

Chapter 1

Tendencies to trade imbalance

The purpose of this chapter is to examine structural tendencies in the world economy which give rise to imbalances in trade. These tendencies arise in large part on the supply side, due to differing resource endowments, particularly in energy, and differing capacities for producing and marketing manufactures. They also reflect demand influences, notably the pressure of demand for energy which affects world oil prices and hence the value of each country's net exports or imports of oil. In addition, tendencies to imbalance in trade are influenced by national and international policies on trade barriers, exchange rates and other matters which affect the way markets are shared between producers in different parts of the world.

To analyse the significance of these phenomena we shall distinguish conceptually between '*ex ante*' trade imbalances, which are conditional on given assumptions about growth of real spending, and the '*ex post*' imbalances which do occur in practice. Chapter 2 will consider how financial policies and institutions constrain the pattern of spending in such a way as to keep *ex post* trade imbalances within certain bounds.

Here, however, we abstract from financial constraints in order to clarify tendencies to imbalance arising in the 'real' economy. Our purpose is to examine the sensitivity of the pattern of trade, prices and production to growth of demand, taking the pattern of demand as given *ex ante*.

The model used for this analysis employs simplified trade and GDP accounts (see page 11).

Each country is assumed to have supplies of raw materials and energy which respond positively to rises in world prices of these commodities relative to prices of manufactures. It is also assumed to have a manufacturing sector which both supplies the home market and has certain shares of the import market in other countries. Demands for raw materials and energy are assumed to respond negatively to world price increases and positively to real domestic spending. Imports of manufactures are assumed to vary in proportion to domestic spending.

Given any pattern of spending, changes in world prices for raw materials and energy are

assumed to bring total world supplies and demands into balance. The whole pattern of trade and GDP resulting from any given pattern of spending can then be determined.

The essential properties of the model for each group of countries or 'bloc' separately distinguished are:

- (1) that the overall trade balance of each is improved by a reduction in spending within the bloc;
- (2) that the balance on trade in manufactures is improved by higher spending in other blocs;
- (3) that the *volume* balance on raw materials and fuels of each bloc is improved by higher world prices; and
- (4) that the effect of world price changes on the *value* of net raw material and fuel trade of each bloc depends on the degree to which it is a net exporter or importer.

The first section of the chapter summarises the actual pattern of spending, income and trade imbalances in the past. The second section presents an *ex ante* projection of the pattern of world prices and trade flows which might be generated by a target pattern of real spending up to 1985. The following sections consider projections of trade in energy and manufactures in more detail. The final section assesses the sensitivity of the projected position of each bloc to changes in assumptions.

1.1 Historical patterns of spending, income and trade

Up to 1973 Japan and the centrally planned economies led the world in growth of per capita spending and real income. Japan in particular was rapidly catching up with the average income level in Western Europe, itself slowly converging towards that of the United States. The two poorest blocs of the world, Africa and Asia, fell increasingly behind with low per capita growth rates while Latin America and the Middle East maintained their intermediate position. Over the period from 1964 to 1973 growth of real income in the developed market economies generally matched the growth of spending,

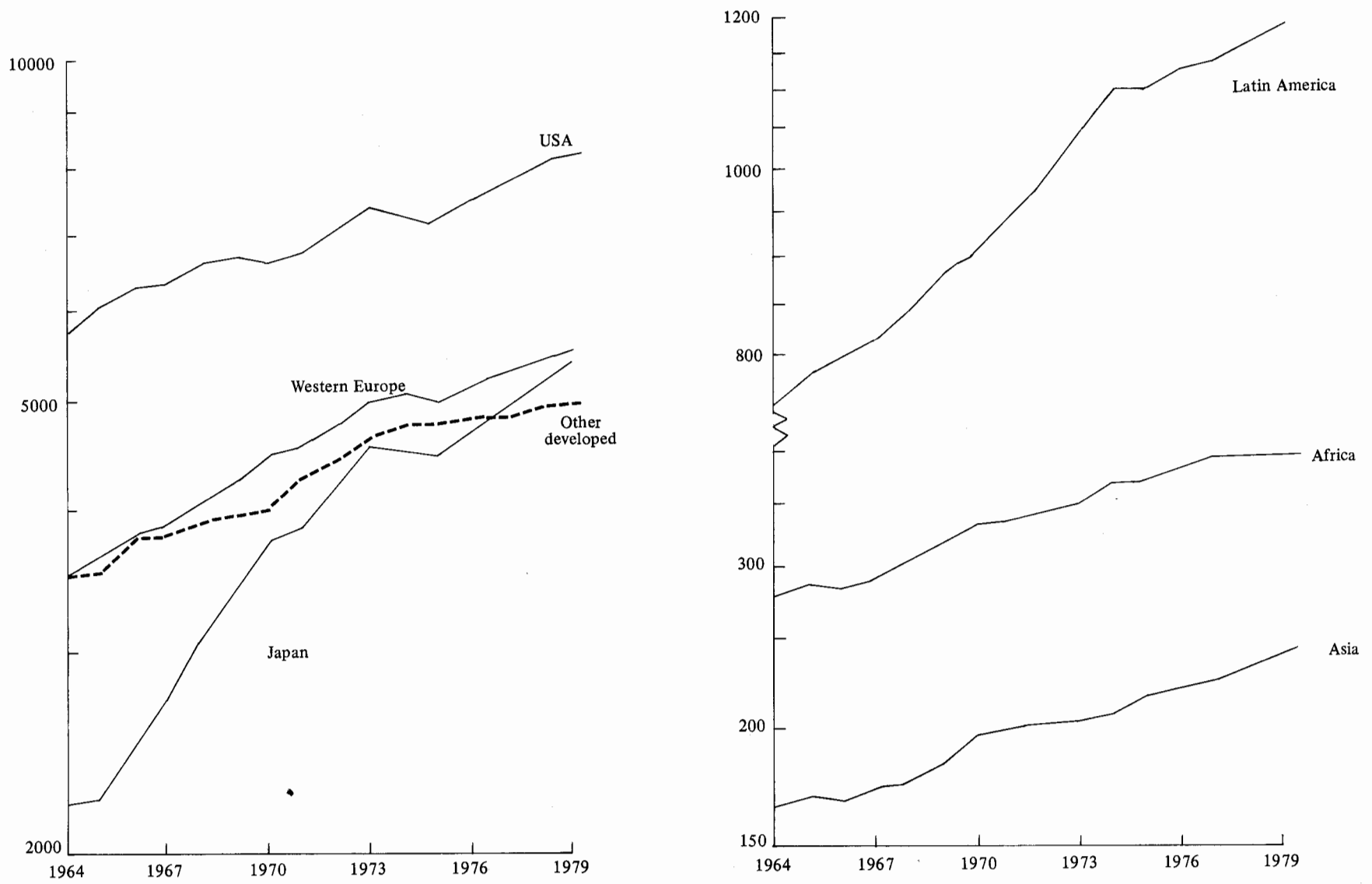


Figure 1.1 GDP per capita, 1964 - 1979 (\$1975 per person per year)

The accounting system

The tables in this Review are based on accounts constructed from UN sources, linked and reconciled where necessary to ensure correct summation.

AREAS

USA	
Western Europe	includes Yugoslavia
Japan	
Other developed	Canada, Australia, New Zealand, Israel, South Africa
Latin America	
Africa	excludes South Africa
Asia	includes Pacific, excludes China and other Asian centrally planned
Middle East	includes Turkey and Iran, excludes Israel
Centrally planned	trade and energy data include China and other Asian centrally planned; population and GDP (net material product) data exclude China and other Asian centrally planned
World totals	trade and energy data include all countries; population and GDP data exclude China and other Asian centrally planned.

TRADE DATA

The basic data consists of matrices of exports by source, destination and commodity group.

(Source: UN Yearbook of International Trade Statistics).

Units: 1975 US dollars – dollar values deflated by an index of world prices of exports of manufactures.

Exports: exports of goods to all destinations

Imports: exports of goods from all sources to the given destination

Trade balance: exports less imports as defined above – ie measured on shipment rather than on arrival. Trade balances measured in this way sum to zero for the world as a whole.

Food and raw materials: SITC 0-2 and 4

Energy: SITC 3

Manufactures: SITC 5-9

WORLD PRICES

Series for 'real' prices of energy and food and raw materials are export price indices divided by the index of world prices of exports of manufactures.

(Source: UN Monthly Bulletin of Statistics).

POPULATION DATA

The series exclude China and other Asian centrally planned economies.

(Source: UN Demographic Yearbook).

INCOME AND EXPENDITURE DATA

The basic GDP series are estimates at 1975 market prices converted to US dollars at 1975 exchange rates. In the case of centrally planned economies the data are for net material product, which covers about $\frac{2}{3}$ of GDP, and exclude China and other Asian centrally planned economies.

(Source: UN Yearbook of National Accounts).

GDP: gross domestic output

Volume trade balance: exports less imports of each commodity group divided by the relevant world export price index

Domestic spending^a: GDP plus volume trade balance.

Value trade balance: the value of exports less imports deflated by the world price index for exports of manufactures.

Real income^a: domestic spending plus value trade balance – equal to GDP plus terms of trade gain/loss where the terms of trade effect is defined as the difference between value and volume trade balances.

ENERGY DATA

The basic series are estimates of supply and net exports or imports in million tons of oil equivalent (mtoe). Consumption is defined as supply plus exports less imports (imports adjusted to equal exports for the world as a whole). UN supply data for developed areas and the centrally planned bloc have been adjusted by increasing the oil-equivalent value of nuclear and hydro-electricity in line with IEA measurement conventions.

(Source: UN World Energy Supplies).

^aThese series differ from national accounts estimates – see Appendix A.

Table 1.1 Historical growth of per capita spending and changes in trade balances^a

	Growth of per capita spending (% per year)		Trade balance (% of GDP)		
	1964-73	1973-78	1964	1973	1978
USA	3.2	2.0	+1.6	+ 0.1	- 1.2
Western Europe	4.0	1.2	-1.2	- 0.7	+ 0.1
Japan	8.4	1.4	+0.2	+ 0.8	+ 3.8
Other developed	3.0	1.3	-0.6	+ 0.2	- 0.1
Latin America	4.0	2.5	+0.3	- 1.3	- 2.3
Africa	1.6	5.8	-1.3	- 0.3	- 7.2
Asia	2.1	2.7	-4.6	- 2.3	- 2.2
Middle East	3.9	6.4	+5.1	+12.1	+11.9
Centrally planned ^b	6.0	4.0	+0.1	0.0	+ 0.1

^aSee p. 11 and Appendix A for details of the accounts from which data are derived.

^bSpending and GDP data exclude China and are on a net material product basis. Trade balances expressed as percentages of GDP for the centrally planned bloc in this and subsequent tables have been scaled to improve comparability with figures for other blocs.

their net exports of manufactures rising as fast as their net imports of food, raw materials and energy. Due to its oil exports, the Middle East had a slowly rising trade surplus while other developing areas incurred regular trade deficits. The two exceptions to the general pattern were the United States where exports of manufactures failed to keep pace with the growth of its imports and Asia where overall trade deficits fell relative to GDP as several Asian countries began to achieve significant exports of manufactures.

Between 1972 and 1974 there were huge

increases in world prices of primary commodities. Relative to manufactures, the price of oil rose by 150% and the average price of food and raw materials went up by at least one third.

The immediate effect of these changes in world prices was a radical shift in trade balances. The raw material and energy deficits of Western Europe and Japan doubled while Africa and the Middle East began to earn energy surpluses equivalent to 20% and 50%, respectively, of their GDP (but note that the African countries gaining from the high price of oil - Libya, Algeria and

Table 1.2 Historical balances on trade in primary commodities and manufactures

(% of GDP)

	1964	1972	1974	1978
<i>Food, raw materials and energy</i>				
USA	0.0	- 0.3	- 0.9	- 1.1
Western Europe	- 3.2	- 2.9	- 5.8	- 4.0
Japan	- 4.0	- 4.4	- 9.2	- 6.6
Other developed	+ 5.9	+ 5.6	+ 4.4	+ 4.3
Latin America	+ 7.8	+ 5.2	+ 6.0	+ 4.8
Africa	+10.0	+13.7	+20.1	+13.5
Asia	+ 3.0	+ 1.5	+ 1.4	+ 1.2
Middle East	+12.9	+20.3	+49.3	+34.4
Centrally planned ^a	- 0.2	+ 0.1	+ 0.4	+ 0.3
<i>Manufactures</i>				
USA	+ 1.5	- 0.3	+ 0.7	- 0.1
Western Europe	+ 2.0	+ 2.6	+ 3.2	+ 4.0
Japan	+ 4.2	+ 7.4	+ 9.1	+10.5
Other developed	- 6.5	- 5.0	- 7.3	- 4.5
Latin America	- 7.5	- 7.4	- 8.1	- 7.1
Africa	-11.3	-14.3	-15.4	-20.7
Asia	- 7.6	- 4.5	- 5.4	- 3.4
Middle East	- 7.9	-10.4	-11.7	-22.5
Centrally planned ^a	+ 0.3	- 0.1	- 0.4	- 0.2

^aSee Table 1.1

Table 1.3 Per capita spending: growth targets

(% per year)

	Actual 1964-73	Actual 1973-78	Required for convergence ^a			Assumed target 1978-85
			20 years	50 years	100 years	
USA	3.2	2.0	0.9	2.1	2.6	2.5
Western Europe	4.0	1.2	3.0 ^a	3.0 ^a	3.0 ^a	3.0
Japan	8.4	1.4	3.5	3.2	3.1	4.0
Other developed	2.8	1.3	3.7	3.3	3.1	3.0
Latin America	4.0	2.5	11.2	6.2	4.6	4.5
Africa	1.6	5.8	17.1	8.4	5.7	6.0
Asia	2.1	2.7	20.4	9.6	6.3	6.5
Middle East	3.9	6.4	10.2	5.8	4.4	4.5
Centrally planned ^b	6.0	4.0	5.2	3.9	3.4	5.0

^aConvergence of per capita spending levels by end of period with that of Western Europe, assumed to grow at 3% per year

^bSee note (a) to Table 1.1

Nigeria – account for under one quarter of the bloc's population).

There was at first little offsetting change in the pattern of trade in manufactures, so that Western Europe and Japan found themselves, for the first time, in substantial overall trade deficit. But in the period which followed the deficits of these two blocs were progressively eliminated; by 1978 Western Europe achieved overall trade balance while Japan had re-established a large trade surplus. The readjustment was achieved, principally, by drastic reductions in the growth of spending in the two blocs which sharply cut back growth of their imports and caused a weakening of world prices for primary commodities including oil. By contrast the USA, having briefly and dramatically cut its imports in the 1975 recession, expanded its spending rapidly. It therefore incurred an increasing oil deficit and for a second time eliminated its surplus on manufactures despite some improvement in its export performance. By 1978 the oil surpluses of OPEC

were matched by manufacturing surpluses of Japan and Western Europe. Latin America, Africa and Asia were once again the overall deficit blocs, joined now by the USA.

1.2 An *ex ante* spending projection

The most important questions for the coming years are whether tendencies to trade imbalance which emerged in the 1970s are likely to persist or worsen, and what effects they will have on the growth of spending and income in different parts of the world. Already, since 1979, oil prices have risen sharply, increasing the energy trade deficits of oil-importing countries. Will energy imbalances continue to worsen, and how far will they be offset by trends in food, raw materials and manufactures?

In the remainder of this chapter we shall examine the prospects for trade imbalance in the early 1980s on an *ex ante* basis, using our model of world trade and prices to project the pattern of

Table 1.4 *Ex ante* projection: trade balances on food, raw materials and energy

	1974	1978	1981	1985
<i>Prices relative to manufactures (1975 = 100)</i>				
Food and raw materials	115	99	105	109
Energy	104	92	166	294
<i>Trade balances (% of GDP)</i>				
USA	- 0.9	- 1.1	- 1.3	- 2.2
Western Europe	- 5.8	- 4.0	- 5.6	- 8.0
Japan	- 9.2	- 6.6	- 9.3	-12.7
Other developed	+ 4.7	+ 4.3	+ 4.3	+ 1.3
Latin America	+ 6.0	+ 4.8	+ 6.0	+ 6.9
Africa	+20.1	+13.5	+22.3	+28.5
Asia	+ 1.4	+ 1.2	+ 0.2	- 4.8
Middle East	+49.3	+34.4	+39.3	+56.7
Centrally planned ^a	+ 0.4	+ 0.3	+ 1.0	- 1.5

^aSee Table 1.1

The model of income and trade flows

WORLD VARIABLES

- PA real price of food and raw materials (1975 = 1.00)
 PF real price of energy (1975 = 1.00)

VARIABLES FOR EACH BLOC

- N_i population (millions)
 Q_i GDP (\$1975 billion)
 H_i domestic spending (\$1975 billion)
 Y_i real income (\$1975 billion)
 X_i exports of manufactures (\$1975 billion)
 M_i imports of manufactures (\$1975 billion)
 AB_i volume balance on food and raw materials (\$1975 billion)
 FB_i volume balance on energy (\$1975 billion)
 B_i trade balance (\$1975 billion)
 MR_i ratio of imports of manufactures to domestic spending (ratio)
 FQ_i energy supply (mtoe)
 FD_i energy consumption (mtoe)

SHARES OF TRADE IN MANUFACTURES

- S_{ij} share of exports from bloc 'i' in total exports to bloc 'j' (ratio)

EXOGENOUS VARIABLES

- N_i, H_i, MR_i, S_{ij}

The model estimates income and trade flows generated by a given pattern of domestic spending. Population, manufactured import coefficients and export shares are extrapolated on the basis of 1973-78 trends.

ENDOGENOUS VARIABLES

Trend and residual terms in equations, denoted $\gamma_0 + \gamma_1 t + u_1$, are fitted to historical data for each bloc but their extrapolated values may be modified for projections. Values of structural coefficients, denoted α , are imposed and lie within the ranges indicated.

Imports of manufactures are determined by domestic spending.

$$M_i = MR_i \cdot H_i$$

Exports of manufactures by each bloc are determined by imports of all blocs.

$$X_i = \sum S_{ij} M_j$$

Net exports of food and raw materials depend on a supply response to world prices and, on the demand side, on population and domestic spending.

$$AB_i = PA \alpha_1 \cdot \exp[\gamma_0 + \gamma_1 t + u_1] - \alpha_2 N_i - \alpha_3 H_i$$

$$\alpha_1 = 0.5, \alpha_2 = .06, \alpha_3 = 0.07$$

Energy supply responds to world prices with a varying elasticity.

$$FQ_i = PF \alpha_4 \exp[\gamma_2 + \gamma_3 t + u_2]$$

$$\alpha_4 = 0.0625 \text{ to } 0.25$$

Energy consumption varies with domestic spending and falls in response to a rise in world prices.

$$FD_i = H_i \cdot (PF \cdot PF_{-1})^{-\alpha_5} \exp[\gamma_4 + \gamma_5 t + u_3]$$

$$\alpha_5 = 0.125$$

The energy volume trade balance is determined by supply less consumption, converted from mtoe to billion 1975 dollars.

$$FB_i = \alpha_6 [FQ_i - FD_i] + \gamma_6 + \gamma_7 t + u_4$$

$$\alpha_6 = .082$$

The overall trade balance is given by exports less imports of manufactures plus volume balances on food and raw materials and energy, multiplied by their corresponding world prices.

$$B_i = PA \cdot AB_i + PF \cdot FB_i + X_i - M_i$$

The volume of domestic output is given by domestic spending plus the volume of net exports.

$$Q_i = H_i + AB_i + FB_i + X_i - M_i$$

Real income is given by domestic spending plus the value trade balance (equal to domestic output plus terms of trade gain/loss).

$$Y_i = H_i + B_i$$

Table 1.5 *Ex ante* projection: trade balances on manufactures

	(% of GDP)			
	1974	1978	1981	1985
USA	+ 0.7	- 0.1	+ 0.3	+ 0.3
Western Europe	+ 3.2	+ 4.0	+ 3.9	+ 5.1
Japan	+ 9.1	+10.5	+10.3	+12.5
Other developed	- 7.3	- 4.5	- 3.6	- 3.0
Latin America	- 8.1	- 7.1	- 7.2	- 7.2
Africa	-15.4	-20.7	-18.1	-18.0
Asia	- 5.4	- 3.4	- 3.7	- 4.3
Middle East	-11.7	-22.5	-21.1	-20.1
Centrally planned ^a	- 0.4	- 0.2	- 0.2	- 0.1

^aSee Table 1.1

income and trade flows which might be generated if the spending of each bloc grew strictly in accordance with a given set of targets (see Table 1.3). These estimates are designed to investigate the imbalances which would emerge if the world as a whole, and each bloc within it, achieved reasonably satisfactory growth rates of spending. They are not a forecast of what is likely to happen in practice, since they ignore the financial processes which govern the growth of spending itself and whose implications are deferred for consideration until Chapter 2.

So far as the developed blocs are concerned, our *ex ante* projection assumes per capita growth targets in the range 2½%-5% per year with the USA at the bottom and Japan and the centrally planned economies at the top of the range. The developing blocs, Latin America, Africa, Asia and the Middle East, are assumed to achieve spending growth rates high enough to secure slow convergence with the developed blocs. This implies considerable acceleration of the growth of spending in Latin America and Asia compared with that achieved in the past.

The most crucial question about such a pattern of accelerated growth in spending concerns its impact on trade in primary commodities – particularly energy. Our estimate, discussed in detail in the next section, is that there would be continuing increases in the 'real' world price of oil up to 1985. By then the Middle East and Africa

would be earning surpluses on primary commodity trade as large as in 1974 despite, in the case of the Middle East, a lower *volume* of oil production and exports. The USA, Western Europe and Japan would face large energy deficits (as would Asia, given the high growth of spending assumed).

How far could trade in manufactures be expected to offset such a pattern of widening imbalance in primary commodities? Still assuming that the *ex ante* spending targets were met, with accelerated spending in Western Europe, the USA, Latin America and Asia, the pattern of trade balances in manufactures is projected to remain almost unchanged relative to GDP in the next few years (see Table 1.5 — details of the estimates are discussed below in Section 1.4).

In consequence, the overall effect of the target pattern of spending set out above would be that Japan lost its trade surplus, the USA, Western Europe and the 'other developed' bloc moved into deficit rising to over 2% of GDP, Asia's trade deficit rose to nearly 10% of GDP, while Africa moved into substantial surplus and the Middle East earned a surplus almost as large, relative to GDP, as in 1974.

The dominating tendency to imbalance in these projections stems from the unequal distribution of energy demand and supply between blocs. Given fast growth of their overall spending, those parts of the world which import energy would be unlikely to earn surpluses on manufactures or other primary

Table 1.6 *Ex ante* projection: overall trade balances

	(% of GDP)			
	1974	1978	1981	1985
USA	- 0.2	- 1.2	- 1.0	- 2.0
Western Europe	- 2.6	+ 0.1	- 1.7	- 3.0
Japan	- 0.1	+ 3.8	+ 1.1	- 0.2
Other developed	- 2.6	- 0.1	+ 0.7	- 1.7
Latin America	- 2.2	- 2.3	- 1.2	0.0
Africa	+ 4.7	- 7.2	+ 4.2	+10.5
Asia	- 4.1	- 2.2	- 3.4	- 9.1
Middle East	+37.6	+11.9	+18.3	+36.7
Centrally planned ^a	- 0.1	+ 0.1	+ 0.4	- 0.9

^aSee Table 1.1

Table 1.7 Trade balances in energy

(% of GDP)

	1974	1978	<i>Ex ante</i> projection	
			1981	1985
USA	- 1.7	- 1.8	- 2.3	- 3.7
Western Europe	- 4.0	- 2.6	- 3.9	- 6.3
Japan	- 5.6	- 3.9	- 6.4	-10.1
Other developed	- 0.7	- 0.2	- 0.2	- 2.0
Latin America	1.8	0.9	2.4	3.9
Africa	16.5	12.0	20.9	28.4
Asia	- 0.7	- 0.5	- 1.7	- 6.8
Middle East	51.2	36.4	41.2	58.2
Centrally planned ^a	0.4	0.5	0.8	- 0.4

^aSee Table 1.1

commodities large enough to compensate for their energy deficits. This appears, *ex ante*, to be a significant problem for the developed blocs and a huge problem for many developing countries, essentially non-oil countries in Asia and Africa.

1.3 Trade balances in energy

The key element in changes in trade balances in the early 1980s will be energy. During the 1960s net imports of energy represented a negligible proportion of GDP for most countries and were under 1% of GDP even in the main deficit areas, Western Europe and Japan. Surpluses of most oil-exporting countries were correspondingly small. Even in the Middle East, the positive trade balance in oil formed little over 10% of GDP.

In the early 1970s rapid growth of demand in industrial countries and a huge increase in the price of oil resulted in energy dominating the pattern of trade balances. By 1974 all of the industrialised blocs plus developing Asia were net importers of energy, with deficits equivalent to almost 2% of GDP in the USA and over 5% in Japan. The trading position of oil exporters altered dramatically. Oil surpluses represented over half of GDP in the Middle East and a sixth of GDP in developing Africa, although in the latter case the gains were virtually confined to three countries.

Projections of energy trade balances must be based on assumptions about the tendencies of supply and demand in each bloc and the impact of potential shortfalls or surpluses on world oil prices. In our model the future world price of oil relative to manufactures varies so as to bring projected world supply and demand for energy into balance, assuming a certain pattern of response of supply and demand in each bloc to changes in the world price level.

Given the implications for demand relative to prospective supply and hence for the price of oil, continued world economic expansion in the future, even at rates somewhat lower than in the decade prior to 1974, is likely to lead to imbalances in energy trade which become proportionally larger even than those of 1974. For Japan our *ex ante*

projection shows an energy deficit rising to 10% of GDP by 1985 despite domestic spending being assumed to grow only half as fast as it did before 1974. The other developed blocs are also projected to have substantial energy deficits by 1985. For Western Europe the deficit would climb to over 6% of GDP while the US deficit reached 3½% of GDP despite the large volume of its internal energy production.

The rising price of oil which underlies the increasing size of projected imbalances in energy trade would have very considerable effects upon non-oil developing countries. The position is best illustrated by the projection for developing Asia whose net energy imports would be expected to rise to 7% of GDP by 1985 if per capita spending grew fast enough for any significant convergence of living standards to take place. The same would be true for non-oil African countries (figures for Africa as a bloc are completely dominated by energy exports from Libya, Algeria and Nigeria). The projected high price of oil induced by accelerated world spending assumed in our *ex ante* projection would be such that by 1985 the value of oil exports dwarfed all other contributions to GDP in the Middle East.

Energy supply

The view that accelerated growth of spending will continue to push up world oil prices, causing large imbalances in energy trade, stems from necessarily pessimistic assumptions about trends of energy supply in developed blocs and about the amount of energy saving which could be stimulated within the next few years.

World energy supply (including coal, hydro and nuclear electricity as well as oil and gas) is dominated by the centrally planned economies, the USA and the Middle East which together account for 70% of the total. Prospects for growth in energy supply are poor in the Middle East, particularly because of the Iraq-Iran war, and in the United States. Moreover, albeit for differing reasons, neither in the Middle East nor in the centrally planned economies is the volume of energy supply likely to be all that responsive in the next few years to rising world prices.

The centrally planned bloc has in recent years achieved massive coal production (well over half the world total) as well as a considerable output of oil and natural gas. Although it may continue to increase output of coal, hydroelectricity and nuclear power, its oil and gas production is thought to be nearing a peak¹. In any case continued expansion of energy supply in the centrally planned bloc is unlikely to ease supply problems in the rest of the world since these economies have high and fast-growing energy consumption.

Hopes for the USA rest greatly on expansion of coal production. The IEA, for example, assumes an increase of almost 50% by 1985. This target seems unrealistic, given slow growth of output in the past (1½% a year between 1973 and 1978) and considerable environmental opposition to strip mining. Even more problematic is the IEA's assumption that nuclear power output in the USA could double by 1985, given past experience of operating problems and continued anxiety about safety. Moreover the USA will have difficulty in even maintaining the level of its oil and natural gas production as traditional fields are rapidly exhausted.

Oil production in the Middle East, already cut back in 1979, will be seriously diminished, at least for a year or two, by war damage to production equipment, pipelines, refineries and terminals in Iraq and Iran. In Western Europe, North Sea oil and gas production is now nearing a peak while the historic decline in coal production is only gradually being reversed and nuclear power programmes are encountering many difficulties and delays. Although oil production may grow rapidly in other parts of the world, especially if world prices continue to rise, the

¹ United Nations 1980, *World Economic Survey 1979-1980*.

total contribution of these blocs to world energy supply is still under 20%. Overall, therefore, it must be assumed that the volume of world energy supply will not rise much up to 1985, even if world market prices rise to very high levels.

Energy consumption

Given none-too-favourable world supply prospects, the impact of energy on trade balances will depend critically on growth of demand in the world as a whole and in each bloc.

Since 1973 there have been reductions in the ratio of the volume of energy consumption to total spending or GDP in most parts of the world, and especially in the major energy-deficit blocs. The USA, Western Europe and Japan have all achieved energy saving, relative to their total spending, of the order of 10% of GDP. Much of this saving must reflect responses to the rise in world oil prices, whether directly as higher costs induce commercial and domestic consumers to economise, or indirectly by stimulating governments to undertake energy conservation policies. However some part of the apparent energy saving must also have been due to the investment slump and its impact on industries such as steel and cement which happen to be heavy energy users. With a recovery of spending, including investment, it will be difficult to achieve further energy saving of the same magnitude now that many of the easiest forms of economy have been quite widely exploited. In our *ex ante* projection, with world spending and GDP rising by 4½% per year and total energy supply by at most 3½% per year, substantial further progress in energy saving, amounting to nearly 10% between 1978 and 1985, would be an absolute necessity to bring energy supply and demand into balance. This is the main reason for continued large increases in world oil prices in our projection.

Table 1.8 Past and projected growth of energy supply

(% per year)

	Share of world total 1978	Growth rate 1973-78	Our <i>ex ante</i> projection 1978-85	IEA projection ^a 1978-85
USA	22	-0.5	2.1	2.5
Western Europe	9	4.6	4.1	4.7 ^b
Japan	1	2.0	9.9	8.6
Other developed	6	1.3	3.2	3.3 ^c
Latin America	5	-0.8	7.2	n.a.
Africa	5	0.7	7.1	n.a.
Asia	3	6.7	7.2	n.a.
Middle East	17	0.3	-0.6	n.a.
Centrally planned	33	5.8	4.2	n.a.
World total	100	2.4	3.4	n.a.

^aInternational Energy Agency, *Energy Policies and Programmes of IEA Countries, 1979 Review*, OECD Paris 1980

^bIEA Europe (omits France, Finland, Portugal and Yugoslavia)

^cAustralia, Canada and New Zealand (omits Israel and South Africa)

Table 1.9 Energy saving: the ratio of the volume of energy consumption to total domestic spending, relative to 1973

(Indices, 1973 = 100)

	1978	<i>Ex ante</i> projection 1985
USA	89	78
Western Europe	92	82
Japan	87	68
Other developed	97	95
Latin America	90	79
Africa	92	88
Asia	112	122
Middle East	86	68
Centrally planned	102	98
World total	96	88

The effect on trade balances

The prospect of high world prices for energy, stimulating production of energy and energy saving in many parts of the world, should be sufficient to encourage gradual progress towards greater self-sufficiency in most of the deficit blocs (the main exception is developing Asia which, with rapid industrialisation, might find its energy consumption outstripping growth of production). The USA is already quite near self-sufficiency so that if growth of supply exceeds growth of consumption its net energy imports could fall considerably in volume terms. On the other hand, with much smaller domestic supplies, Western Europe and Japan will be hard put to prevent the volume of their net imports rising with a recovery of internal economic activity. The impli-

cation is that, with rising world prices, the energy deficits of Western Europe and Japan will increase considerably in value terms.

It must however be noted that the energy deficits of the developed blocs projected for 1985 are not only or entirely due to the assumption of high prices due to poor supply prospects in the Middle East and elsewhere. They are primarily due to supply and demand trends within the developed blocs themselves. If, for example, we assumed little or no increase in world energy prices relative to manufactures from their present end-1980 levels, then energy saving and increases in supply within the developed blocs would be less and the volume deficits projected for these blocs correspondingly greater. In the case of nearly self-sufficient blocs such as the United States, energy trade deficits might even be greater in value as well as volume if world prices rose less (see Table 1.10). However with lower prices there would probably be a large *ex ante* deficit of energy supply in the world as a whole. The fact is that the developed blocs will have to come to terms with the gradual exhaustion of cheap oil supplies by increased energy saving and development of alternative sources of energy if they are to maintain growth in their economies in the 1980s.

1.4 Trade in manufactures

The structure of trade balances in manufactures has not changed very rapidly in the past because world prices of manufactures have been relatively stable (compared with those of primary commodities) while changes in market shares, although in several cases pronounced in the long run, have taken effect only gradually. Short-run changes in manufacturing trade balances, in so far as they have occurred, have been

Table 1.10 Projected balances on energy trade in 1985 at different world price levels

(real values, \$1975 billion)

	Actual 1978	<i>Ex ante</i> projection 1985	Alternative projection for 1985 with lower world price
World price relative to manufactures (1975 = 100)	92	294	150
<i>Energy trade balances:</i>			
USA	-32	- 81	- 99
Western Europe	-48	-148	-112
Japan	-23	- 84	- 52
Other developed	- 1	- 10	- 22
Latin America	+ 4	+ 26	- 5
Africa	+19	+ 90	+ 34
Asia	- 1	- 33	- 34
Middle East	+74	+250	+103
Centrally planned	+ 9	- 10	- 80
World total	0	0	-266

Table 1.11 Growth of world markets for manufactures, excluding trade within blocs

	Share of world imports	1964-73	Growth of imports	<i>Ex ante</i> projection
	1978 (%)		1973-78 (% per year)	1978-85
USA	20.6	13.4	5.4	6.4
Western Europe	15.2	9.1	3.9	6.7
Japan	3.7	16.7	- 0.7	9.1
Other developed	11.6	7.8	0.8	4.0
Latin America	9.3	6.5	5.7	7.2
Africa	9.2	7.6	10.5	7.4
Asia	10.8	7.0	8.8	11.5
Middle East	12.4	13.1	23.9	9.1
Centrally planned	7.2	14.0	8.2	6.3
World total	100.0	9.8	6.7	7.4

due mainly to fluctuations in internal spending in certain blocs, provoking short-run variations in imports.

For the purposes of our *ex ante* analysis of tendencies to trade imbalance, the growth of spending in each bloc is taken as given. Here we shall examine the prospects for growth of markets, and hence for trade balances in manufactures, on the assumption that trends in market shares observed in the 1970s broadly persist through the early 1980s. We leave consideration of the possibility of major changes occurring in these trends, for example through radical changes in industrial and trade policies, until Chapter 3.

When considering the manufacturing trade balances of blocs, it is convenient to exclude trade within blocs, since such intra-bloc trade cancels out

in the determination of trade balances at bloc level.

If trade within Western Europe is excluded, the USA is at present the largest market for exports of manufactures from other blocs, accounting for 20% of the world total. Other blocs, apart from Japan and the centrally planned economies, provide export markets of roughly equal size (in the range 9-15% of the world total). Up to 1973 all these export markets grew fast, well in excess of internal spending and GDP growth, with increasing import penetration led in particular by Western European and Japanese export industries. The slow-down after 1973 in the growth of markets in developed blocs and in centrally planned economies was sufficient to cut world export growth from 10% to 7% a year despite an acceleration of exports of manufactures to OPEC countries.

Table 1.12 Shares of world exports of manufactures, excluding trade within blocs

	(per cent)			
	1964	1973	1978	<i>Ex ante</i> projection 1985
USA	30.1	22.5	20.3	20.1
Western Europe	36.7	33.7	34.6	32.9
Japan	10.5	17.1	19.5	20.2
Other developed	8.4	9.1	7.6	7.1
Latin America	2.1	2.2	1.9	1.7
Africa	2.2	1.6	0.8	0.5
Asia	3.6	6.8	8.4	10.8
Middle East	0.1	0.6	0.8	0.5
Centrally planned	6.3	6.4	6.1	6.2
World total	100.0	100.0	100.0	100.0

The reduced growth of imports of manufactures by developed blocs was due mainly to the slow-down in their internal spending and economic activity. But it also reflected shifts in the composition of demand away from manufactures, competitive resistance to invasion of markets and incipient protectionist policies like those limiting textile or steel imports to the EEC. In many other parts of the world the growth of imports of manufactures relative to internal spending slowed or was brought to a halt through tighter restriction made necessary by foreign exchange problems in the wake of the oil crisis. This has been true, in particular, of the 'other developed' bloc. In Latin America import penetration is held back by increasingly comprehensive internal industrialisation. In Africa, the fact that just three countries earn the lion's share of oil revenues tends to limit the bloc's ability to absorb imports of manufactures. At the same time import penetration in the Middle East is now so high that it must be close to saturation, whether or not Iran's puritanical attitude to imports is emulated by other Middle Eastern oil exporting countries. It is therefore almost certain that even if growth of per capita spending accelerates in coming years, growth of world exports of manufactures (excluding intra-bloc trade) will remain below the very high rate of expansion experienced before 1973.

The most significant change in shares of the world market for exports of manufactures between the early 1960s and 1973 was the substantial gain by Japan and some other Asian countries at the expense of the USA and, to a lesser extent, Western Europe. After 1973 Japan's rate of acquisition of markets slowed down while the USA's share began to stabilise, aided by depreciation of the dollar. Western Europe's share actually increased between 1973 and 1978 owing to its dominant position as a supplier of OPEC countries.

The long-run process of decline in the shares of the USA and Western Europe in world export markets for manufactures has affected their trade even in machinery and transport equipment (SITC 7) which is broadly the 'advanced technology' section of the international trade classification. The chief reason for their gradual displacement in this branch of trade has been the entry and rapid growth of Japan whose share of the world market (*including* intra-bloc trade) climbed from under 5% in 1964 to nearly 15% in 1978. But Japan's lead is now being followed by other newly-industrialising parts of the world, often aided by American and European multinational companies. The 'other developed' bloc has acquired roughly 5% of this market and developing Asia's share, at 3%, is now becoming significant.

Accompanying progressive changes in market shares there has been a gradual shift in the distribution of world manufacturing output. The traditional exporters, namely the USA and Western Europe, have seen their share of the world total fall from 66% in 1964 to about 55% by 1977. Despite a weak external trade performance in manufactures, the largest gain has been made by centrally planned economies whose share of world production rose from under 15% to over 20%. Other relatively

Table 1.13 Shares of world exports of machinery and transport equipment (including intra-bloc trade)

	(per cent)		
	1964	1973	1978
USA	22.9	17.0	15.8
Western Europe	55.2	53.1	51.2
Japan	4.8	11.1	14.6
Other developed	2.7	5.4	4.4
Asia	0.5	1.9	3.0
Other developing	0.3	0.9	1.2
Centrally planned	13.6	10.6	9.9
World total	100.0	100.0	100.0

closed blocs – Latin America and 'other developed' – also increased their share of world production, from 8% to 10½%. On the other hand the export-orientated developing Asia bloc barely increased its tiny share of world production up to 1973, although the share then began to rise rapidly (from 2.2% to 2.7% between 1973 and 1977).

Table 1.14 Shares of world manufacturing output

	(per cent)		
	1964	1973	1977
U.S.A.	29.4	23.9	22.4
Western Europe	36.7	34.2	32.5
Traditional exporters	66.1	58.1	54.9
Japan	7.8	10.2	9.3
Other developed	3.3	5.2	4.9
Latin America	4.6	5.3	5.7
Asia	2.1	2.2	2.7
Newly industrialising	6.7	7.5	8.4
Africa and Middle East	1.4	1.7	2.1
Centrally planned	14.6	17.2	20.3
World total	100.0	100.0	100.0

The development of manufacturing industries in other parts of the world and their gradual acquisition of increased shares of export markets does not imply any immediate threat to the large export surpluses of Western Europe and Japan. Any bloc whose exports very much exceed its imports can, for a long time, afford a relatively low growth rate of exports compared with imports before the absolute magnitude of its surplus begins to decline. Japan is definitely in such a position with respect to trade in manufactures. Our *ex ante* projection implies that although Japan's imports of manufactures may grow rapidly while its share of world export markets rises only very little, the Japanese surplus on trade in manufactures will tend to grow considerably – from \$60 billion (at

Table 1.15 Ex ante projection of balances on trade in manufactures

	Trade balance	Projected growth 1978-85		Projected trade
	1978 (\$1975 billion)	Exports ^a	Imports ^a	balance 1985 (\$1975 billion)
		(% per year)		
USA	- 1.2	7.3	6.4	+ 5.8
Western Europe	+76.2	6.6	6.7	+117.3
Japan	+62.2	8.0	9.1	+103.8
Other developed	-15.8	6.4	4.0	- 14.2
Latin America	-29.1	5.8	7.2	- 46.9
Africa	-33.1	- 0.9	7.4	- 56.9
Asia	- 9.5	11.4	11.5	- 20.8
Middle East	-45.6	1.9	9.1	- 86.0
Centrally planned	- 4.1	7.6	6.3	- 0.3
World total	0.0	7.4	7.4	0.0

^aExcluding trade within blocs

1975 prices) in 1978 to about \$100 billion in 1985. This surplus, which arises predominantly on Japan's trade with the USA and developing Asia, may cause serious problems for these two energy-deficit blocs.

The other main surplus bloc in manufactures, Western Europe, also seems well placed to maintain its position. Our *ex ante* projection, with Europe's exports and imports of manufactures growing at almost identical rates, shows the surplus rising from \$75 billion in 1978 to almost \$120 billion in 1985. Since Europe's exports of manufactures are well over double its imports (excluding intra-trade), its surplus on trade and in manufactures would only start to diminish if its imports grew at over twice the rate of its exports.

Most other parts of the world are, correspondingly, certain to incur rising deficits on trade in manufactures unless the growth of their imports is drastically cut back. The only blocs which now have relatively balanced positions in manufactures are the United States, the 'other developed' bloc and the centrally planned economies. The balances of these blocs could go either way, depending on their export performance and on how fast they expand their spending. Our *ex ante* projection, on the basis of their

Table 1.16 The distribution of Japan's surplus on trade in manufactures by bloc

	(\$ 1975 billion)	
	1978	Ex ante projection 1985
USA	15.9	27.2
Western Europe	7.4	11.4
Other developed	3.3	2.3
Latin America	4.7	6.4
Africa	3.9	2.9
Asia	14.8	30.6
Middle East	7.7	15.8
Centrally planned	4.5	7.8
World total	62.2	104.3

performance between 1973 and 1978, is that they could all achieve slight improvements, even with quite fast growth of internal spending.

1.5 Sensitivity of the results

Projections of trade for any one bloc are evidently determined as much by external as by internal conditions. The tendencies to imbalance discussed here have been projected on the basis of quite ambitious target growth rates for spending in all blocs which imply a continuously rising world price for energy. How sensitive are these results to changes of assumptions?

In all blocs the projected trade balance is strongly sensitive to assumed levels of domestic spending. A reduction of 2-4% in the 1985 level of spending (i.e. a reduction in the growth rate up to 1985 of $\frac{1}{3}$ - $\frac{2}{3}$ % per year) would in nearly all cases improve the projected trade balance in 1985 by about 1% of GDP, *provided that the reduction in spending was confined to the bloc in question*. Thus 'deflation' of internal demand, whether it occurs as a deliberate result of fiscal and monetary policy or as a result of changes in trade or private savings and investment behaviour, is an effective way of reducing the trade deficit of any one country or bloc, but is not necessarily effective in improving the trade balances of many blocs if they all deflate simultaneously.

Reduced spending in one bloc will evidently diminish imports from other blocs. The effects on balances in manufactures are not very strong except for the few blocs - notably Japan and Asia - whose exports of manufactures to other parts of the world are a substantial percentage of total GDP. Within Western Europe, though individual countries are strongly inter-linked by the high level of internal trade in manufactures, exports of manufactures to the rest of the world account for only about 5% of total GDP.

An important part of the impact of changes in spending in any one bloc on the rest of the world is transmitted through world markets for energy and other primary commodities. Our tentative assumption

is that a 1% increase in world spending would raise world prices for oil and other primary commodities by 2-3%.

Variations in world prices, particularly for oil, may have large effects on trade balances. Even blocs which are net importers of energy may improve their trade balances in response to higher world prices as the volume of their energy production tends to rise and internal consumption to diminish. The Middle East has a trade balance which is 'super-sensitive' to the world oil price (assuming unchanged internal spending). Our estimate is that a 1% rise in world oil

prices may raise the Middle East trade surplus by nearly 0.8% of GDP.

Tendencies to widening trade imbalance due to energy problems and to the unequal distribution of manufacturing capacity and competitiveness could be corrected by a variety of means. The next chapter will consider processes of expenditure adjustment which are most likely to occur in practice. We defer to Chapter 3 the consideration of possible structural measures which could help to make accelerated growth of spending more feasible.

Table 1.17 Sensitivity of projected trade balances in 1985

	Changes in trade balances as % of GDP in response to 1% change in:		
	Domestic spending ^a	World trade in manufactures ^b	World price for energy ^c
USA	-0.32	+0.06	+0.04
Western Europe	-0.19	+0.05	-0.02
Japan	-0.20	+0.16	-0.07
Other developed	-0.41	+0.10	+0.09
Latin America	-0.30	+0.02	+0.12
Africa	-0.33	0.00	+0.40
Asia	-0.49	+0.15	+0.04
Middle East	-0.36	+0.01	+0.75
Centrally planned ^d	-0.27	+0.02	+0.08

^aExcluding indirect effects on exports to other blocs and on world prices

^bExcluding indirect effects on domestic spending and on world prices

^cResponse to 1% increase in world price of energy allowing for induced changes in energy production and consumption, excluding indirect effects on domestic spending and on non-energy exports to other blocs

^dSee Table 1.1