



**Economic and Social
Council**

Distr.
RESTRICTED

CES/1996/R.20
19 March 1996

ORIGINAL: ENGLISH

STATISTICAL COMMISSION and ECONOMIC COMMISSION FOR EUROPE
CONFERENCE OF EUROPEAN STATISTICIANS

Forty-fourth plenary session
(Paris, 11-13 June 1996)

**Changes in the labour market: Longitudinal data and analyses of persons and
establishments**

Submitted by Statistics Denmark¹

I. Introduction

1. Analyses of the labour market seen from a dynamic perspective have steadily attracted greater interest. A dynamic description implies that time becomes an important element. This type of analyses will frequently be based on longitudinal data, i.e. data over time for a specific sample of, e.g. persons or establishments. In some areas, these analyses have already provided new knowledge of how the labour market operates.

2. Over the last few years, enterprises - the demand side of the labour market - have increasingly become the focus of interest (see, e.g. Heckman & Singer 1985). In the early 70s, when unemployment became the prevalent problem of labour market policies, attention was particularly focused on the supply side of the labour market, i.e. persons. For the purpose of obtaining wider knowledge of the causes and consequences of unemployment the person side was subjected to examinations and analyses. The realization that enterprises are of crucial importance to employees with regard to, e.g. unemployment (Leonard 1987), hourly pay (Albæk et al. 1994), career (Esping-Andersen et al. 1994; DiPrete 1993; Kalleberg 1994) and job mobility (Carroll 1986; Leth-Sørensen 1993) is due to the greater interest in the demand side. This is also reflected in the ongoing work on constructing data sets covering both types of units (Baron & Bielby 1980; Ministry of Labour 1993; Kalleberg 1994).

1. Prepared by Søren Leth-Sørensen.

3. An example of a new area in which focus is on the dynamic aspect and on enterprises is the statistics of the so-called job-creation/job-destruction at the level of establishments. In discussing labour market problems in Europe it is claimed that the lack of flexibility is a distinctive feature of the European labour market. In this respect, enterprises also play an important part, as the job-creation and job-destruction is one way in which to assess the degree of flexibility (OECD 1994).

4. Developments with regard to the requirements of statistics and analyses of the labour market seem to indicate:

- that the longitudinal aspect has increasingly become the focus of interest
- that persons and enterprises are to a higher degree regarded as equally important

5. In the following sections, the possibilities of providing longitudinal data for persons and establishments (i.e. local units) are discussed. On the basis of Danish conditions a description of the registers of persons and business units, which are essential to the compilation of these statistics, is given, followed by a discussion of the advantages and disadvantages of using these data. Finally, a description is given of the new possibilities of longitudinal studies resulting from using this type of panel data.

II. Data types

6. The simplest form of data is obtained by compiling a specific phenomenon at a given point in time. This type of data is called cross-sectional data (Blossfeld & Rohwer 1995). The purpose of this data type could be, for example, to compile the number of employed and unemployed persons at a given point in time. Compiling statistics of this type at different times makes it possible to describe changes over time. These aggregated items of information will constitute a **time series**, providing data on net changes over time at the macro level in, for example, the number of employed persons. In the following sections, data of this type will not be further described.

7. By contrast, **panel data** relate to information from different points in time for the same units at the micro level, for example persons or establishments. The simplest form of panel data relate to two points in time and result in analyses which are often called gross flows. An example is the number of persons changing from employment to unemployment and vice versa. Gross flows of shifts in the labour market have proved that comparatively modest net changes frequently conceal very considerable gross changes. Panel data will normally contain information from different points in time fixed in advance. Survey-based panel studies of a sample of, for example, persons are characterized by the recurrent problem of an increasing nonresponse rate among the original sample.

8. Finally, there is another type of data, **event history data**, which contain detailed information on the time for specific types of events. This could, for example, be the date of commencement and cessation of a person's

unemployment periods. In Denmark this type of data provides information on unemployment of the persons on a weekly basis. One of the advantages of this form of data is the possibility of also creating cross-sectional and panel data from this information. Event history data will presumably become increasingly important, as this data type yields a range of analytical possibilities (Tuma & Hannan 1984; Blossfeld et al. 1989). Since access to these data types is still limited, they will only be sporadically referred to in the following sections.

9. In Denmark it has been possible to establish a population register containing statistical information relating to labour market conditions covering the whole Danish population. From the central business register all establishments with employees can be retrieved. For persons as well as establishments, comprehensive register information is thus available. Furthermore, it has been possible to follow persons and establishments year by year over time and thus create a form of panel data for persons and establishments. As this information provides total coverage, attrition of the sample, which is a typical problem in panel studies, is thus avoided. In the following sections, **longitudinal data** are to be understood as panel data providing total coverage where individual persons or establishments can be followed over time, based on register information on an annual basis. Below, data of this type and analyses undertaken in this respect will be further discussed.

III. The population's status in relation to the labour market analysed by register-based statistics

10. The total population's status in relation to the labour market was previously analysed by means of questionnaire-based population censuses. However, since 1980 the labour market status of all persons in the Danish population has been compiled by means of information exclusively based on administrative register-based data (Danmarks Statistik 1995). A prerequisite of this was the introduction of a central person number system in 1968. By means of this number the same persons can without ambiguity be retrieved in various registers. The information on a person's labour market status has been created by an extensive and elaborated processing of the various data stored on a number of administrative registers. The following sources are examples of data used in constructing this information:

- Information from the Danish tax authorities based on reports submitted by the employers: Registration number of employer and establishment, hourly pay, period of employment.
- Information on unemployment from the Central Register of Labour Market Statistics (CRAM): Degree of unemployment in each individual week.
- Information from the central business register: Business owners.

11. The person number is used as key in connection with this information on each individual person. In this way, information on the same person from different registers can be linked. Similarly, for each individual employer and establishment a registration number is available which can be used as key. Persons in employment at the time of compilation can therefore be linked to a specific employer and establishment.

III.A. Longitudinal statistics of persons

12. Using the person number as common key ensures that the same person can immediately be followed over time. Consequently, it has been relatively easy to compile gross flows of, for example, changes in the population's status in relation to the labour market from one year to the next. Moreover, analyses can be conducted for a large number of years. For example, in Denmark studies have been conducted on the proportion of persons, who at a given point in time can be said to be marginalised in relation to the labour market, and who after some years have a permanent job and vice versa (Ingerslev et al. 1992). Results seem to indicate that the gap between "insiders" and "outsiders" in the labour market has widened.

IV. Information on enterprises from the business units registers

13. The creation of business-related registers has contributed to improving data on the significance of enterprises. In many countries, registers of this type are now operated. The registers contain information on a larger or smaller share of enterprises in each country, possibly limited with regard to size, sector or other factors. Data intended for these registers will frequently be based on information from administrative procedures, e.g. payment of social contributions by the employers or information reported to the tax authorities on earnings of the employees.

14. The Danish Central Business Registers provides comprehensive information on enterprises (i.e. legal units) and establishments (i.e. local units) with employees. For enterprises without employees, information is available on enterprises which are subject to VAT. Enterprises registered for VAT consist of nearly all enterprises, since most sectors are included and the annual turnover may be very low¹. The register contains a registration number at the level of enterprises and establishments. Previously, there was one numbering system intended for work by the Danish tax authorities and another intended for payment of VAT by enterprises to the customs authorities. Furthermore, special numbering systems were used in some parts of the sector statistics. Incorporating this information in a cohesive system has involved many problems.

15. The Central Business Register contains information on, e.g.:

- . owner (registration number)
- . industry
- . type of ownership
- . address
- . number of employees

IV. Longitudinal statistics of establishments

16. There are however major problems involved in using information from the business-related registers for longitudinal statistics. This is partly due to the fact that it is complicated to decide whether an enterprise is still "the same" over a period of time and partly due to technical problems in using information from the central business register.

17. Linkage of information for establishments from two points in time. The idea of longitudinal statistics of establishments is to link the information from the Central Business Register at two points in time. Hereby one can decide which establishments still exist, the openings and closings of establishments. However, many problems are, in practice, involved in compiling this type of statistics.

18. **Selection of unit: Enterprise or establishment.** The first problem is to decide whether compiling changes in business units should be undertaken at enterprise or establishment level. The level of establishments is typically chosen. This is among other reasons due to the fact that it is the smallest unit for which information is available. In addition, it is relatively easy to classify establishments by location and industry. Persons changing establishment within an enterprise will frequently also lead to a change in industry, location and size, which is another reason for using establishments as basic unit. The disadvantage is that important economic information is normally compiled at enterprise level.

19. **What defines an establishment as an identical entity over time.** In order to be able to compile changes at the level of establishments it is necessary to determine what defines an establishment as an identical entity over time and when a new establishment exists or has been closed. An establishment can be described by different characteristics. The problem is to determine the changes in these characteristics if an establishment is still to be considered "the same". The decision must be based on the purpose of the concrete statistics, cf. Baldwin et al. (1992). Depending on the object of the study, emphasis can be put on, e.g. the legal aspect, the physical location or the economic activity. Consequently, there are several possible options of how to define an establishment as an identical entity over time.

20. **Problems of registration numbers of establishments.** Using information on owner and thus registration numbers of establishments seems obvious in determining identical establishments over time. However, in Denmark these registration numbers can change for purely administrative reasons, and consequently cannot be regarded as actual changes². If only the continuity of existing registration numbers at two different points in time are used, it will result in a too great number of newly opened and closed enterprises. In addition to information on owner, we can include information on, e.g. industry and location in the definition of identical establishments.

21. **Continuity of employees at two points in time.** In countries where employees can also be followed over time and linked to the relevant establishments, there is also the possibility of including the **workforce** in defining the identity of establishments over time. In this case, the continuity of employees from one year to the next is used as one indicator of identical establishments.

Figure 1. Continuity of employees at an establishment in year 1 and year 2.

22. The argument is based on the fact that, for establishments continuing to exist, there will normally be a continuity of employees from one year to the next. If two establishments - with different registration numbers - show a similar pattern, we can decide to use this as an indicator that the two units might be identical³.

23. Identical establishments over time can thus be defined in different ways, by using information on: owner (registration number), industry, location (address) and workforce (continuity of employees at two consecutive points in time).

V. Linkage of information on persons and establishments

24. Using information from the population and business units registers within labour market statistics, employees can as mentioned be linked to a specific establishment. This offers the possibility of undertaking the so-called contextual analyses where information from two levels is included, e.g. information on the establishment and information on the persons employed (DiPrete & Forristal 1994, Kalleberg 1994). For establishments this information may relate to the year of birth, industry and size, and for persons it could be information on sex, age, occupation and level of education. For persons with the same background data it is thus possible to analyse whether there are any pay differentials between new and old establishments, between establishments in different industries and between small and large establishments (Albæk et al. 1994; le Grand et al. 1994).

Figure 2. Linkage of information on persons and establishments.

25. For establishments this implies that information on the employees can be used for classifying the establishment. This could be, for example, information on the proportion of women or persons with a vocational education.

26. In addition to the possibility of combining information on persons and establishments, longitudinal data can also be compiled in Denmark, which include persons as well as establishments. This has become possible through the creation of the so-called IDA database.

VI. An example of longitudinal data on persons and establishments: The IDA database

27. The IDA database (the Integrated Database for Labour Market Research) is an example of a data collection, which contains information on labour market conditions for persons as well as establishments (Danmarks Statistik 1991). The database was set up for the purpose of satisfying the needs of labour market researchers. The database provides total coverage, as it contains information on **all persons in the population** and **all establishments** with paid employees. In the IDA database the employees can be linked to a specific establishment. In this way, the database can be used for analyses on the basis of the demand side (establishments) and the supply side (persons). The information on persons and establishment mainly relates to a short reference period of each year, viz. the last week in November. Furthermore, the database is **longitudinal**, as persons as well as establishments can be followed over time. It now contains annual information covering the period 1980-1992.

Units at several levels

Figure 3. Structure of the IDA database

28. The IDA database contains units at different levels:

29. **Persons.** Information in the IDA database covers all persons in the population. This makes it possible to study and analyse very diverse problems. For example, persons can be followed before they are employed in their first job or when they have retired from the labour market.

30. **Jobs.** Information on jobs is contained in the database. In addition, persons employed are linked to a specific establishment. It is thus possible to combine information on persons and establishments.

31. **Establishments.** Information is available at the level of establishments. Identical establishments over time are determined from a workforce perspective, by including information on the registration number of the establishment, industry, address and continuity of employees. The database contains all private and public establishments with paid employees.

Variable types

32. Main groups of information on the 3 basic units to be found in the database are given below:

Main groups of information in the IDA database

Persons	Jobs	Establishments
Sex, age, etc. Family, marital status Education Employment and work experience Unemployment Income	Job, full-/part-time Hourly pay Tenure Job mobility	Year of birth Industry, location, etc. Employees, wage level Changes in identity over time
Key: Person number	Key: Person number - serial number of the establishment	Key: Serial number of the establishment

33. Since 1990, when work on setting up the database was concluded, data have been used for a wide number of projects. Particularly labour market researchers and the central government have widely used data from the IDA database. In this perspective, the idea of the setting up this type of database has been a success.

VII. Advantages and limitations of using register information for labour market statistics

34. In Denmark the longitudinal data providing total coverage of labour market conditions will be register information based on administrative data. It is therefore important to realize which advantages and limitations this involves.

VII.A. Advantages

35. **Total coverage.** Statistics based on registers providing total coverage of persons and establishments yield the obvious advantage that it is not necessary to raise figures, with the subsequent sampling errors.

36. **Nonresponse.** In questionnaire-based panel studies there are problems of nonresponse, which over some years typically becomes uncomfortably high. Using register data covering all persons in the population and all establishments yield the obvious advantage that there are never any problems of nonresponse.

37. **Loss of memory effects are minimized.** One of the advantages inherent in using register information as data material for studies covering a large number of years is that the effects of forgetfulness and loss of memory can be minimized. In cases of relatively factual information relating to a point in time going back, say 12 years, it will be difficult for a persons to remember this.

38. **Low price.** Another advantage of using register data based on administrative data is that the cost of compiling these statistics is comparatively low. Compared to the expenses involved in conducting population censuses, the costs of constructing these registers are much lower.

VII.B. Limitations

39. **Factual information.** As the registers on persons and business units are constructed on the basis of administrative data, they only contain what could be called factual information. There is thus no information on, for example, a person's motives or an enterprise's objectives. This is presumably the most important disadvantage of using data based on administrative sources.

40. **Administrative data of high quality are required.** A prerequisite of using administrative data as a basis for statistics is that the data quality must be reasonably high. It is generally known that the quality depends on whether the administrative data are of direct significance for the persons or enterprises. For example, information on personal income tax is considered to be of high quality. Discontinuities in the statistical series as a result of changes in administrative rules can also cause problems.

VIII. Possibilities of conducting new analyses based on longitudinal data

41. **Check on the time factor.** The possibilities of compiling longitudinal data offer the obvious advantage that there is a far greater check on the time factor, compared to using data from a traditional cross-sectional study.

Analyses of the effects of labour-market policy measures aimed at reducing unemployment rates, for example, can be conducted.

42. **Not confined to a specific research design.** It can generally be said that the use of comprehensive longitudinal data provides a wide range of different types of research designs. This can apply to **retrospective** research designs, where information from earlier periods is used for examining the causes of a specific problem. Another possibility is **prospective** research designs, where, for example, a group of persons is followed from a specific point in time and onwards. As another example, persons who, in 1980, were employed for the first time. Thus, this gives many possibilities of selecting **specific populations**. Tracking down selected samples of this type will in practice be difficult to carry out in other ways, and it will also be complicated to provide longitudinal data for a longer period of time.

43. **Interaction between participation in the labour market and other conditions (Life course analysis).** The availability of longitudinal data has also implied that it is now possible to analyse the interaction between participation in the labour market and other events in a person's life history. An obvious example is the relationship between women's labour supply and personal events such as marriage or births.

44. **Analysis based on cohorts.** When information in the registers gradually cover a large number of years analyses based on cohorts (year of birth) can be undertaken (see, e.g. Leth-Sørensen & Rohwer 1993). Taking specific cohorts as the starting point offers the possibility of detailed descriptions, allowing for the circumstance that each generation has lived through various life stages at different periods of time. For example, women's status in the labour market can with great advantage be based on cohorts, because women's activity rates in Denmark have increased sharply since the 1960s. There are thus great disparities between the generations in relation to the labour market (Blossfeld 1987).

45. **Need for new information on the duration of states.** It was previously considered adequate to compile the population's labour market status at a given point in time, but there is now great interest in obtaining information on the length of the period in which a person was in a given state. An example is the statistics on unemployment. As unemployment has become a permanent phenomenon it is now also an essential requirement to analyse how long an unemployed person has been out of work. At a given unemployment level there are naturally great disparities in the measures which could be launched, dependent on whether the unemployed constitute a specific group or whether there is a high turnover of persons in this group.

46. It has also been maintained that while the USA has experienced a heavy growth in the number of jobs, Europe has experienced a form of jobless growth. The Europeans have claimed that the new jobs in the USA are bad and low paid jobs (so-called "McJobs") in the service sector (Esping-Andersen 1990). An important premise of this criticism is that the persons who get these jobs are practically stuck in these jobs. In order to be able to establish whether or not this is correct, longitudinal data are needed.

47. **The use of new statistical methods.** Concurrently with the appearance of longitudinal data, statistical methods which make allowance for the special character of this data type have been developed. In this context, we are thinking of "event-history analyses" using the so-called "spells", in which a person is characterized by being in a specific state. These methods have proved to be highly suitable for analyses of conditions in the labour market (Tuma & Hannan 1984; Blossfeld et al. 1989; Esping-Andersen et al. 1994). Information on the length of the period in which a person has been in a specific state, for example unemployed, can be directly included. Studies thus seem to indicate that a longer unemployment period reduces the probability of getting a job again.

48. **Enterprise demography.** Statistics on enterprises and establishments can primarily analyse the appearance and disappearance of business units. It is also possible to distribute this information by ownership, industry and size. Similarly, as in demography, a survival graph can also be produced, by types of business units. Based on information from the IDA database it appears that the chance of surviving has a positive relationship with the size of an enterprise, namely, an enterprise consisting of only one establishment (Vejrup-Hansen 1993).

49. A special issue is the development of enterprises founded by an entrepreneur, i.e. a person who for the first time sets up his own enterprise. In Denmark these enterprises can be followed over time. For example, just over 50 per cent of the units set up by entrepreneurs in 1990 have survived until 1993 (Bøegh Nielsen et al. 1995). By linking information on enterprises with information on entrepreneurs it can be examined whether entrepreneurs have any distinctive characteristics, and whether the successful entrepreneurs differ from others. For example, it can be mentioned that prior knowledge of the sector in which the enterprise is engaged plays an important part in the chance of surviving.

50. Information on changes in appearances and disappearances of business units can also be of interest in connection with analyses of job mobility (Haveman & Cohen 1994). This is due to the fact that job-creation and job destruction naturally have an effect on the extent and direction of the persons' mobility among different establishments.

IX. An example of new statistics based on longitudinal data: Job creation and job destruction

51. The so-called job creation/job destruction is an example of a new type of statistics which can be attributed to the availability of longitudinal data for establishments (OECD 1987).

52. Determination of identical establishments over time offers the possibility of comparing the number of employees in each establishment at two points in time, e.g. from one year to the next. Frequently, the number of employees are compiled, whereas owners, etc. are not counted. The surviving establishments can be distributed over the following three groups: no change, fall or increase in number of employees.

53. First, net changes in the number of jobs in each establishment are compiled from one year to the next. Then the total development in each of the above-mentioned categories of units is compiled, by aggregating information from each establishment. In this way, the statistics of gross job gains and gross job losses are compiled by adding information on jobs in establishment openings and closings. The difference between gross gains and gross losses is equal to the net development in the number of jobs, whereas the sum of gross gains and gross losses indicates the total job turnover, cf. figure 4.

Figure 4. Components in the statistics of jobs⁴

54. **Main issues in job creation.** The European labour market is accused of being inflexible, compared to the American labour market. In this respect, enterprises also play an important part as the appearance and disappearance of jobs are one of the ways of assessing the degree of flexibility. Information shows that the extent of job creation/job destruction is surprisingly high. In many countries, the level of job gains and job losses is just over 10 per cent (OECD 1994).

55. Another question which has attracted attention in connection with statistics of job-creation is the importance of small enterprises (Picot & Dupuy 1995). It is obvious that the majority of all new enterprises are small. It is difficult to determine their importance in the long term. On the one hand, there is a relatively high job-creation by small enterprises, but at the same time the small newly established enterprises have a very high risk of closing down. Furthermore, the relationship between job-creation and structural and short-term conditions have gradually become a classic area of interest (Albæk & Sørensen 1995; Davis & Haltiwanger 1990; Davis et al. 1994; Vejrup-Hansen 1995).

56. In countries where not only establishments but also persons employed can be followed over time it is possible to compile the turnover of specific groups of employees from one year to the next (worker flows). This means that the proportion among one selected group of persons, who appear and disappear from one year to the next, can be compiled (Albæk & Sørensen 1995; Davis &

Haltiwanger et al. 1994; Hamermesh et al. 1994). Results based on the IDA database show that job creation as well as job destruction is higher among wage earners than salaried employees (Vejrup-Hansen 1995).

X. Conclusion

57. Setting up registers on the population's labour market status and on business units has resulted in access to new longitudinal data. In Denmark, this information is available on an annual basis, dating back to 1980. This information can thus be characterized as panel data, but total coverage is also provided, which results in new possibilities of undertaking analyses. Furthermore, new data sets can be constructed since information on persons/establishments can be linked. The access to data for both persons and establishments implies that greater emphasis is attached not only to the supply side but also to the demand side in the labour market.

58. Longitudinal analyses of the labour market have steadily become important and in many areas they have provided new information on the labour market. An important result is that relatively small net changes in the employment level might conceal major gross changes.

59. It must be expected that there will still be efforts to integrate and harmonize statistics relating to the labour market, and to include the time-related perspective to a higher degree. This work should be viewed in relation to attempts at constructing a so-called **Labour accounting system** (Hoffmann 1991). This is a general system for information on the labour market which can provide information with regard to status, flows, etc. where the information is consistent or the lack of consistency is identified.

60. An important area to be analysed is the determination of concepts and operationalizations in longitudinal statistics. In this respect, we will only point at the problems involved in defining identical establishments over time. Furthermore, consensus as to compiling statistics based on longitudinal data has not yet been reached. Finally, in comparing data among different countries there is a need for longitudinal statistics of the most important conditions in the labour market.

References

- Albæk, K., Arai, M., Asplund, R., Barth, E. & Madsen, E.S. 1994. "Employer Size-Wage Effects in the Nordic Countries". Preliminary Version.
- Albæk, Karsten & Sørensen, Bent E. 1995. "Worker Flows and Job Flows in Danish Manufacturing, 1980-91". Discussions Papers 95-12, Institute of Economics, University of Copenhagen.
- Baldwin, J., Dupuy, R. & Penner, W. 1992. "Development of Longitudinal Panel data from Business Registers: Canadian Experience". Statistical Journal of the United Nations, ECE 9, pp. 289-303.
- Baron, James N. & Bielby, William T. 1980. "Bringing the Firms Back In: Stratification, Segmentation, and the Organization of Work". American Sociological Review 45: 737-65.
- Baron, James N. & Bielby, William T. 1984. "The Organization of Work in a Segmented Economy". American Sociological Review 49: 454-73.
- Blossfeld, H.P. 1987. "Labor-Market Entry and Sexual Segregation of Careers in the Federal Republic of Germany". American Journal of Sociology, Vol. 93, No. 1: 89-118.
- Blossfeld, H.P., Hamerle, A. & Mayer, K.U. 1989. Event History Analysis. New Jersey: Lawrence Erlbaum Associates, Inc.
- Blossfeld, H.P., Rohwer, G. 1995. Techniques of Event History Modeling. New Jersey: Lawrence Erlbaum Associates, Inc.
- Bøegh Nielsen, P., Björnsson, K. & Leth-Sørensen, S. 1995. "Economic and Social Performance of New Enterprises and Entrepreneurs in the Service Sector". Paper prepared for the meeting in Voorburg Group on Service Statistics.
- Carroll, G.R. & Mayer, K.U. 1986. "Job-Shift Patterns in the Federal Republic of Germany: The Effects of Class, Industrial Sector, and Organizational Size". American Sociological Review 51: 323-41
- Danmarks Statistik 1991. IDA - en integreret database for arbejdsmarkedsforskning. Hovedrapport.
- Danmarks Statistik 1995. "Registerbaseret arbejdsstyrkestatistik, 1. januar 1994". Arbejdsmarked 1995:13.
- Danmarks Statistik 1994. Personstatistik i Danmark. Et registerbaseret statistiksystem. Kbhvn: Danmarks Statistiks trykkeri.
- Danmarks Statistik 1995. Statistics on Persons in Denmark. A register-based statistical system. Eurostat.

- Davis, S.J. & Haltiwanger, J. 1990. "Gross Job Creation and Destruction: Microeconomic Evidence and Macroeconomic Implications". NBER Macroeconomics Annual, 5:123-186.
- Davis, S.J. & Haltiwanger, J. 1992. "Gross Job Creation, Gross Job Destruction, and Labor Reallocation". Quarterly Journal of Economics 1992, 107.
- Davis, S.J., Haltiwanger, J. & Schuh, S. 1994. "Job Flows, Worker Flows, and Unemployment Over the Business Cycle". Paper November 1994. U.S. Department of Commerce. Bureau of the Census. Center of Economic Studies.
- DiPrete, Thomas A. 1993. "Industrial Restructuring, Organizational Labor Market, and the Mobility Response of American Workers in the 1980s". American Sociological Review 58: 74-96.
- DiPrete, T. A. & Forristal, J.D. 1994. "Multilevel Models: Methods and Substance". Annual Review of Sociology 20: 331-57.
- Esping-Andersen, G. 1990. The Three Worlds of Welfare Capitalism. Cambridge: Polity Press.
- Esping-Andersen, G., Leth-Sørensen, S. & Rohwer, G. 1994. "Institutions and Occupational Class Mobility: Scaling the Skill Barrier in the Danish Labour Market". European Sociological Review, vol. 10, No. 2, p. 119-134.
- le Grand, C., Szulkin, R. & Tåhlin, M. 1994. "Organizational Structures and Job Rewards in Sweden". Acta Sociologica vol. 37, no. 3 1994.
- Hamermesh, D.S, Hassink, W.H.J. & van Ours, J.C. 1994. "Job Turnover and Labor Turnover: A Taxonomy of Employment Dynamics". Vrije Universiteit, Amsterdam, Research Memorandum 1994-50
- Haveman, H.A. & Cohen, L.E. 1994. "The Ecological Dynamics of Careers: The Impact of Organizational Founding, Dissolution, and Merger on Job Mobility". American Journal of Sociology, Vol. 100, No. 1: 104-152.
- Heckman, J.J. & Singer, B. 1985. Longitudinal Analysis of Labor Market Data. Cambridge University Press.
- Hoffmann, Eivind 1991. "A Labour Accounting System: Reflections on Main Concepts and Principles". Report by the ILO Bureau of Statistics for Third Joint ECE/ILO Meeting on Labour Force Statistics.
- Ingerslev, O., Ploug, N. & Reib, J. 1992. Forløbsanalyser af de 25-59 årige i 1980'erne. København: Socialkommissionens sekretariat.
- Kalleberg, Arne L. 1994. "Studying Employers and Their Employees: Comparative Approaches". Acta Sociologica vol. 37, no. 3 1994.

Leonard, J.S. 1987. "In the Wrong Places at the Wrong Time: The Extent of Frictional and Structural Unemployment". In Lang, K. & Leonard, J.S. (Eds): Unemployment and the Structure of Labor Markets. New York: Basil Blackwell.

Leth-Sørensen, S. 1993. "Jobmobilitet belyst ved hjælp af IDA-databasen". Dansk Sociologi, nr. 2, pp. 62-80.

Leth-Sørensen, S. & Rohwer, G. 1993: "Aspects of the Female Life Cycle and Labor Market Participation in Denmark". In Blossfeld, H.-P. (In print): Between equalization and marginalization. Part-time working women in Europe and the United States of America. Oxford: Oxford University Press.

Ministry of Labour 1993. Arbejdsmarkedspolitisk Årbog 1993. Tema: Rundt om IDA - nye snitflader i arbejdsmarkedsforskningen.

OECD 1987. Employment Outlook. Paris

OECD 1994. Employment Outlook. Paris

Picot, G. & Dupuy, R. 1995. "Job Creation by Size Class: Recent Evidence for Canada. Draft". Maj 1995. Paper to OECD conference on "SMES: Employment, Innovation and Growth", Washington 1995.

Tegsjö, Björn 1995. "Företagens dynamik ur ett arbetsmarknads-perspektiv". Paper to Nordic Seminar on Labour Market Statistics in Finland, 1995.

Tuma, N. & Hannan, T. 1984. Social Dynamics. Models and Methods. London: Academic Press.

Vejrup-Hansen, P. 1993. "Virksomhedsdemografi: Overlevelse og vækst i nye virksomheder". Samfundsøkonomen 1993:2.

Vejrup-Hansen, P. 1995. Job Creation and Job Destruction among Occupational Groups: Differentials in Job Stability and Cyclical Sensitivity. København: Handelshøjskolen, Working paper.

¹ In 1991 the threshold for being VAT registered was a turnover of DKK 10,000.

² In the article entitled (in Danish only) **Tilgang af nye virksomheder 1993**, Genel erhvervsstatistik og handel 1995:13, Danmarks Statistik, a summary is given of gross increases of VAT-registered entities according to whether they constitute an actual new increase or not.

³ This method is used by Canada (Baldwin et al. 1992), Sweden (Tegsjö 1995) and Denmark (see, e.g. Danmarks Statistik 1991; Danmarks Statistik 1994).

⁴ Source: OECD 1994.