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No. 404

Rita Asplund

EDUCATION, EXPERIENCE AND EARNINGS IN FINLAND

**Data analysis and
complementary estimation results**

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ABSTRACT: The present paper analyses in detail the cross-sectional micro data underlying several empirical studies of human capital-related earnings effects for Finland reported in separate discussion papers. The data set in question is the labour force survey for 1987 conducted by the Central Statistical Office of Finland. In addition, the paper offers complementary as well as comparative empirical evidence on earnings determination in support of the definitions of variables actually used in the estimations and of the sorting procedures resulting in the final estimating data.

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TIIVISTELMÄ: Tässä raportissa tarkastellaan yksityiskohtaisesti Tilastokeskuksen vuoden 1987 työvoimatiedustelun vuosiaineistoa. Tätä henkilöaineistoa hyödynnetään laajassa tutkimusprojektissa, jonka päätavoitteena on selvittää inhimillisen pääoman vaikutusta palkkatasoon ja palkkaeroihin Suomessa. Empiirisiä tutkimustuloksia esitetään erillisissä tutkimusraporteissa. Esillä oleva raportti sisältää niinkään joitakin täydentäviä ja vertailevia tutkimustuloksia, jotka tukevat erillisissä tutkimusraporteissa käytettyjä muuttujien määrittelyjä kuten myös aineiston muokkaamisessa käytettyjä karsintamenetelmiä.

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1. INTRODUCTION

The present paper analyses in detail the data underlying several empirical studies of human capital-related earnings effects for Finland reported in separate discussion papers. In addition, it offers complementary as well as comparative empirical evidence on earnings determination in support of the definitions of variables actually used in the estimations and of the sorting procedures resulting in the final estimating data.

The empirical work relies on the simple relationship between earnings and human capital investment implied by human capital theory (Mincer, 1974).¹ More exactly, the regression results reported in the present paper are based on the standard human capital earnings function completed with various personal and job indicator variables. This extended earnings model is estimated using sample selection procedures to allow for the possibility of selectivity bias influencing the estimation results. The econometric specification of the earnings function and the estimation procedure used are described in Asplund (1992b).

The human capital earnings equations are throughout estimated using cross-sectional micro data from the labour force survey for 1987 conducted by the Central Statistical Office of Finland. The year 1987 is chosen because it is the first and, until recently, only year for which Finnish labour force survey data have been supplemented with income data from the tax rolls. The labour force survey data base is preferred to population census data because it comprises additional information of vital importance in human capital earnings analysis not available in Finnish census data.² However, a fundamental shortcoming of the survey data base is that it is not panel data; the survey sample varies from one year to another.

The paper is organized as follows. Section 2 defines the variables used in the estimations of human capital earnings specifications. Section 3 describes the procedures adopted for sorting out the survey data and compares various sorted sample groups mainly in terms of their distribution across crucial personal and job characteristics. Finally in Section 4, the actual estimating data set is investigated in more detail with respect to alternative definitions of crucial variables as well as the conspicuous parameter estimates obtained for certain variables.

2. DEFINITION OF VARIABLES

This section defines the variables used in the estimations of human capital earnings equations. Some of the variables are described somewhat more in detail in subsections 2.1 to 2.7. A summary of definitions concludes the section. In some cases, alternative definitions of variables have been implemented. These alternative definitions and the corresponding estimation results are reported and discussed in Section 4.

2.1. Earnings

The dependent variable is chosen to be before-tax hourly earnings (EARN) in order to allow for individual differences in months and weekly hours worked during the survey year. This approach also makes the earnings of full-time and part-time employees comparable.

The hourly earnings of individuals are calculated from the annual wage/salary income recorded in the tax rolls and the annual amount of hours worked, exclusive of earnings from and hours worked in spare-time occupations. The earnings data used comprise most types of compensation. Fringe benefits are not accounted for, unless otherwise indicated. The annual amount of working hours is estimated from information on the total number of months worked during the year and weekly normal working hours. In the case of part-time employees, account is also made for the weekly frequency of part-time work.

The annual amount of hours worked thus refers to normal working hours, while the earnings data include, *inter alia*, overtime and vacation pay. Accordingly the calculated average hourly earnings may overestimate the individuals' actual hourly earnings. (For slightly different definitions of the dependent variable, see Section 4.1.)

2.2. Schooling

Ideally, earnings differentials should be related to the actual schooling differences which generate them. The employed data set does not allow this, however; the available register data on formal schooling merely show the highest single education completed by each individual. There is a total of eight levels of education which are turned into years of full-time schooling

(SCHOOL) using the Finnish standard classification of education (CSO, 1985):

Basic education:

1. lower level of basic education (less than 9 years),
2. upper level of basic education (about 9 years),

Upper secondary education:

3. lower level of upper secondary education (about 10-11 years),
4. upper level of upper secondary education (about 12 years),

Higher education:

5. lowest level of higher education (about 13-14 years),
6. undergraduate level of higher education (about 15 years),
7. graduate level of higher education (about 16 years), and
8. postgraduate or equivalent education.

The use of this stereotype key gives rise to several problems, especially when the person has completed no formal schooling beyond basic education. First, the only information provided by the classification key is that a person at the lower level of basic education has acquired less than 9 years of formal schooling. The actual number of schooling years is not known but can be expected to vary considerably, not least across age groups. The question then is how many years of primary education these persons should be assigned.

Closely linked to this question is a second complication: due to an increasing length of compulsory schooling, persons from different age groups have of necessity received different amounts of basic education. Should persons with shorter compulsory education be regarded as less educated than persons with longer compulsory schooling? And how are such differences to be taken into account when people from different age groups are registered to have completed the same level of above-primary education?

These types of problem have been circumvented by setting basic education equal to 9 years for all individuals with no formal schooling beyond primary education. Likewise, each individual with a given level of above-primary education has been assigned the same "normal" number of schooling years irrespective of the length of the previous schooling and the actual number of years needed by the individual to acquire the degree.³ In the estimations, the schooling variable (S) is defined as total years of schooling minus 9.

The question has also been raised whether it is appropriate to let schooling enter the regression in a linear form as in the

standard human capital earnings function. This question is addressed by letting dummy variables represent the different levels of education listed above. More exactly, six schooling dummies are distinguished in the estimations. BASIC, which is used as the reference group, comprises all individuals with basic education only (educational levels 1 and 2). LOWER VOCATIONAL and UPPER VOCATIONAL stand for individuals with, respectively, completed lower-level (educational level 3) and completed upper-level (educational level 4) of upper secondary education. The former category comprises mainly persons with vocational and professional training of less than three years, while the latter is to most part made up of persons with vocational and professional training of three years or more. The four levels of higher education are represented by three dummy variables: SHORT NON-UNIV (educational level 5), UNDERGRADUATE (educational level 6), GRADUATE (educational levels 7 and 8).

2.3. Experience

The data comprise self-reported information on the person's total labour market experience (EXP) and his or her years with the current employer (SEN), i.e. seniority (tenure). The reported years of work experience have been checked against the person's age and his or her transformed years of formal schooling plus 7 (the age of school start in Finland). If the sum of experience years, formal schooling years and pre-school years exceeds the person's physical age, the total years of work experience are reduced to the same extent.

Any inconsistencies between reported total work experience and seniority are also eliminated, the datum being that people generally remember their years with the present employer better than their total work experience.

Previous work experience (PREEXP) is simply defined as total work experience minus seniority, i.e. $PREEXP = EXP - SEN$.

2.4. On-the-job training

The survey information on on-the-job training (OJT) received by the employee during the year refers to any professional or trade union training provided within the framework of a structured course that is partly or wholly sponsored by the employer. In other words, these self-reported data cover only employer-financed formal on-the-job training, excluding all other forms

of labour market training. But on the other hand, this is the by far most important mode of formal adult training in Finland (e.g. Asplund, 1991).

2.5. Unemployment

The survey data provide information on temporary unemployment and layoffs experienced by individuals classified as employees as well as on unemployment benefits received during the survey year. The information on the individuals' state of employment is self-reported, whereas the information on unemployment benefits is according to tax rolls.

More detailed analysis of the data reveals that there are obvious inconsistencies between the self-reported state of employment and the unemployment benefits recorded in the tax rolls. Three categories can be distinguished: (1) individuals who have self-reportedly been temporarily unemployed or laid off during the year and who have also received unemployment benefits subject to taxation; (2) individuals who have self-reportedly been temporarily unemployed or laid off during the year but who have not received unemployment benefits subject to taxation; and (3) individuals who have self-reportedly been in employment during the whole year but who have, according to the tax rolls, received unemployment benefits.⁴ In the estimations, the unemployment dummy variable (UNEMPL) takes a value of one in all three cases, and a value of zero otherwise.

2.6. Occupational status

The labour force survey comprises two-digit level information on the individuals' occupational status according to the standard Finnish classification of socio-economic groups of 1983 (CSO, 1983). In determining the occupational status of an individual, several different criteria of classification are used, of which the by far most decisive is the nature of the person's occupation and work. In part, also industry, the juridical form of the enterprise or workplace, and the size of the personnel are used as a basis of division.

Individuals in paid-employment are classified into three broad categories: upper-level salaried employees, lower-level salaried employees, and manual workers. Each of the two categories of salaried employees is further divided into four subgroups depending on, inter alia, the level of responsibility and

independency associated with the working tasks performed. The category of manual workers is also divided into four subgroups, but according to occupational group and industrial sector. Hence, a distinction is made between no less than 12 occupational status categories:

Upper-level employees with administrative, managerial, professional and related occupations:

- 31 Senior officials and upper management
- 32 Senior officials and employees in research and planning
- 33 Senior officials and employees in education and training
- 34 Other senior officials and employees

Lower-level employees with administrative and clerical occupations:

- 41 Supervisors
- 42 Clerical and sales workers, independent work
- 43 Clerical and sales workers, routine work
- 44 Other lower-level employees with administrative and clerical occupations

Manual workers:

- 51 Workers in agriculture, forestry and commercial fishing
- 52 Manufacturing workers
- 53 Other production workers
- 54 Distribution and service workers

2.7. Industrial sector

The survey data provide three-digit level information on the employees' distribution across industrial sectors according to The Standard Industrial Classification (SIC) 1979 (CSO, 1979). Since the SIC is an application for Finland of the 1968 edition of the ISIC, the main principles and definitions used in compiling the SIC follow the recommendations in the ISIC.

The most detailed level of the SIC is represented by six-digit codes, in which the first four digits are identical with the code of the ISIC group to which the class in question belongs. Exceptions occur, though, in the case of some classes, in which the last digit or the last two or three digits in the ISIC are zeros. In these cases, national subdivisions of the ISIC classes have been introduced already at the two-, three- or four-digit level. The ISIC groups where national subdivisions have been introduced at the four-digit or higher level are the following: agricultural and livestock production (1110), forestry (1210), construction (5000), wholesale trade (6100), retail trade (6200), restaurants and other eating and drinking places (6310),

hotels and other lodging places (6320), insurance (8200), real estate (8310), public administration and defense (9100), sanitary and similar services (9200), education services (9310), and welfare institutions (9340).

In the estimations both one- and two-digit level classifications into industrial sectors are used.

2.8. Summary of definitions

Table 1 gives a summary of definitions of variables employed both in the more detailed examination of the estimation data undertaken in the next two sections and also in the empirical analyses of earnings determination in Finland reported in separate discussion papers. The male and female employees retained in the actual estimating data are described in terms of these variables in Table A of Appendix. The simple correlations between selected variables are displayed in Tables B-D of Appendix.

Table 1. Summary of definitions of variables employed in the empirical analysis of earnings differentials in Finland

Variable	Definition
EARN	Average hourly earnings (in FIM) calculated from the before-tax annual wage/salary income recorded in the tax rolls and an estimated amount of annual normal working hours.
ln EARN	Natural logarithm of EARN.
SCHOOL	Years of formal schooling evaluated from register information on the highest single education completed using the Finnish standard classification of education.
S	Years of formal schooling with basic education (9 years of schooling) set equal to zero.
BASIC	Dummy variable = 1 for persons with basic education only (educational level 1 or 2).
LOWER VOCATIONAL	Dummy variable = 1 for persons with completed lower-level of upper secondary education (educational level 3).
UPPER VOCATIONAL	Dummy variable = 1 for persons with completed upper-level of upper secondary education (educational level 4).
SHORT NON-UNIV	Dummy variable = 1 for persons with completed lowest level of higher education (educational level 5).
UNDERGRADUATE	Dummy variable = 1 for persons with completed undergraduate university education (educational level 6).

Table 1. (cont.)

GRADUATE	Dummy variable = 1 for persons with completed graduate university education (educational level 7 or 8).
EXP	Self-reported total years of labour market experience.
SEN	Seniority, i.e. self-reported years with the present employer.
PREEXP	Total years of experience with previous employers calculated as $PREEXP = EXP - SEN$.
WOM, MALE	Dummy variables for gender.
AGE	Physical age of the individual.
MARRIED	Dummy variable = 1 for married persons and singles living together.
CHILD ⁰⁻¹⁷	Dummy variable = 1 for children aged 0 to 17 living at home.
CHILD ⁰⁻⁶	Dummy variable = 1 for children aged 0 to 6 living at home.
CHILD ⁷⁻¹⁷	Dummy variable = 1 for children aged 7 to 17 living at home.
SOUTH	Dummy variable = 1 for residence in the southern parts of Finland (Uudenmaan lääni, Turun- ja Porin lääni, Ahvenanmaa, Hämeen lääni, and Kymen lääni).
CAPITAL	Dummy variable = 1 for residence within the capital region (the region of Helsinki).
TEMPEMPL	Dummy variable = 1 for persons who are self-reportedly in temporary employment.
PART-TIME	Dummy variable = 1 for persons who are self-reportedly in part-time work.
PIECE-RATE	Dummy variable = 1 for persons who are not being paid on a monthly, weekly or hourly basis.
NODAYWORK	Dummy variable = 1 for persons who are not in regular day-time work.
UNEMPL	Dummy variable = 1 for persons who have been temporarily unemployed or laid off during the year.
UNION	Dummy variable = 1 for unionized employees.
OJT	Dummy variable = 1 for persons who have self-reportedly received formal on-the-job training during the year.
OJTDAYS	Self-reported total number of days in formal on-the-job training during the year.
MOVE	Dummy variable = 1 for job mobility proxied by $MOVE = 1$ if $EXP > SEN$.
NWWH	Self-reported weekly normal working hours.
SWWH	Self-reported hours worked during the week of the questionnaire.
OTWH	Self-reported overtime hours worked during the week of the questionnaire.
PUBSTATE	Dummy variable = 1 for employment in the central government sector.
PUBLICLOCAL	Dummy variable = 1 for employment in the local government (municipality) sector.

Table 1. (cont.)

OCC31	Dummy variable = 1 for senior officials and upper management (category 31 in FCSEG).
OCC32	Dummy variable = 1 for senior officials and employees in research and planning (category 32 in FCSEG).
OCC33	Dummy variable = 1 for senior officials and employees in education and training (category 33 in FCSEG).
OCC34	Dummy variable = 1 for other senior officials and employees (category 34 in FCSEG).
OCC41	Dummy variable = 1 for supervisors (category 41 in FCSEG).
OCC42	Dummy variabel = 1 for clerical and sales workers, independent work (category 42 in FCSEG).
OCC43	Dummy variable = 1 for clerical and sales workers, routine work (category 43 in FCSEG).
OCC44	Dummy variable = 1 for other lower-level employees with administrative and clerical occupations (category 44 in FCSEG).
OCC51	Dummy variable = 1 for workers in agriculture, forestry and commercial fishing (category 51 in FCSEG).
OCC52	Dummy variable = 1 for manufacturing workers (category 52 in FCSEG).
OCC53	Dummy variable = 1 for other production workers (category 53 in FCSEG).
OCC54	Dummy variable = 1 for distribution and service workers (category 54 in FCSEG).
INDU11	Dummy variable = 1 for employment in agriculture (SIC 11).
INDU12	Dummy variable = 1 for employment in forestry (SIC 12).
INDU13	Dummy variable = 1 for employment in fishing (SIC 13).
INDU20	Dummy variable = 1 for employment in mining and quarrying (SIC 2).
INDU31	Dummy variable = 1 for employment in food manufacturing (SIC 31).
INDU32	Dummy variable = 1 for employment in textile and equiv. industries (SIC 32).
INDU33	Dummy variable = 1 for employment in manufacturing of wood products (SIC 33).
INDU34	Dummy variable = 1 for employment in manufacturing of paper products (SIC 34).
INDU35	Dummy variable = 1 for employment in manufacturing of chemicals (SIC 35).
INDU36	Dummy variable = 1 for employment in manufacturing of non-metallic products (SIC 36).
INDU37	Dummy variable = 1 for employment in basic metal industries (SIC 37).

Table 1. (cont.)

INDU38	Dummy variable = 1 for employment in manufacturing of metal products (SIC 38).
INDU39	Dummy variable = 1 for employment in other manufacturing (SIC 39).
INDU40	Dummy variable = 1 for employment in electricity, gas and water (SIC 4).
INDU50	Dummy variable = 1 for employment in construction (SIC 5).
INDU61	Dummy variable = 1 for employment in wholesale trade (SIC 61).
INDU62	Dummy variable = 1 for employment in retail trade (SIC 62).
INDU63	Dummy variable = 1 for employment in restaurants and hotels (SIC 63).
INDU71	Dummy variable = 1 for employment in transport and storage (SIC 71).
INDU72	Dummy variable = 1 for employment in communication (SIC 72).
INDU81	Dummy variable = 1 for employment in financing (SIC 81).
INDU82	Dummy variable = 1 for employment in insurance (SIC 82).
INDU83	Dummy variable = 1 for employment in real estate and business services (SIC 83).
INDU91	Dummy variable = 1 for employment in public administration, defence and public order (SIC 91).
INDU92	Dummy variable = 1 for employment in sanitary services (SIC 92).
INDU93	Dummy variable = 1 for employment in social services (SIC 93).
INDU94	Dummy variable = 1 for employment in recreational and cultural services (SIC 94).
INDU95	Dummy variable = 1 for employment in personal and household services (SIC 95).

Notes. FCSEG = Finnish Classification of Socio-economic Groups.
SIC = National Standard Industrial Classification.

3. SORTING OUT THE SURVEY DATA

The labour force survey contains 9000 individuals, representing the entire population aged 15 to 64 years as stratified according to sex, age, and region. For data quality-related reasons such as drop-outs, the effective survey data base, from which the actual estimation data are formed, comprises a total of 7748 persons. These individuals are classified into nine categories according to their main state of activity during the week of the questionnaire. When disregarding persons in self-employment (some 14 per cent of the employed and close to 5½ per cent of the unemployed), the remaining 6964 sample individuals are distributed across the nine activity categories as shown in Table 2.

Table 2. Distribution of sample individuals according to their main activity during the week of the questionnaire

Category of activity	Effective survey data		Actual estimating data	
	No. of obs.	Rel. share	No. of obs.	Rel. share
1. Employed*	4 694	67.4	3 895	64.7
2. Students	824	11.8	680	11.3
3. Invalidity pensioners	569	8.2	568	9.4
4. Unemployed*	261	3.7	260	4.3
5. Persons in home-work	258	3.7	257	4.3
6. Old-age pensioners	161	2.3	161	2.7
7. Unemployment pensioners	115	1.6	115	1.9
8. Conscripts	56	0.8	56	0.9
9. Others	26	0.4	26	0.4
1-9 Total	6 964	100.0	6 018	100.0

* Exclusive of self-employed persons.

As can be seen from the table, a large majority of the sample individuals is recorded to be in employment. The second largest category is made up of students, followed by invalidity pensioners. The share in the whole sample of each of the other categories is relatively minor.

In this section, the sorting procedure resulting in the actual estimating data set, which is also displayed in Table 2, is outlined in more detail. In addition, each category of sample individuals is described in terms of the variables used in the empirical analysis of earnings determination. Section 3.1. starts with the non-participant groups (categories 2-9) which are used in order to correct for the potential presence of sample selectivity bias in the estimations of earnings equations. Thereafter focus is turned to the main issue of the data analysis, i.e. the category of employed.

3.1. Non-participants

Correction for sample selection bias in the estimations is done with reference to all non-participant categories in the survey. This approach is chosen because of the small share in the sample of each non-participant category.

The slight difference in the absolute size of the various non-participant categories between the effective survey data and the actual estimating data (Table 2) is almost entirely due to restricting the investigated sample to individuals at the age 16 to 64. As is to be expected, the exclusion of 15-year old persons reduces mainly the number of students.

In the estimations, the probability of being in employment, i.e. of being classified as an employee (category 1), is explained by means of six personal indicator variables: age, gender, marital status, family size, educational degree, and location of residence. More precisely, apart from the physical age of the individual (AGE), the selectivity equation incorporates dummy variables for being a male (MALE), marriage (MARRIED), dependent children (CHILD⁰⁻¹⁷), no formal schooling beyond basic education (BASIC), and residence in the southern, economically more developed regions of Finland (SOUTH). In Table 3, each of the eight non-participant categories is described in terms of these characteristics. For comparison, the corresponding statistics for the category of employed as well as for the whole estimating data set are also displayed in the table.

Table 3. Sample means of explanatory variables included in the selectivity equation; non-participant categories compared with the category of employed and the whole estimation data set

Category of activity	AGE	Selectivity equation variables MALE	MARRIED	CHILD ⁰⁻¹⁷	BASIC	SOUTH	No. of obs.
1. Employed	37.17	0.4899	0.7366	0.4876	0.3605	0.6644	3 895
2. Students	20.13	0.4279	0.1500	0.0603	0.5882	0.5676	680
3. Invalidity pensioners	54.22	0.5229	0.6197	0.0880	0.7975	0.4912	568
4. Unemployed	35.20	0.5346	0.5423	0.2731	0.5385	0.4385	260
5. Persons in home-work	41.83	0.0156	0.8949	0.6381	0.4903	0.5486	257
6. Old-age pensioners	60.72	0.4348	0.7702	0.0435	0.6708	0.5838	161
7. Unemployment pensioners	59.87	0.4174	0.7217	0.0609	0.7826	0.5130	115
8. Conscripts	20.02	1.0000	0.1250	0.0536	0.3214	0.5357	56
9. Others	36.96	0.4615	0.3077	0.1154	0.6154	0.5769	26
1-9. Total	37.87	0.4694	0.6507	0.3730	0.4578	0.6158	6 018
- Males	37.25	-	0.6368	0.3487	0.4506	0.6046	2 825
- Females	38.42	-	0.6630	0.3946	0.4641	0.6257	3 193

Note. The variables are defined in Section 2.

3.2. The category of employed

The category of employed comprises only those sample individuals who had self-reportedly been in paid-employment during the week of the questionnaire, i.e. who had worked one or several days during the survey week or had been only temporarily away from work. As illustrated in Table 2 above, there is a total of 4694 employees in the effective survey data, of which 3895 are retained in the actual estimating data. The sorting procedure resulting in this reduction in the data base is outlined below.

When the effective survey data are restricted to employed wage and salary earners at the age 16 to 64, the data set shrinks only slightly (to some 4680 persons). As is to be expected, the number of employed 15-year old persons is negligible. Missing data on critical variables further reduce the estimation data base to a total of 4040 observations. However, only a small number of observations is rejected because of incomplete information on explanatory variables used in the estimations of earnings equations. Instead, a major part of the rejected observations had to be skipped because of inappropriate or missing data on variables needed for the calculation of the dependent variable, i.e. average before-tax hourly earnings.

More exactly, all observations are rejected for which there is incomplete information either on total months worked during the year or on weekly normal working hours, or on both. Part-time employees with insufficient information on the weekly frequency of their work are also disregarded. Individuals who had worked both full-time and part-time during the survey year are of necessity excluded, too. The reason is that the labour force survey only provides information on weekly normal working hours in the current job. It is also not explicitly stated whether these working hours refer to the reported months worked in full-time or part-time employment. Although the amount of weekly working hours allows a distinction *ex post* in this respect, we still lack information on weekly normal working hours for the rest of the months worked during the year.

However, of the almost 640 rejected observations, the above sorting procedures explain only about one-half. A conspicuous number of observations (306 in all) had to be skipped because, according to the tax rolls, these self-reportedly employed persons had had no earnings from principal occupation subject to taxation during the year concerned. For a large majority, no other incomes subject to taxation are neither recorded in the tax rolls. Detailed analysis of self-reported personal and job

characteristics of these zero earners offers no unambiguous explanation to this rather unsatisfactory outcome. On the contrary, it reveals quite a few circumstances which are clearly at variance with the zero earnings recorded in the tax rolls.

Thus only a minor number of the 306 zero earners had been unemployed/laid off or had been studying during at least part of the survey year. Less than 5 per cent of them had been in part-time employment, mostly during the whole year. Conversely, some 95 per cent of the zero earners reported that they had been in full-time employment. Of these over 90 per cent had worked full-time during the entire year. Moreover, some 84 per cent of the full-time working individuals with zero earnings reported their weekly normal working hours to fall within the range 35 to 40 hours. About 6½ per cent of them reported an even longer normal working time per week. Equally confusing is the fact that some 88 per cent of the 306 zero earners have self-reportedly a permanent employmentship, which has generally lasted for several years; only 15 per cent had been with the present employer for less than a year. Furthermore, about 40 per cent of them had received employer-sponsored formal on-the-job training, and some 73 per cent were recorded to be unionized.

In view of these extraordinary characteristics of the 306 employees with recorded zero earnings it is most comfortable to note that, on the whole, they seem to be randomly distributed (cf. column 2 of Table 4). Hence, their exclusion from the sample of employees should not distort the estimation results to any significant degree.

Because of data limitations and shortcomings, the specification of the earnings variable, in particular, represents a rather critical step of the empirical analysis. As noted earlier, the dependent variable is chosen to be before-tax hourly earnings in order to account for interpersonal differences in months and weekly hours worked and to make the earnings of full-time and part-time employees comparable. Specifically, the average hourly earnings of individuals are calculated by dividing the annual wage/salary income recorded in the tax rolls with an annual amount of working hours estimated from information on the total number of months worked during the year and weekly normal working hours.

Table 4. Sample means of personal and job characteristics for various sorted groups of employed individuals

Variable*	Various sorted groups of employed individuals**				
	(1)	(2)	(3)	(4)	(5)
EARN	40.57	0.00	43.65	12.24	44.82
SCHOOL	11.00	11.33	10.97	10.21	11.00
BASIC (1,0)	0.366	0.337	0.368	0.566	0.360
LOWER VOCA- TIONAL (1,0)	0.302	0.242	0.306	0.248	0.308
UPPER VOCA- TIONAL (1,0)	0.200	0.222	0.198	0.138	0.200
SHORT NON- UNIV (1,0)	0.059	0.111	0.055	0.021	0.056
UNDER- GRADUATE (1,0)	0.024	0.016	0.025	0.007	0.026
GRADUATE (1,0)	0.050	0.072	0.048	0.021	0.049
EXP	16.93	21.68	16.57	10.79	16.78
SEN	8.93	11.33	8.75	3.94	8.92
AGE	37.35	42.62	36.95	30.96	37.17
WOM (1,0)	0.509	0.428	0.516	0.662	0.510
MARRIED (1,0)	0.742	0.869	0.732	0.614	0.737
CHILD ⁰⁻¹⁷	0.488	0.503	0.487	0.476	0.488
CHILD ⁰⁻⁶	0.236	0.212	0.238	0.359	0.233
CHILD ⁷⁻¹⁷	0.351	0.395	0.347	0.276	0.350
SOUTH (1,0)	0.657	0.634	0.659	0.510	0.664
CAPITAL (1,0)	0.190	0.180	0.191	0.090	0.195
PART-TIME (1,0)	0.038	0.049	0.038	0.055	0.037
TEMPEMPL (1,0)	0.100	0.075	0.102	0.234	0.097
PIECE-RATE (1,0)	0.090	0.069	0.092	0.131	0.090
NODAYWORK (1,0)	0.240	0.245	0.239	0.221	0.240
UNEMPL (1,0)	0.102	0.026	0.106	0.207	0.103
UNION (1,0)	0.750	0.729	0.751	0.428	0.763
OJT (1,0)	0.360	0.402	0.356	0.069	0.367
NWWH	38.23	37.90	38.26	41.39	38.14
SWWH	38.92	38.99	38.90	40.47	38.85
OWWH***	7.70	8.05	7.67	6.60	7.69
PUBSTATE (1,0)	0.119	0.147	0.117	0.048	0.119
PUBLOCAL (1,0)	0.237	0.255	0.236	0.297	0.233
OCC31 (1,0)	0.038	0.062	0.036	0.007	0.037
OCC32 (1,0)	0.033	0.029	0.033	0.014	0.034
OCC33 (1,0)	0.044	0.075	0.042	-	0.043
OCC34 (1,0)	0.055	0.082	0.053	0.034	0.054
OCC41 (1,0)	0.074	0.114	0.071	0.007	0.074
OCC42 (1,0)	0.129	0.088	0.132	0.090	0.134
OCC43 (1,0)	0.068	0.049	0.070	0.041	0.071
OCC44 (1,0)	0.116	0.108	0.116	0.269	0.110
OCC51 (1,0)	0.020	0.013	0.021	0.138	0.017
OCC52 (1,0)	0.207	0.157	0.210	0.166	0.212
OCC53 (1,0)	0.074	0.056	0.076	0.069	0.076
OCC54 (1,0)	0.142	0.167	0.140	0.166	0.139
INDU1 (1,0)	0.025	0.010	0.026	0.131	0.022
INDU2 (1,0)	0.001	-	0.002	-	0.002
INDU3 (1,0)	0.248	0.209	0.251	0.131	0.255
INDU4 (1,0)	0.013	0.020	0.013	-	0.013
INDU5 (1,0)	0.078	0.085	0.078	0.069	0.078

Table 4. (cont.)

Variable*	Various sorted groups of employed individuals**				
	(1)	(2)	(3)	(4)	(5)
INDU6 (1,0)	0.136	0.124	0.136	0.097	0.138
INDU7 (1,0)	0.082	0.101	0.080	0.062	0.081
INDU8 (1,0)	0.085	0.095	0.085	0.055	0.086
INDU9 (1,0)	0.332	0.356	0.330	0.455	0.326
No. of obs.	4 346	306	4 040	145	3 895

* The variables are defined in Section 2.

** (1) Retained sample of employees after rejection of 15-year old employees and observations with incomplete or missing data on critical variables.

(2) Employees with no earnings from principal occupation recorded in the tax rolls.

(3) Employees with positive earnings.

(4) Employees with below-minimum (< FIM 18) hourly earnings.

(5) Employees with above-minimum (\geq FIM 18) hourly earnings.

*** The total number of employees in respective category, who had self-reportedly worked overtime during the week of the questionnaire, amounts to: (1) 517, (2) 37, (3) 480, (4) 10, and (5) 470.

This way of calculating the annual amount of working hours and, moreover, from self-reported data results without doubt also in clearly incorrect measures of annual hours worked and thus in unacceptable levels of average hourly earnings. There are at least three potential sources of measurement error. First, the sample individuals may simply have given incorrect information. For instance, it is questionable whether a person works regularly 98 hours a week. Apart from this exceptional survey individual, 14 other persons (some 0.4 per cent of the 4040 retained sample individuals with positive earnings) report their normal weekly working time to be over 60 hours.

Second, the survey only provides information on the total number of months in employment during the year. This is definitely an imprecise measure of the actual working time if the person has been in employment during only part of the year and then for periods which are longer or shorter than full months. Similar imprecisions may arise if the person has been temporarily unemployed or laid off during the year. In fact, comparison of reported total number of months worked and weeks of unemployment or layoffs reveals that such imprecisions occur to some degree in the survey data.

Third, the reported weekly normal working hours refer to the current job. Hence, if the individual has moved to that particular job during the survey year, the information on normal weekly hours worked may not apply to the previous job(s) held in that year. Already the fact that some 15 per cent of the 4040 retained sample individuals with positive earnings have reported their length of seniority to be less than one year indicates the presence of such measurement errors. But it is impossible to draw any conclusions about the factual importance of this source of measurement error on the basis of the survey data.

The calculated annual average hourly earnings of the 4040 retained sample employees range from FIM 1.06 to FIM 380.40, yielding a mean value of FIM 43.65. The lower end of the estimated hourly earnings scale points to obvious shortcomings in the information used in the calculation of individual average hourly earnings. This conclusion is further strengthened by the fact that, as pointed out earlier, the calculated hourly earnings are likely to overestimate actual hourly earnings because the wage/salary income data used comprise most types of compensation. A minimum hourly earnings principle is therefore implemented⁵, reducing the actual estimating data to a total of 3895 observations.

This 3.6 per cent loss in observations concerns mostly young persons and, consequently, persons with relatively little formal schooling and work experience (cf. column 4 of Table 4). Of the rejected observations some 15 per cent are younger than 20 years of age, and more than one-half are younger than 30 years of age. Close to 60 per cent have acquired no formal schooling beyond primary education. About one-third have reported less than five years of work experience; almost 60 per cent have been less than ten years in the labour market.

It is also of interest to analyse the observations with below-minimum hourly earnings in view of the aforementioned potential sources of measurement error. First, these individuals have typically reported fairly large amounts of weekly normal working hours. In addition, quite a few have been temporarily unemployed or laid off during the year, and about one-fourth are recorded to be in temporary employment. Finally, close to 37 per cent of the 145 individuals with below-minimum hourly earnings have self-reportedly been with their current employer for less than a year. Hence, there seems to be good reason for implementing a minimum hourly earnings principle. For convenience, though, Table 5 reports estimation results for the extended human capital earnings function based on all 4040 sample observations

with positive earnings, on one hand, and the 3895 observations with above-minimum hourly earnings retained in the actual estimating data, on the other.

However, when comparing the two sets of estimation results, it should be kept in mind that both are based on sorted data. Moreover, twice as many observations had to be rejected because the tax rolls included no information on earned income. It is not known to what extent the rejection of these zero earners has influenced the regression results obtained for the 4040 sample individuals with positive earnings. On the whole, though, it is comfortable to note that the means of the gradually sorted samples of employed persons and the fully sorted sample of employees (actual estimating data) are very similar (cf. columns 1, 3 and 5 of Table 4).

More important, a simple t-test indicates that the parameter estimates displayed in Table 5 do not differ significantly. The only exception is the schooling coefficient; the null hypothesis that the estimated coefficients of the schooling variable are identical is rejected at a 5 % risk level but is accepted at a 2.5 % risk level.

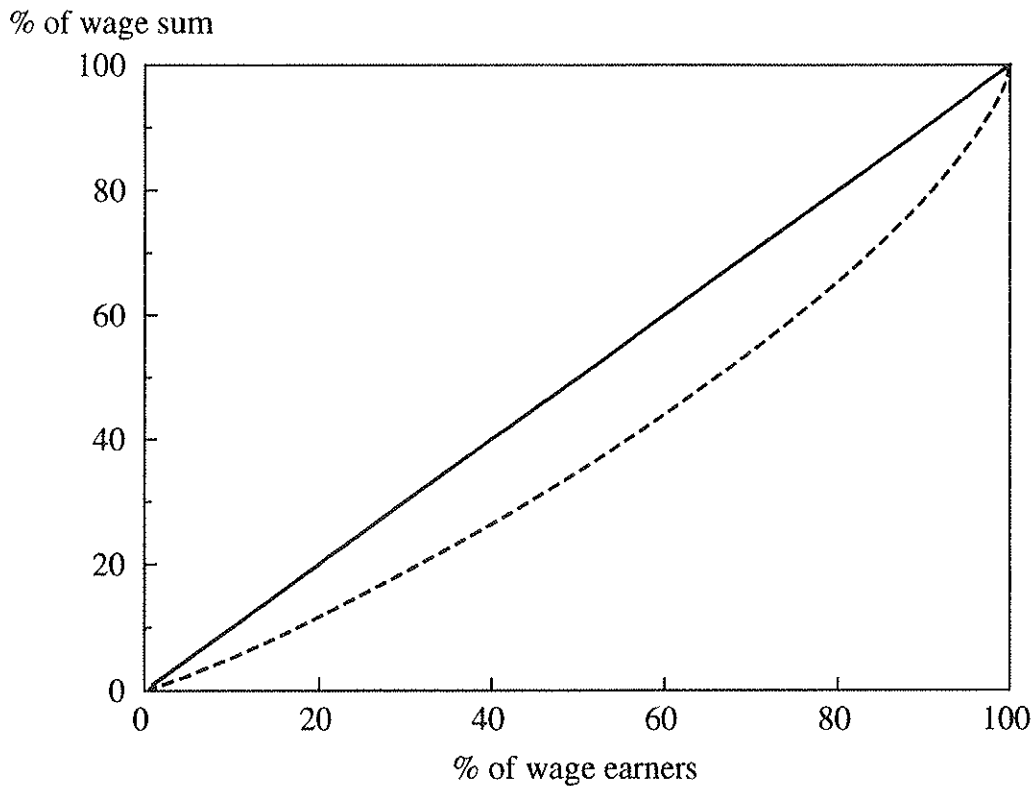
The overall distribution of the calculated average hourly earnings of the 3895 sample employees retained in the final estimation data is shown by means of a Lorenz diagram in Figure 1. The Gini coefficient is calculated to be 0.23. The Lorenz curves portraying the distribution of, respectively, male and female hourly earnings are approximately identical to the full-sample Lorenz curve, and are therefore not displayed in the figure.

Table 5. Comparison of regression results for the extended human capital earnings specification using data comprising (1) sample employees with above-minimum hourly earnings (2) all sample employees with positive earnings¹

Variable	(1)	(2)
CONSTANT	3.34650** (.02981)	3.32582** (.03077)
S	0.08718** (.00292)	0.09269** (.00314)
EXP	0.01744** (.00224)	0.01703** (.00259)
EXP ²	-0.00023** (.00006)	-0.00018** (.00007)
WOM	-0.20022** (.01135)	-0.20658** (.01399)
MARRIED	0.02992* (.01429)	0.04245** (.01737)
CHILD ⁰⁻⁶	0.01615 (.01345)	-0.02166 (.01674)
CHILD ⁷⁻¹⁷	0.03080** (.01299)	0.02287 (.01680)
TEMPEMPL	0.03660** (.01574)	-0.01570 (.01692)
PART-TIME	0.28055** (.01662)	0.29446** (.02111)
PIECE-RATE	0.02612 (.01890)	-0.00298 (.02015)
NODAYWORK	0.08048** (.01173)	0.08502** (.01406)
UNEMPL	-0.07542** (.01571)	-0.06301** (.01891)
CAPITAL	0.13381** (.01236)	0.14339** (.01639)
SIGMA(ϵ)	0.31282** (.00212)	0.39029** (.00255)
RHO(ϵ, μ)	0.04202 (.07184)	-0.19029** (.05513)
Log-Likelihood	3769.7	4757.3
Number of obs.	3895	4040

-
- * Standard errors are given in parentheses below the estimates. Maximum likelihood estimates corrected for selectivity bias, where $\text{SIGMA}(\epsilon)$ is the standard error of the disturbance term in the earnings equation and $\text{RHO}(\epsilon, \mu)$ measures the correlation between the error term (ϵ) in the earnings equation and the error term (μ) in the selection (probit) equation. The corresponding probit estimates are reported in Table E of Appendix.
- ** Significant at a 1 % risk level.
- * Significant at a 5 % risk level.

Figure 1. Lorenz curve for earnings in Finland in 1987



4. ACTUAL ESTIMATING DATA

In this section, the actual estimation data base is analysed with respect to alternative definitions of crucial variables and the conspicuous coefficients obtained in the estimations for some of the variables. In particular, in order to examine the sensitivity of the estimation results to the definition of the dependent variable used, the extended human capital earnings specification is re-estimated using two alternative ways of calculating average hourly earnings. The self-reported total years of labour market experience also invite to incorporating alternative definitions in the estimated earnings equations. In addition, the regression results obtained call for somewhat more detailed analysis of the categories of part-time employees and employees in temporary employment.

Summary statistics of relevant variables for the whole sample of retained employees and separately for male and female employees are reported in Table A of Appendix.

4.1. Calculated hourly earnings - two extensions

As described earlier, the average hourly earnings of individuals are calculated as the annual wage/salary income recorded in the tax rolls divided by an estimated amount of annual normal hours worked. Accordingly, the earnings data used in the estimations comprise most types of compensation, whereas the annual amount of working hours includes only regular hours worked.

The tax rolls also provide information on the tax value of fringe benefits received by earners. One extension would thus be to account also for this type of compensation. The inclusion of fringe benefits in the dependent variable may be justified not least as a means of narrowing the gap between the individuals' money earnings and their "total" earnings, that is, earnings comprising not only pecuniary but also non-pecuniary aspects of jobs (Siebert, 1990).

Another digression of interest is linked to the estimated amount of annual working hours. As pointed out above, the adopted way of calculating individual average hourly earnings does not account for overtime working hours. Attempts were therefore made to estimate an annual amount of overtime working hours for each employee using the limited information provided in the survey; information on overtime hours worked is available only for the week of the questionnaire.

In brief, the required annual amounts of overtime working hours were estimated as follows. The sample of employees in full-time employment⁶ was stratified into 48 groups according to gender, sector of employment (private/public) and occupational status (12 categories). For each group, the total amount of weekly overtime working hours was calculated and distributed across the employees in the group in two different ways.⁷ In Method I, the total amount of weekly overtime hours worked was distributed across all employees in the group. More precisely, each employee was assigned the average amount of weekly overtime working hours estimated for the group.

In Method II, half of the total amount of weekly overtime working hours was distributed across those in the group who had worked overtime during the week of the questionnaire, while the other half was distributed across those who had not worked overtime during that particular week. The corresponding annual amounts of overtime working hours were then calculated in proportion to the employees' total number of months worked during the year and added to their annual amount of normal working hours.

The regression results obtained from estimating the extended human capital earnings equation on the full sample data with the dependent variable comprising fringe benefits, on the one hand, and two different estimates of the annual amount of overtime working hours, on the other, are reported in Table 6. The corresponding estimation results for each gender are given in Tables F and G of Appendix.

As is to be expected, the inclusion of fringe benefits in the dependent variable shifts the average earnings profile upwards, while addition of overtime working hours to the measure of annual normal working hours logically has the reverse effect. These overall estimates also imply that male employees typically receive more fringe benefits and also work more overtime than their female counterparts. However, a simple t-test suggests that these effects are not statistically significant. More generally, the alternative definitions of the dependent variable leave the estimated coefficients for the human capital variables as well as for the other explanatory variables included in the earnings specification roughly unchanged. Obviously, the most plausible explanation for this negligible average effect is a strong concentration of, especially, more notable amounts of fringe benefits or overtime working hours to a fairly small number of employees.⁸

Table 6. Comparison of regression results for the extended human capital earnings specification using different definitions of the dependent variable, all employees¹

Variable	Definition of dependent variable ²			
	(1)	(2)	(3)	(4)
CONSTANT	3.34650** (.02981)	3.35315** (.03025)	3.31842** (.02945)	3.32215** (.02937)
S	0.08718** (.00292)	0.08820** (.00296)	0.08657** (.00288)	0.08607** (.00287)
EXP	0.01744** (.00224)	0.01708** (.00228)	0.01753** (.00222)	0.01757** (.00221)
EXP ²	-0.00023** (.00006)	-0.00022** (.00006)	-0.00023** (.00006)	-0.00023** (.00006)
WOM	-0.20022** (.01135)	-0.20286** (.01144)	-0.18544** (.01128)	-0.18943** (.01127)
MARRIED	0.02992* (.01429)	0.03316* (.01442)	0.03009* (.01415)	0.02937* (.01414)
CHILD ⁰⁻⁶	0.01615 (.01345)	0.01622 (.01357)	0.01524 (.01331)	0.01642 (.01330)
CHILD ⁷⁻¹⁷	0.03080** (.01299)	0.03244** (.01307)	0.02985** (.01286)	0.02954* (.01287)
TEMPEMPL	0.03660** (.01574)	0.03465* (.01595)	0.03604* (.01563)	0.03652** (.01554)
PART-TIME	0.28055** (.01662)	0.28768** (.01688)	0.29764** (.01638)	0.29568** (.01632)
PIECE-RATE	0.02612 (.01890)	0.02625 (.01898)	0.02697 (.01868)	0.02336 (.01863)
NODAYWORK	0.08048** (.01173)	0.07588** (.01195)	0.08079** (.01162)	0.08409** (.01160)
UNEMPL	-0.07542** (.01571)	-0.07628** (.01595)	-0.07513** (.01555)	-0.07552** (.01545)
CAPITAL	0.13381** (.01236)	0.14083** (.01246)	0.13281** (.01223)	0.13304** (.01224)
SIGMA(ϵ)	0.31282** (.00212)	0.31589** (.00214)	0.31003** (.00210)	0.30956** (.00208)
RHO(ϵ, μ)	0.04202 (.07184)	0.03573 (.07195)	0.04070 (.07183)	0.04646 (.07156)
Log-Likelihood	-3769.7	-3808.2	-3734.9	-3728.8
Mean of lnEARN	3.7184	3.7255	3.6973	3.6993

¹ Standard errors are given in parentheses below the estimates. Maximum likelihood estimates corrected for selectivity bias, where $SIGMA(\epsilon)$ is the standard error of the disturbance term in the earnings equation and $RHO(\epsilon, \mu)$ measures the correlation between the error term (ϵ) in the earnings equation and the error term (μ) in the selection (probit) equation. The corresponding probit estimates are identical in all four cases and are reported in column (1) of Table E in Appendix.

² (1) Annual wage/salary income divided with the annual amount of normal working hours (adopted definition).
(2) Annual wage/salary income inclusive of the tax value of fringe benefits divided with the annual amount of normal working hours.
(3) Annual wage/salary income divided with the annual amount of normal working hours supplemented with an estimate of annual overtime hours worked (Method I).
(4) Annual wage/salary income divided with the annual amount of normal working hours supplemented with an estimate of annual overtime hours worked (Method II).

** Significant at a 1 % risk level.

* Significant at a 5 % risk level.

4.2. Actual vs. potential labour market experience

As noted in Section 2, the information on total years of labour market experience and years with the current employer is self-reported. For estimation purposes, the reported years of work experience were checked against the individual's age, years of formal schooling and pre-school years, and any inconsistencies were corrected for. Comparison of columns (1) and (2) of Tables 7-9 suggests that the influence of these corrections on the estimation results is negligible for both genders.

Since many empirical studies use, of necessity, potential years of work experience instead of actual/self-reported years of work experience, it is of interest to examine how sensitive the estimation results are to the definition of total years on the labour market. In the case of potential years of work experience ($EXP^{pot.}$), the individuals are assumed to enter the labour market immediately after having completed schooling and to be continuously employed; i.e., $EXP^{pot.}$ is equal to physical age minus the sum of formal schooling and pre-school years.

Comparison of columns (1) and (3) of Tables 7-9 reveals that the difference in estimation results is substantial for women, especially when it comes to the estimated earnings effect of

Table 7. Comparison of regression results for the extended human capital earnings specification using alternative definitions of total years of labour market experience, all employees¹

Variable	Definition of total work experience ²		
	EXP ^{adj.} (1)	EXP ^{unadj.} (2)	EXP ^{pot.} (3)
CONSTANT	3.34650** (.02981)	3.36352** (.02977)	3.04292** (.02186)
S	0.08718** (.00292)	0.08574** (.00291)	0.09143** (.00278)
EXP	0.01744** (.00224)	0.01565** (.00220)	0.04158** (.00195)
EXP ²	-0.00023** (.00006)	-0.00019** (.00006)	-0.00082** (.00004)
WOM	-0.20022** (.01135)	-0.19804** (.01138)	-0.22910** (.01171)
MARRIED	0.02992* (.01429)	0.03107* (.01428)	0.06759** (.01462)
CHILD ⁰⁻⁶	0.01615 (.01345)	0.01412 (.01347)	0.00993 (.01447)
CHILD ⁷⁻¹⁷	0.03080** (.01299)	0.03334** (.01298)	0.00861 (.01426)
TEMPEMPL	0.03660** (.01574)	0.03376* (.01585)	0.01710 (.01493)
PART-TIME	0.28055** (.01662)	0.27987** (.01669)	0.17772** (.01606)
PIECE-RATE	0.02612 (.01890)	0.02575 (.01893)	0.02255 (.01704)
NODAYWORK	0.08048** (.01173)	0.07974** (.01176)	0.07329** (.01124)
UNEMPL	-0.07542** (.01571)	-0.07689** (.01575)	-0.08584** (.01528)
CAPITAL	0.13381** (.01236)	0.13341** (.01239)	0.13564** (.01235)
SIGMA(ϵ)	0.31282** (.00212)	0.31346** (.00213)	0.36008** (.00322)
RHO(ϵ, μ)	0.04202 (.07184)	0.01393 (.07022)	0.79322** (.01647)
Log-Likelihood	-3769.7	-3778.9	-3738.4
Number of obs.	3895	3895	3895
Mean of EXP	16.78	17.11	19.68

¹ Standard errors are given in parentheses below the estimates. Maximum likelihood estimates corrected for selectivity bias, where $SIGMA(\epsilon)$ is the standard error of the disturbance term in the earnings equation and $RHO(\epsilon, \mu)$ measures the correlation between the error term (ϵ) in the earnings equation and the error term (μ) in the selection (probit) equation. The corresponding probit estimates are reported in Table H of Appendix.

An F test indicates that the hypothesis of unequal sample distributions for the two genders can be rejected at a significance level exceeding 99.9 per cent. A simple Chow-test is therefore performed which suggests that the hypothesis of the parameter estimates being equal for male and female employees can be rejected at a significance level exceeding 99.9 per cent. These tests are based on Heckman estimates of the models.

² $EXP^{adj.}$ = self-reported total years of labour market experience checked against the individual's age, years of formal schooling, and pre-school years.

$EXP^{unadj.}$ = self-reported total years of work experience.

$EXP^{pot.}$ = physical age minus the sum of formal schooling and pre-school years.

** Significant at a 1 % risk level.

* Significant at a 5 % risk level.

work experience. As is to be expected, the use of potential instead of actual work experience gives a notable overestimation of the effect of labour market experience on female earnings. Indeed, the absolute size of the female coefficient for the linear experience variable is tripled when using potential years of work experience, and is almost twice as large as the corresponding estimate obtained for their male counterparts. For male employees, on the other hand, a simple t-test shows that the difference in the estimated earnings effect of experience is statistically insignificant. It is also noteworthy that the regression results based on potential work experience point to the presence of a non-negligible selectivity bias problem among both genders.

All in all, then, the information on self-reported labour market experience contained in the labour force survey is without doubt a strong advantage of the data set over, for example, population census data.

Table 8. Comparison of regression results using alternative definitions of total years of labour market experience, male employees (1908 obs.)¹

Variable	Definition of total work experience		
	EXP ^{adj.} (1)	EXP ^{unadj.} (2)	EXP ^{pot.} (3)
CONSTANT	3.29887** (.04350)	3.30434** (.04282)	3.20810** (.04629)
S	0.08865** (.00379)	0.08765** (.00380)	0.08936** (.00376)
EXP	0.02015** (.00319)	0.01936** (.00306)	0.02628** (.00333)
EXP ²	-0.00030** (.00008)	-0.00028** (.00008)	-0.00043** (.00008)
MARRIED	0.07470** (.02194)	0.07562** (.02164)	0.08489** (.02161)
CHILD ⁰⁻⁶	-0.01311 (.02063)	-0.01391 (.02063)	-0.01308 (.02086)
CHILD ⁷⁻¹⁷	0.05503** (.01833)	0.05649** (.01835)	0.04899** (.01846)
TEMPEMPL	-0.06272** (.02552)	-0.06233** (.02560)	-0.06853** (.02520)
PART-TIME	0.19858** (.03558)	0.19568** (.03585)	0.20510** (.03528)
PIECE-RATE	0.05522* (.02414)	0.05410* (.02424)	0.05578** (.02386)
NODAYWORK	0.04469** (.01756)	0.04386** (.01759)	0.04637** (.01754)
UNEMPL	-0.07424** (.02322)	-0.07593** (.02322)	-0.07273** (.02323)
CAPITAL	0.13797** (.01646)	0.13764** (.01645)	0.13911** (.01635)
SIGMA(ϵ)	0.30391** (.00357)	0.30418** (.00356)	0.30588** (.00442)
RHO(ϵ, μ)	0.10793 (.12409)	0.09997 (.12044)	0.26620* (.12508)
Log-Likelihood	-1557.6	-1559.7	-1550.0
Mean of EXP	17.46	17.88	19.13

¹ For notes, see Table 7. Probit estimates are given in Table I.

Table 9. Comparison of regression results using alternative definitions of total years of labour market experience, female employees (1987 obs.)¹

Variable	Definition of total work experience		
	EXP ^{adj.} (1)	EXP ^{unadj.} (2)	EXP ^{pot.} (3)
CONSTANT	3.22148** (.04519)	3.24384** (.04505)	2.82934** (.03121)
S	0.08120** (.00461)	0.07975** (.00456)	0.08985** (.00435)
EXP	0.01477** (.00333)	0.01250** (.00330)	0.04711** (.00295)
EXP ²	-0.00018* (.00009)	-0.00014 (.00009)	-0.00097** (.00007)
MARRIED	-0.01569 (.01938)	-0.01342 (.01941)	-0.00253 (.02095)
CHILD ⁰⁻⁶	0.03060* (.01778)	0.02768 (.01782)	-0.01237 (.01896)
CHILD ⁷⁻¹⁷	0.00299 (.01822)	0.00638 (.01822)	-0.04069* (.01979)
TEMPEMPL	0.08987** (.02073)	0.08409** (.02093)	0.06181** (.01974)
PART-TIME	0.30025** (.01998)	0.29888** (.02011)	0.18295** (.01894)
PIECE-RATE	-0.02879 (.03140)	-0.02799 (.03127)	-0.02429 (.02632)
NODAYWORK	0.11245** (.01605)	0.11176** (.01609)	0.09476** (.01517)
UNEMPL	-0.06498** (.02193)	-0.06654** (.02204)	-0.08424** (.02135)
CAPITAL	0.12549** (.01866)	0.12552** (.01873)	0.13147** (.01818)
SIGMA(€)	0.31538** (.00298)	0.31648** (.00307)	0.38389** (.00457)
RHO(€, μ)	-0.008491 (.09431)	-0.02708 (.09330)	0.87486** (.01367)
Log-Likelihood	-2115.7	-2122.3	-2072.1
Mean of EXP	16.14	16.37	20.20

¹ For notes, see Table 7. Probit estimates are given in Table J.

4.3. Part-time employees

A large majority of the employees in the estimating data is in full-time employment; only 144 individuals, or some 3.7 per cent, are recorded as part-time employees, and most of them are women (about 84 per cent). It seems plausible to expect that persons in full-time employment are generally better paid than persons in part-time employment. However, the employed data set points to the opposite. The average hourly earnings of all employees in part-time employment amount to some FIM 59.00 compared with FIM 44.30 for their full-time counterparts. The difference in average hourly earnings between part-time and full-time employees is more moderate among male employees (FIM 57.30 compared with FIM 48.90) than among female employees (FIM 59.28 compared with 39.60).

As is to be expected, these remarkable differences are strongly reflected in the parameter estimates of the dummy variable for part-time employment included in the earnings specifications. In particular, the estimates indicate that, other things held constant, the hourly earnings of part-time employees exceed those of full-time employees by some 20-35 per cent on average (cf. the estimation results reported in previous tables).

The higher hourly earnings level of part-time employees raises the question whether this unexpected outcome is simply due to measurement errors and the way of calculating hourly earnings. Or, is it so that the personal and job characteristics of part-time employees do differ markedly from those of full-time employees. These questions cannot be answered unambiguously. More detailed analysis of critical variables offers no straightforward explanation to the earnings premium observed for part-time employees. For example, there seems to exist no inverse relation between calculated average hourly earnings and reported weekly normal working hours. Moreover, the hours worked during the week of the questionnaire are in most cases roughly the same as those normally worked during a week.

Change of employer during the survey year may be a non-negligible source of measurement error among male part-time employees but to a much lesser extent among their predominant female counterparts; about one-half of the male part-time employees but only one-fourth of the female part-time employees have been less than a year with the current employer. In fact, the reported months worked during the year seem to be the only potential source of measurement error of greater importance. In particular, a majority of the female part-time employees with

high average hourly earnings had been in employment during only part of the year.⁹

But on the other hand, the share of these high earners among all female part-time employees is fairly small; only one-fourth received hourly earnings higher than FIM 65, and for less than one-tenth, the calculated hourly earnings exceeded FIM 100. In addition, most of the high earning males in part-time employment had self-reportedly been in employment during the entire year. Hence, even if the reported months worked understated the actual time worked during the year, this can hardly offer more than part of an explanation of the observed income advantage of part-time employees. Moreover, the same sources of measurement error obviously affect - possibly to an even larger extent - the calculated hourly earnings of full-time employees. All in all, then, it is very difficult to point to any measurement errors that would be more evident among part-time employees and therefore explain their higher average hourly earnings.

Analysis of personal and job characteristics seems to indicate that part-time employees differ from their full-time counterparts in at least some distinct aspects (cf. Table 10). Thus men in part-time employment are mostly young (some 52 per cent are in the age interval 16-20 years), unmarried, childless, and living in the southern parts of Finland. The young age of male part-time employees explains their relatively low educational level, their few years of labour market experience (about 60 per cent reported less than three years of work experience), and their short employmentship with the present employer. Moreover, a large majority of them works for a private enterprise in the service sector (SIC 6-9), and are consequently classified as salaried employees. In addition, most of them do not have a regular day-time work. In the earnings estimations, many of these characteristics are found to have a significant, positive effect on hourly earnings. Eventually male part-time employment can be interpreted as some kind of interaction term combining these effects.

The personal characteristics of female part-time employees are very different from those of their male counterparts but fairly similar to those of females in full-time employment. This is reflected not least in the distributions across age groups, educational levels, and years of work experience and seniority. But there are also certain similarities between men and women in part-time employment. Like their male counterparts, a large majority of the female part-time employees is classified as salaried employees working for private enterprises in the

Table 10. Sample means of personal and job characteristics for male and female employees in part-time employment

Variable*	Male employees	Female employees
EARN	57.28	59.28
SCHOOL	10.91	10.87
BASIC (1,0)	0.391	0.446
LOWER VOCATIONAL (1,0)	0.130	0.231
UPPER VOCATIONAL (1,0)	0.391	0.190
SHORT NON-UNIV (1,0)	0.044	0.025
UNDERGRADUATE (1,0)	-	0.041
GRADUATE (1,0)	0.044	0.066
EXP	6.39	12.71
SEN	1.83	5.18
AGE	24.83	36.97
MARRIED (1,0)	0.174	0.744
CHILD ⁰⁻¹⁷	0.130	0.479
SOUTH (1,0)	0.609	0.645
CAPITAL (1,0)	0.304	0.207
TEMPEMPL (1,0)	0.522	0.223
PIECE-RATE (1,0)	0.044	0.091
NODAYWORK (1,0)	0.609	0.405
UNEMPL (1,0)	0.261	0.182
UNION (1,0)	0.130	0.504
OJT (1,0)	0.174	0.165
NWWH	18.00	18.13
SWWH	18.09	18.78
OTWH	-	8.25**
PUBSTATE (1,0)	0.130	0.083
PUBLICLOCAL (1,0)	0.304	0.298
OCC31 (1,0)	0.087	0.008
OCC32 (1,0)	0.044	-
OCC33 (1,0)	0.087	0.091
OCC34 (1,0)	0.044	0.033
OCC41 (1,0)	-	0.008
OCC42 (1,0)	0.174	0.198
OCC43 (1,0)	0.174	0.116
OCC44 (1,0)	-	0.149
OCC51 (1,0)	-	0.025
OCC52 (1,0)	0.044	0.008
OCC53 (1,0)	0.348	0.041
OCC54 (1,0)	-	0.322
INDU1 (1,0)	0.044	0.016
INDU2 (1,0)	-	-
INDU3 (1,0)	0.130	0.066
INDU4 (1,0)	-	-
INDU5 (1,0)	-	0.025
INDU6 (1,0)	0.044	0.174
INDU7 (1,0)	0.130	0.041
INDU8 (1,0)	0.087	0.116
INDU9 (1,0)	0.565	0.562
Number of obs.	23	121

* The variables are defined in Section 2.8.

** Of the 121 female part-time employees in the estimating data, slightly less than 7 per cent had worked overtime during the week of the questionnaire.

service sector, which may involve problems of self-selection. But apart from this, there seems to be no apparent personal- or job-related explanation for the higher average hourly earnings observed for female employees in part-time employment.

Hence, there is a possibility that the substantial income advantage obtained for employees in part-time employment is due to measurement errors or a distinct distribution of personal and job characteristics, or both. The stronger earnings effect of part-time employment obtained for female employees may, in part, be caused by a much larger variance in the average hourly earnings of female part-time employees.

4.4. Employees in temporary employment

Another category of employees requiring somewhat more detailed examination is employees in temporary employment. As in the case of part-time employment, it would be expected that hourly earnings received in temporary employment are generally lower than hourly earnings received in permanent employment. The estimation results suggest that this holds for male employees only (cf. Tables 8 and 9). For female employees, there seems to be a fairly strong, positive relation between earnings and temporary employment. It is therefore of interest to investigate whether the distribution of male and female employees in temporary employment across important variables can shed some light on the oppositely signed parameter estimates on the dummy variable capturing the earnings effect of temporary employment.

It seems very unlikely that the highly diverging male and female coefficients for temporary employment could be explained by significant differences in the sources of measurement error imbedded in the information used in calculating individual average hourly earnings. Instead, Table 11 displays conspicuous differences in the distribution of temporarily employed males and females across occupational status categories, public and private sectors, and industries. Specifically, a large majority of the female employees in temporary employment works in the public service sector. This in combination with a fairly long seniority offers, in effect, quite a reasonable explanation of the earnings premium observed for females in temporary employment compared with their male counterparts as well as with their female colleagues in permanent employment.

Table 11. Sample means of personal and job characteristics for male and female employees in temporary employment

Variable*	Male employees	Female employees
EARN**	41.66	45.23
SCHOOL	11.36	11.56
BASIC (1,0)	0.266	0.216
LOWER VOCATIONAL (1,0)	0.315	0.271
UPPER VOCATIONAL (1,0)	0.287	0.352
SHORT NON-UNIV (1,0)	0.035	0.055
UNDERGRADUATE (1,0)	0.007	0.042
GRADUATE (1,0)	0.091	0.064
EXP	9.69	7.85
SEN	1.18	1.63
AGE	29.78	29.96
MARRIED (1,0)	0.413	0.627
CHILD ⁰⁻¹⁷	0.231	0.424
SOUTH (1,0)	0.454	0.572
CAPITAL (1,0)	0.112	0.127
PART-TIME (1,0)	0.084	0.114
PIECE-RATE (1,0)	0.056	0.047
NODAYWORK (1,0)	0.182	0.267
UNEMPL (1,0)	0.518	0.377
UNION (1,0)	0.546	0.670
OJT (1,0)	0.133	0.203
NWWH	36.90	35.52
SWWH	38.24	35.29
OTWH***	9.00	7.26
PUBSTATE (1,0)	0.182	0.157
PUBLICLOCAL (1,0)	0.210	0.525
OCC31 (1,0)	0.014	0.004
OCC32 (1,0)	0.063	0.013
OCC33 (1,0)	0.084	0.106
OCC34 (1,0)	0.063	0.102
OCC41 (1,0)	0.049	0.008
OCC42 (1,0)	0.042	0.093
OCC43 (1,0)	0.014	0.131
OCC44 (1,0)	0.056	0.301
OCC51 (1,0)	0.056	0.042
OCC52 (1,0)	0.350	0.072
OCC53 (1,0)	0.084	0.114
OCC54 (1,0)	0.126	-
INDU1 (1,0)	0.049	0.017
INDU2 (1,0)	0.007	-
INDU3 (1,0)	0.147	0.080
INDU4 (1,0)	-	0.013
INDU5 (1,0)	0.315	0.013
INDU6 (1,0)	0.042	0.064
INDU7 (1,0)	0.098	0.008
INDU8 (1,0)	0.049	0.072
INDU9 (1,0)	0.294	0.733
Number of obs.	143	236

* The variables are defined in Section 2.8.

** The calculated average hourly earnings of males in permanent employment amount to FIM 49.60 and those of females to FIM 40.20.

*** Of males in temporary employment, roughly 13 per cent had worked overtime during the week of the questionnaire. The corresponding share among females was some 8 per cent.

Footnotes:

1. For a brief theoretical introduction to human capital earnings functions, see e.g. Asplund (1992a) and the literature referred to.

2. Some empirical work on human capital earnings functions based on Finnish population census data are reported in Brunila (1990).

3. In other words, the analysis overlooks variations in the age at which schooling is completed and the impact this may have on post-school investments and thus on experience-earnings profiles. Empirical evidence for Sweden, presented by Klevmarken & Quigley (1976), indicates that there are substantial differences in the experience-earnings profiles of individuals who receive identical quantities of formal schooling but complete their schooling at different ages.

4. Of the totally 400 employees in the actual estimating data who had been temporarily unemployed or laid off during the survey year, roughly 61 per cent reported that they had been unemployed/laid off and had, according to tax rolls, also received unemployment benefits subject to taxation. Some 17 per cent reported that they had been unemployed/laid off but had, according to tax rolls, not received unemployment benefits subject to taxation. Finally, about 22 per cent reported that they had been employed during the whole year but had, according to tax rolls, received unemployment benefits subject to taxation.

For the 205 male employees who had experienced unemployment or layoffs during the survey year and/or had received unemployment benefits subject to taxation, the corresponding shares are: 58 per cent, 18 per cent, and 24 per cent, respectively. For the 195 female employees who had been temporarily unemployed or laid off during the survey year and/or had received unemployment benefits subject to taxation, the corresponding shares are: 65 per cent, 16 per cent, and 19 per cent, respectively.

5. In Finland there is no minimum wage legislation. Between 1971 and 1976 a national minimum wage clause was included in the central income agreements. Since then, minimum wage levels to be applied in different contracting industries have been determined in wage negotiations. According to these standard wages, persons over 18 years of age are to be paid the full wage negotiated for the industry. This type of minimum wage clauses have not been implemented on persons under 18 years of age. See further Lilja et al. (1990). In view of this, a hypothetical minimum hourly earnings level is set at 20 per cent below the lowest salary-grade employed in the central government sector in 1987. This amounts to about 18 FIM.

6. Of the male employees in part-time employment, no one had worked overtime during the week of the questionnaire. Information on overtime working hours was available for only four of the female employees in part-time employment. Estimates

of overtime working hours were therefore not made for employees in part-time employment.

7. I am grateful to Tuire Santamäki-Vuori at the Labour Institute for Economic Research in Helsinki for these suggestions.

8. Of all employees retained in the actual estimating data, only some 18 per cent are recorded to have received fringe benefits subject to taxation. The corresponding share is about 16 per cent for male employees and close to 20 per cent for female employees.

The frequency of overtime working hours is even more moderate. The share of overtime workers is some 12 per cent among all employees, almost 15 per cent among male employees, and slightly less than 10 per cent among female employees.

9. The simple correlation between calculated average hourly earnings and reported months worked is -0.572 for female part-time employees compared with 0.047 for male part-time employees.

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APPENDIX

- Table A.** Sample means of crucial characteristics for all employees in the actual estimating data and separately for male and female employees
- Table B.** Correlation matrix for selected variables, all sample employees
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- Table E.** Comparison of regression results for the extended human capital earnings specification using data comprising (1) sample employees with above-minimum hourly earnings (2) all sample employees with positive earnings: maximum likelihood estimates of the probit equation
- Table F.** Comparison of regression results for the extended human capital earnings specification using different definitions of the dependent variable, male employees
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- Table H.** Comparison of regression results for the extended human capital earnings specification using alternative definitions of total years of labour market experience: maximum likelihood estimates of the probit equation for the whole estimating data set
- Table I.** Comparison of regression results for the extended human capital earnings specification using alternative definitions of total years of labour market experience: maximum likelihood estimates of the probit equation for all sample males
- Table J.** Comparison of regression results for the extended human capital earnings specification using alternative definitions of total years of labour market experience: maximum likelihood estimates of the probit equation for all sample females

Table A. Sample means of crucial characteristics for all employees in the actual estimating data and separately for male and female employees

Variable*	All obs. Mean	Women Mean	Men Mean
EARN	44.82	40.80	49.00
ln EARN	3.72	3.63	3.81
SCHOOL	11.00	10.99	11.01
S (SCHOOL - 9)	2.00	1.99	2.01
BASIC (1,0)	0.3605	0.3674	0.3532
LOWER VOCATIONAL (1,0)	0.3083	0.2823	0.3354
UPPER VOCATIONAL (1,0)	0.2000	0.2174	0.1819
SHORT NON-UNIV (1,0)	0.0565	0.0604	0.0524
UNDERGRADUATE (1,0)	0.0257	0.0352	0.0157
GRADUATE (1,0)	0.0490	0.0372	0.0613
EXP	16.78	16.14	17.46
EXP ²	388.85	356.83	422.19
SEN	8.92	8.60	9.26
SEN ²	149.11	139.40	159.34
PREEXP	7.85	7.51	8.21
PREEXP ²	123.09	110.99	135.84
AGE	37.17	37.72	36.60
WOM (1,0)	0.5101	-	-
MARRIED (1,0)	0.7366	0.7313	0.7421
CHILD ⁰⁻¹⁷ (1,0)	0.4875	0.4947	0.4801
CHILD ⁰⁻⁶ (1,0)	0.2334	0.2094	0.2584
CHILD ⁶⁻¹⁷ (1,0)	0.3499	0.3694	0.3297
SOUTH (1,0)	0.6644	0.6784	0.6499
CAPITAL (1,0)	0.1946	0.2074	0.1813
PART-TIME (1,0)	0.0370	0.0609	0.0121
TEMPEMPL (1,0)	0.0973	0.1188	0.0749
PIECE-RATE (1,0)	0.0901	0.0649	0.1164
NODAYWORK (1,0)	0.2401	0.2486	0.2311
UNEMPL (1,0)	0.1027	0.0981	0.1074
UNION (1,0)	0.7633	0.7957	0.7296
MOVE (1,0)	0.8614	0.8556	0.8676
OJT (1,0)	0.3671	0.3770	0.3569
OJTDAYS***	6.60	5.72	7.57
NWWH	38.14	37.10	39.23
SWWH	38.85	36.94	40.77
OTWH**	7.69	6.38	8.59
PUBSTATE (1,0)	0.1191	0.1107	0.1279
PUBLICLOCAL (1,0)	0.2334	0.3362	0.1263
OCC31 (1,0)	0.0367	0.0106	0.0639
OCC32 (1,0)	0.0339	0.0156	0.0529
OCC33 (1,0)	0.0434	0.0478	0.0388
OCC34 (1,0)	0.0537	0.0629	0.0440
OCC41 (1,0)	0.0737	0.0423	0.1064
OCC42 (1,0)	0.1338	0.2058	0.0587
OCC43 (1,0)	0.0709	0.1309	0.0084
OCC44 (1,0)	0.1104	0.1802	0.0377
OCC51 (1,0)	0.0167	0.0075	0.0262
OCC52 (1,0)	0.2121	0.1057	0.3229
OCC53 (1,0)	0.0757	0.0554	0.0970
OCC54 (1,0)	0.1392	0.1354	0.1431

Table A. (cont.)

Variable*	All obs. Mean	Women Mean	Men Mean
INDU11 (1,0)	0.0110	0.0086	0.0136
INDU12 (1,0)	0.0108	0.0010	0.0210
INDU13 (1,0)	0.0003	-	0.0005
INDU20 (1,0)	0.0015	0.0010	0.0021
INDU31 (1,0)	0.0329	0.0357	0.0299
INDU32 (1,0)	0.0272	0.0433	0.0105
INDU33 (1,0)	0.0249	0.0161	0.0341
INDU34 (1,0)	0.0508	0.0367	0.0655
INDU35 (1,0)	0.0200	0.0116	0.0288
INDU36 (1,0)	0.0100	0.0035	0.0168
INDU37 (1,0)	0.0072	0.0015	0.0131
INDU38 (1,0)	0.0798	0.0393	0.1221
INDU39 (1,0)	0.0023	0.0015	0.0031
INDU40 (1,0)	0.0131	0.0055	0.0210
INDU50 (1,0)	0.0780	0.0146	0.1441
INDU61 (1,0)	0.0367	0.0287	0.0451
INDU62 (1,0)	0.0765	0.0946	0.0577
INDU63 (1,0)	0.0246	0.0393	0.0094
INDU71 (1,0)	0.0539	0.0272	0.0818
INDU72 (1,0)	0.0270	0.0226	0.0314
INDU81 (1,0)	0.0362	0.0589	0.0126
INDU82 (1,0)	0.0082	0.0086	0.0079
INDU83 (1,0)	0.0413	0.0398	0.0430
INDU91 (1,0)	0.0639	0.0695	0.0582
INDU92 (1,0)	0.0103	0.0121	0.0084
INDU93 (1,0)	0.2211	0.3468	0.0901
INDU94 (1,0)	0.0177	0.0242	0.0110
INDU95 (1,0)	0.0126	0.0081	0.0173
Number of obs.	3895	1987	1908

* The variables are defined in Section 2.8. in the text.

** Of all employees in the actual estimating data, some 12 per cent (470 obs.) had worked overtime during the week of the questionnaire. The corresponding share was 14½ per cent (279 obs.) for male employees and 9½ per cent (191 obs.) for female employees.

*** Average days of formal on-the-job training for those who had received training during the year.

Table B. Correlation matrix for selected variables, all sample employees

	1-lnEARN	2-S	3-BASIC	4-LOWER VOCATION	5-UPPER VOCATION
1-lnEARN	1.0000000				
2-S	0.3918992	1.0000000			
3-BASIC	-0.1912381	-0.7660275	1.0000000		
4-LOWER VOCATIONAL	-0.1555560	0.0000875	-0.5012673	1.0000000	
5-UPPER VOCATIONAL	0.0836284	0.2535474	-0.3753762	-0.3338433	1.0000000
6-SHORT NON-UNIV	0.1813360	0.3745541	-0.1836874	-0.1633636	-0.1223355
7-UNDER- GRADUATE	0.1427382	0.3313259	-0.1218683	-0.1083844	-0.0811641
8-GRADUATE	0.3045609	0.5902772	-0.1704817	-0.1516191	-0.1135406
9-EXP	0.1253129	-0.2776267	0.3679171	-0.1483189	-0.2137107
10-SEN	0.0069181	0.0258085	-0.0105690	0.0003381	-0.0166789
11-MARRIED	0.1040576	0.0088435	0.0325751	-0.0348836	-0.0346799
12-CHILD (AGE 0-6)	0.0506598	0.1072298	-0.1209319	0.0535140	0.0367222
13-CHILD (AGE 7-17)	0.0900575	0.0143784	0.0209541	-0.0084775	-0.0573284
14-WOM	-0.2476086	-0.0040591	0.0147205	-0.0574736	0.0444251
15-CAPITAL	0.1620711	0.0808012	-0.0232722	-0.0838687	0.0654982
16-TEMPEMPL	-0.0538799	0.0813723	-0.0859089	-0.0147485	0.1043862
17-PART-TIME	0.0803526	-0.0124709	0.0314376	-0.0394855	0.0108852
18-UNEMPL	-0.1436899	-0.0897158	0.0243354	0.0744692	-0.0253728
19-PIECE-RATE	-0.0233475	-0.1266810	0.0793229	0.0752743	-0.0968330
20-NODAYWORK	0.0329507	-0.1180080	0.0650610	0.0594820	-0.0571047
21-UNION	-0.0098584	-0.0074694	0.0205631	0.0736258	-0.1579461
22-OJT	0.2290202	0.2843682	-0.1813319	-0.0979562	0.1225043
23-OJTDAYS	0.1724297	0.2052220	-0.1339083	-0.0545844	0.0817810
24-OCC31	0.2738158	0.1414323	-0.0754811	-0.0919185	0.1037562
25-OCC32	0.1795666	0.2845439	-0.1287894	-0.1035455	0.0092227
26-OCC33	0.2443525	0.4038297	-0.1546397	-0.1340120	-0.0655298
27-OCC34	0.1555472	0.2802322	-0.1289373	-0.1170487	0.0518395
28-OCC41	0.0863605	0.0170851	-0.0582352	-0.0372281	0.1611646
29-OCC42	-0.0928089	-0.0303510	0.0191636	-0.0859847	0.1335002
30-OCC43	-0.0623063	-0.0551015	0.0198235	-0.0392227	0.1020590
31-OCC44	-0.0692010	0.0364131	-0.1177314	0.0858826	0.0634915
32-OCC51	-0.0728495	-0.0777026	0.0649933	0.0171758	-0.0551159
33-OCC52	-0.0727343	-0.2444493	0.1403070	0.1704225	-0.1981577
34-OCC53	-0.1179071	-0.1202769	0.0599514	0.0862316	-0.0800556
35-OCC54	-0.1498264	-0.2115245	0.1647396	0.0495979	-0.1268469

	6-SHORT NON-UNIV	7-UNDER- GRADUATE	8-GRADUATE	9-EXP	10-SEN
6-SHORT NONU	1.0000000				
7-UNDERGRAD	-0.0397170	1.0000000			
8-GRADUATE	-0.0555602	-0.0368617	1.0000000		
9-EXP	0.0072411	-0.0577879	-0.0703981	1.0000000	
10-SEN	0.0190068	0.0152107	0.0222117	0.0394677	1.0000000
11-MARRIED	0.0276497	-0.0061121	0.0413289	0.2001388	0.0072314
12-CHILD(0-6)	0.0175039	0.0485949	0.0321137	-0.2030385	-0.0309500
13-CHILD(7-17)	0.0256825	0.0170392	0.0377954	0.1283878	0.0394816
14-WOM	0.0172839	0.0616516	-0.0557402	-0.0635640	0.0504279
15-CAPITAL	-0.0022863	0.0596141	0.0685591	0.0088518	0.0169757
16-TEMPEMPL	-0.0127846	0.0069537	0.0377682	-0.2614156	0.0146206
17-PART-TIME	-0.0243630	0.0112092	0.0122151	-0.0962274	0.0020597
18-UNEMPL	-0.0717821	-0.0388738	-0.0611562	-0.1404542	-0.0335290
19-PIECE-RATE	-0.0653481	-0.0510859	-0.0507042	-0.0092165	-0.0077512
20-NODAYWORK	-0.0463779	-0.0684300	-0.0663878	-0.0244849	-0.1808731
21-UNION	0.0551460	0.0254773	0.0117819	0.1831464	0.1892227
22-OJT	0.1505001	0.0952578	0.1550847	0.0328335	0.0921933
23-OJTDAYS	0.0712320	0.0804362	0.1279179	-0.0195446	0.0474342
24-OCC31	0.0468551	0.0287321	0.1010744	0.0626278	-0.0385259
25-OCC32	0.2061731	0.0593085	0.2268617	-0.0549129	0.0063090
26-OCC33	0.2153766	0.3319461	0.2784355	0.0037018	0.0151920
27-OCC34	0.1144757	0.1270297	0.2255553	-0.0486526	0.0137855
28-OCC41	-0.0094100	-0.0395694	-0.0503933	0.0798330	0.0300707
29-OCC42	-0.0438703	-0.0065625	-0.0543062	-0.0273835	0.0209736
30-OCC43	-0.0588997	-0.0385022	-0.0580772	-0.0281848	0.0234076
31-OCC44	0.0664068	-0.0571843	-0.0686139	-0.0798160	0.0136757
32-OCC51	-0.0318742	-0.0211471	-0.0295827	0.0007748	0.0124093
33-OCC52	-0.1242122	-0.0842143	-0.1148990	0.0263924	-0.0341570
34-OCC53	-0.0658360	-0.0464680	-0.0650041	0.0096140	-0.0121651
35-OCC54	-0.0919441	-0.0652645	-0.0912986	0.0452057	-0.0282979
	11-MARRIED	12-CHILD (AGE 0-6)	13-CHILD (AGE 7-17)	14-WOM	15-CAPITAL
11-MARRIED	1.0000000				
12-CHILD(0-6)	0.2830968	1.0000000			
13-CHILD(7-17)	0.2921115	0.0698778	1.0000000		
14-WOM	-0.0123534	-0.0579399	0.0416484	1.0000000	
15-CAPITALE	-0.0593777	-0.0535061	-0.0656063	0.0328375	1.0000000
16-TEMPEMPL	-0.1419241	-0.0254971	-0.0937669	0.0739197	-0.0607349
17-PART-TIME	-0.0372786	0.0044837	-0.0210844	0.1293960	0.0136662
18-UNEMPL	-0.1010607	-0.0346927	-0.0726584	-0.0153223	-0.1128893
19-PIECE-RATE	-0.0051731	0.0065393	0.0022042	-0.0897855	-0.0595794
20-NODAYWORK	-0.0187055	0.0096541	-0.0078013	0.0204633	-0.0576339
21-UNION	0.1427870	0.0530815	0.1097204	0.0777511	-0.1686918
22-OJT	0.0915145	0.0154534	0.0888832	0.0207747	0.0762953
23-OJTDAYS	0.0526572	0.0172416	0.0326555	-0.0448142	0.0895311
24-OCC31	0.0702567	0.0213901	0.0399566	-0.1418754	0.0902477
25-OCC32	0.0282521	0.0207789	0.0291793	-0.1031416	0.0799639
26-OCC33	0.0129229	0.0076254	0.0154854	0.0221489	-0.0251110
27-OCC34	0.0182445	0.0302338	-0.0170478	0.0418915	0.0412301
28-OCC41	0.0504200	0.0163121	0.0320773	-0.1226883	0.0202236
29-OCC42	-0.0013030	-0.0313639	-0.0084075	0.2160831	0.0735551
30-OCC43	0.0197679	0.0013914	0.0344423	0.2385890	0.0613846
31-OCC44	-0.0273991	0.0264346	0.0283891	0.2272060	-0.0179652
32-OCC51	-0.0494952	-0.0102795	-0.0031341	-0.0728047	-0.0640375
33-OCC52	-0.0219862	0.0047981	-0.0211316	-0.2655754	-0.1407923
34-OCC53	-0.0006448	-0.0065290	-0.0086083	-0.0786000	-0.0181611
35-OCC54	-0.0542753	-0.0499637	-0.0694673	-0.0111241	-0.0158848

	16-TEMPEMPL	17-PART-TIME	18-UNEMPL	19-PIECE-RATE	20-NODAY-WORK
16-TEMPEMPL	1.0000000				
17-PART-TIME	0.1147211	1.0000000			
18-UNEMPL	0.3540835	0.0592190	1.0000000		
19-PIECE-RATE	-0.0458442	-0.0046407	0.0589357	1.0000000	
20-NODAYWORK	-0.0040148	0.0905769	-0.0257829	0.0477401	1.0000000
21-UNION	-0.1085949	-0.1469696	-0.0443995	0.0318224	0.0245033
22-OJT	-0.1296563	-0.0814872	-0.1716960	-0.0908930	-0.0951158
23-OJTDAYS	-0.0765742	-0.0579930	-0.0963828	-0.0492935	-0.0306439
24-OCC31	-0.0502769	-0.0165454	-0.0570508	-0.0280651	-0.0905445
25-OCC32	-0.0040414	-0.0291771	-0.0493393	-0.0589422	-0.0952979
26-OCC33	0.0874034	0.0450941	-0.0346869	-0.0582219	-0.0872415
27-OCC34	0.0486814	-0.0164649	-0.0655439	-0.0550438	-0.0244630
28-OCC41	-0.0627560	-0.0500525	-0.0662790	-0.0784637	-0.0618798
29-OCC42	-0.0577580	0.0349295	-0.0335537	-0.0578168	-0.0954761
30-OCC43	0.0207428	0.0201302	-0.0472799	-0.0764266	-0.1060146
31-OCC44	0.1027173	0.0264965	0.0184619	-0.0994196	0.1856292
32-OCC51	0.0316162	0.0063403	0.0549630	0.1199844	-0.0591405
33-OCC52	-0.0431754	-0.0983195	0.1327761	0.3280555	0.0466410
34-OCC53	0.0009667	-0.0252315	0.0278258	0.0047982	0.0026919
35-OCC54	-0.0193698	0.1059957	0.0228209	-0.0565842	0.1821723
	21-UNION	22-OJT	23-OJTDAYS	24-OCC31	25-OCC32
21-UNION	1.0000000				
22-OJT	0.0770633	1.0000000			
23-OJTDAYS	0.0229685	0.5292333	1.0000000		
24-OCC31	-0.1578585	0.1005430	0.0838102	1.0000000	
25-OCC32	-0.0225444	0.1134396	0.1143293	-0.0365642	1.0000000
26-OCC33	0.0622723	0.0939963	0.0514790	-0.0415775	-0.0398880
27-OCC34	-0.0094532	0.1329976	0.1183282	-0.0464871	-0.0445980
28-OCC41	0.0206611	0.0869137	0.0411795	-0.0550610	-0.0528235
29-OCC42	-0.0952362	0.0543297	0.0005470	-0.0767155	-0.0735980
30-OCC43	0.0290311	0.0574371	0.0371386	-0.0539134	-0.0517226
31-OCC44	0.0593369	0.0444120	0.0000169	-0.0687732	-0.0659785
32-OCC51	-0.0547590	-0.0077500	-0.0209279	-0.0254328	-0.0243993
33-OCC52	0.1012532	-0.2413868	-0.1392038	-0.1012810	-0.0971654
34-OCC53	-0.0049526	-0.0670479	-0.0421819	-0.0558851	-0.0536142
35-OCC54	-0.0256554	-0.1184787	-0.0674252	-0.0784909	-0.0753013
	26-OCC33	27-OCC34	28-OCC41	29-OCC42	30-OCC43
26-OCC33	1.0000000				
27-OCC34	-0.0507128	1.0000000			
28-OCC41	-0.0600661	-0.0671588	1.0000000		
29-OCC42	-0.0836890	-0.0935711	-0.1108292	1.0000000	
30-OCC43	-0.0588142	-0.0657591	-0.0778875	-0.1085192	1.0000000
31-OCC44	-0.0750247	-0.0838838	-0.0993551	-0.1384296	-0.0972843
32-OCC51	-0.0277446	-0.0310208	-0.0367422	-0.0511922	-0.0359764
33-OCC52	-0.1104876	-0.1235342	-0.1463185	-0.2038628	-0.1432689
34-OCC53	-0.0609652	-0.0681640	-0.0807360	-0.1124880	-0.0790533
35-OCC54	-0.0856258	-0.0957367	-0.1133941	-0.1579899	-0.1110307
	31-OCC44	32-OCC51	33-OCC52	34-OCC53	35-OCC54
31-OCC44	1.0000000				
32-OCC51	-0.0458923	1.0000000			
33-OCC52	-0.1827571	-0.0675848	1.0000000		
34-OCC53	-0.1008422	-0.0372921	-0.1485085	1.0000000	
35-OCC54	-0.1416333	-0.0523769	-0.2085809	-0.1150913	1.0000000

Table C. Correlation matrix for selected variables, male sample employees

	1-IN EARN	2-S	3-BASIC	4-LOWER VOCATION	5-UPPER VOCATION
1-IN EARN	1.0000000				
2-S	0.4287641	1.0000000			
3-BASIC	-0.2219512	-0.7478113	1.0000000		
4-LOWER VOCATIONAL	-0.1554188	-0.0028147	-0.5250525	1.0000000	
5-UPPER VOCATION	0.1064995	0.2336794	-0.3484461	-0.3349605	1.0000000
6-SHORT NON-UNIV	0.2014121	0.3546242	-0.1738094	-0.1670826	-0.1108828
7-UNDER- GRADUATE	0.1053208	0.2542754	-0.0934082	-0.0897931	-0.0595904
8-GRADUATE	0.3351125	0.6584224	-0.1888937	-0.1815831	-0.1205059
9-EXP	0.1764218	-0.2641733	0.3822701	-0.2074773	-0.1629935
10-SEN	0.0360477	0.0550152	-0.0406062	0.0060399	-0.0022831
11-MARRIED	0.2459698	0.0802217	0.0170414	-0.0963471	-0.0078333
12-CHILD (AGE 0-6)	0.0360458	0.0905806	-0.0905569	0.0447153	0.0072636
13-CHILD (AGE 7-17)	0.2042466	0.0500361	0.0298708	-0.0660843	-0.0416027
14-CAPITAL	0.2063217	0.1352353	-0.0774764	-0.0721953	0.1060549
15-TEMPEMPL	-0.1329828	0.0500306	-0.0521159	-0.0125062	0.0773688
16-PART-TIME	-0.0002559	-0.0052782	0.0087945	-0.0479601	0.0599759
17-UNEMPL	-0.2026414	-0.1071350	0.0445575	0.0582033	-0.0275651
18-PIECE-RATE	-0.0375474	-0.1373517	0.0737920	0.0849381	-0.0905726
19-NODAYWORK	-0.0254216	-0.1594347	0.1202148	0.0317979	-0.0683395
20-UNION	0.0533504	-0.0065072	0.0006831	0.1151631	-0.1840160
21-OJT	0.3220340	0.3245222	-0.2187179	-0.1029406	0.1677515
22-OJTDAYS	0.1721324	0.2218355	-0.1592639	-0.0481321	0.1088277
23-OCC31	0.3306018	0.1846567	-0.0900719	-0.1403078	0.1489110
24-OCC32	0.2238681	0.3682878	-0.1600329	-0.1481312	-0.0022359
25-OCC33	0.1971920	0.3781265	-0.1427738	-0.1369581	-0.0454464
26-OCC34	0.1465241	0.2463422	-0.1211845	-0.1091727	0.0975134
27-OCC41	0.0739742	0.0328968	-0.0914275	-0.0759349	0.2867859
28-OCC42	-0.0777938	0.0068761	-0.0166249	-0.0640747	0.1308140
29-OCC43	0.0031081	0.0459788	-0.0559383	-0.0044661	0.0609439
30-OCC44	-0.0301331	0.0283228	-0.0945650	0.0457239	0.0991519
31-OCC51	-0.1214623	-0.1031607	0.0984141	-0.0053611	-0.0603326
32-OCC52	-0.1413679	-0.3015627	0.1463330	0.2383054	-0.2441865
33-OCC53	-0.1587811	-0.1441144	0.0802227	0.0823276	-0.0902069
34-OCC54	-0.1876817	-0.2067893	0.1646000	0.0330580	-0.1150502

	6-SHORT NON-UNIV	7-UNDER- GRADUATE	8-GRADUATE	9-EXP	10-SEN
6-SHORT NONU	1.0000000				
7-UNDERGRAD	-0.0297244	1.0000000			
8-GRADUATE	-0.0601099	-0.0323041	1.0000000		
9-EXP	-0.0155352	-0.0375788	-0.0573099	1.0000000	
10-SEN	0.0327996	0.0164120	0.0337062	0.0499716	1.0000000
11-MARRIED	0.0579872	0.0167174	0.1057159	0.3171658	0.0140115
12-CHILD(0-6)	0.0116123	0.0408881	0.0487506	-0.1783752	-0.0429683
13-CHILD(7-17)	0.0451936	0.0278727	0.0809945	0.2105797	0.0557100
14-CAPITAL	-0.0191304	0.0498577	0.1178332	0.0073081	0.0214521
15-TEMPEMPL	-0.0222827	-0.0199753	0.0351038	-0.2038831	0.0218755
16-PART-TIME	-0.0044276	-0.0139611	-0.0082149	-0.1127627	0.0090142
17-UNEMPL	-0.0664074	-0.0438513	-0.0745692	-0.1351415	-0.0567840
18-PIECE-RATE	-0.0706701	-0.0458628	-0.0791197	-0.0380368	-0.0027539
19-NODAYWORK	-0.1010509	-0.0593035	-0.0675869	-0.0182479	-0.2163655
20-UNION	0.0531793	0.0105585	0.0129911	0.1714876	0.2040037
21-OJT	0.1438706	0.0817155	0.1926068	0.0186198	0.1087405
22-OJTDAYS	0.0663612	0.0793474	0.1342606	-0.0586631	0.0511728
23-OCC31	0.0827281	0.0358493	0.1207139	0.0789359	-0.0110791
24-OCC32	0.3540406	0.0265674	0.2712975	-0.0695515	0.0310442
25-OCC33	0.2085489	0.3455517	0.2541415	0.0180962	0.0100022
26-OCC34	0.0412407	0.0755573	0.2220097	-0.0448549	0.0097221
27-OCC41	-0.0430133	-0.0436113	-0.0669380	0.0725205	0.0541539
28-OCC42	-0.0187096	-0.0136394	-0.0266528	-0.0576132	0.0293008
29-OCC43	0.0299537	-0.0116228	0.0004520	-0.0399271	-0.0321876
30-OCC44	-0.0095474	-0.0250290	-0.0391505	-0.0679635	-0.0154179
31-OCC51	-0.0385801	-0.0207336	-0.0419283	0.0227633	0.0209546
32-OCC52	-0.1573603	-0.0872714	-0.1764836	-0.0000911	-0.0416242
33-OCC53	-0.0770627	-0.0414148	-0.0837507	-0.0098629	-0.0086776
34-OCC54	-0.0826671	-0.0516458	-0.1044402	0.0258954	-0.0205509
	11-MARRIED	12-CHILD (AGE 0-6)	13-CHILD (AGE 7-17)	14-CAPITAL	15-TEMPEMPL
11-MARRIED	1.0000000				
12-CHILD(0-6)	0.3424596	1.0000000			
13-CHILD(7-17)	0.3725941	0.1107285	1.0000000		
14-CAPITAL	0.0069034	-0.0447512	-0.0551635	1.0000000	
15-TEMPEMPL	-0.2144285	-0.0907112	-0.0979894	-0.0513086	1.0000000
16-PART-TIME	-0.1434805	-0.0322871	-0.0774637	0.0352643	0.1874352
17-UNEMPL	-0.1746328	-0.0733396	-0.1028998	-0.0930122	0.3768914
18-PIECE-RATE	-0.0327115	0.0023836	-0.0041222	-0.0647274	-0.0536246
19-NODAYWORK	-0.0121725	0.0228686	-0.0168789	-0.0418564	-0.0332973
20-UNION	0.1401038	0.0844407	0.1207482	-0.1636144	-0.1179765
21-OJT	0.1515542	0.0300872	0.0849368	0.0837758	-0.1331145
22-OJTDAYS	0.0592291	0.0193056	0.0170345	0.0879309	-0.0593563
23-OCC31	0.1050886	0.0072280	0.0719167	0.1494338	-0.0581212
24-OCC32	0.0537443	0.0101762	0.0532990	0.1135119	0.0127152
25-OCC33	0.0501481	0.0116545	0.0439128	-0.0311341	0.0665339
26-OCC34	0.0564165	0.0367419	0.0288477	0.0382402	0.0262396
27-OCC41	0.0790553	0.0254246	0.0472881	0.0096508	-0.0530275
28-OCC42	-0.0006091	0.0054031	-0.0375763	0.0502856	-0.0202733
29-OCC43	-0.0114858	-0.0148914	-0.0400368	0.0462206	0.0174808
30-OCC44	-0.0404520	0.0213388	0.0015455	-0.0146807	0.0271981
31-OCC51	-0.0683011	-0.0218799	0.0175652	-0.0772075	0.0529891
32-OCC52	-0.0695870	-0.0209095	-0.0264044	-0.1649723	0.0163145
33-OCC53	-0.0254902	-0.0153811	0.0000454	0.0112708	-0.0125476
34-OCC54	-0.0670755	-0.0223598	-0.1050681	0.0174568	-0.0139880

	16-PART-TIME	17-UNEMPL	18-PIECE-RATE	19-NODAYWORK	20-UNION
16-PART-TIME	1.0000000				
17-UNEMPL	0.0547274	1.0000000			
18-PIECE-RATE	-0.0251046	0.0746754	1.0000000		
19-NODAYWORK	0.0989333	-0.0416816	0.0220572	1.0000000	
20-UNION	-0.1489908	-0.0859575	0.0369372	0.0567189	1.0000000
21-OJT	-0.0421943	-0.1595627	-0.0451574	-0.0762973	0.0915437
22-OJTDAYS	-0.0323814	-0.0824142	-0.0325185	0.0173224	0.0048166
23-OCC31	0.0103916	-0.0768437	-0.0480708	-0.1280535	-0.1736567
24-OCC32	-0.0046654	-0.0669083	-0.0857885	-0.1185187	0.0069270
25-OCC33	0.0275594	-0.0521614	-0.0728893	-0.0779380	0.0611877
26-OCC34	-0.0002945	-0.0497062	-0.0460009	0.0156652	-0.0131308
27-OCC41	-0.0381148	-0.0922725	-0.1199074	-0.0964476	0.0302285
28-OCC42	0.0541409	-0.0218415	0.0415030	-0.0575813	-0.1390974
29-OCC43	-0.0101580	0.0052139	-0.0333693	0.0041159	-0.0345864
30-OCC44	0.0789384	-0.0065355	-0.0718584	0.1197784	0.0091128
31-OCC51	-0.0181205	0.0596254	0.1758121	-0.0821600	-0.0478483
32-OCC52	-0.0762724	0.1766975	0.2213812	0.0787673	0.1453344
33-OCC53	-0.0199648	-0.0107347	0.0026230	-0.0241989	-0.0198123
34-OCC54	0.0645890	-0.0016035	-0.0969275	0.2091347	0.0061672
		21-OJT	22-OJTDAYS	23-OCC31	24-OCC32
21-OJT	1.0000000				
22-OJTDAYS	0.4988029	1.0000000			
23-OCC31	0.1451298	0.0905137	1.0000000		
24-OCC32	0.1561100	0.1197658	-0.0617904	1.0000000	
25-OCC33	0.1053176	0.0515783	-0.0524995	-0.0474895	1.0000000
26-OCC34	0.1120830	0.1230934	-0.0560875	-0.0507351	-0.0431066
27-OCC41	0.1332083	0.0374053	-0.0901831	-0.0815769	-0.0693110
28-OCC42	0.0838879	0.0244990	-0.0652672	-0.0590388	-0.0501617
29-OCC43	0.0274642	-0.0038568	-0.0240347	-0.0217411	-0.0184721
30-OCC44	0.0246967	0.0329261	-0.0517570	-0.0468179	-0.0397783
31-OCC51	0.0079034	-0.0245271	-0.0428747	-0.0387832	-0.0329517
32-OCC52	-0.2851202	-0.1722591	-0.1804672	-0.1632453	-0.1386996
33-OCC53	-0.0259897	-0.0285862	-0.0856411	-0.0774684	-0.0658202
34-OCC54	-0.1200911	-0.0413160	-0.1067976	-0.0966060	-0.0820802
		26-OCC34	27-OCC41	28-OCC42	29-OCC43
26-OCC34	1.0000000				
27-OCC41	-0.0740480	1.0000000			
28-OCC42	-0.0535899	-0.0861671	1.0000000		
29-OCC43	-0.0197345	-0.0317311	-0.0229644	1.0000000	
30-OCC44	-0.0424969	-0.0683307	-0.0494522	-0.0182108	1.0000000
31-OCC51	-0.0352038	-0.0566041	-0.0409655	-0.0150856	-0.0324857
32-OCC52	-0.1481789	-0.2382566	-0.1724308	-0.0634978	-0.1367379
33-OCC53	-0.0703186	-0.1130652	-0.0818275	-0.0301330	-0.0648893
34-OCC54	-0.0876899	-0.1409965	-0.1020418	-0.0375770	-0.0809193
		31-OCC51	32-OCC52	33-OCC53	34-OCC54
31-OCC51	1.0000000				
32-OCC52	-0.1132717	1.0000000			
33-OCC53	-0.0537533	-0.2262572	1.0000000		
34-OCC54	-0.0670324	-0.2821510	-0.1338954	1.0000000	

Table D. Correlation matrix for selected variables, female sample employees

	1-1nEARN	2-S	3-BASIC	4-LOWER VOCATION	5-UPPER VOCATION
1-1nEARN	1.0000000				
2-S	0.3780780	1.0000000			
3-BASIC	-0.1662072	-0.7840695	1.0000000		
4-LOWER VOCATIONAL	-0.1962232	0.0026087	-0.4779863	1.0000000	
5-UPPER VOCATIONAL	0.0899460	0.2731766	-0.4016710	-0.3305966	1.0000000
6-SHORT NON-UNIV	0.1829715	0.3939007	-0.1932023	-0.1590157	-0.1336273
7-UNDER- GRADUATE	0.2073050	0.3955981	-0.1456236	-0.1198560	-0.1007198
8-GRADUATE	0.2616706	0.5142479	-0.1498829	-0.1233616	-0.1036657
9-EXP	0.0453069	-0.2943701	0.3574627	-0.0915266	-0.2611031
10-SEN	-0.0044591	-0.0194080	0.0340363	-0.0012120	-0.0457203
11-MARRIED	-0.0326119	-0.0605731	0.0475334	0.0246328	-0.0575257
12-CHILD (AGE 0-6)	0.0391491	0.1248133	-0.1509587	0.0564681	0.0706415
13-CHILD (AGE 7-17)	0.0078623	-0.0194375	0.0115440	0.0527375	-0.0747798
14-CAPITAL	0.1475494	0.0303401	0.0248132	-0.0918967	0.0283673
15-TEMPEMPL	0.0393755	0.1083919	-0.1152077	-0.0090928	0.1195145
16-PART-TIME	0.1812522	-0.0163331	0.0416720	-0.0288117	-0.0168724
17-UNEMPL	-0.1009054	-0.0720246	0.0047699	0.0899868	-0.0221280
18-PIECE-RATE	-0.0603658	-0.1170675	0.0915471	0.0525413	-0.0992676
19-NODAYWORK	0.1010090	-0.0782000	0.0133092	0.0893130	-0.0491246
20-UNION	-0.0373040	-0.0079099	0.0392487	0.0377887	-0.1414034
21-OJT	0.1641007	0.2456839	-0.1468534	-0.0910567	0.0809603
22-OJTDAYS	0.1690871	0.1920976	-0.1033141	-0.0756740	0.0552933
23- OCC31	0.1223568	0.0792329	-0.0583438	-0.0320244	0.0648388
24- OCC32	0.0634377	0.1683296	-0.0875142	-0.0518967	0.0419425
25- OCC33	0.3125920	0.4285614	-0.1658708	-0.1300674	-0.0837977
26- OCC34	0.1933482	0.3115593	-0.1372570	-0.1210692	0.0141877
27- OCC41	0.0375041	-0.0068775	-0.0096530	0.0015772	0.0165979
28- OCC42	-0.0233184	-0.0531750	0.0354721	-0.0870379	0.1299964
29- OCC43	-0.0058418	-0.0939672	0.0386296	-0.0378182	0.1174829
30- OCC44	-0.0069318	0.0465898	-0.1481023	0.1394144	0.0386224
31- OCC51	-0.0552809	-0.0416820	0.0179604	0.0486317	-0.0459694
32- OCC52	-0.1656658	-0.1964245	0.1624740	0.0498573	-0.1375389
33- OCC53	-0.1235160	-0.0933411	0.0392011	0.0828365	-0.0635730
34- OCC54	-0.1272526	-0.2164147	0.1652955	0.0655274	-0.1372413

	6-SHORT NON-UNIV	7-UNDER- GRADUATE	8-GRADUATE	9-EXP	10-SEN
6-SHORT NONU	1.0000000				
7-UNDERGRAD	-0.0484458	1.0000000			
8-GRADUATE	-0.0498628	-0.0375834	1.0000000		
9-EXP	0.0321178	-0.0686408	-0.0973099	1.0000000	
10-SEN	-0.0018735	0.0101389	0.0083071	0.0324922	1.0000000
11-MARRIED	0.0011896	-0.0196297	-0.0366485	0.0775784	-0.0011518
12-CHILD(0-6)	0.0253236	0.0627004	0.0033140	-0.2407427	-0.0043007
13-CHILD(7-17)	0.0073184	0.0064588	-0.0073554	0.0501775	0.0123840
14-CAPITAL	0.0110389	0.0638729	0.0174143	0.0147168	0.0075463
15-TEMPEMPL	-0.0081802	0.0142261	0.0510244	-0.3101733	-0.0016718
16-PART-TIME	-0.0380550	0.0084165	0.0388296	-0.0889680	-0.0159941
17-UNEMPL	-0.0765294	-0.0355078	-0.0470117	-0.1491352	0.0047609
18-PIECE-RATE	-0.0582275	-0.0503512	-0.0194625	0.0166387	-0.0043161
19-NODAYWORK	0.0008118	-0.0783385	-0.0639387	-0.0284862	-0.1448046
20-UNION	0.0551183	0.0291325	0.0205679	0.2095487	0.1646839
21-OJT	0.1559208	0.1048490	0.1157505	0.0507027	0.0713204
22-OJTDAYS	0.0869234	0.1044072	0.1114752	0.0387008	0.0462898
23-OCC31	-0.0055420	0.0603367	0.0316549	0.0035410	-0.1122116
24-OCC32	0.0021792	0.1301385	0.1253662	-0.0522726	-0.0444423
25-OCC33	0.2204402	0.3282145	0.3171719	-0.0072796	0.0215524
26-OCC34	0.1692508	0.1528678	0.2445992	-0.0480423	0.0159092
27-OCC41	0.0412325	-0.0265806	-0.0413217	0.0754926	-0.0062802
28-OCC42	-0.0663655	-0.0230147	-0.0606884	0.0117661	-0.0044484
29-OCC43	-0.0983692	-0.0660496	-0.0763131	-0.0090280	0.0370557
30-OCC44	0.1010336	-0.0895816	-0.0783708	-0.0744576	0.0170333
31-OCC51	-0.0221111	-0.0166660	-0.0171534	-0.0563357	0.0020532
32-OCC52	-0.0871534	-0.0656907	-0.0589670	0.0262884	0.0270230
33-OCC53	-0.0521351	-0.0462596	-0.0476127	0.0245771	-0.0075020
34-OCC54	-0.1003190	-0.0756141	-0.0778257	0.0649492	-0.0415916
	11-MARRIED	12-CHILD (AGE 0-6)	13-CHILD (AGE 7-17)	14-CAPITAL	15-TEMPEMPL
11-MARRIED	1.0000000				
12-CHILD(0-6)	0.2226668	1.0000000			
13-CHILD(7-17)	0.2193649	0.0341619	1.0000000		
14-CAPITAL	-0.1183866	-0.0587564	-0.0776596	1.0000000	
15-TEMPEMPL	-0.0862387	0.0366708	-0.0972692	-0.0726531	1.0000000
16-PART-TIME	0.0072081	0.0344879	-0.0074019	-0.0004624	0.0821495
17-UNEMPL	-0.0289801	0.0048840	-0.0421764	-0.1311614	0.3442696
18-PIECE-RATE	0.0261176	-0.0000379	0.0183981	-0.0491135	-0.0272850
19-NODAYWORK	-0.0242677	-0.0012142	-0.0011680	-0.0730396	0.0155724
20-UNION	0.1489118	0.0276122	0.0930397	-0.1810846	-0.1148877
21-OJT	0.0358212	0.0030342	0.0910551	0.0683853	-0.1314801
22-OJTDAYS	0.0452137	0.0077216	0.0639062	0.1036871	-0.1013405
23-OCC31	0.0071460	0.0314924	0.0024736	0.0078386	-0.0227305
24-OCC32	-0.0152878	0.0250518	0.0046157	0.0458006	-0.0085600
25-OCC33	-0.0184579	0.0064394	-0.0102292	-0.0215158	0.1000057
26-OCC34	-0.0112528	0.0297015	-0.0565828	0.0413198	0.0586464
27-OCC41	0.0088847	-0.0158995	0.0257572	0.0467820	-0.0616696
28-OCC42	0.0025761	-0.0355775	-0.0079565	0.0804282	-0.1022591
29-OCC43	0.0366065	0.0277528	0.0462433	0.0665893	0.0005502
30-OCC44	-0.0200528	0.0548726	0.0291782	-0.0330448	0.1152739
31-OCC51	-0.0258224	-0.0020066	-0.0306114	-0.0446067	0.0218976
32-OCC52	0.0348472	0.0041612	0.0116193	-0.1071781	-0.0756063
33-OCC53	0.0276127	-0.0055698	-0.0120111	-0.0478157	0.0267685
34-OCC54	-0.0421651	-0.0806923	-0.0346501	-0.0463591	-0.0225054

	16-PART-TIME	17-UNEMPL	18-PIECE-RATE	19-NODAYWORK	20-UNION
16-PART-TIME	1.0000000				
17-UNEMPL	0.0716261	1.0000000			
18-PIECE-RATE	0.0268581	0.0366651	1.0000000		
19-NODAYWORK	0.0921126	-0.0097071	0.0847289	1.0000000	
20-UNION	-0.1841210	0.0035409	0.0423419	-0.0117302	1.0000000
21-OJT	-0.1112178	-0.1832793	-0.1459447	-0.1134406	0.0593449
22-OJTDAYS	-0.0853202	-0.1270076	-0.0971172	-0.1035529	0.0650872
23-OCC31	-0.0057380	-0.0340931	-0.0272326	-0.0252894	-0.1185078
24-OCC32	-0.0320578	-0.0278779	-0.0331718	-0.0630193	-0.0570646
25-OCC33	0.0514367	-0.0184186	-0.0398972	-0.0961505	0.0609041
26-OCC34	-0.0313076	-0.0785026	-0.0598584	-0.0579187	-0.0126409
27-OCC41	-0.0430414	-0.0356767	-0.0350569	-0.0109010	0.0320302
28-OCC42	-0.0047179	-0.0382355	-0.1038346	-0.1315688	-0.1093761
29-OCC43	-0.0114382	-0.0677988	-0.0840675	-0.1644920	0.0263718
30-OCC44	-0.0208119	0.0390273	-0.1022657	0.2302450	0.0654381
31-OCC51	0.0507320	0.0494058	-0.0229807	-0.0232627	-0.0567444
32-OCC52	-0.0806939	0.0736839	0.5007310	0.0219320	0.1011277
33-OCC53	-0.0156314	0.0754899	-0.0101952	0.0389641	0.0298890
34-OCC54	0.1391347	0.0474718	-0.0087405	0.1569740	-0.0585019
	21-OJT	22-OJTDAYS	23-OCC31	24-OCC32	25-OCC33
21-OJT	1.0000000				
22-OJTDAYS	0.6195692	1.0000000			
23-OCC31	0.0414750	0.0376494	1.0000000		
24-OCC32	0.0612941	0.0845744	-0.0130111	1.0000000	
25-OCC33	0.0836649	0.0591423	-0.0231590	-0.0282096	1.0000000
26-OCC34	0.1491913	0.1315745	-0.0267783	-0.0326183	-0.0580586
27-OCC41	0.0327013	0.0326516	-0.0217139	-0.0264495	-0.0470784
28-OCC42	0.0355158	0.0004894	-0.0526170	-0.0640921	-0.1140800
29-OCC43	0.0708041	0.0973383	-0.0401013	-0.0488469	-0.0869444
30-OCC44	0.0514792	-0.0035312	-0.0484506	-0.0590170	-0.1050467
31-OCC51	-0.0318449	-0.0237201	-0.0090138	-0.0109797	-0.0195431
32-OCC52	-0.1998334	-0.1207439	-0.0355291	-0.0432775	-0.0770313
33-OCC53	-0.1156388	-0.0815159	-0.0250197	-0.0304762	-0.0542457
34-OCC54	-0.1165563	-0.1149205	-0.0408962	-0.0498151	-0.0886678
	26-OCC34	27-OCC41	28-OCC42	29-OCC43	30-OCC44
26-OCC34	1.0000000				
27-OCC41	-0.0544359	1.0000000			
28-OCC42	-0.1319087	-0.1069617	1.0000000		
29-OCC43	-0.1005323	-0.0815194	-0.1975371	1.0000000	
30-OCC44	-0.1214636	-0.0984921	-0.2386652	-0.1818953	1.0000000
31-OCC51	-0.0225973	-0.0183237	-0.0444018	-0.0338402	-0.0408859
32-OCC52	-0.0890699	-0.0722248	-0.1750145	-0.1333848	-0.1611562
33-OCC53	-0.0627234	-0.0508609	-0.1232459	-0.0939301	-0.1134868
34-OCC54	-0.1025250	-0.0831352	-0.2014525	-0.1535342	-0.1855007
	31-OCC51	32-OCC52	33-OCC53	34-OCC54	
31-OCC51	1.0000000				
32-OCC52	-0.0299818	1.0000000			
33-OCC53	-0.0211133	-0.0832205	1.0000000		
34-OCC54	-0.0345109	-0.1360287	-0.0957919	1.0000000	

Table E. Comparison of regression results for the extended human capital earnings specification using data comprising (1) sample employees with above-minimum hourly earnings (2) all sample employees with positive earnings: maximum likelihood estimates of the probit equation¹

Variable	(1)	(2)
CONSTANT	-5.93550** (.54834)	-5.66469** (.53296)
MALE	0.23448** (.04101)	0.22364** (.04041)
AGE	0.37792** (.04705)	0.36459** (.04589)
AGE ²	-0.00576** (.00124)	-0.00555** (.00122)
AGE ³	0.00001 (.00001)	0.00001 (.00001)
MARRIED	0.28802** (.04885)	0.28006** (.04820)
CHILD ⁰⁻¹⁷	0.00971 (.05433)	0.02056 (.05393)
SOUTH	0.38344** (.03931)	0.36068** (.03850)
BASIC	-0.31403** (.04236)	-0.27998** (.04157)
Number of obs.	6018	6163

¹ Standard errors are given in parentheses below the estimates.

** Significant at a 1 % risk level.

* Significant at a 5 % risk level.

Table F. Comparison of regression results for the extended human capital earnings specification using different definitions of the dependent variable, male employees¹

Variable	Definition of dependent variable ²			
	(1)	(2)	(3)	(4)
CONSTANT	3.29887** (.04350)	3.30375** (.04459)	3.27241** (.04344)	3.27607** (.04291)
S	0.08865** (.00379)	0.09045** (.00385)	0.08824** (.00374)	0.08710** (.00371)
EXP	0.02015** (.00319)	0.01967** (.00328)	0.02010** (.00317)	0.02037** (.00314)
EXP ²	-0.00030** (.00008)	-0.00029** (.00008)	-0.00030** (.00008)	-0.00030** (.00008)
MARRIED	0.07470** (.02194)	0.07753** (.02226)	0.07414** (.02177)	0.07312** (.02171)
CHILD ⁰⁻⁶	-0.01311 (.02063)	-0.01353 (.02072)	-0.01382 (.02043)	-0.01370 (.02045)
CHILD ⁷⁻¹⁷	0.05503** (.01833)	0.05730** (.01844)	0.05377** (.01814)	0.05305** (.01817)
TEMPEMPL	-0.06272** (.02552)	-0.06612** (.02609)	-0.06306** (.02544)	-0.06380** (.02509)
PART-TIME	0.19858** (.03558)	0.19493** (.03643)	0.22898** (.03520)	0.22123** (.03482)
PIECE-RATE	0.05522* (.02414)	0.05806** (.02424)	0.05505* (.02380)	0.05051* (.02366)
NODAYWORK	0.04469** (.01756)	0.04038* (.01803)	0.04555** (.01747)	0.05048** (.01729)
UNEMPL	-0.07424** (.02322)	-0.07532** (.02364)	-0.07602** (.02292)	-0.07642** (.02273)
CAPITAL	0.13797** (.01646)	0.14955** (.01662)	0.13745** (.01623)	0.13834** (.01618)
SIGMA(ϵ)	0.30391** (.00357)	0.30761** (.00362)	0.30050** (.00352)	0.29971** (.00351)
RHO(ϵ, μ)	0.10793 (.12409)	0.09685 (.12575)	0.09959 (.12658)	0.11107 (.12437)
Log-Likelihood	-1557.6	-1581.3	-1536.6	-1530.8
Mean of lnEARN	3.8147	3.8230	3.7857	3.7896

¹ Standard errors are given in parentheses below the estimates. Maximum likelihood estimates corrected for selectivity bias, where $SIGMA(\epsilon)$ is the standard error of the disturbance term in the earnings equation and $RHO(\epsilon, \mu)$ measures the correlation between the error term (ϵ) in the earnings equation and the error term (μ) in the selection (probit) equation. The corresponding probit estimates are identical in all four cases and can be found in column (1) of Table I below.

- ²
- (1) Annual wage/salary income divided with the annual amount of normal working hours (adopted definition).
 - (2) Annual wage/salary income inclusive of the tax value of fringe benefits divided with the annual amount of normal working hours.
 - (3) Annual wage/salary income divided with the annual amount of normal working hours supplemented with an estimate of annual overtime hours worked (Method I).
 - (4) Annual wage/salary income divided with the annual amount of normal working hours supplemented with an estimate of annual overtime hours worked (Method II).

** Significant at a 1 % risk level.

* Significant at a 5 % risk level.

Table G. Comparison of regression results for the extended human capital earnings specification using different definitions of the dependent variable, female employees¹

Variable	Definition of dependent variable ²			
	(1)	(2)	(3)	(4)
CONSTANT	3.22148** (.04519)	3.22870** (.04550)	3.20825** (.04471)	3.20547** (.04468)
S	0.08120** (.00461)	0.08131** (.00464)	0.08038** (.00455)	0.08061** (.00455)
EXP	0.01477** (.00333)	0.01450** (.00336)	0.01488** (.00330)	0.01491** (.00330)
EXP ²	-0.00018* (.00009)	-0.00018* (.00009)	-0.00018* (.00009)	-0.00018* (.00009)
MARRIED	-0.01569 (.01938)	-0.01390 (.01946)	-0.01550 (.01919)	-0.01537 (.01920)
CHILD ⁰⁻⁶	0.03060* (.01778)	0.03132* (.01794)	0.02950* (.01760)	0.03168* (.01762)
CHILD ⁷⁻¹⁷	0.00299 (.01822)	0.00394 (.01831)	0.00230 (.01804)	0.00247 (.01807)
TEMPEMPL	0.08987** (.02073)	0.08901** (.02089)	0.08878** (.02061)	0.08996** (.02061)
PART-TIME	0.30025** (.01998)	0.30920** (.02013)	0.31463** (.01972)	0.31378** (.01973)
PIECE-RATE	-0.02879 (.03140)	-0.03257 (.03170)	-0.02578 (.03102)	-0.02825 (.03101)
NODAYWORK	0.11245** (.01605)	0.10785** (.01620)	0.11200** (.01595)	0.11365** (.01598)
UNEMPL	-0.06498** (.02193)	-0.06576** (.02220)	-0.06234** (.02177)	-0.06271** (.02168)
CAPITAL	0.12549** (.01866)	0.12818** (.01878)	0.12383** (.01850)	0.12404** (.01858)
SIGMA(ϵ)	0.31538** (.00298)	0.31746** (.00302)	0.31315** (.00297)	0.31311** (.00293)
RHO(ϵ, μ)	-0.00849 (.09431)	-0.00965 (.09422)	-0.00877 (.09413)	-0.00192 (.09434)
Log-Likelihood	-2115.7	-2128.8	-2101.6	-2101.4
Mean of lnEARN	3.6260	3.6318	3.6125	3.6126

-
- ¹ Standard errors are given in parentheses below the estimates. Maximum likelihood estimates corrected for selectivity bias, where $SIGMA(\epsilon)$ is the standard error of the disturbance term in the earnings equation and $RHO(\epsilon, \mu)$ measures the correlation between the error term (ϵ) in the earnings equation and the error term (μ) in the selection (probit) equation. The probit estimates are approximately identical in all four cases. The probit estimates corresponding to the regression results in column (1) are reported in column (1) of Table J below.
- ² (1) Annual wage/salary income divided with the annual amount of normal working hours (adopted definition).
(2) Annual wage/salary income inclusive of the tax value of fringe benefits divided with the annual amount of normal working hours.
(3) Annual wage/salary income divided with the annual amount of normal working hours supplemented with an estimate of annual overtime hours worked (Method I).
(4) Annual wage/salary income divided with the annual amount of normal working hours supplemented with an estimate of annual overtime hours worked (Method II).
- ** Significant at a 1 % risk level.
* Significant at a 5 % risk level.

Table H. Comparison of regression results for the extended human capital earnings specification using alternative definitions of total years of labour market experience: maximum likelihood estimates of the probit equation for the whole estimating data¹

Variable	Definition of total work experience ²		
	EXP ^{adj.} (1)	EXP ^{unadj.} (2)	EXP ^{pot.} (3)
CONSTANT	-5.93550** (.54834)	-5.93550** (.54851)	-5.54439** (.43940)
MALE	0.23448** (.04101)	0.23448** (.04101)	0.24904** (.03999)
AGE	0.37792** (.04705)	0.37792** (.04707)	0.36658** (.03751)
AGE ²	-0.00576** (.00124)	-0.00576** (.00124)	-0.00587** (.00099)
AGE ³	0.00001 (.00001)	0.00001 (.00001)	0.00002* (.00001)
MARRIED	0.28802** (.04885)	0.28802** (.04886)	0.28501** (.04723)
CHILD ⁰⁻¹⁷	0.00971 (.05433)	0.00971 (.05435)	0.01315 (.05102)
SOUTH	0.38344** (.03931)	0.38344** (.03931)	0.24348** (.03450)
BASIC	-0.31403** (.04236)	-0.31403** (.04238)	-0.39358** (.03804)
Number of obs.	6018	6018	6018

¹ Standard errors are given in parentheses below the estimates.

² EXP^{adj.} = self-reported total years of labour market experience checked against the individual's age, years of formal schooling, and pre-school years.
 EXP^{unadj.} = self-reported total years of work experience.
 EXP^{pot.} = physical age minus the sum of formal schooling and pre-school years.

** Significant at a 1 % risk level.

* Significant at a 5 % risk level.

Table I. Comparison of regression results for the extended human capital earnings specification using alternative definitions of total years of labour market experience: maximum likelihood estimates of the probit equation for all sample males*

Variable	Definition of total work experience		
	EXP ^{adj.} (1)	EXP ^{unadj.} (2)	EXP ^{pot.} (3)
CONSTANT	-6.71548** (.82946)	-6.71548** (.82924)	-6.78178** (.83160)
AGE	0.47329** (.07211)	0.47329** (.07209)	0.47920** (.07227)
AGE ²	-0.00864** (.00193)	-0.00864** (.00193)	-0.00875** (.00194)
AGE ³	0.00004** (.00002)	0.00004** (.00002)	0.00004** (.00002)
MARRIED	0.56403** (.07932)	0.56403** (.07933)	0.56272** (.07885)
CHILD ⁰⁻¹⁷	0.34189** (.09279)	0.34189** (.09281)	0.32873** (.09243)
SOUTH	0.35321** (.06102)	0.35321** (.06103)	0.32565** (.06058)
BASIC	-0.29308** (.06484)	-0.29308** (.06484)	-0.30540** (.06433)
Number of obs.	2825	2825	2825

* For notes, see Table H.

Table J. Comparison of regression results for the extended human capital earnings specification using alternative definitions of total years of labour market experience: maximum likelihood estimates of the probit equation for all sample females*

Variable	Definition of total work experience		
	EXP ^{adj.} (1)	EXP ^{unadj.} (2)	EXP ^{pot.} (3)
CONSTANT	-5.57443** (.76130)	-5.54410** (.76056)	-4.77974** (.56664)
AGE	0.34700** (.06504)	0.34409** (.06499)	0.31856** (.04807)
AGE ²	-0.00465** (.00171)	-0.00457** (.00171)	-0.00487** (.00124)
AGE ³	0.000003 (.000014)	0.000002 (.000014)	0.00001 (.00001)
MARRIED	0.08292 (.06519)	0.08289 (.06520)	0.11381* (.06250)
CHILD ⁰⁻¹⁷	-0.18410** (.06858)	-0.18429** (.06859)	-0.06440 (.06325)
SOUTH	0.39742** (.05258)	0.39809** (.05259)	0.23509** (.04400)
BASIC	-0.32651** (.05756)	-0.32237** (.05757)	-0.43972** (.04974)
Number of obs.	3193	3193	3193

* For notes, see Table H.

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