

Appendix A

Historical data and projections

This Appendix defines the main projections quoted in the text and tabulates results for 1985, with historical figures for comparison. The accounting concepts and data sources are those described on p.11 (see note overleaf on national income concepts). The model used to obtain the projections was the one defined on p.14 supplemented (except for the *ex ante* projection) by the expenditure adjustment processes set out in Chapter 2 (see p.23-5 and Table 2.1). Complete historical series were assembled for the years 1961-79 but the extrapolation of most trends in inexact equations and of exogenous variables — population, manufactured import ratios and export shares — was fitted to data for 1973-78 since many figures for 1979 were provisional. Trends in fuel supply equations were extrapolated in the light of IEA projections. A small number of extrapolated export shares and import ratios appeared implausible, and were modified accordingly. Projections were calculated year by year for 1980-85 but only the 1985 results have been used in the text.

Definition of projections

Except where noted, the following assumptions about spending objectives and financial targets were

imposed on all projections:

The Tables which follow show summary outcomes for each bloc (A.1), energy supply and demand (A.2) and manufactured import ratios and export shares (A.3).

- P1 *Ex ante projection (Chapter 1)*
Zero financial adjustment in all blocs, implying full achievement of spending objectives.
- P2 *Base projection (Chapter 2)*
Spending adjustment as tabulated below.
- P2 *Energy saving in developed blocs (Chapter 3)*
Cumulative reduction in trend term of energy demand equations for USA, Western Europe, Japan and Other Developed by 3% per year as compared with base projection.
- P4 *General preferences in favour of developing blocs (GSP) (Chapter 3)*
Manufactured export shares of developing blocs (Latin America, Africa, Asia, Middle East) to all destinations rising each year by up to 8% of the share in the preceding year.*

	Target growth of per capita spending (% per year)	Target trade balance (\$1975 bn)	Strength of financial adjustment (see Table 2.1)
USA	2.5	0	strong
Western Europe	3.0	- 5	strong
Japan	4.0	+ 5	normal
Other developed	3.0	0	normal
Latin America	4.5	-10	normal
Africa	6.0	- 5	normal
Asia	6.5	-10	normal
Middle East	4.5	(+25)	zero
Centrally planned	5.0	0	very strong

*Developing bloc shares were increased by 8% and all shares (including those of other blocs) were then scaled such that their sum in each market remained unity.

P5 *US protection with unchanged non-energy deficit (Chapter 3)*

The financial adjustment process for the USA was altered so that spending objectives were fully achieved while the manufactured import ratio was adjusted to achieve the same non-energy trade deficit for the USA as in the base projection. (This implied an increase in the US financial deficit equal to the increased cost of its net energy imports.)

Note on national income accounting concepts
(see p.11)

To simplify the model we have used approximate measures of the real spending and real income of each bloc.

(a) *Real spending*, H, is defined as the volume of GDP, Q, less the 'volume' balance on commodity trade. The precise relationship between this measure and the usual national accounts definition is given by

the following identity:

	Real spending, H
<i>plus</i>	Net exports of services
<i>less</i>	Difference between imports of goods on shipment basis and on arrivals basis
<i>less</i>	Specific terms of trade gains not due to changes in world prices of food and raw materials and energy relative to manufactures
<i>equals</i>	Real domestic spending (national accounts definition)

(b) *Real income*, Y, is defined as the volume of GDP, Q, adjusted for 'world' terms of trade effects. It is related to the national accounts definition of the real value of GNP as follows:

	Real income, Y
<i>plus</i>	Net income from abroad
<i>plus</i>	Specific terms of trade gains as above
<i>equals</i>	GNP in terms of domestic purchasing power

Table A.1 Past and projected trade and GDP by bloc

	1964	1973	1978	Alternative projections for 1985				
				P1 <i>Ex ante</i>	P2 Base projection	P3 Energy saving	P4 GSP	P5 US protection
World exports of manufactures (\$1975 billion)	213	513	673	1096	1003	1048	1000	1010
World GDP (excl. China) (\$1975 billion)	3518	5633	6609	9086	8315	8725	8279	8648
World population (excl. China) (millions)	2482	2947	3250	3741	3741	3741	3741	3741
World prices relative to manufactures (1975 = 100)								
Food and raw materials	87.9	101.2	99.2	108.9	95.7	102.6	95.2	101.3
Energy	48.3	46.4	91.8	294.4	225.7	192.5	223.0	253.6
USA								
Trade balance (\$1975 billion)								
Exports of manufactures	37	64	80	130	120	125	116	122
Imports of manufactures	20	62	81	124	111	121	110	104
Net food and raw materials	3	11	12	32	32	28	32	22
Net energy	- 2	- 11	- 32	- 81	- 53	- 33	- 51	- 90
Total	17	1	- 21	- 44	- 12	- 2	- 13	- 50
GDP volume (1975 = 100)	72.0	102.0	116.0	145.7	131.0	142.4	129.9	145.6
Real income from GDP (\$1975 billion)	1101	1570	1774	2174	1968	2158	1953	2168
Domestic spending (\$1975 billion)	1083	1569	1795	2217	1980	2160	1966	2217
Population (millions)	192	210	218	230	230	230	230	230
Spending per capita (\$1975 per person)	5641	7469	8234	9638	8607	9388	8546	9638
Western Europe								
Trade balance (\$1975 billion)								
Exports of manufactures	114	282	364	587	538	566	523	543
Imports of manufactures	92	236	288	468	420	454	413	422
Net food and raw materials	- 26	- 31	- 27	- 41	- 28	- 38	- 26	- 27
Net energy	- 10	- 27	- 48	-148	-105	- 79	-101	-110
Total	- 14	- 12	1	- 70	- 15	- 5	- 17	- 14
GDP volume (1975 = 100)	66.0	99.0	110.0	143.0	129.0	138.9	126.6	130.1
Real income from GDP (\$1975 billion)	1145	1727	1889	2348	2153	2341	2115	2162
Domestic spending (\$1975 billion)	1158	1739	1888	2419	2168	2346	2132	2177
Population (millions)	322	339	347	359	359	359	359	359
Spending per capita (\$1975 per person)	3598	5131	5440	6736	6038	6534	5938	6063

Table A.1 Past and projected trade and GDP by bloc (continued)

	1964	1973	1978	Alternative projections for 1985				
				P1	P2	P3	P4	P5
				<i>Ex ante</i>	Base projection	Energy saving	GSP	US protection
Japan								
Trade balance (\$1975 billion)								
Exports of manufactures	13	48	76	131	117	122	113	117
Imports of manufactures	4	15	14	26	26	29	26	25
Net food and raw materials	- 7	- 19	- 16	- 22	- 21	- 27	- 20	- 20
Net energy	- 2	- 10	- 23	- 84	- 69	- 56	- 67	- 73
Total	0	4	23	- 1	2	11	0	- 1
GDP volume (1975 = 100)	43.0	99.0	118.0	177.6	172.0	187.8	168.6	169.1
Real income from GDP (\$1975 billion)	219	509	595	834	826	915	811	805
Domestic spending (\$1975 billion)	219	505	572	836	825	904	811	805
Population (millions)	98	109	115	124	124	124	124	124
Spending per capita (\$1975 per person)	2233	4632	4974	6747	6660	7301	6546	6504
Other developed								
Trade balance (\$1975 billion)								
Exports of manufactures	10	27	31	48	44	47	41	42
Imports of manufactures	22	45	47	63	57	61	56	58
Net food and raw materials	12	19	16	16	14	14	14	16
Net energy	- 1	0	- 1	- 10	- 8	- 4	- 7	- 6
Total	- 1	1	0	- 8	- 7	- 3	- 8	- 6
GDP volume (1975 = 100)	57.7	94.8	109.9	149.1	135.2	144.9	132.9	137.7
Real income from GDP (\$1975 billion)	186	306	354	476	431	466	424	440
Domestic spending (\$1975 billion)	187	305	355	484	438	469	432	447
Population (millions)	53	66	72	83	83	83	83	83
Spending per capita (\$1975 per person)	3531	4624	4930	5858	5304	5679	5226	5406
Latin America								
Trade balance (\$1975 billion)								
Exports of manufactures	3	9	11	16	15	15	23	15
Imports of manufactures	16	30	40	64	61	60	63	63
Net food and raw materials	11	14	16	22	16	21	14	18
Net energy	3	4	4	26	14	7	11	18
Total	1	- 4	- 9	0	- 16	- 17	- 14	- 13
GDP volume (1975 = 100)	51.0	90.0	114.0	182.9	171.8	170.2	178.6	178.4
Real income from GDP (\$1975 billion)	177	317	407	672	621	612	643	648
Domestic spending (\$1975 billion)	177	321	416	673	637	628	657	661
Population (millions)	241	307	351	424	424	424	424	424
Spending per capita (\$1975 per person)	733	1047	1185	1585	1501	1481	1548	1558

Table A.1 Past and projected trade and GDP by bloc (continued)

	1964	1973	1978	Alternative projections for 1985				
				P1 <i>Ex ante</i>	P2 Base projection	P3 Energy saving	P4 GSP	P5 US protection
Africa								
Trade balance (\$1975 billion)								
Exports of manufactures	3	4	3	3	3	3	7	3
Imports of manufactures	11	22	36	60	64	59	66	70
Net food and raw materials	6	6	2	0	- 4	- 1	- 5	- 5
Net energy	2	11	19	90	60	49	59	69
Total	- 1	0	-12	33	- 6	- 8	- 5	- 3
GDP volume (1975 = 100)	57.0	90.0	116.0	184.4	190.3	177.8	196.7	204.5
Real income from GDP (\$1975 billion)	77	113	160	317	299	272	307	327
Domestic spending (\$1975 billion)	78	113	172	283	305	280	312	330
Population (millions)	284	357	409	496	496	496	496	496
Spending per capita (\$1975 per person)	274	316	420	572	615	564	629	665
Asia								
Trade balance (\$1975 billion)								
Exports of manufactures	6	23	39	86	78	82	87	77
Imports of manufactures	17	32	49	106	88	91	91	90
Net food and raw materials	4	4	5	10	6	11	5	10
Net energy	0	0	- 1	- 33	- 18	- 22	- 21	- 18
Total	- 6	- 5	- 6	- 44	- 22	- 21	- 21	- 21
GDP volume (1975 = 100)	58.1	89.3	115.9	205.3	173.8	179.5	180.8	178.2
Real income (from GDP (\$1975 billion)	141	218	283	481	414	428	430	425
Domestic spending (\$1975 billion)	148	223	289	524	436	448	450	446
Population (millions)	855	1069	1215	1451	1451	1451	1451	1451
Spending per capita (\$1975 per person)	173	209	238	361	301	309	310	307
Middle East								
Trade balance (\$1975 billion)								
Exports of manufactures	0	2	3	3	3	3	6	3
Imports of manufactures	6	17	48	89	89	89	89	89
Net food and raw materials	- 1	0	- 4	- 6	- 7	- 7	- 7	- 7
Net energy	9	31	74	250	177	143	174	206
Total	3	16	24	157	84	51	84	113
GDP volume (1975 = 100)	42.0	91.0	115.0	145.3	140.9	139.3	142.6	142.8
Real income from GDP (\$1975 billion)	67	130	203	429	355	322	356	384
Domestic spending (\$1975 billion)	63	114	179	271	271	271	271	271
Population (millions)	87	111	127	153	153	153	153	153
Spending per capita (\$1975 per person)	728	1030	1406	1774	1774	1774	1774	1774

Table A.1. Past and projected trade and GDP by bloc (continued)

	1964	1973	1978	Alternative projections for 1985				
				P1 <i>Ex ante</i>	P2 Base projection	P3 Energy saving	P4 GSP	P5 US protection
Centrally planned^a								
Trade balance (\$1975 billion)								
Exports of manufactures	27	54	65	93	85	85	83	87
Imports of manufactures	25	55	69	95	87	84	86	89
Net food and raw materials	- 3	- 2	- 4	- 10	- 7	- 1	- 7	- 8
Net energy	2	3	9	- 10	3	- 6	4	5
Total	0	0	1	- 23	- 6	- 7	- 6	- 5
GDP ^b volume (1975 = 100)	49.0	90.0	114.0	164.4	150.3	146.4	149.4	155.1
Real income from GDP (\$1975 billion)	405	743	944	1355	1248	1211	1241	1289
Domestic spending (\$1975 billion)	405	743	944	1378	1254	1218	1248	1293
Population (millions)	350	379	396	422	422	422	422	422
Spending per capita (\$1975 per person)	1156	1960	2383	3270	2976	2889	2960	3068

^aCentrally planned trade includes China and the centrally planned economies of Asia. GDP, income, spending and population exclude China and the centrally planned economies of Asia.

^bEstimates of GDP, income and spending are net material product, which excludes some services, and covers about $\frac{2}{3}$ of GDP.

Table A.2. Past and projected energy supply and consumption

	1964	1973	1978	(million tons, oil equivalents)		
				P1 <i>Ex ante</i>	P2 Base projection	P3 Energy saving
Energy supply						
USA	1135	1518	1477	1712	1656	1624
Western Europe	428	473	593	784	758	743
Japan	53	39	43	83	78	76
Other developed	162	350	373	465	440	427
Latin America	265	324	311	507	475	456
Africa	87	303	313	507	474	455
Asia	80	158	219	355	332	319
Middle East	386	1089	1108	1063	995	956
Centrally planned	1085	1675	2225	2967	2918	2889
Energy consumption						
USA	1231	1821	1858	2008	1901	1795
Western Europe	793	1238	1240	1415	1345	1260
Japan	139	353	348	399	418	396
Other developed	196	321	364	483	463	429
Latin America	129	248	290	410	412	422
Africa	28	47	66	104	119	113
Asia	90	174	252	498	440	469
Middle East	47	104	139	167	177	184
Centrally planned	1027	1624	2105	2957	2852	2877

Table A.3. Import penetration and export shares in trade in manufactures

(per cent)

	1964	1973	1978	Base projection 1985
Ratio of imports of manufactures to domestic spending				
USA	1.8	4.0	4.5	5.6
Western Europe	7.9	13.5	15.3	19.4
Japan	1.7	2.9	2.5	3.2
Other developed	11.9	14.7	13.3	12.9
Latin America	9.3	9.4	9.5	9.5
Africa	14.6	19.5	21.1	21.1
Asia	11.3	14.4	16.9	20.3
Middle East	8.7	14.5	27.1	32.9
Centrally planned	6.2	7.3	7.3	6.9
Export shares of USA by market				
USA	0.0	0.0	0.0	0.0
Western Europe	12.5	7.6	7.1	6.8
Japan	43.8	29.7	28.1	25.8
Other developed	47.6	48.4	49.9	55.2
Latin America	43.1	33.9	35.3	39.4
Africa	8.7	5.8	6.7	7.5
Asia	24.0	16.5	14.5	13.5
Middle East	16.8	14.6	15.2	12.7
Centrally planned	0.2	1.0	1.1	1.6
Export shares of Western Europe by market				
USA	44.3	36.6	31.0	26.8
Western Europe	75.6	79.2	79.4	79.2
Japan	35.5	28.5	29.5	30.4
Other developed	39.2	32.5	27.7	19.7
Latin America	36.3	35.7	32.9	29.0
Africa	64.4	61.1	65.8	69.8
Asia	28.1	21.2	24.8	29.1
Middle East	56.6	49.8	49.2	46.2
Centrally planned	18.8	26.6	29.8	31.5
Export shares of Japan by market				
USA	18.0	20.4	24.7	27.1
Western Europe	1.6	3.6	4.0	4.2
Japan	0.0	0.0	0.0	0.0
Other developed	4.1	9.1	10.1	9.1
Latin America	5.0	11.8	12.8	11.0
Africa	7.8	15.1	11.2	5.0
Asia	23.9	35.7	36.9	34.3
Middle East	7.5	12.7	16.0	17.3
Centrally planned	2.8	4.8	7.5	10.2
Export shares of Other Developed by market				
USA	24.1	25.7	23.5	22.3
Western Europe	2.9	1.9	1.5	1.3
Japan	7.8	7.0	9.9	12.7
Other developed	3.9	2.8	2.7	3.6
Latin America	3.3	3.6	3.9	4.6
Africa	4.7	3.7	2.2	1.4
Asia	1.7	5.0	3.7	2.4
Middle East	2.7	2.0	1.7	1.7
Centrally planned	0.1	0.2	0.5	1.1

Table A.3. Import penetration and export shares in trade in manufactures (continued)

	1964	1973	1978	(per cent) Base projection 1985
Export shares of Latin America by market				
USA	5.3	4.7	4.2	4.0
Western Europe	1.2	0.9	0.8	0.6
Japan	1.3	4.0	2.7	1.9
Other developed	0.1	0.6	0.6	0.3
Latin America	4.4	8.4	7.7	7.1
Africa	0.1	0.2	1.0	1.9
Asia	1.0	0.3	0.4	0.5
Middle East	0.2	0.2	0.5	0.9
Centrally planned	0.1	0.3	0.3	0.2
Export shares of Africa by market				
USA	0.4	0.1	0.2	0.7
Western Europe	2.0	1.2	0.6	0.2
Japan	2.4	2.8	1.1	0.4
Other developed	0.3	0.1	0.1	0.0
Latin America	0.0	0.5	0.1	0.0
Africa	3.9	2.4	1.4	0.9
Asia	0.3	0.3	0.1	0.0
Middle East	0.1	0.4	0.2	0.2
Centrally planned	0.5	0.5	0.4	0.2
Export shares of Asia by market				
USA	7.3	11.4	15.3	17.6
Western Europe	1.1	2.1	3.0	4.5
Japan	0.1	21.1	23.0	24.7
Other developed	3.8	4.2	6.8	9.2
Latin America	2.1	0.9	1.1	3.3
Africa	2.9	2.6	4.1	6.4
Asia	9.6	13.7	13.5	14.3
Middle East	5.1	4.4	6.2	9.6
Centrally planned	0.4	0.9	0.6	0.8
Export shares of Middle East by market				
USA	0.0	0.3	0.0	0.0
Western Europe	0.0	0.2	0.3	0.2
Japan	1.3	0.5	0.8	0.9
Other developed	0.3	0.3	0.1	0.0
Latin America	0.0	0.1	0.1	0.0
Africa	0.0	0.4	0.3	0.1
Asia	0.0	0.4	0.5	0.0
Middle East	1.3	3.7	2.7	2.1
Centrally planned	0.1	0.1	0.1	0.1
Export shares of Centrally Planned by market				
USA	0.5	0.8	1.1	1.5
Western Europe	3.1	3.4	3.3	3.0
Japan	7.7	6.4	5.0	3.3
Other developed	0.7	2.0	2.1	2.9
Latin America	5.9	5.2	6.2	5.6
Africa	7.5	8.7	7.3	7.0
Asia	11.4	6.9	5.5	5.7
Middle East	9.7	12.3	8.3	9.2
Centrally planned	76.9	65.4	59.7	54.3