OECD Science, Technology and Industry Working Papers
1998/04

OECD Data on Skills: Employment by Industry and Occupation

OECD

https://dx.doi.org/10.1787/502262621044

OECD

Unclassified **DSTI/DOC(98)4**

Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

OLIS : 15-Jul-1998
Dist. : 15-Jul-1998

English text only

DIRECTORATE FOR SCIENCE, TECHNOLOGY AND INDUSTRY

DSTI/DOC(98)4
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STI WORKING PAPERS
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67548

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OECD DATA ON SKILLS: EMPLOYMENT BY INDUSTRY AND OCCUPATION

Economic Analysis and Statistics Division

This document is aimed at disseminating to a wider public the data on employment by industry and occupations for ten OECD countries, that have been collected over the last few years in the context of analytical work aimed at exploring empirically the changing patterns of skills in OECD countries. The industrial coverage of the data allows them to be used in conjunction with similar disaggregated OECD databases, while the occupational detail and time coverage track the evolution of skills profiles over the last one or two decades. The data in this document have been declassified by the Statistical Working Party of the OECD Industry Committee with the understanding that they represent OECD Secretariat estimates and not official country submissions.

The country-specific data are not included in the paper version of this document, but are available on the OECD Web site at the following address: <http://www.oecd.org/dsti/sti/prod/sti_wp.htm>

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LES DONNÉES DE L'OCDE SUR LES COMPÉTENCES : L'EMPLOI PAR INDUSTRIE ET PAR ACTIVITÉ PROFESSIONNELLE

Division des analyses économiques et des statistiques

Ce document a pour but une diffusion plus large des données de l'emploi par industrie et par activité professionnelle pour 10 pays de l'OCDE. Ces données ont été collectées au cours des dernières années dans le cadre des travaux analytiques sur l'évolution des compétences dans les pays de l'OCDE. La couverture industrielle en permet l'utilisation conjointe avec d'autres bases de données désagrégées de l'OCDE. Le détail de la ventilation par activité et la période couverte permettent de suivre l'évolution des profils de compétence sur les deux dernières décennies. Les données présentées dans ce rapport ont été déclassifiées par le Groupe de travail sur les statistiques industrielles du Comité de l'industrie. Il faut en effet souligner qu'il s'agit d'estimations du Secrétariat de l'OCDE et non pas de soumissions officielles des pays Membres.

Les données relatives aux pays ne figurent pas dans la version papier de ce rapport, mais sont mises à la disposition du public sur le site Web de l'OCDE à l'adresse suivante : <http://www.oecd.org/dsti/sti/prod/sti_wp.htm>

Introduction

This document presents data on employment by industry and occupations for ten OECD countries. Its aim is to disseminate the data to a wider public, rather than to present analytical results. These data have been collected by the OECD Secretariat (the Economic Analysis and Statistics Division of the Directorate for Science, Technology and Industry) over the last few years in the context of analytical work aimed at exploring empirically the changing patterns of skills in OECD countries and the relationship between technology and skill formation. Their industrial coverage allows them to be used in conjunction with similar disaggregated OECD databases, while the occupational detail and time coverage allow a discussion of occupational structure that goes beyond simple white-collar/blue-collar distinctions and that tracks the evolution of skills profiles over the last one or two decades.

The data in this document have been declassified by the Statistical Working Party of the Industry Committee following a review process. The Secretariat sent for review to each Member country which responded to the original data request or for which data have been obtained from other national sources, a copy of the country's industry by occupation data after adjustments for international comparability, together with a note outlining problems and questions. The resulting database has benefited from comments by Member countries during this review process, although because of the adjustments made in the case of some countries (the United Kingdom and Finland), the national authorities were unable to confirm the validity of the final data. **It should be noted that the data in this document represent OECD estimates constructed for the purpose of analytical work by the OECD Secretariat and are not official country submissions**.

The structure of the document is as follows. The remainder of this section gives the background against which the data collection exercise took place, the specifics of the data request and the response from countries. It also discusses briefly the use of the data in analyses to date. The following sections discuss some methodological issues and summarise the work undertaken on the international comparability of the data by outside consultants.[1] The concluding section explains the structure of the data files.

Background

In the context of follow-up work to the *OECD Jobs Study* (the DSTI project on "Technology, Productivity and Job Creation"), the Secretariat launched in early 1995 a request for data on employment by industry broken down by occupations. This data request was intended to provide the Secretariat with the analytical tools to examine the evolution in the composition of employment with respect to industries and occupations, and the role of technology and skills upgrading in industry performance.

Variables and time. Member countries were asked to provide matrices of number engaged (or employees) in each industry by type of occupation. In addition, they were asked to supply the Secretariat with vectors of *average wages* in each occupation (there was no response to this request). Given that the aim was to cover evolutions since 1970, matrices for at least five data points: 1970, 1975, 1980, 1985,

1. The outside consultants were Thibaut Desjonqueres (Centre for Economic Performance, London School of Economics), Stephen Machin and and Johannes Wiegand (Department of Economics, University College London and Centre for Economic Performance, London School of Economics), and John Van Reenen (Department of Economics, University College London and Institute of Fiscal Studies).

1990 (or adjacent years) plus the latest available were requested. At the minimum, the data request specified at least two data points, one in the early 1980s and one in the 1990s.

Source and classification. Given that industry by occupation matrices are available either through a Census or through Labour Force surveys, the data request specified that either source was acceptable. In terms of classification, in order for the industry by occupation matrices to be used in conjunction with other OECD industrial databases (such as STAN, ANBERD or the Input-Output database) and to allow international comparisons, data were requested in the International Standard Industrial Classification (ISIC) Rev.2 for industries, and in the International Standard Classification of Occupations (ISCO 88) of the International Labour Office for occupations (see Box 1). Similar (unpublished) data on employment by industry and occupation for EU countries are available from EUROSTAT in ISIC Rev.3 for industries and ISCO 88 for occupations, covering the 1993-97 period.

Detail requested. The detail requested is presented in Annex 1 in both English and French). For *industries*, the aim was to achieve the level of detail of the OECD STAN database for manufacturing, and 2-digit detail in services. For *occupations*, the desired detail in the matrices consisted of the 28 major sub-groups of ISCO 88. If countries were unable to provide this detail, they were asked to provide the ten major occupational groups in ISCO 88 or their closest national aggregation.

. ***Response***. A large number of countries responded to the request, and data submissions varied in terms of source, years covered, classification used and detail available in both industries and occupations. With few exceptions, the data started around 1980, with earlier data typically not available. In many cases there was a break in the matrices submitted, usually due to a change in the classification for occupations, but also in some cases due to a change in the classification of industries. The detail supplied for both industries and occupations varied from 1-digit to over 300, although many countries supplied data to the OECD specifications. Employment by industry did not always match the data in other OECD databases such as STAN or the figures in the OECD National Accounts, and adjustments were made by the Secretariat in order to achieve greater international comparability. There were often missing industries and occupations in the matrices. In some cases, the Secretariat commissioned researchers to prepare the data for particular countries.

Use of the data. The data collected have been used in the context of the "Technology, Productivity and Job Creation" activity. Tables and graphs based on the data, as well as econometric results, have appeared in two recent publications: OECD (1996), *Technology, Productivity and Job Creation*, and OECD (1996), *Technology and Industrial Performance*, as well as in a recent *STI Working Paper*.[2] The occupational data were aggregated into four broad categories: white collar high-skilled, white collar low-skilled, blue-collar high-skilled and blue collar low-skilled. These were then used to compare international trends in upskilling in the aggregate and in different industries, and to examine econometrically the relationship between technology and upskilling. Given that there were some uncertainties about the extent to which the actual numbers employed in different occupations were comparable across countries, direct comparisons of levels and shares were not presented. The graphs and tables were restricted to comparing growth rates over time, which assumes consistency over time in the manner in which national occupational classifications were transformed into ISCO 88.

2. Colecchia, A. and G. Papaconstantinou (1996), "The Evolution of Skills in OECD Countries and the Role of Technology", *STI Working Paper* 1996/6.

Box 1. Skills and how to measure them

The term "skill" refers to the qualifications needed to perform certain tasks in the labour market. It is a multi-dimensional concept, since most jobs require various skills, ranging from physical abilities such as eye-hand co-ordination, dexterity and strength, to cognitive skills (analytic and synthetic reasoning, numerical and verbal abilities) and interpersonal (supervisory, leadership) skills.

In empirical work, researchers often use proxies based on education and occupation. Education is usually categorised by years of schooling or final degree obtained and is not adjusted for quality. Occupation sometimes provides more information on the skills required of workers, but measures vary considerably across countries and may be ambiguous. Work that attempts international comparisons, however, typically uses crude proxies such as the ratio of production and non-production workers or of blue- and white-collar workers, or the share of the workforce with a higher education qualification.

In order to improve on such measures, the data request sent to the Statistical Working Party of the Industry Committee in 1995 asked countries to submit data on employment by industry broken down by occupation. The occupational data requested are based on the new version of the International Standard Classification of Occupations of the International Labour Office, ISCO 88. Underlying the occupational categories in this classification are different levels of educational attainment, and this allows a proxy of different skill levels to be constructed, something which was not possible with other occupational classifications. For analytical needs, in order to describe the broad evolution of the occupations mix in economies over time, occupations were subsequently aggregated in the following way:

- White-collar high-skill (WCHS): Legislators, senior officials and managers (Group 1), Professionals (Group 2), Technicians and associate professionals (Group 3).
- White-collar low-skill (WCLS): Clerks, service workers (Group 4), shop & sales workers (Group 5).
- Blue-collar high-skill (BCHS): Skilled agricultural and fishery workers (Group 6), Craft & related trade workers (Group 7).
- Blue-collar low-skill (BCLS): Plant & machine operators and assemblers (Group 8), Elementary occupations (Group 9).

Detail of data in this document. The data in this paper have been prepared following methodological work on international comparability and a review process by countries. They cover the ten countries (the G7 group, Finland, Australia and New Zealand) for which industrial data in ISIC Rev.2 and occupational data in ISCO 88 were available for at least two points in time, one in the 1970s or 1980s and one in the 1990s (more for some countries). In the process of preparation, it became apparent that significant differences between countries in the share of occupations in specific 1-digit ISCO 88 categories reflected different definitions of occupations and different ways of reclassifying national occupational data into ISCO 88 rather than true differences in the skill composition of economies. These differences were particularly pronounced between ISCO 88 categories 2 (professionals) and 3 (technicians and associate professionals), as well as between ISCO 88 categories 6 (skilled agricultural and fishery workers) and 7 (craft and related trade workers). For this reason, it was decided to limit the detail in the publication of the data to the four occupational categories of Box 1 where such differences do not seem to pose a problem in international comparability of levels and shares. Annex 2 presents the detail of the data for the ten countries covered (years, national specificities, source of original data).

Methodological issues

Issues related to the occupational classification. The statistical problems in the occupational classification of the OECD database relate first to difficulties in comparisons over time. Not all OECD countries have adopted the ISCO 88 classification, and those that have, have done it only recently. Hence in a number of cases, data referring to the 1980s follow a different classification (national or ISCO 68). Another problem is the lack of information on how the bridging from national classifications to ISCO 88 was done. There are differences in definitions and sources, for example in the labour force definition used (employees, self employed) and the source for the data (census, labour force surveys). Finally, there is some inconsistency in totals: problems with defining/accounting for residual categories such as the unemployed, military forces, etc.

Issues related to the industrial classification. Almost all countries sent in their data submission in the ISIC Rev.2 classification, so that problems relating to industry classifications are few. There are some problems in selected sectors such as government services. Moreover, not all countries provided a detailed industrial classification, with some industries grouped together, especially in the high-technology sector. The Secretariat attempted to address these problems in two ways: *i)* by collaborating with outside consultants in order to examine, using statistical evidence, whether the dataset compiled is reliable and consistent and whether an accurate proxy of different skill levels can be constructed with this new occupational classification; and *ii)* by asking countries to review their data, after adjustment by the OECD Secretariat. The next section of this document presents a summary of the results of the work on international comparability which, for simplicity, has focused on only one skill group, the white-collar high-skilled workers.

International comparability of the industry by occupation data: some results

To obtain an insight into data reliability, a number of tests have been applied by comparing the OECD data on employment by industry and occupations with UN and Eurostat data on occupations at the aggregate level; and with data on education by industry from national micro data sources and from an OECD database based on ISCED levels. These statistical tests involve: *(a)* correlations of levels of education and occupational structure; *(b)* correlation of changes in educational and occupational mix within and between industries; *(c)* comparison of the OECD data with the UN Database and with Eurostat Labour Force surveys data; *(d)* comparison of results for countries with *a priori* comparable industrial structures and/or endowments.

Correlation of levels of education and occupational structures of industries. Educational data are collected from surveys derived from national statistical offices (such as the Labour Force Survey in the United Kingdom or Current Population Surveys in the United States). Merging the OECD occupational and national educational datasets together gives a panel on occupation and education for 16 manufacturing and 18 non-manufacturing sectors in each country for at least two data points. Available and reliable matches with enough data (education and occupation) were found in the United States, the United Kingdom, France, Germany, Italy and Japan.

The idea behind the test was the following: it is reasonable to expect a person working in a white collar high skilled occupation to be in the high educational attainment group with some probability, and to have a lower probability of being in the low-skilled educational group. Pearson correlation coefficients were therefore computed between the occupational and educational variables, concentrating on the white-collar high-skilled correlation coefficients only. The following coefficients are of particular interest: white-collar high-skilled occupation/high education (WCHS/HIGH), and white-collar high-

skilled occupation/low education (WCHS/LOW). The Pearson correlation coefficient should be positive in the first case, but negative in the second. The test performed very well: in all 24 cases (high and low education categories) the correlation had the expected sign; in 19 of them, its absolute value was larger than 0.5. The hypothesis that the two measures are uncorrelated was always rejected in manufacturing. All outliers were in services where the coefficient was calculated on the basis of fewer observations. Pearson correlation coefficients were remarkably high in manufacturing in the United States, the United Kingdom and Italy.

Consistency of occupation and education data in tracking changes in skill structures. Changes in the occupational and educational composition of the workforce can be split up into within-industry and between-industry effects. This methodology allows a calculation of how much of the aggregate movement towards more skilled workers is due to a between-industry shift (low-skilled industries have shrunk in size relative to high-skilled industries) and how much of the change is due to a within-industry shift (a movement towards more skilled workers in both growing and declining sectors).[3]

The results of this decomposition showed that, in manufacturing, the within-industry component dominates whether educational or occupational measures of skill are used. With one exception,[4] more than 80 per cent of structural change was due to changes within industries. In seven out of twelve cases the within-industry change explained more than 90 per cent of the overall change in skilled employment. The consistency between education- and occupation-based results is somewhat less for non-manufacturing industries. For education-based measures the within effect dominated, while for occupation-based measures this is less clearly the case for some countries.[5] In two cases (occupational and educational changes in Italy), the within-industry component explained less than half of the structural change of the WCHS/highly educated workforce. On the whole, the overall picture indicates that by far the vast majority of the increase in the proportion of high-skilled workers has taken place within industries. The measures of skill seem more comparable for manufacturing than for non-manufacturing based on this criterion.

A second way of comparing the educational and occupational data is to examine whether the upgrading was occurring in the same industries. Broadly speaking, the industries with fastest upgrading should be the similar whichever proxy for skill (occupation or education) is used. For the five countries with comparable occupation and education data (the United States, the United Kingdom, France, Germany and Japan), the industries with the largest individual contributions were found to be almost the same

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3. The aggregate change in the share of high skilled workers can be decomposed into a *between* effect and a *within* effect (respectively the first and second term on the right hand side of the following equation) using the following decomposition: $\Delta P^{WCHS}=\sum_I \Delta S_i \ \overline{P_i}^{WCHS}+\sum_i \Delta P_i^{WCHS} \ \overline{S_I}$ where P_i^{WCHS} is the share of the employed who are white-collar high skilled, S_i is the share of total employment in manufacturing or non-manufacturing, and bars over variables denote period average. See Eli Berman, John Bound and Zvi Griliches (1994), "Changes in the Demand for Skilled Labor within US Manufacturing Industries", *Quarterly Journal of Economics*, 109, pp. 367-398, for the methodology.

4. The largest discrepancy is in Germany where education-based measures suggest that 65 per cent is within and the occupation-based measure implies that 81 per cent is within.

5. This is in line with the results of other studies, *e.g.* D.R. Howell and N. Wolff (1991), "Trends in the Growth and Distribution of Skills in the US workplace, 1960-1985", *Industrial and Labor Relations Review*, Vol. 44.

whether education or occupation data are used.[6] In all five countries, the largest individual industrial contributions to changes in white-collar high-skilled employment are broadly the same sectors that contribute most to the variation in high educational shares in manufacturing in the 1980s.[7] Reproducing these calculations for the non-manufacturing sector, similar conclusions can be drawn, with real estate and business services, financial institutions and sanitary services being the sectors which contributed most to the increase in skilled employment. Once again, these results are confirmed by both types of skill measures.

Comparison with UN and Eurostat/ILO data. A comparison of OECD with UN data with respect to the share of white-collar workers in the workforce showed that, whereas numbers do not exactly match in levels (UN data generally show a lower white-collar share), the trends are the same for all three countries where comparisons can be made (the United Kingdom, the United States and Finland).[8] Hence, this cross-check provides some additional evidence in favour of the quality of the data under consideration.

In addition, Graph 1 compares the shares of total employment accounted for by the nine 1-digit occupational groups defined in ISCO 88 according to OECD data and Eurostat or International Labour Office data. The comparisons are at the level of the total economy, where the different sources should give identical results, since all the databases are constructed on the basis of the same ILO definitions. This is not the case in the graph because of the availability of the data in different years from different databases. Nevertheless, it is clear that there is broad consistency between the databases in all four large European countries and in New Zealand (the five countries for which this comparison is made). The one difficulty is in the United Kingdom, where there are substantial differences between the OECD and Eurostat data in the way occupations are allocated between ISCO 1-digit categories 2 and 3 and between categories 8 and 9.

Pairwise comparison of results for countries with similar industrial structures. An additional test provided some indications on the countries which are similar with respect to their employment structure within industries. Having broken down the change in the skilled employment share into each of the 16 manufacturing and 18 non-manufacturing industries and ranked these sectors according to their contributions, Spearman rank correlation statistics were now computed across countries by the total and "within-industry" component. To obtain an informal testing procedure, the focus was on three country correlations: the United States with the United Kingdom, Australia with New Zealand, and France with Germany. In all three cases, rather high correlations should be expected, in the area of 0.5 and above. For manufacturing, the expected result was obtained in all three cases, whether looking at overall changes or

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6. The calculation follows the methodology in S. Machin, A. Ryan and J. Van Reenen (1996), "Technology and Changes in Skill Structure: Evidence from an International Panel of Industries", Centre for Economic Policy Research Working Paper No. 1434.

7. Spearman rank correlations between education and occupation variables in manufacturing were .718 in the United States, .744 in the United Kingdom, .889 in France, .361 in Japan and .433 in Germany. The relatively low figure for Germany is largely due to the fact that there are missing values in the data in different industrial sectors whether occupation or education data are used, making the calculations rely on a very small number of observations. In Japan, clear opposite rankings for the "other manufacturing" industry are obtained. Again, this is due to different methods of compilation of the data and different definitions.

8. This is mainly due to the structure of the UN study, which excludes establishments of less than 30 employees. More in line with the OECD shares and trends is the Japanese Wage Census which gives the proportion of non-manual employees as 36 per cent in 1980 and 38 per cent in 1987 (latest available year).

at within-industry changes. The coefficient was particularly high between the United States and the United Kingdom. The procedure worked less well for non-manufacturing industries, but the coefficient remained very high between the United States and the United Kingdom, and between Germany and Japan.

Graph 2 provides some additional evidence on the extent of international comparability of the occupation-based skills data. It shows the evolution over time of the shares accounted for by white-collar high-skill (WCHS), white-collar low-skill (WCLS), blue-collar high-skill (BCHS) and blue-collar low-skill (BCLS) occupations in the ten countries for which such groups can be constructed. In particular, the skills profile of total employment is similar for the following groups of countries: the United States and Canada; Australia and New Zealand; and the European countries in the graph. In addition, while there are many differences across countries, the skills profile in manufacturing and in the services segments has some common features: in manufacturing, the largest employment shares are accounted for by BCLS and BCHS, while in services the largest shares are accounted for by WCLS and WCHS.

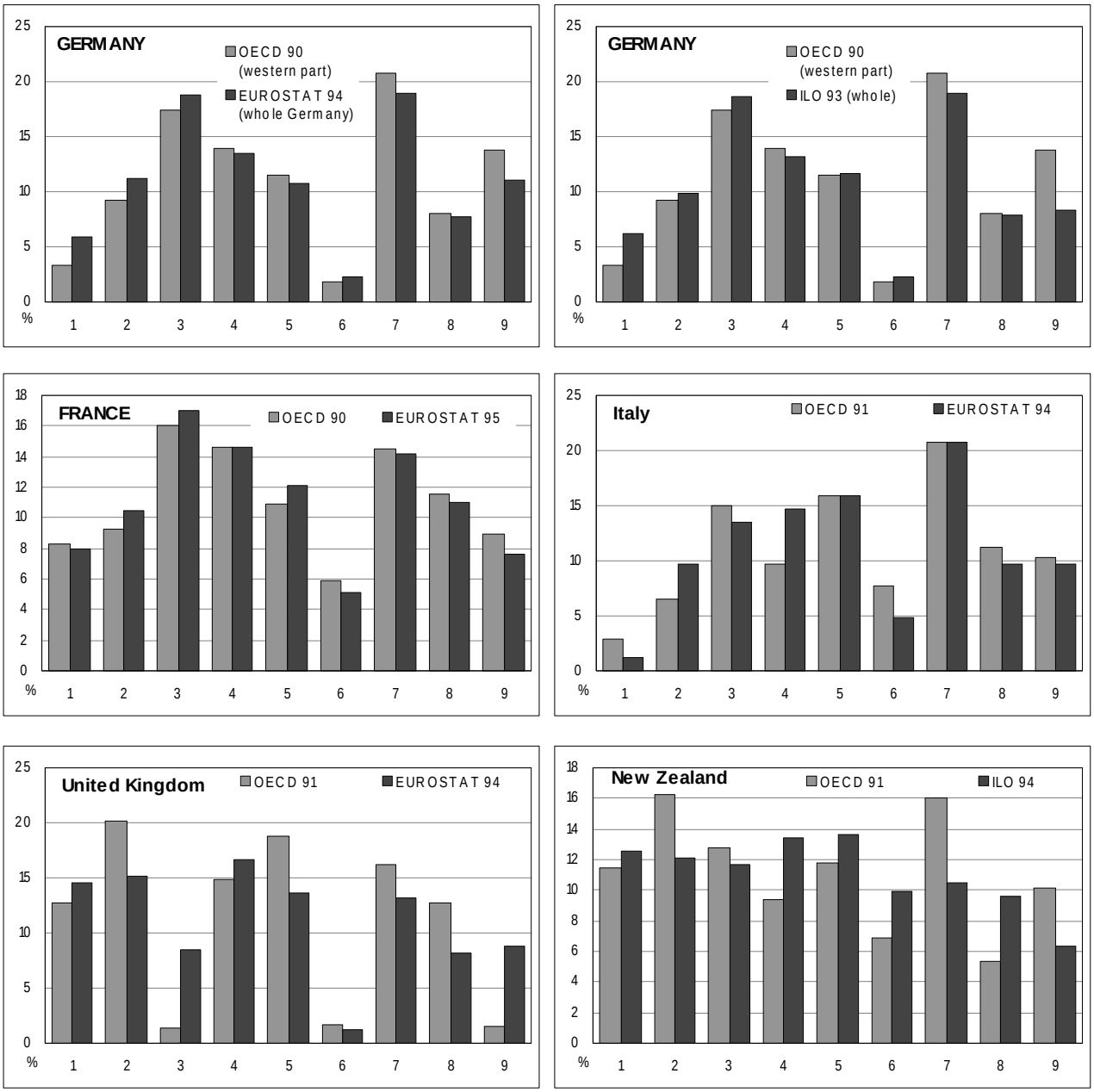
The data in this document

The data on employment by industry and occupation are organised in EXCEL files, one per country. Each file contains data in tabular form for the years available (see Annex 2), as well as some summary graphs. The files are as follows:

Australia:	SKILLAUS.XLS
Canada:	SKILLCAN.XLS
Finland:	SKILLFIN.XLS
France:	SKILLFRA.XLS
Germany:	SKILLGER.XLS
Italy:	SKILLITA.XLS
Japan:	SKILLJPN.XLS
New Zealand:	SKILLNZ.XLS
United Kingdom:	SKILLUKM.XLS
United States:	SKILLUSA.XLS

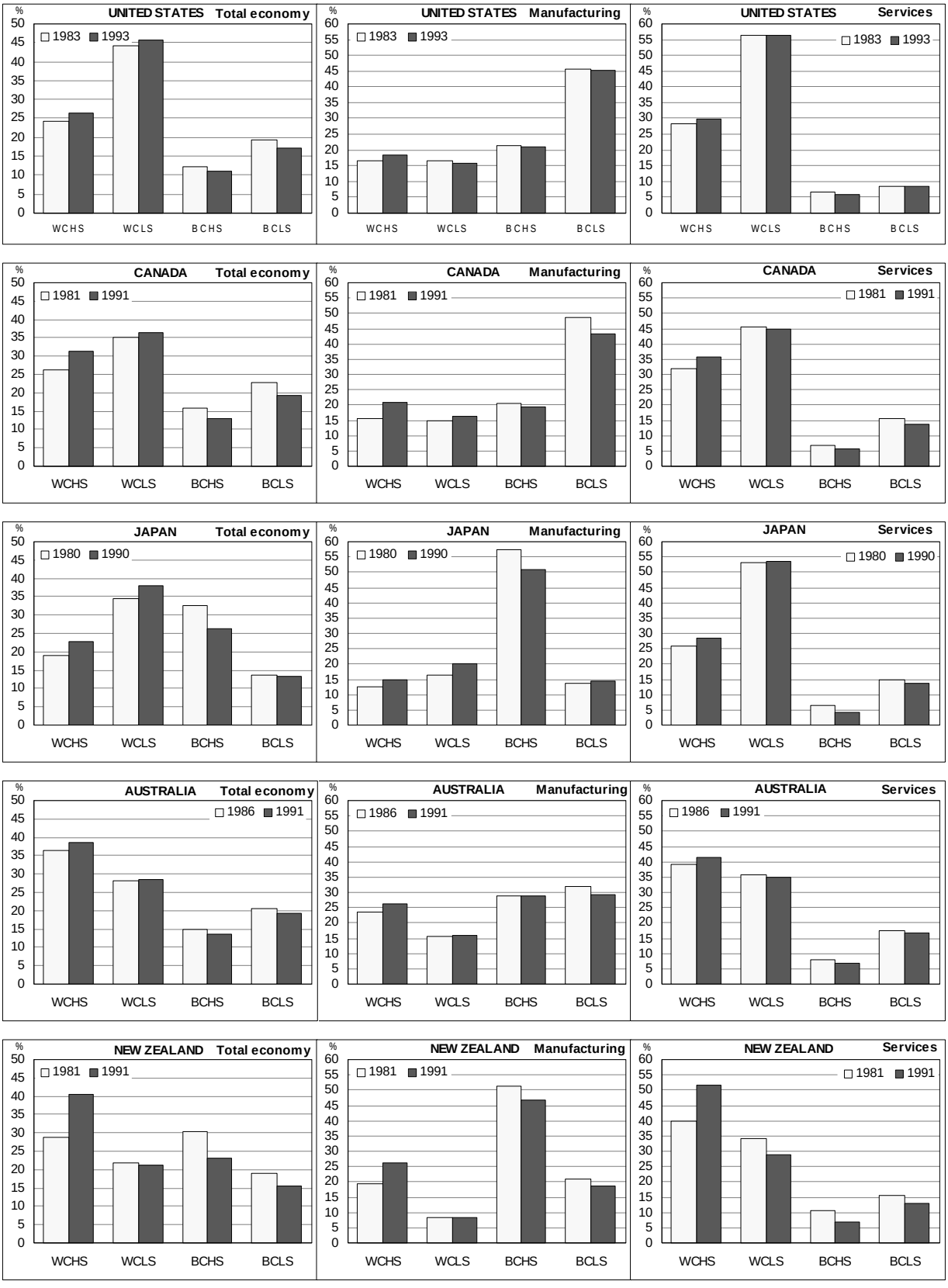
Graph 1. Shares of 1-digit ISCO-88 occupations in total civilian employment

Comparison between OECD occupational data and other sources

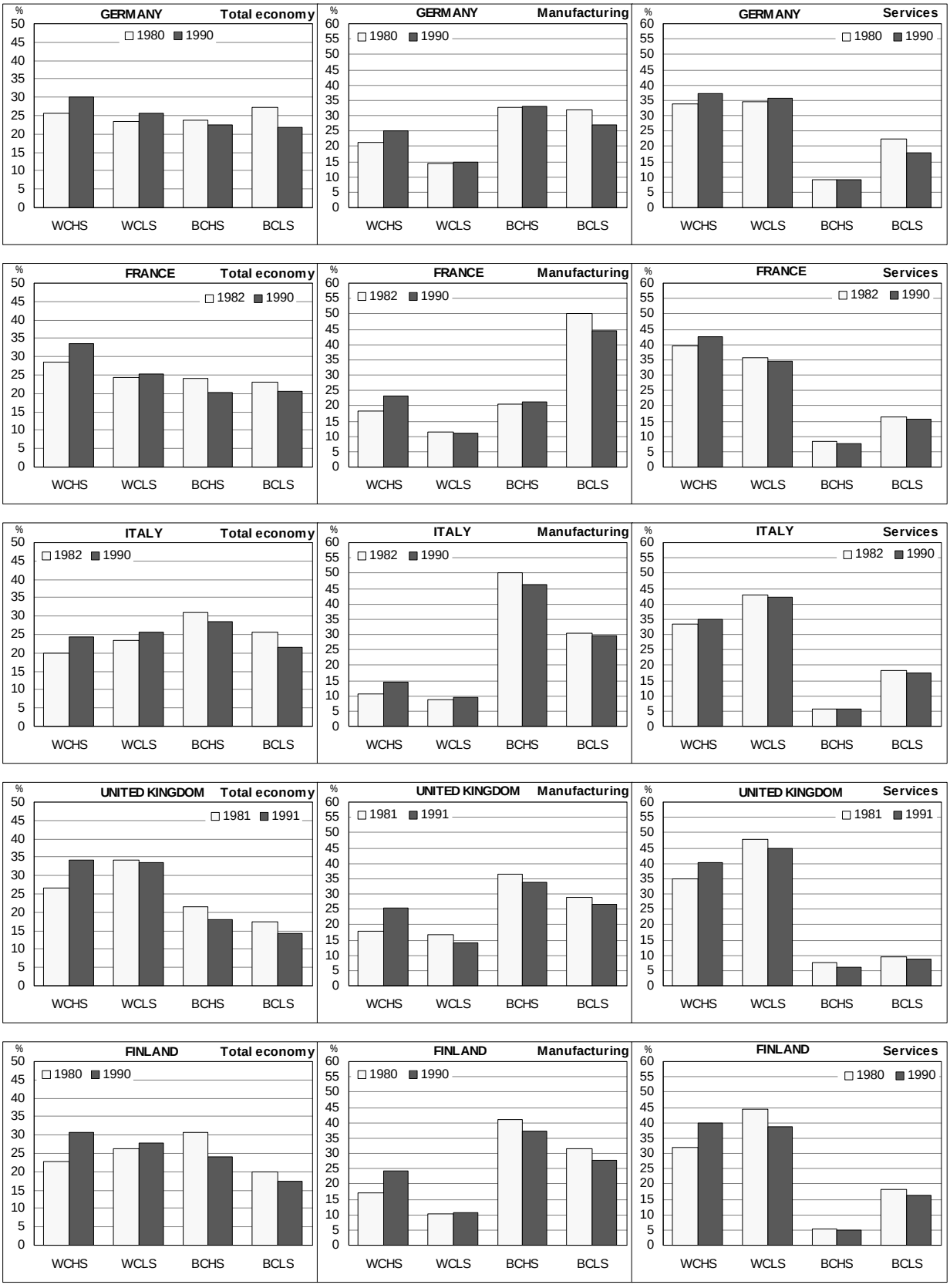


Note: For definitions of the 9 1-digit ISCO-88 occupations see Annex 1 below.

Graph 2. Shares of the four skill level categories in employment



Graph 2 *(cont'd.)***. Shares of the four skill level categories in employment**



Annex 1. Industry and occupational categories

	BRANCHE D'ACTIVITES	INDUSTRY NAME
	Codes CITI	**ISIC Codes**
1000	**AGRICULTURE,CHASSE,PECHE.**	**AGRICULTURE, FORESTRY, FISHING**
2000	**ACTIVITES EXTRACTIVES.**	**MINING**
3000	**TOTAL DES INDUSTRIES MANUFACTURIERES**	**TOTAL MANUFACTURING**
3100	ALIMENTATION,BOISSONS,TABAC	FOOD, DRINK & TOBACCO
3200	TEXTILES,HABILLEMENT,CUIR	TEXTILE, FOOTWEAR & LEATHER
3300	BOIS ET MEUBLES	WOOD, CORK & FURNITURE
3400	PAPIER,IMPRIMERIE,EDITION	PAPER, PRINTING & PUBLISHING
3500	PRODUITS CHIMIQUES	CHEMICALS
3510	INDUSTRIE CHIMIQUE	INDUSTRIAL CHEMICALS
3512X	PRODUITS CHIMIQUES DE BASE SAUF PRODUITS PHARMACEUTIQUES	BASIC CHEMICALS
3522	PRODUITS PHARMACEUTIQUES	PHARMACEUTICALS
3530	RAFFINERIES DE PETROLE	PETROLEUM REFINERIES
3540	DERIVES DU PETROLE ET DU CHARBON	OIL AND COAL PRODUCTS
3534A	RAFFINERIES DE PETROLE ET PRODUITS DERIVES	PETROLEUM REFINERIES & PRODUCTS
3550	INDUSTRIE DU CAOUTCHOUC	RUBBER PRODUCTS
3560	PLASTIQUE	PLASTIC PRODUCTS
3556A	INDUSTRIES DU CAOUTCHOUC ET DU PLASTIQUE	RUBBER & PLASTIC PRODUCTS
3600	PRODUITS MINERAUX NON METALLIQUES	STONE, CLAY & GLASS
3700	METALLURGIE DE BASE	BASIC METAL INDUSTRIES
3710	SIDERURGIE	FERROUS METALS
3720	METAUX NON FERREUX	NON FERROUS METALS
3800	OUVRAGES EN METAUX,MACHINES,MATERIELS	FABRICATED METAL PRODUCTS AND MACHINERY
3810	OUVRAGES EN METAUX	FABRICATED METAL PRODUCTS
382X	MACHINES NON ELECTRIQUES	OTHER NON-ELECTRICAL MACHINERY
3825	MACHINES DE BUREAU ET A CALCULER	COMPUTERS AND OFFICE EQUIPMENT
383X	MACHINES ELECTRIQUES SAUF TELECOMMUNICATIONS	ELECTRICAL EQUIPMENT
3832	APPAREILS DE RADIOS,TELEVISIONS ET TELECOMMUNICATIONS	ELECTRONIC EQUIPMENT
3841	CONSTRUCTION NAVALE	SHIPBUILDING
3842	MATERIEL FERROVIAIRE	RAILROAD EQUIPMENT
3843	VEHICULES AUTOMOBILES	MOTOR VEHICLES
3844	DEUX ROUES	MOTOCYCLES & CYCLES
3845	CONSTRUCTION AERONAUTIQUE	AIRCRAFT
3849	AUTRES MATERIELS DE TRANSPORTS	OTHER TRANSPORT EQUIPMENT
3842A	AUTRES MATERIELS DE TRANSPORTS	OTHER TRANSPORT EQUIPMENT
3850	MATERIEL PROFESSIONNEL	INSTRUMENTS
3900	AUTRES INDUSTRIES MANUFACTURIERES	OTHER MANUFACTURING
4000	**ELECTRICITE,GAZ ET EAU**	**ELECTRICITY, GAS AND WATER**
5000	**CONSTRUCTION**	**CONSTRUCTION**
6000	**COMMERCE**	**WHOLESALE / RETAIL TRADE, HOTELS, RESTAURANTS**
6100	COMMERCE DE GROS	WHOLESALE TRADE
6200	COMMERCE DE DETAIL	RETAIL TRADE
6300	HOTELS ET RESTAURANTS	HOTELS & RESTAURANTS
7000	**TRANSPORTS,ENTREPOTS ET COMMUNICATIONS**	**TRANSPORT, STORAGE AND COMMUNICATIONS**
7100	TRANSPORTS ET ENTREPOSAGE	TRANSPORT & STORAGE
7200	COMMUNICATIONS	COMMUNICATIONS
8000	**BANQUES,ASSURANCES,IMMOBILIER.**	**FINANCE, INSURANCE, REAL ESTATE, BUSINESS SERVICES**
8100	ETABLISSEMENTS FINANCIERS	FINANCE
8200	ASSURANCES	INSURANCE
8300	AFFAIRES IMMOBILIERES,SERVICES AUX ENTREPRISES	REAL ESTATE & BUSINESS SERVICES
9000	**SERVICES A LA COLLECTIVITE**	**COMMUNITY, SOCIAL & PERSONAL SERVICES**
9100	ADMINISTRATION PUBLIQUE ET DEFENSE	PUBLIC ADMINISTRATION & DEFENSE
9200	SERVICES SANITAIRES ET ANALOGUES	SANITARY & SIMILAR SERVICES
9300	SERVICES SOCIAUX	SOCIAL & RELATED COMMUNITY SERVICES
9400	SERVICES RECREATIFS ET CULTURELS	RECREATIONAL& CULTURAL SERVICES
9500	SERVICES AUX PARTICULIERS	PERSONAL & HOUSEHOLD SERVICES
9600	SERVICES INTERNATIONAUX	INTERNATIONAL SERVICES
HT	INDUSTRIES DE HAUTE TECHNOLOGIE	HIGH-TECHNOLOGY INDUSTRIES
MHT	INDUSTRIES DE MOYENNE-HAUTE TECHNOLOGIE	MEDIUM-HIGH-TECHNOLOGY INDUSTRIES
MLT	INDUSTRIES DE MOYENNE-FAIBLE TECHNOLOGIE	MEDIUM-LOW-TECHNOLOGY INDUSTRIES
LT	INDUSTRIES DE FAIBLE TECHNOLOGIE	LOW-TECHNOLOGY INDUSTRIES
TOT	ECONOMIE	ECONOMY
TOTS	SERVICES	TOTAL SERVICES

Annex 1 *(cont'd.)*. **Industry and occupational categories**

	CATEGORIES PROFESSIONNELLES	OCCUPATIONS
	Codes CITP-88	**ISCO-88 Codes**
0	**FORCES ARMEES**	**ARMED FORCES**
10	**EXECUTIF CADRES SUPERIEURS**	**LEGISLATORS, SENIOR OFFICIALS & MANAGERS**
11	MEMBRE DE L'EXECUTIF	LEGISLATORS AND SENIOR OFFICIALS
12	DIRECTEURS DE SOCIETES	CORPORATE MANAGERS
13	DIRIGEANTS ET GERANTS	GENERAL MANAGERS
20	**PROFESSIONNELS INTELLECTUELS SCIENTIFIQUES**	**PROFESSIONALS**
21	SPECIALISTES DES SCIENCES PHYSIQUES	PHYSICAL, MATHEMATICAL & ENGINEERING SCIENCE PROFESSIONALS
22	SPECIALISTES DES SCIENCES DE LA VIE	LIFE SCIENCE & HEALTH PROFESSIONALS
23	SPECIALISTES DE L'ENSEIGNEMENT	TEACHING PROFESSIONALS
24	AUTRES SPECIALISTES	OTHER PROFESSIONALS
30	**PROFESSIONS INTERMEDIAIRES**	**TECHNICIANS & ASSOCIATE PROFESSIONALS**
31	PROFESSIONS INTERMEDIAIRES DES SCIENCES PHYSIQUES	PHYSICAL & ENGINEERING ASSOCIATE PROFESSIONALS
32	PROFESSIONS INTERMEDIAIRES DES SCIENCES DE LA VIE	LIFE SCIENCE & HEALTH ASSOCIATE PROFESSIONALS
33	PROFESSIONS INTERMEDIAIRES DE L'ENSEIGNEMENT	TEACHING ASSOCIATE PROFESSIONALS
34	AUTRES PROFESSIONS INTERMEDIAIRES	OTHER ASSOCIATE PROFESSIONALS
40	**EMPLOYES ADMINISTRATIFS**	**CLERKS**
41	EMPLOYES DE BUREAU	OFFICE CLERKS
42	EMPLOYES DE RECEPTION	CUSTOMER SERVICE CLERKS
50	**PERSONNELS DE SERVICE**	**SERVICE WORKERS, SHOP & MARKET SALES WORKERS**
51	PERSONNELS DE SERVICE AUPRES DES PARTICULIERS	PERSONAL & PROTECTIVE SERVICE WORKERS
52	MANNEQUINS, VENDEURS & DEMONSTRATEURS	MODELS, SALESPERSONS & DEMONSTRATORS
60	**AGRICULTEURS PECHEURS QUALIFIES**	**SKILLED AGRICULTURAL & FISHERY WORKERS**
61	AGRICULTEURS ET PECHEURS QUALIFIES	MARKET-ORIENTED SKILLED AGRICULTURAL & FISHERY WORKERS
62	AGRICULTEURS ET PECHEURS DE SUBSISTANCE	SUBSISTENCE AGRICULTURAL & FISHERY WORKERS
70	**ARTISANS OUVRIERS DE TYPE ARTISANAL**	**CRAFT & RELATED TRADES WORKERS**
71	ARTISANS OUVRIERS EXTRACTION ET BATIMENT	EXTRACTION & BUILDING TRADES WORKERS
72	ARTISANS OUVRIERS DE LA METALLURGIE	METAL, MACHINERY & RELATED TRADES WORKERS
73	ARTISANS OUVRIERS DE LA MECANIQUE DE PRECISION	PRECISION, HANDICRAFT, PLANTING, RELATED TRADES WORKERS
74	AUTRES ARTISANS ET OUVRIERS	OTHER CRAFT & RELATED TRADES WORKERS
80	**CONDUCTEURS ET OUVRIERS DE L'ASSEMBLAGE**	**PLANT & MACHINE OPERATORS & ASSEMBLERS**
81	CONDUCTEURS D'INSTAL LATION	STATIONARY-PLANT & RELATED OPERATORS
82	CONDUCTEURS DE MACHINES	MACHINE OPERATORS & ASSEMBLERS
83	CONDUCTEURS DE VEHICULES	DRIVERS & MOBILE-PLANT OPERATORS
90	**OUVRIERS ET EMPLOYES NON QUALIFIES**	**ELEMENTARY OCCUPATIONS**
91	EMPLOYES NON QUALIFIES DES SERVICES	SALES & SERVICES ELEMENTARY OCCUPATIONS
92	MANOEUVRES DE L'AGRICULTURE ET DE LA PECHE	AGRICULTURAL, FISHERY AND RELATED LABOURERS
93	MANOEUVRES DES MINES , DE LA CONSTRUCTION, DU SECTEUR MANUFACTURIER ET DES TRANSPORTS	LABOURERS IN MINING, CONSTRUCTION, MANUFACTURING, TRANSPORT
10+20+30	**COLS BLANCS TRES QUALIFIES**	**WHITE-COLLAR HIGH-SKILLED**
40+50	**COLS BLANCS PEU QUALIFIES**	**WHITE-COLLAR LOW-SKILLED**
60+70	**COLS BLEUS TRES QUALIFIES**	**BLUE-COLLAR HIGH-SKILLED**
80+90	**COLS BLEU PEU QUALIFIES**	**BLUE-COLLAR LOW-SKILLED**
	TOTAL POPULATION ACTIVE CIVILE OCCUPEE	**TOTAL CIVILIAN EMPLOYMENT**

Annex 2. Data availability and sources

COUNTRIES	YEARS AVAILABLE	ADJUSTEMENT TO NATIONAL ACCOUNTS[1]	NATIONAL SPECIFICITIES	SOURCES FOR ORIGINAL DATA
AUSTRALIA	1986, 1991	Yes	--	Population census - Australian Bureau of Statistics
CANADA	1971, 1981, 1986, 1991	Yes	No manufacturing detail - no breakdown of ISIC 9 into subsectors	Population census - Statisitics Canada
FINLAND	1970, 1975, 1980, 1985, 1990	Yes	--	Population census - Finnish Bureau of Statistics
FRANCE	1982, 1990	Yes	--	Population census - INSEE France
GERMANY (western)	1980, 1985, 1990	Yes	Some manufacturing details are missing. These ISIC 8 subsectors are included directly in the group total	Based on employment register - suplied by IAB Germany
ITALY	1981, 1991	Adjustment of services sectors despite notable gaps between national and STAN/ISDB data	Mining (ISIC 2) included in manufacturing - No decomposition in ISIC 8 (Finance-Insurance-Real estate)	Population census - supplied by ISPE Italy
JAPAN	1970, 1975, 1980, 1985, 1990	Adjustment of services sectors (ISIC 6-7-8-9) to 1-digit level data.	Some manufacturing industries not detailed (3522-3832-3845) . No breakdown of wholesale trade from finance and insurance.	Population census & I/O tables - MITI Japan
NEW ZEALAND	1976, 1981, 1986, 1991, 1996	Yes		Population census - New Zealand Bureau of Statistics
UNITED KINGDOM	1981, 1983-91	Adjustment of services sectors (ISIC 6-7-8-9) to 1-digit level data.	--	Based on Labour Force Survey; supplied by LSE consultants
UNITED STATES	1983-94	Yes	ISIC 3832&3850 industries included in ISIC 3830 - Some ISIC 9 services sectors (93 -94-96) regrouped under ISIC 92. No ISCO 6 occupation : "skilled agri. fishery workers" under ISCO 9 "Elementary occupations".	Population census - US Bureau of Labour Statistics

1. Data are adjusted to national accounts, via Stan and ISDB databases. Occupation weight in total employment of each industry are multiplied by STAN/ISDB corresponding industry employment values
In national accounts, producers of government services are classified separately. Here, these data are included in "Community, social & personal services" sector (ISIC 9) and subsectors.

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