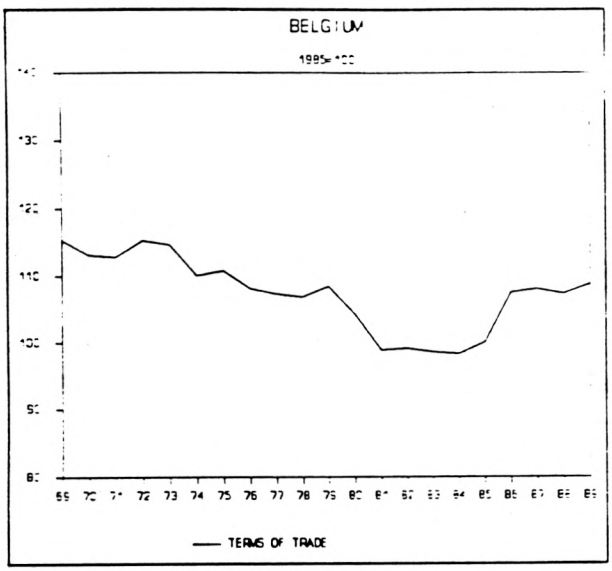
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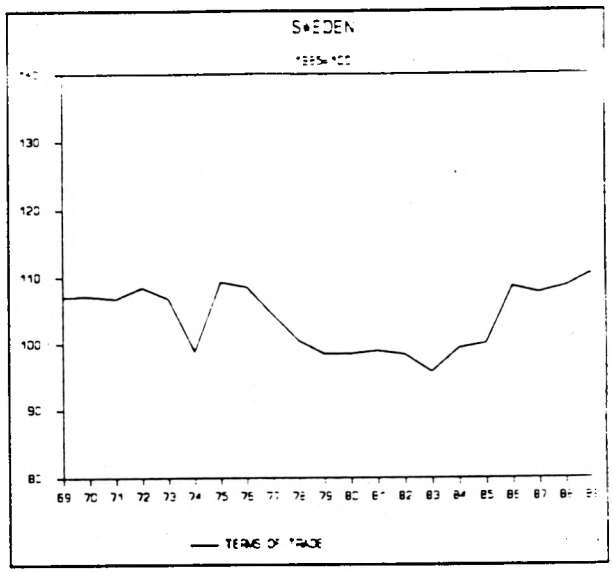
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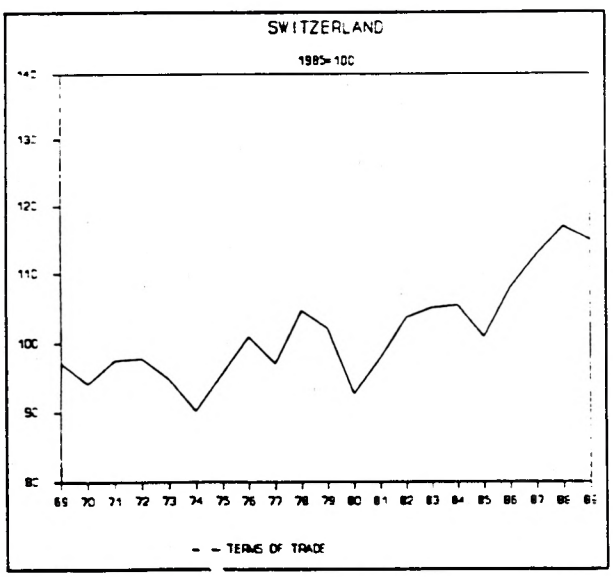
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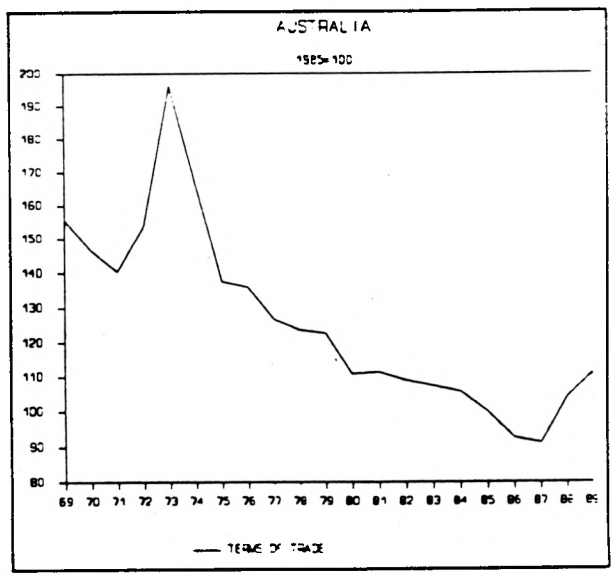
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TERMS OF TRADE

Table IV

Absolute Terms of Trade Correlations 1969-89

	1969-89 correlation with:			1969-79 correlation with:			1979-89 correlation with:		
	G-10[1]	U.S.A.	Germany	G-10	U.S.A.	Germany	G-10	U.S.A.	Germany
Canada	-.85	-.86	-.58	-.80	-.79	-.43	-.38	-.45	-.13
United States	.63	1.00	.61	.84	1.00	.42	.62	1.00	.59
Japan	.89	.85	.82	.89	.87	.56	.83	.68	.97
Germany	.77	.61	1.00	.51	.42	1.00	.97	.59	1.00
France	.82	.49	.82	.85	.70	.67	.99	.68	.98
Italy	.93	.87	.76	.93	.95	.52	.99	.62	.99
United Kingdom	-.03	.02	-.26	.74	.68	.36	-.92	-.79	-.88
Netherlands	.72	.92	.49	.73	.93	.22	.53	.79	.50
Belgium	.85	.81	.85	.84	.88	.52	.86	.44	.91
Sweden	.72	.54	.77	.51	.58	.48	.89	.52	.87
Switzerland	.02	-.35	.04	-.17	-.32	-.19	.82	.70	.78
Australia	.58	.69	.47	.52	.46	.37	-.40	-.33	-.36

1. Calculated as the correlation against the trade-weighted average terms of trade of the other G-10 countries plus Switzerland. Weights used were for 1981-86 average bilateral trade shares. See appendix for details.

Table V

Relative[1] Terms of Trade Variability 1969-89

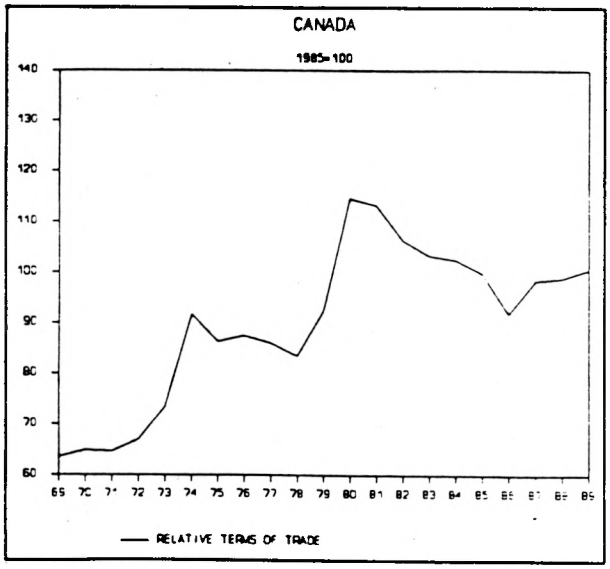
G-10 Country Rankings

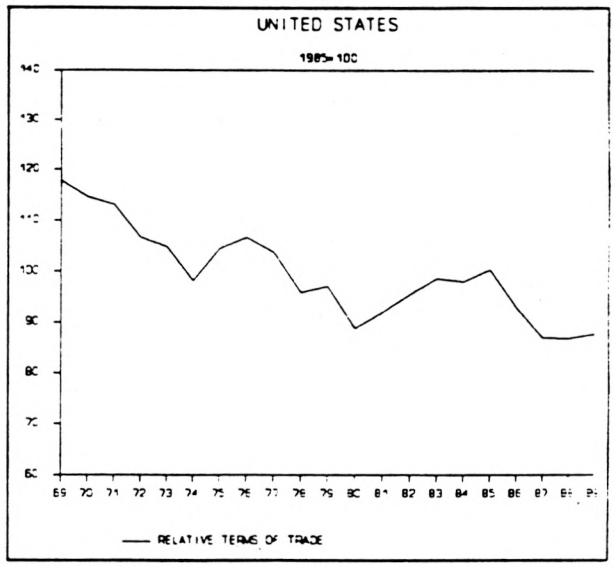
1969-89			1969-79			1979-89		
Country	S.D.%	Range%	Country	S.D.%	Range%	Country	S.D.%	Range%
Canada	17.5	56.5	Canada	14.8	36.6	Japan	16.1	36.8
Australia	16.5	62.7	Japan	12.9	35.4	Australia	14.8	40.1
Japan	15.7	42.1	Australia	12.8	36.6	United Kingdom	8.2	22.0
United Kingdom	9.9	32.6	Italy	8.2	21.1	Canada	7.1	22.3
Switzerland	9.9	29.5	Switzerland	8.0	19.9	United States	5.4	14.5
United States	9.1	31.0	United States	6.8	20.7	Netherlands	5.0	12.8
Italy	6.9	21.8	Germany	5.4	21.0	Switzerland	4.2	12.9
Germany	5.3	21.4	United Kingdom	5.3	18.3	Germany	4.0	11.1
Netherlands	4.5	12.9	Sweden	5.3	15.0	Italy	3.2	7.8
Sweden	4.2	14.7	Netherlands	3.4	11.2	Belgium	2.7	8.7
France	3.8	13.0	France	3.2	9.1	France	2.7	7.1
Belgium	3.1	12.0	Belgium	3.0	10.1	Sweden	2.4	8.3
AVERAGE[2]	8.9	29.0		7.3	21.7		6.2	16.2

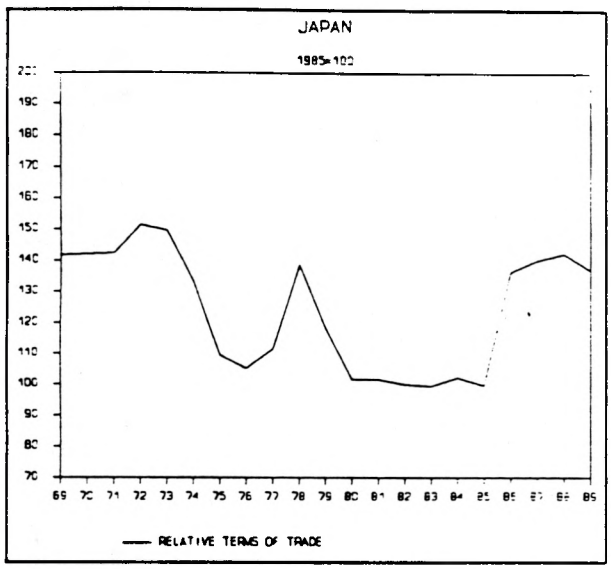
1. Terms of trade relative to a trade-weighted average of other G-10 plus Switzerland terms of trade.

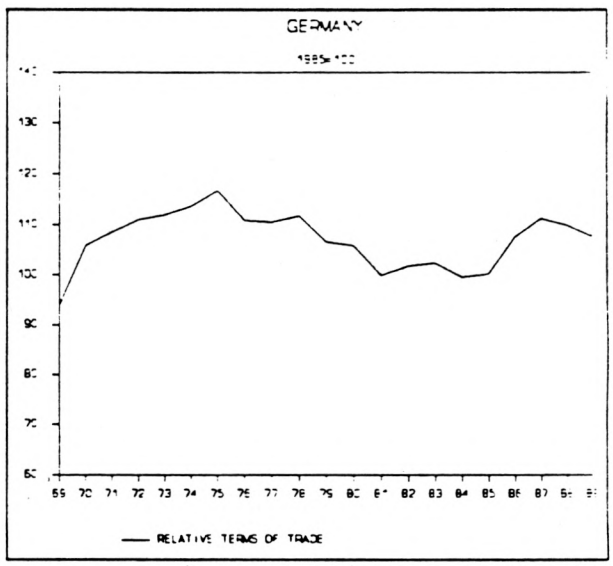
2. Geometric average calculated using 1987 GNP/GDP weights.

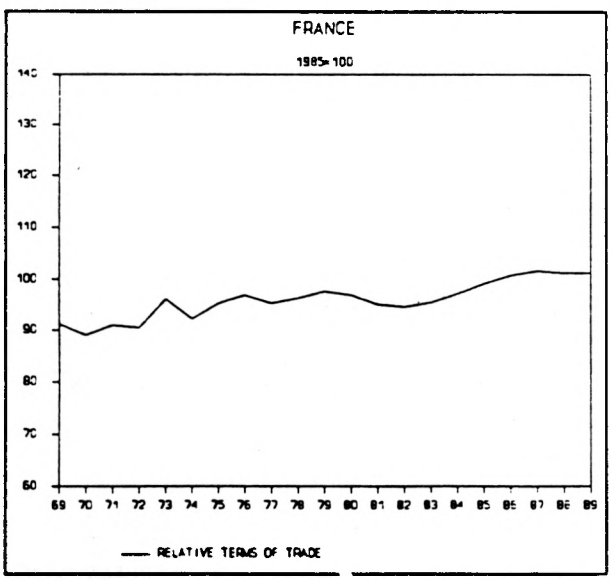
Relative Terms of Trade of Industrial Countries
1969 - 89

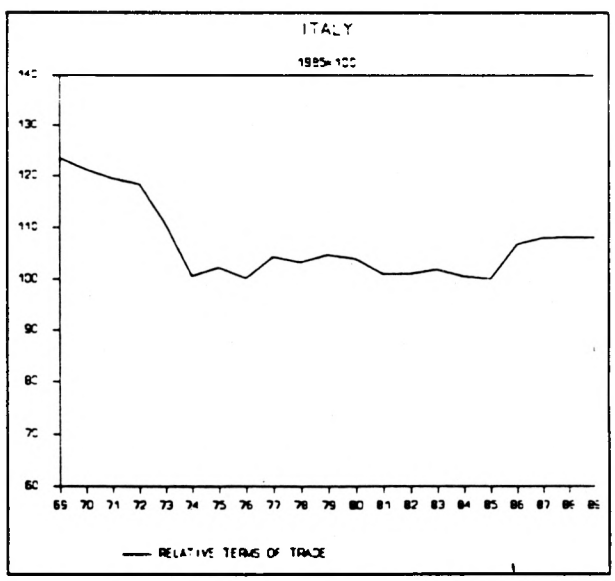


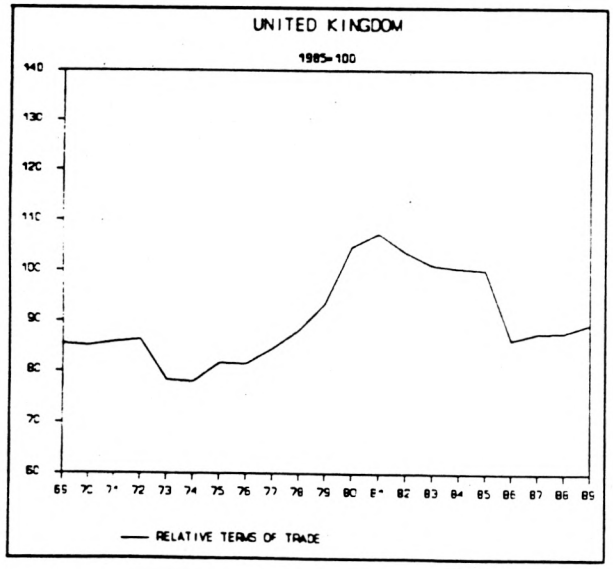








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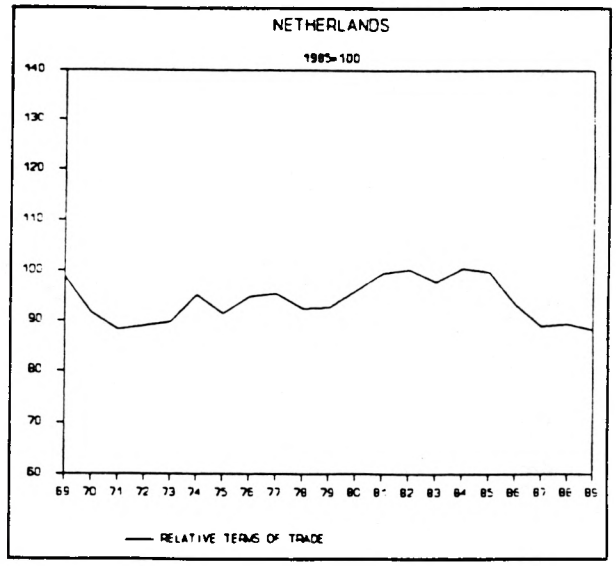
RELATIVE TERMS OF TRADE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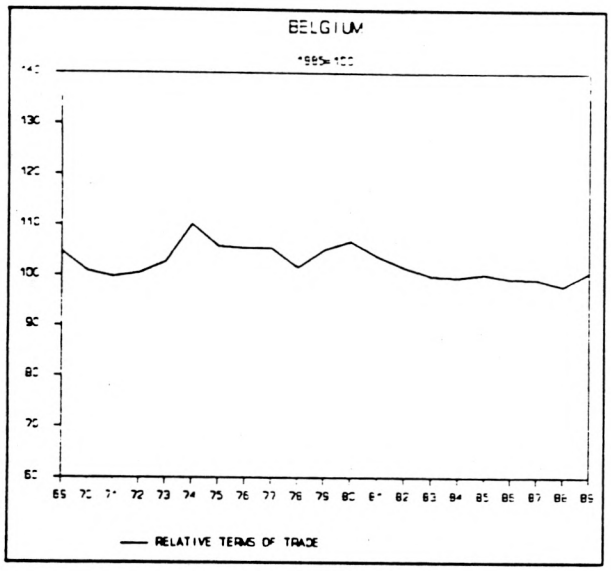
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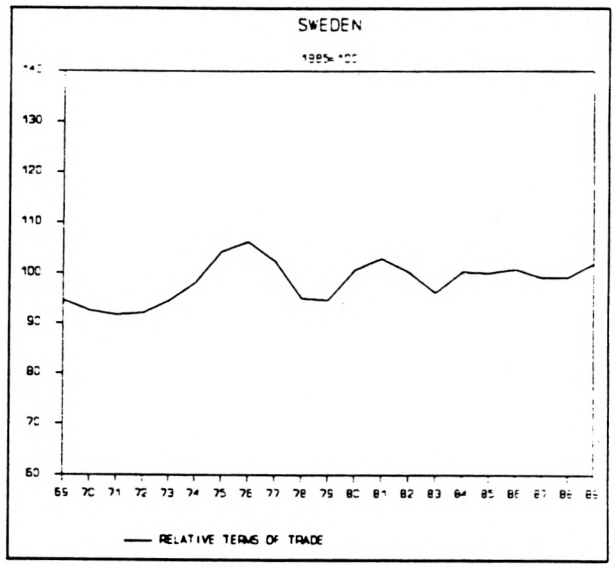
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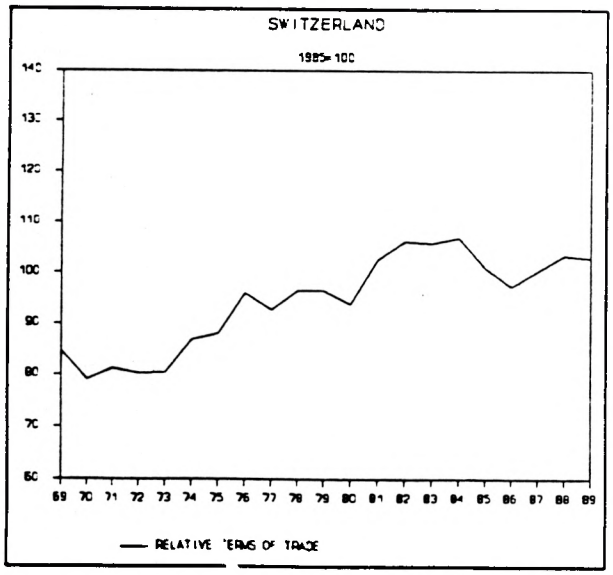
RELATIVE TERMS OF TRADE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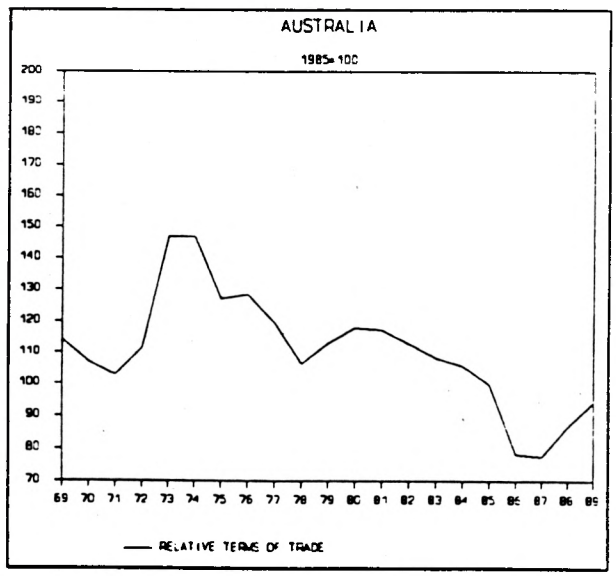
AUSTRALIA
1985=100
RELATIVE TERMS OF TRADE

Table VI

Bilateral Relative Terms of Trade' Variability 1969-1989

	1969-89		1969-79		1979-89	
Country	S.D.%	Range%	S.D.%	Range%	S.D.%	Range%
Canada/US	17.8	58.5	14.9	38.2	6.9	22.3
Japan/US	14.3	37.7	11.4	32.9	16.4	39.0
Japan/Germany	16.6	58.9	17.0	50.6	11.3	30.2
Germany/US	8.8	37.1	9.2	31.5	6.8	18.9
France/Germany	4.8	15.7	4.4	15.0	2.7	7.1
Italy/Germany	7.9	34.9	11.0	34.5	0.9	3.2
UK/Germany	12.1	39.3	7.9	24.6	10.4	28.0
Netherlands/Germany	7.5	21.8	6.3	22.1	7.6	19.0
Belgium/Germany	4.8	17.8	4.9	17.0	2.7	8.7
Sweden/Germany	5.7	19.3	5.1	15.6	4.7	14.2
Switzerland/Germany	10.7	33.3	7.5	19.9	5.5	16.8
Australia/US	15.1	61.8	13.5	41.3	11.3	34.5

1. Defined as the first country's terms of trade divided by the terms of trade of the second country.

Table VII

Correlation of Industrial Countries' Relative Terms of Trade with Oil and Non-Oil Commodity Prices 1969-89

	1969-89		1969-79		1979-89	
	oil	non-oil	oil	non-oil	oil	non-oil
Canada	.94	.90	.93	.94	.79	.35
United States	-.68	-.88	-.80	-.89	.45	-.44
Japan	-.78	-.50	-.75	-.59	-.91	.08
Germany	-.42	-.01	.36	.44	-.84	.22
France	.48	.74	.78	.84	-.89	-.04
Italy	-.74	-.77	-.85	-.89	-.86	.26
United Kingdom	.87	.50	.28	.10	.96	.08
Netherlands	.62	.22	.26	.21	.89	-.32
Belgium	-.07	.05	.54	.58	.45	.43
Sweden	.52	.55	.54	.46	.29	-.05
Switzerland	.85	.81	.91	.81	.25	-.14
Australia	-.21	-.15	.13	.37	.78	.39
AVERAGE[1]	-.37	-.36	-.34	-.34	-.09	-.10

1. Arithmetic average using 1987 GNP/GDP weights.

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