



OECD Economics Department Working Papers No. 57

An International Sectoral
Data Base for Thirteen
OECD Countries

**F. J. M. Meyer-zu-
Schlochtern**

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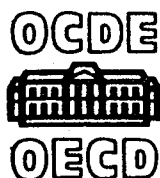
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F.J.M. Meyer-zu-Schlochtern
(Econometric Unit)

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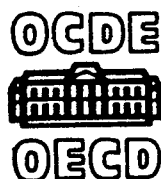
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No. 57: AN INTERNATIONAL SECTORAL DATA BASE FOR THIRTEEN OECD COUNTRIES

by

F.J.M. Meyer-zu-Schlochtern
(Econometric Unit)

The author is Principal Administrator in the OECD Econometric Unit of the Economics and Statistics Department. Special thanks go to Pete Richardson, Andrew Dean, Mike Feiner and John Martin for comments and suggestions on an earlier draft.

This paper describes an international sectoral data base, the ISDB, which has been created at the OECD as part of the continuing study of industrial structure and economic performance in OECD Member countries. This data base is one which relates primarily to sectoral output and factor resource use in thirteen OECD Member countries. In the context of recent OECD work, substantial use was made of the ISDB in preparing the recent OECD study, "Structural Adjustment and Economic Performance" (1987), and in other studies. Part II of the paper reports an analysis of a number of summary statistics derived from the data base for the period 1970 to 1985; specifically those related to economic structure and sectoral growth over the period.

* * * * *

Cet article décrit une base de données sectorielles et internationales, la ISDB, créée à l'OCDE dans le cadre des recherches poursuivies sur la structure industrielle et les performances économiques dans les pays Membres. Cette base de données se réfère principalement à la production et l'utilisation des facteurs de production par branche dans 13 pays Membres. La ISDB a été utilisée dans le contexte de travaux récents de l'OCDE, notamment dans l'élaboration de l'étude "Ajustement structurel et performance économique" (1987). La deuxième partie de cet article présente une analyse d'un certain nombre de statistiques dérivées de cette base de données pour la période 1970 à 1978, notamment celles portant sur la structure économique et la croissance sectorielle pour cette même période.

QUESTIONNAIRE

SECTORAL STATISTICS ON MICROCOMPUTER DISKETTE

The OECD Department of Economics and Statistics are planning to make the International Sectoral Data Base, the ISDB, described in this Working Paper, available on microcomputer diskettes. To assist us in planning this new data product, you or your organisation/institution are invited to fill in the following questionnaire and return it to us. Further details of the final coverage and form of the diskettes will be sent to all respondents in due course.

Name:

Address:

Title/Function:

Organisation:

Principal Activity : COMMERCIAL/ EDUCATIONAL/ GOVERNMENT/ RESEARCH/ OTHER(*)

Type of Application: STATISTICAL/ ECONOMETRIC/ OTHER(*)

PC Type: IBM/ IBM-COMPATIBLE/ APPLE MACKINTOSH/ OTHER(*)

Diskette Type: 5¼-inch/ 3½-inch/ OTHER(*)

Software Type: LOTUS 1-2-3/ SYMPHONY/ MULTIPLAN/ OTHER(*)

Would you also be interested in obtaining periodic updates of the ISDB?

Replies should be returned to:

ISDB Project
OECD Econometric Unit
Economics and Statistics Department
2, rue Andre-Pascal
75775 PARIS CEDEX 16
FRANCE

* Please specify as appropriate

AN INTERNATIONAL SECTORAL DATA BASE FOR THIRTEEN OECD COUNTRIES

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AN INTERNATIONAL SECTORAL DATA BASE FOR THIRTEEN OECD COUNTRIES

INTRODUCTION

1. This paper describes an international sectoral data base, the ISDB, which has been created at the OECD as part of the continuing study of industrial structure and economic performance in OECD Member countries. This data base is one which uniquely combines a range of data series related primarily to sectoral output and factor resource use in thirteen OECD Member countries. In doing so it draws upon the wealth of industrial and national accounts statistics published by national and international statistical agencies. As such it provides an important basis for international study of structural performance issues and in the context of recent OECD work substantial use has been made of the ISDB in preparing the OECD study of "Structural Adjustment and Economic Performance" (1987). It was also drawn on by a number of recent OECD studies of total factor productivity [Englander (1988), Englander and Mittelstadt (1988) and Englander et al. (1988)] and is used in ongoing work with respect to the determinants of capital investment carried out in the OECD Economics and Statistics Department.

2. The main part of this paper (Part I) concerns the sources and methods used in constructing the database. Special emphasis is given to the development of adequate correspondences between differing national and international classification systems for the data concerned, which are essential to the production of internationally comparable statistics. Also discussed are some of the basic principles used in developing internationally comparable measures of capital stock, total factor productivity and relative performance indicators, at a sectoral level.

3. Part II of the paper provides an analysis of a number of summary statistics derived from the data base for the period 1970 to 1985; specifically those related to economic structure and sectoral growth over the period. The final section then draws together some overall conclusions and considers the scope for further developments.

I. COVERAGE AND MEASUREMENT ISSUES

A. Coverage of the data base

7. In order to meet the basic requirements of international analyses of output and resource use by sector, the ISDB distinguishes between the following main categories of output and expenditures:

- Output: at current and constant prices;
- Employment: total employment (including self-employed) and numbers of employees;
- Investment: at current and constant prices;
- Capital stock: at constant replacement cost;
- Factor payments: compensation per employee, operating surpluses and net indirect tax payments, at current prices;

and, by implication, the ISDB also includes relevant output and factor price/cost deflators. Factor payments are of particular use for weighting together factors of production for the calculation of various measures of total factor productivity.

8. The number of sectors considered was selected on the basis of the availability of consistent data for output and factor use across as many countries and time periods as possible. A major part of the data set covers the period from 1960 to 1986, but for analytical purposes a thirteen-country-consistent sample is only available from 1970 to 1985. Extending the period in either direction reduces the number of countries in the sample.

9. For the chosen sample, time series data are available for nineteen sectors and ten broad categories of output and expenditure items, for the following countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Norway, Sweden, the United Kingdom and the United States.

10. For each of these countries, data are present for the following broad sectoral classification:

<u>Sector Code</u>	<u>Sector Description</u>
AGR	Agriculture
EGW	Electricity, gas and water
CST	Construction
RET	Retail trade, wholesale, restaurants and hotels
TRS	Transport, storage and communications

<u>Sector Code</u>	<u>Sector Description</u>
FNS	Financial institutions and insurance
RES	Real estate and business services
SOC	Community, social and personal services
PGS	Producers of government services
FOD	Food and kindred products
TEX	Textiles and leather
WOD	Lumber, wood products and furniture
PAP	Paper and allied products, printing and publications
CHE	Chemicals and allied products
MNM	Stone, clay and glass products
BMI	Primary metals industry
MEQ	Machinery and equipment
MOT	Misc. manufacturing industries
MIN	Mining

11. The sector classification used is broadly that of the International Standard Industrial Classification system (ISIC). However, a number of the national and international data sources used in the construction of the data base are not available on exactly this classification; Annex A gives the details of the system correspondence matrices used in going from national and international source classifications to the ISIC and SNA systems. These are of particular relevance to the data for the United States, Canada and Japan.

12. Annex A also provides a more detailed account of the country and industry classifications and the variables available in the data base, along with a detailed account of sources and methods and sample availability by country, sector and variable. The following sections discuss some of the more important measurement issues involved in the construction and analytical use of the data system.

B. The measurement of capital stocks

13. In the present study, gross capital stock data are used as measures of the capital inputs in the production process, representing the total volume of the existing physical capital assets available in the respective countries and sectors. Source data for gross capital stocks are not, however, generally available at the detailed sector level for many of the countries. Where official data are unavailable, estimates have therefore been made using a perpetual inventory method similar to that used by national administrations. The following paragraphs describe the basic procedures involved.

14. The perpetual inventory model simulates the process of capital accumulation, using data for past capital formation expenditures adjusted for scrapping, according to the following relationship:

$$GCS = \sum INV_j * g_j \quad [1]$$

where:

GCS = gross capital stock in constant prices

INV = gross fixed capital formation in constant prices

g = the survival coefficient

j = the number of time periods since the investment took place

15. The survival coefficient, g, represents the amount of capital formation of a given vintage still installed at a given point in time. The capital stock estimate is thus related to capital which is believed to be available, but not necessarily utilised. The survival coefficient lies between 1 and 0 and is commonly assumed to be a decreasing function of time. The exact values are usually defined in terms of certain "survival" or "mortality" functions, which, in practice, vary widely between different national statistical offices (1).

16. In the calculations reported here, a delayed linear retirement pattern is assumed, with scrapping beginning five years after the capital asset has been installed. Such a mortality function is flexible, easy to use and consistent with the assumption of an acceleration in the rate of scrapping as capital assets approach the end of their service lives. It also comes close to the class of survival functions used by a majority of national statistical offices.

17. The impact of a delay in scrapping on the estimated levels of the capital stock depends on the rate of growth of capital investment. If investment is not growing, the estimated level of the capital stock is not affected by the delay. If the level of investment is rising over time, the estimated level of the capital stock will be higher, the longer the initial delay period. Conversely, its level will be smaller when investment is falling. A number of alternative specifications have also been considered, but the gross capital stock estimates proved to be relatively insensitive to choice of mortality functions, except in the case of extreme assumptions, such as "simultaneous exits" or "sudden deaths", as reported by Blades (1983).

18. A second important element in the calculation of the capital stock is the service life of the capital asset. In the present study, these have been taken from a number of independent estimates [see those cited by Blades (1983) and Paccoud (1983)], and are expressed in the form of the average service life, the ASL, of the asset. Introducing this component, the generalised formula for the gross capital stock becomes:

$$GCS = \sum_{i=0}^{s-1} INV_{t-i} + \sum_{n=s+1}^{s+(ASL-s)*2} (1-ak)^n * INV_{t-n} \quad [2]$$

where:

S = the initial delay period (assumed to be five years in the present study)

ASL = the average service life

k = $(ASL-S)*2$

a = the scrapping rate = $1/(k+1)$

n = the final period before the original gross fixed capital formation is completely scrapped

= $S+(ASL-S)*2$

INV = gross fixed capital formation in 1980 prices and converted to U.S. dollars.

19. For comparative purposes, the capital stock data thus obtained are expressed in constant U.S. dollars (2). The average service life assumptions used are reported in detail, in Table A-8 in Annex A.

20. The scrapping rate assumptions used by different national authorities tend to differ widely, often for reasons which appear to reflect the methods of estimation used rather than fundamental differences in the nature of the capital goods or their utilisation. For example, the assumed average service life of buildings is 42 years in Finland, compared with 70 years in Sweden. To analyse in greater detail the importance of such differences for the estimation of total factor productivity growth (considered in later sections), some preliminary tests were carried out. In these, factor productivity estimates were first calculated, by sector, using capital stocks estimates based on the cross-country mean average service life for each sector and these were then compared with alternative estimates based on country-specific scrapping rate assumptions. The resulting differences in estimates were found to be quite significant for the levels of capital stock estimates but relatively minor for factor productivity growth. In general, it was found that use of sectoral mean ASL's tended to give capital/output ratios which were more similar between countries, as might be expected.

21. A major difficulty in estimating capital stocks, whether at an aggregate or sectoral level, is the lack of sufficiently long capital expenditure time series and adequate historical benchmarks. In the present study, specific procedures were adopted using a combination of the available time series information and "reasonable" assumptions concerning the capital-output ratio, the scrapping rate and the intersectoral distribution of capital. Essentially, these procedures have involved the estimation of capital stock benchmarks and corresponding investment time series at both an aggregate and sectoral level for the period 1860 to 1980. These in turn have been aligned with the available investment data for the period 1967 to 1973. The resulting historical time series estimates for investment by sector were then combined with actual data for the period 1970 to 1985 and passed through the capital stock estimation procedure described by equation [2] above (3).

22. As a test of the adequacy of this method of approximation, the capital stock estimates thus obtained have been compared with a range of available official estimates. Graphs A and B overleaf illustrate the relationship between annual average growth rates of available official capital stock series and the corresponding estimates, for the period 1973 to 1985. These cover the full range of countries for which capital stocks are available by sector at two general levels of sectoral aggregation -- that of the individual sectors and also sub-aggregates, with sectors grouped according to degree of international exposure, as outlined in Table A.1 of Annex A.

23. On the whole, the goodness-of-fit between the estimated and actual growth rates is good, particularly for the sub-aggregate groupings. At the individual sector level, there is a zero mean difference between the growth rates of the calculated and published capital stocks, with a standard error of 1 per cent. For the grouped data there is also a zero mean difference and a standard error of 0.3 per cent. In general this suggests that there are no systematic errors in the basis of the calculations.

C. Total factor productivity

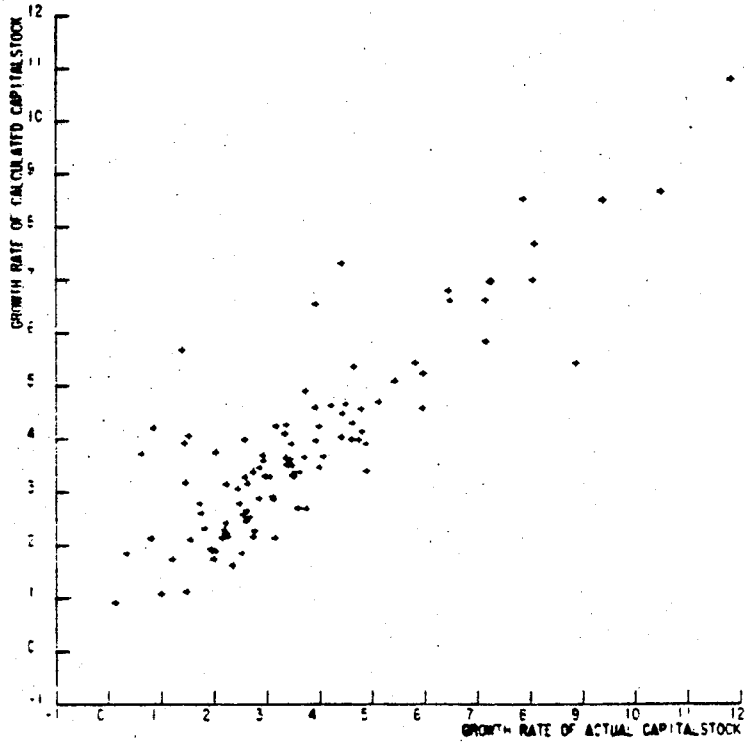
24. The concept of total factor productivity, TFP, has been an important focus of interest in a number of recent studies, notably at the level of aggregate manufacturing industry and the business sector (4). The ISDB permits the extension of a similar approach to a number of individual sectors of the economy. Essentially, total factor productivity growth is calculated as the residual difference between output growth and the weighted growth of factor inputs, in this case capital and labour inputs, combined in a specific manner. A common assumption is to use the respective factor shares in total costs as individual factor weights, following a Cobb-Douglas-type production function framework.

25. To the extent that the measurement of total factor productivity is related to the "true" physical input of factors which is relevant, the lack of data relating to hours worked, both for labour and capital, represents an important limitation to the existing measures, particularly at a sectoral level. Hours-worked data are not always ideal, since they often relate to hours paid for rather than hours actually worked. The latter might be lower during periods of labour hoarding than in periods of labour scarcity, even with identical numbers of hours worked. For capital, also, working hours may differ from those reported for labour, for example as the result of multiple shift work which in many countries has tended to increase the "work week" of fixed capital over the period (5). In any event, the relevant data are not available at the detailed sector level used in this study for many countries. However, bias due to the failure to allow for cyclical variation in hours worked and capacity utilisation is likely to be greatest for short-run comparisons and less important for medium- and longer-term analyses.

26. Although it is fairly common practise to use calculated factor shares to weight together labour and capital as a composite measure of inputs into the production process [see, for example, EEC (1985)], preliminary inspection of the data sources suggests that the automatic use of the available data for different variables and different sectors may be hazardous. Indeed, in a number of cases important differences in factor shares, both between sectors and countries, seem more likely to reflect differences in the coverage of individual categories of data than actual differences in factor shares.

COMPARISON BETWEEN GROWTH RATE OF ACTUAL AND CALCULATED CAPITAL STOCK

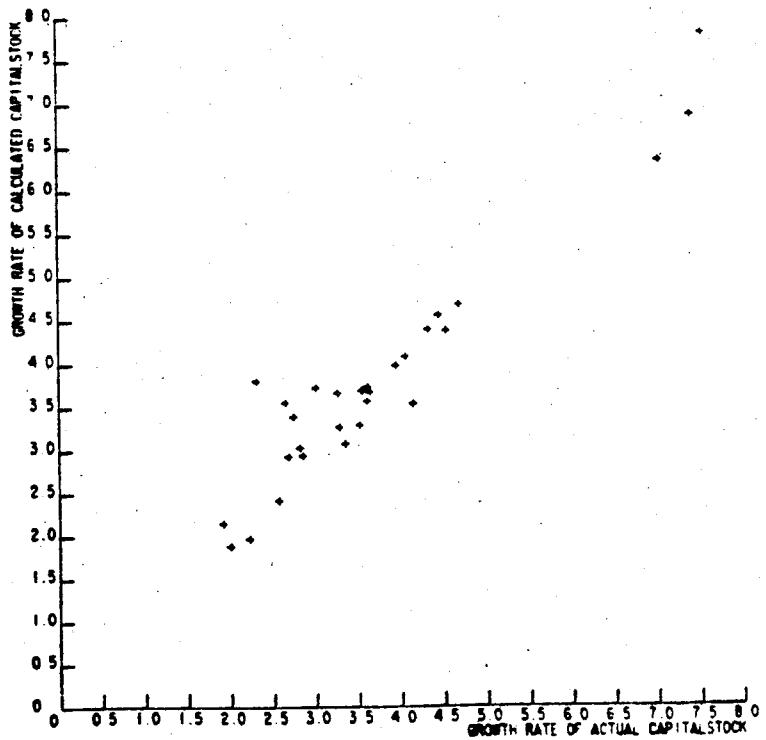
GRAPH A



PER SECTOR PERIOD 1970-1985

COMPARISON BETWEEN GROWTH RATE OF ACTUAL AND CALCULATED CAPITAL STOCK

GRAPH B



FOR SECTOR GROUPINGS PERIOD 1970-1985

27. To assess the extent of this kind of problem, factor shares have been calculated by country and sector on the following basis:

$$SW = COMP \cdot (ET/EE) / (VA^*) \quad (3)$$

where:

SW = share of labour in value added
 ET = total employment
 EE = total employees
 COMP = compensation of employees
 VA* = value added, at current prices

28. In these calculations, total compensation per employee is rescaled by the ratio of total employment to total employees in order to include also the self-employed in the weighting scheme. In effect, the self-employed are assumed to be paid the same average rate of compensation as employees and the same marginal rate of productivity is assumed for dependent and independent workers (6).

29. Analysis of these data across countries shows some important outliers, with the most notable differences occurring in the calculated labour shares for agriculture, mining, social services, basic metals and residual manufacturing. Nonetheless, there is a striking central tendency, with the majority of sectors in the majority of countries showing labour shares very close to 75 per cent. The main systematic sectoral differences across countries are for government services with a labour share of 94 per cent and for electricity, gas and water, and real estate, both with labour shares slightly below one third.

30. Given these results, a standardised weighting method was adopted across countries. In effect, the calculations were simplified by setting the weight attached to labour inputs to 75 per cent for all sectors and countries, with the exception of personal and government services, where a labour weight of 94 per cent was used, and electricity, gas and water and real estate, where a labour weight of 33 per cent were used.

31. Given these weights, total factor productivity indices were calculated using the familiar formula:

$$TFP = VA / [ET^{(w)} \cdot GCS^{(1-w)}] \quad [4]$$

where:

TFP = total factor productivity index
 GCS = capital stock
 VA = value added, in constant price terms
 w = standardised labour share weights

D. Relative sector performance

32. Comparisons of the observed rates of sectoral growth do not necessarily give a particularly good basis for the assessment of relative sectoral performance within or between countries. For example, the output and productivity growth rates for many sectors of the Japanese economy may have been absolutely greater than those for the United Kingdom, yet for some of these sectors, U.K. growth performance may have been relatively better than that for Japan, given overall macroeconomic and external circumstances. The underlying question is therefore one of relative sectoral performance and the standards against which this might be measured in an international context.

33. One possible approach is to consider the difference between the observed rates of growth for a particular sector in a particular country, and those which might have been expected, given the average growth rate of the same sector for all countries and the growth performance of all sectors of that economy (i.e. the total economy) in relation to that of all countries. The rationale for such a measure is broadly analogous to that for measures of Revealed Comparative Advantage (RCA), used commonly in the trade performance literature (7).

34. The sectoral performance indicator can be defined thus:

$$p(i,j) = g(i,j) - G(i,j) \quad [5]$$

where:

$p(i,j)$ = the performance indicator for sector i , in country j

$g(i,j)$ = the actual growth of sector i , in country j

$G(i,j)$ = the expected growth of sector i , in country j

35. Defining the "expected" growth rate, $G(i,j)$, for the individual sector as being the growth rate of that sector averaged over all countries, adjusted for the difference between the overall growth of the total economy and the average growth of all countries, gives the following expression:

$$G(i,j) = g(i,.) + g(.,j) - g(.,.) \quad (6)$$

where:

$g(.,j)$ = the average growth of country j , across all sectors

$g(i,.)$ = the average growth of sector i , across all countries

$g(.,.)$ = the average growth of all countries, across all sectors

With such a definition the expected growth, $G(i,j)$, represents the growth which might be observed in a hypothetically "neutral" world. For example, if the total Japanese economy grew by 1 per cent per annum faster than the cross-country average, and the retail sector, averaged over all countries, grew by

4 per cent per annum, then the "expected" growth rate for the Japanese retail sector would be 5 per cent per annum. Substituting equation [6] into equation [5] gives a performance indicator of the form:

$$\begin{aligned} p(i,j) &= g(i,j) - [g(i,.) + g(.,j) - g(.,.)] \\ &= g(i,j) - g(i,.) - g(.,j) + g(.,.) \end{aligned} \quad [7]$$

36. Equation [7] can also be rearranged into the following form:

$$\begin{aligned} p(i,j) &= [g(i,j) - g(.,.)] - [g(i,.) - g(.,.)] \\ &\quad - [g(.,j) - g(.,.)] \end{aligned} \quad [8]$$

In effect, the performance indicator can be viewed as having three components, namely the deviations in growth for, respectively, individual sector i in country j , $g(i,j)$, sector i averaged across countries, $g(i,.)$, and country j averaged across sectors, $g(.,j)$, from total growth, $g(.,.)$. It therefore takes a positive sign, when a given sector in a given country grows faster in relation to that country's overall performance than does the same sector, averaged in relation to the corresponding cross-country and cross-sector averages. Conversely, a negative value indicates that the relative growth of the sector is below that of the relative growth of the total economy.

37. In practice, the calculation of a consistent set of hypothetical growth rates by sector presents a number of specific problems, insofar as the country and sector average growth rates are also required to equal those experienced. The application of equation [6] alone does not guarantee that the projections of sector and country totals will coincide with actual outturns. An extension of the RAS matrix estimation method was therefore applied, to provide a consistent estimation technique, with equation [6] providing only an approximation to the final indicator values. A detailed discussion of the estimation method used is given in Annex B.

II. RECENT TRENDS IN SECTORAL DEVELOPMENT

38. Detailed tables summarising various sectoral shares and main trends in sectoral growth, by country, are reported in Annex C, based on the data set available in the ISDB for the period 1970 to 1985. These include a range of value added, factor input and total factor productivity growth measures and corresponding relative sector performance indicators described in the previous section.

39. A sectoral approach allows a more detailed evaluation of economic trends and a better insight into the changing structural characteristics of the economies in question. However, there is also the danger that the mass of

data may, at least in the first instance, be more confusing than clarifying. To assist in the basic presentation therefore, summary details have been collated using two different forms of broad sectoral groupings. These also provide some interesting observations concerning the relationship between competition and sectoral performance. Specific details on the grouping of individual sectors are again given in Table A.1 of Annex A.

40. First, sectors have been grouped judgmentally according to general openness to foreign competition. The most open sectors -- essentially manufacturing and agriculture -- are subdivided into two further sub-groups: Supply, containing those sectors heavily influenced by supply conditions, namely agriculture and basic metals, and Open -- composed of the remaining sectors of manufacturing industry. The sheltered sectors are divided generally into government, community and social services, Gov&Soc; other services, Sheltered, and, given the quite different capital intensity for the real estate sector, a further group, Sheltered less residential, which excludes the real estate sector.

41. The second criterion orders sectors according to the average output growth rates for all countries in the sample. Three equal-sized groups are identified: Low, containing the sectors with lowest growth rate of output; Medium, with sectors having an average growth rate; and High, covering the remaining sectors with the highest growth rates over the period. This ordering is also applied to the other variable categories such as employment, capital stock and productivity.

42. Tables 1 to 3 present summary information on structure and performance based on these sectoral groupings. The following sections discuss some of their main features -- those related to overall structure, comparative growth performance and relative productivity trends.

A. Economic structure

43. Table 1 reports for the period 1970 to 1985 individual sectoral shares, in terms of value-added, employment and capital stock, expressed in relation to individual country (Tables 1a and 1b) and aggregate sector totals (Table 1c).

44. The first and, perhaps, most important feature is that the sectoral composition of the individual countries, at the chosen levels of aggregation, are rather similar insofar as there is relatively little variance across countries in the shares of value-added, employment and capital stock. Estimated standard deviations across countries for the broad sectoral shares are typically in the range of 2½ to 6½ per cent, with little systematic variation across output and factor input classifications. There are, however, some important exceptions. With respect to output, Germany has a relatively large open sector, accounting for 32 per cent of total value-added, compared with 24 per cent for the thirteen countries taken together. Notably also, the share of machinery and equipment manufacturing in Germany's total output, at 16 per cent is well above the average 11 per cent (see Annex C, Table C.1). Compared to the other large European countries and Japan, France appears to have, on these definitions, a relatively small open sector, accounting for 21 per cent of value-added, more in line with the smaller European countries.

Table 1.a

SECTORAL SHARES OF THE TOTAL ECONOMY

Sectors grouped by openness to foreign competition

Average 1970-1985

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC	TOTAL	S.D.(1)
VALUE ADDED (VOLUME)																	
G&S	22.68	21.73	25.69	17.93	24.40	20.39	24.16	31.29	18.73	21.89	19.89	21.50	20.76	23.53	23.23	22.07	3.5
Sheltered	50.32	51.51	48.58	44.73	49.24	48.79	37.96	33.78	48.29	50.74	53.78	52.47	43.89	42.44	48.48	47.73	5.8
Supply	8.26	6.82	6.26	12.83	5.03	9.62	5.38	8.18	6.31	7.31	8.63	4.64	7.38	7.25	7.20	6.19	2.2
Open	18.75	19.94	19.47	24.51	21.33	21.21	32.50	26.76	26.67	20.05	17.69	21.38	27.97	26.78	21.08	24.01	4.4
Sheltered	41.43	41.85	35.95	34.58	38.49	35.98	31.69	33.78	29.68	33.06	34.93	37.02	30.22	33.15	37.76	34.53	3.8
less Res.																	
EMPLOYMENT																	
G&S	27.97	27.05	30.56	21.25	33.68	29.23	22.07	23.53	27.39	28.71	25.53	32.05	22.33	25.58	29.33	27.50	3.9
Sheltered	40.61	42.21	36.09	37.70	35.73	37.62	34.10	35.38	41.09	46.31	46.88	44.39	36.08	37.27	37.19	40.11	4.3
Supply	11.31	8.40	9.78	19.69	8.10	13.80	10.51	15.95	6.34	7.73	9.42	4.88	16.63	11.29	11.43	9.90	4.4
Open	20.11	22.34	23.57	21.36	22.50	19.36	33.32	25.14	25.19	17.25	18.16	18.68	24.96	25.86	22.05	22.48	4.2
Sheltered	37.58	38.84	31.78	35.03	32.26	33.76	31.33	35.38	33.32	37.04	37.98	37.56	32.28	33.54	33.78	34.95	2.6
less Res.																	
CAPITAL STOCK																	
G&S	17.94	21.86	21.86	19.38	19.59	25.34	26.15	18.53	18.37	25.00	21.54	30.56	26.52	22.78	19.72	26.80	3.9
Sheltered	62.93	59.51	60.91	56.98	59.48	56.04	55.93	56.48	59.46	54.11	62.83	57.76	47.30	56.91	59.84	56.32	4.1
Supply	8.44	5.68	6.23	10.81	5.42	6.71	5.88	10.27	6.58	7.34	5.92	4.09	10.54	7.04	7.29	6.07	2.1
Open	10.70	12.95	11.00	12.82	15.51	11.91	12.04	14.72	15.59	13.55	9.71	7.58	15.63	13.26	13.14	10.81	2.5
Sheltered	40.04	27.90	24.14	25.91	24.52	23.48	20.81	22.75	31.74	23.92	31.21	23.41	15.64	24.32	27.47	23.14	6.0
less Res.																	

1. Standard deviation

Table 1.b

SECTORAL SHARES OF THE TOTAL ECONOMY

Sectors grouped by sample value added growth classes

Average 1970-1985

Growth Class	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EUS	NORDIC	TOTAL	S.D.(1)
High	32.87	35.21	31.49	27.18	40.14	39.27	46.83	35.24	40.01	35.09	27.51	44.96	46.43	40.55	34.85	42.03	6.6
Medium	32.50	33.01	31.29	31.61	24.23	26.94	25.02	28.57	29.22	30.78	40.49	29.76	27.47	27.50	28.37	28.52	4.2
Low	34.63	31.78	37.23	41.20	35.63	33.80	28.15	36.19	30.77	34.12	32.01	25.29	26.09	31.95	36.78	29.45	4.5
EMPLOYMENT																	
High	22.72	27.02	21.56	15.84	24.10	28.22	32.32	19.88	29.63	27.40	36.60	36.82	32.85	27.85	21.76	30.75	6.4
Medium	34.63	33.55	31.80	33.11	29.55	27.87	29.49	31.69	32.21	37.20	37.30	32.79	31.54	30.43	31.56	31.55	2.8
Low	42.66	39.43	46.64	51.05	46.35	43.91	38.19	48.42	38.16	35.40	26.10	30.39	35.61	41.72	46.68	37.70	7.3
CAPITAL STOCK																	
High	39.10	51.86	48.35	48.82	53.55	56.91	57.11	56.20	59.45	53.30	52.87	54.11	50.61	57.15	48.90	54.84	5.2
Medium	32.61	20.87	20.03	19.76	19.93	17.62	15.68	18.43	22.14	17.90	19.09	13.53	11.96	18.18	22.14	16.27	4.9
Low	28.29	27.27	31.62	31.41	26.52	25.47	27.20	25.36	18.41	28.79	28.04	32.36	37.42	24.67	28.95	28.88	4.5

1. Standard deviation

Table 1.c

COUNTRY SHARES OF SECTORAL TOTALS

Sectors ranked by openness to foreign competition

Average 1970-1985

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC	TOTAL
	VALUE ADDED (VOLUME)															
Total	0.57	1.34	0.70	0.61	1.54	7.55	9.13	6.91	6.94	3.70	2.28	42.74	16.00	31.87	3.41	100.00
G&S	0.58	1.32	0.82	0.49	1.70	6.98	9.99	9.80	5.89	3.67	2.06	41.65	15.05	33.98	3.59	100.00
Sheltered	0.60	1.45	0.72	0.57	1.59	7.72	7.26	4.89	7.02	3.93	2.57	46.98	14.71	28.34	3.47	100.00
Supply	0.75	1.48	0.71	1.26	1.25	11.73	7.93	9.13	7.08	4.36	3.18	32.06	19.07	37.35	3.97	100.00
Open	0.44	1.12	0.57	0.62	1.37	6.67	12.35	7.70	7.71	3.09	1.68	38.06	18.63	35.54	3.00	100.00
Sheltered less Res.	0.68	1.63	0.73	0.61	1.72	7.87	8.37	6.76	5.97	3.54	2.31	45.82	14.00	30.60	3.73	100.00
	EMPLOYMENT															
Total	0.59	1.29	0.83	0.77	1.45	7.94	9.02	7.22	8.69	3.37	2.17	36.21	20.46	34.15	3.65	100.00
G&S	0.60	1.27	0.92	0.60	1.77	8.43	7.24	6.18	8.65	3.51	2.02	42.20	16.61	31.76	3.90	100.00
Sheltered	0.60	1.36	0.75	0.73	1.29	7.44	7.67	6.37	8.90	3.89	2.54	40.08	18.40	31.73	3.39	100.00
Supply	0.68	1.09	0.82	1.53	1.19	11.06	9.57	11.63	5.56	2.63	2.07	17.84	34.34	38.91	4.22	100.00
Open	0.53	1.28	0.87	0.73	1.45	6.83	13.37	8.07	9.73	2.58	1.76	30.09	22.71	39.28	3.58	100.00
Sheltered less Res.	0.64	1.43	0.75	0.77	1.34	7.66	8.08	7.31	8.28	3.57	2.36	38.91	18.89	32.77	3.53	100.00
	CAPITAL STOCK															
Total	0.72	1.27	0.85	0.88	1.63	7.68	10.07	5.83	6.25	3.88	2.30	46.76	11.89	31.09	4.07	100.00
G&S	0.48	1.04	0.69	0.64	1.19	7.26	9.82	4.03	4.28	3.62	1.85	53.33	11.77	26.44	3.00	100.00
Sheltered	0.80	1.35	0.92	0.90	1.72	7.64	10.00	5.84	6.60	3.73	2.57	47.96	9.99	31.42	4.33	100.00
Supply	1.00	1.19	0.87	1.57	1.45	8.48	9.75	9.85	6.77	4.69	2.24	31.50	20.63	36.04	4.89	100.00
Open	0.71	1.52	0.86	1.05	2.33	8.46	11.21	7.93	9.01	4.86	2.07	32.80	17.19	38.13	4.95	100.00
Sheltered less Res.	1.24	1.54	0.88	0.99	1.72	7.79	9.06	5.73	8.57	4.01	3.11	47.32	8.04	32.69	4.84	100.00

45. The average share for the total sheltered sector across countries is 48 per cent, with the highest shares being those for the United States, Australia, Belgium, Norway and Canada. For some countries this appears to reflect the imputation of relatively large service flows for owner-occupied houses in the real estate sector. Excluding real estate, the highest shares for the sheltered sector are those for the United States, Norway and Sweden. The relatively high weight, of 31 per cent, shown for community and social services in the case of Italy, reflects a coverage problem. For Italy, the available statistics do not permit a proper separation of financial institutions and real estate from this sector. Assuming that the latter categories represent an average 10 per cent of the total (i.e. in line with that for other countries) the adjusted shares for Italy come close to those of other countries.

46. In terms of output and employment shares, Table 1b shows the faster-growing sectors to account for significantly higher shares in Germany, Japan and the United States. Thus for output, the open sector of these countries accounts for 45 to 46 per cent of the total economy, compared with an average 34 per cent for the other countries included. In terms of capital stock though, high growth sectors have had uniformly above-average shares for Germany and the larger European economies. By contrast, there appears to be a rather different sectoral distribution of output and employment for the smaller European economies with the slower growing sectors being more important, notably so for the Nordic countries.

B. Sectoral growth between 1970 and 1985

47. Table 2 summarises the average growth rates of output, employment, capital stock and total factor productivity over the period 1970 to 1985 for different country and sector groupings.

48. At first sight, these developments again suggest common patterns for a number of countries and variables presented. This impression is supported by a comparison of the variance of the growth rates in specific sectors. In particular, the variance in each specific sector is generally lower than that for all sectors taken together, implying that countries tend to show much the same growth tendencies. A number of trends in sectoral decline therefore appear to be common across countries. Similarly, high growth rates are often scored by countries in sectors where overall growth is high. Such a similarity would also be consistent with demand patterns being relatively similar for the countries included in this study.

49. Output growth comparisons for individual sectors do however show some interesting contrasts, notably between the experiences of the sheltered and open sectors. For the period in question, the variances in sectoral growth rates across countries show a markedly higher average variance for the open sectors, of about 3 per cent per annum, when compared with the government and sheltered sectors, with an average of about 2 per cent per annum.

Table 2.a

AVERAGE ANNUAL GROWTH RATES 1970 TO 1985

Sectors ranked by openness to foreign competition

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC	TOTAL
VALUE ADDED (VOLUME)																
Total	3.15	2.43	2.46	3.44	2.15	2.51	2.35	2.31	1.54	3.65	3.03	2.78	4.71	2.20	2.60	2.92
G&S	4.53	2.73	3.54	3.93	2.83	2.53	3.44	2.84	1.90	2.86	3.75	2.06	3.83	2.78	3.41	2.68
Sheltered	3.39	2.12	1.64	3.72	2.25	2.64	2.45	1.94	2.25	4.38	3.34	3.03	4.59	2.35	2.55	3.10
Supply	2.07	2.01	3.70	1.19	0.80	1.42	0.65	1.16	-0.45	1.63	2.34	0.60	2.11	0.86	1.67	1.13
Open	1.40	3.05	2.74	3.79	1.46	2.70	1.72	2.50	0.48	3.45	1.64	3.39	6.36	1.84	2.16	3.27
Sheltered less Res.	3.09	1.87	0.82	3.25	2.21	2.11	2.18	1.94	1.13	3.88	2.90	2.72	3.92	1.89	2.26	2.65
TOTAL FACTOR PRODUCTIVITY																
Total	1.21	1.41	1.07	1.83	0.72	1.04	1.48	0.86	1.04	0.39	0.82	0.59	1.57	1.14	1.06	0.93
G&S	1.20	0	-0.12	0.44	-0.41	0.11	0.70	-0.65	0.28	-0.44	-0.14	0.15	-0.05	0.10	0.03	0.08
Sheltered	0.99	0.55	0.51	1.64	0.74	0.42	1.34	0.42	0.62	0.48	0.48	-0.02	0.65	0.70	0.88	0.35
Supply	2.98	3.79	4.71	2.47	2.01	2.80	2.33	2.31	1.91	0.51	2.20	0.96	2.21	2.44	2.80	1.87
Open	0.87	3.62	2.23	2.61	1.34	2.13	1.89	2.26	1.85	1.02	1.76	2.23	3.87	2.05	1.68	2.35
Sheltered less Res.	1.16	0.75	0.30	1.83	1.02	0.46	1.34	0.42	0.38	0.88	0.83	-0.07	0.65	0.70	1.03	0.38
EMPLOYMENT																
Total	0.87	-0.03	0.51	0.47	0.64	0.28	-0.34	0.43	-0.03	2.58	1.56	1.88	0.75	0.05	0.61	0.99
G&S	2.98	2.58	3.67	3.30	3.08	2.24	2.11	3.07	1.77	3.29	3.77	1.83	2.76	2.25	3.24	2.26
Sheltered	1.28	0.17	-0.57	0.71	0.20	0.59	-0.11	0.86	0.87	2.88	1.76	2.97	1.52	0.54	0.32	1.80
Supply	-2.74	-3.28	-2.62	-2.83	-2.88	-3.11	-3.02	-2.80	-3.39	0	-0.33	-1.03	-2.87	-3.04	-2.79	-2.47
Open	-0.82	-2.36	-0.49	0.31	-0.98	-0.87	-1.37	-0.59	-2.65	1.80	-0.99	0.17	0.26	-1.47	-0.57	-0.46
Sheltered less Res.	0.97	-0.10	-1.14	0.42	-0.07	0.30	-0.27	0.86	0.31	2.56	1.29	2.48	1.34	0.27	-0.01	1.42
CAPITAL STOCK																
Total	3.77	3.70	2.74	3.99	2.90	4.25	3.22	3.29	2.25	4.57	3.81	2.81	7.47	3.30	3.25	3.58
G&S	4.30	3.34	2.34	4.07	2.47	4.52	4.09	3.77	1.69	4.16	3.52	2.30	8.65	3.72	3.06	3.45
Sheltered	3.57	4.01	2.70	4.36	2.96	4.37	3.13	3.39	2.52	4.94	4.35	3.04	7.07	3.38	3.30	3.63
Supply	3.86	2.55	3.85	2.20	3.37	2.96	1.71	3.05	1.71	4.14	1.52	2.32	6.99	2.39	3.17	3.34
Open	4.03	3.40	3.16	3.79	3.06	3.89	2.51	2.48	2.08	4.14	2.51	3.46	7.12	2.74	3.37	3.76
Sheltered less Res.	3.02	4.18	3.18	4.05	3.23	4.54	3.42	4.09	2.61	4.79	4.35	3.63	7.80	3.62	3.33	3.98

Table 2.b

AVERAGE ANNUAL GROWTH RATES 1970 TO 1985

Sectors ranked by sample value added growth class

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC	TOTAL
VALUE ADDED (VOLUME)																
Total	3.15	2.43	2.46	3.44	2.15	2.51	2.35	2.31	1.54	3.65	3.03	2.78	4.71	2.20	2.60	2.92
Growth Class																
High	3.05	4.09	3.32	4.58	2.68	3.67	3.34	2.91	2.65	5.23	4.03	3.76	6.41	3.21	3.12	4.05
Medium	2.76	1.59	1.87	3.43	1.68	2.72	1.96	2.97	1.29	3.46	2.65	3.06	4.59	2.18	2.27	2.99
Low	3.61	1.52	2.24	2.72	1.86	1.05	1.09	1.22	0.35	2.30	1.97	0.79	2.11	0.97	2.38	1.21
TOTAL FACTOR PRODUCTIVITY																
Total	1.21	1.41	1.07	1.83	0.72	1.04	1.48	0.86	1.04	0.39	0.82	0.59	1.57	1.14	1.06	0.93
Growth Class																
High	0.16	1.84	1.44	1.43	0.89	0.83	1.68	0.27	1.49	0.74	0.38	0.94	2.32	1.18	0.94	1.21
Medium	1.48	0.60	1.37	2.26	0.88	1.07	1.50	1.32	0.90	0.55	1.17	0.72	1.49	1.17	1.37	1.00
Low	1.88	1.80	0.52	1.74	0.41	1.21	1.20	1.02	0.66	-0.02	0.97	-0.07	0.65	1.07	0.92	0.53
EMPLOYMENT																
Total	0.87	-0.03	0.51	0.47	0.64	0.28	-0.34	0.43	-0.03	2.58	1.56	1.88	0.75	0.05	0.61	0.99
Growth Class																
High	1.61	1.31	0.45	1.71	0.52	1.94	0.31	1.74	0.42	3.39	3.15	2.76	2.28	0.97	0.87	2.10
Medium	0.45	-0.05	-0.43	0.42	0.12	0.61	-0.27	1.33	0.09	2.67	0.90	2.03	1.00	0.38	0.12	1.21
Low	0.82	-0.93	1.18	0.12	1.03	-0.99	-0.96	-0.70	-0.49	1.87	0.30	0.66	-0.85	-0.79	0.82	-0.18
CAPITAL STOCK																
Total	3.77	3.70	2.74	3.99	2.90	4.25	3.22	3.29	2.25	4.57	3.81	2.81	7.47	3.30	3.25	3.58
Growth Class																
High	4.59	3.96	2.64	4.69	2.91	4.53	3.65	3.28	2.39	4.99	4.36	3.15	7.26	3.53	3.46	3.80
Medium	2.48	4.47	3.21	3.50	3.20	4.72	3.06	3.84	2.49	4.19	3.58	3.33	8.34	3.52	3.07	3.84
Low	4.19	2.64	2.59	3.24	2.68	3.35	2.41	2.93	1.51	4.06	2.95	2.05	7.49	2.62	3.04	3.05

50. The cross-country variances for individual sectors are as follows:

<u>Sector</u>	<u>Variance</u> (per cent p.a.)	
PGS	1.4	} Government, social and sheltered sectors mean variance = 1.9 std. deviation = 0.7
SOC	1.1	
RET	1.7	
EGW	2.4	
CST	2.8	
TRS	1.6	
RES	1.1	
FNS	3.0	
AGR	1.1	
BMI	5.8	
FOD	1.3	} Open sectors mean variance = 3.0 std. deviation = 1.6
PAP	1.7	
CHE	3.5	
MNM	1.9	
TEX	4.7	
MEQ	5.6	
MOT	2.9	
WOD	2.1	

51. The data given in Table 2 also show consistently that the High output growth group corresponds to the highest growth rate of the three groups for each individual country, with the exception of Norway. The latter country has experienced the highest growth rate for the government sector -- generally included in the group with sectors with low overall growth (see also Table C.7).

52. Table 2 also suggests that sectors experiencing relatively high output growth rates do not generally correspond to those with high rates of growth for employment, the capital stock or productivity. Indeed, growth in employment has mainly been concentrated in the sheltered sectors, with total factor productivity showing the opposite development, growing most rapidly in the open sectors. With the notable exception of Japan, growth in the capital stock has not differed much between countries and sectors. In the case of Japan, the capital stock has grown significantly faster than for any other country. Japan has also experienced an above-average TFP growth in the open sectors, whilst for other sectors TFP growth rates have been similar to or lower than those of the other countries.

53. Generally speaking, developments in output and TFP growth rates for the open sectors have been very similar. Such a finding is similar to that found by Verdoorn (1949) for manufacturing industry in fourteen countries, albeit with output and labour productivity data covering the period before the Second World War. Verdoorn's original regression result was:

$$\text{PROD} = 0.57 * Y + 0.24$$

where:

PROD = Labour productivity growth in manufacturing

Y = Growth in manufacturing output

54. Carrying out a similar regression on a cross-country basis using data for the open sector gives a very similar result:

$$\text{TFP} = 0.54 * \text{VA} + 0.72 \quad (R^2 = 0.618)$$

(4.22) (2.00)

(t-ratios are given in brackets).

C. Relative growth performance

55. As discussed in Section I.D, actual sectoral growth rates do not necessarily provide a good indication of relative sector performance on an international basis. For this reason performance indicators have been calculated for value-added, total factor productivity and factor use on the basis of the estimation procedure outlined in Section I.D. These are reported in detailed sectoral form, for the period 1970 to 1985, in Appendix C and are also summarised on the more aggregate basis in Tables 3a and 3b which follow.

56. Perhaps the most striking feature of the performance indicators shown in Table 3a is the relationship between output and factor productivity performance indicators in the relatively open sectors.

57. Indeed, the correlations between value-added and the respective TFP, labour and capital stock indicators for the open and supply sectors are as follows:

<u>Correlation Coefficients (R²)</u>			
Value-added indicator for:	TFP indicator	Employment indicator	Capital stock indicator
Open sector	0.82**	0.27	0.00
Supply sector	0.83**	0.03	0.10

(** indicates statistical significance at the 99% level)

58. The relationship between relative output and total factor productivity performance over the period for these sectors is therefore significantly positive. On the other hand, corresponding correlations between output performance and relative factor growth, both for labour and capital, while positive, are insignificant.

Table 3.b

DIFFERENCE BETWEEN ACTUAL AND CALCULATED GROWTH RATES

Average annual growth rates for the period 1970 to 1985

Sectors ranked by sample value added growth class

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC
VALUE ADDED (VOLUME)															
Growth Class															
High	-1.25	0.47	-0.48	-0.35	-0.63	-0.10	-0.11	-0.59	-0.18	0.24	-0.09	-0.04	0.48	-0.19	-0.66
Medium	-0.55	-1.10	-0.84	-0.38	-0.52	-0.03	-0.35	0.31	-0.23	-0.38	-0.47	0.25	-0.13	-0.14	-0.57
Low	2.07	0.70	1.30	0.60	1.26	0.17	0.57	0.42	0.53	0.10	0.86	-0.24	-0.81	0.43	1.25
TOTAL FACTOR PRODUCTIVITY															
Growth Class															
High	-1.29	0.33	-0.01	-0.43	-0.12	-0.43	-0.44	-0.79	0.01	0.08	-0.28	0.12	0.51	-0.36	-0.32
Medium	0.11	-0.98	0.01	0.32	-0.08	-0.06	0.16	0.36	-0.14	-0.04	0.16	0.01	-0.11	0.02	0.05
Low	1.08	0.66	0	-0.01	0.20	0.44	0.45	0.39	0.13	-0.03	0.14	-0.19	-0.60	0.38	0.25
EMPLOYMENT															
Growth Class															
High	-0.36	0.25	-1.15	-0.47	-0.95	0.37	0.04	0.28	-0.33	-0.53	0.06	-0.03	0.14	0.07	-0.82
Medium	-0.62	-0.31	-1.11	-0.64	-0.64	-0.06	-0.39	0.04	-0.02	0.17	-0.48	0.27	-0.18	-0.12	-0.74
Low	0.76	0.10	1.46	0.65	0.98	-0.24	0.30	-0.16	0.30	0.30	0.66	-0.27	0.02	0.04	0.98
CAPITAL STOCK															
Growth Class															
High	0.64	0.09	-0.23	0.51	-0.13	0.05	0.21	-0.22	-0.11	0.14	0.41	0.08	-0.45	0.02	0.10
Medium	-1.43	0.16	0.17	-1.08	0.03	0.02	-0.49	0.15	0.09	-0.53	-0.78	0.21	0.24	-0.08	-0.57
Low	0.86	-0.30	0.26	-0.07	0.26	-0.13	-0.17	0.40	0.28	0.08	-0.23	-0.23	0.57	0.01	0.28

59. The important inference which emerges is that relative sector output performance over the period appears to have been largely associated with "residual" total factor productivity developments rather than the relative intensity of factor use, confirming the earlier results of Denison (1967) and others (8). Thus a relatively good performance in the open sectors has not been associated with the application of more visible production factors but with underlying increases in productivity.

60. For the supply sector, it is also interesting to note that, with the exception of Finland, both value-added and factor productivity growth has been consistently high for the group of European economies. For Japan, the United States and Canada, the supply sectors show signs of relative decline, in spite of significant absolute rates of growth and a dominant share of the production of the country group as a whole. In the open sectors, the most outstanding growth performance, both in terms of output and factor productivity, has clearly been that of Japan.

61. In the sheltered sectors, the actual growth of value-added is generally close to the calculated "expected" growth, with the variance of the performance indicators being fairly close to zero. At an aggregate level this is not too surprising since, as Table 1a indicates, the sheltered sectors account for a relatively large share of the "total" economy (9). At the individual sector level, though, factor productivity and value-added performance indicators also tend to show a smaller variance across countries for these sectors. One possible explanation is that, being subject to less foreign competition, output for these sectors tends to follow demand relatively closely and, given rather similar levels of per capita income, demand patterns may also be rather similar across countries.

62. For the sheltered sectors, total factor productivity developments are also close to their "expected" values, resulting in the lowest overall variances between actual and calculated growth rates of TFP. This may also reflect the fact that TFP growth rates for this sector are themselves generally lower than in the open and supply sectors. An important feature of the government and service sectors is, of course, the difficulty in measuring output. To the extent that labour service inputs are often used as indicators of output, a strong correlation between employment and output might not be too surprising.

63. The correlations between value-added, factor productivity and factor input indicators for the government and sheltered sectors are as follows:

Correlation Coefficients (R^2)

Value-added growth indicator for:	TFP growth indicator	Employment growth indicator	Capital stock growth indicator
Government and services sector	0.18	0.50**	0.00
Sheltered sector	0.31*	0.45*	0.11

(* indicates significance at the 95% level

** indicates significance at the 99% level)

64. In contrast to the open and supply sectors, these results suggest a significant positive association between value-added and employment growth indicators for both sectors, and TFP for the sheltered sector only. Given the above qualifications, the result for the government and services sector is not particularly surprising.

65. Looking next at sectoral performance grouped by output growth class, a notable feature is the tendency for the slower growing sectors to have the largest variance between actual and calculated growth rates for TFP. It is thus in these sectors that countries have differed most in their productivity growth rather than the sectors with medium and high output growth rates.

66. The results grouped by overall sectoral growth also provide some important insight into the recent findings that European economies have typically shown slowest growth in the sectors which are growing quickest at a world level. One underlying rationale is that, for structural reasons, European economies have failed to shift resources quickly enough into high-growth sectors [see, for example EEC (1985)]. Whilst Table 3b confirms the basic observation with respect to relative output performance in Europe, comparisons with the lower panels suggest that the underlying problem may not lie in the flexibility of factor inputs. Indeed, comparative rates of labour and capital stock growth appear to have been quite close to "expected" rates over the period, for the "high-growth" sectors. Rather, the problem appears to be associated with a relatively poor total factor productivity performance. In general the indicators for the European countries show productivity growth rates which are systematically lower than "expected" in the high-growth sectors, whilst those for North America and Japan show generally higher-than-expected productivity growth.

D. The catch-up hypothesis

67. In the early 1970s, productivity levels in Japan and most European countries were well below those in the United States. For these countries there was therefore an opportunity to catch up with countries with higher productivity levels, in particular the United States. These countries will thus have had an opportunity for relatively high growth rates in sectors which lagged specifically behind other countries in terms of productivity levels. All that was necessary for these countries was to follow the existing innovation and techniques of the frontrunners (10).

68. The so-called "catch-up hypothesis" is tested at a sectoral level in Table 4 below. For this test, sectors were first divided into three groups: those showing low, medium and high levels of labour and total factor productivity in 1970, on an overall sample basis. Then, the average growth rates of labour and total factor productivity were calculated on a country-by-country basis for each of these three sectoral groupings.

69. On a total factor productivity basis, the highest rates of growth over the period coincide with the group with the lowest productivity levels in 1970 for nine out of thirteen countries (i.e. those underlined in Table 4). It is also worth noting that the main outliers -- Germany, France and Finland -- are cases where there are in any case relatively small differences in actual growth rates between the three groups. A similar result is obtained for labour productivity estimates, for ten out of thirteen countries. Thus we conclude that there is reasonably strong (but not overwhelming) support for the catch-up hypothesis in terms of sectoral data.

Table 4

THE CATCH-UP EFFECT

Productivity growth rates 1970 to 1985,
with sectors grouped by productivity levels

COUNTRY	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	UKM	CAN	AUS	U.S.	JAP
per cent per annum													
<u>Total Factor Productivity</u>													
LOW	<u>2.0</u>	<u>4.0</u>	<u>4.0</u>	1.9	<u>1.7</u>	1.1	1.4	<u>2.7</u>	<u>1.9</u>	<u>1.1</u>	<u>1.1</u>	0.0	<u>4.0</u>
MED	0.6	2.8	0.5	1.5	1.1	<u>1.7</u>	0.9	0.6	0.4	0.6	0.9	<u>0.9</u>	0.2
HIGH	0.2	0.3	0.7	<u>2.1</u>	0.0	1.3	<u>1.6</u>	0.1	-0.3	-0.6	0.8	0.4	0.8
<u>Labour Productivity</u>													
LOW	<u>2.4</u>	<u>5.4</u>	<u>5.1</u>	2.6	<u>2.2</u>	2.3	<u>2.5</u>	<u>2.7</u>	<u>1.9</u>	1.0	<u>2.4</u>	<u>1.0</u>	<u>5.6</u>
MED	2.1	3.7	1.5	2.7	1.3	2.0	2.4	2.0	0.9	<u>2.1</u>	0.9	0.8	1.5
HIGH	1.1	1.2	1.1	<u>2.8</u>	1.3	<u>2.8</u>	2.2	0.6	1.1	0.2	1.5	0.7	3.3

LOW sectors with lowest productivity levels in 1970
 MED sectors with average productivity levels in 1970
 HIGH sectors with highest productivity levels in 1970

III. CONCLUSIONS AND FUTURE DIRECTIONS

A. Concluding remarks

70. In describing the construction of the ISDB, Part I of this paper covers a range of measurement issues. Many other important problems arise in drawing together such a large body of data and the interested reader is advised to consult Appendix A, and its numerous footnotes, for a more detailed account of some of the many pitfalls involved. In a number of important areas, particularly for the services sector, coverage problems abound in the source national statistics, which cannot be easily resolved by the individual researcher or statistician. Nonetheless, the construction of the ISDB represents an important step forward and the preliminary analysis of the data in its present form, described in Part II, has already revealed a number of interesting and important points.

71. The general picture which emerges is that over the period from 1970 to 1985, the broad structural characteristics of the countries in the sample, measured in terms of sectoral output and factor shares, are rather similar. Also, their sectoral growth experiences have not been too different, although there are two notable exceptions. First, the cross-country variance of output growth seems to have been higher for those sectors most open to foreign competition. Second, Japan has experienced exceptionally high growth in the capital stock, on an economy-wide basis.

72. With respect to relative sector performance, an important finding is that for those sectors most open to foreign competition relatively high rates of output growth, on a sectoral basis, tend also to be associated with relative high rates of total factor productivity growth, rather than high rates of growth in labour and capital inputs. In the case of the European economies, there is also some confirmation that relatively slow growth has been largely experienced in those sectors which have tended to grow most rapidly on a global basis. In contrast with recent findings, the evidence suggests that such slow growth may be related to a generally poor total factor productivity performance, rather than sluggishness in the mobility of factors between fast- and slow-growth sectors.

73. The same body of data also appears to lend some support to the so-called "catch-up" hypothesis in suggesting that sectors with initially low labour or total factor productivity levels have experienced higher productivity growth rates than those with high productivity levels.

B. Future directions

74. Although the ISDB provides an important starting point for the study of sectoral behaviour on an international basis, it is nonetheless incomplete in a number of important respects. It has evolved, so far, along moderately restrictive lines -- concerned largely with the production accounts and factor costs. This largely reflects the nature of its uses to date, the fairly major complications involved in augmenting the content of the data set on a consistent basis and the underlying resource constraints.

75. From an international viewpoint, an important and obvious omission is that of compatible trade flows statistics, those for imports and exports, which would be essential in exploring more thoroughly the international linkage aspects of sectoral performance and transmission. A major obstacle here is not so much that of reconciling industrial and trade classification systems, the ISIC and SITC, but more the thorny problem of devising suitable price deflation methods. Statistics related to trade in the service sector are also elusive on an international basis. Work in each of these important areas is currently under way, both at the OECD and in other international organisations, and it is hoped that such information could be added to the ISDB on a consistent basis in the near future (11).

76. For industrial policy purposes, the inclusion of more industrial structure-related information, for example with respect to firm size and concentration, both of ownership and the work force, would be important. Adequate sectoral data in these areas are more likely to be available on a cross-section rather than a time-series basis. From an industrial development standpoint, compatible data on R&D and other innovation-relevant expenditures would be a useful addition. In this area two major problems arise, both in terms of measurement and the sectoral attribution of expenditures, as between the initiating activity and the relevant production activity (12).

77. Finally, it is noted that the analyses described in this paper represent a fairly restricted subset of the potential uses of the existing data set, both in terms of topic and the period of analysis. This is clearly an area where there is no shortage of entries for a future research agenda.

NOTES

1. For a survey of these methods, see Ward (1976).
2. Conversions to U.S. dollars are made using the purchasing power parity exchange rates given by Ward (1985).
3. In calculating consistent capital expenditure series, the following steps were taken:
 - a) Benchmark indices for the capital stock at an aggregate level were calculated for the period 1860 to 1930 assuming constant output growth rates and unchanged capital-output ratios and then extrapolated from 1930 to 1980, using annual output series.
 - b) Given the resulting capital stock series, corresponding investment time series estimates were then calculated and rescaled, on a sectoral basis, using the average recorded levels for 1967 to 1973.
 - c) The resulting reference series were then merged with actual data, starting from the earliest period for which sectoral data were available.
 - d) The capital stocks were then recalculated, using equations [1] and [2] on the basis of the merged investment time series for the period 1860 to 1985.

4. See OECD (1985), EEC (1985), UN (1986), and Englander (1988).
5. See Foss (1985).
6. In a number of cases, notably in sectors where unpaid family workers are included in the category of independent workers or self-employed, such an adjustment can introduce a distortion such that the calculated labour weight exceeds 100 per cent. In such cases, the labour weights were set to the sample mean values.
7. Similar measures of comparative performance have been proposed in a number of areas, most notably for the assessment of comparative trade advantage, see, for example, Balassa (1967) and Bowen (1983).
8. See, for example, the recent review by Maddison (1987).
9. Indeed, relative sector performance indicators of this type tend towards zero as the level of aggregation tends to that of the total economy.
10. An interesting review of catch-up and convergence theories is given by Baumol (1986).
11. At the OECD, recent work on a standardised trade and output classification for the manufacturing sectors is included in the COMTAP data base, which is currently available in current price terms only. Similar work has been undertaken at the European Commission with the VOLUMEX data base.
12. For example, most of the R&D expenditures in the mechanical and electrical engineering sector are directed to improving the factor productivity of other sectors. A general discussion of the measurement problems associated with R&D data is given by Englander et al. (1988).

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Annexes

Annex A

INTERNATIONAL SECTORAL DATA BASE

Sources and Methods

Contents

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General notes

The countries included in the ISDB sample are as follows:

Australia (AUS), Belgium (BEL), Canada (CAN), Denmark (DNK), the Federal Republic of Germany (GER), Finland (FIN), France (FRA), Italy (ITA), Japan (JPN), Norway (NOR), Sweden (SWE), the United Kingdom (UKM) and the United States (USA).

The general sectoral breakdown used is taken from the International Standard Industrial Classification (ISIC), currently used in the National Accounts (ANA) publications of the OECD. The latter represent the primary source of information for most countries, along with the OECD's Labour Force Statistics (LFS). For Belgium, France and the United Kingdom, data are also drawn from the EUROSTAT BDS files (Base Données Sectorielles), which also include capital stock data.

The BDS data are classified according to the NACE classification, which differs from the ISIC. In developing sector groupings, the matching of ISIC sectors against NACE sectors necessarily involves a considerable degree of aggregation and approximation.

Data are collected for output (value and volume), investment (value and volume), capital stock, employment, total and employees, and for the breakdown of cost components of value added, namely: compensation of employees and operating surplus.

For comparative purposes, all data have been rebased and converted to 1980 constant prices and are expressed in constant U.S. dollar equivalences, by means of the purchasing power parity exchange rates given by Ward (1985).

Table A.1

ISDB SECTORAL GROUPS AND CLASSIFICATIONS

Sectoral Codes	Description	Output growth group; high (H), medium (M) or low (L).	International exposure group
AGR	Agriculture	L	Supply
EGW	Electricity, gas and water	M	Sheltered
CST	Construction	L	Sheltered
RET	Wholesale, retail trade, restaurants and hotels	H	Sheltered
TRS	Transport, storage and communication	H	Sheltered
FNS	Financial institutions and insurance	H	Sheltered
RES	Real estate and business services	H	Sheltered
FNI	= FNS + RES	H	Sheltered
SOC	Community, social and personal services	H	G & S
PGS	Producers of government services	M	G & S
<u>Manufacturing</u>			
FOD	Food, kindred products and tobacco	M	Open
TEX	Textile, leather	L	Open
WOD	Lumber, wood products and furniture	L	Open
PAP	Paper and allied products, petroleum and coal products, rubber and misc. plastic products	M	Open
CHE	Chemicals and allied products	L	Open
MNM	Stone, clay and glass products	L	Open
BMI	Primary metal industry	L	Supply
MEO	Machinery and equipment	H	Open
MOT	Misc. manufacturing industries	M	Open
MIN	Mining	excluded	

Table A.2

RELATION BETWEEN ISIC AND BDS/NACE SECTOR CODES

Description of sector	ISDB ISIC	BDS	NACE
Agriculture	AGR	1	1
Mining and quarrying	MIN	2	6
Electricity, gas and water	EGW	-	-
Manufacturing	MAN	3	30
Food, beverages and tobacco	FOD	13	36
Wood and wood products	WOD	17	-
Paper, printing and publishing	PAP	15	47
Chemicals, petroleum, rubber, plastic	CHE	7+16	17+49
Non-metallic mineral products	MNM	6	15
Basic metal products	BMI	5+8	13+19
Machinery and equipment	MEQ	29+10+11+12	21+23+25+28
Other manufactured products	MOT	17	-
Construction	CST	19	53
Wholesale, retail trade, restaurants and hotels	RET	22+23	56+59
Wholesale and retail trade	RWH	-	-
Restaurants and hotels	HOT	-	-
Transport, storage and communication	TRS	24+25+26+27	61+63+65+67
Finance, insurance, real estate	FNI	28	69A
Finance, insurance	FNS	-	-
Real estate	RES	-	-
Community, social and personal services	SOC	29	74+93
Total industries	TIN	-	-
Producers of government services	PGS	81+85+89	86-93
Other producers	OPR	-	-
Total	TET		

Table A.3

RELATION BDS AND NACE SECTOR CODES

BDS Code	Description	NACE-CLIO R25 code
1	Agricultural, forestry and fishery products	01
2	Fuel and power products	06
3	Manufactured products	30
5	Ferrous and non-ferrous ores and metals, other than radioactive	13
6	Non-metallic minerals and mineral products	15
7	Chemical products	17
8	Metal products, except machinery and transport equipment	19
9	Agricultural and industrial machinery	21
10	Office and data processing machines, precision and optical instruments	23
11	Electrical goods	25
12	Transport equipment	28
13	Food, beverages and tobacco	36
14	Textiles and clothing, leather and footwear	42
15	Paper and printing products	47
16	Rubber and plastic products	49
17	Other manufactured products	48
19	Building and construction	53
20	Market services	68
22	Recovery and repair services, wholesale and retail trade services	56
23	Loading and catering services	59
24	Inland transport services	61
25	Maritime and air transport services	63
26	Auxiliary transport services	65
27	Communication services	67
28	Services of credit and insurance institutions	69A
29	Other market services	74
33	Non-market services	86
35	General government services	
36	Other non-market services	
37	Total	

Table A.4

UNITED STATES CLASSIFICATIONS

Sector Description	ISIC ISDB Code	Capital Stocks	Fixed Capital Formation
Agriculture	AGR	390	366
Mining and quarrying	MIN	393	372
Electricity, gas and water	EGW	408	402
Manufacturing	MAN		
Food, beverages and tobacco	FOD	261	108
		264	117
Textiles	TEX	267	120
		270	126
		288	162
Wood and wood products	WOD	228	042
		231	048
Paper, printing and publishing	PAP	273	132
		276	138
Chemicals, petroleum, rubber, plastic	CHE	279	144
		282	150
		285	156
Non-metallic mineral products	MNM	234	054
Basic metal products	BMI	237	060
		240	066
Machinery and equipment	MEQ	243	072
		246	078
		249	084
		252	090
		255	096
Other manufactured products	MOT	258	102
Construction	CST	225	36
Wholesale, retail trade, restaurants and hotels	RET	337	240
Wholesale and retail trade	RWH	330	246
Restaurants and hotels	HOT	357	300
Transport, storage and communication	TRS	402	390
		405	396
Finance, insurance, real estate	FNI	411	408
Finance, insurance	FNS	Survey of Current	
Real estate	RES	Business, August 1984	
Community, social and personal services	SOC	414	357
		414	302
Total industries	TIN		
Producers of government services	PGS	Survey of Current	
Other producers	OPR	Business, August 1984	
Total	TET		

Notes:

Codes are for constant cost valuation 1982 dollars
equipment + structures
(2 capital stock (1 gross capital
Code = S + (4 investment fixed + (3 net capital + 0 + above codes
(non-resid. private (6 investment

Example: S210 393 = gross capital stock constant 1982 dollars mining
S460 366 = investment constant 1982 dollars agriculture

Source: United States Department of Commerce
Survey of Current Business: "Fixed Reproducible Tangible Wealth in
the United States: Revised Estimates," J.C. Musgrave, January 1986.

Table A.5

CANADA

Sector Description	ISIC ISDB	Fixed Capital Formation
Agriculture	AGR	2584
		2624
		2656
Mining and quarrying	MIN	2696
Electricity, gas and water	EGW	3168
		3208
Manufacturing	MAN	
Food, beverages and tobacco	FOD	1768
		1808
Textile	TEX	1888
		1928
		1968
		2000
Wood and wood products	WOD	2032
		2072
Paper, printing and publishing	PAP	2104
		2144
Chemicals, petroleum, plastic	CHE	1848
		2424
		2464
Non-metallic mineral products	MNM	2384
Basic metal products	BMI	2184
		2224
Machinery and equipment	MEQ	2264
		2304
		2344
Other manufactured products	MOT	2504
Construction	CST	2728
Wholesale, retail trade, restaurants and hotels	RET	
Wholesale and retail trade	RWH	3248
		3432
Restaurants and hotels	HOT	
Transport, storage and communication	TRS	2760
		2800
		2840
		2880
		2920
		2968
		3032
		3000.
		3088
		3128
Finance, insurance, real estate	FNI	3288
Finance, insurance	FNS	
Real estate	RES	
Community, social and personal services	SOC	3312
		3336
		3360
		3384
		3408
Total industries	TIN	
Producers of government services	PGS	3472
Other producers	OPR	3504
		3536
Total	TET	

Fixed Capital Formation Constant Prices
Above codes are preceded by D88

Source: CANSIM

Table A.6

JAPAN

Sector Description	ISIC ISDB Code	Row number in EPA publication
Agriculture	AGR	2
Mining and quarrying	MIN	3
Electricity, gas and water	EGW	22
Manufacturing	MAN	5
Food, beverages and tobacco	FOD	6
Textile	TEX	7
Wood and wood products	WOD	-
Paper, printing and publishing	PAP	8
Chemicals, petroleum, plastic	CHE	9
Non-metallic mineral products	MNM	-
Basic metal products	BMI	10
Machinery and equipment	MEQ	11+12+13+14
Other manufactured products	MOT	15
Construction	CST	-
Wholesale, retail trade, restaurants and hotels	RET	16
Wholesale and retail trade	RWH	-
Restaurants and hotels	HOT	-
Transport, storage and communication	TRS	21
Finance, insurance, real estate	FNI	19+20
Finance, insurance	FNS	19
Real estate	RES	20
Community, social and personal services	SOC	23
Total industries	TIN	1
Producers of government services	PGS	
Other producers	OPR	
Total	TET	

Source: Economic Planning Agency, "Gross capital stock by industry"

Table A.7: Detailed Sources by Country

The following tables A.7a to A.7m report, for each individual country, the specific sources used in the preparation of sectoral data for the following variables:

Employees

Total Employment

Gross Investment

Gross Domestic Product

Compensation per Employee

Operating Surplus

Capital Stock

Individual country notes concerning specific data availability, sources, reporting conventions and methods of construction. The generalised source abbreviations are as follows:

ANA = OECD Annual National Accounts Statistics

BDS = EEC Sectoral Data Bank

CPI = Capital stock constructed using the perpetual inventory method

LFS = Labor Force Statistics OECD

* = data not available

Table A.7a
AUSTRALIA

Code	Employees (1)	Total Employment	Gross investment (in 1980 US \$)	Gross Domestic product (in 1980 US \$)	Compensation of employees (in US \$)	Operating surplus (in US \$)	Capital Stock (in 1980 US \$)
AGR	ANA/LFS	ANA	(2)	ANA	ANA	ANA	(2)
MIN	ANA/LFS	ANA	(2)	ANA	ANA	ANA	(2)
MAN	ANA/LFS	ANA	(2)	ANA	ANA	ANA	(2)
FOD	ANA/LFS	ANA(6)	*	*	*	*	*
TEX	ANA/LFS	ANA(6)	*	*	*	*	*
WOD	ANA/LFS	ANA(6)	*	*	*	*	*
PAP	ANA/LFS	ANA(6)	*	*	*	*	*
CHE	ANA/LFS	ANA(6)	*	*	*	*	*
MNH	ANA/LFS	ANA(6)	*	*	*	*	*
BMI	ANA/LFS	ANA(6)	*	*	*	*	*
MEQ	ANA/LFS	ANA(6)	*	*	*	*	*
MOT	ANA/LFS	ANA(6)	*	*	*	*	*
EGW(5)	ANA/LFS	ANA	(2)	ANA	ANA	ANA	(2)
CST	ANA/LFS	ANA	(2)	ANA	ANA	ANA	(2)
RET(4)(5)	ANA/LFS	ANA	(2)	ANA	ANA	ANA	(2)
TRS	ANA/LFS	ANA	(2)	ANA	ANA	ANA	(2)
SOC(3)(4)(5)	ANA/LFS	ANA	(2)	ANA	ANA	ANA	(2)
PGS(3)	ANA/LFS	ANA	(2)	ANA	ANA	ANA	(2)
FNI	ANA/LFS	ANA	(2)	ANA	ANA	ANA	(2)
FNS	*	*	*	*	*	*	*
RES	*	*	*	*	*	*	*
TIN	ANA/LFS	ANA	*	*	*	*	*

1. LFS data are taken for the period 1970 to 1978 and linked to ANA series.
2. Australian National Accounts Statistics (fiscal years beginning 1st July).
3. PGS covers only government administration and defence; other items are included in SOC.
4. Restaurants and hotels included in SOC excluded from RET
5. Data for SOC, EGW and RET are corrected for changes in definition.
6. Series start in 1971.

Table A.7b
BELGIUM

Code	Employees	Total Employment	Gross investment (in 1980 US \$)	Gross Domestic product (in 1980 US \$)	Compensation of employees (in US \$)	Operating surplus (in US \$)	Capital Stock (in 1980 US \$)
AGR MIN(3) MAN	BDS * BDS	BDS * BDS	BDS ANA BDS	BDS ANA BDS	BDS * BDS	* * *	CPI CPI CPI
FOD TEX WOD(4)	BDS BDS *	BDS BDS *	BDS BDS *	BDS BDS *	BDS BDS *	* * *	BDS BDS *
PAP CHE MNM	BDS BDS BDS	BDS BDS BDS	BDS BDS BDS	BDS BDS BDS	BDS BDS BDS	* * *	BDS BDS BDS
BMI MEQ MOT(4)	BDS BDS BDS	BDS BDS BDS	BDS BDS BDS	BDS BDS BDS	BDS BDS BDS	* * *	BDS BDS BDS
EGW(3) CST RET	BDS BDS BDS	BDS BDS BDS	BDS BDS BDS	BDS BDS BDS	BDS BDS BDS	* * *	CPI CPI CPI
TRS SOC(5) PGS	BDS (2) BDS	BDS (2) BDS	BDS (8) BDS	BDS BDS(2) BDS	BDS BDS(9) BDS	* * *	CPI CPI(8) CPI
FNI FNS RES	LFS BDS (1)	LFS BDS (1)	(6) BDS (7)	ANA BDS (1)	* BDS *(9)	* * *	CPI CPI CPI(6)
TIN	ANA	ANA	ANA	ANA	*	*	CPI

1. RES = FNI - FNS

2. SOC = SOC(BDS) - RES

3. EGW includes MIN

4. MOT includes WOD

5. SOC private non-profit institutions are included

6. FNI = FNS + RES(ANA)

7. RES = Residential building (ANA Table 4 Total line 12)

8. SOC = SOC(BDS) - RES(ANA)

9. SOC includes RES

Table A.7c

CANADA

Code	Employees (1)	Total Employment	Gross investment (in 1980 US \$)	Gross Domestic product (in 1980 US \$)	Compensation of employees (in US \$)	Operating surplus (in US \$)(6)	Capital Stock (in 1980 US \$)
AGR	LFS	LFS	{3}	ANA	ANA	ANA(7)	CPI
MIN	LFS	LFS	{3}	ANA	ANA	ANA(7)	CPI
MAN	LFS	LFS	{3}	ANA	ANA	ANA(7)	CPI
FOD	LFS	LFS(2)	{3}	ANA	ANA	ANA(7)	CPI
TEX	LFS	LFS(2)	{3}	ANA	ANA	ANA(7)	CPI
WOD	LFS	LFS(2)	{3}	ANA	ANA	ANA(7)	CPI
PAP	LFS	LFS(2)	{3}	ANA	ANA	ANA(7)	CPI
CHE	LFS	LFS(2)	{3}	ANA	ANA	ANA(7)	CPI
MNM	LFS	LFS(2)	{3}	ANA	ANA	ANA(7)	CPI
BMI	LFS	LFS(2)	{3}	ANA	ANA	ANA(7)	CPI
MEQ	LFS	LFS(2)	{3}	ANA	ANA	ANA(7)	CPI
MOT	LFS	LFS(2)	{3}	ANA	ANA	ANA(7)	CPI
EGW	LFS	LFS	{3}	ANA	ANA(4)	ANA(7)	CPI
CST	LFS	LFS	{3}	ANA	ANA	ANA(7)	CPI
RET	LFS	LFS	{3}	ANA	ANA	ANA(7)	CPI
TRS	LFS	LFS	{3}	ANA	ANA	ANA(7)	CPI
SOC	LFS	LFS	{3}	ANA	ANA(4)	ANA(7)	CPI
PGS	LFS	LFS	{3}	ANA	ANA	ANA(7)	CPI
FNI	LFS	LFS	{3}	ANA	ANA	ANA(7)	CPI
FNS	*	*	*	ANA	ANA	ANA(7)	CPI
RES	*	*	(5)	ANA	ANA	ANA(7)	* CPI
TIN	*	*	*	ANA	ANA	ANA(7)	*

A - 11

- Series are constructed from different volumes of LFS
- Total employment has been put equal to total employees
- Source: CANSIM tape (see Table A.5)
- Water works and supply are included in SOC
- Residential building (ANA Table 4 Total line 12)
- 1985 based on the Canadian Statistical Review.
- Data from 1970 to 1984

Table A.7d

DENMARK

Code	Employees	Total Employment	Gross investment (in 1980 US \$)	Gross Domestic product (in 1980 US \$)	Compensation of employees (in US \$)	Operating surplus (in US \$)	Capital Stock (in 1980 US \$)
AGR	ANA	FNA	ANA	ANA	ANA	ANA	CPI
MIN	ANA	FNA	ANA	ANA	ANA	ANA	CPI
MAN	ANA	FNA	ANA	ANA	ANA	ANA	CPI
FOD	ANA	ANA	ANA (1)	ANA	ANA	ANA	CPI (1)
TEX	ANA	ANA	ANA (1)	ANA	ANA	ANA	CPI (1)
WOD	ANA	FNA	ANA (1)	ANA	ANA	ANA	CPI (1)
PAP	ANA	ANA	ANA (1)	ANA	ANA	ANA	CPI (1)
CHE	ANA	ANA	ANA (1)	ANA	ANA	ANA	CPI (1)
MNM	ANA	ANA	ANA (1)	ANA	ANA	ANA	CPI (1)
BMI	ANA	ANA	ANA (1)	ANA	ANA	ANA	CPI (1)
MEQ	ANA	ANA	ANA (1)	ANA	ANA	ANA	CPI (1)
MOT	ANA	ANA	ANA (1)	ANA	ANA	ANA	CPI (1)
EGW	ANA	ANA	ANA	ANA	ANA	ANA	CPI
CST	ANA	ANA	ANA	ANA	ANA	ANA	CPI
RET	ANA	ANA	ANA (2)	ANA	ANA	ANA	CPI (1)
TRS	ANA	ANA	ANA (2)	ANA	ANA	ANA	CPI (1)
SOC	ANA	ANA	ANA (2)	ANA	ANA	ANA	CPI (1)
PGS	ANA	ANA	ANA	ANA	ANA	ANA	CPI
FNI	ANA	ANA	ANA	ANA	ANA	ANA	CPI
FNS	ANA	ANA	ANA	ANA	ANA	ANA	CPI
RES	ANA	ANA	ANA	ANA	ANA	ANA	CPI
TIN	ANA	ANA	ANA	ANA	ANA	ANA	CPI

A - 12

1. Series updated with growth rate of nearest available aggregate.

2. No data available after 1983

3. Includes only investment in recreational and cultural services

Table A.7e

FINLAND

Code	Employees	Total Employment	Gross investment (in 1980 US \$)	Gross Domestic product (in 1980 US \$)	Compensation of employees (in US \$)	Operating surplus (in US \$)	Capital Stock (in 1980 US \$)
AGR	ANA	ANA	ANA	ANA	ANA	ANA	CPI
MIN	ANA	ANA	ANA	ANA	ANA	ANA	CPI
MAN	ANA	ANA	ANA	ANA	ANA	ANA	CPI
FOD	ANA	ANA	*	ANA	ANA	ANA	*
TEX	ANA	ANA	*	ANA	ANA	ANA	*
WOD	ANA	ANA	*	ANA	ANA	ANA	*
PAP	ANA	ANA	*	ANA	ANA	ANA	*
CHE	ANA	ANA	*	ANA	ANA	ANA	*
MNM	ANA	ANA	*	ANA	ANA	ANA	*
BMI	ANA	ANA	*	ANA	ANA	ANA	*
MEO	ANA	ANA	*	ANA	ANA	ANA	*
MOT	ANA	ANA	*	ANA	ANA	ANA	*
EGW	ANA	ANA	ANA	ANA	ANA	ANA	CPI
CST	ANA	ANA	ANA	ANA	ANA	ANA	CPI
RET	ANA	ANA	ANA	ANA	ANA	ANA	CPI
TRS	ANA	ANA	ANA	ANA	ANA	ANA	CPI
SOC	ANA	ANA	ANA	ANA	ANA	ANA	CPI
PGS	ANA	ANA	ANA	ANA	ANA	ANA	CPI
FNI	ANA	ANA	ANA	ANA	ANA	ANA	CPI
FNS	ANA	ANA	*	ANA	ANA	ANA	*
RES	ANA	ANA	*	ANA	ANA	ANA	CPI(1)
TIN	ANA	ANA	ANA	ANA	ANA	ANA	CPI

1. Constructed with investment data for residential buildings ANA Table 4 Total line 12

Table A.7f

FRANCE

Code	Employees	Total Employment	Gross investment (in 1980 US \$)	Gross Domestic product (in 1980 US \$)	Compensation of employees (in US \$)(11)	Operating surplus (in US \$)	Capital Stock (in 1980 US \$)
AGR MIN(4)	BDS *	BDS *	BDS *	BDS *	BDS *	*	BDS *
MAN	BDS	BDS	BDS	BDS	BDS	*	BDS
FOD	BDS	BDS	BDS	BDS	BDS	*	BDS
TEX	BDS	BDS	BDS	BDS	BDS	*	BDS
WOD(5)	*	*	*	*	*	*	*
PAP	BDS	BDS	BDS	BDS	BDS	*	BDS
CHE	BDS	BDS	BDS	BDS	BDS	*	BDS
MNM	BDS	BDS	BDS	BDS	BDS	*	BDS
BMI	BDS	BDS	BDS	BDS	BDS	*	BDS
MEQ	BDS	BDS	BDS	BDS	BDS	*	BDS
MOT(5)	BDS	BDS	BDS	BDS	BDS	*	BDS
EGW(4)	BDS	BDS	BDS	BDS	BDS	*	BDS
CST	BDS	BDS	BDS	BDS	BDS	*	BDS
RET	BDS	BDS	BDS	BDS	BDS	*	BDS
TRS	BDS	BDS	ANA	BDS	BDS	*	CPI
SOC	BDS(3)	BDS(3)	BDS(3)(7)	BDS(3)	BDS(10)	*	CPI(3)
PGS	ANA	ANA	ANA	ANA	ANA	*	CPI
FNI	(1)	(1)	(6)	ANA	*	*	CPI
FNS	BDS	BDS	BDS	BDS	BDS	*	CPI
RES	(2)	(2)	(7)	(9)	*	*	CPI(7)
TIN	ANA	ANA	BDS	ANA	BDS	*	CPI

A - 14

1. FNI = LFS for 1970 to 1974, ANA for the remaining years 7. RES = Residential building ANA Table 4 Total line 12

2. RES = FNI(ANA and LFS) - FNS(BDS)

3. SOC = SOC(BDS) - RES

4. EGW includes MIN

5. MOT includes WOD

6. FNI = FNS(BDS) + RES(ANA)

8. SOC includes RES

9. RES = FNI(ANA) - FNS(BDS)

10. SOC includes RES

11. 1985 added with the aid of the INSEE tape

Table A.7g
GERMANY

Code	Employees	Total Employment	Gross investment (in 1980 US \$)	Gross Domestic product (in 1980 US \$)	Compensation of employees (in US \$)	Operating surplus (in US \$)	Capital Stock (in 1980 US \$)
AGR	ANA	ANA	ANA	ANA	ANA	ANA	BDS
MIN(1)	ANA	ANA	ANA	ANA	ANA	ANA	CPI
MAN(1)(2)(3)	ANA	ANA	ANA	ANA	ANA	ANA	BDS
FOD	ANA	ANA	ANA	ANA	ANA	ANA	BDS
TEX	ANA	ANA	ANA	ANA	ANA	ANA	BDS
WOD	ANA	ANA	ANA	ANA	ANA	ANA	CPI
PAP(3)	ANA	ANA	ANA	ANA	ANA	ANA	BDS
CHE	ANA	ANA	ANA	ANA	ANA	ANA	BDS
MNM(1)	ANA	ANA	ANA	ANA	ANA	ANA	BDS
BMI	ANA	ANA	ANA	ANA	ANA	ANA	BDS
MEQ(2)	ANA	ANA	ANA	ANA	ANA	ANA	BDS
MOT	ANA	ANA	ANA	ANA	ANA	ANA	CPI
EGW	ANA	ANA	ANA	ANA	ANA	ANA	(5)
CST(2)	ANA	ANA	ANA	ANA	ANA	ANA	BDS
REI	ANA	ANA	ANA	ANA	ANA	ANA	BDS
TRS	ANA	ANA	ANA	ANA	ANA	ANA	BDS
SOC(3)(4)	ANA	ANA	ANA	ANA	ANA	ANA	CPI
PGS	ANA	ANA	ANA	ANA	ANA	ANA	CPI
FNI(4)	ANA	ANA	ANA	ANA	ANA	ANA	(6)
FNS(4)	*	*	ANA	ANA	ANA	ANA	BDS
RES	*	*	(7)	ANA	ANA	ANA	CPI
TIN	ANA	ANA	ANA	ANA	ANA	ANA	CPI

1. MNM includes quarrying (in ISIC classified under MIN) 5. EGW = EGW(BDS) - MIN(CPI)
2. MEQ includes structural steel erection (in ISIC under CST) 6. FNI = FNS(BDS) + RES(CPI)
3. SOC includes publishing (in ISIC under PAP) 7. Residential buildings only
4. SOC includes business services and real estate except dwellings (in ISIC under FNS)

Table A.7h

ITALY

Code	Employees (5)	Total Employment (5)	Gross investment (in 1980 US \$)	Gross Domestic product (in 1980 US \$)	Compensation of employees (in US \$)	Operating surplus (in US \$)	Capital Stock (in 1980 US \$)
AGR	ANA	ANA	ANA	ANA	ANA	ANA	BDS
MIN(1)(4)	*	*	*	*	*	*	*
MAN(1)	ANA	ANA	ANA	ANA	ANA	ANA	BDS
FOD	ANA	ANA	ANA	ANA	ANA	ANA	BDS
TEX	ANA	ANA	ANA	ANA	ANA	ANA	BDS
WOD	ANA	ANA	ANA	ANA	ANA	ANA	CPI
PAP	ANA	ANA	ANA	ANA	ANA	ANA	BDS
CHE	ANA	ANA	ANA	ANA	ANA	ANA	BDS
MNM	ANA	ANA	ANA	ANA	ANA	ANA	BDS
BMI	ANA	ANA	ANA	ANA	ANA	ANA	BDS
MEQ	ANA	ANA	ANA	ANA	ANA	ANA	BDS
MOT	ANA	ANA	ANA	ANA	ANA	ANA	*
EGW(4)	ANA	ANA	ANA	ANA	ANA	ANA	CPI
CST	ANA	ANA	ANA	ANA	ANA	ANA	BDS
RET	ANA	ANA	ANA	ANA	ANA	ANA	BDS
TRS	ANA	ANA	ANA	ANA	ANA	ANA	BDS
SOC(2)(6)	ANA	ANA	ANA	ANA	ANA	ANA	CPI
PGS	ANA	ANA	ANA	ANA	ANA	ANA	CPI
FNI	*	*	*	*	*	*	*
FNS	*	*	*	*	*	*	*
RES	*	*	(6)	*	*	*	CPI(6)
TIN	ANA	ANA	ANA	ANA	ANA	ANA	BDS

1. MAN includes most parts of MIN

2. SOC includes FNI

3. RET includes recovery and repair services
(normally classified under SOC)

4. EGW includes natural gas and oil refineries

5. EEC classification as used in BDS

6. RES = Residential buildings ANA Table 4 Total line 12

7. SOC includes FNI

Table A.7i

JAPAN

Code	Employees	Total Employment	Gross investment (in 1980 US \$)	Gross Domestic product (in 1980 US \$)	Compensation of employees (in US \$)	Operating surplus (in US \$)	Capital Stock (in 1980 US \$)
AGR	ANA	ANA	(8)	ANA	ANA	ANA	(8)
MIN	ANA	ANA	(8)	ANA	ANA	ANA	(8)
MAN(3)	ANA	ANA	(8)	ANA	ANA	ANA	(8)
FOD(1)	ANA	ANA	(8)	ANA	ANA	ANA	(8)
TEX(2)	ANA*	ANA*	(8)*	ANA*	ANA*	ANA*	(8)*
WOD(8)	ANA*	ANA*	(8)*	ANA*	ANA*	ANA*	(8)*
PAP(3)	ANA	ANA	(8)	ANA	ANA	ANA	(8)
CHE(4)	ANA	ANA	(8)	ANA	ANA	ANA	(8)
MNM	ANA	ANA	(8)	ANA	ANA	ANA	(8)
BMI	ANA	ANA	(8)	ANA	ANA	ANA	(8)
MEQ	ANA	ANA	(8)	ANA	ANA	ANA	(8)
MOT(7)	ANA	ANA	(6)	ANA	ANA	ANA	(8)
(1)(2)(4)							
EGW	ANA	ANA	(8)	ANA	ANA	ANA	(8)
CST	ANA	ANA	(8)	ANA	ANA	ANA	(8)
RET(5)	ANA	ANA	(8)	ANA	ANA	ANA	(8)
TRS	ANA	ANA	(8)	ANA	ANA	ANA	(8)
SOC(3)	ANA	ANA	(10)	ANA	ANA	ANA	(8)
PGS	ANA	ANA	(11)	ANA	ANA	ANA	(8)
FNI	ANA	ANA	(8)	ANA	ANA	ANA	(8)
FNS	ANA	ANA	(9)	ANA	ANA	ANA	(8)
RES	ANA	ANA	(8)	ANA	ANA	ANA	(8)
TIN	ANA	ANA	(8)	ANA	ANA	ANA	(8)

1. FOD excluding tobacco
 2. TEX textiles only
 3. PAP excluding printing and publishing
 4. CHE excluding rubber and plastic products
 5. SOC includes hotels and restaurants
 6. MOT = MAN - (FOD+TEX+WOD+PAP+CHE+MNM+BMI+MEQ)
 7. MOT includes WOD
 8. Source: Economic Planning Agency: Private gross capital stock by industry. It excludes investment by public enterprises which form around 15 % of private non-residential investment. This is especially important for TRS and EGW (see Table A.6).
 9. RES = Residential buildings ANA Table 4 Total line 12
 10. PGS = ANA Table 4 General Government line 11
 11. FNI = FNS + RES

Table A.7j
NORWAY

Code	Employees	Total Employment	Gross investment (in 1980 US \$)	Gross Domestic product (in 1980 US \$)	Compensation of employees (in US \$)	Operating surplus (in US \$)	Capital Stock (in 1980 US \$)
ACR	ANA	ANA	ANA	ANA	ANA	ANA	CPI
MIN	ANA	ANA	ANA (1)	ANA	ANA	ANA	CPI
MAN	ANA	ANA	ANA	ANA	ANA	ANA	CPI
FOD	ANA	ANA	ANA	ANA	ANA	ANA	CPI
TEX	ANA	ANA	ANA	ANA	ANA	ANA	CPI
WOD	ANA	ANA	ANA	ANA	ANA	ANA	CPI
PAP	ANA	ANA	ANA	ANA	ANA	ANA	CPI
CHE	ANA	ANA	ANA	ANA	ANA	ANA	CPI
MNM	ANA	ANA	ANA	ANA	ANA	ANA	CPI
BMI	ANA	ANA	ANA	ANA	ANA	ANA	CPI
MEQ	ANA	ANA	ANA	ANA	ANA	ANA	CPI
MOT	ANA	ANA	ANA	ANA	ANA	ANA	CPI
EGW	ANA	ANA	ANA	ANA	ANA	ANA	CPI
CST	ANA	ANA	ANA (2)	ANA	ANA	ANA	CPI
RET	ANA	ANA	ANA (5)	ANA	ANA	ANA	CPI
TRS	ANA	ANA	ANA (3)	ANA	ANA	ANA	CPI
SOC	ANA	ANA	ANA (4)	ANA	ANA	ANA	CPI
PGS	ANA	ANA	ANA	ANA	ANA	ANA	CPI
FNI	ANA	ANA	ANA	ANA	ANA	ANA	CPI
FNS	ANA	ANA	ANA	ANA	ANA	ANA	CPI
RES	ANA	ANA	ANA (5) (4)	ANA	ANA	ANA	CPI
TIN	ANA	ANA	ANA	ANA	ANA	ANA	CPI

1. MIN including crude petroleum and natural gas production.
2. CST including oil and gas exploration and drilling.
3. TRS including pipeline transport for oil and gas.
4. SOC business services are included.
5. RET including producer's capital goods, which are normally included in RES.

Table A.71
UNITED KINGDOM

Code	Employees (3)	Total Employment (3)	Gross investment (in 1980 US \$)	Gross Domestic product (4) (in 1980 US \$)	Compensation of employees (in US \$)	Operating surplus (in US \$)	Capital Stock (in 1980 US \$)
AGR	ANA	ANA	ANA	ANA	ANA	ANA	CPI
MIN	LFS	LFS	ANA	ANA	ANA	ANA	CPI
MAN	ANA	ANA	ANA	ANA	ANA	ANA	CPI
FOD	BDS	BDS	BDS	BDS	BDS	*	BDS
TEX	BDS	BDS	BDS	BDS	BDS	*	BDS
WOD(1)	*	*	*	*	*	*	*
PAP	BDS	BDS	BDS	BDS	BDS	*	BDS
CHE	BDS	BDS	BDS	BDS	BDS	*	BDS
MNM	BDS	BDS	BDS	BDS	BDS	*	BDS
BMI	BDS	BDS	BDS	BDS	BDS	*	BDS
MEQ	BDS	BDS	BDS	BDS	BDS	*	BDS
MOT(1)	BDS	BDS	BDS	BDS	BDS	*	BDS
EGW	LFS	LFS	ANA	ANA	ANA	ANA	BDS
CST	ANA	ANA	ANA	ANA	ANA	ANA	BDS
RET	LFS	LFS	ANA	ANA	ANA	ANA	BDS
TRS	ANA	ANA	ANA	ANA	ANA	ANA	CPI
SOC	ANA(2)	ANA(2)	ANA	ANA	ANA	ANA	CPI
PCS	ANA	ANA	ANA	ANA	ANA	ANA	CPI
FNI	LFS	LFS	ANA	ANA	ANA	ANA	CPI
FNS	=FNI	=FNI	ANA	=FNI	*	*	CPI
RES	*	*	(6)	*	*	*	CPI
TIN	ANA	ANA	ANA	ANA	ANA	ANA	CPI

1. MOT includes WOD
2. SOC = SOC(ANA) - RET(LFS) - FNI(LFS)
3. No 1970 data are available in ANA, estimates were made using LFS series.
4. 1970 not available in 1980 prices, estimates were made using 1970 data expressed in 1975 prices.

Table A.7m
UNITED STATES

Code	Employees	Total Employment investment	Gross product (in 1980 US \$)	Gross Domestic of employees (in 1980 US \$)	Compensation surplus (in US \$)	Operating (in US \$)	Capital Stock (in 1980 US \$)
AGR	ANA	ANA	{3}	ANA	ANA	ANA	{3}
MIN	ANA	ANA	{3}	ANA	ANA	ANA	{3}
MAN	ANA	ANA	{3}	ANA	ANA	ANA	{3}
FOD	ANA	ANA	{3}	ANA	ANA	ANA	{3}
TEX	ANA	ANA	{3}	ANA	ANA	ANA	{3}
WOD	ANA	ANA	{3}	ANA	ANA	ANA	{3}
PAP	ANA	ANA	{3}	ANA	ANA	ANA	{3}
CHE	ANA	ANA	{3}	ANA	ANA	ANA	{3}
MNM	ANA	ANA	{3}	ANA	ANA	ANA	{3}
BMI	ANA	ANA	{3}	ANA	ANA	ANA	{3}
MEQ	ANA	ANA	{3}	ANA	ANA	ANA	{3}
MOT	ANA	ANA	{3}	ANA	ANA	ANA	{3}
EGW	ANA	ANA	{3}	ANA	ANA	ANA	{3}
CST	ANA	ANA	{3}	ANA	ANA	ANA	{3}
RET	ANA	ANA	{3}	ANA	ANA	ANA	{3}
TRS	ANA	ANA	{3}	ANA	ANA	ANA	{3}
SOC	ANA	ANA	{3}	ANA	ANA	ANA	{3}
PGS	ANA	ANA	{3}	ANA	ANA	ANA	{3}
FNI	ANA	ANA	{3}	ANA	ANA	ANA	{3}
FNS	ANA	ANA	{3}	ANA	ANA	ANA	{3}
RES	ANA	ANA	{3}	ANA	ANA	ANA	{3}
TIN	ANA	ANA	ANA	ANA	ANA	ANA	CPI

1. EGW includes sanitary and similar services
2. FNS = FNI - RES
3. Source: US Department of Commerce (see Table A.4)

Table A.8

AVERAGE SERVICE LIVES (ASL) OF MACHINERY AND EQUIPMENT (ME) AND BUILDING & ENGINEERING CONSTRUCTION (B)
(years)

	France									Italy									United Kingdom									Germany								
	ME			B			ME			B			ME			B			ME			B			ME			B								
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c						
AGR	10	--	10	40	--	40	18	--	18	--	46.2 ⁵	25	--	25	40	--	40	75 ⁴	15	--	15	15	--	15	--	46.2 ⁵										
MIN	16	16	16	35	35	35	17	18	17	35 ³	35	35	16	33	16	35	80	75 ⁴	17	21	17	--	--	40	40											
MAN	--	--	17 ¹	37	--	36 ¹	--	--	17 ¹	38 ³	38	--	--	28 ¹	80	--	75 ⁴	75 ⁴	--	--	20 ¹	--	--	40 ¹	--											
FOD	16	16	16	--	35	35	18	18	18	--	40	40	27	29	27	--	80	75 ⁴	25	25	25	--	--	40	40											
TEX	20	20	20	--	35	35	18	18	18	--	40	40	27	35	27	--	80	75 ⁴	30	19	19	--	--	40	40											
WOD	20	--	20	--	35 ²	--	18	--	18	--	37 ¹	25	--	25	--	--	75 ⁴	75 ⁴	23	--	20 ¹	--	--	40 ¹	--											
PAP	20	20	20	--	40	40	16	17	16	--	40	40	34	40	34	--	80	75 ⁴	21	21	21	--	--	40	40											
CHE	16	17	16	--	35	35	16	17	16	--	35	35	29	32	29	--	80	75 ⁴	18	21	21	--	--	40	40											
MNM	16	16	16	--	35	35	16	17	16	--	35	35	29	34	29	--	80	75 ⁴	20	17	17	--	--	40	40											
BMI	20	17	20	--	35	35	15	18	15	--	35	35	27	32	27	--	80	75 ⁴	17	18	18	--	--	40	40											
MEQ	16	16	16	--	35	35	17	17	17	--	40	40	27	27	27	--	80	75 ⁴	23	22	22	--	--	40	40											
MOT	20	20	20	--	40	40	18	17	18	--	36	36	26	30	26	--	80	75 ⁴	--	18	18	--	--	40	40											
EGW	16	--	16	38	--	38	18	--	18	35 ³	35	--	25	--	25	50	--	50	20	--	20	--	--	45.6 ⁵	--											
CST	12	12	12	30	30	30	18	14	18	40 ³	40	40	26	20	26	80	80	75 ⁴	10	10	10	--	--	40	40											
RET	16	--	16	30	--	30	--	--	16.5 ⁵	--	47.0 ⁵	30	--	30	80	--	75 ⁴	75 ⁴	--	--	16.5 ⁵	--	--	47.5 ⁵	--											
TRS	16	--	16	40	--	40	--	--	16.5 ⁵	--	46.3 ⁵	20	--	20	55	--	55	55	13	--	13	--	--	46.3 ⁵	--											
FNI	16	--	16	30	--	30	--	--	14.6 ⁵	--	47.2 ⁵	30	--	30	80	--	75 ⁴	75 ⁴	--	--	14.6 ⁵	--	--	47.2 ⁵	--											
SOC	16	--	16	30	--	30	--	--	16.5 ⁵	--	52.4 ⁵	20	--	20	75	--	75 ⁴	75 ⁴	--	--	16.5 ⁵	--	--	52.4 ⁵	--											

a. Source: Blades (1983)

b. Source: Paccoud (1983)

c. ASL used in the ISDB estimates

1. Average of manufacturing sectors

2. Median of manufacturing sector

3. Building only

4. At the time of compiling the table a few preliminary results were available for the new ASLs for machinery and equipment, which were lower than the ones recorded in Blades (1983); the new ASLs are introduced in the table. A similar reduction was applied to building and construction.

5. Average of the sector for all countries

6. No data are available for the branches in the manufacturing sector, the ASL for manufacturing has been applied to all sectors.

Table A.8 (cont.)

AVERAGE SERVICE LIVES (ASL) OF MACHINERY AND EQUIPMENT (ME) AND BUILDING & ENGINEERING CONSTRUCTION (B)
(Years)

	<u>Canada</u>		<u>USA</u>		<u>Japan</u>		<u>Finland</u>		<u>Sweden</u>		Mean of average <u>service lives</u>	
	ME	B	ME	B	ME	B	ME	B	ME	B		
AGR	10	28	16	38	6	46.25	14.45	50	17	60	14.4	46.2
MIN	20	27	10	27	8	40.35	20	27	30	70	16.9	40.3
MAN	23 ¹	44	18 ¹	29	11 ¹	46.65	17 ¹	42	23 ¹	70	19.3	46.6
FOD	28	44 ⁶	18	29 ⁶	11	46.95	20	42 ⁶	20	70 ⁶	20	46.9
TEX	21	44 ⁶	18	29 ⁶	10	46.95	19	42 ⁶	20	70 ⁶	18.7	46.9
WOD	26	44 ⁶	18	29 ⁶	10	46.45	18	42 ⁶	15	70 ⁶	18.3	46.4
PAP	26	44 ⁶	18	29 ⁶	12	47.85	17	42 ⁶	30	70 ⁶	20.3	47.8
CHE	19	44 ⁶	18	29 ⁶	9	46.5	18	42 ⁶	20	70 ⁶	18	46
MNM	26	44 ⁶	18	29 ⁶	9	46.5	15	42 ⁶	33	70 ⁶	18.8	46
BMI	22	44 ⁶	18	29 ⁶	13	46.5	15	42 ⁶	35	70 ⁶	20.2	46
MEQ	23	44 ⁶	18	29 ⁶	11	46.95	15	42 ⁶	25	70 ⁶	18.9	46.9
MOT	13	44 ⁶	18	29 ⁶	11	47.15	20	42 ⁶	20	70 ⁶	18.4	47.1
EGW	35	55	21	28	15	45.65	25	40	35	75	23.6	45.6
CST	10	25	9	29	5	41.95	10	35	10	75	11.9	41.9
RET	20	50	16.55	35	10	47.55	15	40	15	75	16.5	47
TRS	15	50	15	31	16.35	46.35	16.35	46.35	16.35	70	16.3	46.3
FNI	15	50	10	36	14.65	47.25	10	40	20	75	14.6	47.2
SOC	20	50	16.55	48	16.55	52.45	16.55	55	20	75	16.5	52.4

a. Source: Blades (1983)

1. Average of manufacturing sectors

5. Average of the sector for all countries

6. No data are available for the branches in the manufacturing sector; the ASL for manufacturing has been applied to all sectors.

Annex B

THE CALCULATION OF SECTOR PERFORMANCE INDICATORS

As outlined in the main body of the paper, measures of "expected" sectoral growth have been calculated for all countries and sectors, based on the relative growth in the total economy and the relative growth of individual sectors, across all countries. Such calculation, however, involves specific issues of consistency, which have been dealt with using an extended version of the RAS estimation method (1). This Annex provides a brief technical summary of the methods involved.

The "intuitive" definition of the "expected" growth rate, $G(i,j)$ -- that given in the main text -- is defined as being the growth rate of sector i averaged over all countries, adjusted for the difference between the overall growth of the total economy j and the average growth of all countries. In effect, the following expression:

$$G(i,j) = g(i,.) + g(.,j) - g(.,.) \quad [1]$$

where:

$g(.,j)$ = the average growth of country j , across all sectors

$g(i,.)$ = the average growth of sector i , across all countries

$g(.,.)$ = the average growth of all countries, across all sectors

The above formula does not, however, guarantee a consistent set of growth "expectations", in the sense that applying the full set of individual expected rates to the matrix of individual level indicators (value added, factor productivity, factor inputs, etc.) for the starting period will not give a final set of "expected" levels which sum exactly to the actual levels of sector and total economy aggregates in the terminal year. The reasons for discrepancies lie in the importance of cross-product effects and also the fact that linear computation methods do not respect non-linear restrictions. However, this class of adding-up problem is identical to that commonly encountered in input-output analysis, for example where a base-year matrix is to be updated or projected using information about column and row sums of a more recent year. The basic estimation method has therefore been refined to give system consistency, using the input-output-based RAS estimation method described below.

The Estimation Method

Starting with the basic matrix of level variables for the initial year, 1970, organised in terms of rows (sectors) and columns (countries), the principal steps in the estimation procedure are as follows:

- a) First, the percentage rates of the growth for each row (sector) total between 1970 and 1985 are applied to all values in each row.

When the cells of this matrix are added up by column (i.e. across sectors for each given country), the column totals will not equal the actual country totals for 1985.

- b) The ratio of actual to calculated column (country) totals are then applied to the cells belonging to each specific column (country).

When the cells of this transformed matrix are added up across rows (i.e. across countries for each given sector), the row sums will not equal the actual sector totals for 1985.

- c) The ratio of actual to calculated row (sector) totals are next applied to the cells belonging to each specific row (sector).

Steps b) and c) are then repeated until convergence has been reached (2).

The hypothetical growth rates, $G(i,j)$, are finally obtained by dividing the resulting 1985 level estimates, for each specific sector and country, by the corresponding level in the 1970 and converting to an annualised rate. The performance indicators are then calculated as the difference between actual and "expected" growth rates.

The following example gives an idea of the quantitative differences between the hypothetical growth rates obtained with the RAS method and those given by the simple application of equation [1].

Over the period 1970 to 1985, the actual rate of output growth for the food sector across countries was 1.96 per cent per annum, the average growth rate of the Japanese economy was 4.71 per cent, whilst that for all countries taken together was 2.92 per cent. Using equation (1) the calculated value for the food industry in Japan would be 3.75 per cent (i.e. $1.96 + 4.71 - 2.92$); which compares with a RAS-based estimate of 3.92 per cent. Given an actual growth rate for value added in that sector of 2.08 per cent, the performance indicator is -1.84 (i.e. $2.08 - 3.92$), suggesting a relatively weak performance.

NOTES

1. This method was first used in Stone (1963).
2. Bacharach (1970) shows the RAS method gives a unique solution to this sort of problem.

Annex C

SECTORAL TRENDS IN DETAIL

Contents

The following tables report on a detailed country and ISDB sectoral basis, the individual sector shares, trend growth and related performance indicators for output, factor inputs and total factor productivity over the period 1970 to 1985. The individual tables are as follows:

Table C.1	Value added, sector shares in country totals
Table C.2	Value added, country shares in sector totals
Table C.3	Employment, sector shares in country totals
Table C.4	Employment, country shares in sector totals
Table C.5	Capital stocks, sector shares in country totals
Table C.6	Capital stocks, country shares in sector totals
Table C.7	Value added, annual average growth 1970/1985
Table C.8	Employment, annual average growth 1970/1985
Table C.9	Capital stocks, annual average growth 1970/1985
Table C.10	Factor productivity (TFP), annual average growth 1970/1985
Table C.11	Value added, growth performance indicators 1970/1985
Table C.12	Employment, growth performance indicators 1970/1985
Table C.13	Capital stock, growth performance indicators 1970/1985
Table C.14	Factor productivity (TFP), growth performance indicator 1970/1985

In these, all country and sector classifications are as defined in Annex A. TFP and growth performance indicators were calculated on the basis of the various definitions set out in the main body of the paper (Part I) and also Annex B.

Table C.2

VALUE ADDED

SECTORS EXPRESSED IN PERCENTAGE OF THE SECTOR TOTALS

Average 1970-1985

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC.	TOTAL
PGS	0.78	1.56	1.17	0.69	2.63	8.00	9.00	6.95	8.04	5.06	0.93	44.55	10.63	33.56	5.28	100.00
SOC.	0.32	1.02	0.37	0.24	0.51	5.66	11.26	13.45	3.14	1.88	3.50	37.93	20.72	34.52	1.43	100.00
RET	0.53	1.53	0.68	0.46	1.12	7.13	6.93	6.71	5.94	3.62	2.42	49.45	13.48	28.24	2.78	100.00
EGW	0.74	2.01	0.32	0.56	1.38	11.09	6.78	10.47	7.09	3.68	2.33	38.19	15.36	37.44	3.00	100.00
CST	0.61	1.33	0.82	0.72	1.73	8.49	9.43	8.41	6.56	4.20	2.63	36.05	19.01	34.21	3.89	100.00
TRS	1.03	1.84	0.94	0.74	1.35	6.82	8.94	6.55	7.70	4.23	2.78	41.19	15.90	31.85	4.06	100.00
RES	0.38	0.98	0.67	0.47	1.25	7.32	4.34	*	9.79	4.95	3.26	50.03	16.56	22.43	2.77	100.00
FNS	0.80	1.99	0.80	0.87	5.85	9.26	13.75	*	*	*	*	66.69	*	24.99	8.31	100.00
AGR	0.82	0.96	1.13	1.58	1.53	10.01	6.05	12.27	4.00	4.97	3.92	35.19	17.56	33.28	5.07	100.00
BMI	0.65	2.28	0.07	0.76	0.83	14.36	10.80	4.34	11.76	3.44	2.06	27.28	21.36	43.55	2.31	100.00
FOD	0.38	1.75	1.02	0.61	1.22	10.80	12.36	8.59	12.48	3.49	1.66	31.41	14.23	45.99	3.23	100.00
PAP	0.86	1.09	0.77	0.97	2.47	5.85	7.47	6.22	9.09	6.49	2.63	48.75	7.36	29.71	5.07	100.00
CHE	0.45	1.32	0.41	0.55	0.96	7.63	16.62	6.28	7.18	2.77	1.50	37.81	16.50	39.04	2.37	100.00
MNM	0.41	1.75	0.73	1.64	1.11	8.04	11.63	13.18	9.19	2.21	4.47	27.53	18.11	43.79	3.88	100.00
TEX	0.31	1.82	0.50	1.07	0.79	9.43	10.77	20.18	8.63	2.99	2.90	30.51	10.11	50.83	2.66	100.00
MEQ	0.40	0.74	0.46	0.17	1.43	5.42	13.36	5.67	6.77	2.40	0.47	42.02	20.67	31.96	2.47	100.00
MOT	*	1.44	0.23	1.50	0.19	5.31	1.83	1.43	5.92	1.81	4.07	16.45	59.83	15.93	1.92	100.00
WOD	1.12	*	0.97	2.25	3.56	*	13.26	15.60	*	7.17	6.10	49.96	*	28.86	7.90	100.00
All	0.57	1.34	0.70	0.61	1.54	7.55	9.13	6.91	6.94	3.70	2.28	42.74	16.00	31.87	3.41	100.00
G&S	0.58	1.32	0.82	0.49	1.70	6.98	9.99	9.80	5.89	3.67	2.06	41.65	15.05	33.98	3.59	100.00
Sheltered	0.60	1.45	0.72	0.57	1.59	7.72	7.26	4.89	7.02	3.93	2.57	46.98	14.71	28.34	3.47	100.00
Supply	0.75	1.48	0.71	1.26	1.25	11.73	7.93	9.13	7.08	4.36	3.18	32.06	19.07	37.35	3.97	100.00
Open	0.44	1.12	0.57	0.62	1.37	6.67	12.35	7.70	7.71	3.09	1.68	38.06	18.63	35.54	3.00	100.00
Sheltered less Res.	0.68	1.63	0.73	0.61	1.72	7.87	8.37	6.76	5.97	3.54	2.31	45.82	14.00	30.60	3.73	100.00

Table C.4

EMPLOYMENT

SECTORS EXPRESSED IN PERCENTAGE OF THE SECTOR TOTALS

		Average 1970-1985														
		NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC. TOTAL
PGS.		0.83	1.52	1.39	0.88	2.71	9.44	8.63	6.94	11.98	4.39	0.65	41.98	8.66	38.51	5.81
SOC.		0.35	0.98	0.38	0.26	0.69	7.26	5.62	5.29	4.77	2.49	3.61	42.46	25.86	23.92	1.67
RET		0.47	1.29	0.65	0.61	1.08	6.55	7.50	7.21	8.43	3.92	2.26	42.15	17.90	30.97	2.81
EGW		0.65	2.47	0.57	0.93	1.18	12.39	9.84	7.06	13.22	4.06	4.69	30.82	12.13	44.97	3.33
CST		0.71	1.33	0.98	0.98	1.63	8.91	10.43	9.23	7.83	2.67	2.35	27.27	25.69	37.73	4.29
TRS		1.10	1.60	1.11	0.99	1.89	8.53	9.45	7.56	10.16	4.55	3.10	29.10	20.87	37.31	5.08
RES		0.35	0.84	0.70	0.40	0.97	5.94	4.84	*	13.09	6.05	3.75	47.97	15.10	24.71	2.42
FNS		0.79	2.39	*	1.05	1.48	9.89	*	*	*	*	*	84.40	*	12.28	3.88
AGR		0.71	0.64	0.97	1.62	1.18	9.66	8.05	13.17	3.11	2.65	1.91	17.11	39.20	34.64	4.48
BMI		0.52	3.17	0.15	1.16	1.19	17.42	16.53	4.56	16.77	2.50	2.77	21.16	12.10	58.45	3.01
FOD		0.83	1.80	1.51	0.84	1.22	8.85	13.29	6.84	10.17	3.41	2.01	26.44	22.78	40.95	4.40
PAP		1.16	1.35	1.15	1.22	2.61	7.18	9.53	5.07	11.87	4.78	2.92	43.59	7.57	35.01	6.14
CHE		0.48	1.57	0.77	1.01	1.25	8.87	17.79	7.78	10.54	2.90	2.41	34.02	10.62	46.55	3.50
MNM		0.40	2.02	0.88	1.85	1.09	8.75	12.49	12.80	10.37	1.60	4.42	20.52	22.82	46.43	4.21
TEX		0.31	1.92	0.69	0.67	0.83	8.49	11.00	16.88	10.38	2.40	1.61	28.00	16.82	48.67	2.49
MEQ		0.46	0.88	0.78	0.22	1.58	5.69	15.82	5.69	10.07	2.07	0.52	31.62	24.60	38.16	3.04
MOT		0.08	1.45	0.25	1.20	0.65	7.08	2.01	1.51	8.01	1.16	2.86	9.25	64.49	20.06	2.17
WOD		1.21	*	1.52	2.15	2.99	*	15.65	18.76	*	5.20	5.15	47.38	*	34.41	7.87
All		0.59	1.29	0.83	0.77	1.45	7.94	9.02	7.22	8.69	3.37	2.17	36.21	20.46	34.15	3.65
G&S		0.60	1.27	0.92	0.60	1.77	8.43	7.24	6.18	8.65	3.51	2.02	42.20	16.61	31.76	3.90
Sheltered		0.60	1.36	0.75	0.73	1.29	7.44	7.67	6.37	8.90	3.89	2.54	40.08	18.40	31.73	3.39
Supply		0.68	1.09	0.82	1.53	1.19	11.06	9.57	11.63	5.56	2.63	2.07	17.84	34.34	38.91	4.22
Open		0.53	1.28	0.87	0.73	1.45	6.83	13.37	8.07	9.73	2.58	1.76	30.09	22.71	39.28	3.58
Sheltered less Res.		0.64	1.43	0.75	0.77	1.34	7.66	8.08	7.31	8.28	3.57	2.36	38.91	18.89	32.77	3.53

Table C.6

CAPITAL STOCK

SECTORS EXPRESSED IN PERCENTAGE OF THE SECTOR TOTALS

Average 1970-1985

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EUS	NORDIC. TOTAL
PGS	0.55	1.04	0.84	0.67	1.41	5.33	8.59	2.96	2.33	3.24	1.96	58.44	12.64	20.25	3.47
SOC.	0.19	1.05	0.09	0.52	0.31	14.98	14.76	8.29	12.07	5.15	1.39	32.92	8.27	51.16	1.11
RET	0.62	2.01	0.73	1.07	1.58	9.82	9.75	7.42	8.76	2.23	2.61	41.24	12.16	37.76	4.00
EGW	1.05	1.64	0.63	0.88	2.50	9.45	9.55	6.89	8.31	7.06	4.35	38.53	9.17	35.84	5.06
CST	1.59	1.49	1.87	0.97	2.29	12.06	10.62	3.90	7.74	4.31	2.98	30.76	19.42	35.81	6.71
TRS	2.31	1.53	1.31	0.90	1.88	7.75	10.53	7.05	9.09	4.89	2.74	44.99	5.04	35.94	6.40
RES	0.49	1.21	0.94	0.83	1.71	7.53	10.66	5.92	5.22	3.53	2.19	48.41	11.35	30.54	3.97
FNS	0.24	0.82	0.39	1.23	0.30	1.77	4.34	*	8.01	*	2.59	76.62	3.70	14.93	2.15
AGR	1.23	0.72	1.32	2.13	1.50	7.68	8.91	10.42	5.73	5.06	2.84	28.98	23.48	33.47	6.19
BMI	0.59	1.98	0.10	0.63	1.36	9.85	11.16	8.88	8.55	4.06	1.24	35.79	15.81	40.42	2.68
FOD	1.17	2.17	1.59	1.00	1.94	11.70	12.77	7.82	11.15	4.60	1.97	30.34	11.80	45.59	5.69
PAP	1.08	1.07	0.82	1.27	5.57	6.62	7.22	5.06	6.53	10.91	2.51	37.48	13.88	26.49	8.74
CHE	0.66	1.67	0.63	0.60	1.43	6.64	10.13	8.96	9.67	4.03	1.19	39.67	14.73	37.06	3.32
MNM	0.50	2.07	1.13	1.69	1.13	9.51	11.11	11.42	8.75	8.25	3.34	21.65	19.45	42.86	4.46
TEX	0.31	2.54	0.65	1.84	0.91	11.57	12.75	13.90	10.68	2.99	3.63	23.38	14.85	51.44	3.71
MEQ	0.54	0.92	0.71	0.39	2.57	7.84	12.46	6.88	8.32	3.07	0.77	34.07	21.45	36.41	4.22
MOT	*	3.69	0.23	4.01	0.28	18.96	2.59	*	9.20	1.97	7.90	12.10	39.08	34.43	4.52
VOD	1.76	*	1.58	3.98	5.22	*	17.40	8.08	7.69	9.72	7.84	36.73	*	33.17	12.54
All	0.72	1.27	0.85	0.88	1.63	7.68	10.07	5.83	6.25	3.88	2.30	46.76	11.89	31.09	4.07
G&S	0.48	1.04	0.69	0.64	1.19	7.26	9.82	4.03	4.28	3.62	1.85	53.33	11.77	26.44	3.00
Sheltered	0.80	1.35	0.92	0.90	1.72	7.64	10.00	5.84	6.60	3.73	2.57	47.96	9.99	31.42	4.33
Supply	1.00	1.19	0.87	1.57	1.45	8.48	9.75	9.85	6.77	4.69	2.24	31.50	20.63	36.04	4.89
Open	0.71	1.52	0.86	1.05	2.33	8.46	11.21	7.93	9.01	4.86	2.07	32.80	17.19	38.13	4.95
Sheltered less Res.	1.24	1.54	0.88	0.99	1.72	7.79	9.06	5.73	8.57	4.01	3.11	47.32	8.04	32.69	4.84

Table C.7

VALUE ADDED (VOLUME)

AVERAGE ANNUAL GROWTH RATE FOR THE PERIOD 1970 TO 1985

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC.	TOTAL
PGS	5.13	2.80	4.05	4.44	2.92	2.00	2.55	1.98	1.43	2.17	2.16	1.13	3.44	2.04	3.68	1.87
SOC.	2.75	2.60	1.52	2.14	2.21	3.51	4.40	3.42	3.48	5.38	4.31	3.50	4.09	3.73	2.14	3.74
RET	3.28	1.39	2.24	3.05	1.53	2.41	1.96	2.79	1.40	3.55	1.85	3.34	6.26	2.12	2.28	3.30
EGW	3.99	3.76	4.89	5.27	6.50	3.11	3.75	1.15	1.41	5.55	5.32	3.76	4.36	2.37	5.45	3.47
CST	3.34	-0.59	-2.82	1.49	0.70	-0.47	-0.12	-0.24	-0.71	3.15	1.62	-0.13	0.86	-0.37	0.52	0.18
TRS	3.27	1.75	0.63	3.46	3.45	3.54	3.30	3.55	2.22	4.70	5.74	2.86	3.33	3.05	2.73	3.14
RES	4.82	3.21	4.09	5.38	2.38	4.19	3.84	*	4.10	5.35	4.19	3.81	6.16	4.04	3.60	4.31
FNS	0.79	6.20	2.00	5.74	2.39	3.03	4.21	*	*	*	*	3.20	*	3.91	2.52	3.32
AGR	2.02	1.98	3.79	0.40	0.54	1.43	1.10	0.88	2.77	1.86	2.58	1.99	0.13	1.34	1.44	1.43
BMI	2.17	2.03	1.67	3.79	1.53	1.41	0.26	2.38	-2.11	1.12	1.64	-2.11	4.76	0.30	2.44	0.67
FOD	0	1.95	3.61	3.79	0.10	3.17	1.19	2.92	0.96	1.66	1.64	2.01	2.08	1.94	1.86	1.96
PAP	1.22	1.60	0.73	3.79	1.82	1.83	1.09	2.71	-0.10	2.18	1.64	2.75	4.92	1.22	1.92	2.33
CHE	3.33	8.80	5.03	3.79	2.77	3.91	2.54	4.21	2.42	4.82	1.64	2.92	6.52	3.23	3.49	3.65
MNM	-0.19	0.45	-0.94	3.79	-1.66	0.96	0.20	1.83	-0.32	1.99	1.64	1.51	1.74	0.73	0.90	1.20
TEX	-3.31	-0.75	1.65	3.79	-3.64	-0.79	-1.53	1.57	-0.86	2.92	1.64	1.78	1.98	-0.02	0.36	0.87
MEQ	2.03	3.90	3.22	3.79	2.53	3.48	2.38	2.33	0.30	4.70	1.64	4.40	9.71	2.14	2.66	4.53
MOT	*	2.03	1.37	3.79	0.12	1.74	-1.24	3.35	-1.22	2.63	1.64	2.72	3.38	0.46	3.11	2.71
WOD	1.08	*	2.08	3.79	-0.48	*	-0.26	2.82	*	3.54	1.64	2.57	*	1.38	1.24	2.13
All	3.15	2.43	2.46	3.44	2.15	2.51	2.35	2.31	1.54	3.65	3.03	2.78	4.71	2.20	2.60	2.92
G&S	4.53	2.73	3.54	3.93	2.83	2.53	3.44	2.84	1.90	2.86	3.75	2.06	3.83	2.78	3.41	2.68
Sheltered	3.39	2.12	1.64	3.72	2.25	2.64	2.45	1.94	2.25	4.38	3.34	3.03	4.59	2.35	2.55	3.10
Supply	2.07	2.01	3.70	1.19	0.80	1.42	0.65	1.16	-0.45	1.63	2.34	0.60	2.11	0.86	1.67	1.13
Open	1.40	3.05	2.74	3.79	1.46	2.70	1.72	2.50	0.48	3.45	1.64	3.39	6.36	1.84	2.16	3.27
Sheltered less Res.	3.09	1.87	0.82	3.25	2.21	2.11	2.18	1.94	1.13	3.88	2.90	2.72	3.92	1.89	2.26	2.65

Table C.8

EMPLOYMENT

AVERAGE ANNUAL GROWTH RATE FOR THE PERIOD 1970 TO 1985

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC.	TOTAL
PGS	3.43	2.33	4.50	4.00	3.74	1.50	2.11	2.41	1.13	3.00	3.20	1.02	1.50	1.72	3.91	1.59
SOC.	1.75	3.05	0.33	0.67	0.20	3.38	2.09	4.11	3.69	3.89	3.89	2.78	3.26	3.28	0.62	3.05
RET	1.17	0.41	-0.74	0.39	0.16	0.81	0.22	1.83	1.04	3.20	1.56	2.66	1.39	0.95	0.17	1.82
EGW	1.69	-2.49	1.13	2.58	1.34	-0.31	0.88	0.70	-1.72	2.21	2.19	1.76	1.56	-0.42	1.71	0.79
CST	0.70	-2.71	-1.96	-0.70	-2.04	-1.78	-1.70	-1.55	-0.38	1.52	0.20	2.34	1.70	-1.44	-1.26	0.51
TRS	0.34	0.52	0.74	0.66	1.04	0.83	0.15	1.44	-0.70	1.48	1.42	1.07	0.61	0.35	0.75	0.72
RES	5.34	3.42	3.87	4.61	2.71	3.24	1.82	*	3.31	4.20	3.87	5.88	3.08	3.00	3.72	4.47
FNS	3.10	2.64	*	3.23	1.78	3.07	*	*	*	*	*	3.36	*	2.99	0.27	3.19
AGR	-2.93	-3.60	-2.64	-3.35	-3.03	-3.62	-3.39	-2.94	-1.62	-0.16	-0.12	-0.52	-2.95	-3.12	-3.04	-2.46
BMI	-1.55	-2.99	-2.28	0.31	-2.16	-1.88	-2.22	-0.99	-4.98	0.76	-0.99	-2.94	-1.68	-2.82	-1.11	-2.51
FOD	-0.45	-1.56	-0.71	0.31	-1.33	0.19	-1.24	-0.35	-2.22	1.22	-0.99	-0.75	1.61	-1.04	-0.64	-0.26
PAP	-0.62	-2.28	-0.92	0.31	-0.34	-0.41	-2.33	-0.23	-1.72	2.20	-0.99	1.19	-0.38	-1.42	-0.37	0.05
CHE	-0.69	*	0.79	0.31	0.13	-0.22	-0.31	-0.50	-1.58	3.01	-0.99	0.66	-0.41	-0.60	0.22	-0.03
MNM	-0.92	-4.74	-2.55	0.31	-3.72	-2.19	-2.37	-1.10	-2.55	0.94	-0.99	-0.50	0.21	-2.12	-1.42	-1.12
TEX	-6.09	-5.06	-3.26	0.31	-6.62	-3.31	-4.90	-1.03	-4.20	-0.10	-0.99	-1.88	-3.32	-3.10	-3.61	-2.69
MEQ	0.07	-1.39	0.60	0.31	-0.22	-0.31	-0.66	-0.30	-2.92	1.72	-0.99	0.65	0.94	-1.16	0.07	0.03
MOT	-3.22	-2.09	-0.14	0.31	2.80	-0.59	-1.39	-0.06	-1.34	5.73	-0.99	-0.45	-0.01	-1.04	0.86	-0.20
WOD	-1.00	*	-1.16	0.31	-2.35	*	-1.91	-0.30	*	2.64	-0.99	0.39	*	-1.03	-1.18	-0.18
All	0.87	-0.03	0.51	0.47	0.64	0.28	-0.34	0.43	-0.03	2.58	1.56	1.88	0.75	0.05	0.61	0.99
G&S	2.98	2.58	3.67	3.30	3.08	2.24	2.11	3.07	1.77	3.29	3.77	1.83	2.76	2.25	3.24	2.26
Sheltered	1.28	0.17	-0.57	0.71	0.20	0.59	-0.11	0.86	0.87	2.88	1.76	2.97	1.52	0.54	0.32	1.80
Supply	-2.74	-3.28	-2.62	-2.83	-2.88	-3.11	-3.02	-2.80	-3.39	0	-0.33	-1.03	-2.87	-3.04	-2.79	-2.47
Open	-0.82	-2.36	-0.49	0.31	-0.98	-0.87	-1.37	-0.59	-2.65	1.80	-0.99	0.17	0.26	-1.47	-0.57	-0.46
Sheltered less Res.	0.97	-0.10	-1.14	0.42	-0.07	0.30	-0.27	0.86	0.31	2.56	1.29	2.48	1.34	0.27	-0.01	1.42

Table C.9

CAPITAL STOCK

AVERAGE ANNUAL GROWTH RATES FOR THE PERIOD 1970 TO 1985

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC.	TOTAL
PGS	4.15	2.95	2.32	3.92	2.45	3.82	2.95	3.30	1.46	4.01	3.30	2.02	8.15	3.05	2.96	3.04
SOC.	6.14	4.94	3.15	4.81	2.87	5.55	7.03	4.47	1.87	4.53	4.78	4.39	12.35	4.83	4.33	5.14
RET	4.91	4.16	3.26	2.82	3.37	5.64	2.92	3.05	3.55	4.42	4.06	5.04	8.85	3.84	3.43	4.88
EGW	4.35	3.29	3.37	4.30	3.08	3.62	3.84	3.80	1.35	5.15	3.21	3.03	7.46	3.16	3.58	3.63
CST	6.05	1.47	2.25	2.21	2.95	3.08	0.87	1.43	1.73	5.06	5.43	1.93	9.81	1.88	3.33	3.54
TRS	1.73	5.49	3.23	3.81	3.30	4.69	3.64	5.34	1.86	4.45	3.90	2.45	6.28	3.79	2.78	3.27
RES	4.56	3.85	2.38	4.62	2.78	4.26	2.96	2.93	2.42	5.06	4.35	2.64	6.72	3.21	3.27	3.39
FNS	7.67	3.94	3.46	5.98	4.01	6.29	4.19	*	5.32	*	8.68	4.70	6.51	5.02	5.39	4.92
AGR	4.05	3.65	3.86	1.93	4.11	3.62	1.99	3.19	1.82	4.28	1.27	2.32	7.65	2.74	3.27	3.73
BMI	3.21	1.88	3.78	3.79	2.04	2.12	1.32	2.76	1.58	3.84	2.51	2.32	5.45	1.91	2.77	2.70
FOD	3.84	2.72	3.26	3.79	2.78	3.31	1.53	1.55	2.60	3.83	2.51	2.48	7.38	2.30	3.30	3.03
PAP	4.60	3.58	3.12	3.79	2.88	2.86	2.67	0.56	2.05	3.52	2.51	3.37	7.13	2.19	3.24	3.51
CHE	3.51	4.54	3.02	3.79	3.23	2.28	2.26	1.86	2.33	5.59	2.51	3.34	5.69	2.28	3.35	3.35
MNM	3.46	2.01	2.12	3.79	3.02	3.15	1.45	2.85	2.16	4.00	2.51	2.13	1.95	2.37	3.13	2.40
TEX	2.83	1.05	1.82	3.79	2.32	0.30	-0.52	0.77	0	2.68	2.51	1.61	3.59	0.20	2.99	1.28
MEQ	4.37	4.88	3.96	3.79	3.18	6.93	3.99	4.39	2.13	4.28	2.51	4.48	8.38	4.23	3.52	5.08
MOT	*	3.46	4.35	3.79	3.20	4.42	2.77	*	2.47	3.16	2.51	3.14	18.78	3.66	3.78	7.30
VOD	4.53	*	2.38	3.79	3.52	*	2.16	3.82	2.04	4.11	2.51	3.01	*	2.53	3.60	2.99
All	3.77	3.70	2.74	3.99	2.90	4.25	3.22	3.29	2.25	4.57	3.81	2.81	7.47	3.30	3.25	3.58
G&S	4.30	3.34	2.34	4.07	2.47	4.52	4.09	3.77	1.69	4.16	3.52	2.30	8.65	3.72	3.06	3.45
Sheltered	3.57	4.01	2.70	4.36	2.96	4.37	3.13	3.39	2.52	4.94	4.35	3.04	7.07	3.38	3.30	3.63
Supply	3.86	2.55	3.85	2.20	3.37	2.96	1.71	3.05	1.71	4.14	1.52	2.32	6.99	2.39	3.17	3.34
Open	4.03	3.40	3.16	3.79	3.06	3.89	2.51	2.48	2.08	4.14	2.51	3.46	7.12	2.74	3.37	3.76
Sheltered less Res.	3.02	4.18	3.18	4.05	3.23	4.54	3.42	4.09	2.61	4.79	4.35	3.63	7.80	3.62	3.33	3.98

Table C.10

TOTAL FACTOR PRODUCTIVITY

AVERAGE ANNUAL GROWTH RATES FOR THE PERIOD 1970 TO 1985

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC.	TOTAL
PGS	1.66	0.43	-0.31	0.45	-0.74	0.35	0.38	-0.48	0.28	-0.88	-1.05	0.05	1.54	0.18	-0.14	0.19
SOC.	-0.09	-0.92	0.48	0.43	1.34	-0.42	1.07	-0.78	0.25	1.33	0.20	0.32	-1.45	-0.01	0.68	-0.10
RET	1.18	0.04	1.99	2.05	0.57	0.39	1.07	0.66	-0.27	0.05	-0.34	0.08	3.00	0.47	1.28	0.58
EGW	0.52	2.38	2.25	1.54	4.00	0.79	0.89	-1.63	1.08	1.38	2.45	1.15	-1.15	0.30	2.51	0.59
CST	1.30	1.07	-1.91	1.46	1.50	0.09	0.94	0.56	-0.85	0.74	0.12	-2.37	-2.87	0.32	0.72	-1.06
TRS	2.59	-0.01	-0.73	2.01	1.84	1.75	2.28	1.13	2.28	2.48	3.70	1.45	1.30	1.83	1.46	1.65
RES	0.01	-0.50	1.22	0.76	-0.37	0.27	*	*	1.10	-0.48	-0.32	0.10	0.65	0.69	0.24	0.26
FNS	-3.45	3.23	*	1.82	0.06	-0.85	1.80	*	*	*	*	-0.50	*	0.97	-0.11	-0.09
AGR	3.20	3.77	4.81	2.43	1.79	3.24	3.14	2.28	3.53	0.91	2.36	1.80	0.43	2.92	2.86	2.00
BMI	2.53	3.80	2.43	2.61	2.64	2.29	1.59	2.44	1.23	-0.41	1.76	-0.48	4.65	1.89	2.59	1.68
FOD	-0.62	2.44	3.32	2.61	0.40	2.21	1.74	2.79	1.98	-0.21	1.76	1.95	-0.97	2.13	1.56	1.61
PAP	0.54	2.41	0.64	2.61	1.36	1.43	2.16	2.74	0.68	-0.34	1.76	1.01	3.42	1.68	1.32	1.36
CHE	2.97	7.67	3.68	2.61	1.86	3.51	2.21	4.12	3.02	1.16	1.76	1.59	5.40	3.07	2.55	2.80
MNM	-0.37	3.50	0.45	2.61	0.38	1.81	1.62	1.94	1.05	0.28	1.76	1.36	1.10	1.71	1.14	1.47
TEX	0.55	2.78	3.63	2.61	0.74	1.62	2.28	2.15	2.29	2.32	1.76	2.78	3.58	2.13	1.87	2.45
MEQ	0.89	3.72	1.78	2.61	1.90	1.98	1.88	1.46	1.95	2.34	1.76	2.80	6.91	1.88	1.76	3.07
MOT	*	2.73	0.39	2.61	-2.78	1.08	-0.89	*	-0.84	-2.46	1.76	2.28	-1.31	0.19	1.82	-0.10
WOD	0.70	*	2.36	2.61	0.41	*	0.63	2.09	*	0.53	1.76	1.53	*	1.36	1.24	1.41
All	1.21	1.41	1.07	1.83	0.72	1.04	1.48	0.86	1.04	0.39	0.82	0.59	1.57	1.14	1.06	0.93
G&S	1.20	0.00	-0.12	0.44	-0.41	0.11	0.70	-0.65	0.28	-0.44	-0.14	0.15	-0.05	0.10	0.03	0.08
Sheltered	0.99	0.55	0.51	1.64	0.74	0.42	1.34	0.42	0.62	0.48	0.48	-0.02	0.65	0.70	0.88	0.35
Supply	2.98	3.79	4.71	2.47	2.01	2.80	2.33	2.31	1.91	0.51	2.20	0.96	2.21	2.44	2.80	1.87
Open	0.87	3.62	2.23	2.61	1.34	2.13	1.89	2.26	1.85	1.02	1.76	2.23	3.87	2.05	1.68	2.35
Sheltered less Res.	1.16	0.75	0.30	1.83	1.02	0.46	1.34	0.42	0.38	0.88	0.83	-0.07	0.65	0.70	1.03	0.38

Table C.11

VALUE ADDED (VOLUME)

DIFFERENCE BETWEEN ACTUAL AND CALCULATED GROWTH RATES

Average annual growth rates for the period 1970 to 1985

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EUS	NORDIC
PGS	2.89	1.19	2.39	1.52	1.72	0.29	1.22	0.37	0.86	-0.63	0.05	-0.56	-0.44	0.73	2.01
SOC	-1.09	-0.60	-1.74	-2.37	-0.58	0.21	1.48	0.22	1.31	0.98	0.61	0.21	-1.38	0.69	-1.31
RET	-0.36	-1.61	-0.82	-1.27	-1.07	-0.69	-0.76	-0.22	-0.57	-0.65	-1.66	0.25	0.99	-0.62	-0.91
EGW	0.26	0.66	1.74	0.86	3.81	-0.09	0.94	-1.95	-0.65	1.26	1.72	0.58	-1.00	-0.51	2.05
CST	3.00	-0.29	-2.58	0.47	1.40	-0.28	0.46	0.05	0.62	2.25	1.42	0.08	-1.12	0.17	0.64
TRS	-0.08	-0.97	-2.15	-0.57	1.13	0.73	0.86	0.83	0.54	0.78	2.51	0.05	-1.66	0.64	-0.28
RES	0.25	-0.71	0.10	0.14	-1.15	0.16	0.19	*	1.20	0.22	-0.24	-0.21	-0.04	0.56	-0.43
FNS	-3.14	2.90	-1.35	1.13	-0.50	-0.36	1.20	*	*	*	*	-0.18	*	0.73	-0.68
AGR	0.54	1.15	2.90	-1.75	0.10	0.50	0.54	0.03	2.97	-0.17	1.24	1.06	-2.98	0.62	0.14
BMI	1.19	1.69	1.28	2.14	1.59	0.97	0.20	2.04	-1.42	-0.41	0.80	-2.53	2.15	0.32	1.66
FOD	-2.30	0.30	1.90	0.82	-1.15	1.42	-0.18	1.26	0.34	-1.20	-0.51	0.27	-1.84	0.63	0.03
PAP	-1.56	-0.56	-1.48	0.33	0.07	-0.42	-0.79	0.55	-1.22	-1.17	-1.01	0.51	0.50	-0.55	-0.40
CHE	-0.66	5.45	1.62	-0.88	-0.19	0.46	-0.53	0.85	0.10	0.26	-2.21	-0.52	0.89	0.18	-0.16
MNM	-1.61	-0.33	-1.78	1.70	-2.04	0.08	-0.30	1.04	-0.06	0.01	0.36	0.65	-1.31	0.23	-0.30
TEX	-4.60	-1.41	0.93	1.82	-3.90	-1.55	-1.91	0.90	-0.48	1.06	0.48	1.03	-0.95	-0.46	-0.69
MEQ	-2.89	-0.38	-1.11	-1.80	-1.35	-0.90	-1.62	-1.96	-2.95	-0.78	-3.14	0.04	3.16	-1.80	-1.60
MOT	*	0.69	-0.02	1.14	-0.81	0.31	-2.29	2.01	-1.52	0.10	-0.19	1.30	-0.22	-0.46	0.83
WOD	-1.55	*	0.03	0.48	-2.08	*	-1.98	0.81	*	0.34	-0.86	0.49	*	-0.47	-0.98
G&S	1.79	0.54	1.46	0.58	1.38	0.26	1.35	0.27	0.97	-0.26	0.47	-0.24	-1.03	0.71	1.35
Sheltered	0.01	-0.60	-1.00	-0.18	-0.15	-0.15	0.20	-0.23	0.43	0.35	-0.01	0.05	-0.22	0.04	-0.30
Supply	0.76	1.47	2.83	-0.87	0.48	0.72	0.36	0.40	0.11	-0.25	1.13	-0.12	-0.82	0.49	0.48
Open	-2.23	0.59	-0.10	0.34	-1.19	-0.17	-1.19	-0.14	-1.41	-0.52	-0.99	0.14	1.37	-0.76	-0.83
Sheltered less Res.	-0.05	-0.58	-1.42	-0.28	0.17	-0.28	0.21	-0.23	-0.10	0.42	0.12	0.16	-0.31	-0.12	-0.26

Table C.12

EMPLOYMENT

DIFFERENCE BETWEEN ACTUAL AND CALCULATED GROWTH RATES

Average annual growth rate for the period 1970 to 1985

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC
PGS	1.78	1.66	3.30	2.35	2.46	0.45	1.52	0.74	0.60	0.14	1.33	-1.02	0.16	0.83	2.54
SOC.	-1.25	1.04	-2.22	-2.32	-2.42	0.98	0.15	1.10	1.82	-0.31	0.68	-0.61	0.25	0.98	-2.11
RET	-0.68	-0.46	-2.14	-1.45	-1.31	-0.44	-0.58	-0.04	0.31	0.15	-0.51	0.43	-0.47	-0.18	-1.43
EGW	0.71	-2.49	0.59	1.59	0.72	-0.70	0.95	-0.31	-1.58	0.02	0.98	0.39	0.56	-0.63	0.94
CST	0.03	-2.40	-2.18	-1.37	-2.34	-1.86	-1.32	-2.24	0.07	-0.35	-0.69	1.28	1.01	-1.44	-1.68
TRS	-0.48	0.68	0.36	-0.17	0.59	0.60	0.38	0.60	-0.40	-0.56	0.37	-0.15	-0.23	0.28	0.16
RES	0.87	-0.07	-0.16	0.14	-1.40	-0.64	-1.61	*	-0.04	-1.49	-0.83	1.01	-1.41	-0.50	-0.47
FNS	0.14	0.66	*	0.27	-0.81	0.71	*	*	*	*	*	0.02	*	0.70	-2.44
AGR	-0.55	-0.25	0.19	-0.98	-0.29	-0.65	0.03	-0.58	1.88	1.01	2.02	1.47	-0.60	-0.24	-0.48
BMI	0.59	0.12	0.31	2.45	0.34	0.86	0.97	1.12	-1.73	1.69	0.92	-1.19	0.44	0.17	1.21
FOD	-0.36	-0.49	-0.18	0.40	-0.88	0.87	-0.11	-0.29	-1.02	0.09	-1.14	-1.06	1.68	-0.16	-0.29
PAP	-0.76	-1.44	-0.62	0.17	-0.11	0.04	-1.42	-0.40	-0.74	0.84	-1.36	0.66	-0.54	-0.73	-0.27
CHE	-0.87	0.80	1.06	0.13	0.32	0.20	0.56	-0.70	-0.63	1.62	-1.40	0.10	-0.61	0.01	0.26
MNM	-0.02	-2.86	-1.21	1.21	-2.45	-0.70	-0.42	-0.22	-0.53	0.63	-0.32	0.01	1.09	-0.54	-0.32
TEX	-3.57	-1.56	-0.29	2.83	-3.73	-0.20	-1.33	1.46	-0.56	1.21	1.30	0.26	-0.82	0.06	-0.83
MEQ	-0.15	-0.63	0.83	0.09	-0.07	0.07	0.17	-0.54	-2.02	0.30	-1.44	0.04	0.70	-0.53	0.16
MOT	-3.12	-1.01	0.40	0.41	3.27	0.10	-0.25	0.01	-0.12	4.62	-1.12	-0.75	0.07	-0.11	1.10
WOD	-0.76	*	-0.47	0.55	-1.75	*	-0.62	-0.09	*	1.67	-0.98	0.24	*	-0.32	-0.70
G&S	0.90	1.43	2.10	1.29	1.47	0.67	0.99	0.89	0.93	-0.02	0.78	-0.82	0.14	0.88	1.50
Sheltered	-0.27	-0.54	-1.85	-0.87	-1.11	-0.53	-0.65	-0.49	0.04	-0.40	-0.42	0.53	-0.20	-0.39	-1.08
Supply	-0.39	-0.05	0.19	-0.49	-0.17	-0.21	0.33	-0.46	-0.03	1.13	1.75	0.90	-0.53	-0.13	-0.26
Open	-0.64	-0.85	0.21	0.67	-0.45	0.12	-0.10	0.05	-1.26	0.85	-0.86	0.03	0.47	-0.33	-0.09
Sheltered less Res.	-0.38	-0.59	-2.12	-0.96	-1.07	-0.51	-0.54	-0.49	0.06	-0.06	-0.30	0.43	-0.02	-0.38	-1.15

Table C.13

CAPITAL STOCK

DIFFERENCE BETWEEN ACTUAL AND CALCULATED GROWTH RATES

Average of 1970-1985

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC
PGS	0.75	-0.26	-0.08	0.46	-0.06	0.11	0.19	0.45	-0.09	-0.13	-0.03	-0.33	1.03	0.15	0.17
SOC.	0.51	-0.51	-1.48	-0.89	-1.87	-0.39	2.03	-0.61	-1.92	-1.85	-0.78	-0.19	2.99	-0.12	-0.98
RET	-0.24	-0.80	-0.88	-2.40	-0.89	0.18	-1.59	-1.55	0.25	-1.47	-1.01	0.95	-0.02	-0.67	-1.22
EGW	0.41	-0.46	0.44	0.30	0.03	-0.63	0.55	0.42	-0.74	0.46	-0.66	0.15	-0.20	-0.14	0.21
CST	2.42	-1.98	-0.38	-1.48	0.21	-0.86	-2.12	-1.64	-0.06	0.68	1.87	-0.64	2.46	-1.21	0.30
TRS	-2.08	1.86	0.43	-0.06	0.38	0.57	0.47	2.09	-0.10	-0.10	0.16	-0.30	-1.25	0.72	-0.61
RES	0.88	0.36	-0.29	0.89	-0.01	0.28	-0.07	-0.19	0.60	0.64	0.75	0.02	-0.67	0.12	0.23
FNS	1.94	-1.61	-1.27	0.19	-0.83	0.25	-0.91	*	1.44	*	3.02	0.03	-2.94	0.38	-0.03
AGR	0.57	0.36	1.38	-1.61	1.52	-0.17	-0.84	0.27	0.19	0.06	-2.13	-0.10	0.45	-0.15	0.16
BMI	0.53	-0.62	2.09	1.04	0.25	-0.88	-0.73	0.63	0.75	0.40	-0.11	0.69	-0.96	-0.18	0.57
FOD	0.58	-0.36	1.01	0.47	0.41	-0.26	-1.09	-1.15	1.19	-0.17	-0.68	0.28	0.41	-0.33	0.62
PAP	1.05	0.20	0.57	0.17	0.21	-1.01	-0.25	-2.45	0.34	-0.79	-0.98	0.86	-0.15	-0.73	0.34
CHE	0.09	1.30	0.61	0.31	0.70	-1.45	-0.52	-1.00	0.76	1.43	-0.84	0.97	-1.45	-0.43	0.48
MNM	1.61	0.34	1.27	1.88	2.06	0.98	0.24	1.55	2.16	1.40	0.73	1.34	-3.62	1.13	1.74
TEX	1.62	0.02	1.61	2.51	2.00	-1.22	-1.10	0.11	0.64	0.72	1.37	1.45	-1.34	-0.42	2.16
MEQ	-0.61	0.08	-0.02	-1.25	-0.91	1.64	-0.35	-0.04	-1.00	-1.45	-2.40	0.55	-0.32	0.01	-0.76
MOT	*	-3.59	-1.87	-3.50	-3.14	-3.11	-3.82	*	-2.91	-4.81	-4.65	-3.03	7.84	-3.17	-3.40
WOD	0.87	*	-0.28	0.07	0.75	*	-0.86	0.72	0.23	-0.30	-1.08	0.41	*	-0.24	0.42
G&S	0.73	-0.32	-0.12	0.21	-0.17	-0.11	0.76	-0.02	-1.19	-0.68	-0.16	-0.31	1.30	0.04	0.07
Sheltered	-0.32	0.16	-0.19	0.20	-0.03	0.15	-0.15	0.04	0.32	0.36	0.43	0.06	-0.56	0.07	-0.07
Supply	0.56	-0.24	1.41	-1.25	1.08	-0.47	-0.80	0.39	0.44	0.17	-1.74	0.22	0.05	-0.16	0.24
Open	0.32	-0.08	0.53	-0.15	-0.03	-0.19	-0.56	-0.39	0.11	-0.21	-1.30	0.68	-0.36	-0.27	0.09
Sheltered less Res.	-0.98	-0.07	-0.04	-0.57	-0.06	-0.02	-0.28	0.37	0.08	0.01	0.11	0.11	-0.34	*	-0.41

Table C.14

TOTAL FACTOR PRODUCTIVITY

DIFFERENCE BETWEEN ACTUAL AND CALCULATED GROWTH RATES

Average 1970-19785

	NOR	BEL	DNK	FIN	SWE	FRA	GER	ITA	GBR	CAN	AUS	USA	JPN	EU5	NORDIC
PGS	1.23	-0.38	-0.79	-0.68	-0.83	-0.02	-0.08	-0.60	0.08	-0.63	-1.36	0.11	0.54	-0.14	-0.49
SOC.	-0.12	-1.33	0.41	-0.29	1.66	-0.39	1.02	-0.49	0.45	1.98	0.29	0.78	-2.04	0.09	0.64
RET	0.37	-1.16	1.13	0.53	0.10	-0.37	0.22	0.16	-0.86	-0.09	-1.03	-0.25	1.62	-0.25	0.48
EGW	-0.24	1.23	1.45	0.08	3.58	0.08	0.09	-2.08	0.54	1.30	1.80	0.87	-2.48	-0.33	1.74
CST	2.24	1.62	-1.03	1.69	2.77	1.08	1.84	1.81	0.31	2.36	1.17	-0.95	-2.51	1.36	1.66
TRS	0.78	-2.20	-2.58	-0.50	0.38	*	0.44	-0.36	0.70	1.36	2.01	0.12	-1.08	0.12	-0.38
RES	-0.49	-1.38	0.68	-0.44	-0.53	-0.17	*	0.82	-0.30	-0.70	-0.70	0.09	-0.42	0.31	-0.21
FNS	-3.70	2.59	*	0.87	0.15	-1.05	1.52	*	*	*	*	-0.27	*	0.70	-0.16
AGR	1.09	1.27	2.64	-0.39	0.01	1.18	0.99	0.48	1.64	-0.53	0.36	0.16	-2.26	0.94	0.59
BMI	0.73	1.61	0.58	0.10	1.18	0.53	-0.25	0.94	-0.35	-1.53	0.08	-1.80	2.28	0.17	0.70
FOD	-2.37	0.31	1.53	0.16	-1.00	0.51	-0.04	1.36	0.46	-1.28	0.14	0.69	-3.29	0.48	-0.17
PAP	-1.10	0.39	-1.04	0.27	0.06	-0.16	0.49	1.41	-0.74	-1.30	0.25	-0.14	1.22	0.17	-0.27
CHE	0.01	4.32	0.67	-1.06	-0.76	0.60	-0.78	1.47	0.28	-1.12	-1.08	-0.89	1.87	0.18	-0.45
MNM	-1.92	1.56	-1.15	0.35	-0.83	0.31	0.03	0.70	-0.28	-0.59	0.33	0.29	-1.03	0.27	-0.55
TEX	-2.07	-0.23	0.96	-0.72	-1.54	-0.96	-0.38	-0.16	-0.11	0.38	-0.74	0.64	0.38	-0.36	-0.86
MEQ	-2.37	0.08	-1.53	-1.35	-1.01	-1.23	-1.41	-1.49	-1.08	-0.24	-1.37	0.02	3.08	-1.28	-1.35
MOT	*	2.67	0.67	2.24	-2.10	1.46	-0.59	*	-0.28	-1.44	2.22	3.09	-1.54	0.60	1.67
VOD	-1.03	*	0.58	0.17	-0.98	*	-1.14	0.67	*	-0.52	0.15	0.28	*	-0.24	-0.49
G&S	0.89	-0.68	-0.50	-0.59	-0.44	-0.14	0.42	-0.54	0.15	-0.12	-0.17	0.34	-0.82	-0.05	-0.26
Sheltered	0.27	-0.49	-0.12	0.38	0.64	-0.02	0.79	0.22	0.24	0.57	0.04	-0.12	-0.42	0.26	0.38
Supply	0.97	1.47	2.56	-0.30	0.31	0.88	0.35	0.56	0.25	-0.83	0.29	-0.55	-0.37	0.59	0.62
Open	-1.68	0.93	-0.22	-0.07	-0.87	-0.31	-0.87	0.01	-0.43	-0.67	-0.09	0.07	1.19	-0.43	-0.71
Sheltered less Res.	0.39	-0.33	-0.36	0.56	0.93	0.02	0.79	0.22	-0.05	0.93	0.35	-0.20	-0.42	0.25	0.52

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