The labour market by education and occupation to 1994. Prototype

THE LABOUR MARKET BY EDUCATION AND OCCUPATION TO 1994

-Prototype-

ROA-R-1991/5E

RESEARCH CENTRE FOR EDUCATION AND THE LABOUR MARKET

Faculty of Economic Science
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CONTENTS

PREFACE

The Research Centre for Education and the Labour Market (ROA) is developing the Information System for Education and Labour Market, on behalf of the Ministry of Education and Science. This system is intended to provide up-to-date information about the labour market in relation to education, and short and medium-term forecasts of the disequilibrium between the two sub-systems. One important application of this information system is the Information System on Education and Employment, I-See!. This system is a project of the National Career Guidance Information Centre (LDC). I-See! contains a considerable amount of data, on CD-ROM, about more than 17,000 educational possibilities and around 1,500 occupations. This data has been combined, in I-See!, with the labour market information which ROA provides about occupations and educational possibilities. Thus an important information need in the field of study and occupational choice is satisfied.

However ROA's Information System for Education and the Labour Market has broader application possibilities. This programming year ROA has initiated some projects intended to extend the information system's application possibilities and relevance to policy[1]. One of these projects involves examining the possibility of regionalizing the information system, so that a contribution can be made to the needs of regional labour exchanges and trade and industry, and provincial and municipal authorities, for data at a regional level. Another project concerns the development of a report for policy-makers. This report, in which the most important data in the information system are further analyzed, would appear with up-dated forecasts every two years.

The present analysis is a prototype for this policy-orientated report. It is intended to support policy-making by government, labour exchanges, unions and employers, and organizations in the educational field. The report includes ROA's forecasts for the period 1989-1994. After evaluation by the main users, the report will receive a more definitive form at the end of 1991, using forecasts which will be completely up-dated then.

The Information System for Education and the Labour Market was constructed under the direction of Prof. Dr. J.A.M. Heijke and Dr. A. de Grip. The data from this information system has been the basis of the present report. Within ROA, Dr. R.K.W. van der Velden was responsible for the analyses done specifically for this report, and for the final wording.

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1. See ROA (1990), *Het informatiesysteem onderwijs-arbeidsmarkt, onderzoekprogramma 1990/1991*, Maastricht (ROA-R-1990/4).

Contributions were made by Drs. Th.B.J. Beekman, Drs. R.J.P. Dekker, Dr. A. De Grip and Drs. P. van de Loo, while P. Ghijsen assisted in the data processing.

Maastricht, August 1991.

Prof. Dr. J.A.M. Heijke
Director.

1. INTRODUCTION

This report is based on the data that is or will soon become available from the Information System for Education and the Labour Market, developed by ROA under contract from the Ministry of Education and Science. The report is intended to indicate the main trends in the labour market, accentuating the quantitative match of education and occupation and the changes which can be expected in this balance. The report is meant in the first place for policy-makers concerned with this issue: government, labour exchanges, education authorities and unions and employers' organisations.

The report gives a description of the most important developments on the labour market and deals with a number of relevant themes. In contrast to other Dutch labour market reports,[2] it concentrates on forecasts of the relationship between education and the labour market, and supplies information at a low level of aggregation.

The Information System distinguishes 21 sectors, 77 occupational classes and 54 types of education. The economic sectors are based on the classification used by the Central Planning Bureau (CPB) in the Central Economic Plan. The occupational classes follow the 2-digit level of the occupational classification used by the CBS (Central Bureau of Statistics)[3]. The types of education were divided on the basis of the Standard Educational Classification (3 digit) into 54 types of education relevant to the labour market.

No occupational or educational forecasts from third parties were included in this report because, at the low aggregation level used here, this would not be possible for the full width of the labour market. However, the working group "comparison and coordination of forecasts '89" of the interdepartmental Commission of Education and Labour Market Forecasting (OAP) has compared forecasts for the period 1985-1992 from the CPB, the Ministry of Education and Science, ROA, and others, admittedly at a much higher level of aggregation. They concluded

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2. See *Rapportage Arbeidsmarkt* (Reporting on the Labour Market) by the Ministry of Social Affairs and Employment, the *Trendrapport* (Trend Report) by the Organisation of Labour Market Research (OSA), and the Central Planning Bureau's *Toekomstverkenningen* (Future Exploration).

3. As of the end of this year, a new occupational classification better suited to the analysis of matching problems will be used. This new classification is based on the training characteristics of those working in a particular occupational group (See Dekker, De Grip and Van de Loo, 1990).

that the most important trend forecasts agreed with one another, and differences, if any, could be traced to the methodology used [Commission OAP, 1989].

The forecasts of others, as well as the internal evaluation[4], can of course give reason for adjusting our own forecasting models. Thus, as a result of the work of the CPB [Kuhry and Van Opstal, 1987] the possibility of modelling changes in employment by occupation and education using a multinominal logit-model was examined [Peeters, 1990]. In addition, achieving compatibility with existing CPB forecasts of changes in employment by sectors and with the 'SKILL' forecasts of the number of school leavers from fulltime education[5] is given a high priority in ROA's working guidelines.

The structure of the rest of the report is as follows. Section 2 gives a general impression of the main flows in the labour market. In section 3 the future demand and supply on the labour market are compared and the market position of occupational classes and types of education is gone into. Section 4 analyses structural shifts between 1979 and 1994, by sector and occupation as well as by types of education. Finally, section 5 considers the position of women in the labour market. The appendices contain detailed statistical information on the occupational classes and types of education that are distinguished in the report.

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4. The set up of the information system can be traced in the various reports of ROA's work. Recently an initial evaluation report appeared, which examines the methods used in the different parts of the information system and makes a first evaluation of the forecasting results.

5. Responsibility for the SKILL forecasts has recently been transferred to the Ministry of Education and Science.

2. FLOWS IN THE LABOUR MARKET

2.1. Introduction

Labour market forecasts can be divided into those relating to a given moment in the future and those relating to a future period. The latter approach, called the 'flow figures' approach, makes a more discerning description of the various underlying demand and supply factors possible. This is the approach chosen for the ROA information system. On the demand side, a distinction is made between expansion demand, which is due to changes in the level of employment for a certain occupation or type of education, and replacement demand, which is due to permanent or temporary retirement, mobility within the labour market, and so on. Matching this on the supply side of the labour market is the expected flow of school leavers[6] onto the labour market and the reservoir of the long and short-term unemployed (see diagram 2.1).

The forecasts relate to the period 1989-1994. The employment forecasts of the Central Planning Bureau (CPB), for 21 economic sectors, were the starting point. These forecasts are expressed in terms of labour volume. On the basis of an estimate by the CPB of the expected increase in part-time work, these forecasts can be expressed in terms of numbers of working persons. The employment level for each economic sector that is thus obtained is then converted into the expected changes in employment for 77 occupational classes. This calculation is based on ROA's occupational model, with which the occupational structure of economic sectors can be forecast. Changes in the occupational structure are explained by means of technological development, trade cycle factors, and structural or long-term trend effects (see also Dekker, De Grip and Heijke, 1990). In this way the expected expansion demand (the change in employment levels) for each occupational class can be determined.

The replacement demand for each occupational class is determined by means of a cohort analysis of the outflows, by sex and age class, for every occupational class. The outflows for each age group over the analysis period are then corrected for cyclical effects on staff turnover during this period (the flow of working people to unemployment). On top of that, a correction is made for expected changes in the total participation rate for each sex and age group (see Willems and De Grip, 1990).

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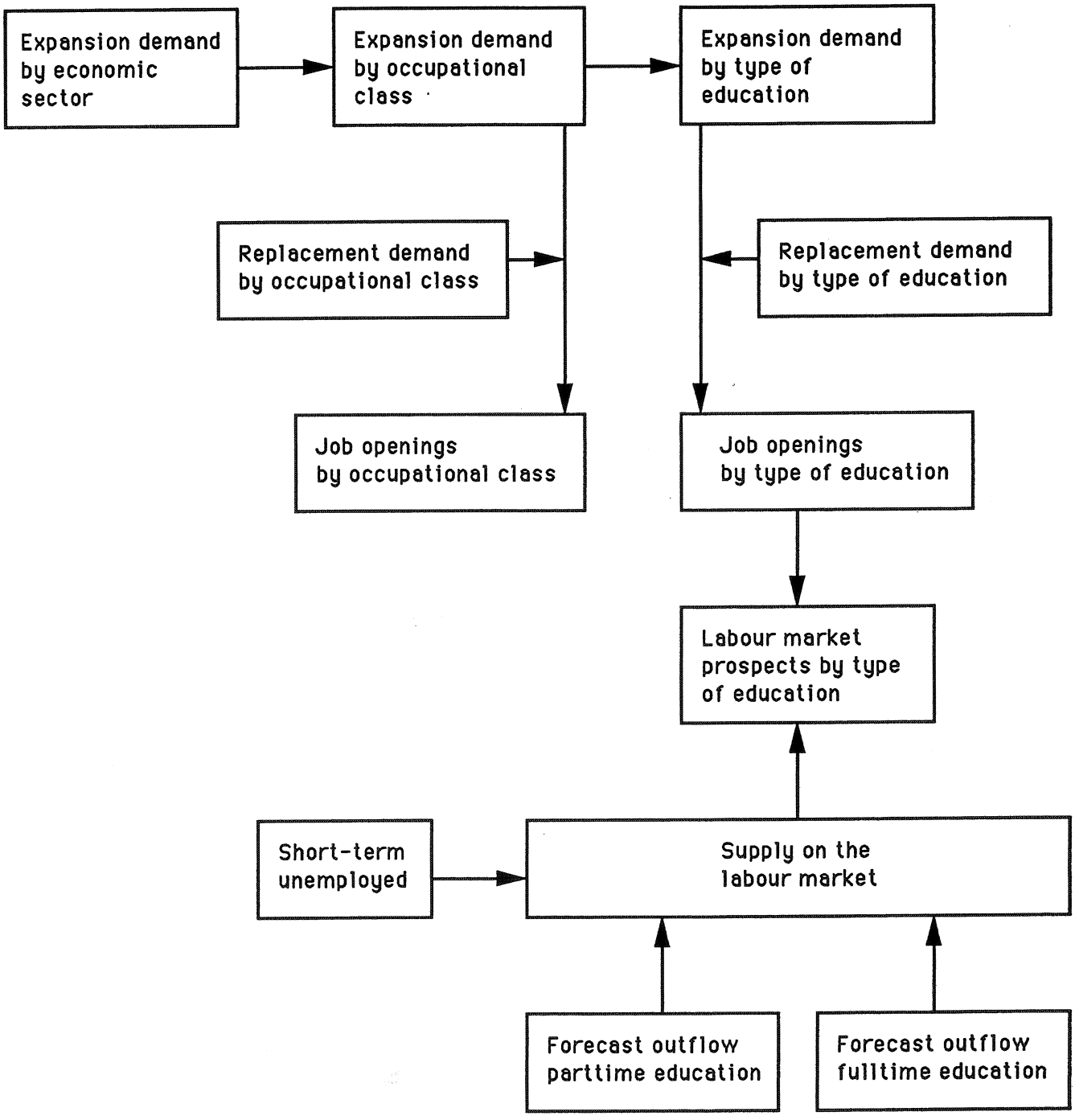
6. The term 'school leavers' is used throughout to include graduates from tertiary education and technical institutes.

Figure 2.1. Supply and demand on the labour market



The expansion demand and the replacement demand together give the number of job openings per occupational class expected for the forecasting period.

The expected expansion demand per type of education is determined with the aid of the ROA model for types of education (see also Beekman, Dekker, De Grip and Heijke, 1989). This model analyses changes in the educational structure of occupational classes at economic sector level. Changes are explained on the basis of demand factors (technological development) and supply factors (substitution or displacement). Technological developments can explain an elevation (upgrading) or lowering (downgrading) of the skill level required to practice a certain occupation. The skills actually demanded on the labour market is also influenced by the relative scarcity of the different educational categories. By adjusting the relative reward or otherwise, an increasing supply of a certain educational category will, through this substitution mechanism, also lead to an increasing demand for this type of education.

The forecast of the expansion demand for each type of education is complemented by a forecast of replacement demand. The procedure is similar, but occupational mobility does not influence the replacement demand for a given type of education. In general, the replacement demand by types of education is therefore lower than the replacement demand by occupational classes. (see Willems and De Grip, 1990).

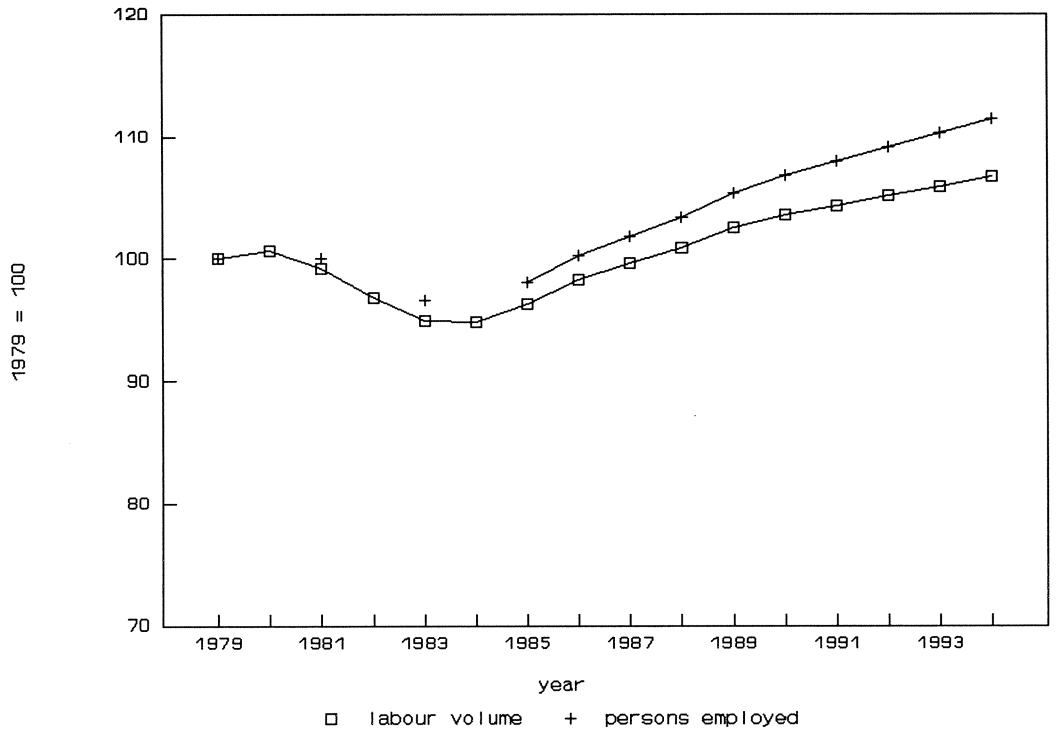
The job openings for each type of education (the sum of the expansion demand and the replacement demand) are then matched with the forecast flow of school leavers onto the labour market. This supply-side forecast is set up with the aid of the forecasts of the Ministry of Education and Science and various other data on the expected flow from part-time education (see also De Grip, Dekker and Heijke, 1989). In the final comparison of demand and supply for each type of education, the calculated flows are converted back into static figures, in which the population already working and the number of short-term unemployed at the beginning of the forecasting period are also taken into account. On the basis of this comparison, statements are made about the expected labour market prospects for each type of education.

In this section, the expansion demand and the replacement demand for occupational classes and for types of education will be discussed. Furthermore, the data on the expected flow of school leavers onto the labour market will be presented. The comparison of the two sets of data will follow in the next section.

2.2. Expansion demand, replacement demand and outflow

Figure 2.2 shows changes in total employment in the Netherlands for the period of 1979 - 1994. The data here refer to the figures of the CPB, as revised by ROA.

Figure 2.2. General development in employment



Source: CPB/ROA

In 1979 a total of over 5.2 million persons were working. After a decline in the early eighties, the total employment rises again from 1984 by an average of 1.8% per year. A further increase in the number working is forecast for the period 1989-1994. In all, an increase of 315,000 persons is expected. However, the growth rate will fall to 1.1% per year.

Relatively less favourable changes are expected in the labour volume: the decline in the early eighties has been stronger than was the case for the number of working persons, and the growth from the mid eighties has been less strong. The difference between the two developments is of course related to the increasing numbers of those working part-time.

Table 2.1 shows how the labour volume has developed in the different sectors. The figures are based on CPB data. The table shows the average yearly growth rates in three periods, 1979-1985, 1985-1989 and 1989-1994, roughly corresponding with three trade cycle phases: a period of strong economic decline (until 1984), a period of strong economic growth (until 1989) and the forecasting period, for which moderate growth is forecast.

Table 2.1. Change in labour volume by sector 1979-1994 (average yearly growth rates)

		1979/85 %	1985/89 %	1989/94 %
1	Agriculture, fishing, forestry	-0.5	-0.5	-0.5
2	Manufacture of foodstuffs, beverages, tobacco products	-1.5	-0.2	-1.0
3	Manufacture of textiles, waering apparel, leather and footwear	-5.6	0.5	-0.9
4	Manufacture of wood and building materials	-4.0	3.0	0.0
5	Manufacture of paper and printing and publishing industries	-1.2	2.4	0.0
6	Chemical industry and manufacture of rubber and plastic products	0.0	2.3	1.6
7	Basic metal industries	-0.5	0.0	0.2
8	Manufacture of metal products, mechanical and instrument engineering	-1.8	1.5	0.5
9	Electrical engineering	-1.5	0.0	0.2
10	Manufacture of transport equipment	-2.6	-0.8	0.2
11	Mining and quarrying	1.0	0.5	0.1
12	Electricity, gas and water	1.0	0.5	0.1
13	Construction	-4.5	2.6	-0.2
14	Trade	-1.0	2.5	2.2
15	Sea and air transport	0.4	2.2	1.3
16	Transport storage and communication	0.4	2.2	1.3
17	Banking and insurances	0.7	1.4	1.7
18	Other private services	0.6	3.4	1.8
19	Medical and veterinary services	1.7	1.5	0.7
20	Other public services	1.4	1.5	0.9
21	Public administration and education	0.8	0.4	-0.1
Total		-0.6	1.6	0.8

Source: CPB/ROA

The recession in the early eighties had an especially unfavourable effect on the textile and clothing industry, the lumber and construction materials industry and the building industry. The non-commercial sector (including government), and in particular medical and veterinary services and the 'miscellaneous' non-commercial services, had growing labour volume in this period. The picture in the second half of the eighties is different. Sectors that strongly profited from the economic growth were: miscellaneous tertiary services and house construction, the lumber and construction materials industry, trade, the building industry and the paper and printing industry.

For the forecasting period the differences in the change in the labour volume between sectors are less striking. For the food and confectionary industry, the textile and clothing industry, and for agriculture and fisheries a slight decline in the labour volume is expected. Growth sectors are in trade, other tertiary services and construction, the banking and insurance industry, the chemical industry, the transport sector and the non-commercial sector (which includes government).

Table 2.2. Strongly growing occupational classes in the period 1989-1994

Absolute

CBS	Occupational class	number	%
97	Freight handlers, packers & construction machine operators	46600	25
08	Programmers, statisticians, and assistants etc.	45400	57
21	Company directors and senior executives	42300	20
48	Shop assistants etc.	29700	10
37	Postal workers and mail clerks	22000	36
02/03	Architects, engineers and related technicians	21200	11
06/07	Medical, dental pharmaceutical and veterinary professions and assistants	20200	7
33	Bookkeepers, cashiers, etc.	12600	4
43	Working proprietors, retail	12300	12
39	Miscellaneous administrative personnel	10700	3

Relative

CBS	Occupational class	number	%
08	Programmers, statisticians, and assistants etc.	45400	57
37	Postal workers and mail clerks	22000	35
15	Authors, journalists etc.	7400	26
97	Freight handlers, packers and construction machine operators	46600	25
21	Company directors and senior executives	42300	20
43	Working proprietors, retail	12300	12
40	Managers, wholesale	4600	12
42	Working proprietors, wholesale	3500	12
41	Managers, retail	2100	12
02/03	Architects, engineers and related technicians	21200	11

Table 2.2 shows which occupational classes profit most from the growth in employment in the period 1989-1994. The top part of the table indicates which occupational classes will grow the most in absolute terms. The bottom part indicates which occupational classes will have the greatest relative growth. The increase in employment is expressed as a percentage of the number of working persons in that particular occupational class in 1989.

Occupational classes with a very strong absolute growth are the freight handlers, packers and construction machine operators, the programmers, statisticians and assistants, and the company directors and senior executives. The growth in these three occupational classes (a total of 135,000 persons) accounts for over 40% of the total growth in employment in this period. Other strongly growing occupational classes are shop assistants, postal workers and mail clerks, architects, engineers and related technicians, and medical, dental, pharmaceutical and veterinary professions and their assistants. For the latter occupational class, however, the growth is, in relation to the size of the occupation, not so strong. The same applies to bookkeepers, cashiers and miscellaneous administrative personnel. There are only six occupational classes that could be called 'occupational winners' (De Grip, 1987) in both an absolute and a relative sense. Smaller occupational classes with good relative growth are the authors and journalists and working proprietors in the retail and wholesale trades.

Table 2.3. Strongly declining occupational classes in the period 1989-1994

CBS	Occupational class	number	%
45	Departmental managers, purchasing and sales	-7100	-18
83	Blacksmiths, toolmakers, and miscellaneous metalworkers	-3900	-14
61	Farmers	-3500	-3
38	Radio, telephone and telegraph operators	-3300	-23
80	Shoemakers and leather goods workers	-3290	-5
95	Building trades and construction workers	-3200	-2
62	Agricultural workers	-2300	-2
92	Printers and related functions	-2100	-5
98	Drivers, sailors, engine drivers	-1400	-1
85	Electrical and electronics workers, etc.	-1100	-1

Table 2.3. shows which occupational classes will decline rapidly, according to the forecast. Comparing the figures to those of table 2.2, the first thing one notices is that the figures for growth are far more spectacular than the figures for decline. A relatively strongly declining occupational class is that of departmental managers in purchasing and sales, which is remarkable because the other management occupations belong to the growth group. Other declining groups are connected mainly to traditional occupations in industry and to agriculture. The table also indicates the relative rates of decline, strongest among radio, telephone and telegraph operators, departmental managers in purchasing and sales, and blacksmiths, toolmakers, and miscellaneous metal workers. For the other occupational classes mentioned, the decline amounts to only a few percent.[7]

7. There are other occupational classes with a strong relative decline, but these are very small occupational classes, so that these forecasts have little significance.

Table 2.4. Occupational classes with a high replacement demand in the period 1989-1994

Absolute

CBS	Occupational class	number	%
48	Shop assistants etc.	55200	19
39	Miscellaneous administrative personnel	48100	12
33	Bookkeepers, cashiers, etc.	38300	13
32	Secretaries, typists, etc.	27300	18
13	Teachers	25300	8
54	Miscellaneous domestic, geriatric care, and hotel workers	25300	15
62	Agricultural workers	24300	18
83	Blacksmiths, toolmakers, and miscellaneous metalworkers	23500	14
96	Machine operators	22500	12
06/07	Medical, dental pharmaceutical and veterinary professions and assistants	22100	8

Relative

CBS	Occupational class	number	%
69	Military professionals	9300	22
64	Fishermen, hunters, etc.	800	22
60	Farm managers and supervisors	1600	21
38	Radio, telephone and telegraph operators	2900	20
72	Furnace, casting, and galvanising workers, etc.	2000	20
14	Ministers of religion, etc.	1700	19
48	Shop assistants, etc.	55200	19
56	Launderers, dry-cleaners and pressers	2000	18
32	Secretaries, typists, etc.	27300	18
62	Agricultural workers	24300	18

The growth in employment is not the only major factor in determining the number of job openings in a particular occupational class. Replacement demand as a result of, for instance, retirement is also very important (see table 2.4). Many of the traditional women's occupations, such as shop assistants, secretaries and typists, miscellaneous administrative personnel, radio, telephone and telegraph operators, domestic, geriatric care and hotel workers, and medical, dental, pharmaceutical and veterinary professions and their assistants, can be found among those occupations with a high replacement demand (see also section 5). As has been mentioned before, some of these occupational classes (shop assistants, medical, dental, pharmaceutical and veterinary professions and assistants and miscellaneous administrative personnel) also have a high absolute expansion demand. In an absolute sense there is also a high replacement demand for bookkeepers and cashiers, teachers, agricultural workers and some industrial occupations. A high relative replacement demand is found among agricultural

workers and military professionals. The other occupational classes with a high relative replacement demand are rather small.

Table 2.5. Occupational classes with a low replacement demand in the period 1989-1994

Absolute

CBS	Occupational class	number	%
78	Tobacco and tobacco product workers	100	4
36	Conductors, transport services	200	7
63	Forestry workers	250	6
31	Senior civil servants	400	2
20	Senior Government appointees	550	11
91	Process workers, paper and card products	600	11
82	Cabinetmakers, woodworkers, stonemasons, etc.	800	4
64	Fishermen, hunters, etc.	800	22
94	Miscellaneous craftsmen and production workers	850	6
89	Glass and ceramics workers etc.	900	10

Relative

CBS	Occupational class	number	%
08	Programmers, statisticians, and assistants, etc.	1600	2
31	Senior civil servants	400	2
15	Authors, journalists, etc.	1100	4
78	Tobacco and tobacco product workers	100	4
81	Cabinetmakers, woodworkers, stonemasons etc.	800	4
99	Miscellaneous labourers	2200	5
63	Forestry workers	250	6
94	Miscellaneous craftsmen and production workers	850	6
37	Postal workers and mail clerks	4000	6
93	Painters	2400	7

These small occupational classes (fishermen and hunters, for instance) are naturally also found in the list of occupational classes with a low replacement demand in the absolute sense (table 2.5.). There are five occupational groups with low absolute and relative replacement demand: tobacco and tobacco product workers, forestry workers, senior civil servants, cabinetmakers, woodworkers and stonemasons and miscellaneous craftsmen and production workers. Groups with a high expansion demand, such as statisticians and programmers and their assistants, authors and journalists, and the postal workers and mail clerks, have a relatively low replacement demand.

Table 2.6. Types of education with a high number of job openings in the period 1989-1994, broken down to replacement demand and expansion demand

Absolute

Type of education	number	%	% replacement demand	% expansion demand
Intermediate Vocational Education, Commerce & Administration	227800	31	15	85
Intermediate Vocational Education, Non-medical Laboratory	103700	18	44	56
Lower General Secondary Education	67000	15	64	36
Lower Vocational Education, Technical	57100	12	100	0
Intermediate Vocational Education, Community Care	41600	29	62	38
Lower Vocational Education, Community Care, Hotel & Catering	41100	18	85	15
Primary Education	39200	6	100	0
Higher General Secondary Education	34500	15	45	55
Higher Vocational Education, Commerce & Administration	34000	24	17	83
Higher Vocational Education, Teacher training	25800	12	68	32

Relative

Type of education	number	%	% replacement demand	% expansion demand
Academic Education, Econometrics & Business Administration Technology	3100	74	5	95
Higher Vocational Education, Business Administration Technology	1500	42	12	88
Academic Education, Economics & Business Administration	10300	35	17	83
Intermediate Vocational Education, Commerce & Administration	227800	31	15	85
Intermediate Vocational Education, Community Care	41600	29	62	38
Lower Vocational Education Transport & Harbour	6200	27	32	68
Higher Vocational Education, Commerce & Administration	34000	24	17	83
Intermediate Vocational Education, Para-medical services	8700	24	60	40
Intermediate Vocational Education, Nursing	20700	21	58	42
Intermediate Vocational Education, Medical Laboratory	4500	21	52	48

Table 2.7. Types of education with a low number of job openings in the period 1989-1994, broken down to replacement demand and expansion demand

Absolute

Type of education	number	%	% replacement demand	% expansion demand
Academic Education, Fine Arts	150	9	55	45
Lower Vocational Education, Security	300	3	100	0
Higher Vocational Education, Interpreter & Translator	350	5	100	0
Academic Education, Pharmacy	500	13	34	66
Academic Education, Agriculture	650	11	53	47
Higher Vocational Education, Theology	700	19	62	38
Higher Vocational Education, Hotel & Catering Industry	750	19	43	57
Higher Vocational Education, Police, Fire & Defence Forces	850	11	66	34
Academic Education, Theology	1300	18	81	19
Higher Vocational Education, Agriculture	1300	11	62	38

Relative

Type of education	number	%	% replacement demand	% expansion demand
Lower Vocational Education, Security	300	3	100	0
Higher Vocational Education, Interpreter & Translator	350	5	100	0
Primary Education	39200	6	100	0
Higher Vocational Education, Fine Arts	1800	7	100	0
Academic Education, Teacher training	1500	7	60	40
Lower Vocational Education, Agriculture	8100	8	100	0
Academic Education, Arts	1700	8	65	35
Academic Education, Fine Arts	150	9	55	45
Intermediate Vocational Education, Administrative, Legal & Fiscal	3800	9	95	5
Academic Education, Law & Public Administration	3300	10	56	44

The expansion demand and replacement demand for each occupational class has been converted by ROA to job openings per type of education. The top part of table 2.6 indicates which types of education have the highest demand in an absolute sense. The bottom part indicates which types of education have the highest demand in a relative sense (compared to

the number of working persons with that particular educational background in 1989).[8] In both relative and absolute terms there are a large number of job openings for Intermediate and Higher Vocational Education (hereafter I.V.E. and H.V.E.) in Commerce & Administration, and for I.V.E. Community Care. For the first two this relates especially to a high expansion demand, for the latter especially to a high replacement demand. Strong demand in the absolute sense is found for technical education at a Lower Vocational Education level (hereafter L.V.E.) and the I.V.E. level, for all the varieties of general secondary education (i.e. Higher General Secondary Education and Lower General Secondary Education), for Primary Education and for teacher training at H.V.E. level. Especially for the lower types of education (L.V.E. Technical and primary education) the job openings consist mostly of replacement demand. A relatively strong demand which does relate principally to expansion demand is found for Academic Education (hereafter A.E.) in Econometrics and Business Administration Technology and in Economics and Business Administration, L.V.E. Transport and Harbour trades, and H.V.E. Business Administration Technology. A relatively high demand relating to both expansion and replacement is found for I.V.E. Para-medical Services, Nursing, and I.V.E. Medical Laboratory.

A limited number of job openings, in a relative as well as absolute sense, may be expected for A.E. Fine Arts, L.V.E. Security Services and H.V.E. Interpreters and Translators (table 2.7). Other types of education for which, relatively seen, few job openings may be expected, are: primary education (which offers, however, many openings in the absolute sense), H.V.E. Fine Arts, A.E. Teacher training, L.V.E. Agriculture, A.E. Arts (i.e., the humanities), I.V.E. Administration Legal and Fiscal, and A.E. Law and Public Administration. The other types of education for which a limited number of job openings in an absolute sense are expected are some of the smaller courses at H.V.E. and academic levels.

These developments all occur on the demand side of the labour market. An understanding of the position of educational categories on the labour market can only be obtained when these data are matched with changes on the supply side of the market. Table 2.8 reviews the types of education which will have a high output of school leavers in the forecasting period, in an absolute sense or as a percentage of the number of working persons with that educational background in 1989.

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8. For those not familiar with the Dutch education system a short explanation may be in order here. The system can be briefly described as divided into a general primary (basic) education and four further levels: lower (L), intermediate (I), Higher (H), and Academic. The lower, intermediate, and higher levels (secondary education) are not consecutive. They amount to an ability streaming system, with some switching possibilities. A great variety of different study 'directions' can be followed through one or more of these levels: the most important being general education and vocational education.

The types of education with high absolute numbers of graduates are especially from Intermediate Vocational Education, general secondary education and also school leavers with only primary education. It should be remembered that school leavers are here divided according to the highest educational certificate they have obtained: the 'school leavers with primary education' are therefore drop-outs from secondary education, rather than students who never attended a secondary school. Types of education with a high relative output, on the other hand, are found especially in academic education and Higher Vocational Education. For a number of these types of education, the number of school leavers who will flow onto the labour market in the forecasting period 1989-1994 is higher or almost as high as the number of people with that educational background who were working in 1989. A very high relative outflow may be expected from the A.E. Fine Arts (an education that offers a very limited number of job openings), and from H.V.E. Business Administration Technology and A.E. Econometrics and Business Administration Technology (two types of education that showed a relatively high number of job openings), and from A.E. Arts.

Table 2.8. Types of education with high flows of school leavers onto the labour market in 1989-1994

Absolute

Type of education	number	%
Intermediate Vocational Education, Non-medical Laboratory	157500	27
Primary Education	142500	23
Intermediate Vocational Education, Commerce & Administration	132800	18
Higher General Secondary Education	126400	54
Intermediate Vocational Education, Community Care	70300	49
Lower Vocational Education, Technical	54200	11
Higher Vocational Education, Teacher training	37900	18
Lower General Secondary Education	37200	8
Intermediate Vocational Education, Agriculture	36700	34
Higher Vocational Education, Technical	35800	31

Relative

Type of education	number	%
Academic Education, Fine Arts	164	3100
Higher Vocational Education, Business Administration Technology	118	4100
Academic Education, Econometrics & Business Administration Technology(ir)	89	3700
Academic Education, Arts	83	18000
Higher Vocational Education, Agriculture	76	9200
Intermediate Vocational Education, Social & Cultural	74	20900
Academic Education Law & Public Administration	73	23500
Academic Education Agriculture	70	4200
Academic Education Economics & Business Administration	68	19700
Higher Vocational Education, Nursing & Physiotherapy etc.	61	28000

The types of education with limited numbers of graduates were chiefly H.V.E. and academic courses (table 2.9). These are mainly rather specific, small-scale courses. In contrast, the types of education with low relative flows of school leavers are mainly varieties of lower and intermediate vocational education. For H.V.E. Interpreters & Translators, A.E. Theology, and L.V.E. Commerce & Administration and L.V.E.. Transport & Harbour trades, the flow onto the labour market is limited in an absolute as well as in a relative sense. For H.V.E. Interpreters & Translators this may compensate for the limited number of job openings, whereas for L.V.E. Transport and Harbour trades, considering the relatively high number of job openings, this may mean that the problems in personnel supply will become more acute. In the next section we will consider the matching of demand and supply further.

Table 2.9. Types of education with a low flow of school leavers to the labour market in 1989-1994

Absolute

Type of education	number	%
Higher Vocational Education, Interpreter & Translator	650	9
Higher Vocational Education, Theology	650	18
Academic Education, Theology	750	10
Lower Vocational Education Transport & Harbour	1000	5
Higher Vocational Education, Police, Fire & Defense Forces	1300	15
Academic Education, Pharmacy	1600	41
Higher Vocational Education, Hotel & Catering Industry	2100	55
Higher Vocational Education, Medical Laboratory	2500	16
Academic Education, Teacher training	2800	14
Lower Vocational Education, Commerce & Administration	2900	3

Relative

Type of education	number	%
Lower Vocational Education, Commerce & Administration	2900	3
Lower Vocational Education, Transport & Harbour	1000	5
Lower General Secondary Education	37200	8
Higher Vocational Education, Interpreter & Translator	650	9
Lower Vocational Education, Community Care, Hotel & Catering	20700	9
Lower Vocational Education, Agriculture	10300	10
Academic Education, Theology	750	10
Intermediate Vocational Education, Administrative, Legal & Fiscal	4300	11
Intermediate Vocational Education, Police, Fire & Defense Forces	6400	11
Lower Vocational Education, Technical	54200	11
Higher Vocational Education, Air, Sea, and Land Transport	3100	12

3. THE MARKET POSITION OF TYPES OF EDUCATION AND OCCUPATIONAL CLASSES

3.1. Introduction

This section will examine the types of education for which shortages or absorption problems are expected. The likelihood of these problems is determined on the basis of the so-called 'indicator of the future labour market situation' (IFL) of an educational variety.[9] For each type of education a comparison is made of the expected demand and supply of new entrants to the market. The supply consists on the one hand of the expected inflow in the period 1989-1994 and on the other hand of the number of unemployed with the same educational background that had been unemployed for less than one year in 1989 (see also diagram 2.1). The exclusion of those unemployed for more than one year is based on the supposition that they do not compete on the labour market with the school leavers of that type of education. Matching this supply, on the demand side of the labour market, is the sum of the expansion and replacement demand. Section 3.2 discusses the labour market indicators of specific types of education. An unfavourable labour market indicator does not automatically mean that school leavers will be confronted with unemployment, any more than a clear demand surplus will automatically lead to unfilled vacancies. The final consequences of a demand or supply surplus depend also on the market position of a particular type of education and occupational class, for instance on whether school leavers can switch to other sectors of the labour market or on the substitution possibilities between the types of education within an occupational class. Section 3.3 therefore looks at the market position of occupational classes, examining which occupational classes run a greater risk of supply problems. Section 3.4 focuses on the market position of the types of education, showing which types of education run a greater risk of absorption problems and which types are in a position to transfer possible problems to other supply categories.

3.2. The labour market prospects: demand and supply compared

The total number of job openings for a type of education, matched with the total supply of that education, gives an indication of the labour market prospects for this education. Table 3.1 shows which types of education are expected to have the best labour market prospects in the

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9. See Wieling, 1990, for an explanation.

period 1989-1994.[10]

Table 3.1. Types of education with favourable labour market prospects in the period 1989-1994

Type of education	indicator of future labour market
Lower Vocational Education, Transport & Harbour	0.84
Intermediate Vocational Education, Commerce & Administration	0.91
Academic Education, Theology	0.95
Intermediate Vocational Education, Transport, Harbour & Telecommunications	0.98
Lower Vocational Education, Community Care, Hotel & Catering	0.99
Higher Vocational Education, Theology	1.00
Higher Vocational Education, Medical Laboratory	1.00
Higher Vocational Education, Commerce & Administration	1.00
Intermediate Vocational Education, Police, Fire & Defense Forces	1.01
Lower General Secondary Education	1.01
Intermediate Vocational Education, Medical Laboratory	1.02
Intermediate Vocational Education, Administrative, Legal & Fiscal	1.02
Higher Vocational Education, Air, Sea and Land Transport	1.04

Types of education with good labour market prospects can be found especially in the following areas: Transport & Harbour, Commerce & Administration, Theology, and Medical Laboratory. If we look at the various levels of education, we see that I.V.E. and H.V.E. are especially well represented. L.V.E. Transport & Harbour trades owes its favourable labour market prospects to a relatively high number of job openings combined with a relatively limited number of school leavers. The Commerce & Administration courses at I.V.E. and H.V.E. level owe their favourable labour market prospects mainly to the high expansion demand in this sector. A relatively high number of job openings is also the main reason for the favourable position of I.V.E. Medical Laboratory. On the other hand, A.E. Theology, L.V.E. Community Care, Hotel & Catering trades, I.V.E. Police, Fire & Defense Forces, I.V.E. Administrative, Legal & Fiscal, and H.V.E. Air, Sea & Land Transport, along with Lower General Secondary Education have good prospects mainly because they have a relatively low outflow. It is remarkable that the technical educational varieties (excluding medical laboratory education) do not figure in this list. It is true that the expansion demand for these branches of study, particularly at H.V.E. and academic level, is relatively high. The replacement demand is relatively low however, while the flow of school leavers is average. The prospects of these types of education are therefore reasonably, rather than highly favourable.

10. The value 1.05 is a balance situation of demand and supply, since the frictional unemployment is set at 5%.

Table 3.2 shows the types of education with relatively unfavourable labour market prospects. The first striking feature is that supply surpluses threaten especially at the highest level (H.V.E. and A.E.) on the one hand and for unqualified people (with only primary education) on the other hand. Fine Arts and Agriculture are under particular threat. H.V.E. Business Administration Technology has a high place in the list, the only technically orientated education to appear there. Its bad labour market prospects are caused especially by the relatively high flow of graduates. This applies also for both of the agricultural courses, I.V.E. Social & Cultural, and A.E. Law & Public Administration. The A.E. Arts and Fine Arts owe their poor prospects to the limited number of job openings as well as to a very high relative outflow. This makes their position especially vulnerable. Finally, for those with Primary Education only, and for H.V.E. Fine Arts, the problem is mainly that the relative demand for these types of school leavers continues to be weak.

Table 3.2. Types of education with unfavourable labour market prospects in the period 1989-1994

Type of education	indicator of future labour market
Academic Education, Fine Arts	2.62
Academic Education, Arts	1.80
Higher Vocational Education, Agriculture	1.64
Academic Education, Agriculture	1.64
Intermediate Vocational Education, Social & Cultural	1.63
Academic Education Law & Public Administration	1.62
Higher Vocational Education, Business Administration Technology	1.55
Primary Education	1.52
Higher Vocational Education, Fine Arts	1.49
Academic Education, Social Sciences	1.48
Higher Vocational Education, Nursing en Physiotherapy etc.	1.47
Higher General Secondary Education	1.43
Lower Vocational Education, Security	1.43

3.3. The market position of occupational classes

The last subsection showed that types of education with good labour market prospects are found especially in the following sectors: Transport & Harbour, Commerce & Administration, Theology, and Medical Laboratories. As for the level of education, I.V.E. and H.V.E. levels had good prospects. Occupational classes that depend largely on these types of education will also run the highest risk of problems in personnel supply. Whether these problems will indeed arise depends on a number of other factors. This subsection will discuss a number of factors that increase or diminish the likelihood of problems. It explicitly does not deal with the balancing of risks for suppliers of labour, but rather examines the risk factors on the demand side and in

particular the degree to which an occupational class is dependent on school leavers, its cyclical sensitivity and the relative prestige of an occupational class.[11] The relative replacement demand which we examined above (see the bottom section of table 2.4) can also indicate a risk factor, that is, in so far as it is related to high turnover in the occupational class. A high turnover can indicate relatively unattractive labour conditions.

Table 3.3. Occupational classes with a relatively high, or with a relatively low proportion of employees under thirty years old

High proportion

CBS	Occupational class	proportion < 30 years old
48	Shop assistants etc.	0.53
58	Fire, police and security officers	0.53
32	Secretaries, typists, etc.	0.52
06/07	Medical, dental, pharmaceutical and veterinary professions and assistants	0.52
54	Miscellaneous domestic, geriatric care and hotel workers	0.50
77	Food and beverage processors, abattoir workers	0.50
78	Tobacco and tobacco product workers	0.49
34	Computer operators etc.	0.48
60	Farm managers and supervisors	0.48
33	Bookkeepers, cashiers, etc.	0.46

Low proportion

CBS	Occupational class	proportion < 30 years old
20	Senior Government appointees	0.00
50	Managers, hotel and catering industry	0.00
31	Senior civil servants	0.02
21	Company directors and senior executives	0.05
40	Managers, wholesale	0.06
14	Ministers of religion etc.	0.09
70	Production supervisors and general foremen	0.10
61	Farmers	0.12
43	Working proprietors, retail	0.12
11	Accountants	0.12

11. As of the coming year we intend, in addition to these risk factors, to look also at the degree to which workers with the various varieties of training offered for a given occupational class can substitute for one-another.

The flow of school leavers onto the labour market will decrease in the early nineties by some 8% (see also section 5, figure 5.5). Because pupils increasingly continue their education for longer, this decrease is less than would be forecast on the basis of demographic developments. The decrease in the outflow is felt especially at the lower levels of vocational and general secondary education, due to the increased shift to continued education. At these levels the decrease in the outflow is about 30%. Occupational classes that are strongly dependent on the flow of school leavers therefore run a greater risk of problems in personnel supply. Table 3.3 indicates the occupational classes in which relatively many people below thirty are working, and also those with relatively few. Among the occupational classes with a high proportion of younger people are relatively many of the traditional women's occupations (shop assistants, secretaries and typists, medical, dental, pharmaceutical and veterinary occupations, and miscellaneous domestic, geriatric care, and hotel workers). In the ten occupational classes concerned, half or more of the workers are younger than thirty. In two of these occupational classes there is also a high relative replacement demand: for shop assistants, and for secretaries and typists (see table 2.4). The occupational classes with a relatively low proportion of young workers are especially management functions and independent professions.

The labour security of an occupational class can be a risk factor as well. Occupational classes with a strongly fluctuating employment situation are in an unfavourable situation on the labour market. Occupational classes with a stable level of employment, on the other hand, are relatively attractive for those offering their labour. Table 3.4 shows the occupational classes that are concentrated in sectors which are highly sensitive to cyclical factors and also those which are concentrated in sectors in which employment trends have been relatively stable.[12] Occupations which are highly sensitive to cyclical effects can be found in the textile and clothing, construction, and metal working industries. For the workers in base metals (furnace, casting and galvanizing workers) there is the extra problem of a relatively high replacement demand. Occupational classes with limited cyclical sensitivity are found in agriculture and fisheries, the food and drink industry, and in the public sector: education, army, government and public transportation.

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12. The cyclical sensitivity of a sector, FI_s, is calculated with the aid of a fluctuation index of the changes in employment levels in the sector, based on the absolute deviations from the employment trend between 1950 and 1988 (De Grip, Heijke and Dekker, 1989). The cyclical sensitivity of an occupational class is then determined as the weighted average of the cyclical sensitivity of the sectors in which the occupation is found.

Table 3.4. Occupational classes with a relatively high or low cyclical sensitivity (FI_b)

High cyclical sensitivity

CBS	Occupational class	FI_b
75	Spinners, weavers, knitters, dyers, etc.	3.9
80	Shoemakers and leather goods workers	3.3
95	Building trades and construction workers	3.3
79	Tailors, dressmakers etc.	3.1
93	Painters	3.0
85	Electrical and electronics workers	2.7
87	Plumbers, welders, sheet metal workers etc.	2.7
99	Miscellaneous labourers	2.7
83	Blacksmiths, toolmakers, and miscellaneous metalworkers	2.6
72	Furnace, casting, and galvanising workers etc.	2.6

Low cyclical sensitivity

CBS	Occupational class	FI_b
61	Farmers	1.0
64	Fishermen, hunters, etc.	1.0
69	Military professionals	1.0
13	Teachers	1.0
31	Senior civil servants	1.0
20	Senior Government appointees	1.1
78	Tobacco and tobacco product workers	1.1
36	Conductors, transport services	1.1
62	Agricultural workers	1.2
77	Food and beverage processors, abattoir workers	1.2

The last risk factor discussed here is the relative prestige of an occupational class. Occupational classes are differentiated by the social prestige they enjoy (Sixma and Ultee, 1983). We can assume that occupations with a high prestige will also be attractive for potential employees, and this will affect the occupation's labour market position. Occupations with a low prestige, on the other hand, will probably be less attractive for those offering labour (unless there are other compensations such as higher wages). The problem here is that the prestige of an occupational class is strongly related to the occupational level: the higher the occupational level, the higher, in general, the prestige. Those offering labour, naturally, have within their reach only occupations of a certain level. For someone with L.V.E. level, the profession of accountant may have a high prestige, but it certainly is not obtainable and will therefore play no part in the weighing of possible alternative occupations. In choosing among occupations which are at an obtainable level, however, the relative prestige may well be a factor. Instead of using

the occupational prestige as such, it is therefore more sensible to look at the *relative* prestige of an occupational class, that is, its prestige corrected for the function level, because it is this, and not the absolute prestige, which will influence the market position of an occupation.

Table 3.5. Occupational classes with a relatively low or with a relatively high prestige

Low prestige

CBS	Occupational class	relative prestige	weighted level of function
99	Miscellaneous labourers	-1.64	1.0
56	Launderers, dry-cleaners and pressers	-1.59	1.1
55	Caretakers, cleaners, etc.	-1.59	1.3
77	Food and beverage processors, abattoir workers	-1.54	2.4
48	Shop assistants etc.	-1.39	2.1
90	Process workers, rubber and plastic products	-1.38	1.3
73	Timber, pulp and paper workers	-1.38	1.8
89	Glass and ceramics workers etc.	-1.38	1.4
91	Process workers, paper and card products	-1.38	1.0
80	Shoemakers and leather goods workers	-1.32	1.9

High prestige

CBS	Occupational class	relative prestige	weighted level of function
20	Senior Government appointees	2.18	6.4
12	Legal professionals and assistants	2.13	7.0
21	Company directors and senior executives	2.08	6.0
40	Managers, wholesale	1.72	6.0
04	Aircraft and ships'officers	1.56	4.6
09	Economists	1.41	6.0
31	Senior civil servants	1.25	6.1
08	Programmers, statisticians, and assistants etc.	1.18	6.0
14	Ministers of religion etc.	1.15	5.7
11	Accountants	1.15	6.2

Table 3.5. shows the occupational classes with a high, and with a low relative prestige.[13] The

13. The relative prestige is calculated as the residue from the regression of the standardized prestige of an occupational group against the standardized function level. The prestige of the occupational class is taken from Sixma and Ultee (1983). The function level of an occupational class is determined as the weighted average of the function levels of the underlying occupational groups (Huijgen, 1989). Since prestige scores at the level of occupational groups are virtually non-existent, we were forced to use the less detailed classification of occupational classes.

average function level of the occupational class in question is also indicated. These level scores relate to the skill level required for a function and were taken from Huijgen (1989). The range is from 1 (unskilled labour) to 7 (academic work). The occupational classes with a low relative prestige all concern unskilled or semi-skilled work. In other words, despite the correction for function level, it is particularly occupations which require no, or only low, qualifications (in particular in industry) which have a low relative prestige. The opposite picture is found for functions with a high relative prestige: they are almost exclusively occupational classes at H.V.E. and academic level. Of the occupational classes with a relatively low prestige, there are two groups with a rather high replacement demand: the launderers, dry-cleaners and pressers and the shop assistants.

If one goes through the risk factors systematically again, there are a number of occupational classes that can be marked as having multiple risks for the demand side of the labour market.[14] This concerns in the first place shop assistants: there is a high replacement demand, a high influx of younger people, and a low relative prestige. For secretaries and typists there is a relatively high replacement demand together with a high flow of younger people. For food and beverage processors and abattoir workers there is a high proportion of young people in the working population and low relative prestige. For labourers, industrial labourers, and shoemakers and leather goods workers there is a low relative prestige and high cyclical sensitivity. Finally, for the occupational class of furnace, casting and galvanizing workers there is high cyclical sensitivity as well as a relatively high replacement demand.

3.4. The market position of types of education

For types of education it is also true that a supply surplus does not automatically lead to absorption problems on the labour market, and that excess demand for a certain educational category does not automatically mean that school leavers from that category will find work. The occurrence of absorption problems is highly dependent on the position which an educational variety occupies on the market. In that respect a number of risk factors can be distinguished: current unemployment, the function level attained by graduates (does this fully utilise their qualifications), and the alternative possibilities on the labour market.

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14. As of next year it is intended to give a composite indicator of the market position of the occupational groups.

Table 3.6. Types of education with high or low unemployment (figures as of April 1990)

High unemployment

Type of education	%
Academic Education, Fine Arts	32
Primary Education	28
Higher Vocational Education, Fine Arts	25
Academic Education, Arts	17
Higher General Secondary Education	17
Lower Vocational Education, Commerce & Administration	15
Academic Education, Social Sciences	14
Lower General Secondary Education,	14
Academic Education, Agriculture	13
Intermediate Vocational Education, Social & Cultural	13
Higher Vocational Education, Social & Cultural	13

Low unemployment (less than 5%)

Type of education	%
Intermediate Vocational Education, Police, Fire & Defense Forces	0
Higher Vocational Education, Police, Fire & Defense Forces	0
Intermediate Vocational Education, Administrative, Legal & Fiscal	1
Higher Vocational Education, Commerce & Administration	1
Intermediate Vocational Education, Commerce & Administration	2
Intermediate Vocational Education, Non-medical Laboratory	2
Intermediate Vocational Education, Transport, Harbour & Telecommunications	2
Academic Education, Pharmacy	3
Higher Vocational Education, Engineering	3
Academic Education, Econometrics & Business Administration	
Technology	3
Intermediate Vocational Education, Agriculture	3
Intermediate Vocational Education, Medical Laboratory	3
Academic Education and Higher Vocational Education, Theology	3
Higher Vocational Education, Medical and Non-medical Laboratories	3
Higher Vocational Education, Air, Sea and Land Transport	3
Academic Education, Engineering	3

Current unemployment is an important indicator of the market position of an educational variety. Table 3.6 indicates which types of education have high, and which low, unemployment figures.[15] Types with a high rate of registered unemployment are found at the bottom as well

15. The unemployment percentage is calculated as the number of registered unemployed in 1990 with training X (source: Ministry for Social Affairs and Employment) divided by the sum of the number of registered unemployed in 1990 and the number of working persons

as at the top of the educational system, but not, or hardly at all, at the I.V.E. or H.V.E. level. The 'general' education types are particularly severely hit by unemployment: Primary Education, Lower General Secondary Education, and Higher General Secondary Education, along with the 'softer' university courses (Fine Arts, Arts, and Social Sciences). The I.V.E. and H.V.E. types of education almost all have a favourable labour market position, with the exception of the socio-cultural sector and fine arts.

However, the unemployment percentage only gives a partial insight into the market position of an educational variety. The kind of functions the school leavers occupy, and whether the levels of these functions match the qualifications acquired during the study, is at least as important. The extent to which qualifications are utilized was examined by first finding the average function level for the occupational classes in which the graduates of each educational variety work (taken from Huijgen (1989)). Then, for each educational variety, the percentage of those working in these occupations, but at a level below their education, was determined.[16] The data is based on the labour force census of 1985.[17] Table 3.7 shows which types of education had relatively high, and which low under-utilization in 1985. These must be interpreted with some caution because the levels following Huijgen (1989) are determined for occupational classes, a classification that is not really sufficiently precise. This may produce a systematic distortion for individual types of education, in either direction.

Under-utilization is strongly related to the skill level. Some 45% of workers with an education at L.V.E. level experience under-utilization of their qualifications. At I.V.E. level this figure is 43%, at the H.V.E. level 24%, and at the academic level it is 14%.[18] Types of education with relatively high under-utilization are found at L.V.E., I.V.E., and H.V.E. levels. Between 50% and 90% of workers with these types of qualifications are in a function below their level of education. The sectors in which a lot of under-utilization occurs, are: Transport & Harbour, Security (including police, firemen, etc.) and Community Care. It is notable that two higher

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in 1989 (both with training X), times 100%.

16. Using Huijgen's function scale (Huijgen, 1989) the under-utilization level for those with academic (WO) education is 5.5, for HBO training 4.5, for MBO training 3.5 and for LBO, 2.5.

17. *Arbeidskrachtentellingen, 1985.*

18. Due to slightly differing classifications, these percentages differ somewhat from the figures of Huijgen (1989).

types of education: H.V.E. Commerce & Administration and H.V.E. Non-medical Laboratory, also appear in the list.

Table 3.7. Types of education with high, and with low, under-utilization

Higher under-utilization

Type of education	under-utilization %	weighted level of functions
Lower Vocational Education, Security	89	2.4
Lower Vocational Education, Transport & Harbour	85	2.2
Intermediate Vocational Education, Police, Fire & Defense Force	79	3.1
Lower Vocational Education, Community Care, Hotel & Catering	67	2.4
Intermediate Vocational Education, Transport, Harbour & Telecommunications	63	3.3
Higher Vocational Education, Police, Fire & Defense Forces	62	3.8
Intermediate Vocational Education, Community Care	61	3.3
Higher Vocational Education, Commerce & Administration	56	4.5
Higher Vocational Education, Non-medical Laboratory	53	4.8
Higher General Secondary Education	49	3.8

Low under-utilization

Type of education	under-utilization %	weighted level of functions
Academic Education, Pharmacy	4	6.8
Academic Education, Veterinary & Medical Sciences & Dentistry	4	6.8
Higher Vocational Education, Nursing & Physiotherapy etc.	6	5.2
Academic Education, Teacher training	7	6.4
Academic Education, Arts	9	6.2
Academic Education, Mathematics & Natural Sciences	9	6.5
Higher Vocational Education, Fine Arts	11	5.3
Higher Vocational Education, Teacher training	12	5.8
Intermediate Vocational Education, Medical Laboratory	12	4.2
Higher Vocational Education, Theology	13	5.7

The types of education with relatively little under-utilization are especially A.E. and H.V.E. courses, especially those aimed at a professionalised market sector: health care, institutional religion and education. These are market sectors with strong regulations governing access to

the profession: competition from other categories of labour supply is impossible or impracticable. These types of education have a strong market position in that respect, though they are more vulnerable to quantitative fluctuations in the demand-supply relationship (see the high unemployment percentages for A.E. Arts, in table 3.6).

Table 3.8. Types of education with limited alternative occupations at a matching function level, and those with extensive alternatives

Few alternatives

Type of education	GH
Lower Vocational Education, Security	0.21
Lower Vocational Education, Transport & Harbour	0.29
Intermediate Vocational Education, Police, Fire & Defense Forces	0.38
Academic Education, Teacher training	0.47
Higher Vocational Education, Theology	0.51
Intermediate Vocational Education, Para-medical services	0.51
Lower Vocational Education, Community Care, Hotel & Catering	0.54
Academic Education, Veterinary & Medical Sciences & Dentistry	0.55
Academic Education, Theology	0.55
Higher Vocational Education, Police, Fire & Defense Forces	0.59

Extensive alternatives

Type of education	GH
Higher Vocational Education, Engineering	0.95
Academic Education, Engineering	0.95
Higher Vocational Education, Business Administration Technology	0.91
Academic Education, Mathematics & Natural Sciences	0.91
Higher Vocational Education, Agriculture	0.90
Academic Education, Economics and Business Administration	0.90
Academic Education, Agriculture	0.89
Intermediate Vocational Education, non-medical Laboratory	0.86
Academic Education, Econometrics & Business Administration Technology	0.86
Intermediate Vocational Education,Commerce & Administration	0.86

Thus it is important to know what alternative possibilities school leavers have on the labour market. A type of education which allows many alternative possibilities is less vulnerable to fluctuations in the labour market than one that has no alternative possibilities at all. The dispersion of each type of education among occupational classes was therefore examined. The Gini-Hirschmann coefficient was chosen as a dispersion standard: this has the value 0 when all persons with a certain educational background are concentrated in one occupation, and 1 when these persons are equally spread over all occupational classes (see De Grip, Heijke and Dekker,

1989). The calculations were based on the labour force census of 1985 and relate to dispersion over occupational classes with a function level matching the education. The possibility of shifting to an occupation with a lower function level is not considered: this is not a 'real' alternative. It is important to note that the standard that is used deals with proven alternative occupations, not potential alternatives.

Types of education with limited alternative possibilities occur at all skill levels, especially in professionalised and semi-professionalised sectors, such as security, health care, education and institutional religion. The types of education with relatively wide alternative possibilities are especially the technical, agricultural and commerce & administration courses at H.V.E. and academic level.

If one looks at these data again, the following picture appears.[19] In the first place, a group of types of education can be distinguished that are oriented to professional and semi-professional market sectors. These types of education suffer little competition from other types of education in their own sector, but they also have few alternative possibilities in other sectors or lower functions. Depending on the relationship of demand and supply in their market sector, they may have a good labour market position (for instance A.E. Veterinary & Medical Sciences & Dentistry and A.E. or H.V.E. Theology) or, in contrast, they may have a relatively weak labour market position (A.E. Arts, for instance). A second group includes some types of education that are directed at the top end of the labour market. These are characterized by a very good labour market position: the unemployment figure is very low, there is relatively little under-utilization and there are relatively many alternative occupations. They are mainly university qualifications, such as the A.E. Engineering, Mathematics & Natural Sciences, Economics & Business Administration, and Econometrics & Business Administration Technology. A third group of types of education relate to the market for vocational trades. The technical, agricultural and laboratory education offered at intermediate and higher level can be placed in this group. Unemployment among these types of education is very low, the under-utilization is relatively low and the alternative possibilities are rather high. Finally, a group of types of education can be distinguished which can be located at the bottom end of the labour market: the alternative possibilities are very high, but this is due to the fact that for most functions no specific qualifications are required. The fact that the under-utilization percentages are not bad has to do with bottom effects. The poor market position of these types of education is therefore expressed primarily in high unemployment figures. Lower General Secondary Education, Primary Education alone, and some L.V.E. types of education fall in this last group.

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19. As of the coming year, it is intended to summarise the market position of training varieties with a composite indicator.

4. DEVELOPMENTS IN THE QUALIFICATION STRUCTURE AND THE EMPLOYMENT STRUCTURE

4.1. Introduction

This section will examine changes in the qualification structure of school leavers between 1979 and 1988, along with the forecasts to 1994. Changes in the employment structure in the period 1979-1989, and developments which are expected to occur in the forecasting period 1989-1994, will also be examined. Subsection 4.3 will discuss shifts in the occupational structure and 4.4 will look at changes in the educational structure.

4.2. Changes in the qualification structure

The qualification structure of the working population is an important determinant of technological development. The education of the population determines, to a large extent, the innovative capability of society and it is also an important determinant of the rate at which technological developments take place. Shifts in the flow of school leavers are especially important for the development of the qualification structure of the working population. Figure 4.1 shows how the flow of graduates has developed, in terms of level, in the period 1979-1988, and what the forecasts are for the period 1988-1994. The figures relate exclusively to those graduating from a course with a diploma, because, for the period 1979-1988, there is no information on the highest certificate from previous education held by those who leave their current course without graduating. In the educational levels discussed here, these 'drop-outs' are therefore left out. Since the figures for the forecast outflows and the available data on the realized outflow do not entirely match, the analysis will focus on trends rather than absolute numbers.[20]

After a slight decline in the early eighties, the total number of qualified school leavers increases again until 1988. In total, the number of qualified school leavers increased by 12% in this period. The big losers in the period 1979-1988 are Lower General Secondary Education (-65%), Higher General Secondary Education (-35%), and Lower Vocational Education (L.V.E., -25%). The flow of graduates from Academic Education (A.E.) almost triples in this period, with an explosive increase in the academic year 1987-1988. Intermediate Vocational Education (I.V.E.) is also a clear growth category with an increase of 85% in the period 1979-1988. The flow from Higher

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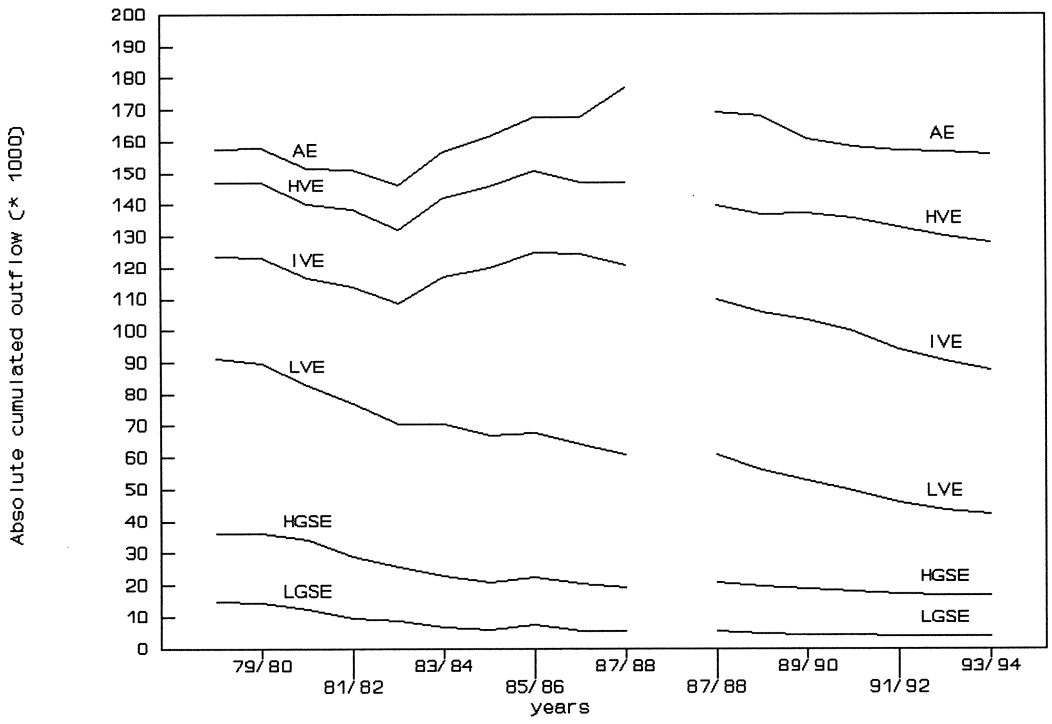
20. For the year 1987-1988 historical figures, taken from the Educational flow matrices of the Central Bureau for Statistics, and forecasts taken from the SKILL estimate of 1990 are both presented. The two figures do not entirely match: most notably, the number of school leavers at IVE level is underestimated in the forecasts.

Vocational Education (H.V.E.) increased by 14% in the same period.

In the forecast period, a growth of 36% is forecast for H.V.E. For all the other types of education the numbers graduating with a qualification decrease, especially for L.V.E. (-36%), Lower General Secondary Education (-26%) and Higher General Secondary Education (-17%). In all of these three types of education the downward trend of the eighties is expected to be continued. The forecasts for I.V.E. and A.E. are for declines in absolute numbers of 8% and 5% respectively, more or less in line with a decline in the total flow of school leavers of 8% over the forecast period.

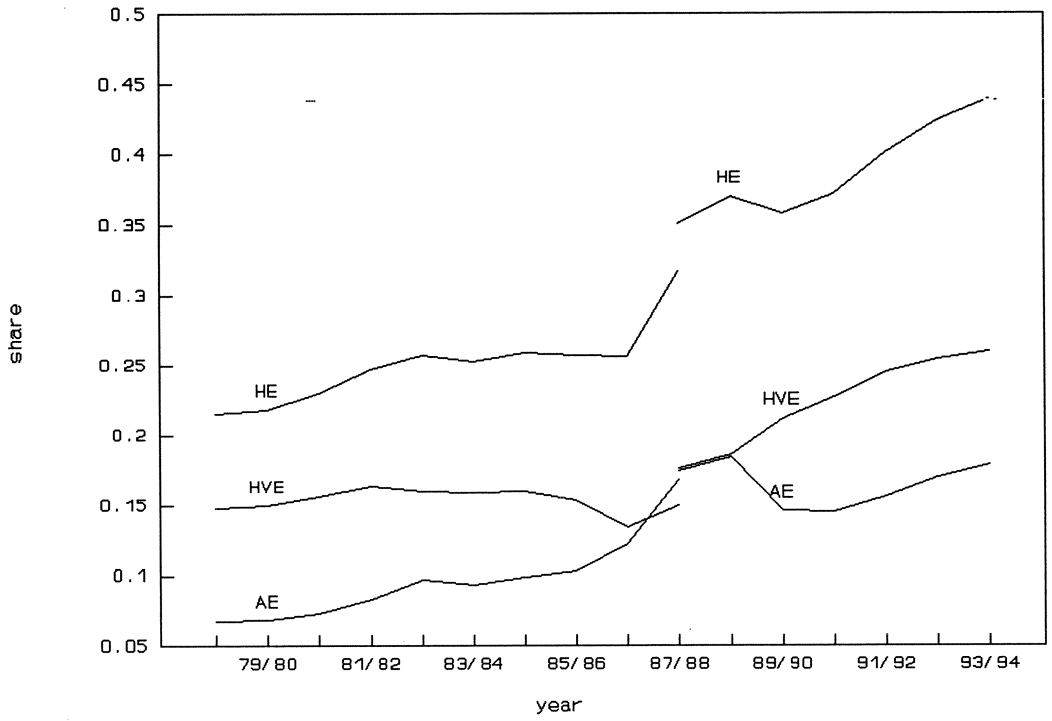
Figure 4.1. Outflow of the educational levels



Legend:
AE = Academic Education
HVE = Higher Vocational Education
IVE = Intermediate Vocational Education
LVE = Lower Vocational Education
HGSE = Higher General Secondary Education
LGSE = Lower General Secondary Education

Source CBS/ROA

Figure 4.2. Share of Higher Education in total outflow



Legend:
HE = Higher Education
HVE = Higher Vocational Education
AE = Academic Education

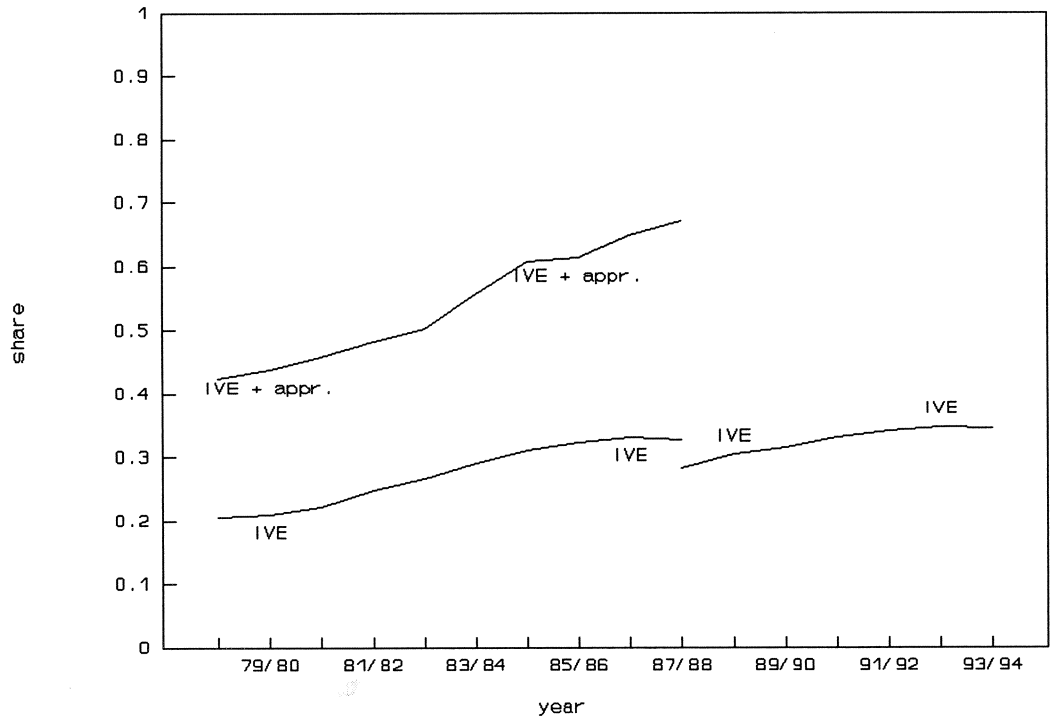
Source: CBS/ROA

The changes in the flow of people with tertiary education come even more to the fore when we look at the changes in the share of this group in the total flow of those leaving education with a qualification. Figure 4.2 clearly shows that those with tertiary education form an increasing portion of the total flow during the entire period: between 1979 and 1988 their share increased by 10 percentage points, and in the period after that by 9 points. The growth in the first period can be attributed especially to the growth in academic education, and that in the second period to the H.V.E. types of education. For 1994 the forecast is that 44% of those leaving education with a qualification will come from H.V.E. or academic education, double the percentage in 1979. The question is, whether so many tertiary graduates can also be completely absorbed by the market. Section 3 has already shown that the higher types of education in particular have unfavourable labour market prospects. In the period 1989-1994 it is expected that 27% of the total outflow (with or without qualifications) will consist of those with tertiary education (16% H.V.E. and 11%

academic education). But only 18% of the total number of job openings are explicitly intended for these graduates: 14% for H.V.E. graduates and 4% for academic education.

The number of people entering the labour market without any occupational qualification is also an important determinant of the level of education of the labour force. A marked decrease in this category of school leavers (Lower and Higher General Secondary Education and L.V.E.) could be deduced from figure 4.1 above. In 1979 57% of all those leaving education with a qualification had had no more than General Secondary Education or L.V.E. In 1988 this proportion had decreased to 34%. In the period 1988-1994 this share will decrease further to 25%. Of course this is strongly related to the growth of tertiary education as shown in figure 4.2. However, in addition to that, the proportion of those leaving secondary education without any occupational qualification has also decreased (see figure 4.3).

Figure 4.3. Share of Intermediate Vocational Education and apprenticeship training in total outflow of Secondary Education



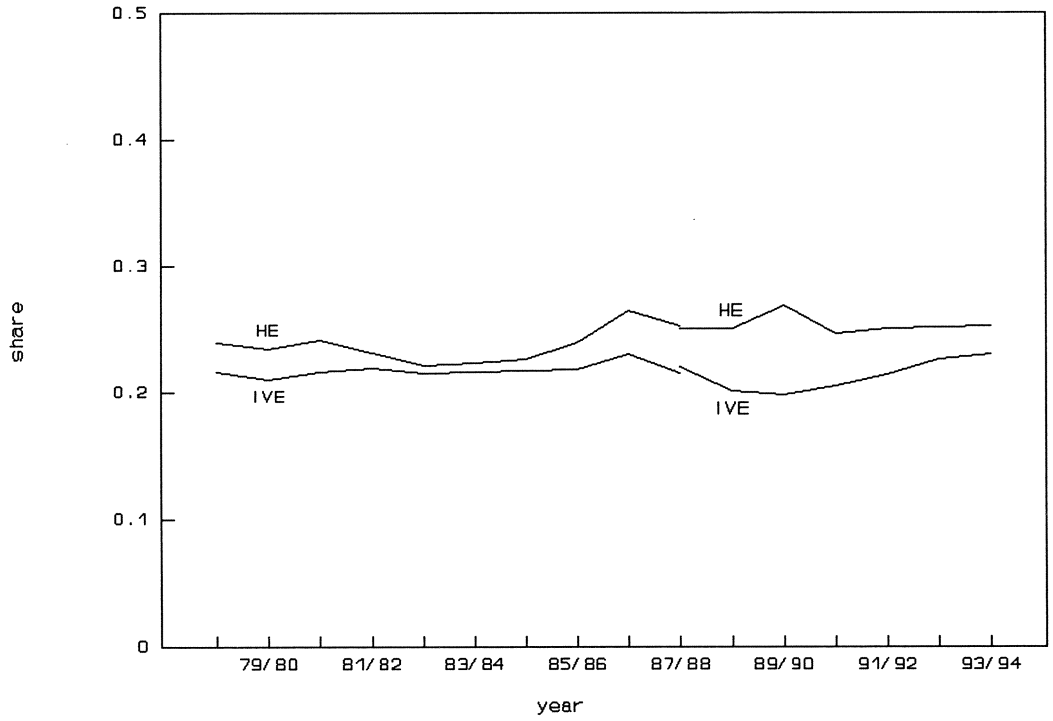
Legend:

IVE = Intermediate Vocational Education
appr. = Apprenticeship Training and Short Intermediate Vocational Education

Source: CBS/ROA

The proportion of those leaving education with a qualification who had I.V.E. or apprenticeship training increased by 25% in the period 1979-1988 (figure 4.3). For the period 1988-1994 a further 7% growth in this share is expected for I.V.E. Unfortunately there are no such forecasts for apprenticeship training. Overall, we can conclude that the average qualification of those leaving a course with the qualification, and entering the labour market, has increased markedly, due to the growth of tertiary education on the one hand and to the decreasing numbers of school leavers with only General Secondary Education or L.V.E. on the other hand.

Figure 4.4. Share of technically educated in total outflow of Higher Education and Intermediate Vocational Education



Legend:

HE = Higher Education
IVE = Intermediate Vocational Education

Source: CBS/ROA

The educational level of the labour force is determined not only by the level of education they have, but also by the field of education. Figure 4.4 shows how the share of technical education in the flow from I.V.E. and tertiary education, respectively, has developed. This share is very stable for

both levels: for I.V.E. it fluctuated around 22% and for tertiary education around 25%. The share of intermediate and higher technical education in the total outflow increases, but this is exclusively due to the growth of I.V.E. and tertiary education. Within these skill levels the relative importance of technical education is very constant. Overall, this outflow seems to be only just sufficient for the needs of the labour market. Intermediate and higher technical education accounted for 13% and 5% of the total (graduate and drop-out) numbers, respectively. Of the total number of job openings, 12% and 4%, respectively, are for these two categories.

4.3. Changes in the occupational structure

We have already seen, in section 2, how the employment situation by sectors changed between 1979 and 1989, and is expected to develop until 1994. The recession in the early eighties was seen to have had a negative effect especially on the textile and clothing industry, the lumber and construction materials industry and on construction. But the non-commercial sector, especially the medical and veterinary services and the 'miscellaneous' non-commercial services, showed a growth of employment in exactly this period. In the second half of the eighties, the sectors which appeared to profit strongly from economic growth were miscellaneous tertiary services and house construction, the lumber and construction materials industry, trade, the building industry and the paper and printing industry. For the forecasting period, a slight decrease is expected in the number of workers in the food and drink industry, the textile and clothing industry and agriculture and fishing. Growth sectors are trade, other tertiary services and house construction, the banking and insurance industry, the chemical industry, the transport sector and the non-commercial sector.

Using a shift-share analysis, we have examined how the occupational structure changes during the three periods we have distinguished (see also De Grip, 1987, and Teulings and Webbink, 1990). Three effects can be distinguished. In the first place, a sector structure effect may occur. That is, the employment situation in an occupational class may change as a result of a change in the total employment situation in the sectors in which the members of the class in question are working. In the second place, an occupational structure effect can be distinguished. This is an increase or decrease of employment for an occupational class as a result of the increasing or decreasing importance of the occupational class in the economic sectors in which they are working. In the third place, an interaction effect is possible. For instance employment might grow as a result of the combination of an increase in the employment share of the occupational class in a certain sector and an increase in the total employment level in this sector. Table 4.1 indicates how big the total

change in the occupational structure in the three periods has been,[21] broken down into the portions attributable to the sector effect, the occupational effect and the interaction effect.

Table 4.1. Relative importance of the occupational structure effect, the sector structure effect and the interaction effect

	total effect	sector effect	occupational effect	interaction effect
1979 - 1985	13.5	10.1	8.8	1.4
1985 - 1989	8.6	5.7	6.2	0.6
1989 - 1994	6.1	2.8	5.1	0.3

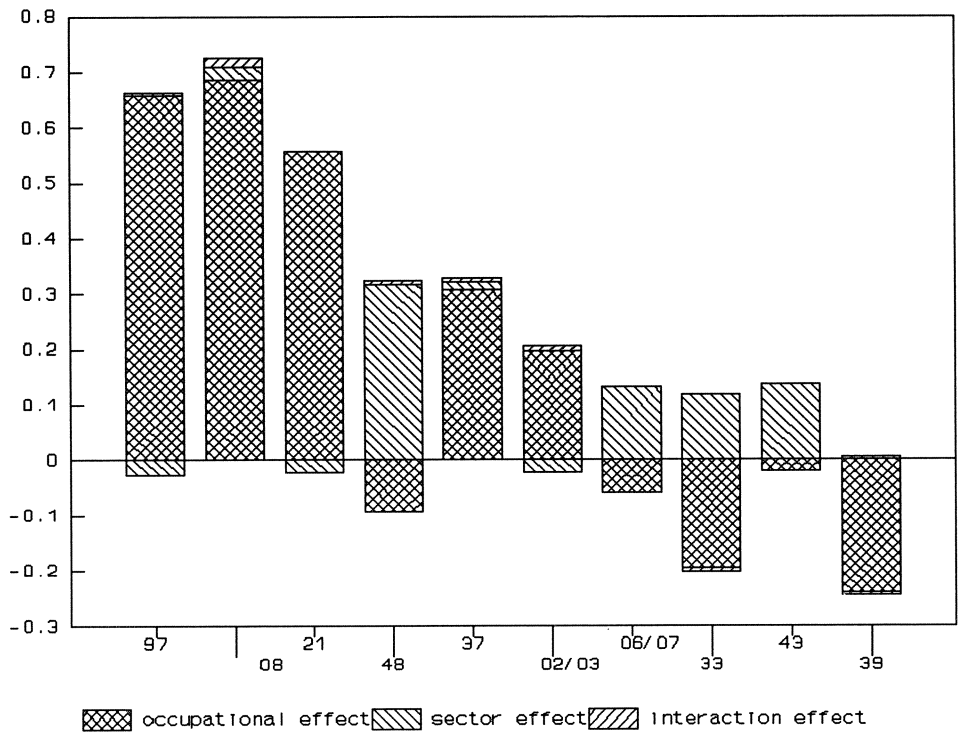
Table 4.1 lists the absolute values of the individual shifts in employment share for all occupational classes. The shift in overall dynamics is noteworthy. The total shifts in the employment structure by occupational classes are expected to be considerably less in the first half of the nineties than in the eighties. However, it should be kept in mind that, for the period 1989-1994 and part of the period 1985-1989, we are dealing with predicted figures. Because of the forecasting methodology the total movement is underestimated: where there are movements in the analysis period which are below the significance threshold the forecast is based on the assumption of constant shares. The shifts in the first half of the eighties are therefore the largest. The underlying structural shifts are in fact larger than would appear from the sum of total effects, because the occupational and sector effects in part compensate for each other. The sum of the occupational and sector effects is considerably bigger for each period than the total effects. Leaving aside the forecasting period, the sector and occupational effects are almost equal to each other. The interaction effect is very limited in all cases.

To give a more exact picture of the individual effects for certain occupational classes, figure 4.5 outlines the shifts underlying the growth of the ten occupational classes with the highest forecasts for absolute growth in employment in the period 1989-1994 (see table 2.2).

The sector effect appears to lead to a noteworthy shift in the employment share of only a few groups. A positive sector effect occurs for shop assistants (code 48), working proprietors in the retail trade (code 43), the medical, dental, pharmaceutical and veterinary professions and their assistants (code 06/07) and bookkeepers and cashiers etc. (code 33). No noteworthy negative sector effects occurred in the occupational classes under discussion.

21. This is defined as the sum of the absolute shifts in the share of an occupational class in the total employment.

Figure 4.5. Shift-share of occupations 1989-1994



Source: ROA

A negative occupational effect is noted for bookkeepers and cashiers etc. (code 33) and for miscellaneous administrative functions (code 39). These are large occupational classes with high absolute employment growth but a less than average growth in percentage terms, (that is, with a decreasing employment share). A negative occupational effect is also expected for shop assistants (code 48) and medical, dental, pharmaceutical and veterinary professions and their assistants (code 06/07). On the other hand, a strong positive occupational effect is expected for the groups freight handlers, packers, and construction machine operators (code 97), programmers, statisticians, and assistants (code 8) and company directors and senior executives (code 21). A clearly positive occupational effect is also expected for postal workers and mail clerks (code 37) and architects, engineers and related technicians (code 02/03). For all ten occupational classes the interaction effects are small or very small.

4.4. Shifts in the educational structure

It is also possible to give a more detailed picture of the various components of the changes in the employment shares of the various types of education. Once again we can distinguish three effects. In the first place, an occupation/sector effect is possible, which represents the shifts in employment shares caused by shifts in the occupational structure and/or the sector structure. In the second place, there may be an educational structure effect: the shifts in the employment share which result from changes in the share held by a type of education in the employment within a given occupation/sector combination. There may also be an effect due to the interaction of the first two effects.

Table 4.2 gives a picture of the total changes in the educational structure of employment and splits it up according to the occupation/sector effect, the educational effect and the interaction effect for the periods 1979-1985, 1985-1989 and 1989-1994. In each case the absolute values of the shifts are aggregated.

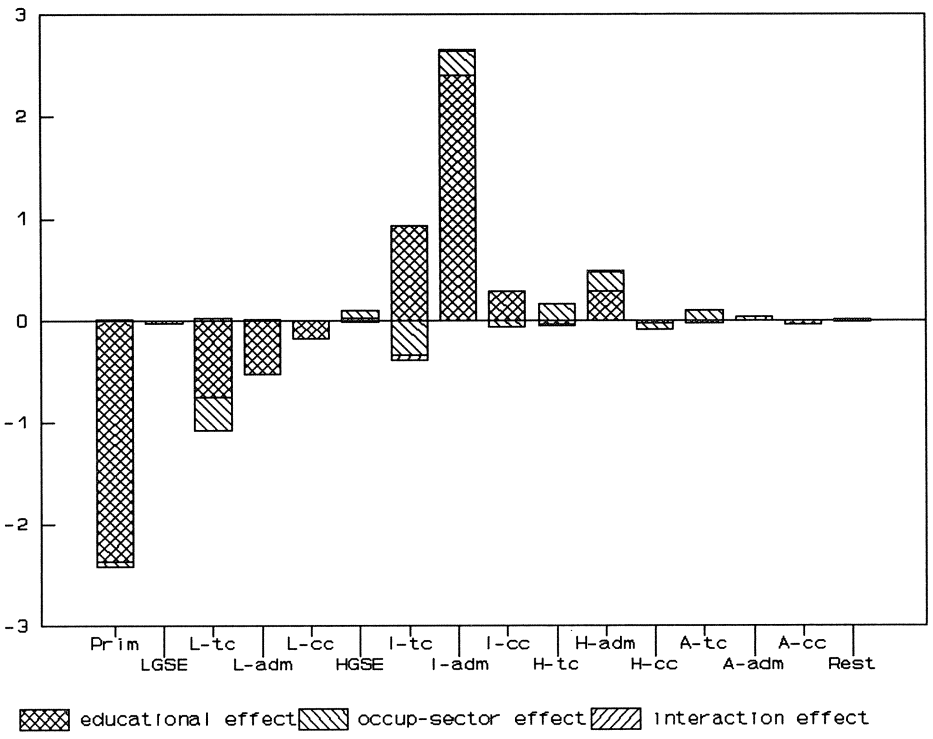
Table 4.2. Relative importance of the occupation/sector structure effect, educational structure effect and interaction effect

Period	total effect	occupation/sector-effect	educational effect	interaction effect
1979-1985	25,2	10,1	19,5	4,0
1985-1989	12,6	3,2	11,8	1,3
1989-1994	8,6	1,7	7,9	0,2

The table shows that the total movement in the educational structure of employment is expected to decrease considerably. This also applies to each of the three effects considered separately. As has already been indicated in subsection 4.3, this decrease is partly related to the forecasting methodology. In all three periods the educational effect appears to be the main cause of the shifts in the educational structure of employment. The influence of the occupation/sector effect seems to be less strong. In all cases the interaction effect is very small.

The strong educational structure effect cannot automatically be interpreted as a displacement effect. It is possible that a shift to other function levels took place within an occupational class. Because of the classification of occupations used this is not made entirely clear in the shift-share analysis. The combined occupation/sector effect indicates that the shift in the educational structure is at least partly led by the demand side.

Figure 4.6. Shift-share of educational classes 1989-1994



Legend:

Prim	= Primary Education
LGSE	= Lower General Secondary Education
L-tc	= L.V.E. - technical
L-adm	= L.V.E. - administration
L-cc	= L.V.E. - community care, hotel catering
HGSE	= Higher General Secondary Education
I-tc	= I.V.E. - technical
I-adm	= I.V.E. - administration
I-cc	= I.V.E. - community care, hotel catering
H-tc	= H.V.E. - technical
H-adm	= H.V.E. - administration
H-cc	= H.V.E. - community care, hotel catering
A-tc	= A.E. - technical
A-adm	= A.E. - administration
A-cc	= A.E. - community care

Source: ROA

Figure 4.6 shows which shifts underlie the forecast changes in employment for the different educational categories. It is based on a broader educational classification of the kind also used by the Central Planning Bureau (Kuhry and Van Opstal, 1987). This has five skill levels (primary education, I.V.E., H.V.E. and academic education) and four educational fields (general, technical,

administrative and community care). The types of education that do not fall under these categories are put together in a remainder category.

The figure shows that the biggest employment decrease is expected to occur for educational categories at the lowest level. On the other hand, the biggest employment growth is expected to occur for I.V.E. and H.V.E. The percentage growth in employment for academic education is expected to be slight.

If we look at the different components of the changes in employment levels, the great importance of the educational effect is very clear. For those who have not completed any secondary education (having only primary education) the educational effect is almost entirely responsible for the expected decrease in employment. There is also a strong negative educational effect for L.V.E. courses in the technical and commercial-administrative fields. Intermediate level education in the commercial-administrative field has the strongest positive educational effect, followed by intermediate level education in the technical and community-care fields. A positive educational effect is also expected to occur for H.V.E. courses in the commercial-administrative field.

The technical types of education at lower and intermediate level have the largest negative occupation/sector effects. At the intermediate level however, this negative effect does not outweigh the positive educational structure effect already mentioned, so that on balance there is an increase in the employment share. The commercial-administrative types of education at I.V.E. and H.V.E. level are the types of education for which the biggest positive occupation/sector effect is expected, followed by technical education at H.V.E. and academic level. These higher technical types of education thus present us with a mirror-image of the picture for the technical types of education at a lower and intermediate level, highlighting the shift in the occupational structure towards higher skilled labour force in technical fields.

To summarise: a number of conclusions can be drawn about the shifts in employment and educational structures. In the first place, there is more movement in the labour market than would appear from a broad analysis, because the various types of effects can partly compensate for each other. In the second place it would appear that, leaving aside the forecasting period, the sector effect is almost as strong as the occupation effect. The occupation effect is demonstrable especially in the growth occupations. Thirdly, the change in the educational structure appears to be caused largely by changes in the shares of various types of education within a given occupational class. Nevertheless there are also demand-led factors.

5. SEX, EDUCATION AND THE LABOUR MARKET

5.1. Introduction

In this section the relation between sex, education, and the labour market is the central theme.[22] The primary goal is to give a description of the differences between the positions of men and women on the labour market. A number of recent sex-specific labour market developments are discussed, and forecasts of the labour market prospects of some typical women's occupations and women's types of education are presented.

Subsection 5.2 will deal with the differences in labour market participation, part-time labour, and unemployment between men and women. Subsection 5.3 explains the segregation of working men and women so far as their educational qualifications and current occupation go. Next, in subsection 5.4, the present and future labour market positions of those practising their trade in typical women's occupations are outlined. Subsection 5.5 closes with a description of a number of the labour market characteristics of traditional women's types of education.

5.2. Participation rate, part-time labour and unemployment

Since the sixties, the percentage of women who present themselves on the labour market has strongly increased (see *Rapportage Arbeidsmarkt*, 1990). This participation in the labour market is usually expressed as the so-called 'participation rate' or the 'participation percentage'. In the past decades the participation rates of men and women have grown significantly closer. In 1960 the participation rate[23] for men was 90% and for women 26%, whereas in 1987 the figures were 76% and 44% respectively (*Rapportage Arbeidsmarkt,* 1990).

The participation rate of men has gone down, due on the one hand to increasing participation in education by younger men and on the other hand to an increase in the number of (older) men who are incapacitated or retire early. The participation rate for men between 25 and 50 years of age has hardly changed. For women, on the other hand, the growth in participation occurred especially in the middle age-groups and for married women in particular. This is the 'fertile' phase of life for

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22. For a thorough description of the relation between sex, education and the labour market, see Van de Loo and Van der Velden (1991).

23. This relates to the proportion of the population aged between 15 to 65 who are in the labour force.

married women (Bruyn-Hundt, 1988).

Table 5.1. Participation rates[24] by sex and level of education in 1979 and 1985

Level of education	Men		Women	
	1979	1985	1979	1985
Primary Education	81,8	76,0	22,8	27,1
Lower General Secondary Education	94,3	89,2	46,3	45,7
Lower Vocational Education	92,9	90,6	36,5	42,7
Higher General Secondary Education	96,4	93,9	58,8	65,6
Intermediate Vocational Education	95,6	93,0	54,3	59,2
Higher Vocational Education	97,0	94,3	64,9	73,0
Academic Education	98,6	96,5	78,8	85,9

Source: CBS/ROA

There is a positive relationship between the participation rate and the level of education (see table 5.1). Especially for women, a high level of education is coupled to a relatively high participation rate. The declining participation of men and the growing participation of women can also be observed in this table. With the exception of women whose highest level is Lower General Secondary Education, this trend appears at all educational levels. The declining participation of men is relatively greater among men with a low level; the increased participation of women on the other hand was relatively stronger among women with secondary and tertiary education.

In formulating its forecasts of labour supply, the Central Planning Bureau also determined the future participation rates for men and women (Kuhry and Van Opstal, 1987). They extrapolate the trend for growing participation by women to 58% in the year 2000, whereas the participation rate for men is frozen at the level of 1985, that is, at 89%.

Although the participation rate is usually used as key indicator of changes in the female labour supply, this only gives a partial insight into the dynamics of labour supply. The 'employment share' would serve the end better.[25] Because women work in part-time jobs more often than men and because the registered unemployment among women is higher than that among men, the employment share for women is smaller than the participation rate. For example, women made up

24. The participation degree here concerns the labour force as the percentage of the potential labour force (i.e., persons between the ages of 15 and 65, who are not students).

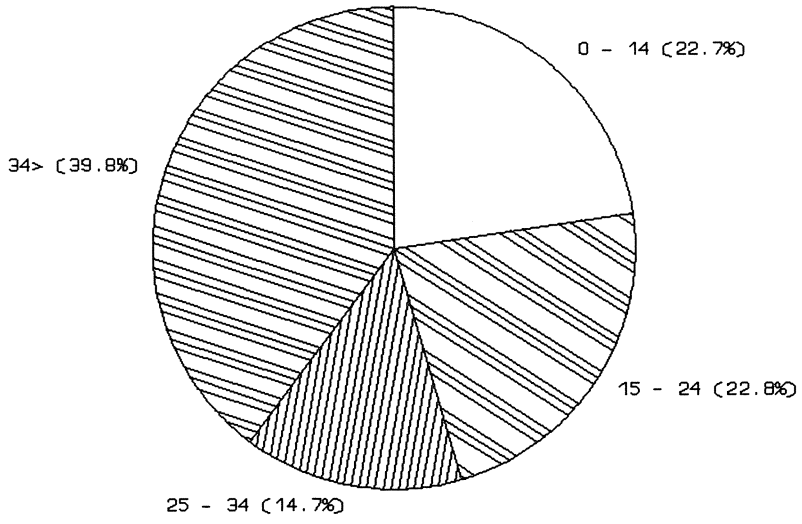
25. The proportion of the potential labour force who are actually employed. The employment level is expressed in labour years to allow for part-time employment.

34% of labour force in 1983, but their employment share was only 26% (Bruyn-Hundt, 1988). Moreover, despite the considerable increase in the participation rate among women since the early sixties, women's employment share in this period increased considerably more slowly than their participation rate. In the period 1977-1985 the employment volume of women grew by 16%, whereas the number of working women in the same period increased by over 29% (Huijgen, 1989).

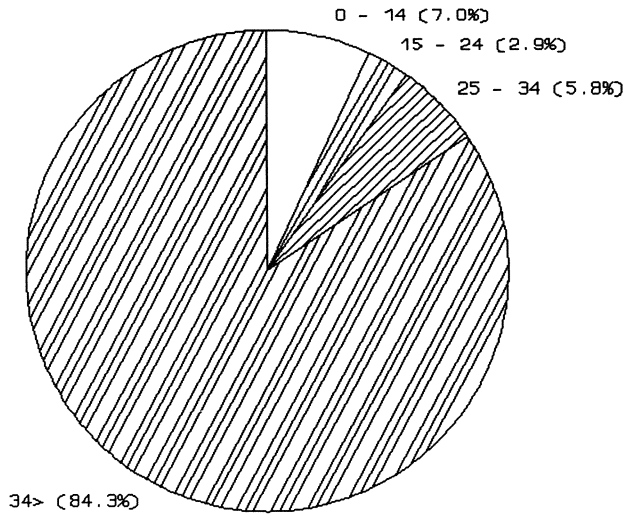
This picture is confirmed when the weekly working hours of women working in salaried employment in 1979 are compared to those in 1985. In 1979, 56% of these women worked in a full-time job, whereas in 1985 only 46% had a full working week. On the other hand, the percentage of women working part-time increased considerably during this period.

Figure 5.1. Women and men employed in working hours

Women



Men



Source: CBS/ROA

The fact that part-time work is women's work can also be seen from figure 5.1, which indicates the hours per week worked by men and women. Almost 85% of the men have a full-time job, whereas not even 40% of the women have full-time employment. Those men who do work part-time appear to have mainly very small part-time jobs. These are especially school pupils and students with a job alongside their study.

The differences between the employment share and participation rate measures of male and female participation are determined not only by the differences in part-time work but also, in equal measure, by the differences in their recruitment and redundancy situation. For example, unemployment for women is proportionally higher than for men. It also appears that women gained less from the decrease in unemployment: whereas the number of unemployed men decreased by almost a quarter between 1988 and 1990, unemployment among women decreased by only 13%. This difference between the sexes is related in particular to short-term unemployment of less than one year. Between 1988 and 1990, short-term unemployment among men decreased three times

as fast as that among women, while long-term unemployment decreased for men and women at almost the same rate (*Rapportage Arbeidsmarkt*, 1990).

5.3. Educational and occupational segregation

As a rule, sex-specific segregation is considered only in terms of the horizontal occupational segregation. An important component of segregation is thus left out. Since there is a strong relationship between education and occupation, the total occupational segregation can be split into two components. In the first place, during education, there is a pre-selection of men and women into education for some kinds of qualifications. After that there is a second selection process regarding occupational choice and career paths in the course of working life (Groot, 1990).

In this subsection the educational segregation[26] and occupational segregation will be discussed. For both forms of segregation, two segregation indices will be used. Both indices can have values between 0 and 100. The indices (s) are equal to the sum of the percentages of the male, and of the female, labour force that would have to change their occupation or education in order to end all segregation. The corrected indices indicate the percentage of the entire labour force that would have to change their occupation or education to end segregation, under the restriction that the distribution of the total labour force over the occupation or educational categories remains unchanged (see also Siegers, 1979 and Groot, 1990).

Changes in the educational segregation and occupational segregation of men and women can be split into three components (Van Mourik and Siegers, 1988):

* changes as a result of alterations in the share of women in the active labour force;
* changes as a result of alterations in the distribution of the total labour force by educational backgrounds and occupations;
* changes as a result of alterations in the numerical relation between men and women within certain educational backgrounds and occupations.

Alterations in index s are the result of changes in the last two components of the segregation. The changes in index S are the result of developments in index s plus the first of these components.

Educational segregation between men and women is related in particular to the field in which they

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26. The training segregation is here discussed using the active labour force as a base, because in this way the relationship between training segregation and occupational segregation can be analyzed. As of next year however, training segregation will also be calculated using the flow from full-time education as a base.

trained. This appears from the educational segregation indices s and S in table 5.2, where the types of education are distinguished according to level[27] and field of study.[28]

Table 5.2. Educational segregation indices in 1985, in percentages

	s	S
Educational segregation: 4 levels	4,6	2,1
Educational segregation: 5 fields	41,5	18,7

Source: Groot, 1990

Women appear to be over-represented in the nursing, commercial & administrative, educational and general courses. Men on the other hand are over-represented in the technical and agricultural fields. In 1985, with an unchanged educational structure, 19% of the active labour force would have had to change their field of study in order to neutralize educational segregation by fields, whereas only 2% would have to shift to correct the educational segregation by level. The strong segregation in educational fields therefore indicates a rather strong pre-selection process (Groot, 1990).

Table 5.3. Educational segregation by educational levels in 1979 and 1985

	1979		1985	
Level of education	s	S	s	S
Lower Vocational Education, Lower General Secondary Education	59	26	63	29
Intermediate Vocational Education, Higher General Secondary Education	55	22	52	23
Higher Vocational Education	38	16	37	18
Academic Education	33	8	32	10

Exactly because the educational segregation by levels is much smaller than that by fields of study, we examined how this segregation by fields of study has developed between 1979 and 1985. The

27. These are the four levels employed by the Standard Educational Classification (SOI) of the Central Bureau of Statistics: primary education, lower general and lower vocational education, secondary general and secondary vocational education, and tertiary education.

28. Five training fields are distinguished: general, educational, technical and agricultural, medical and nursing, and commercial and legal.

field segregation indices have been determined for each educational level. From table 5.3 it can be seen that the segregation of men and women into education fields diminishes as the educational level rises. For workers with an L.V.E. or I.V.E. qualification, the division between typically men's and women's qualifications is therefore bigger than for those who have had an H.V.E. or academic education. The corrected segregation index S appears to have increased slightly at all educational levels between 1979 and 1985. This increase in the difference between the qualifications of working men and women is mainly because the share of women in the active labour force has grown from 29% in 1979 to 34% in 1985. Indeed, the segregation index s has slightly decreased at all but the lowest levels (see also Van Mourik and Siegers, 1988). The difference shows the importance of presenting both indices.

In determining occupational segregation the indices were calculated on the basis of the number of working persons in each occupational class. Unlike Van Mourik and Siegers (1988), who only measured occupational segregation over the whole labour force, in this case the sex-specific occupational segregation is determined, with the changes in the period 1979-1985, for each function level (see table 5.4).[29]

Table 5.4. Occupational segregation by function levels in 1979 and 1985

Level of function	number of occupational classes	1979		1985	
		s	S	s	S
1	31	49	19	61	28
2	74	70	28	66	30
3	42	66	31	62	31
4	49	70	29	69	32
5	58	70	26	64	26
6	36	59	16	54	15
7	24	35	12	30	12
Total	314	66	27	64	28

Occupational segregation appears to occur more in the intermediate occupational classes than in the higher or lower groups. It should however be taken into account that there is a slight positive correlation between the number of occupational classes and the value of the indices. Therefore no hard conclusions can be drawn from the differences between the values of the segregation indices at the various function levels.

29. The definition of the function levels was taken from Huijgen (1989).

It is therefore better to analyze the differences between the function levels in relation to the changes in segregation between 1979 and 1985. With the exception of the lowest function level, the segregation index s appears to have decreased at all function levels in the period under consideration, whereas the index S has remained fairly constant between 1979 and 1985. For the lowest function level, on the other hand, both indices increased strongly between 1979 and 1985. This is probably because it is at the lowest function level that the number of women has most increased, and from which men have particularly withdrawn. The lowest function level therefore appears to be becoming more and more a 'women's segment' (see also Elfring and Kloosterman, 1989).

To end this subsection, it will be interesting to have a look at the extent to which the educational and occupational segregation are related to each other. This is mainly a question of how large the occupational segregation is for people with the same educational background. This occupational segregation, the so-called 'post-selection', is 14% according to Groot (1990). In principle the 14% post-selection effect came on top of a 20% pre-selection within the educational system. Two comments should be made however. In the first place, the pre-selection of 20% and the post-selection of 14% do not add up to the total occupational segregation of 25-30%, because the two components can in part compensate for each other. In the second place, within any one of the rather broad fields of education we have defined there may be several specific kinds of education in which either men or women are strongly over-represented. These may even be oriented for different occupational segments, as is the case for instance for the commercial and secretarial specialisations within the I.V.E. Commerce and Administration. This effect could mean that the importance of pre-selection is in reality even greater than we have shown above.

The conclusion regarding the educational and occupational segregation of men and women is that an important part of the total occupational segregation has its origin in a rather strong pre-selection in the course of education, but that occupational segregation becomes even stronger along the career path that follows. Moreover, both forms of segregation appear to be changing only gradually.

5.4. Labour market characteristics of women's occupations

This subsection will discuss a number of characteristics of typically 'female' occupational classes, that is, groups in which 60% or more of the practitioners in 1985 were women.[30] The

30. As of the coming year, ROA wants to base its occupational data on a new classification of occupational classes resulting from a redefinition of occupational groups by the Central Bureau of Statistics. Occupations are clustered according to their training background.

characteristics in question are given in table 5.5.

In 1985 an average of 76% of the workers in these women's occupations are women, varying from 60% for the 'cooks, waiters and bartenders' to 96% for miscellaneous domestic, geriatric care, and hotel workers. In the total active labour force, 34% of workers are women. Thus one can conclude that there are twice as many women in these women's occupations as in an average occupational class.

Of the women working in 1985, 53% appear to work in one of these eleven women's occupations; just six of these occupational classes account for 49% of the employment for women: medical, dental, veterinary, and pharmaceutical personnel and assistants, shop assistants and other sales personnel, maintenance and domestic personnel, secretaries and typists, cleaners and caretakers, and cooks, waiters and bartenders.

The function level of these occupational classes appears to be lower than average: only one of the eleven has a relatively high function level.

The 'relative prestige' of the women's occupations was also examined. This was done on the basis of a score for the social prestige of an occupational class, incorporating a correction for the function level (see also section 3). Only the medical, dental, veterinary, and pharmaceutical personnel have a high relative prestige. For seven of the eleven, the social prestige of the occupational class is lower than one would predict on the basis of the function level. This applies in particular to occupational classes with a lower function level.

In accordance with our expectations, the average proportion of part-timers[31] in the women's occupations is high. For four of the eleven occupational classes the proportion of part-timers was very high. None of the women's occupations has a low percentage of part-timers.

Because sex and fields of training appear to be related to each other, the new occupational classes used by ROA will be more likely to be markedly female or markedly male. (See Dekker, De Grip and Van de Loo (1990)).

31. The proportion of working persons who, in the period 1979-1985, had a working week of less than 30 hours.

Table 5.5. Labour market characteristics of women's occupations

CBS	Occupational class	a	b	c	d	e	f	g	h	i	j
06/07	Medical, dental, pharmaceutical and veterinary professions and assistants	72	11	+	+	=	=	=	=	-	=
32	Secretaries, typists	95	8	=	=	=	+	--	=	+	+
38	Radio, telephone and telegraph operators	82	1	=	-	=	+	--	--	+	=
48	Shop assistants etc.	71	10	-	--	=	++	--	+	++	++
53	Cooks, waiters, bartenders etc.	60	4	-	--	=	+	--	=	=	=
54	Miscellaneous domestic, geriatric care, and hotel workers	96	10	-	--	=	++	--	=	=	=
55	Caretakers, cleaners etc.	74	6	--	--	-	++	--	=	=	=
56	Launderers, dry-cleaners and pressers	72	0	--	--	=	=	=	=	++	+
57	Hairdressers, barbers, beauticians, etc.	77	1	=	=	-	+	+	=	=	=
59	Miscellaneous service workers	68	1	=	=	=	+	-	=	+	+
79	Tailors, dressmakers	66	1	-	-	++	++	=	=	-	-
Women's occupations		76		-	-	=	+	-	=	=	=
Average CBS-occupational classes		34		3,7	0,01	1,75	17	9	6	12	18

a = % women in 1985
b = share of occupational classes in total female labour force
c = function level in 1985
d = relative prestige (see also section 3)
e = cyclical sensitivity (period 1950-1988)
f = proportion of part-timers (< = 30 hours a week)
g = proportion of self-employment (average in the period 1979-1985)
h = expansion demand in the period 1989-1994
i = replacement demand in the period 1989-1994
j = number of job openings in the period 1989-1994

++ = very high
+ = high
= = average
- = low
-- = very low

The average proportion of self-employment in the women's occupations could be called low. Among the hairdressers, barbers and beauticians there are relatively more smaller businessmen and business women. Within this occupational class however, relatively more women are in salaried employment than men (63% versus 40%).

We also examined whether women's occupations are over-represented or under-represented in the economic sectors that are cyclically sensitive. With the exception of the very cyclically sensitive occupational class of tailors and dressmakers and upholsterers, the women's occupations appear to have an average and sometimes even relatively low cyclical sensitivity.

Thus far, we have discussed a number of the present characteristics of women's occupations. Needless to say, the labour market prospects for the near future are also of great importance for those working in these occupational classes. The sum of the expansion demand and the replacement demand, in the women's occupations in general, will result in an average to relatively high number of job openings in the period 1989-1994. The replacement demand often plays a more important part here than in other occupations, the often high or very high replacement demand reflecting the pattern of women's participation in the labour market.

In most cases, the expansion demand is the same as the average growth. The growth of employment will therefore be no better or worse in the women's occupations than in all occupational classes together. The only shrinking occupation among them was the radio, telephone and telegraph operators. On the other hand, the demand for shop assistants is expected to grow relatively strongly in the forecasting period. The occupational class of shop assistants and other sales personnel therefore belongs among the growing occupations.

Finally, appendix 10 provides a list of the main educational backgrounds for all women's occupations, differentiated by sex. From this it appears that there is a big difference between the qualifications of the two sexes. Men often appear to move into a 'women's occupation' with a completely different qualification than women.

5.5. Labour market characteristics of women's types of education

There were eight 'typically female' types of education, for which more than 60% of the workers with that background were women, in 1985. In that year, 37% of all working women held one of these eight qualifications. The percentage of those holding these types of qualification who were women varies from 60% for L.V.E. Commerce and Administration to 92% for the I.V.E. Community Care. The average figure, in 1985, was 78%, whereas only 34% of the active labour force are

women. Table 5.6 gives a number of the labour market characteristics of the working people with one of these qualifications. Each is compared with the average score for the educational level in question.

At L.V.E. level the workers with a 'female' qualification appear to be more often unemployed and to have a higher than average occupational dispersion. Within this group there are large differences regarding function levels and the under-utilization of qualifications. Those with L.V.E. Community Care have, on average, a lower function level and are more likely to work below the level of their education than those with L.V.E. Commerce and Administration. Those with L.V.E. Commerce and Administration do not have very good prospects because employment in that field is expected to decrease strongly in the near future and this will not be compensated for by the high replacement demand and the very low inflow. For the L.V.E. Community Care, Hotel & Catering Trades on the other hand, the very high replacement demand and very low inflow will amply compensate for the low expansion demand; good labour market prospects are therefore expected. This could mean that the differences in the labour market positions of those with L.V.E. Community Care, Hotel & Catering Trades and L.V.E. Commerce and Administration will decrease in the future.

Workers with one of the 'female' qualifications at I.V.E. level appear on average to have a higher function level and to work less often below their level than is the case for I.V.E. qualifications in general. The rather good labour market prospect for school leavers with a 'female' qualification at I.V.E. level are due especially to the high replacement demand. The education in 'Community Care' does not entirely fit this image of I.V.E. education. Workers with this educational background have a greater occupational dispersion, a lower function level and the majority of them work below the level of their education. Because of a relatively high flow of school leavers onto the labour market they have only limited labour market prospects, despite the very high number of job openings.

At the H.V.E. level the occupational dispersion of workers with a 'female' educational background appears to be considerably less than average. Although the function level for those with women's education is lower than the average for H.V.E., they are no more likely to work below the level of their education. For the H.V.E. Nursing & Physiotherapy, low replacement demand in the period 1989-1994 and a high inflow of school leavers is expected. In combination with an expansion demand which is no more than average, this points to bad labour market prospects. For the higher medical laboratory education on the other hand, the good labour market prospects are due in the first place to the low inflow of school leavers.

Table 5.6. Labour market characteristics of women's types of education

Type of education	a	b	c	d	e	f	g	h	i	j	k
Lower Vocational Education, Commerce & Administration	60	5	+	+	3.0	36	--	+	=	--	moderate
Lower Vocational, Community Care, Hotel & Catering	89	13	+	+	2.4	67	-	+ +	+	--	good
Average, Lower Vocational Education	30		=	=	2.9	47	-	+	=	--	reasonable
Intermediate Vocational Education, Nursing	85	5	-	-	4.6	15	=	+	+	-	reasonable
Intermediate Vocational Education, Medical Laboratory	72	1	--	=	4.2	12	+	+	+	-	good
Intermediate Vocational Education, Para-medical services	91	2	-	--	3.7	22	+	+	+ +	-	reasonable
Intermediate Vocational Education, Community Care	92	8	-	+	3.3	61	+	+ +	+ +	=	moderate
Average, Intermediate Vocational Education	45		-	=	3.8	4.3	+ +	=	+	-	reasonable
Higher Vocational Education, Nursing & Physiotherapy etc.	67	2	-	--	5.2	6	=	-	=	-	poor
Higher Vocational Education, Medical Laboratory	70	1	--	-	4.8	17	=	=	+	-	good
Average, Higher Vocational Education	31	1	-	=	5.9	23	+	-	=	-	moderate

a = % women in 1985
b = share of women with the same educational background in the total female labour force in 1985
c = unemployment figure in april 1990
d = occupational dispersion (average 1979-1985)
e = average function level in 1985
f = under-utilization in 1985
g = expansion demand in the period 1989-1994
h = replacement demand in the period 1989-1994
i = number of job openings in the period 1989-1994
j = inflow of school leavers on to the labour market in the period 1989-1994
k = labour market prospects in the period 1989-1994
+ + = very high
+ = high
= = average
- = low
-- = very low

Just as for the women's occupations, the data for those working with a 'female' educational background, men and women, has been examined to see which occupational class they were working in 1985 (see appendix 11). From this we can see that, even if they have had the same educational background, men and women end up in different occupations. As was already observed in subsection 5.3 as regards educational and occupational segregation, the occupational differences between men and women cannot therefore be entirely attributed to 'pre-selection' in education.

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Appendix 1: Expansion demand 1989-1994 per occupational class, absolute and as a percentage of the total labour force in 1989

CBS	Occupational class	number	%	qualification
01	Physical scientist and related technicians	250	1	average
02/03	Architects, engineers and related technicians	21200	11	relatively high
04	Aircraft and ships' officers	1400	10	relatively high
05	Life scientists and technicians	1300	4	average
06/07	Medical, dental, pharmaceutical and veterinary professions and assistants	20200	7	average
08	Programmers, statisticians, and assistants, etc.	45400	57	relatively very high
09	Economists	500	3	average
11	Accountants	650	5	average
12	Legal professionals and assistants	550	3	average
13	Teachers	3900	1	average
14	Ministers of religion etc.	400	5	average
15	Authors, journalists etc.	7400	26	relatively very high
16	Creative artists and industrial and interior designers	1300	4	average
17	Performing artists	600	4	average
18	Sports professionals etc.	400	4	average
19	Miscellaneous professions	3400	3	average
20	Senior Government appointees	50	1	average
21	Company directors and senior executives	42300	20	relatively very high
30	Departmental managers, administration	350	2	average
31	Senior civil servants	250	1	average
32	Secretaries, typists etc.	5100	3	average
33	Bookkeepers, cashiers etc.	12600	4	average
34	Computer operators etc.	450	3	average
35	Transport supervisors	-100	-0	average
36	Conductors, transport services	-150	-5	relatively low
37	Postal workers and mail clerks	22000	35	relatively very high
38	Radio, telephone and telegraph operators	-3300	-23	relatively very low
39	Miscellaneous administrative personnel	10700	3	average
40	Managers, wholesale	4600	12	relatively high
41	Managers, retail	2100	12	relatively high
42	Working proprietors, wholesale	3500	12	relatively high
43	Working proprietors, retail	12300	12	relatively high
45	Departmental managers, purchasing and sales	-7100	-18	relatively very low
46	Sales representatives	4100	7	average
47	Insurance agents, real estate agents etc.	1300	4	average
48	Shop assistants etc.	29700	10	relatively high
50	Managers, hotel and catering industry	550	5	average
51	Working proprietors, hotel and catering industry	1600	5	average
52	Supervisors, catering cleaning and maintenance	550	5	average
53	Cooks, waiters, bartenders etc.	5000	4	average
54	Miscellaneous domestic, geriatric care, and hotel workers	7900	5	average
55	Caretakers, cleaners, etc.	5200	4	average
56	Launderers, dry-cleaners and pressers	500	5	average
57	Hairdressers, barbers, beauticians, etc.	1600	5	average
58	Fire, police, and security officers	850	1	average
59	Miscellaneous service workers	1800	6	average
60	Farm managers and supervisors	-150	-2	relatively low
61	Farmers	3500	-3	relatively low
62	Agricultural workers	-2300	-2	relatively low
63	Forestry workers	-50	-1	relatively low
64	Fishermen, hunters etc.	-50	-2	relatively low
70	Production supervisors and general foremen	-450	-1	relatively low
72	Furnace, casting, and galvanising workers etc.	-150	-1	relatively low
73	Timber, pulp and paper workers	-200	-3	relatively low
74	Chemical process workers etc.	50	1	average

CBS	Occupational class	number	%	qualification
75	Spinners, weavers, knitters, dyers, etc.	-350	-3	relatively low
77	Food and beverage processors, abattoir workers	3300	-5	relatively low
78	Tobacco and tobacco product workers	-250	-11	relatively very low
79	Tailors, dressmakers etc.	400	1	average
80	Shoemakers and leather goods workers	-100	-1	relatively low
82	Cabinetmakers, woodworkers, stonemasons etc.	150	1	average
83	Blacksmiths, toolmakers, and miscellaneous metalworkers	-3900	-14	relatively very low
84	Lathe operators, mechanics, etc.	3500	2	average
85	Electrical and electronics workers	-1100	-1	relatively low
87	Plumbers, welders, sheet metal workers, etc.	700	1	average
89	Glass and ceramics workers etc.	0	-0	average
90	Procesworkers, rubber and plastic products	150	1	average
91	Process workers, paper and card products	-200	-4	relatively low
92	Printers and related functions	-2100	-5	relatively low
93	Painters	500	1	average
94	Miscellaneous craftsmen and production workers	1000	7	average
95	Building trades and construction workers	-3200	-2	relatively low
96	Machine operators	-100	-2	relatively low
97	Freight handlers, packers & construction machine operators	46600	25	relatively very high
98	Drivers, sailors, engine drivers	-1400	-1	relatively low
99	Miscellaneous labourers	500	1	average
69	Military professionals	500	1	average

Appendix 2: Replacement demand 1989-1994 per occupational class, absolute and as percentage of the total labour force in 1989

CBS	Occupational class	number	%	qualification
01	Physical scientists and related technicians	5500	16	relatively high
02/03	Architects, engineers and related technicians	16200	8	relatively low
04	Aircraft and ships' officers	1900	14	average
05	Life scientists and technicians	2800	9	relatively low
06/07	Medical, dental, pharmaceutical and veterinary professions and assistants	22100	8	relatively low
08	Programmers, statisticians, and assistants, etc.	1600	2	relatively very low
09	Economists	1600	10	average
11	Accountants	1400	10	average
12	Legal professionals and assistants	1600	8	relatively low
13	Teachers	25300	8	relatively low
14	Minister of religion etc.	1700	19	relatively high
15	Authors, journalists etc.	1100	4	relatively very low
16	Creative artists and industrial and interior designers	3700	12	average
17	Performing artists	1300	9	relatively low
18	Sports professionals etc.	1300	14	average
19	Miscellaneous professions	8300	8	relatively low
20	Senior Government appointees	550	11	average
21	Company directors and senior executives	18700	9	relatively low
30	Departmental managers, administration	1400	8	relatively low
31	Senior civil servants	400	2	relatively very low
32	Secretaries, typists, etc.	27300	18	relatively high
33	Bookkeepers, cashiers etc.	38300	13	average
34	Computer operators etc.	1700	14	average
35	Transport supervisors	3300	12	average
36	Conductors, transport services	200	7	relatively low
37	Postal workers and mail clerks	4000	6	relatively low
38	Radio, telephone and telegraph operators	2900	20	relatively very high
39	Miscellaneous administrative personnel	48100	12	average
40	Managers, wholesale	2800	7	relatively low
41	Managers, retail	1500	9	relatively low
42	Working proprietors, wholesale	2300	8	relatively low
43	Working proprietors, retail	6900	7	relatively low
45	Departmental managers, purchasing and sales	6900	17	relatively high
46	Sales representatives	5500	10	average
47	Insurance agents, real estate agents etc.	4700	14	average
48	Shop assistants etc.	55200	19	relatively high
50	Managers, hotel and catering industry	1300	11	average
51	Working proprietors, hotel and catering industry	5100	15	average
52	Supervisors, catering cleaning and maintenance	1700	16	relatively high
53	Cooks, waiters, bartenders etc.	15900	14	average
54	Miscellaneous domestic, geriatric care, and hotel workers	25300	15	average
55	Caretakers, cleaners, etc.	14900	10	average
56	Launderers, dry-cleaners and pressers	2000	18	relatively high
57	Hairdressers, barbers, beauticians, etc.	4500	14	average
58	Fire, police, and security officers	4500	7	relatively low
59	Miscellaneous service workers	4600	14	average
60	Farm managers and supervisors	1600	21	relatively very high
61	Farmers	17300	13	average
62	Agricultural workers	24300	18	relatively high
63	Forestry workers	250	6	relatively low
64	Fishermen, hunters etc.	800	22	relatively very high
70	Production supervisors and general foremen	13600	17	relatively high
72	Furnace, casting, and galvanising workers etc.	2000	20	relatively very high
73	Timber, pulp and paper workers	950	12	average
74	Chemical process workers etc.	2900	11	average

CBS	Occupational class	number	%	qualification
75	Spinners, weavers, knitters, dyers, etc.	1000	10	average
77	Food and beverage processors, abattoir workers	9700	16	relatively high
78	Tobacco and tobacco product workers	100	4	relatively very low
79	Tailors, dressmakers etc.	2900	9	relatively low
80	Shoemakers and leather goods workers	1100	14	average
82	Cabinetmakers, woodworkers, stonemasons etc.	800	4	relatively very low
83	Blacksmiths, toolmakers, and miscellaneous metalworkers	4100	14	average
84	Lathe operators, mechanics, etc.	23500	14	average
85	Electrical and electronics workers	13100	12	average
87	Plumbers, welders, sheet metal workers, etc.	10900	12	average
89	Glass and ceramics workers etc.	900	10	average
90	Procesworkers, rubber and plastic products	2100	16	relatively high
91	Process workers, paper and card products	600	11	average
92	Printers and related functions	6100	14	average
93	Painters	2400	7	relatively low
94	Miscellaneous craftsmen and production workers	800	6	relatively low
95	Building trades and construction workers	14200	8	relatively low
96	Machine operators	800	13	average
97	Freight handlers, packers & construction machine operators	22500	12	average
98	Drivers, sailors, engine drivers	20800	13	average
99	Miscellaneous labourers	2200	5	relatively very low
69	Military professionals	9300	22	relatively very high

Appendix 3: Number of job openings per type of education in the period 1989-1994, absolute and as percentage of the total labour force in 1989, divided in expansion and replacement demand

Type of education	number	%	qualification	% replacement demand	% expansion demand
Primary Education	39200	6	relatively low	100	0
Lower General Secondary Education	67000	15	average	64	36
Lower Vocational Education, Agriculture	8100	8	relatively low	100	0
Lower Vocational Education, Technical	57100	12	average	100	0
Lower Vocational Education, Transport & Harbour	6200	27	relatively very high	32	68
Lower Vocational Education, Commerce & Administration	11300	11	relatively low	100	0
Lower Vocational Education, Community Care, Hotel & Catering	41100	18	average	85	15
Lower Vocational Education, Security	300	3	relatively very low	100	0
Higher General Secondary Education	34500	15	average	45	55
Intermediate Vocational Education, Agriculture	18500	17	average	46	54
Intermediate Vocational Education, Engineering and Laboratory	103700	18	average	43	57
Intermediate Vocational Education, Transport, Harbour & Telecommunications	8100	18	average	40	60
Intermediate Vocational Education, Nursing	20700	21	relatively high	58	42
Intermediate Vocational Education, Medical Laboratory	4500	21	relatively high	52	48
Intermediate Vocational Education, Para-medical services	8700	24	relatively high	60	40
Intermediate Vocational Education, Commerce & Administration	227800	31	relatively very high	15	85
Intermediate Vocational Education, Administrative, Legal & Fiscal	3800	9	relatively low	95	5
Intermediate Vocational Education, Social & Cultural	3300	12	average	63	37
Intermediate Vocational Education, Community Care	41600	29	relatively very high	61	39
Intermediate Vocational Education, Hotel, Catering & Hairdressing	6700	19	average	51	49
Intermediate Vocational Education, Police, Fire & Defense Forces	9000	16	average	51	49
Higher Vocational Education, Teacher Education	25800	12	average	68	32
Higher Vocational Education, Interpreter & Translator	350	5	relatively low	100	0
Higher Vocational Education, Theology	700	19	average	62	38
Higher Vocational Education, Agriculture	1300	11	relatively low	62	38
Higher Vocational Education, Non-medical Laboratory	3200	15	average	35	65
Higher Vocational Education, Engineering	20500	18	average	36	64
Higher Vocational Education, Air, Sea and Land Transport	2700	11	relatively low	81	19
Higher Vocational Education, Nursing & Physiotherapy etc.	5600	12	average	36	64
Higher Vocational Education, Medical Laboratory	2700	18	average	53	47

Type of education	number	%	qualification	% replacement demand	% expansion demand
Higher Vocational Education, Commerce & Administration	34000	24	relatively high	17	83
Higher Vocational Education, Business Administration Technology	1500	42	relatively very high	12	88
Higher Vocational Education, Administrative, Legal & Fiscal	1700	12	average	56	44
Higher Vocational Education, Social & Cultural	9800	14	average	42	58
Higher Vocational Education, Hotel & Catering Industry	750	19	average	43	57
Higher Vocational Education, Fine arts	1800	7	relatively low	100	0
Higher Vocational Education, Police, Fire & Defense Forces	850	11	relatively low	66	34
Academic Education, Teacher training	1500	7	relatively low	60	40
Academic Education, Arts	1700	8	relatively low	65	35
Academic Education, Theology	1300	18	average	81	19
Academic Education, Agriculture	650	11	relatively low	53	47
Academic Education, Mathematics & Natural Sciences	4000	14	average	49	51
Academic Education, Engineering	10200	21	relatively high	28	72
Academic Education, Veterinary & Medical Sciences & Dentistry	4400	9	relatively low	40	60
Academic Education Pharmacy	500	13	average	34	66
Academic Education, Economics & Business Administration	10300	35	relatively very high	17	83
Academic Education, Econometrics & Business Administration Technology	3100	74	relatively very high	5	95
Academic Education, Law & Public Administration	3300	10	relatively low	56	44
Academic Education, Social Sciences	4100	10	relatively low	59	41
Academic Education, Fine arts	150	9	relatively low	55	45
Total	884200	17	average	48	52

Appendix 4: Outflow of school leavers per educational type in the period 1989-1994, absolute and as percentage of the total labour force in 1989

Type of education	number	%	qualification
Primary Education	142500	23	average
Lower General Secondary Education	37200	8	relatively low
Lower Vocational Education, Agriculture	10300	10	relatively low
Lower Vocational Education, Technical	54200	11	relatively low
Lower Vocational Education, Transport & Harbour	1000	5	relatively very low
Lower Vocational Education, Commerce & Administration	2900	3	relatively very low
Lower Vocational Education, Community Care, Hotel & Catering	20700	9	relatively low
Lower Vocational Education, Security	3000	34	average
Higher General Secondary Education	126400	54	relatively high
Intermediate Vocational Education, Agriculture	36700	34	average
Intermediate Vocational Education, Engineering and Laboratory	157500	27	average
Intermediate Vocational Education, Transport, Harbour & Telecommunications	6300	14	relatively low
Intermediate Vocational Education, Nursing	33100	34	average
Intermediate Vocational Education, Medical Laboratory	3600	17	average
Intermediate Vocational Education, Para-medical services	12400	34	average
Intermediate Vocational Education, Commerce & Administration	132800	18	average
Intermediate Vocational Education, Administrative, Legal & Fiscal	4300	11	relatively low
Intermediate Vocational Education, Social & Cultural	20900	74	relatively high
Intermediate Vocational Education, Community Care	70300	49	relatively high
Intermediate Vocational Education, Hotel, Catering & Hairdressing	9200	26	average
Intermediate Vocational Education, Police, Fire & Defense Forces	6500	11	relatively low
Higher Vocational Education, Teacher Education	37900	18	average
Higher Vocational Education, Interpreter & Translator	650	9	relatively low
Higher Vocational Education, Theology	650	18	average
Higher Vocational Education, Agriculture	9200	76	relatively very high
Higher Vocational Education, Non-medical Laboratory	4600	21	average
Higher Vocational Education, Engineering	35800	31	average
Higher Vocational Education, Air, Sea and Land Transport	3100	12	relatively low
Higher Vocational Education, Nursing & Physiotherapy etc.	28000	61	relatively high
Higher Vocational Education, Medical Laboratory	2500	16	average
Higher Vocational Education, Commerce & Administration	33300	23	average
Higher Vocational Education, Business Administration Technology	4100	118	relatively very high
Higher Vocational Education, Administrative, Legal & Fiscal	3200	22	average
Higher Vocational Education, Social & Cultural	26000	38	average

Type of education	number	%	qualification
Higher Vocational Education, Hotel & Catering Industry	2100	55	relatively high
Higher Vocational Education, Fine arts	9500	38	average
Higher Vocational Education, Police, Fire & Defense Forces	1300	15	average
Academic Education, Teacher training	2800	14	relatively low
Academic Education, Arts	18000	83	relatively very high
Academic Education, Theology	750	10	relatively low
Academic Education, Agriculture	4200	70	relatively high
Academic Education, Mathematics & Natural Sciences	8100	29	average
Academic Education, Engineering	17000	35	average
Academic Education, Veterinary & Medical Sciences & Dentistry	9400	20	average
Academic Education Pharmacy	1600	41	relatively high
Academic Education, Economics & Business Administration	19700	68	relatively high
Academic Education, Econometrics & Business Administration Technology	3700	89	relatively very high
Academic Education, Law & Public Administration	23500	73	relatively high
Academic Education, Social Sciences	22800	55	relatively high
Academic Education, Fine arts	3100	164	relatively very high
Total	1233800	23	average

Appendix 5: Labour market prospects per educational type 1994

Type of education	ITA	qualification
Primary Education	1.52	poor labour market prospects
Lower General Secondary Education	1.01	good labour market prospects
Lower Vocational Education, Agriculture	1.07	reasonable labour market prospects
Lower Vocational Education, Technical	1.11	reasonable labour market prospects
Lower Vocational Education, Transport & Harbour	0.84	good labour market prospects
Lower Vocational Education, Commerce & Administration	1.26	moderate labour market prospects
Lower Vocational Education, Community Care, Hotel & Catering	0.99	good labour market prospects
Lower Vocational Education, Security	1.43	poor labour market prospects
Higher General Secondary Education	1.44	poor labour market prospects
Intermediate Vocational Education, Agriculture	1.15	reasonable labour market prospects
Intermediate Vocational Education, Engineering and Laboratory	1.09	reasonable labour market prospects
Intermediate Vocational Education, Transport, Harbour & Telecommunications	0.98	good labour market prospects
Intermediate Vocational Education, Nursing	1.14	reasonable labour market prospects
Intermediate Vocational Education, Medical Laboratory	1.01	good labour market prospects
Intermediate Vocational Education, Para-medical services	1.10	reasonable labour market prospects
Intermediate Vocational Education, Commerce & Administration	0.91	good labour market prospects
Intermediate Vocational Education, Administrative, Legal & Fiscal	1.02	good labour market prospects
Intermediate Vocational Education, Social & Cultural	1.63	poor labour market prospects
Intermediate Vocational Education, Community Care	1.19	moderate labour market prospects
Intermediate Vocational Education, Hotel, Catering & Hairdressing	1.08	reasonable labour market prospects
Intermediate Vocational Education, Police, Fire & Defense Forces	1.01	good labour market prospects
Higher Vocational Education, Teacher Education	1.08	reasonable labour market prospects
Higher Vocational Education, Interpreter & Translator	1.25	moderate labour market prospects
Higher Vocational Education, Theology	1.00	good labour market prospects
Higher Vocational Education, Agriculture	1.64	poor labour market prospects
Higher Vocational Education, Non-medical Laboratory	1.07	reasonable labour market prospects
Higher Vocational Education, Engineering	1.13	reasonable labour market prospects
Higher Vocational Education, Air, Sea and Land Transport	1.04	good labour market prospects
Higher Vocational Education, Nursing & Physiotherapy etc.	1.47	poor labour market prospects
Higher Vocational Education, Medical Laboratory	1.00	good labour market prospects
Higher Vocational Education, Commerce & Administration	1.00	good labour market prospects
Higher Vocational Education, Business Administration Technology	1.55	poor labour market prospects
Higher Vocational Education, Administrative, Legal & Fiscal	1.12	reasonable labour market prospects
Higher Vocational Education, Social & Cultural	1.27	moderate labour market prospects

Type of education	ITA	qualification
Higher Vocational Education, Hotel & Catering Industry	1.33	moderate labour market prospects
Higher Vocational Education, Fine arts	1.49	poor labour market prospects
Higher Vocational Education, Police, Fire & Defense Forces	1.09	reasonable labour market prospects
Academic Education, Teacher training	1.08	reasonable labour market prospects
Academic Education, Arts	1.80	poor labour market prospects
Academic Education, Theology	0.95	good labour market prospects
Academic Education, Agriculture	1.64	poor labour market prospects
Academic Education, Mathematics & Natural Sciences	1.18	moderate labour market prospects
Academic Education, Engineering	1.13	reasonable labour market prospects
Academic Education, Veterinary & Medical Sciences & Dentistry	1.13	reasonable labour market prospects
Academic Education Pharmacy	1.27	moderate labour market prospects
Academic Education, Economics & Business Administration	1.26	moderate labour market prospects
Academic Education, Econometrics & Business Administration Technology	1.10	reasonable labour market prospects
Academic Education, Law & Public Administration	1.62	poor labour market prospects
Academic Education, Social Sciences	1.48	poor labour market prospects
Academic Education, Fine arts	2.62	poor labour market prospects

Appendix 6: The proportion of employees younger than thirty and the cyclical sensitivity (FI_b) per occupational class

CBS	Occupational class	proportion < 30 year	qualification	FI_b	qualification
01	Physical scientists and related technicians	0.37	average	1.72	average
02/03	Architects, engineers and related technicians	0.20	relatively low	2.12	relatively high
04	Aircraft and ship's officers	0.26	average	1.25	relatively low
05	Life scientists and technicians	0.42	relatively high	1.48	average
06/07	Medical, dental, pharmaceutical and veterinary professions and assistants	0.52	relatively very high	1.65	average
08	Programmers, statisticians, and assistants, etc.	0.36	average	1.66	average
09	Economists	0.18	relatively low	1.55	average
11	Accountants	0.12	relatively very low	1.33	relatively low
12	Legal professionals and assistants	0.21	relatively low	1.25	relatively low
13	Teachers	0.23	relatively low	1.03	relatively low
14	Ministers of religion etc.	0.09	relatively very low	1.53	average
15	Authors, journalists etc.	0.24	relatively low	1.70	average
16	Creative artists and industrial and interior designers	0.25	relatively low	1.58	average
17	Performing artists	0.30	average	1.51	average
18	Sports professionals etc.	0.37	average	1.51	average
19	Miscellaneous professions	0.25	relatively low	1.41	relatively low
20	Senior Government appointees	0.00	relatively very low	1.07	relatively low
21	Company directors and senior executives	0.05	relatively very low	2.06	relatively high
30	Departmental managers, administration	0.14	relatively very low	1.48	average
31	Senior civil servants	0.02	relatively very low	1.04	relatively low
32	Secretaries, typists, etc.	0.52	relatively very high	1.58	average
33	Bookkeepers, cashiers, etc.	0.46	relatively high	1.53	average
34	Computer operators etc.	0.48	relatively high	1.62	average
35	Transport supervisors	0.12	relatively very low	1.37	relatively low
36	Conductors, transport services	0.33	average	1.12	relatively low
37	Postal workers and mail clerks	0.38	average	1.20	relatively low
38	Radio, telephone and telegraph operators	0.40	average	1.47	average
39	Miscellaneous administrative personnel	0.43	relatively high	1.52	average
40	Managers, wholesale	0.06	relatively very low	1.43	relatively low
41	Managers, retail	0.14	relatively very low	1.43	relatively low
42	Working proprietors, wholesale	0.13	relatively very low	1.43	relatively low
43	Working proprietors, retail	0.12	relatively very low	1.43	relatively low
45	Departmental managers, purchasing and sales	0.25	relatively low	1.68	average
46	Sales representatives	0.19	relatively low	1.71	average
47	Insurance agents, real estate agents etc.	0.21	relatively low	1.46	average
48	Shop assistants etc.	0.53	relatively very high	1.46	average
50	Managers, hotel and catering industry	0.00	relatively very low	1.46	average
51	Working proprietors, hotel and catering industry	0.19	relatively low	1.30	relatively low
52	Supervisors, catering, cleaning and maintenance	0.15	relatively very low	1.55	average
53	Cooks, waiters, bartenders etc.	0.20	relatively low	1.45	relatively low
54	Miscellaneous domestic, geriatric care, and hotel workers	0.50	relatively high	1.52	average
55	Caretakers, cleaners etc.	0.370	average	1.38	relatively low
56	Launderers, dry-cleaners and pressers	0.22	relatively low	1.53	average
57	Hairdressers, barbers, beauticians etc	0.44	relatively high	1.32	relatively low
58	Fire, police, and security officers	0.53	relatively very high	1.17	relatively low

CBS	Occupational class	proportion < 30 year	qualification	FI_b	qualification
59	Miscellaneous service workers	0.36	average	1.63	average
60	Farm managers and supervisors	0.48	relatively high	1.20	relatively low
61	Farmers	0.12	relatively very low	0.97	relatively very low
62	Agricultural workers	0.40	average	1.15	relatively low
63	Forestry workers	0.24	relatively low	1.45	relatively low
64	Fishermen, hunters etc.	0.38	average	1.01	relatively low
70	Production supervisors and general foremen	0.10	relatively very low	2.46	relatively high
72	Furnace, casting, and galvanising workers etc.	0.38	average	2.58	relatively very high
73	Timber, pulp and paper workers	0.37	average	1.98	average
74	Chemical process workers etc.	0.37	average	2.35	relatively high
75	Spinners, weavers, knitters, dyers, etc.	0.34	average	3.91	relatively very high
77	Food and beverage processors, abattoir workers	0.50	relatively high	1.16	relatively low
78	Tobacco and tobacco product workers	0.49	relatively high	1.09	relatively low
79	Tailors, dressmakers etc.	0.41	relatively high	3.12	relatively very high
80	Shoemakers and leather goods workers	0.40	average	3.33	relatively very high
82	Cabinetmakers, woodworkers, stonemasons, etc.	0.35	average	2.25	relatively high
83	Blacksmiths, toolmakers, and miscellaneous metalworkers	0.40	average	2.62	relatively very high
84	Lathe operators, mechanics, etc.	0.44	relatively high	1.95	average
85	Electrical and electronics workers	0.38	average	2.70	relatively very high
87	Plumbers, welders, sheet metal workers, etc.	0.41	relatively high	2.69	relatively very high
89	Glass and ceramics workers etc.	0.40	average	2.30	relatively high
90	Process workers, rubber and plastic products	0.45	relatively high	2.49	relatively high
91	Process workers, paper and card products	0.41	relatively high	2.05	average
92	Printers and related functions	0.44	relatively high	2.03	average
93	Painters	0.41	relatively high	2.96	relatively very high
94	Miscellaneous craftsmen and production workers	0.36	average	2.32	relatively high
95	Building trades and construction workers	0.39	average	3.26	relatively very high
96	Machine operators	0.36	average	2.04	average
97	Freight handlers, packers & construction machine operators	0.13	relatively very low	1.85	average
98	Drivers, sailors, engine drivers	0.41	relatively high	1.35	relatively very low
99	Miscellaneous labourers	0.28	average	2.66	relatively very high
69	Military professionals	0.44	relatively high	1.01	relatively low

Appendix 7: The relative prestige and the weighted function level per occupational class

CBS	Occupational class	relative prestige	qualification	weighted function level
01	Physical scientists and related technicians	0.68	relatively high	4.9
02/03	Architects, engineers and related technicians	0.37	average	5.5
04	Aircraft and ship's officers	1.56	relatively very high	4.6
05	Life scientists and technicians	0.99	relatively high	5.4
06/07	Medical, dental, pharmaceutical and veterinary professions and assistants	0.97	relatively high	5.0
08	Programmers, statisticians, and assistants, etc.	1.18	relatively high	6.0
09	Economists	1.41	relatively very high	6.0
11	Accountants	1.15	relatively high	6.2
12	Legal professionals and assistants	2.13	relatively very high	7.0
13	Teachers	1.12	relatively high	6.4
14	Ministers of religion etc.	1.15	relatively high	5.7
15	Authors, journalists etc.	1.00	relatively high	5.6
16	Creative artists and industrial and interior designers	0.01	average	4.9
17	Performing artists	0.22	average	5.4
18	Sports professionals etc.	0.32	average	5.0
19	Miscellaneous professions	1.05	relatively high	5.8
20	Senior Government appointees	2.18	relatively very high	6.4
21	Company directors and senior executives	2.08	relatively very high	6.0
30	Departmental managers, administration	1.00	relatively high	5.0
31	Senior civil servants	1.25	relatively high	6.1
32	Secretaries, typists, etc.	0.22	average	3.6
33	Bookkeepers, cashiers, etc.	0.53	relatively high	3.5
34	Computer operators etc.	0.89	relatively high	4.4
35	Transport supervisors	0.22	average	3.5
36	Conductors, transport services	-0.30	average	2.0
37	Postal workers and mail clerks	-0.92	relatively low	1.7
38	Radio, telephone and telegraph operators	-0.71	relatively low	3.1
39	Miscellaneous administrative personnel	-0.40	average	2.8
40	Managers, wholesale	1.72	relatively very high	6.0
41	Managers, retail	0.37	average	6.0
42	Working proprietors, wholesale	1.00	relatively high	5.0
43	Working proprietors, retail	0.22	average	5.0
45	Departmental managers, purchasing and sales	0.37	average	5.2
46	Sales representatives	0.32	average	4.2
47	Insurance agents, real estate agents etc.	0.58	relatively high	4.1
48	Shop assistants etc.	-1.39	relatively very low	2.1
50	Managers, hotel and catering industry	0.89	relatively high	4.1
51	Working proprietors, hotel and catering industry	0.22	average	4.0
52	Supervisors, catering, cleaning and maintenance	-0.40	average	5.0
53	Cooks, waiters, bartenders etc.	-0.61	relatively low	2.2
54	Miscellaneous domestic, geriatric care, and hotel workers	-1.02	relatively low	2.8
55	Caretakers, cleaners etc.	-1.59	relatively very low	1.3
56	Launderers, dry-cleaners and pressers	-1.59	relatively very low	1.1
57	Hairdressers, barbers, beauticians etc	-0.19	average	3.8

CBS	Occupational class	relative prestige	qualification	weighted function level
58	Fire, police, and security officers	0.51	relatively high	3.1
59	Miscellaneous service workers	-0.04	average	3.0
60	Farm managers and supervisors	0.22	average	5.0
61	Farmers	-0.50	average	5.0
62	Agricultural workers	-0.97	relatively low	2.1
63	Forestry workers	-0.61	relatively low	2.5
64	Fishermen, hunters etc.	-0.81	relatively low	2.2
69	Military professionals	1.10	relatively low	6.0
70	Production supervisors and general foremen	0.17	average	4.8
72	Furnace, casting, and galvanising workers etc.	-1.12	relatively low	1.7
73	Timber, pulp and paper workers	-1.38	relatively very low	1.8
74	Chemical process workers etc.	-0.30	average	2.4
75	Spinners, weavers, knitters, dyers, etc.	-0.87	relatively low	2.1
77	Food and beverage processors, abattoir workers	-1.54	relatively very low	2.4
78	Tobacco and tobacco product workers	-0.87	relatively low	1.3
79	Tailors, dressmakers etc.	-0.71	relatively low	2.2
80	Shoemakers and leather goods workers	-1.32	relatively very low	1.9
82	Cabinetmakers, woodworkers, stonemasons, etc.	-0.61	relatively low	2.5
83	Blacksmiths, toolmakers, and miscellaneous metalworkers	-0.45	average	2.5
84	Lathe operators, mechanics, etc.	-0.81	relatively low	3.9
85	Electrical and electronics workers	0.32	average	3.8
87	Plumbers, welders, sheet metal workers, etc.	-1.12	relatively low	3.3
89	Glass and ceramics workers etc.	-1.38	relatively very low	1.4
90	Process workers, rubber and plastic products	-1.38	relatively very low	1.3
91	Process workers, paper and card products	-1.38	relatively very low	1.0
92	Printers and related functions	-0.35	average	2.7
93	Painters	-0.97	relatively low	2.8
94	Miscellaneous craftsmen and production workers	-0.61	relatively low	1.7
95	Building trades and construction workers	-0.92	relatively low	3.3
96	Machine operators	-0.30	average	2.4
97	Freight handlers, packers & construction machine operators	-0.30	average	1.3
98	Drivers, sailors, engine drivers	-0.76	relatively low	2.0
99	Miscellaneous labourers	-1.64	relatively very low	1.0
	Average	0.01	average	3.7

Appendix 8: The unemployment figure and alternative occupations at a matching function level (GH)

Type of education	unemployment figure	qualification	GH	qualification
Primary Education	28	relatively very high		
Lower General Secondary Education	14	relatively high	0.84	relatively high
Lower Vocational Education, Agriculture	5	relatively low	0.73	average
Lower Vocational Education, Technical	11	average	0.82	relatively high
Lower Vocational Education, Transport & Harbour	4	relatively low	0.29	relatively very low
Lower Vocational Education, Commerce & Administration	15	relatively high	0.82	relatively high
Lower Vocational Education, Community Care, Hotel & Catering	13	relatively high	0.54	relatively very low
Higher General Secondary Education	17	relatively very high	0.83	relatively high
Intermediate Vocational Education, Agriculture	3	relatively very low	0.74	average
Intermediate Vocational Education, Engineering and Laboratory	2	relatively very low	0.86	relatively high
Intermediate Vocational Education, Transport, Harbour & Telecommunications	2	relatively very low	0.74	average
Intermediate Vocational Education, Nursing	4	relatively low	0.67	average
Intermediate Vocational Education, Medical Laboratory	3	relatively very low	0.75	average
Intermediate Vocational Education, Para-medical services	4	relatively low	0.51	relatively very low
Intermediate Vocational Education, Commerce & Administration	2	relatively very low	0.86	relatively high
Intermediate Vocational Education, Administrative, Legal & Fiscal	1	relatively very low	0.77	average
Intermediate Vocational Education, Social & Cultural	13	relatively high	0.79	average
Intermediate Vocational Education, Community Care	7	relatively low	0.63	relatively low
Intermediate Vocational Education, Hotel, Catering & Hairdressing	5	relatively low	0.78	average
Intermediate Vocational Education, Police, Fire & Defense Forces	0	relatively very low	0.38	relatively very low
Higher Vocational Education, Teacher Education*	6	relatively low	0.77	average
Higher Vocational Education, Interpreter & Translator	10	average	0.80	average
Higher Vocational Education, Theology	3	relatively very low	0.51	relatively very low
Higher Vocational Education, Agriculture	6	relatively low	0.90	relatively high
Higher Vocational Education, Non-medical Laboratory**	3	relatively very low	0.80	average
Higher Vocational Education, Engineering	3	relatively very low	0.95	relatively very high
Higher Vocational Education, Air, Sea and Land Transport	3	relatively very low	0.77	average
Higher Vocational Education, Nursing & Physiotherapy etc.	6	relatively low	0.73	average
Higher Vocational Education, Medical Laboratory**	3	relatively very low	0.70	average
Higher Vocational Education, Commerce & Administration	1	relatively very low	0.67	average
Higher Vocational Education, Business Administration Technology	5	relatively low	0.91	relatively very high
Higher Vocational Education, Administrative, Legal & Fiscal	4	relatively low	0.78	average

Type of education	unemployment figure	qualification	GH	qualification
Higher Vocational Education, Social & Cultural	13	relatively high	0.79	average
Higher Vocational Education, Hotel & Catering Industry	6	relatively low	0.79	average
Higher Vocational Education, Fine Arts	25	relatively very high	0.85	relatively high
Higher Vocational Education, Police, Fire & Defense Forces	0	relatively very low	0.59	relatively low
Academic Education, Teacher training*	6	relatively low	0.47	relatively very low
Academic Education, Arts	17	relatively very high	0.65	relatively low
Academic Education, Theology	3	relatively very low	0.55	relatively very low
Academic Education, Agriculture	13	relatively high	0.89	relatively high
Academic Education, Mathematics & Natural Sciences	8	average	0.91	relatively very high
Academic Education, Engineering	3	relatively very low	0.95	relatively very high
Academic Education, Vetinary & Medical Sciences & Dentistry	4	relatively low	0.55	relatively very low
Academic Education, Pharmacy	3	relatively very low	0.71	average
Academic Education, Economics & Business Administration	4	relatively low	0.90	relatively high
Academic Education, Econometrics & Business Administration Technology	3	relatively very low	0.86	relatively high
Academic Education, Law & Public Administration	8	average	0.83	relatively high
Academic Education, Social Sciences	14	relatively high	0.80	average
Academic Education, Fine Arts	32	relatively very high	0.81	relatively high

* Unemployment determined for Academic Education and Higher Vocational Education together
** Unemployment determined for non-medical and medical laboratory together

Appendix 9: Under-utilization and weighted function level per educational type in 1985

	under-utilization %	qualification	weighted function level
Primary Education	-		2.4
Lower General Secondary Education	38	average	3.0
Lower Vocational Education, Agriculture	35	average	3.7
Lower Vocational Education, Technical	41	average	3.0
Lower Vocational Education, Transport & Harbour	85	relatively very high	2.2
Lower Vocational Education, Commerce & Administration	36	average	3.0
Lower Vocational Education, Community Care, Hotel & Catering	67	relatively very high	2.4
Lower Vocational Education, Security	89	relatively very high	2.4
Higher General Secondary Education	49	relatively high	3.8
Intermediate Vocational Education, Agriculture	38	average	3.9
Intermediate Vocational Education, Engineering and Laboratory	37	average	3.7
Intermediate Vocational Education, Transport, Harbour & Telecommunications	63	relatively very high	3.3
Intermediate Vocational Education, Nursing	15	relatively low	4.6
Intermediate Vocational Education, Medical Laboratory	12	relatively low	4.2
Intermediate Vocational Education, Para-medical services	22	relatively low	3.7
Intermediate Vocational Education, Commerce & Administration	46	relatively high	3.8
Intermediate Vocational Education, Administrative, Legal & Fiscal	44	average	3.8
Intermediate Vocational Education, Social & Cultural	40	average	4.2
Intermediate Vocational Education, Community Care	61	relatively high	3.3
Intermediate Vocational Education, Hotel, Catering & Hairdressing	26	average	3.6
Intermediate Vocational Education, Police, Fire & Defense Forces	79	relatively very high	3.1
Higher Vocational Education, Teacher Education	12	relatively low	5.8
Higher Vocational Education, Interpreter & Translator	36	average	5.2
Higher Vocational Education, Theology	13	relatively low	5.7
Higher Vocational Education, Agriculture	21	relatively low	5.2
Higher Vocational Education, Non-medical Laboratory	53	relatively high	4.8
Higher Vocational Education, Engineering	15	relatively low	5.4
Higher Vocational Education, Air, Sea and Land Transport	46	relatively high	4.6
Higher Vocational Education, Nursing & Physiotherapy etc	6	relatively low	5.2
Higher Vocational Education, Medical Laboratory	17	relatively low	4.8
Higher Vocational Education, Commerce & Administration	56	relatively high	4.5
Higher Vocational Education, Business Administration Technology	19	relatively low	5.3
Higher Vocational Education, Administrative, Legal & Fiscal	40	average	4.9

	under-utilization %	qualification	weighted function level
Higher Vocational Education, Social & Cultural	20	relatively low	5.1
Higher Vocational Education, Hotel & Catering Industry	40	average	4.6
Higher Vocational Education, Fine Arts	11	relatively low	5.3
Higher Vocational Education, Police, Fire & Defense Forces	62	relatively very high	3.8
Academic Education, Teacher training	7	relatively low	6.4
Academic Education, Arts	9	relatively low	6.2
Academic Education, Theology	13	relatively low	5.8
Academic Education, Agriculture	23	average	5.8
Academic Education, Mathematics & Natural Sciences	9	relatively low	6.5
Academic Education, Engineering	14	relatively low	6.2
Academic Education, Veterinary & Medical Sciences& Dentistry	4	relatively very low	6.8
Academic Education, Pharmacy	4	relatively very low	6.8
Academic Education, Economics & Business Administration	15	relatively low	5.8
Academic Education, Econometrics & Business Administration Technology	39	average	5.7
Academic Education, Law & Public Sciences	15	relatively low	6.2
Academic Education, Social Sciences	25	average	6.0
Academic Education, Fine Arts	42	average	5.6

Appendix 10: The most important educational backgrounds for all women's occupations, differentiated by sex in 1985 (between accolades: as percentages)

Women's occupations		Men	Women
06/07	Medical, dental, pharmaceutical and veterinary professions and assistants	Academic Education, Veterinary & Medical Sciences & Dentistry (33)	Intermediate Vocational Education, Nursing (28)
		Intermediate Vocational Education, Nursing (18) Higher Vocational Education, Nursing & Physiotherapy etc (18)	Higher Vocational Education, Nursing & Physiotherapy etc (14) Intermediate Vocational Education, Community Care (13) Intermediate Vocational Education, Para-medical services (13)
32	Secretaries, Typists etc	Intermediate Vocational Education, Commerce & Administration (23)	Intermediate Vocational Education, Commerce & Administration (31)
		Lower General Secondary Education (19) Higher General Secondary Education(12)	Higher Vocational Education, Commerce & Administration (15) Lower General Secondary Education (15) Higher General Secondary Education (11) Lower Vocational Education, Commerce & Administration (10)
38	Radio, telephone and telegraph operators	Higher Vocational Education, Air, Sea and Land Transport (16)	Lower General Secondary Education (28)
		Intermediate Vocational Education, Police, Fire & Defense Forces (14) Lower General Secondary Education (14) Higher General Secondary Education (13)	Intermediate Vocational Education, Commerce & Administration (15) Higher General Secondary Education (12)
48	Shop assistants etc	Intermediate Vocational Education, Commerce & Administration (25)	Lower Vocational Education, Community Care, Hotel & Catering (22)
		Primary Education (15) Lower General Secondary Education(15) Lower Vocational Education, Technical (12)	Primary Education (17) Lower General Secondary Education (16) Intermediate Vocational Education, Commerce & Administration (14)
53	Cooks, waiters, bartenders etc.	Lower Vocational Education Community Care, Hotel & Catering (33) Primary Education (21) Lower Vocational Education, Technical (10) Lower General Secondary Education (7)	Lower Vocational Education, Community Care, Hotel & Catering (28) Primary Education (28) Lower General Secondary Education (11) Intermediate Vocational Education, Community Care (10)
54	Miscellaneous domestic geriatric care, and hotel workers	Primary Education (24)	Intermediate Vocational Education, Community Care (25)

Women's occupation		Men	Women
		Higher General Secondary Education (11)	Lower Vocational Education, Community Care, Hotel & Catering (23)
		Lower Vocational Education, Technical (11)	Primary Education (21)
55	Caretakers, cleaners etc	Primary Education (39)	Primary Education (46)
		Lower Vocational Education, Technical (20)	Lower Vocational Education, Community Care, Hotel & Catering (27)
		Intermediate Vocational Education, Engineering (10)	
56	Launderers, dry-cleaners and pressers	Primary Education (53)	Primary Education (38)
		Intermediate Vocational Education, Engineering (16)	Lower Vocational Education, Community Care, Hotel & Catering (31)
57	Hairdressers, barbers, beauticians, etc	Intermediate Vocational Education, Hotel, Catering & Hairdressing (52)	Intermediate Vocational Education, Community Care (47)
		Intermediate Vocational Education, Community Care (31)	Intermediate Vocational Education, Hotel, Catering & Hairdressing (36)
59	Miscellaneous service workers	Primary Education (30)	Intermediate Vocational Education, Nursing (42)
		Lower Vocational Education, Technical (18)	Lower General Secondary Education (12)
		Intermediate Vocational Education, Commerce & Administration (10)	Primary Education (6)
79	Tailors, dressmakers etc	Primary Education (33)	Lower Vocational Education, Community Care, Hotel & Catering (29)
		Lower Vocational Education, Technical (25)	Primary Education (24)
		Intermediate Vocational Education, Engineering (21)	Intermediate Vocational Education, Engineering (15)
			Lower Vocational Education, Technical (15)

Appendix 11: The most important occupational classes in which the labour force with a female educational background is located, differentiated by sex in 1985 (between accolades: as percentages)

Women's education	Men	Women
Lower Vocational Education, Commerce & Administration	Bookkeepers, cashiers etc (22)	Miscellaneous administrative personnel (22)
	Miscellaneous administrative personnel (15)	Secretaries, typists, etc. (17)
	Shop assistants, etc.(7)	Bookkeepers, cashiers, etc. (17)
		Shop assistants, etc. (16)
Lower Vocational Education, Community Care, Hotel & Catering	Cooks, waiters, bartenders, etc.(69)	Miscellaneous domestic, geriatric care, and hotel workers (19)
	Working proprietors, hotel and catering (12)	Shop assistants, etc. (17)
	Caretakers, cleaners, etc. (5)	Caretakers, cleaners, etc. (13)
		Cooks, waiters, bartenders, etc. (9)
Intermediate Vocational Education, Nursing	Medical, dental, pharmaceutical and veterinary professions and assistants, etc. (88)	Medical, dental, pharmaceutical and veterinary professions and assistants, etc. (64)
		Miscellaneous service workers (10)
		Miscellaneous domestic, geriatric care, and hotel workers (7)
Intermediate Vocational Education, Medical Laboratory	Medical, dental, pharmaceutical and veterinary professions and assistants, etc. (30)	Medical, dental, pharmaceutical and veterinary professions and assistants, etc. (68)
	Lathe operators, mechanics, etc. (18)	Programmers, statisticians and assistants, etc. (11)
	Working proprietors, retail (9)	
	Programmers, statisticians, and assistants, etc. (7)	
Intermediate Vocational Education, Para-medical services	Medical, dental, pharmaceutical and veterinary professions and assistants, etc. (82)	Medical, dental, pharmaceutical and veterinary professions and assistants, etc. (73)
		Miscellaneous domestic, geriatric care, and hotel workers (15)

Women's education	Men	Women
Intermediate Vocational Education, Community Care	Medical, dental, pharmaceutical and veterinary professions and assistants, etc. (26) Hairdressers, barbers, beauticians, etc (19) Cooks, waiters, bartenders etc (8) Miscellaneous domestic, geriatric care, and hotel workers (7)	Miscellaneous domestic, geriatric care, and hotel workers (33) Medical, dental, pharmaceutical and veterinary professions and assistants, etc. (19) Hairdressers, barbers, beauticians, etc. (8) Shop assistants, etc. (8)
Higher Vocational Education, Nursing & Physiotherapy etc	Medical, dental, pharmaceutical and veterinary professions and assistants (87)	Medical, dental, pharmaceutical and veterinary professions and assistants, etc. (88)
Higher Vocational Education, Medical Laboratory	Programmers, statisticians and assistants, etc. (48) Medical, dental, pharmaceutical and veterinary professions and assistants (22) Physical scientists and related technicians (15)	Programmers, statisticians, and assistants, etc. (48) Medical, dental, pharmaceutical and veterinary professions and assistants, etc. (34) Physical scientists and related technicians (6)