VOORBURG GROUP ON SERVICE STATISTICS

Twelfth Meeting

Copenhagen, 15-19 September 1997

Employment Characteristics in Market Services Activities: Case Study of Denmark and Finland

Session 8

Abstract

The objective of this paper is to profile the employment characteristics in selected market services activities. The paper identifies employment related characteristics by activity in Denmark and Finland. The variables studied are age, sex, education, wages and the appearance of part-time and temporary work (only Finland). The comparative study of the Danish and Finnish employment data showed that the studied characteristics of the employed persons are relatively similar, also at a 2-digit activity level. The paper shows clear coincidence between high average wages and high average educational attainment at a detailed level of activity.

Peter Bøegh Nielsen (Statistics Denmark)
Samuli Rikama (Statistics Finland)

1. Background

The objective of this paper is to profile the employment characteristics in selected market services activities. The paper identifies employment related characteristics by activity classification in Denmark and Finland. This is also meant to serve as a feasibility study for developing an employment module to be used as a general framework for business surveys[1].

The study firstly introduces the characteristics of market services in relation to manufacturing and construction activities. The focus, however, is on the market services, NACE classes 50-74, with a more detailed study of the business services activities, NACE classes 72-74. The variables studied are age, gender, education, wages and the appearance of part-time and temporary work (the latter only for Finland).

As the aim of the study is to provide a profile of employment characteristics in a flexible way (feasibility study), the sources and reference years of variables for the two studied countries may vary. Furthermore, it was not possible in this study to provide all information for both countries. The comparability problems were solved by using a single indicator as index for each of the variables. This allows to list, for instance, the part-time intensive activities from the top to the bottom.

As a result, a great majority of the studied activities appeared to have similar employment characteristics in Finland and Denmark. Particularly, this is the case on the 2-digit level, while the picture is somewhat more blurred at the detailed level of business services activities.[2]

2. Market Services vs. Manufacturing and Construction Activities

The comparison of employment structures of the market services group (NACE 50-74) to manufacturing (NACE 15-17) and construction activities (NACE 45) shows a relatively similar overall pattern in Denmark and Finland. Services activities employ clearly more often females than the construction and manufacturing activities. The employed persons in the services sector are the youngest of all three groups. The difference between manufacturing and services is rather small but the employed persons in construction are clearly the oldest of all three groups.

As regards the average level of education, there are differences between Denmark and Finland. In Finland, the lowest educational attainment level was recorded for construction, but in Denmark it was the highest. However, this has no reflection on wages in Denmark, where the wage level was far the lowest in construction. In both countries the level of education in market services sector exceeded the average.

The market services sector employs part-time workers much more often than manufacturing or construction industries in Denmark and Finland. Also temporary work tends to be less common in manufacturing than in services. However, due to the seasonal character of construction work the temporary labour is most commonly used in construction. The data concerning temporary work refer only to Finland.

[1] Cf. Poul Johanis and Peter Bøegh Nielsen: Proposal for an Employment Module for Model Surveys for the Services Sector, paper to be presented at the 12th Voorburg Group Meeting.
[2] For further information concerning the methods and data sources used, see annex II.

3. The Profile of Market Services Activities

The market services activities are divided into 18 NACE categories from 50 to 74 on the 2-digit level (exept 641 & 642 post and telecom activities which were separated due to their dual character).

3.1 Gender and age structure

The *gender structure* is remarkably similar in Denmark and Finland for market services. However, the concentration of females or males in certain activities appears to be larger in Finland. The most male dominated activities in both countries are sale, maintenance and repair of motor vehicles, land transport, water transport, renting and leasing of machinery. On the other hand, the female dominated activities are retail trade, hotels and restaurants, financial intermediation and insurance.

Only in three out of the 18 activities there are differences in the gender pattern. The air transport in Finland employees less males than the average for services, while in Denmark the opposite is true[3]. Furthermore, differences are recorded in post and courier activities employing more males in Denmark, and research and development.

Concerning the *age structure*, the similarities are again remarkable. The range of index values is smaller in Finland than in Denmark. The youngest personnel in both countries is employed in the HORECA activities, while activities as real estate, insurance, financial intermediation, land transport, telecom and research and development are characterised by older group of persons employed.

The activities where the age distribution is below average in Finland but above average in Denmark are air transport, activities auxiliary to financial intermediation, computer activities and other business activities. In the first three activities the difference is clear but in other business activities only marginal. The dynamic computer and telecom activities tend to employ relatively younger personnel in Finland compared to Denmark.

Table 3.1: The activities where the age and gender structures are similar in Denmark and Finland. (Compared to service total)

	Female	**Male**
Young	Retail trade, except of motor vehicles etc. Hotels and restaurants	Sale, maintenance and repair of motor vehicles etc. Renting of machinery and equipment
Old	Financial intermediation except insurance etc. Insurance and pension funding	Wholesale trade and commission trade Land transport Water transport Supporting and auxillary transport activities Telecommunication Real estate activities

Source: Statistics Denmark, Statistics Finland.

[3] The Danish data concerning air transport are influenced by the appearence of one large company, the Scandinavian Airlines System, owned by and operating in all 3 Scandinavian countries (Denmark, Norway and Sweden). The complicated structure and registration of this firm influences the statistics in all 3 countries concerning air transportation.

As a conclusion of gender and age structures, there are several common features across both countries, also if we look at the combination of gender and age at the same time. A total of 12 activities behave similarly in terms of gender and age. For instance, the retail trade and hotels and restaurants are characterised by young female workers while financial intermediation and insurance are characterised by females of older age groups.

3.2 Level of education and wages

The similarities in *educational attainment* by activity are remarkable between Denmark and Finland. The only difference in the educational attainment indicator is recorded in air transport activities. In Finland the employed persons in these activities have an educational attainment higher than average, while the records for Denmark are clearly lower. Among the top rankings in the level of education are R&D and computer activities, activities auxiliary to financial intermediation and financial intermediation.

Concerning the *wage level* there are differences in the behaviour of only three activities: supporting and auxiliary to transport services, real estate and other business activities. In the first one the difference is small while in the latter two quite significant.

It is striking how clear the link between wage level and the level of education seems to be in both countries. There are 14 activities behaving the similar way in Denmark and Finland, if we look simultaneously at wages and the level of education, cf. table 3.2 below. These activities show a rather systematic pattern of 'low wages-low education' or 'high wages - high education'.

Table 3.2: The activities where the level of education and average wages are similar in Denmark and Finland.

Education	**Wages** **Lower than average**	**Higher than average**
Lower than average	Sale maintenance and repair of motor vehicles Retail trade, except of motor vehicles etc. Hotels and restaurants Land transport Post and courier activities Renting of machinery and equipment without operator	
Higher than average		Wholesale trade and commission trade Water transport Telecommunications Financial intermediation except insurance etc. Insurance and pension funding Activities auxiliary to financial intermediation Computer and related activities Research and development

Source: Statistics Denmark, Statistics Finland.

A further study of 'low wages - low education' category shows that all the four classes in table 3.1 that are characterised by young personnel fall into this category. On the other hand five out of eight activities in 'high wages - high education' category are characterised as employing older persons. Somewhat surprisingly, no systematic behaviour related to gender can be found.

3.3 Part-time and temporary work

The presence of part-time work by activity is remarkably similar in Denmark and Finland. In all of the 18 studied activities the pattern was the same! The activities that can be characterised as employing a higher than average proportion of part-time workers are retail trade, hotels and restaurants, other business activities, post and courier activities and renting of machinery and equipment. Of these the first three ones employ more females than the average. Furthermore, in retail trade and hotels and restaurants the employed persons tend to be young, having low educational attainment and as well as low wages.

On the basis of the Danish and Finnish figures there is a predominantly negative relation between high education and the appearance of part-time work. There are, however, a few exceptions as in sale, maintenace and repair of motor vehicles, land transport, supporting and auxiliary transport services where the average education as well as the proportion of part-time workers tends to be small. In other business services activities the educational attainment exceeds average although the share of part-time workers is high.

4. The Profile of Business Services Activities

4.1 Gender and age structure

On average the group other business services activities (NACE 74) employ more females than the market services in general. The breakdown of this group into a more detailed level reveals that the 3-digit classes are very heterogenous regarding gender structure. Clearly computer, security and technical activities are male dominated while labour recruitment and provision of personnel and industrial cleaning employ a relatively high proportion of females.

The age of the employed personnel is among the lowest in the low skill -activities as security and industrial cleaning, but also in labour recruitment and provision of personnel and computer services.

As a conclusion, industrial cleaning and labour recruitment are characterised as employing young personnel and females. Security activities mainly employ young males. Furthermore architectural, engineering and technical testing activities are strongly male dominated having the oldest average age of the employed persons.

Table 4.1: The business services activities where the age and gender structures are similar in Denmark and Finland.

	Female	**Male**
Young	Labour recruitment and provision of personnel Industrial cleaning	Computer and related activities Investigation and security services
Old	Legal, accounting book-keeping etc.	Research and development Architectural and engineering & technical testing and analysis

Source: Statistics Denmark, Statistics Finland.

4.2 Level of education and wages

The level of educational attainment shows clear differences across business services activities in Denmark and Finland and the activities can rather easily be classified according to high or low education categories.

The activities of computer, legal, business management and consultancy, architectural and engineering, technical testing are characterised by 'highly' educated personnel. On the other hand, security, industrial cleaning, other business services activities and advertising can be characterized as activities with a low educational level.

It is surprising that in advertising activities the formal education level is clearly lower than in most other business services activities, while the wage level is higher than average both in Denmark and Finland. This might indicate that the personal skills required in these activities are not directly linked to formal education, but rather to other types of individual skills. Furthermore, the advertising activities comprise of heterogenous subclasses as advertising agencies and direct and outdoor advertising which probably have rather different educational requirements.

In the 'low wages - low education' category both industrial cleaning and security activities employ young persons. The 'high wages - high education' activities as legal, accounting, book-keeping etc, and architectural and engineeing and technical testing employ older persons.

Table 4.2: The business services activities where the level of education and average wages are similar in Denmark and Finland.

Education	**Wages** **Lower than average**	**High than average**
Lower than average	Investigation and security services Industrial cleaning Other	Advertising
Higher than average		Computer and related activities Legal accounting, book-keeping etc. Architectural and engineering & technical testing and analysis

Source: Statistics Denmark, Statistics Finland.

4.3 Part-time and temporary work

Although the appearance of part-time work was almost identical on 2-digit NACE level in market services, there are quite a few differences on the level of business services. Firstly, in Finland the part-time work in legal, accounting and book-keeping (NACE 741) and other business services is more frequent than the average, while the opposite is true for Denmark. For Denmark part-time work is frequent in labour recruitment and security services, while the opposite is true for Finland.[4]

[4] One reason for the differences may be that the labour force survey -which is the data source used for Finland in this paper- is not always an accurate enough indicator at this level of detail.

Temporary work in Finland was most common in research and development, advertising, labour recruitment, security and cleaning activities.

5. Conclusions

The comparative study of the Danish and Finnish employment data showed that the studied characteristics of the employed persons broken down by activity are to a large extent similar in both countries. For instance, the level of educational attainment of the employed persons are clearly more determinant for computer or R&D activities than for hotels and restaurants or retail trade. The paper also shows that the high average wages coincide with high average educational attainment at the activity class level in a (perhaps) surprisingly high number of cases. Concerning part-time work, we were able to define common activities where this type of work was predominant and coincided to a large extent with the (relative) dominance of female workers in both countries.

Concerning the educational atttainment one of the results of the study is that one problem using the administrative data from the educational registers is that we only are able to register the formal level of education. The competences achieved on the job and the training and education supplied by the employer are not captured by this data source. In the understanding of the qualifications of the persons employed this is an important gap in our available data sources. This information is normally only collected from the supply side, ie from the employees.

In principle, we argue for the capturing of data from the demand side, ie the enterprises. The reasoning for this is that if we want to study the employment structures of the detailed activity classes we need more exact information about the activity class of the enterprise than provided by the labour force survey or other supply side oriented surveys. More important is that if we want to go one step further in our analysis by studying the individual performance of the enterprises and link the qualifications of the employees with the economic performance of the enterprises.[5] This is only possible when surveying the demand side.

We see this study - even of its preliminary nature - as a feasibility study of a number of selected variables from the proposed employment module. In Denmark and Finland where a large number of register based information also on the linked employer-employee level is available the study showed the possibilities and usefullnes of the proposed employment variables. There are reasons to believe that the general patterns and data possibilities might be quite similar in other countries as well, also in countries not having the possibilities of utilising administrative sources.

[5] An example of studying individual enterprise performance, cf. Kjartan Bjørnsson, Helle Månsson and Peter Bøegh Nielsen: The Use of register-based statistics in micro analysis. Employment Qualifications and Growth Enterprises in the Services Sector. Paper to be presented at the Voorburg Group Meeting in Copenhagen 1997.

Annex I. The characteristics of market services employment

		gender:		age		education		wages		part-time		temporary
		male										
		dominance										
		FIN	DEN	FIN	DEN	FIN	DEN	FIN	DEN	FIN	DEN	FIN
	Total economy											
D	Manufacturing	++	+	-	+	-	-	n.a.	-	---	---	--
F	Construction	+++	+++	+	+	--	+	n.a.	-	---	---	+++
50-74	Services	--	-	-	-	+	+	n.a.	+	+++	++	++
	Total (above)											
	Services	sex		age		education		wages		part-time		temporary
		male										
		dominance										
		FIN	DEN	FIN	DEN	FIN	DEN	FIN	DEN	FIN	DEN	FIN
50	Sale, maintenance and repair of motor vehicles etc.	+++	+++	-	-	--	-	--	--	---	-	---
51	Wholesale trade and commission trade, except of motor vehicle	++	++	+	+	+	++	++	++	---	---	---
52	Retail trade, except of motor vehicles etc.	---	--	-	--	--	--	--	--	+++	+++	--
55	Hotels and restaurants	---	--	-	--	-	---	--	--	+++	+++	+++
60	Land transport	+++	+++	+	++	--	--	--	-	---	---	---
61	Water transport	++	+++	+	+	+	++	++	+	--	---	--
62	Air transport	--	++	-	+	++	--	++	++	---	---	++
63	Supporting and auxiliary transport activities	++	++	+	+	-	--	-	+	---	---	+
641	Post and courier activities	-	+	+	-	--	---	---	--	+++	++	---
642	Telecommunications	++	+	+	++	+	++	+	+	---	---	---
65	Financial intermediation, except insurance etc.	---	--	+	+	++	+++	+	++	---	---	---
66	Insurance and pension funding	---	--	+	++	++	++	++	+++	--	---	---
67	Activities auxiliary to financial intermediation	+	+	-	+	+++	++	+++	+++	-	--	---
70	Real estate activities	+	++	+	++	-	-	-	+	+++	+++	+
71	Renting of machinery and equipment without operator	+++	++	-	-	-	--	--	-	+++	++	---
72	Computer and related activities	++	++	-	+	+++	+++	++	+++	---	---	---
73	Research and development	+	-	+	++	+++	+++	++	+	---	---	+++
74	Other business activities	-	--	-	+	++	++	-	++	+	++	+++
---	if the index is more than 30 points below the average (less than 70)											
--	if the index is 10 to 30 points below the average (70 to 90)											
-	if the index is less than 10 points below the average (>90)											
+	if the index is not more than 10 points above the average (<110)											
++	if the index is 10 to 30 points above the average (110 to 130)											
+++	if the index is more than 30 points above the average (>130)											

	Business services:	FIN	DEN	FIN	DEN	FIN	DEN	FIN	DEN	FIN	DEN	FIN
72	Computer and related activities	++	+++	-	-	++	+	++	++	---	---	---
73	Research and development	+	+	+	+	++	++	++	-	---	---	+++
741	Legal, accounting, book-keeping etc.	--	-	+	+	++	++	++	+	+	--	--
742-743	Architectural and engineering & technical testing and analysis	++	++	+	++	+	++	++	++	---	---	---
744	Advertising	-	++	-	--	--	--	++	+	+	++	++
745	Labour recruitment and provision of personnel	---	---	-	-	+	--	--	--	---	+++	+++
746	Investigation and security services	+++	+++	--	-	--	--	--	-	---	++	+++
747	Industrial cleaning	---	--	-	-	---	---	---	--	+++	+++	+
748	Other	+	-	-	-	--	---	-	--	+++	-	--
	Total business services (above)											
---	if the index is more than 30 points below the average (less than 70)											
--	if the index is 10 to 30 points below the average (70 to 90)											
-	if the index is less than 10 points below the average (>90)											
+	if the index is not more than 10 points above the average (<110)											
++	if the index is 10 to 30 points above the average (110 to 130)											
+++	if the index is more than 30 points above the average (>130)											

ANNEX II: Methodological description

1. Index calculation

For calculating indexes the activity figures related to each variable of the three groups i.e. manufacturing, construction and services (NACE 50-74), NACE 50-74 services (2-digit), and business services 72-74 are added and then the records of each activity are compared to these totals. The high score records for age, for instance, indicate that within the activity concerned, the average age is higher than the average of the group.

2. The sources and methods for the Danish data

2.1 The register based employment statistics

On the annual salary declaration slip, which all employers submit to the Tax Directorate for each employee, the employer indicates the local workplace where the employee was last employed. For the purpose of coding, Danmarks Statistik forwards to employers with several local workplaces a list of the code numbers that are to be used on the salary declaration slip.

This information appear on the Tax Directorate's administrative salary information register, the COR-register. A copy of the register is made available for Danmarks Statistik.

In addition to the workplace identification (the Tax and custom authorities identification-number plus the workplace code number), the salary declaration slip contains information concerning the employee's personal identification number (the socalled CPR-number), period of employment, earnings, and the Labour Market Supplementary Pension Scheme contributions paid for each employee.

This material is linked with the workplace identification number from the Business Register, and information on the workplace's economical activity classification, location and type of ownership are added. Moreover, the material is also linked with information collected separately for the public sector via the public pay transfer systems.

The workplace statistics for 1994 has been used in this paper. The average age of the activity classes is calculated on the basis of age groups (5 years intervals for persons aging 16-30 years and 10 years intervals for persons aging 30-66). Full-time employment is calculated on the information about the annual Labour Market Supplementary Pension Scheme payments of each individual employee. This information allows for identification of full-time employment = full payment of pension contribution = 27 hours of paid work each week per employee aging 16-66 years. The average wage per employee is calculated as the total amount of wages and other payments due to personal tax paid by the enterprise to the employee at the level of the local unit divided with the the no. of employees at the same unit agregated at the activity class level.

2.2 Integrated Database for Labour Market Research

The Integrated Database for Labour Marked Reseach combines information concerning the local activity units and their employees. In principle the IDA database consist of 3 different sub-registers with information on: local units, links between local units and their employees and the

total population. The local units are identified by an “employer-number”, which in most cases is identical to the enterprise number.

The link between the local unit and the employees are insured by the yearly salary statement, which is issued for each and every salary earner in Denmark. This statement contains the persons unique Central Person Number together with the identification number of the employer, cf. above 2.1.

The Central Person Number is the key in almost every administrative register in Denmark, and therefore it is possible to obtain very detailed statistical information, when these administrative sources are combined in the IDA-database. Therefore information concerning sex, age, education, employment, income, adress and family etc. can be obtained for every person living in Denmark on a permanent basis.

In this paper a sample from the total population between 16 and 66 years in the IDA database has been drawn. The sample consists of approximately 40 000 persons in 1994. This has been done by choosing all persons born on a specific date of the year (in fact it is 3 specific dates).

IDA has been used only for the educational variable. For index calculation of education each type of vocational educational have been classified and given a number of point reflecting the “lenght” of education. For instance, In Denmark a long further education were equal to 6 points, a medium-length further education is equal to 5 points, a short further education and a vocational education gives 4 point, while a general education at second level gives 2 point and the rest of the employees 1 point.

The sources and methods for the Finnish data

Labour force survey

The figures for part-time vs. full-time and permanent vs. temporary for Finland are based on Labour Force Survey. The figures of permanent and temporary workers refer to March-May 1996 situation, while the full-time and part-time data refer to the year 1996. Figures in the tables relate to wage and salary earners for these variables. Due to the sample nature of the LFS, the results based on this should be treated as indicative at the most detailed level of activity.

The Eurostat definition is used to define part-time and temporary workers. The distinction between full-time and part-time workers is made on the basis of a spontaneous answer given by the respondent. Furthermore, a job may be regarded as temporary if it is understood by both the employer and the employee that the termination of the job is determined by objective conditions such as reaching a certain date, completion of an assignment or return of another employee who has been temporarily replaced.

Regional employment statistics

The variables of sex, age (preliminary figures for 1995) and education (1994) are based on Regional Employment Statistics. This statistics includes all persons employed in the surveyed activities regardless of their employer (private and public). The production of this statistics is based on the use and linking of different type of administrative registers.

The average age of the industry for Finland is calculated from the 5-year age groups and not from individual data. For defining the index value for the level of education, a weighted average of the score of educational attainment categories of persons employed by activity is calculated. The assumption governing this calculation is that the various educational categories are equidistant. The indicator is calculated on the basis of highest level of education attained by each person, the score assigned increasing with the educational level.

Business register

For the variable wages per wage earner the business register data of 1995 is used as a source. The data covers natural and legal persons, public financial institutions or unincorporated central government enterprises. Consequently, the wages per wage and salary earner do not necessarily refer to the same population as employment statistics. For some activities, such as research and development, the coverage of business register is clearly smaller than that of employment statistics.

For calculating average wages per wage earner unweighted averages are used for Finland because the totals were not available.