CHAPTER FOUR

Past and Future Shifts in Labour Supply and Demand by Education and Occupation

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1. Introduction

The skill structure of labour supply and the occupational and educational structure of labour demand both change, continuously and significantly, over time. This means that some occupational or educational groups can be characterised as 'winners' while others can be seen as 'losers', suffering from bad labour market prospects. The most prominent shift in the skill structure of labour supply is without doubt the continuous increase in the average skill level. Generally speaking, economic theory offers two explanations for this increasing skill level. Within a human capital framework, it can be explained as a supply-side response to a rise in the level of skills demanded, which increases the incentive for investment in further education. Tinbergen (1975) characterized this process as a race between technology and education. Screening theory, however, stresses the importance of an individual's relative skill level for his or her competitive power in the labour market, and explains the increasing skill level as simply the result of skill level competition ('crowding-out processes') on the supply side of the labour market, irrespective of shifts in the skill structure of labour demand (see e.g. Thurow, 1975). In addition to the increasing skill level of the labour supply, there may be significant shifts in the branches of study followed. However, it is important to notice that both the skill level and the branch of study are not determined only by the initial education of workers: adult education also affects the skill structure of the supply of labour. Moreover the impact of adult schooling on the skill structure will probably increase in the future.

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Shifts in the occupational and educational structure of labour demand may in general be due to three different developments:

1. the development of final and intermediate demand for products or services produced in the various industries;
2. technological and organizational developments within sectors of industry ('process innovations');
3. changes in the average working time of particular groups of workers.

Shifts in product demand often lead to shifts in the structure of labour demand, as employment opportunities shift to industries whose occupational and skill structure will often be different. Technological and organizational developments are also probably important causes of shifts in the structure of labour demand within industries. However there is no consensus in the literature as to which way and to what extent technological developments change occupational and skill structures. Generally speaking there are three positions in this debate (see e.g. Spenner, 1985). According to the upgrading view technological developments lead to an increase in the skill level demanded in general and to an increase in upper tier occupations (managers and professionals) in particular, because technological developments are believed to require more skills, greater responsibility, the ability to operate in a continuously changing environment, the handling of more abstract tasks, etc. The downgrading view, however, emphasizes that technological developments lead to a simplification of tasks. Thus for a large part of the workforce a tendency to more repetitive, straightforward tasks can be expected. The third position in the debate is that technological changes have varying impacts on the structure of labour demand, which offset one another, since they depend, for example, on the way management chooses to implement technological innovations in the production process.

For the present decade, the automation or informatization of the service sector is probably the most prominent technological development, so far as impact on the educational and occupational structure of employment goes. However, there are no undisputed grounds on which, a priori, the direction of the shifts in the skill structure caused by new technological developments in the service sector, and by the diffusion of present automation technology, could be predicted (see e.g. Groot and De Grip, 1991).

Apart from shifts in the occupational and skill structure of the supply and demand for labour, a shift in the age structure of the working population will probably also occur in the near future, due to the general decrease in the number of young people entering the market.

Moreover, shifts in the age structure of labour supply and demand within certain educational or occupational groups may result from changes in physical requirements and other working conditions, early pension plans, demographic cycles affecting recruitment, cobweb patterns in labour supply, career patterns, etc. (see also Bottema et.al, 1990). Although labour supply and demand probably interact in various ways, shifts in their structure may also cause significant mismatches between supply and demand, both with regard to the skill structure and the occupational structure. These mismatches can also be influenced by shifts in the age structure; e.g. the expected decrease of young labour supply may cause severe supply shortages in occupational groups in which many young people have traditionally worked.

In this paper we will discuss recent shifts in labour supply and demand, and the expected trends in the 1990s. However, at present we can only give a detailed report on past trends in the educational and occupational structure of labour demand for the first half of the 1980s, because of problems due to changes in the questionnaire used in the Dutch labour force survey[1]. Moreover, the Research Centre for Education and the Labour Market (ROA) has thus far only made medium term forecasts for occupational and educational groups at a detailed level for the period 1989-1994. However these forecasts probably also give an impression of the direction of the shifts we may expect in the late 1990s.

This paper proceeds as follows. First, in section II we show some significant shifts in both the skill structure of labour supply and the occupational and skill structure of labour demand in the first half of the 1980s by depicting the 'winners' and 'losers' on the labour market in this period. This section also reports on the shifts which are forecast in these fields for the 1990s. Section III gives an impression of the actual labour market situation by educational group and shows the mismatches expected in the first half of the 1990s. In addition to this we focus on the occupational groups characterized by a relatively high employment of young workers. These groups will probably suffer most from the expected decrease in the number of young people in the working population.

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1. For the period 1981-1985 data are available from the 'Arbeidskrachtentellingen' (AKT) of the Dutch Central Bureau of Statistics (CBS). In 1987 the CBS started the Enquête Beroepsbevolking (EBB). The EBB measured many more small, part-time jobs than the AKT, which makes it difficult to illustrate developments in the occupational or educational structure of the working population over the entire 1980s. Moreover, at a detailed level, the EBB gives no information on the skill structure of employment.

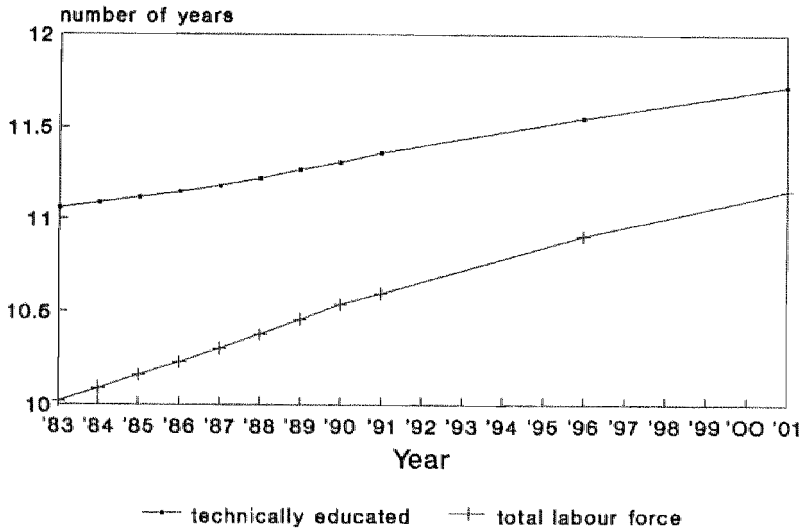
Finally, section IV concludes with indicating some possible long-term developments. Thereby we focus on three themes: the demographic development, the integration of the European market and technological development.

2. Shifts in the occupational and educational structure

2.1 Labour supply

Figure 2.1. illustrates the continuous increase in the skill level of the potential labour supply in the 1980s, measured by the average number of years of schooling achieved. For the 1990s the Dutch Central Planning Office forecasts a continuation of this trend. Moreover, the share of vocational education increased in the 1980s and is expected to increase in the 1990s. The supply of workers with an economic-administrative education shows a relative increase.

Figure 2.1 - Average level of education of the potential labour supply (number of years of initial education)



The ROA supply forecasts for the years 1989-1994 show a very high entry of school leavers to the labour market for art studies, economics and management studies, languages and cultural studies, law studies and

agricultural sciences at university level, and social and welfare work training at an intermediate level. A relatively low entry of school-leavers is forecast for teacher training, police schools, transport and communication schools and lower and intermediate technical schools. A very low entry is expected from school leavers with general secondary education at the lowest level.

2.2 Occupational structure of employment

Tables 2.1 and 2.2 show the greatest occupational winners during the first half of the 1980s. In table 2.1 we see the ten occupations with the highest absolute employment increase.

Table 2.1 - Occupational winners (absolute numbers) 1981-1985

		Occupational group	Employment increase absolute numbers	%
1	(3)*	Physicians and other medical workers	38,000	16.9
2	(10)	Managerial and higher executive employees (excl. public administration)	33,000	25.0
3	(-)	Production supervisors	27,400	37.4
4	(6)	Building caretakers and security workers	21,900	18.6
5	(4)	Bank employees, etc	19,400	7.0
6	(5)	Social workers, etc	18,800	20.4
7	(-)	Software analysts, statisticians, etc	14,800	40.8
8	(-)	Secretaries, typists	12,500	9.1
9	(7)	Lower-level nursing, nurse-aids, etc	12,100	7.1
10	(-)	Managers wholesale trade	12,000	65.9

* The figures between brackets indicate the position of the occupational group on the corresponding winners' list for the period 1971-1981

The list is headed by the medical professions. As indicated in the table this occupational group was also one of the fastest growing occupations in the 1970s. The only other public sector occupations on the list are the social workers and lower level nursing, nurse-aids etc.

The presence of three managerial occupational groups on the list is most remarkable, a sign of the revival of the management profession in the 1980s. The decade is also characterized by an increase in the numbers of software analysts and other automation specialists and bank employees: these two related sectors are clearly booming. 'Building caretakers and security workers' is the only occupational group on the list which employs unskilled workers.

Table 2.2 - Occupational winners (relatively seen) 1981-1985

	Occupational group	Employment increase absolute number	%
1 (-)*	Clerical supervisors	8,000	84.2
2 (-)	Managers wholesale trade, etc	12,000	65.9
3 (6)	Software analysts statisticians, etc	14,800	40.8
4 (10)	Managers retail trade	4,700	39.5
5 (-)	Production supervisors	27,400	37.4
6 (-)	Farm and horticultural managers	1,600	33.3
7 (5)	Lawyers	4,100	28.3
8 (-)	Managerial and higher executive employees (excl. public administration)	33,000	25.0
9 (-)	Paper industry production workers	1,000	21.7
10 (3)	Social workers, etc	18,800	20.4

* See table 2.1

The list of the occupational groups showing the highest relative increase of employment (table 2.2) is even more dominated by the managerial professions. No less than six of the ten occupational groups on this list of winners relate to managerial work. On this list lawyers also feature as one of the fastest growing professions.

Table 2.3 shows the greatest occupational losers by absolute numbers in the period 1981-1985. Most prominently represented on this list are the various building professions: bricklayers and carpenters, plumbers and painters. The decrease for electrical fitters and freight handlers, concrete batchers, etc is also strongly related to the diminishing employment in the building industry.

The employment loss in the occupational group 'miscellaneous administrative functions' is also most striking. A significant decrease also took place in the occupational groups machinery fitters and assemblers, self-employed farmers, drivers and sailors, and porters.

Table 2.3 - Occupational losers (absolutely seen) 1981-1985

	Occupational group	Employment decrease absolute number	%
1 (5)*	Bricklayers and carpenters	44,300	20.7
2 (-)	Misc. administrative functions	27,200	6.6
3 (4)	Plumbers, etc	22,600	17.7
4 (-)	Machinery fitters and assemblers	22,000	12.3
5 (-)	Freight handlers, concrete batchers etc	15,600	8.8
6 (7)	Self-employed farmers	11,700	8.3
7 (-)	Drivers and sailors	11,300	7.1
8 (-)	Electrical fitters, etc	9,400	7.8
9 (1)	Porters, etc	9,000	16.5
10 (9)	Painters	8,200	17.3

* The figures between brackets indicate the position of the occupational group on the corresponding losers' list for the period 1971-1981

Among the occupational groups with the highest relative employment decrease were miscellaneous unskilled workers (minus 28.6%), cabinetmakers (minus 20.7%), shoemakers, etc (minus 19.4%), self-employed commercial agents (minus 19.0%) etc and computing machine operators (minus 16.5%). Generally speaking the occupational losers were less skilled workers, with only a few exceptions.

As has been said before, due to changes in the questionnaire used in the Dutch Labour Force Survey, it is difficult to give a good quantitative indication of the occupational winners and losers in the second half of the 1980s. Therefore we will only mention the greatest winners and losers, relatively seen, in this period. The following occupational groups had the greatest relative increase in employment in the period 1985-1989:

Clerical supervisors; software analysts, statisticians, etc; economists; accountants; self-employed commercial agents; lawyers; shop assistants; journalists; painters, photographers, etc and managerial and higher executive employees. The occupational groups with the greatest employment decrease in this period were: computing machine operators, self-employed shopkeepers, glass-formers, potters and related workers, aircraft- and ship's officers, telephone and telegraph operators, salesmen, textile industry production workers, wood preparation workers and paper-makers and shoemakers, etc.

The most remarkable differences as compared with the winners' list for the first half of the 1980s is that most of the managerial occupational groups are no longer on the list of the greatest winners. The same holds for physicians and other medical workers, bank employees, social workers etc, secretaries, typists and low-level nursing personnel, etc. New occupations on the winners' list of the second half of the 1980s are economists, accountants and journalists. The various building trades have disappeared from the losers' list. Also the miscellaneous administration functions, self-employed farmers, drivers and sailors and porters, etc are no longer on the losers' list. However, as has been stated before, we should be very careful in interpreting these shifts, as the 1989 questionnaire measured more small, part-time, jobs than the 1985 survey.

The ROA employment forecasts for occupational groups for the period 1989-1994 show some remarkable differences from the lists of occupational winners and losers in the first half of the 1980s. Table 2.4 shows the predicted occupational winners in the first half of the 1990s. Remarkably the list of greatest winners in an absolute sense is headed by one of the greatest losers of the first half of the 1980s: the very heterogeneous occupational group 'freight handlers and concrete batchers etc'. Other occupational groups on this list that did not belong to the greatest winners of the 1980s are shop assistants, mail distribution employees, engineers and related technicians, self-employed shopkeepers and miscellaneous administrative functions.

On the list of the greatest winners, relatively seen, the occupational groups journalists, managers wholesale trade, self-employed commercial agents, and retail managers also feature (see table 2.5).

Table 2.4 - Occupational winners (absolutely seen): forecasts 1989-1994

	Occupational group	Employment increase Absolute number	%
1 (-)*	Freight handlers, concrete batchers, etc	47,000	25
2 (7)	Software analysts, statisticians, etc	45,000	57
3 (2)	Managerial and higher executive employees (excl. public administration)	42,000	20
4 (-)	Shop assistants	30,000	10
5 (-)	Mail distribution employees	22,000	36
6 (-)	Engineers and related technicians	21,000	11
7 (1)	Physicians and other medical workers	20,200	7
8 (5)	Bank employees, etc	13,000	4
9 (-)	Self-employed shopkeepers	12,000	12
10 (-)	Miscellaneous administrative workers	11,000	3

* The figures between brackets indicate the position of the occupational group on the corresponding winners' list for the period 1981-1985

The occupational groups that can be described as the occupational losers in the first half of the 1990s are shown in table 2.6. Most of these groups belonged also to the losers in the 1980s. The losers' list is headed by the sales supervisors and buyers, for which an employment decrease of almost 20% is forecast. Other groups for which a severe employment decrease is expected are blacksmiths, toolmakers and telephone and telegraph operators.

The relative decrease for these groups can be seen in the second column. There are some small occupational groups with a predicted absolute loss of less than a thousand, but a relative loss which is higher than those shown here. However no table of relative losses, which would include these small categories, is given here, since, given the various uncertainties, forecast employment losses of less than 1,000 cannot be taken as meaning that a group is an occupational loser.

Table 2.5 - Occupational winners (relatively seen): forecasts 1989-1994

	Occupational group	Employment increase Absolute number	%
1 (3)*	Software analysts, statisticians, etc	45,400	57
2 (-)	Mail distribution employees	22,000	35
3 (-)	Journalists, authors	7,400	26
4 (-)	Freight handlers, concrete batchers, etc	47,000	25
5 (8)	Managerial and higher executive employees	42,300	20
6 (-)	Self-employed shopkeepers	12,300	12
7 (2)	Managers wholesale trade, etc	4,600	12
8 (-)	Self-employed commercial agents	3,500	12
9 (4)	Managers retail trade	2,100	12
10 (-)	Engineers and related technicians	21,200	11

* see table 2.4

Table 2.6 - Occupational losers (absolutely seen): forecasts 1989-1994

	Occupational group	Employment decrease Absolute number	%
1 (-)	Sales supervisors and buyers	7,000	18
2 (-)	Blacksmiths, tool-makers	4,000	14
3 (6)	Self-employed farmers	3,500	3
4 (-)	Telephone and telegraph operators	3,500	23
5 (-)	Shoemakers, etc	3,500	5
6 (1)	Bricklayers and carpenters	3,000	2
7 (-)	Agricultural workers	2,500	2
8 (-)	Printers and related workers	2,000	5
9 (7)	Drivers and sailors	1,500	1
10 (8)	Electrical fitters, etc	1,000	1

Oegema (1990) analyzed the expected consequences of the completion of the European Internal Market in 1992 for the Dutch Labour Market. He concludes that although total employment will not be affected, at least 50,000 workers will have to change jobs. Generally speaking, employment in technical/industrial and commercial occupations is expected to increase; especially since, as a result of the completion of the European internal market, increases are expected in employment for specialized production jobs. Relative losses are forecast for clerical occupations and economic and legal occupations. This is largely due to the expected increase in competition in banking, which will increase the incentive to improve labour productivity by the further automation of banking work.

The educational structure of employment

In the first half of the 1980s the educational structure of employment also shifted significantly. De Grip (1987) and Teulings and Webbink (1990) showed that these shifts are predominantly due to a shift in the skill structure of occupational groups. The less skilled workers in particular were crowded out of employment by more skilled workers. On a priori grounds it is hard to say if this is an upgrading processes as a result of demand-side 'pull', or a crowding-out process as a result of supply side 'push'. The shifts in the industrial and occupational structure also led to a decrease in employment for less skilled workers, especially for workers with technical skills.

Table 2.7 shows more in detail the educational groups with the (relatively seen) largest employment gain in the period 1981-1985.

The list is dominated by the 'semi-higher' studies. Only two types of lower vocational training feature on the list; miscellaneous transport training and part-time training for security work. Econometrics and technical management (B. Sc.) and the various Socio-cultural sciences are the only academic studies on this list of greatest winners. In absolute terms, economic and administrative education (plus 53,000) and technical education (plus 50,000), both at intermediate level, show the largest increase of employment, followed by economic, administrative and commercial schooling at the lowest level (plus 41,000).

Table 2.7 - Educational winners (relatively seen) 1981-1985

	Type of education	Employment increase Absolute number	%
1	Econometrics and technical management (B. Sc.) (H)	2,800	342
2	Lower transport training	20,500	170
3	Technical management and ergonomics (SH)	1,700	152
4	Lower security training	2,600	88
5	Social and library studies (SH)	21,600	48
6	Economic and administrative studies (SH)	30,000	46
7	Nursing and physiotherapy training and related studies (SH)	14,400	45
8	Agricultural studies (SH)	3,300	43
9	Medical care studies (I)	11,000	41
10	Socio-cultural sciences (H)	11,300	41

I = Intermediate level
SH = Semi-higher level
H = Higher level

Only six educational groups can be characterized as 'educational losers' in the first half of the 1980s. The employment loss for 'unskilled workers' (elementary education only) is most noteworthy. Also general secondary education at the lowest level and lower technical and agricultural education suffered from significant employment decreases. Probably the decrease in employment for these educational groups corresponds with the decreasing supply of these group of workers. However, in the next section we will see that these groups also encounter the most severe unemployment problems.

Table 2.8 - Educational losers (relatively seen 1981-1985)

Employment decrease

Type of education	Absolute numbers	%
Elementary education	287,000	29
General secondary education, lowest level	45,000	11
Lower technical education	54,000	10
Lower agricultural education	11,000	9
Transport education (I)	2,400	5
Hotel and catering, and hairdresser's training (I)	1,400	4

I = Intermediate level

To give an impression of the expected developments in labour demand in the first half of the 1990s, we will here present the educational groups for which the ROA forecasts indicate, respectively, the highest and lowest numbers of job openings. These job openings consist of two components: employment increases and replacement demand[2]. Table 2.9. shows the educational groups with the highest relative number of forecast job openings.

Relatively seen the greatest number of job openings are forecast for econometrics and technical management (B.Sc.). Technical sciences at an academic level also feature on this list. For economic and administrative education, both at an intermediate and semi-higher level, relatively large numbers of job openings are also expected. Four studies at intermediate level - social and welfare work education, medical care studies, nursing training, and medical laboratory education - are the only types of education on this list for which the replacement demand component dominates in the number of job openings forecast. All these studies are characterized by an over-representation of females and are related to occupational groups that traditionally show large replacement demands.

2. In De Grip, Heijke and Dekker (1989), an explanation of the way in which the replacement demand is calculated, is given.

In absolute terms a large number of job openings is also expected for lower technical education and general secondary education (lowest level). In both categories replacement demand is dominant: 100% and 64%, respectively.

Table 2.9 - Educational groups with the most job openings (as a percentage of employment in 1989), divided into replacement demand and employment growth

Type of education	job openings %	replacement demand %	employment increase %
Econometrics and technical management (H)	54	8	92
Economic and administrative education (I)	31	15	85
Social and welfare work education (I)	29	62	38
Economic and administrative education (SH)	29	14	86
Lower transport training	27	32	68
Medical care studies (I)	24	60	40
Technical management and ergonomics (SH)	23	23	77
Nursing training (I)	21	58	42
Medical laboratory education (I)	21	52	48
Technical sciences (H)	21	28	72

I = Intermediate level
SH = Semi-higher level
H = Higher level

A very low relative number of job openings is forecast for those educational groups in particular that suffer from a lack of new positions. Apart from the unskilled workers with only elementary education and lower agricultural and security training, the presence of several types of higher and semi-higher education on this list is quite remarkable (see table 2.10). The larger part of the job openings forecast for most types of education on this list refer to replacement demand.

Table 2.10 - Educational groups with the fewest job openings (as a percentage of employment in 1989): forecasts 1989-1994 (divided into replacement demand and employment growth)

Type of education	job openings %	replacement demand %	employment increase %
Lower security training	3	100	-
Interpreters and translators education (SH)	5	100	-
Elementary education	6	100	-
Art studies (SH)	7	100	-
Teacher education (H)	7	60	40
Lower agricultural education	8	100	-
Language and cultural studies (H)	8	65	34
Legal and administrative education (I)	9	95	5
Law and administrative sciences (H)	10	40	60
Socio-cultural sciences (H)	10	60	40

I = Intermediate level
SH = Semi-higher level
H = Higher level

3. Labour market mismatches

In this section we will indicate the most severe mismatches between supply and demand for workers, according to the various educational groups which have been distinguished. First an indication is given of the educational groups suffering from the most severe unemployment problems at the beginning of the 1990s. Table 2.11 shows that, for some types of education, unemployment is relatively high at all skill levels. At the academic level, art studies, languages and cultural studies, socio-cultural sciences and agricultural sciences in particular show significant excess supply. At an intermediate level unemployment is relatively high for workers with only a general education and for those with an education in social and welfare work.

However the highest unemployment is found for unskilled workers with elementary education only.

Table 2.11 - Types of education with severe excess supply (unemployment percentages, April 1990)

Type of education	unemployment %
Elementary education	28
Art studies (SH)	25
Languages and cultural studies (H)	17
General secondary education, highest level	17
Lower administrative and commercial education	15
General secondary education, lowest level	14
Socio-cultural sciences (H)	14
Social and library studies (SH)	13
Agricultural sciences (H)	13
Social and welfare work education (I)	13

I = Intermediate level
SH = Semi-higher level
H = Higher level

On the other hand there are also several labour market segments in which unemployment is below the level that could be considered as frictional unemployment. As a matter of fact all educational groups for which registered unemployment is less than 5% can be characterized as segments with excess demand. In table 2.12 we show the types of education for which this excess demand is most significant. The table shows that workers with an economic-administrative, technical, laboratory or transport education at intermediate or (semi-) higher level were in particularly short supply at the beginning of the 1990s.

The ROA forecasts of the labour market prospects for educational groups in the first half of the 1990s show that these prospects will probably be quite different for the various educational groups.

Table 2.12 - Types of education with the greatest excess demand (unemployment percentages less than 5%), April 1990

Type of education	Unemployment %
Economic and administrative education (SH)	1
Economic and administrative education (I)	1
Technical education (I)	2
Transport education (I)	2
Legal and administrative education (I)	2
Agricultural education (I)	3
Medical laboratory education	3
Theological studies (SH&H)	3
Laboratory education (SH)	3
Technical education (SH)	3
Transport education (SH)	3
Technical sciences (H)	3
Pharmacy (H)	3
Econometrics and technical management (H)	3

I = Intermediate level
SH = Semi-higher level
H = Higher level

Table 2.13 presents the educational groups that will probably face excess demand in the middle of the 1990s. The indicator given is the quotient of the supply and demand prognoses (in absolute numbers). Although the figures presented are quite exact, they should be interpreted with care. We can say no more than that they give an indication of the future labour market situation. For the more skilled groups the indicator does not express an expected level of unemployment, as these groups will probably find jobs at lower levels. However, that does not mean that the labour market for these groups should not be described as having an excess supply.

Table 2.13 - Types of education that will probably face excess demand (forecasts 1989-1994)

	Indicator labour market equilibrium*
Lower transport training	0.84
Economic and administrative education (I)	0.91
Theological studies (H)	0.95
Transport education (I)	0.98
Lower domestic and catering education	0.99
Pastoral studies(SH)	1.00
Medical laboratory education (SH)	1.00
Economic and administrative education (SH)	1.00
Police and military training (I)	1.01
General secondary education, lowest level	1.01
Medical laboratory education (I)	1.01
Legal and administrative education (I)	1.02
Transport education (SH)	1.04

I = Intermediate level
SH = Semi-higher level
H = Higher level

* A value of 1.05 indicates an equilibrium of supply and demand, labour market frictions included.

Excess demand is forecast for transport education at all levels, economic and administrative education and medical laboratory education at intermediate and semi-higher level, theological and pastoral studies at higher and semi-higher level, and police and military education at intermediate level. Most of these educational groups already faced excess demand at the beginning of the 1990s (see table 2.12). However, two less skilled educational groups on the list - lower domestic and catering education and general secondary education at the lowest level - indicate that in the near future some less skilled groups will face excess demand. Probably this is due to the expected decrease in the entry of less skilled youngsters to the labour market.

However, as our forecast also indicates that workers with a general secondary education at a higher level will face severe excess supply (see table 2.14) we may expect that a further substitution of less skilled workers by intermediate, generally skilled, workers will probably diminish excess demand for the groups of less skilled workers mentioned.

Table 2.14 - Types of education that will probably face severe excess supply: forecasts 1989-1994

Type of education	Indicator labour market equilibrium*
Languages and cultural studies (H)	1.80
Agricultural sciences (H)	1.64
Agricultural studies (SH)	1.64
Social and welfare work education (I)	1.63
Law and administrative sciences (H)	1.62
Elementary education	1.52
Art studies (SH,H)**	1.49
Socio-cultural sciences (H)	1.48
Nursing and physiotherapy training, and related studies (SH)	1.47
General secondary education, highest level	1.43
Lower security training	1.44

I = Intermediate level
SH = Semi-higher level
H = Higher level

* See table 2.13
** For the very small group Art studies (H) we calculated an indicator of 2.62

It is striking that higher and semi-higher educational groups dominate in this list of educational groups for which severe excess supply is forecast: languages and cultural studies, agricultural sciences, law and administrative sciences, art studies, socio-cultural studies, and nursing and physiotherapy education and related studies. Although, as has been said before, this does not imply that unemployment for these groups will become extremely high, it still gives a indication that these groups will face severe excess supply. For unskilled workers with only an elementary education the labour market prospects are also quite bad, especially because these workers have hardly any opportunity to 'bump down' other educational groups out of employment. At intermediate level, only social and welfare work training is expected to face excess supply.

In addition to the above picture of the forecast shortages of labour supply by educational groups, it might be interesting to look at those occupational groups that will suffer most from the expected decrease in the young labour supply. Therefore we look at the occupational groups in which a relatively large number of young people (15-24 years old) are working. These groups can be determined from the 1985 Labour force survey: shop assistants (42% young people), hairdressers, beauticians (39%), launderers, etc (37%), food and beverage industry production workers (34%), cooks and waiters (34%), and secretaries and typists (32%).

Several of these occupational groups traditionally recruit workers from the groups 'lower domestic and catering' and 'general secondary education, lowest level', which were mentioned in connection with our forecasts (see table 2.13) as less skilled groups which will enjoy excess demand. The majority of secretaries are recruited from the education group 'economic and administrative education (intermediate level)'. For this educational group we also forecast a situation of excess demand.

It is obvious that new sources of labour should be recruited for these occupational groups, if the supply of youngsters is going to diminish. Obviously, a shift towards more recruiting of women who are willing to re-enter the labour market, supported by the creation of part-time jobs and child-care facilities, will be the best solution for employers facing labour shortages for these occupational groups. For secretaries, in particular, such a policy will require the enlargement of retraining facilities, as developments in information technology are changing the contents of secretaries' work continuously.

Employers will probably also have to shift the emphasis in their human resource management from recruiting policies towards schooling policies, at least for the educational groups at intermediate and semi-higher level for which a situation of excess demand is forecast. No doubt the new policy will in the first place be focused on a firm's own workforce. This can be encouraged by strengthening internal labour market mechanisms such as career ladders. However, to the extent that recruitment will shift towards less skilled workers, it may also imply more intensive efforts to train new employees, by means of apprenticeship training or less formal internal training schemes.

4. Conclusion: some long-term trends

In the foregoing, the expected developments in the labour market in the medium term, in particular, have been discussed. For that period it may be assumed, within broad margins of uncertainty of course, that the structures and development patterns that have been presumed to be constant in formulating the predictions are indeed constant. However, statements on labour market developments in the long run, are more speculative, especially if those statements are made at a relatively low aggregation level by occupation and type of training. Leaving out statements on the possible long-term developments is however very unsatisfactory.

The pursuit of an educational or training policy intended to improve the match of labour supply and demand is by definition an investment problem. The results of this investment extend over a long period, which, for basic schooling, may extend to the entire working life, without considering that the knowledge and skills acquired through education may be passed on to future generations. It is therefore necessary to somehow form an idea of the labour market in the long term.

So long as we do not have operational models that place all the factors which are relevant in the long term in a logical relation to one another, we will have to do with indicating some speculative trends that appear to be important on this time scale. We do not claim to be exhaustive and will limit ourselves to statements of a qualitative nature. We will focus on three themes: the demographic development, the integration of the European market and technological development. In the previous section we have already gone into the importance of demographic development for the labour market. We pointed to the problems that the continuing aging of the population can, in the medium term,

cause for the recruitment of personnel for those occupations that depend relatively strongly on young people, and are expected to be confronted with a surplus of demand. For the less skilled occupations the solution of tapping new sources of labour was mentioned, and for the more skilled occupations an increase in the commitment to training for the working population was indicated. In the long term, however, the issue may possibly change somewhat.

The observed increase in the degree of participation in the labour market is largely attributable to women who keep working longer and more often return to a working life after an interval of several years. Moreover, the perceived continuing increase in participation in higher education may also be attributed to women, who are gradually whittling away the educational disadvantage which they have had in the past as compared to men. It is in the long term plausible for both processes to reach a saturation point. This will mean that the restraints on the growth of the labour supply because of the aging of the population will be enhanced by stagnation in the rate of participation in the labour force. Moreover, this stagnation in the growth of the labour supply may possibly be accompanied by a stabilization of the portion of those entering the labour market who have a higher education. If economic growth continues, the development of labour supply as sketched here will lead to a tightening of the labour market. With an increase in the demand for more highly trained personnel as a result of technological development, such a tightening of the labour market would be felt even harder at the upper end of the labour market, in particular at the semi-high and higher educational levels. In the long term, the lead that education took in the "Tinbergian" race between technology and education will therefore possibly be taken over by technology. The process of downward displacement, characteristic of the eighties, could come to an end by the above mentioned tightening of the labour market, resulting in better chances on the labour market for lower trained workers. Moreover, labour market chances for the latter group can also improve if the higher trained will at the same time shift from lower to higher skilled jobs, coming available by the technology driven upgrading of labour demand.

In the medium term, re-entering women will be a main recruitment source to fill shortages at the lower end of the labour market. Because this source of additional labour supply will run dry in the long term, new sources will have to be explored. To this end, it appears probable that ethnic minorities will increasingly be considered.

At this moment, second and later generation immigrants from countries around the Mediterranean are barely able to get along in education and have a relatively low participation in the work force. The majority stop their education at the level of preparatory vocational education or even at a lower level. It will probably take generations before the educational emancipation of these minorities is comparable to that of the native population. However, the slow down of the downward displacement process outlined above together with the saturation of the new supply of lower-skilled re-entering women could create possibilities for this poorly trained group to be accepted in the lower sections of the labour market, as jobs in the sectors of transport, the catering industry, cleaning, the retail trade, repair and maintenance, the building industry and some industrial sectors.

Due to the lifting of the trade barrier within the European Community in the mid-nineties, the economies of member states will become more and more intertwined. In the long term, the traditionally regional and national labour markets will therefore acquire a broader international scope. The emergence of so-called "Euro-regions" will probably constitute the first step in this process of internationalization. The reduction of social and physical distances within Europe, as measured in time and cost, and the lifting of all kinds of institutional barriers between the member states will at first affect that part of the population that is already more mobile and better informed: those with higher education. This labour market will increasingly pass across national borders, a process which will lead to a large increase in international mobility in the shape of long distance (weekend) commuting and migration (Heijke, 1990). Within these sections of the labour market the competition between European regions will increase. The tightening of the higher sections of the labour market which is expected in the long term will give rise to a recruitment problem that will have to be solved in the context of a labour market which is geographically increased in scale, in which secondary working conditions in the broadest sense, and such things as attractive living conditions, will play a strategically determining role.

In the argument for a long term tightening of the labour market, continuing economic growth and increasing demand for those with a higher education, as a result of technological innovations, were taken as given. It is however not in the least certain that the demand side of the labour market will develop according to these premises.

The current acceleration of technological development is facilitated especially by the occurrence of fundamental innovations which prepare the way for particular technological paths. In the long term the diffusion of new technological possibilities on these paths will probably become more or less saturated, especially in the field of information technology. As a result, the growth of employment in information occupations will slow in the long term. For the labour market as a whole, the saturation of technological developments could mean that the slow-down in the downward displacement process discussed earlier will lead to a smaller shift of the higher trained workers from lower to higher skilled jobs then otherwise would be the case.

However the demographic, international and technological developments outlined above turn out, it is beyond doubt that, in the longer term, the intensification of efforts in adult education will become one of the most important strategies to create human resources that enable the Dutch economy to compete on markets that will become more and more internationalized. As the M.I.T commission on Industrial Productivity in the USA warns, "there seems to be a systematic underestimation in this country (USA) of how much difference it can make when people are well educated and when their skills are continuously developed and challenged. This underestimation of human resources becomes a self-fulfilling prophecy, because within an international competition framework, the availability of human resources will partly determine the industrial, occupational, and skill structure of a country" (American Society for Training and Development, 1990).

The American Society for Training and Development recommends an annual commitment of 2 percent of the payroll for training expenses, as a good start. In 1986 in the Netherlands training expenditures satisfied this goal in only two sectors, both service sectors: transport, storage and communication (2.7%) and banking, insurances and commercial services (2.3%). It is clear that there is serious task here for Dutch trade and industry, if it is to take a more decisive position in the international competitive struggle that is developing.

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