Overeducation among SwedishYouth

Bourdet, Yves; Persson, Inga

2008

OVEREDUCATION AMONG SWEDISH YOUTH

Background, Incidence and Effects

Yves Bourdet* and Inga Persson*

January 2008

Abstract: In this paper we analyse the changes that have taken place on the supply and demand sides of the Swedish labour market during recent decades, with particular focus on youths and the extent to which Swedish youths have become "overeducated". We first provide an overview of theoretical and measurement issues related to the concept of overeducation. Against this background we then survey some of the findings from earlier studies of the evolution of the demand and supply of skills in Sweden and of the extent and character of over- and undereducation. We then look specifically at overeducation among Swedish youths during their labour market entrance and early career and discuss the main issues related to overeducation that have been raised in the Swedish public debate.

Keywords: Overeducation, mismatch, wage-premium, youth employment, Sweden

JEL-codes: J21, J24, J31

*Department of Economics, Lund University, Sweden (Yves.Bourdet@nek.lu.se) **Department of Economics. Lund University, Sweden (Inga.Persson@nek.lu.se)

The paper is a contribution to the IRES (Institut de Recherches Economiques et Sociales, Paris) project "Le déclassement des jeunes : une comparaison France – Suède". Thanks are due to Katarina Katz and Florence Lefresne for their constructive comments on an earlier version of this paper.

Contents

1. Background

PART I. OVEREDUCATION – THEORY, MEASUREMENT AND ISSUES

2. Definition and measures of overeducation

3. Relation to theories of the labour market

4. Issues and some results from earlier international studies

5. Summing up: Overeducation and the functioning of the labour market

PART II. OVEREDUCATION AND LABOUR MARKET ENTRANCE – THE SWEDISH CASE

6. The supply side: The educational expansion in Sweden

7. The demand side: What do we know about the character of job growth?

8. Some results from Swedish studies of overeducation

The overall supply-demand skill balance

The incidence of overeducation and undereducation

Wage-effects of overeducation and undereducation

9. Overeducation and labour market entrance

Overeducation among graduates from upper-secondary school

Overeducation among graduates from higher education

10. The Swedish view of the skill match problems and reforms underway

References

OVEREDUCATION AMONG SWEDISH YOUTH
Background, Incidence and Effects

1. Background

Recent decades have seen a massive expansion of the educational systems in Europe. This has also been the case in Sweden where both the secondary school system and the higher education system have been expanded very significantly since the beginning of the 1990s. This has meant that the educational level and the educational composition of the new cohorts of Swedish youth entering the labour market have changed markedly. Thus, from the supply side the Swedish labour market has been exposed to significant changes to which it has needed to adapt. At the same time the Swedish economy, like other industrialized economies, has undergone large changes on the demand side of the labour market as well. There has been much discussion among economists (but no definite consensus) about the relative role in these demand changes played by globalization (international trade and capital mobility), new technology, immigration and other factors. However, everybody agrees that there are important structural changes taking place on the demand side of the labour markets. In Sweden the demand side of the labour market was also heavily affected by the economic crisis of the early 1990s, which led to massive job losses, economic restructuring, and slimming of work organizations in both the private and public sectors.

This report analyses the changes that have taken place on the supply and demand sides of the Swedish labour market, with particular focus on youths and the extent to which Swedish youths have become “overeducated”. While the focus is on youth, it is evident that the experiences of young people trying to establish themselves on the labour market reflect the changes taking place in the overall functioning of today´s labour markets when it comes to skills required, types of job contracts, job stability, wages and other forms of remuneration. It could even be the case that the experiences

of youth can act as a "litmus test", revealing the character of the on-going transformations of European labour markets.[1] In a similar vein any differences in youth experiences revealed by country-comparative studies (in this case of Sweden and France) might be indicative of more general differences in the functioning of the two countries' labour markets, and the way they are adapting to changing conditions.

The report has two parts. The first part gives a short overview of theoretical and measurement issues related to the concept of overeducation and presents some results from earlier international studies. It serves as a background to the second and main part of the study which treats the Swedish case. There, we first survey and present some of the findings from earlier studies of the evolution of the demand for and supply of skills in Sweden, and of the extent and character of overeducation and undereducation. These studies have in most cases covered all the employed and not only young people. We then go on to look specifically at overeducation among Swedish youths during their labour market entrance and early career. Finally, we discuss the main issues, related to overeducation, that have been raised in the Swedish public debate, as well as reform proposals and actual reforms already underway.

[1] On these transformations see for example IRES (2005).

PART I. OVEREDUCATION – THEORY, MEASUREMENT AND ISSUES

2. Definition and measures of overeducation

The term "overeducation" is used to designate whether (and to what extent) an individual possesses a level of education in excess of that required for the job (and vice versa, for "undereducation"). It thus indicates that there exists some form of mismatch between the types of education supplied by the labour force and the occupational (or skill) structure generated from the demand side of the economy. Closely related to overeducation is so-called "bumping down". If there is overeducation so that jobs with lower educational requirements are increasingly held by people with higher education than is needed for these jobs, then previously (or potentially) well-matched individuals might be "bumped down" into jobs with lower educational requirements (so that they, in turn, become the overeducated) or even bumped out of employment entirely into unemployment or non-participation.

The concept of overeducation was first used by Richard Freeman in his 1976 study of the US graduate market. Overeducation again became a focus of interest in connection with the huge expansion of European higher education in the 1990s. The number of theoretical and empirical studies devoted to the subject grew and today there exists a relatively large scientific literature on the subject.[2]

From the definition of overeducation it immediately follows that in order to find out whether an individual is overeducated or not, i.e. to measure overeducation, one needs to somehow get a measure of "the level of education required" for a particular job. There are four basic approaches to measuring the required education for a job (and hence overeducation), two subjective measures and two objective measures (see McGuinness, 2006, Groot and Maassen van den Brink, 2000, Tåhlin, 2006, Johansson

[2] See the recent review of this literature by McGuinness (2006), and the meta-analysis of the results from the overeducation studies by Groot and Maassen van den Brink (2000) with accompanying comment and re-analysis by Rubb (2003). Several of the overeducation studies have been published in two important anthologies *The Overeducated Worker*, edited by Borghans and Grip, 2000, and *Overeducation in Europe*, edited by Büchel, de Griep and Mertens, 2003. For an extensive discussion and large number of studies of the French case, see Fondeur (1999).

and Katz, 2007, and Lemistre, 2008).[3] The choice of measure(s) in a particular study is often determined by the availability of data. The subjective measures are arrived at by direct questions to (employed) individuals in surveys. The questions can be formulated in two different ways, giving rise to two types of subjective measures. The first (and simplest) is to ask the respondents directly whether they are overeducated for their job or not. The second is to ask the respondents what the minimum (educational) requirements are for performing his/her job, and then compare this with the respondent´s level of education to see whether he/she is overeducated or not.[4] Sometimes the question asked instead is what the minimum (educational) requirements are for being hired into the respondent's type of job. The two types of objective measures are expert-based and statistically based. The expert-based measure is usually derived from the occupational (or socio-economic) classification systems used in most countries, which often also contain a categorization of different occupations ("jobs") indicating the educational level required for the occupation. Data containing information about occupation and level of education can then be used to classify individuals as overeducated, adequately educated (i.e. correctly matched), or undereducated. The statistically based measure is mostly used when there is no expert-based classification of jobs according to educational requirements available to the researchers. Sometimes they can find out the average (or median) educational level of all the individuals in a particular occupation. Individuals who have a markedly higher education than the average for that occupation (often defined as more than one standard deviation higher) are then classified as overeducated (and vice versa for undereducation). One possible advantage (which might, alternatively, be a disadvantage) of the statistically based measure over the expert-based one is that it is less static; it reflects the actual, current situation when it comes to educational level in different occupations, whereas the expert-based occupational classification system might tend to be rather static and not sufficiently updated (McGuinness, 2006, p. 396; Lemistre, 2008).

[3] For Sweden both subjective and objective measures of overeducation are available, see Part II of the report.

[4] In Part II we will call the first a "direct" subjective measure and the second an "indirect" subjective measure.

It should be evident by now that these four types of measures are likely to generate rather different rates of overeducation in a population. This has also been shown to be the case by researchers who have been able to calculate more than one of the four types of measures for the same population (see McGuinness, 2006, pp. 397-399). Furthermore, it seems that the correlation between the different measures is relatively low, which means that individuals might be classified differently, depending on the measure of overeducation that is applied.[5]

3. Relation to labour market theories

The issue of overeducation obviously has to do with the functioning of labour markets. How then is overeducation related to the different theoretical approaches used to analyze how labour markets work? There are three main such approaches, human capital theory, job competition theory and assignment theory, and they differ markedly in their view of overeducation.[6]

Human capital theory assigns the central role to the individuals´ investments in human capital. It is these investments that determine the individual´s productivity and hence his/her wage. An increase in educational investments will, according to human capital theory, in principle raise the individual´s productivity in all (or at least a large number of) productive activities. The demand side of the labour market will adjust so as to profit from and utilize the increased skills of the labour force, by adaptations not only of the occupational structure but also within occupations (e.g. changes in production techniques and work organization). According to human capital theory then, there is no such thing as overeducation, at least not in the long run. Overeducation may arise but only as a temporary phenomenon.[7] Both for the individual and the economy it will disappear once adjustments to the supply changes in the human capital stock

[5] For an in-depth study of this, based on an application of different overeducation measures to French data on recent graduates, see Lemistre (2008). He also discusses and empirically investigates what happens if one instead applies a classification based on a combination of the different overeducation measures. Furthermore, since he has access to detailed data he is able to illuminate the differences in rates of overeducation between different specializations, at given levels of education.

[6] This section draws heavily on the discussion in Guinness (2006).

[7] The role of differences in "work-related" human capital investments and of differences in unobserved skills (ability) will be discussed in section 4 below.

have taken place. In a similar way exogenous changes on the demand side of the labour market will give rise to adaptations of the individuals´ human capital investments so that, once again, overeducation and/or undereducation will be only temporary phenomena. This, of course, does not exclude the possibility that individuals, and their human capital, might suffer in connection with the adjustment processes. For example, in analogue with firm-specific human capital there might be occupation-specific human capital that is lost or depreciated and loses its economic value to the individual. Or, there might be long-lasting scarring effects of the adjustment process on the individual's labour market outcomes.

This view of the labour market can be contrasted to that of job competition theory, where it is the demand side, instead, that is assigned the central role.[8] Job competition theory assumes that the economy generates a specific number and composition of jobs of different kinds at a particular point of time, and that it is the characteristics of the job (and not those of the job-holder) that determine the productivity of the job (and hence the wage paid for it). Workers are assumed to queue up and compete for the (given) jobs, obviously wanting the ones with the most attractive wage and other characteristics. Employers, on the other hand, are assumed to hire from the queue in a specific order, based on the relative attractiveness of workers with different characteristics. For example, an assumption often made is that employers arrange the queue based on the expected future costs of training different kinds of workers for the job. Here educational credentials can serve as an important signal to employers and individuals might invest in education as a means to get hired (advance in the queue) and/or get hired into a better job; hence the name "job competition" theory. Thus, "… job competition theory emphasizes the importance of a person's relative position" (McGuinness, 2006, p. 392). In the framework of job competition theory it is clear that there can exist both overeducation and bumping down, and that these might be not only temporary phenomena. Much will depend on the evolution of the job structure; how well it matches the evolution of the

[8] Job competition theory was first developed by Lester Thurow (see for example Thurow, 1975) to analyse the functioning of the US labour market for different groups of workers.

characteristics of the labour force and how rigid and inadaptable it really is to changes in the availability of different kinds of workers.

Assignment theory (or assignment models) provides a third, alternative view of the functioning of labour markets.[9] Here the matching of workers and jobs is assigned the central role and is assumed to influence productivity (and hence the wage for a specific worker-job match). The labour market matches workers with different characteristics with jobs with different characteristics and there can be good (in terms of productivity and wages) as well as less good matches. The employer will strive for high-productivity (at given cost) matches and the worker will strive for high wage (at given other job characteristics) matches. The outcome will be an equilibrium allocation of jobs with different characteristics to workers with different characteristics that will reflect the supply and demand for different worker and job characteristics.[10] This means that the wage of an individual will be influenced both by his/her individual characteristics (e.g. educational characteristics) and by the characteristics of the job that he/she holds. It also means that there may very well be matches where the individual is overeducated, correctly educated respectively undereducated - but it is likely that the correctly educated matches are bettermatches.

4. Issues and some results from earlier international studies

Against the background of the above definitions and theoretical approaches, what are the issues that have been addressed in the empirical studies of overeducation? And what are the main results? Since there exist good and recent surveys of this literature we will here only briefly (making use of these surveys) present the main issues and results.[11]

---

[9] According to Sloane (2003, p. 13) the job assignment model goes back to Roy (1951) and Tinbergen (1956) and was then further developed by Hartog (1977) and Sattinger (1993).

[10] Compare McGuinness, 2006, p. 392: "Within this framework, the earnings function is no longer a directly observable relationship but instead it is the equilibrium outcome to the solution of the assignment problem."

[11] See McGuinness (2006), Groot and Maassen van den Brink (2000), Rubb (2003) and the introductory chapters in *The Overeducated Worker* and *Overeducation in Europe*. The studies of the French case (mostly published in French) are referenced and surveyed in the French part of this comparative project, see e.g. Fondeur (1999), Lemistre (2008) and Fondeur and Lefresne (2006). Earlier studies of the Swedish case will be referenced and surveyed in Part II below.

Quite naturally a first issue has been the (empirical) existence of overeducation. Making use of the different measures of overeducation, the researchers have made incidence studies - for different countries and for different educational and demographic groups. The results from 33 such studies (which generated 62 estimates, relatively evenly split between subjective and objective measures) are summarized by McGuinness (McGuinness, 2006, Table 2, p. 402-404). These studies are dominated by studies of the US (13 studies), the UK (9 studies), Holland (5 studies), Germany (3 studies) and Ireland (3 studies). No study of France, nor of any of the Scandinavian countries, are included. McGuinness found that the Dutch studies yielded the lowest rates of overeducation under both subjective and objective measures, while the US studies generated the highest rates irrespective of the measurement approach adopted. Objective-based approaches were found to generate lower estimates, with the mean objective-based incidence standing at 22%, some 7 percentage points below the comparable subjective figure. (Mc Guinness, p. 404-405). The variation in the estimated rates of overeducation was very large; the rate ranged from a minimum of 7% to a maximum of 57%.[12]

Similar results were found in the meta-analysis carried out by Groot and Maassen van den Brink (2000), based on 25 studies, generating 50 estimates on the incidence of overeducation. The unweighted average rate of overeducation from all the estimates amounted to 23.3% (with a standard deviation of 9.9 percentage points). The different measures of overeducation led to large differences in the incidence of overeducation, with the rates derived from the (objective) statistical measure being markedly lower than the rates obtained from the other three measures. The rate of overeducation varied from 13.1% among studies that used the statistical measure to 28.6% among studies that used one of the two subjective type measures (namely self-report on skill requirements - for new workers - of the job the respondent currently held). Ignoring the estimates based on the statistical method, their meta analysis indicated the "true" or

[12] These incidence rates can be compared to those found by Fondeur for French graduates three years after labour market entry. His subjective (individual) measure amounted on average to 21% (varying from 8% to 40% for different educational levels and specializations), his expert measure on average to 36% (varying from 0% to 84%) and his statistical measure on average to 7% (varying from 0% to 19%). His combined measure resulted in an average incidence rate of 10%, varying from 0% to a maximum of 28%. (Lemistre, 2008, Table 1). For incidence rates in Sweden, see Part II below.

overall incidence of overeducation to be about 26%. Their analysis further showed that overeducation is more frequent among female workers than among male workers; the incidence of overeducation (on average) amounting to 24% for women as compared to 21% for men.

A natural extension of the incidence studies is to investigate which factors that affect the rate of overeducation, i.e. to make econometric studies of the variation in the rate of overeducation (or in the individuals' probability of being overeducated). For example, Groot and Maassen van den Brink (2000) in their meta-analysis study find that the rate of growth of the labour force seems to affect the rate of overeducation, and Fondeur (1999) shows that overeducation in France varies cyclically, i.e. it is affected by the overall state of demand in the economy. Battu and Sloane (2003), Dolton and Silles (2003) and Lemistre (2008) are examples of econometric studies of the determinants of the individuals´ probability of being overeducated. As an illustration of the results from such studies, the estimates in Lemistre's study of French graduates three years after labour market entry (Lemistre, 2008, Table 3) show that young women's probability of being overeducated is higher than young men's. Furthermore, level and type of education, geographic origin and the duration of job-search before finding the first job all significantly affect the probability of being overeducated. But his perhaps most interesting finding is that of the role of socio-economic origin; everything else the same, the father's and mother's professions have a strong effect on the probability of being overeducated.

A large number of studies have looked at the effects of overeducation, particularly its effect on wages, which is of particular interest from a theoretical perspective, since the three alternative theories about labour market functioning discussed above differ in their predictions about what one would observe when it comes to wages.[13] Within the human capital framework there should be no differential effect on wages depending on whether an individual, with a given amount of schooling (or, more exactly, human capital) holds a "correct" qualification job or not (i.e. is overeducated). Rates of return to schooling will depend on the individual's human

[13] For surveys of the rate-of-return estimates from different studies, see McGuinness (2006) Table 3, pp. 407-408 and Groot and Maassen van den Brink (2000), Table 1, pp. 151-152. For Swedish rate-of-return estimates, see Part II below.

capital characteristics and not on job characteristics. According to the job competition theory the opposite should be the case; it is the job characteristics that can be expected to affect wages and not the human capital characteristics of the individual holding the job. According to assignment models, finally, both human capital characteristics and job characteristics should be expected to affect earnings, since it is the quality of the match between the individual's characteristics and the characteristics of his/her job that will determine productivity and thus earnings. A number of studies have made use of Mincer-type earnings equations to illuminate the effects of overeducation on earnings. This is often done by means of a specification of the earnings function where an individual's completed schooling is decomposed into the number of years required for his/her current job and the number of years of his/her surplus or deficit schooling (if any).[14] Sometimes overeducation and undereducation are instead indicated by dummy variables.[15] The former type of specification enables us to test whether the rate-of-return to overeducation (and to undereducation) differs from the rate-of-return to required education. According to human capital theory the rate-of-return should be the same for years of overeducation as for years of required schooling and according to job competition theory there should be no additional wage pay-off to years of overeducation (or, for that matter, any wage penalty for being undereducated).

The empirical results overwhelmingly indicate that both human capital characteristics and job characteristics do affect earnings, meaning that the assignment models provide a better theoretical approach to the actual functioning of labour

---

[14] A typical specification of the earnings equation would thus be for example:

$$\log w = \alpha + Bx + \gamma_1 S^r + \gamma_2 S^o + \gamma_3 S^u + \delta_1 Ex + \delta_2 Ex^2 + \varepsilon_i$$

where x is a vector of personal characteristics correlated with earnings, S^r is years of required schooling, S^o is years of surplus schooling above the required level (i.e. overeducation), S^u is years of deficit schooling below the required level (i.e. undereducation), and Ex is years of experience (see McGuinness, p. 394). Often an "ordinary" earnings equation, i.e. one including only the total number of years of schooling attained (and not overeducation or undereducation), would also be estimated so as to be able to compare the rate of return estimates from the different specifications.

[15] A typical specification would thus instead be (see McGuinness, 2006, p. 395; Cohn and Khan, 1995, p. 68-69):

$$\log w = Bx + \gamma_1 S + \gamma_2 D^o + \gamma_3 D^u + \delta_1 Ex + \delta_2 Ex^2 + \varepsilon_i$$

where S is years of actual schooling. In this specification the overeducated (undereducated) are being compared to individuals with the same amount of education who are adequately matched. Thus the benchmark with which the individuals are being compared differs between the two specifications, so that one must be careful in interpreting and comparing the results. See the discussion in Cohn and Khan (1995) and McGuinness (2006).

markets.[16] Thus, according to McGuinness' (2006) survey, the return to surplus education is lower than the return to required education, and (in the dummies specification) there is a wage penalty associated with being overeducated that ranges from -8% to -27%, with the mean wage penalty amounting to -15.3%. Rubb´s meta-analysis (Rubb, 2003) of the wage-effects found in different studies gives average rates of returns for a year of overeducation, required education and undereducation amounting to 5.2, 9.5 and -4.8% respectively. In all cases the return to required education is higher than the return to overeducation, but the schooling that causes the overeducation still generates positive returns (Rubb, 2003, p. 627). The return to undereducation is always negative and almost always smaller in magnitude than the return to required education. Undereducated workers thus earn more than they would at a job requiring their level of education, but less than their correctly educated co-workers. Similar rate-of-return patterns are also found for Sweden by Korpi and Tåhlin (2006) and Johansson and Katz (2007).[17]

It should be noted that there might be a problem of bias in the estimated wage effects of overeducation (and undereducation). In (most) wage studies the overeducation and undereducation variables have been treated as exogenous, i.e. the process by which an individual becomes overeducated (or undereducated) has been assumed to be exogenous to the determination of earnings. However, Dolton and Silles (2003) found that when they controlled for endogeneity, the overeducation pay penalty rose substantially. The fact that not controlling for the possible endogeneity of overeducation could result in serious underestimation of the wage effect is also indicated by Lemistre's (2008) results for French recent graduates. When not correcting for endogeneity he found an overeducation wage penalty of about 16%. But the estimated wage penalty became twice as large when he corrected for endogeneity by taking account of the selection process into overeducation.

Some related issues raised in the literature are of interest; one being that of heterogeneity. There are two parts to this. One is that of differences (heterogeneity) in observable characteristics, both individual and job characteristics. Such differences

[16] See the discussion in Dolton and Vignoles, 2000, pp. 180-182 and in McGuinness, 2006, pp. 409-412.
[17] The results from these studies will be presented and discussed below.

should in principle be controlled for in wage effect estimates, but in reality this is often not the case, most probably due to problems with data availability. That this might be problematic is most often noted and discussed when it comes to differences in experience and on-the-job training, i.e. variables that reflect human capital investments that might be substitutes for schooling.[18] But within a matching model framework there should probably also be some attention paid to differences in job characteristics other than direct wages, both pecuniary and non-pecuniary ones.[19] A second part of the heterogeneity problem concerns that of heterogeneity in unobservable characteristics.[20] In overeducation studies it has often been assumed that level of schooling correctly reflects skills, but in reality there might be e.g. differences in ability between individuals with the same level of schooling. This could mean that who will end up being overeducated or correctly matched will not be random, i.e. there might be (hidden) selection processes at work. Thus lower wages for overeducated workers than for correctly matched ones might reflect not the effects of overeducation as such, but underlying, systematic differences in (unobserved) individual skills (ability) between the two groups.

In relation to heterogeneity one should also mention the issue of the role of different types of education (specializations) within given levels of education. The rates of overeducation do tend to vary a lot between different specializations, as shown for example by Dolton and Silles (2003) for the UK and by Lemistre (2008) for France. Thus one should perhaps analyse the situation not only in terms of overeducation (i.e. vertical educational mismatch) but also in terms of "mis-education" (horizontal educational mismatch). A similar issue is also that of overeducation among groups that are likely to face discrimination in hiring (and career advancement), such as women

[18] Compare McGuinness, 2006, p. 390: "Thus, individuals with more schooling may be compensating for a lack of work-related human capital, and the apparent lower earnings of these 'overeducated' may be attributable to an omitted variables problem, i.e. a lack of controls for less formal measures of human capital accumulation." For an empirical investigation of this in the Swedish case, see Korpi and Tåhlin (2006).

[19] Compare McGuinness, 2006, p. 393: "Workers found in a particular sector (or job) are not randomly distributed but are there based on the choices made to maximize their income or utility."

[20] Here too, see Korpi and Tåhlin (2006). Their tentative conclusion from fixed effects and instrumental variables estimations is that, at least for Sweden, unobserved heterogeneity is not the whole story behind overeducation.

and immigrants.[21] For individuals from such groups, to become "overeducated" might be a (conscious) strategy to counteract the effects of discrimination and gain access to the kinds of jobs, wages and careers that they would have been able to get with only the required education had they not been discriminated against.[22]

Finally, a very important issue – particularly in connection with youth – is the dynamics of overeducation, that is the extent to which overeducation is a permanent or a temporary state from the individual´s point of view. Clearly, from a welfare point of view, it is very different if the individual just spends a limited amount of time being overeducated, and then is able to exit or advance into jobs for which he/she is correctly educated. Both the issue of heterogeneity and that of dynamics received special attention in the *Overeducation in Europe* anthology. As to the dynamics of overeducation, the editors tentatively concluded that overeducation dynamics show significant differences between countries, and that this might be due to vastly different institutional labour market settings across countries.

5. Summing up: Overeducation and the functioning of the labour market

From this overview of the theoretical and empirical literature on overeducation, it is clear that behind the issue of overeducation hides the whole, complex issue of how labour markets function and adapt to changes, independently of whether the changes are generated from the supply or the demand side, have their origin in changes in labour market regulations or changes in labour market policies etc. Studying overeducation, then, means studying the functioning of labour markets, and studying differences in overeducation between countries means that one also has to study the differences in the functioning of the countries' labour markets in a wider way. For example, one would expect differences in institutions, policies etc., that affect the

[21] The possible connection between overeducation and discrimination is discussed in Sloane (2003), pp. 28-29. See also Johansson and Katz (2007) on the gender gap in overeducation and its role in the gender wage gap in Sweden.

[22] See the empirical findings on the educational investments of some groups of second-generation males in Sweden in Nordin and Rooth (2007).

educational output and the functioning of labour markets, to also make a difference when it comes to the incidence, dynamics and effects of overeducation.[23]

From the overeducation studies it also emerges that the functioning of today's labour markets (in industrialized countries) can best be represented and analyzed by matching models. This implies that one has to look at both how worker characteristics and how job characteristics are evolving in the economy and, furthermore, at how the matching between them is achieved. What "new" worker characteristics are being demanded? And what is happening in terms of matching; what are the selection processes that match "desirable" job characteristics to specific workers or groups of workers? Are there "winners" and "losers" in these matching processes and, if so, who are they and do they have specific characteristics? Are there selection processes according to age, level and type of education, sex, immigrant background, socio-economic background?

Many overeducation studies have focused on the whole labour force and on what is happening to the balance between the skills offered and demanded on the labour market as a whole. But there have also been more specific studies, focused, for example, on the analysis of overeducation among recent higher education graduates (see e.g. Dolton and Vignoles, 2000; Walker and Zhu, 2005), differences in overeducation between women and men and between immigrants and natives (see e.g. Battu and Sloane, 2003, Ekberg and Rooth, 2005, and Johansson and Katz, 2007), bumping down and the low-skilled (see e.g. Asplund and Lilja, 2000). Our comparative study of Sweden and France will have overeducation among youths during their labour market entrance and early career as its main focus, but within this framework we will look at differences between education levels, between types of education, between young women and young men, and between youths with and without an immigrant background.

[23] For a study taking this as a starting point and hypothesis and then comparing overeducation in Germany and the US, see Daly et al. (1998).

PART II. OVEREDUCATION AND LABOUR MARKET ENTRANCE - THE SWEDISH CASE

In this part of the report the focus is on the Swedish case. We start by describing how the Swedish education system has been expanded and the resultant change in educational attainment; in other words we look at what has happened on the supply (of skills) side of the Swedish labour market. The next section focuses on developments on the demand (for skills) side of the labour market, and contains some of the findings from studies of the evolution of the Swedish job structure. The following section starts with a short description of results concerning the evolution of the overall demand-supply of skills balance on the Swedish labour market. Then we survey and discuss the results from earlier studies of the incidence and wage effects of overeducation in Sweden. These studies have usually dealt with overeducation among the labour force as a whole and not specifically with overeducation among youths. In the subsequent section the focus is entirely on youth and overeducation during labour market entrance and early career. Finally, we take a look at the Swedish policy debate, reform proposals and actual reforms already underway.

6. The supply side: The educational expansion in Sweden[24]

Increased (individual) demand for schooling and for a skilled labour force, together with a political striving for equality of opportunity, resulted in large scale educational reforms and an expansion of the Swedish school system during the 1950 and 1960s. By the early 1960s the reforms had put in place a nine-year compulsory and comprehensive school ("grundskolan") for all children between the ages of 7 and 16. The 1960s also saw a rapid expansion of, and increased access to, upper secondary schooling. In 1970 the up till then different types of upper secondary schools, theoretical and vocational, were amalgamated into one common school form

[24] Main sources for the description of the character and evolution of the Swedish educational system in this section are le Grand et al. (2005) and Holzer (2006).

("gymnasieskolan"), containing both theoretical and vocational lines, but where some of the lines were shorter (2 years instead of 3-4). The increase in graduates from upper secondary school in turn laid the foundation for increased demand for higher education and an expansion of the number of students at Swedish universities. Tendencies towards overcrowding at the universities were met by large scale reforms of higher education in the late 1970s. A number of new (regional) university colleges for undergraduate education were created (often based on earlier vocational colleges for the training of e.g. nurses, teachers etc.), and the earlier open access to some of the faculties at the universities was replaced by a system where all access to higher education took place according to a regulated and restricted system of admission. After the reform the number of students enrolled in Swedish higher education remained roughly unchanged (at around 180,000 students) throughout the 1980s.

During the 1990s there were again significant reforms of all three levels of education. For compulsory schooling ("grundskolan") the reforms were mainly of an organizational character. Responsibility for and decision-making power over the schools (and school staff) were transferred from the state and central authorities to the municipalities. Furthermore, quality standards and common national standards were, to a larger extent than before, to be achieved via so-called steering by objectives, with more freedom for local school authorities, schools and teachers to decide how the objectives were to be achieved. At the same time parents and pupils were given greater freedom to choose between municipal schools, and the regulations were changed so as to allow more independent (state-supported) schools to develop.

For upper secondary schooling ("gymnasieskolan") the changes implemented during the first part of the 1990s had a different character. Their aim was to provide access to upper secondary education of sufficient length, depth and quality for all the members of a cohort, to strengthen the theoretical elements in the vocational lines by a set of common (with the theoretical lines) core courses, and to provide a flexible structure with possibilities for increased choice by students as to the content of their upper secondary schooling. Thus, all upper secondary education was organised into courses, classified by volume (number of points) and level, and the grading for each course was to be based on the achievement of specified objectives set for each course.

The awarding of grades is thus a continuous process and there is no final (baccalauréat) examination. All education is organised into study programmes of three years´ duration and a completed secondary education should have a minimum number of total points.[25] There are 17 national programmes, 14 primarily vocationally oriented programmes (but also intended to give so-called "basic required qualification" for admittance to higher education) and three theoretically oriented programmes (primarily preparing for higher education). Most of the programmes are divided into profiles (with different compulsory course combinations) for the second and third years. In the vocationally oriented programmes at least 15 % of the students' total time is to be spent at workplaces. Besides these programmes, it is also possible for certain students to follow a so-called (national) "individual programme", i.e. an individual study plan designed in cooperation with the school. This could be an alternative for youths who do not qualify for admittance to the national vocational or theoretical programmes (due, for example, to deficiencies in their results from compulsory school) or for other reasons do not want to follow any of these programmes. Often the intention is that the individual study plan should prepare the student for future transfer into a national vocational or theoretical programme. In addition there is a possibility of creating local variations (so-called "special programmes") of the national vocational or theoretical programmes, a possibility that has also often been used by the independent (state-supported) upper secondary schools that have grown in number over time. This then has been the design of the "gymnasieskola" that has produced the graduates from upper secondary education in Sweden during the last decade. Table 1 shows how the composition of graduates has evolved over time.[26]

[25] This means that the earlier 2-year theoretical and vocational lines were abolished and all programmes designed to have a duration of three (or sometimes four) years. The lengthening of some of the programmes and the increase in the overall number of places in upper secondary education were decided upon before the severe economic crisis in Sweden during the early 1990s but the reforms came to be implemented so that they also ended up playing an important role in accommodating more youths when the demand for labour decreased drastically in connection with the crisis.

[26] Graduates from independent upper secondary schools have not been included in Table 1. The number of such graduates has increased over time and in 2004/05 amounted to some 8,000 (out of a total number of 83,000 secondary school graduates).

Table 1: The composition of students who completed study lines in upper secondary school.

School year	1984/85	1989/90	1996/97	2000/01	2004/05	(% females)
2-year vocational lines	45	42				
3-year vocational lines	0	1				
2-year theoretical lines	13	7				
3-4 year theoretical lines	42	50				
Vocational programmes			45	38	43	a)
Theoretical programmes:						
Natural science and technology			20	20	19	(35)
Social science			29	25	22	(65)
Special and individual programmes			6	17	16	(36)
	100	100	100	100	100	

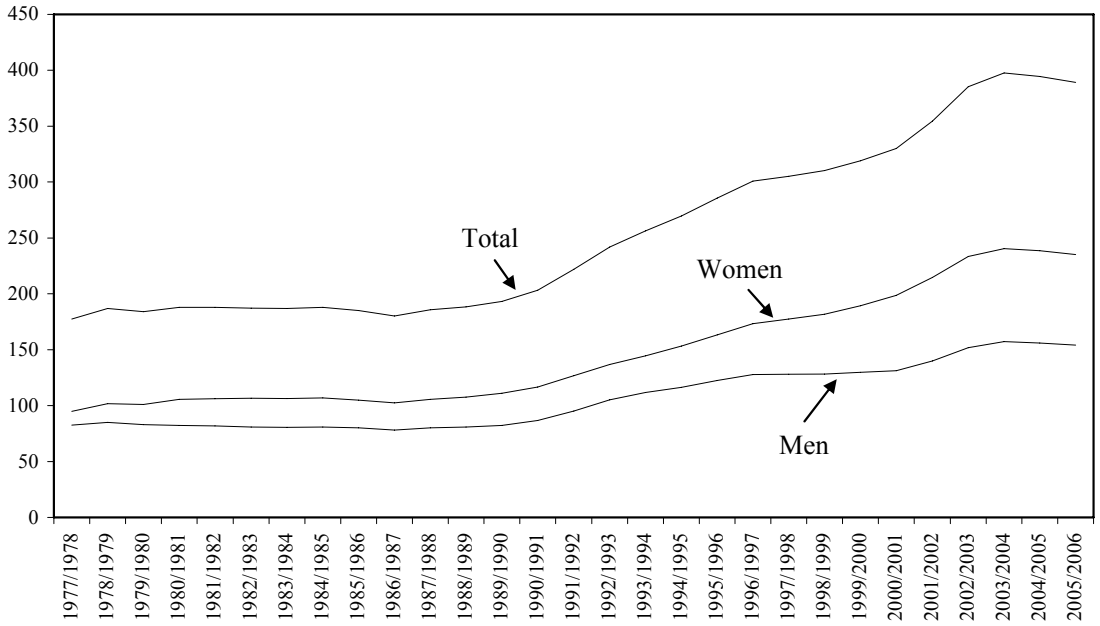
Note: a) Many of the vocational programmes are either heavily male-dominated or heavily female-dominated. The exceptions are e.g. the aesthetical, trade and administration, hotel and restaurant and media programmes, which have a more balanced sex composition.
Source: Yearbook of Educational Statistics, various issues, Statistics Sweden.

The build-up of the Swedish adult education system should also be mentioned here, since it has played an important role in increasing the skills of the Swedish labour force during the last decades. Municipal adult education was instituted in 1968 and since 1992 it has included basic adult education, upper secondary adult education and post-secondary adult education. Basic adult education and upper secondary adult education are constructed so as to supply the same courses as in the regular youth school system to individuals over 20 years old who have not completed such schooling and/or need to complement their earlier schooling with specific courses.[27] The public adult education system has filled an important function for members of earlier cohorts who did not have access to upper secondary education, and for the complementary schooling of adult immigrants. Increasingly, however, it also came to be used by youths who had completed an upper secondary education but wanted to complement their earlier courses and/or improve their grades so as to be able to qualify for, or be more competitive, when it comes to admission into (some of the) higher education

[27] The municipalities must provide upper secondary schooling for all residents who start studying before age 20.

programmes. The purpose of post-secondary adult education has been to provide (higher) vocational courses which are not available in youth education.[28] Adult education is also available outside the public school system at some 150 "folk high schools", mainly residential and run by different (non-profit) organizations.

Figure 1: Students enrolled in higher education, total number and by sex (thousands), 1977/78 – 2005/06.



Source: Statistics Sweden

In the late 1980s several reports stated that Sweden had fallen behind other similar countries when it came to rates of higher education in the population. As mentioned above the central, political steering of the number of places in Swedish higher education had resulted in an almost unchanged number of enrolled students during a decade. This meant that there was an unmet (individual) demand for higher education, and it was also regarded as a threat to Sweden's international competitiveness. Against this background it was decided to increase the number of places in higher education and a gradual and large expansion took place over the

[28] See Lindell and Johansson (2002).

1990s.[29] By the mid-2000s the number of students enrolled in higher education had more than doubled and amounted to almost 400,000 (see Figure 1).[30] The new university colleges bore the brunt of the expansion, and towards the end of the 1990s some of the university colleges were also upgraded to universities. Figure 1 also reveals that the increase in enrolment was particularly marked for women. From the supply side then, the number of individuals with higher education qualifications increased very rapidly during the previous fifteen years and this "supply-shock" could have resulted in overeducation among the graduates if the demand for such skills had not followed suit.

Table 2: Education levels (in %) by cohort. 2001-2003.

	Primary education 7 years	Primary education 9 years	Secondary education ≤ 2 years	Secondary education 3 years	Higher education < 3 years	Higher education ≥ 3 years
Born in:						
1930-39	30	7	29	10	10	11
1940-49	16	8	33	12	15	16
1950-59	4	10	35	12	19	20
1960-69	1	7	37	17	20	18
1970-79	1	5	18	30	25	21

Source: Statistics Sweden, *Levnadsförhållanden, rapport 111*.

The Swedish higher education system is rather flexible with substantial opportunities for the students to design their own individual schooling by choosing between different courses, part-time or full-time studies, taking study breaks etc.[31] There are two kinds of first academic degrees, professional degrees (of varying length and leading to specific professions in e.g. law, medicine, technology etc.) and general

[29] Again, this expansion took place concomitant with the economic crisis and thus also served as a "buffer" against the drastic fall in labour demand. Employment decreased from about 4.5 million (in 1990) to about 3.9 million at its lowest in connection with the crisis.
[30] Figure 1 does not include the students enrolled in Ph.D.-programmes.
[31] In some respects the Swedish higher education system already resembled the Bologna structure in that it was built up by individual academic courses, each assigned a number of "volume" points and classified by level. These courses were combined and added up to fulfill the requirements specified for different academic programmes and degrees.

degrees. The general degrees are awarded after 2 years, 3 years[32] and 4 years[33] of successfully completed full-time studies.[34]

The reforms of the educational system described above resulted in a very significant upgrading of the educational attainment of successive cohorts of the Swedish population (see Table 2). In later cohorts, only 5-6 percent do not have any upper secondary schooling at all, and among those born in 1970-79 46 percent have a higher education of varying lengths and an additional 30 percent a 3-year upper secondary education.

Table 3: Distribution of higher education degrees awarded (%) by field and sex.

School year	1995/96 (% females)		2000/01 (% females)		2004/05 (% females)	
Humanities and theology	6	(65)	7	(68)	6	(69)
Law and social sciences	29	(55)	29	(60)	29	(62)
Teacher training	21	(77)	16	(78)	16	(82)
Natural science	5	(61)	6	(62)	5	(63)
Technology	20	(19)	21	(26)	18	(30)
Agriculture and forestry	1	(35)	1	(61)	1	(62)
Medicine and odontology	3	(53)	3	(60)	3	(66)
Health-related science	14	(89)	17	(88)	21	(88)
Fine and applied arts	1	(60)	1	(61)	1	(61)
	100	(58)	100	(61)	100	(65)
Number of degrees	32,284		40,480		57,100	

Source: Yearbook of Educational Statistics, various issues, Statistics Sweden.

The increased enrolment in higher education during the last decade has also meant a rapid increase in the number of higher education degrees awarded in various fields (see Table 3). Here, too, the number almost doubled, from about 32,000 degrees awarded in the mid-1990s to almost 60,000 towards the mid-2000s. The distribution of the degrees by field remained rather unchanged over this period of rapid expansion, the exceptions being "teacher training" (whose share decreased by some 5 percentage

[32] Bachelor degree, including at least 1.5 years of full-time study in the major subject.
[33] Masters degree, including at least 2.0 years of full-time study in the major subject.
[34] The degree structure etc. in Sweden will be changed and adapted to the Bologna structure, starting from July 1, 2007.

points) and “health-related sciences” (whose share increased markedly instead). At first there also seems to have been a slight increase in the share of degrees in natural sciences and technology, but by the mid-2000s this increase had been more than reversed.

The gradual expansion of the Swedish educational system described above reflects a conscious policy and philosophy as to the need and role of education and skills, both for individuals and for the economy and society as a whole. Increased investments in schooling and skills have been seen as necessary for a small, open economy to be able to compete and adjust in a globalized world. At the same time it has been regarded as the best protection and insurance for the individuals, facilitating adaptations to changes in demand (whether by external job-changes or changes in job tasks with the same employer) and providing the foundation for the individuals to be able to retrain and learn new skills. Thus, policy-wise, the perceived threat seems not to have been that of overeducation but rather that of not being able to upgrade the schooling and skills of the labour force (or parts of the labour force) sufficiently. This does not mean that there has been consensus about all aspects of educational policy or that there are no problems. As a matter of fact educational policies, concerning all three levels of education, are presently both hotly debated and high on the reform agenda in Sweden. We will return to this later in the report.

7. The demand side: What do we know about the character of job growth?

Changes in the demand for particular categories of skilled or unskilled labour reflect inter alia the process of international specialisation and technological progress. Sweden is a country rich in physical and human capital. The international specialisation of the Swedish economy according to comparative advantages is therefore expected to increase the demand for skilled labour and decrease the demand for unskilled labour (since the latter is embodied in imports from labour-intensive countries). By the same token, technological progress and the introduction of information technology on a large scale affect the organisation and division of labour and can be expected to have a skill-bias so that the demand for labour is altered in

favour of jobs with higher qualifications. Other factors as well may affect the demand for particular categories of labour, either in favour of or against the upgrading of educational and skill requirements. Table 4 shows how the proportion of workers in different socio-economic categories has evolved in Sweden. It reveals, first, that over time there has been a shift from blue-collar workers towards white-collar workers. Concomitant with this there has been a relative growth of the high and intermediate level white-collar categories. For blue-collar workers the structural decline is particularly strong for unskilled workers, even if such jobs still constitute a substantial share of total employment (some 23 %).[35]

Table 4: Structural changes in the socio-economic composition (%) of the employed population, 1968-2000.

	1968	1974	1981	1991	2000
Higher level white-collar	7	9	10	14	17
Intermediate level white-collar	14	16	18	19	24
Lower level white-collar	21	19	20	18	17
Skilled manual workers	21	20	19	19	18
Unskilled manual workers	37	37	33	29	23
Total	100	100	100	100	100
Number (thousands)	2,779	2,964	3,266	3,317	3,066

Note: Data are from *Levnadsnivåundersökningarna* (Statistics Sweden). The employed population is made up of the 19-65 year-old employees with a working time of at least 10 hours per week. The self-employed and farmers are excluded. Statistics Sweden's socio-economic classification system (SEI-code) has been used to determine the various categories. At least 6 years of education after compulsory school are required to belong to the category of high-level white-collar employees. At least three years (and less than 6 years) are required to belong to the intermediate-level white-collar category. Manual workers with at least two years of education after compulsory school are considered skilled workers.
Source: le Grand, Szulkin and Tåhlin (2001a), p. 89.

The shift in the structure of employment in favour of jobs with higher educational requirements, at the expense of jobs with relatively low educational

[35] Note that a decline in the proportion of jobs with low educational requirements of the same order of magnitude can be observed in other industrial countries, like the Netherlands, the United Kingdom and the United States (Åberg (2003), pp. 208-209.

requirements, reflects the process of economic growth and restructuring in Sweden. It has resulted in a steady increase in the average (subjective) qualifications requirements on the Swedish labour market. The first row in Table 5 shows that the average (subjective) educational requirement (number of years of education after compulsory school) for the jobs held by the employed population increased from 1.8 years in 1974 to 3.1 years in 2000. The increase was most pronounced after 1991. [36]

Most of the increase in the (subjective) educational requirements can be ascribed to the changes in the structure of the Swedish economy in favour of branches and socio-economic worker categories that are more skill-intensive. Another explanatory factor behind the increase in educational requirements is the changes in qualification requirements within the socio-economic worker categories and within the branches (at given structure). The estimates by le Grand et al. (2001a) suggest that such within-worker category and within-branch changes contributed only marginally to the increase in total educational requirements, except for the most recent period.[37] While the number of (subjectively) required education years after compulsory school, holding the worker category and branch structure constant at their 2000 composition, only increased from 2.5 to 2.7 years between 1974 and 1991, it increased from 2.7 to 3.1 years between 1991 and 2000. Disaggregated information by categories of workers (see table 5) shows that the within-category increases in the most recent period concerned principally intermediate level white-collar workers and skilled manual workers, and to a lesser extent lower level white-collar workers and unskilled manual workers. No increase in qualification requirements can be noticed for higher level white-collar employees.

[36] Gartell et al. (2007) is an in-depth study of the dynamics (as revealed by gross job and worker flows, decomposed by educational levels) of the restructuring process that took place in the Swedish economy during the period 1986-2002. The study confirms that the last decades in Sweden have been characterized by a strong relative employment shift in favor of more highly educated workers. The results also indicate that the restructuring of employment in the Swedish economy during the 1990s was driven by a combination of demand effects (the creation of "new" high-skilled jobs) and supply effects ("old" jobs being filled merely by more highly educated workers).

[37] Other studies confirm this result. See for example Åberg (2003).

Table 5: Subjective educational requirements (number of years of education beyond compulsory school) by socio-economic worker category and branch, 1974-2000.

	1974	1981	1991	2000
Total	1.8	2.1	2.4	3.1
Total, at given structural change	2.5	2.6	2.7	3.1
High-level white-collar	6.0	6.0	6.0	5.9
Intermediate level white-collar	3.5	3.5	3.6	4.4
Lower level white-collar	1.4	1.5	1.9	2.2
Skilled manual workers	1.9	1.9	1.9	2.4
Unskilled manual workers	0.2	0.2	0.5	0.8
Primary sector	1.2	1.1	1.9	1.8
Construction	2.4	2.8	2.5	2.8
Manufacturing	2.3	2.4	2.4	3.1
Other industry	1.7	1.8	1.9	2.3
Wholesale and retailing, hotel, restaurant	1.6	1.7	1.7	1.7
Transport and communication	1.4	1.3	1.5	1.7
Bank, financial services, assurance	2.8	3.3	3.5	3.9
Public administration	3.2	3.4	3.6	3.9
Health, social services, education	3.2	3.0	3.4	3.9
Other services	1.6	1.8	1.6	2.0

Note: The subjective educational requirements reported in the table come from survey questions about the normal educational requirements for the job the individual currently holds. The second row gives the educational requirements when the compositions of socio-economic worker categories and of branches are held constant at their 2000 shares. When reporting on the educational requirements for the different socio-economic worker categories, the branch composition within each worker category has been held constant, and when reporting on the educational requirements for the different branches, the socio-economic worker category composition within each branch has been held constant.
Source: le Grand et al. (2001a), p. 99.

Disaggregating the data in terms of branches shows that the increases in educational requirements after 1991 were concentrated to the industrial sector (manufacturing and other industry) and to the service sector (in particular the financial sector and health, social services and education). In manufacturing the (subjective) qualification requirement increased from 2.4 years to 3.1 years between 1991 and 2000, which reflects the strong specialisation of Swedish manufacturing industry in high-skilled production. But both for manufacturing and health and social services, the supply-side, in the form of the expansion and lengthening of upper-secondary

education during this period, might also have played a role and affected what are considered "normal" educational requirements. It should also be noted that for certain service sectors, such as retailing, hotels and restaurants and transports, the (average) educational requirements did not rise at all or only marginally during the 1990s.

Table 6: Net changes (thousands) in the number of jobs by wage group, 1977-2001.

	1977-1987	1988-1995	1995-2001
Highest quality quintile	+ 308	+ 22	+ 227
Fourth quality quintile	+ 95	- 76	+ 90
Third quality quintile	- 27	-169	+ 72
Second quality quintile	- 48	- 76	- 84
Lowest quality quintile	- 120	- 137	- 35

Note: Data is from the ULF-database (Statistics Sweden). The database contains information on wages for a representative sample of employees (the self-employed are therefore excluded). The job-quality types are arrived at by the use of data on median full-time yearly income (for further description of the methodology, see Åberg, 2004).
Source: Åberg (2004), p. 41.

An analysis (Åberg, 2004) of the patterns of job changes according to job quality provides further support to the above conclusions (see table 6).[38] Except for the period 1988-1995, which includes the severe economic downturn in the Swedish economy during the first half of the 1990s, total job expansion has been larger than total job contraction in Sweden. For the whole period, job expansion took place in high-quality jobs while job contraction exclusively concerned low-quality jobs. While job contraction was largest for the lowest quintile between 1977 and 1995, it was largest for the second quality quintile between 1995 and 2001. More recent data is necessary to see whether this change is of a more structural character. [39]

[38] Åberg's study follows a methodology first used by Joseph Stiglitz in the analysis of job expansion and contraction on the American labour market. The method ranks the jobs after the wage normally paid for them and then groups them e.g. into quintiles.
[39] Åberg's result, namely that there has been a growth in high-skilled jobs and a contraction in low-skilled jobs in Sweden, differs from the results from similar studies of the US, where the job-growth has had a U-shaped character with growth of both low- and high-skilled jobs and an erosion of middle-skilled jobs. (See Dwyer & Wright, 2003). Preliminary results for France (Wright, 2004, p. 11) for the period 1996-2002 are more in line with the US results.

Åberg's study provides further interesting insights into the patterns of job expansion and contraction.[40] A first finding is that the creation of the highest quality jobs almost exclusively occurred in the private sector while the majority of job losses occurred in the public sector and were most pronounced for the lowest quality jobs. A second finding concerns the gender dimension of job expansion versus job contraction. The job expansion in the highest quality quintile benefited women more than men, and the job contraction in the lowest quality quintile was more detrimental to women than to men. An implication of these simultaneous changes is that female employment moved upwards in the employment structure. A third finding concerns immigrants, for whom the quality of the job situation was not altered significantly by the process of job expansion and job contraction. Finally, those with higher education were the main beneficiaries of the job expansion in both the highest quality and fourth quality quintiles. Higher education thus increasingly became a necessity in order to obtain a highest quality quintile job. Those with higher education were only slightly affected by the job contraction in the lowest quintiles, probably due to the fact that those with higher education only constituted a minor share of the two lowest quintiles.

8. Some results from Swedish studies of overeducation

As mentioned in Part I of the report, both subjective and objective measures of overeducation (and undereducation) are available for Sweden. First, there are objective expert-based measures calculated from micro-data on individuals, containing information about their number of years of schooling (e.g. highest education level attained) and their occupation (or socioeconomic status). Secondly, there are indirect subjective measures that are also calculated from micro-data on individuals and their years of schooling, but where the number of years of education required comes instead from the individuals' own answers to survey questions about the education required for the job they hold. Measures of the first and second type have been calculated by Swedish researchers in earlier studies of overeducation. These studies have usually analysed overeducation (and undereducation) among the employed population as a

[40] Åberg (2004), pp. 42-44.

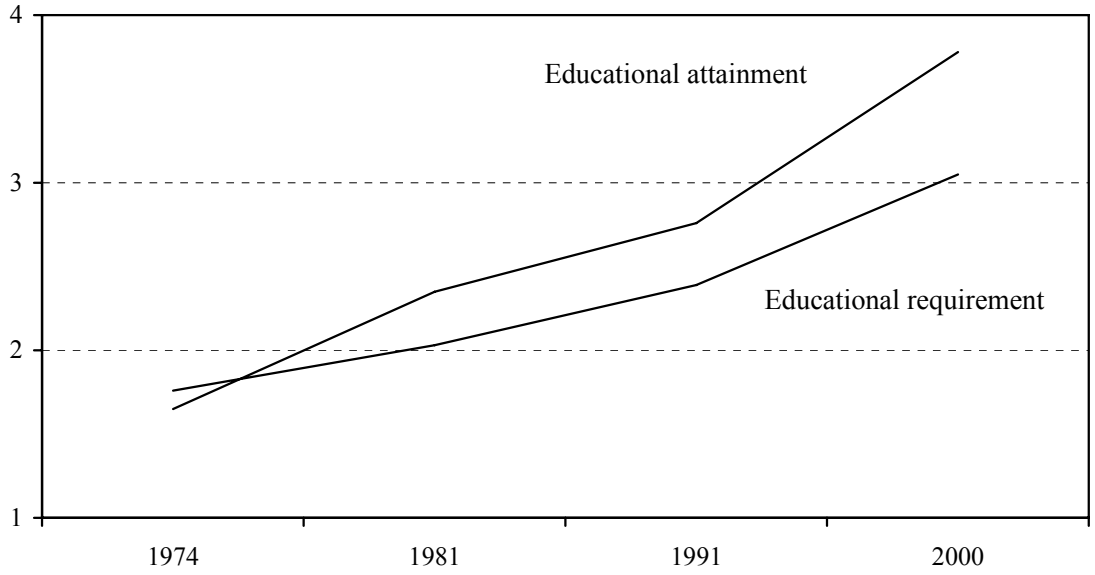
whole, and not specifically among youths. In section 8.2 we compare the rates of overeducation and undereducation obtained in some of these studies.[41] Furthermore, these rates are also compared to the picture of (vertical) skill mismatch obtained via a third type of measure, namely a direct subjective measure based on survey questions about whether the respondent is overqualified or not available in data from Statistics Sweden. In section 8.3 we then survey the wage effects of overeducation and undereducation in Sweden obtained in studies based on the first and second types of measure. First however, in section 8.1, we will sum up the overall picture of developments on the supply and demand sides of the Swedish labour market obtained from the first and second types of measure.

8.1 The overall supply-demand skill balance

Figure 2 summarizes the evolution of the overall educational attainment-educational requirements balance in Sweden during recent decades, as revealed by the second type of measure (indirect subjective). The figure is derived from a study by Korpi and Tåhlin (2006), based on data from the Swedish Level of Living Surveys (LNU) for the years 1974, 1981, 1991 and 2000. The average educational attainment is based on the respondents' attained number of years of full-time education beyond compulsory school, and the average educational requirement is based on the respondents' answers to questions about the educational requirements in their current job (see further Korpi and Tåhlin, 2006). The figure shows that overeducation (measured as the difference between the average number of years of education attained and the average number of years of education required) in Sweden has increased since the mid-1970s and that the skill gap widened further between 1991 and 2000, after having remained roughly unchanged over the 1980s. However, in 2000 the gap still amounted to less than one year.

[41] Early studies of overeducation in Sweden are Åberg (2002) and Oscarsson and Grannas (2002). Here, however, we have chosen to focus on some of the later studies now available.

Figure 2: Educational attainment and required education (number of years beyond compulsory school), averages for employed 19-64 year olds, 1974, 1981, 1991 and 2000.



Source: Korpi and Tåhlin (2006), based on data from Levnadsnivåundersökningarna (LNU).

For the 1990s the evolution of the supply-demand skill gap can be followed in more detail, year by year, thanks to a study by Johansson and Katz (2007). Their study is based on data from the Swedish Household Income Survey (HEK) and they have calculated the educational requirements for the jobs that the individuals hold by means of the (objective expert) classification of the normally required education for the respective occupations used by Statistics Sweden. Figure 3 shows the size of the skill gap (the difference between the educational attainment and the educational requirement, i.e. the average number of years of overeducation) for men and women. The overall picture of developments during the 1990s is similar to that given earlier by the (indirect) subjective measure (in figure 2), namely that the skill gap increased (for both men and women). But figure 3 also reveals that the average number of years of overeducation was and remained markedly higher for women than for men throughout the period. However, for this measure as well, the skill gap in 2002 amounted to less than one year for both women and men.

Figure 3: Overeducation for women and men, number of years (mean values), 1993-2002.

Note: Overeducation is defined as the individual´s actual level of education (number of years of education) minus the normally required education level (number of years of education) for his/her occupation.
Source: Johansson and Katz (2007), pp. 45-46.

8.2 The incidence of overeducation and undereducation

8.2.1 Objective expert measure

A better picture of the extent and character of educational mismatch is provided by the incidence of (vertical) mismatch, i.e. the rates of overeducation and undereducation for the total population and for different subgroups. We will start out by taking a closer look at the situation during the 1990s, as revealed in the study by Johansson and Katz (2007). Their study is based on an objective expert measure of skill mismatch (see section 8.1). Their results, reported in Table 7, indicate that (on average) during the period 1993-2002 about half the employed labour force had the level of education normally required in their occupation, about 31 percent were overeducated and about 19 percent undereducated. The proportion overeducated increased from 36 to 38 percent for women and from 24 percent to 28 percent for men during the period. Table 7 also reports their findings about the proportions of overeducated and undereducated for various subgroups during the period.

Table 7: Percent overeducated, adequately educated and undereducated among the employed, subgroups, 1993-2002.

	Overeducated		Adequately		Undereducated	
	Men	Women	Men	Women	Men	Women
Sector						
Private	25	40	48	42	27	18
Public	29	33	55	56	17	10
Work experience						
0-9 years	39	48	49	43	11	8
10-19 years	29	38	51	50	20	11
20-29 years	22	33	51	53	26	15
30-39 years	17	29	48	51	35	21
40-50 years	14	25	46	54	41	22
Level of education						
Compulsory school, 6 years	0	0	44	76	56	24
Compulsory school, 9 years	0	0	43	61	57	39
Secondary school, short	34	45	43	41	23	13
Secondary school, long	37	59	51	33	13	7
University education, short	22	20	54	66	24	14
University education, long	34	53	66	47	0	0
PhD	10	10	90	90	0	0

Note: An individual is defined as having the adequate level of education if his/her actual level of formal schooling corresponds to the normally required level of schooling for his/her occupation according to the socio-economic (SEI) code. If his/her actual level of schooling is higher (lower) he/she is defined as overeducated (undereducated).
Source: Johansson and Katz (2007), p. 22.

A first observation is that there is a systematic pattern in that, independently of sub-group, the rates of overeducation are always higher for women than for men and the rates of undereducation always higher for men than for women. The gender differences in rates of undereducation are particularly pronounced for older cohorts (those with long work experience), probably reflecting that men in these cohorts have had relatively large opportunities to advance occupationally by means other than formal schooling, e.g. by means of on-the-job training and informal schooling. Rates of undereducation are higher in the private sector than in the public sector, probably

reflecting the more formal educational requirements for advancing in the public than in the private sector. How about the rates of overeducation? There is a clear age-pattern, with younger cohorts (those with shorter work experience) having the highest rates of overeducation, probably reflecting the increased share that has a secondary education (those with only compulsory education cannot, by definition, be overeducated), but probably also that youths might enter via less-qualified jobs and then advance over time. For women the rate of overeducation is higher in the private than in the public sector, whereas the opposite is the case for men. The rates of overeducation for women and men with a long upper secondary education (the normal length for more recent cohorts) are fairly similar to the corresponding rates for those with a long (at least three years) university education.

To what extent are these patterns confirmed by multivariate results, i.e. when other factors or variables are held constant? Johansson and Katz (2007, pp. 23-26) also estimate multinomial logit models of the probability of being overeducated or undereducated (pooling their observations for the 1993-2002 period). Their models control for work experience, educational level, field of education, industry, sector, country of birth, region, family variables, gender and work-time. First, including a dummy variable for gender, confirms that women have a significantly higher probability of being overeducated and a significantly lower probability of being undereducated than men. Second, the probability of being overeducated decreases and the probability of being undereducated increases for both women and men when the number of years of work experience increases. Both overeducation and undereducation are (in most cases) more common in the private than in the public sector. As to family variables, both men and women are less likely to be overeducated if they are married/cohabiting, and women with pre-school children are less likely to be overeducated than women without children. Both men and women born outside Sweden have a significantly lower probability of being undereducated and, for non-European immigrants, a significantly higher probability of being overeducated.

8.2.1 Indirect subjective measure

How does this picture of the incidence of overeducation and undereducation in Sweden, based on an objective measure, compare to that obtained from subjective measures? Based on the attained number of years of full-time education and survey questions in the Level of Living Surveys (LNU) about the required number of years of education beyond compulsory school in the respondent's current job, according to his/her own assessment, researchers at the Swedish Institute for Social Research (SOFI) have calculated rates of overeducation and undereducation for the years 1974, 1981, 1991 and 2000. Table 8 presents the results from this indirect subjective measure, where being overeducated (undereducated) has been defined as having at least two years more (less) than the education required for the job (le Grand et al., 2004, s. 296).

As discussed in Part I of the report, expert-based measures might suffer from not being sufficiently updated and therefore tend to give higher rates of overeducation (and lower rates of undereducation) than subjective or statistical measures.[42] But in this particular case there is probably an offsetting effect to this in that the threshold for being classified as overeducated or undereducated has been set at two years in the subjective measure and (implicitly) at only one year in the expert measure (where the threshold will depend on the levels of education utilized in the Swedish system for educational classification and the Swedish system for socio-economic classification).

Like the objective measure, the indirect subjective measure (in Table 8) indicates that the incidence of overeducation increased in Sweden during the 1990s. But the levels were rather similar according to the two types of measures, amounting to about one out of three of the employed around the year 2000. Of particular interest is that, according to the indirect subjective measure, the rate of overeducation remained the same (29 percent) in the public sector over the 1990s, which means that the increase that did occur was concentrated to the private sector (where the rate went from 28 to about 36 percent). The rate of undereducation decreased somewhat in the private sector, but increased from 13 to 17 percent in the public sector.

[42] The Socio-Economic Index (SEI) used by Johansson and Katz was last up-dated in the mid-1980s.

Table 8: Percent overeducated, adequately educated and undereducated among the employed, 1974, 1981, 1991 and 2000.

	Overeducated	Adequately	Undereducated
All the employed			
1974	14	69	18
1981	21	62	18
1991	29	56	16
2000	33	50	17
Privately employed			
1974	12	69	20
1981	18	61	21
1991	28	54	18
2000	36	48	16
Publicly employed			
1974	17	69	15
1981	24	62	14
1991	29	58	13
2000	29	54	17

Source: le Grand et al. (2001b), p. 141.

The skill-mismatch results from the Swedish Level of Living Surveys (LNU) are rather unique in that they provide a picture of developments over a very long period of time. For example, they show that the incidence of overeducation in Sweden more than doubled between 1974 and 2000 and that the proportion adequately matched decreased by about the same percentage points (see Table 8). These changes were the result of rather complicated underlying changes. An in-depth analysis of the background to the changes that have taken place in the shares of adequately educated and overeducated can be found in le Grand et al. (2004) and Tåhlin (2007). Their analysis highlights the important role played by the rapid decline in the number of individuals in the Swedish work force who have only compulsory education (and who, by definition, cannot be overeducated). This decline means that the category of "adequately matched" individuals comprised of low-educated/low-skill-jobs has decreased dramatically in size. The low-skill jobs have also decreased significantly in number, but still account for around 20 percent of all jobs in Sweden and are expected to continue to do so. Given that almost everyone in the younger cohorts will have more

than compulsory education, the remaining relatively high proportion of low-skill jobs (which are increasingly concentrated to retail, hotels and restaurants and transport and communications) implies that there will be a similar proportion of overeducated workers. Their analysis also illuminates the changes for the high-educated. Their number has grown a lot, but concomitant with this they have filled an increasing proportion of the high skill jobs. The increase in their number has meant an increase in the number of overeducated high-skilled, but the probability of being overeducated, given that you are high-skilled, has not increased.

8.2.3 Direct subjective measure

Finally, it is interesting to also compare the above two measures of overeducation to that obtained from directly asking the individuals whether they are overqualified for their job or not. Such questions were included by Statistics Sweden in the so-called ULF-surveys in 1994-95 and 2002-03. The results from this direct subjective measure are reported in Table 9, for different age groups and for men and women.

In 1994-1995, the share of young (16-24 years) men (but not young women), who considered themselves to be overqualified for the work they did was markedly higher than that for adults. In 2002-2003, the share was rather similar, at some 22-23 percent. The differences between men and women have leveled up over time. While only 15 percent of young women considered themselves over-qualified in the mid-1990s, the percentage had increased to 22 percent by 2002-2003, which should be compared with 23 percent for the young men. The share of 25-34 year-olds who consider themselves over-qualified has increased over time, probably reflecting the rapid increase in higher education enrolment in Sweden. The share of employees, in the younger as well as the older age groups, who consider that they "need to learn more" (and thus in that sense consider themselves to be under-qualified), has decreased significantly since the mid-1990s. But in 2002-03 it was still the case that a larger share of the young women than of the young men felt that they needed to learn more.

Table 9: Employees who consider themselves over-qualified, adequately qualified or think they need to learn more, by age (%), 1994-1995 and 2002-2003.

	Over-qualified		Adequate qualifications		Under-qualified[a)]	
	1994-95	2002-03	1994-95	2002-03	1994-95	2002-03
Total						
16-24	21	23	53	58	26	19
25-34	21	27	55	56	23	16
16-64	18	22	58	61	23	16
Men						
16-24	27	23	48	60	24	17
25-34	22	28	55	57	22	14
16-64	20	23	58	62	22	14
Women						
16-24	15	22	58	56	27	21
25-34	20	25	55	56	25	19
16-64	16	21	59	61	25	18

Note: [a)] The exact formulation in the survey was "need to learn more". It should be noted that this does not necessarily indicate that the individual needed more formal education.

Sources: SCB (1998) and SCB (2005).

There are some interesting differences between this, direct subjective measure and the other measures. First, the rate of overqualification/overeducation is markedly lower (by some 10-15 percentage points around the year 2000) according to the subjective measure. Secondly, the differences between the measures have a clear gendered pattern in that women's direct subjective rates of overeducation are rather similar to those of men's (both around 21-22 percent) but markedly higher than men's according to the expert-based measure (38 percent for women as compared to 28 percent for men). Similarly, men's rate of underqualification/undereducation is much lower according to the direct subjective measure ("need to learn more") than according to the expert-based measure, whereas the opposite is the case for women.

The differences between youths and adults, and between men and women, in the (subjective) shares of over-qualified and under-qualified partly reflect the age and

gender differences in occupational, sector and spatial distributions.[43] It is for the occupations in the transport and communication sector, hotels and restaurants, and education and research that the shares of employees who consider themselves to be over-qualified are the highest. And it is in information technology-related jobs, and in the health and social sectors that the shares of employees who consider that they need to learn more (and thus in that sense are under-qualified) are above the average. Sector-wise, a larger share of the employees in the private than in the public sector consider themselves over-qualified and a larger share of the employees in the public than in the private sector consider that they need to learn more. Spatial-wise, the proportion of over-qualified employees is significantly larger than average in the densely populated regions of Stockholm, Gothenburg and Malmö. There is finally a clear immigrant-native dimension with a larger share of the employees born abroad considering themselves over-qualified: 30 percent of the men and 26 percent of the women born abroad as compared with 23 percent and 22 percent for the whole population.

8.3 Wage-effects of overeducation and undereducation

As discussed in Part I the effect of overeducation and undereducation on wages is highly interesting from a theoretical point of view. But the effects on wages are of course also central from an economic and welfare point of view for those directly concerned, i.e. the overeducated and undereducated. Furthermore, the wage effects might give an indication of the economic losses from (vertical) skill mismatch for the economy as a whole.[44] Estimates of the wage effects of overeducation and undereducation in Sweden are available from recent studies by Korpi and Tåhlin (2006) and by Johansson and Katz (2007). The former is based on the indirect subjective measure of skill mismatch (see section 8.2 above) and the latter on the objective expert-based measure (see section 8.2 above). The results are reported in Table 10.[45]

[43] See SCB (1998) and SCB (2005).
[44] See the discussion in Tåhlin (2007).
[45] The estimates come from Mincer-type earnings equations modified so as to include years of overeducation and years of undereducation, see footnote 14 in Part I.

The rate-of-return estimates in Korpi and Tåhlin (2006) are based on pooled cross-section data from *Levnadsnivåundersökningen* (LNU) for the years 1974, 1981, 1991 and 2000. The wage-premium for a year of required schooling is about +7 percent, that to a year of overeducation about +2.5 percent and that to a year of undereducation about -2.5 percent.[46] This pattern is in agreement with that found earlier for other countries (see section 4 above). It means that there is a positive wage-premium also for years of overeducation, but that it is markedly lower than that for years of required education. Undereducated workers earn less than their correctly educated co-workers (about 2.5 percentage points less per year of undereducation), but more than they would have earned if they had been correctly job-matched according to their years of education.

Table 10: Rate-of-return estimates for years of required education, years of overeducation and years of undereducation.

		Required education	Overeducation	Undereducation
Korpi and Tåhlin		+ 0.067	+ 0.026	- 0.025
Johansson and Katz				
Men	1993	+ 0.065	+ 0.029	- 0.031
	1997	+ 0.073	+ 0.032	- 0.030
	2002	+ 0.077	+ 0.032	- 0.035
Women	1993	+ 0.041	+ 0.018	- 0.019
	1997	+ 0.048	+ 0.013	- 0.027
	2002	+ 0.056	+ 0.022	- 0.027

Source: Korpi and Tåhlin (2006), Table 3 (pooled data for the years 1974, 1981, 1991 and 2000). Johansson and Katz (2007), Tables A5 and A6 (selected years). The estimates for overeducation and undereducation in Johansson and Katz were recalculated so as to be more easily comparable to those in Korpi and Tåhlin.

Korpi and Tåhlin (making use of the panel-data character of their LNU-data) find no evidence that the wages of the overeducated (on average) "catch up" with those of the correctly matched over time; there is no statistically significant difference in the

[46] The estimated model also includes sex, experience and experience squared. The rate-of-return estimates remain the same when, in addition, health and verbal ability are controlled for.

rate of wage growth of the two groups, which means that the initial relative wage disadvantage of the overeducated remains over time. However, there are differences within the group of initially overeducated. Catching up can be achieved either by changing to a higher skilled job (i.e. by leaving overeducation) or by exceptionally rapid wage growth at a given job level. Of those who were overeducated at a particular point in time, almost 60 percent remained overeducated 10 years later (Tåhlin, 2007, p. 85). Those of the overeducated who had managed to advance in the job structure, but not the others, had closed a large part (but not all) of the wage gap to those initially correctly matched.

How do these wage effects of mismatch compare to those of Johansson and Katz (2007). The focus of their study is on the period 1993-2002 and on the role of the gender differences in overeducation and undereducation (see section 8.2) for the wage gap between men and women.[47] A first finding, obtained from "traditional" Mincer earnings equations for years of attained education (i.e. a specification not controlling for overeducation and undereducation), is that the average rate-of-return to schooling increased by about one percentage point over the 1990s, from about 5 to about 6 percent for men and from about 3.5 to about 4.5 percent for women. This confirms findings from other Swedish studies and indicates that investments in schooling in Sweden (on average) paid off better during the 1990s and early 2000s than during the preceding decades, in spite of the large increase in the supply of schooling described in section 6.[48] Johansson and Katz also show that the (average) rate of return to an additional year of schooling for those correctly matched (i.e. a specification controlling for overeducation and undereducation) exhibited a similar increase; it went from about 6.5 to about 7.5 percent for men and from about 4 to about 5.5 percent for women (see the column for required education in Table 10).

---

[47] Johansson and Katz estimate cross-sectional wage equations for each of the years 1993-2002, separately for men and women. All the wage equations estimated also include work experience and its square, industry, country of birth, residence in Stockholm or the other two largest cities in Sweden, being married/cohabiting and number of children.

[48] Barth and Lucifora report similar findings for other European countries as well. They find that there are no signs from the wage structure that the expansion of the educational system in the European labour markets has not been matched by a similar growth in demand. Furthermore, they find this observation to be valid on average as well as in the tails of the distribution of individuals (or jobs) within each educational category. (Barth and Lucifora, 2006, p. 35).

How about the wage-effects of overeducation and undereducation? From Table 10 it can be seen that the estimated effects are rather similar to those obtained by Korpi and Tåhlin, in spite of the differences between the two studies both when it comes to the years included, the measure of educational mismatch and which other variables are controlled for. Johansson and Katz thus also find a positive wage-premium for an additional year of overeducation, amounting to about 3 percent for men and 2 percent for women. An additional year of undereducation, on the other hand, means that the individual earns less than his/her correctly educated co-workers; there is a negative wage premium of about 2-3 percent per year of undereducation for both men and women.

To sum up the findings, the average rate of return to years of attained education increased in Sweden during the 1990s despite the large increase in the supply of schooling. From a theoretical point of view, the wage-effects provide support for a matching model where both worker and job characteristics influence the earnings outcomes in the Swedish labour market. Years of overeducation are positively rewarded in Sweden, but less so than years of required education. Those who are undereducated for their job earn more than they would if they were correctly matched according to their education level, but still less than their correctly matched co-workers. The estimated wage effects from undereducation and overeducation could also be interpreted as saying that productivity in the Swedish economy would have been higher if the undereducated workers had been upgraded to be correctly educated for the jobs they hold, and if the jobs held by the overeducated had been upgraded to match the educational qualifications of their holders.

9. Overeducation and labour market entrance

So far we have looked at overeducation and undereducation in the Swedish (employed) workforce as a whole and not specifically at the situation for youths. Even so, our data and the results from earlier studies have revealed that there is an age dimension to the educational mismatch. The rates of overeducation are higher (and the rates of undereducation lower) for those with shorter work experience (according to

the expert-based measure, see Table 7), even if an age pattern is less apparent in the direct subjective measure (see Table 9). Furthermore, the rate of overeducation has increased over time (according to the indirect subjective measure, see Table 8), probably reflecting the increased educational levels attained by youths in later cohorts. A deeper insight into the extent and character of educational mismatch among the recent, well-educated cohorts of Swedish youths can be gained via the longitudinal follow-up studies of certain cohorts of school-leavers by Statistics Sweden. These are available for the cohorts that graduated from upper-secondary school (gymnasieskolan) and higher education (högskolan) in 2000/01 and 2002/2003. A sample of the former cohort of school-leavers was interviewed about their employment situation in the spring of 2004 and a sample of the latter cohort in the spring of 2006, i.e. about three years after their graduation. For these two cohorts of school-leavers questions about the amount of education that they considered sufficient for performing the tasks in their current job were included in the surveys, so that a measure of the incidence of overeducation can be calculated for those youths that worked three years after graduation. From these surveys we can also get a picture of (any) differences in the rates of overeducation between the educational levels (upper-secondary versus higher education) and between different educational programmes and fields.

9.1 Overeducation among graduates from upper-secondary school

Table 11 summarizes information about the rates of overeducation among the school-leavers from upper secondary school (gymnasieskolan) about three years after graduation. These youths were graduates of the reformed "gymnasieskola", described in section 6 above, with its division into a number of vocational and theoretical programmes of (mostly) three-year duration (see Table 1). In principle all the programmes are supposed to give the (formal) basic competence required to enter higher education. However, the actual transition rates into higher education are much higher for the graduates from the theoretical programmes.[49] Hence, at the time of the

[49] For example, in the spring of 2006 (about three years after graduation) 58 percent of the female and 52 percent of the male graduates from the theoretical programmes had participation in higher education (högskolestudier) as their main activity as compared to 20 percent of the female and 9 percent of the male graduates from the vocational lines. (Statistics Sweden, UF 86 SM 0601, Table 1).

follow-up survey the graduates from the vocational programmes are more likely than those from the theoretical programmes to have made a serious attempt to enter the labour market on the basis of the education obtained in upper-secondary school.[50] On the other hand, it has become very common for the graduates from the theoretical lines to postpone their participation in higher education for one or several years, working in odd jobs, traveling and/or supplementing their secondary education (compare section 6 above about adult education) so as to improve their chances of being admitted to their preferred higher education courses or programmes.[51] Among those graduates from upper-secondary school who do enter higher education within the three-year follow-up period, there are also likely to be many who combine their studies with working, taking whatever jobs (often relatively unskilled) that they can find. Thus a fair share of the graduates from the theoretical programmes might also be working three years after graduation, but not as their main activity and not necessarily in the type of job that they are eventually aiming for. This background information is needed in order to put the overeducation rates reported in Table 11 into proper perspective. The rates reported there refer to all those of the graduates who were working at least one hour during the week of the survey; Hence, it includes both those having their current job as their main activity and those working, e.g. part-time to a smaller or larger extent, in addition to another main activity.

It is probably this differing character of the jobs held three years after graduation by graduates from the theoretical versus the vocational programmes that accounts for the pattern of the rates of overeducation in Table 11. For both cohorts, and for both men and women, the rates of overeducation three years after graduation were markedly higher for graduates from the theoretical than for graduates from the vocational programmes. Since an overwhelming majority of the graduates from the theoretical programmes will eventually participate in higher education, their rates of overeducation at this stage are not so interesting (but their eventual rates of overeducation after higher education will be). One interesting aspect might, however,

[50] For example, in the spring of 2006 (about three years after graduation) 53 percent of the female and 69 percent of the male graduates from the vocational programmes had work/own business as their main activity as compared to 28 percent of the female and 32 percent of the male graduates from the theoretical lines. (Statistics Sweden, UF 86 SM 0601, Table 1).

be the extent to which those unskilled jobs that remain in the Swedish economy after the 1990's restructuring are filled today – on a temporary basis - by relatively highly educated youths during their early transition and educational career and thus perhaps not available for the less skilled parts of the labour force, a particular form of so-called bumping down.

Table 11: Overeducation[a)] for 2000/01 and 2002/03 upper secondary school leavers (in % of those who work during the week of 22-28 March 2004 and 20-26 March 2006, respectively).

Graduation year	2000/01			2002/03		
	Total	Men	Women	Total	Men	Women
Total	27	24	29	25	25	26
Born in Sweden	27	24	30	25	25	26
Born abroad[b]	21	26	16	24	26	22
Vocational programmes	21	19	22	18	17	20
Theoretical programmes	34	32	36	34	36	32

Note: [a)] percentage of upper secondary school leavers (who worked at least one hour during the week of the survey) who consider that the nine-year compulsory school education (grundskoleutbildning) is sufficient for performing the tasks included in the job they currently hold.

[b)] It should be pointed out that for those born abroad the confidence intervals are quite large due to relatively few observations.

Sources: Computed from table 8a, Inträdet på arbetsmarknaden (The Entrance to the Labour Market) – Enkätundersökning våren 2004 bland avgångna från gymnasieskolan läsåret 2000/01, and table 11, Inträdet på arbetsmarknaden – Enkätundersökning våren 2006 bland avgångna från gymnasieskolan läsåret 2002/03 (Statistics Sweden)

The rates of overeducation for the graduates from the vocational programmes are probably of more interest when it comes to evaluating how well the Swedish educational system succeeds in providing the skills demanded on the labour market. According to Table 11 about one out of five of the graduates from the vocational programmes consider that they – three years after graduation – hold a job that does not require upper-secondary education. But behind this average rate there is much

[51] In 2002 the median age of those who started higher education in Sweden was 22.9 years.

variation, as exemplified by the 2002/03 cohort. There are vocational programmes with rates of overeducation well above the average: e.g. the Arts programme with 29 percent, the Media programme with 25 percent and the Retail and Administration programme with 24 percent, but also programmes with rates well below the average: the Health Care programme with 6 percent, the Child and Recreation programme with 12 percent and the Crafts programme with 13 percent. There are also some male-dominated programmes where the rates of overeducation are relatively low for men, but much higher for women: The Construction programme, the Electrical programme and the Industrial programme. A final observation is that there are signs of significant horizontal educational mismatch in the vocational programmes. Three years after graduation 49 percent of the female and 37 percent of the male graduates from the vocational programmes had a job that was not within the area that their upper-secondary education had been aimed at. This was particularly the case for the Arts programme and the Media programme where about 80 percent of the graduates had a job in some other area.

9.2 Overeducation among graduates from higher education

The rapid expansion of Swedish higher education (see section 6) makes it particularly interesting to look at the difficulties met by recent higher education graduates in finding a job that matches their acquired skills. Table 12 summarizes the incidence of overeducation among higher education graduates three years after graduation. It provides information on people working in March 2004 and 2006 and who graduated from university and university colleges in 2000/01 and 2002/03. The age of the surveyed population is not given but should range between 25 and 35 years old. The graduates are distributed between higher education fields, as shown in Table 3 above. Table 12 reveals that the rate of overeducation among higher education graduates is somewhat lower than among upper-secondary school graduates (see Table 11) and among the youth population as a whole (see Table 9). The incidence of overeducation among higher education graduates does, however, vary according to whether a narrow or a broad definition is used.

Table 12: Overeducation by field for 2000/01 and 2002/03 higher education graduates (in % of those who work during the week of 22-28 March 2004 and 20-26 March 2006, respectively).

Graduation year	2000/01		2002/03			
	Narrow definition[a)]		Narrow definition		Broad definition[b)]	
	Men	Women	Men	Women	Men	Women
Humanities and theology	12	18	20	15	26	24
Law and social sciences	9	10	13	13	22	16
Teacher training	6	6	9	4	14	13
Natural science	10	6	16	7	30	13
Technology	7	9	14	10	16	14
Agriculture and forestry	9	6	7	4	20	14
Medicine and odontology	1	1	0	1	12	15
Health-related science	5	1	2	1	8	12
Fine and applied arts	8	13	10	18	21	43
Total	8	7	12	7	18	16
Born abroad	17	13	15	10	21	17

Notes: [a)] percentage of graduates from universities and university colleges who consider that compulsory school or upper secondary school is sufficient for performing the tasks included in the job they hold. [b)] percentage of graduates from universities and university colleges who consider that compulsory school, upper secondary school or qualified vocational education is sufficient for performing the tasks included in the job they hold. Information on overeducation broadly defined could not be estimated for 2000/01 because information on whether qualified vocational education was sufficient is not available in the 2004 survey.

Sources: Computed from table 8b, Inträdet på arbetsmarknaden (The Entrance to the Labour Market) – Enkätundersökning våren 2004 bland examinerade från högskolan läsåret 2000/01, and table 11a, Inträdet på arbetsmarknaden – Enkätundersökning våren 2006 bland examinerade från högskolan läsåret 2002/03 (Statistics Sweden)

Another important insight from Table 12 is that the rate of overeducation seems to change rapidly and markedly over time, as illustrated by the comparison of the 2000/01 and 2002/03 cohorts. There is thus a clear cyclical component in overeducation (but with some difference by gender) with changes of different magnitudes in the demand for skilled labour from different fields significantly

affecting the extent of overeducation across fields. But there is also a clear structural component as illustrated by the rather similar ranking of fields in terms of overeducation incidence for the two points in time. This can be seen as indicating the existence of horizontal educational mismatch. Another interesting result in Table 12 is the markedly larger incidence of overeducation among the foreign-born higher education graduates as compared to their Swedish counterparts, in contrast to the situation observed above for upper secondary school leavers (see Table 11). A likely reason for this result is the relatively important proportion of foreign-born higher education graduates that have not attended Swedish upper secondary schools. A final finding concerns the rather limited (and non-systematic) gender gaps in overeducation. The gaps are sometimes to women's advantage, sometimes to men's and it also seems that men's outcomes were more negatively affected than women's by the cyclical downturn between 2000/01 and 2002/03.

Focusing on the distribution by field shows huge variations in overeducation. Overeducation is most frequent in the humanities and arts (which together account for some 7 % of the total number of higher education degrees in 2004/05, see Table 3). The rates are lowest in medicine, health-related science, teacher training, and agriculture and forestry (which together account for 41 % of higher education degrees, see Table 3). Law and social sciences, technology and natural sciences occupy an intermediate position (together they account for 52 % of higher education degrees). Large changes in the incidence of overeducation can be observed between 2000/01 and 2002/2003 for these three types of graduates, evidence of the strong cyclical dimension of these educations and the demand for the skills they provide. Further, large discrepancies between the narrow and the broad definition of overeducation can be noticed for the natural sciences, agriculture and forestry, medicine, health-related science and the arts, suggesting that an expansion and upgrading of qualified vocational education might contribute to reducing overeducation in these fields. It is worth adding that the aggregation of higher education degrees by field in Table 12 in fact hides significant differences within the various fields. For example, law and social sciences (which together account for 29 % of higher education degrees) include

diplomas in law as well as in business administration (and economics), with levels of narrow overeducation in 2002/03 (2000/01) of 6 % and 17 % (6 % and 14 %).

Table 13: Overeducation by field for 2002/03 higher education graduates (in % of those who work during the week of 20-26 March 2006) and some indicators of their labour market situation.

	Over-education	% working	(of which % with permanent job)	% unemployed	% in labour market policy programmes
Humanities and theology	17	69	(53)	9	2
Law and social sciences	13	81	(73)	4	< 1
Teacher training	4	84	(81)	2	< 1
Natural science	7	68	(65)	4	2
Technology	10	83	(81)	4	< 1
Agriculture and forestry	4	81	(69)	4	0
Medicine and odontology	1	83	(45)	1	0
Health-related science	1	84	(80)	< 1	0
Fine and applied arts	18	71	(32)	10	5
Total	7	81	(75)	3	1
Born abroad	10	77	(68)	6	1

Note: Overeducation: percentage of graduates from universities and university colleges who consider that compulsory school or upper secondary school is sufficient for performing the tasks included in the job they hold.

Source: Computed from tables 1a, 3a and 11a, Inträdet på arbetsmarknaden – Enkätundersökning våren 2006 bland examinerade från högskolan läsåret 2002/03 (Statistics Sweden).

The labour market situation of higher education graduates from different fields three years after graduation provides further insight into the nature of overeducation. Table 13 provides evidence of three rather distinct groups among graduates. A first group consists of graduates from the fields of humanities and the arts. These graduates consider themselves to be overeducated more often than the graduates from the other fields, and are also less integrated into the regular labour market. Their employment rate is lower, they benefit less from permanent jobs, they are more exposed to unemployment risks and they participate to a larger extent in measures of labour market policy. Overeducation for this, first group is of more structural character and

reflects a form of horizontal mismatch. A second group consists of graduates from law and social sciences, technology and natural sciences. Their rate of overeducation is somewhat lower than that of the former group. However, it increased rapidly in the early 2000s following the economic downturn experienced by the Swedish economy. Overeducation for this group has a strong cyclical character, which explains their above-average unemployment in 2002/03 and that they are engaged in measures of labour market policy. A third group consists of graduates from the education and health-related fields. Graduates from these fields benefit from high employment rates, more permanent forms of jobs, very low unemployment rates and do not participate in measures of labour market policy. Worth adding is that these three groups of graduates are of unequal size, some 7, 52 respectively 41 % of higher education graduates in 2004/2005.

10. The Swedish view of the skill match problems and reforms underway

The demand for skilled labour has clearly increased in Sweden. To a large extent this increase reflects the rapid economic growth and the wide restructuring experienced by the Swedish economy during the past one and a half decades. On the supply side the expansion of the education system, at both secondary and higher education levels, has led to a considerable upgrading of the skills of the Swedish labour force. For example, the number of higher education degrees has jumped by some 75 % between 1995 and 2005. As a result of all these changes, the gap between the average educational attainment and the average educational requirement has widened steadily over time. This gap is, however, still relatively limited, amounting to less than one year in the early 2000s.

The widened gap between educational attainments and educational requirements has potentially increased the scope for problems of overeducation on the Swedish labour market and, in a way, put the issue of overeducation on the research agenda. For instance, all the studies attempting to assess the incidence and effects of overeducation in Sweden were made during the past seven years. According to these studies, the rate of overeducation is noticeable and unevenly distributed according to

age, gender, the kind of job, etc. It also varies in size according to the kind of method used to estimate it. Not surprisingly overeducation is more frequent among the younger age groups (less than 30 years old), which are more affected by the recent expansion of upper secondary education and higher education. The rate of overeducation among youth is larger than that of undereducation, while the opposite seems to be the case for the older age groups. The incidence of overeducation is more important among higher education graduates from some specific fields (like humanities and arts), reflecting a kind of horizontal mismatch. There is also a cyclical dimension to Swedish overeducation, with rates of overeducation fluctuating over time in fields such as law and social sciences, technology and natural science. The nature of overeducation, structural mismatch (vertical and horizontal) versus cyclical mismatch, is critical from the point of view of policymaking and for the kind of measures best able to combat it, or at least to limit some of its consequences.

The incidence of overeducation is higher for graduates from higher education who are born abroad. Their labour market situation, in terms of risks of unemployment and labour force participation, is also more precarious. This finding contrasts with that observed for school leavers from upper secondary education for whom there is no marked difference in the incidence of overeducation between school leavers born in Sweden and those born abroad. A plausible explanation is that higher education graduates born abroad were older when they arrived in Sweden and lack the language skills necessary to occupy jobs that match their skills. It can also be the case that this group is more exposed to discrimination on the labour market. More research is needed to improve our understanding of this apparent paradox.

How overeducation (and undereducation) affects wages is critical for the welfare of the individuals concerned. It is also critical for future investments in education and for the way policymakers consider the issue of overeducation. However, a first finding that should be pointed out is that the average rate of return to years of attained education increased in Sweden during the 1990s despite the large expansion in the supply of schooling. But econometric studies also show that overeducated workers in Sweden earn more than their adequately matched co-workers, but less than they would have earned if the educational requirements of their jobs had corresponded to their

years of education. By the same token, undereducated workers earn less than their adequately matched co-workers, but more than they would have earned if the educational requirements of their jobs had matched their years of education. These results mean that productivity in the Swedish economy would have been higher if the undereducated workers had been upgraded to be correctly educated for their jobs, and if the jobs held by the overeducated had been upgraded to match the educational qualifications of their holders. Concerning the long-run wage effects of overeducation, the studies show that the initial wage disadvantage remains over time for most of the overeducated workers; it tends to vanish only for a minority of them and then often because they have managed to advance in the job structure.

How then has the issue of overeducation been viewed and discussed in Swedish public debate? We think that it is fair to say that it has not been highly debated or problematized. And to the extent that the educational expansion has been problematized, it has been more in terms of difficulties of graduates (or certain groups of graduates) to find employment rather than in terms of occupational and status downgrading ("déclassement"). As pointed out above the expansion of the Swedish educational system reflects a conscious policy and philosophy as to the need and role of education and skills, both for the individuals and for the economy. For example, it is seen as a prerequisite for economic growth and for the international specialization of the Swedish economy in skill-intensive production. This basic view of the need for and value of a highly skilled labour force still has wide-spread support and represents a kind of consensus among Swedish policymakers, including the trade unions. Thus the reaction to the rates of overeducation observed for recent cohorts in Sweden has not been that the investments in schooling have been excessive and should be reduced. The focus in the public debate has instead been on three issues: 1) problems of undereducation, in the sense of the failure of certain youths to complete their (compulsory or upper secondary) schooling and/or to achieve satisfactory results; 2) the type of schooling invested in, i.e. the issue of horizontal mismatch (for both upper secondary and higher education); 3) problems concerning the quality of schooling, including that of the quality of higher education. On these three issues, and what to do about them (if anything), there has been (and is) less of a consensus between, for

example, the political parties in Sweden. The differences in views were reflected in the reform proposals and debates concerning the educational system in the 2006 election and might have contributed to the election victory for the conservative alliance government. This victory has also meant that there are now a number of reforms of the educational system already decided upon or being prepared for, based on how the problems of the Swedish educational system and the possible remedies are conceived of by the new government.

The reforms concerning compulsory school are focused on achieving better learning outcomes, particularly in Swedish (reading, writing) and Mathematics, and in that way also ensure that a larger share of the compulsory school-leavers achieve the competence level required to be admitted to the national programmes of the upper secondary school (and not only to the individual programme, see above). In recent years 10-11 percent of compulsory school leavers have not attained the competencies required (in Swedish, Mathematics and English) for such admittance, and the share seems to be increasing. More recent cohorts of Swedish pupils also seem to have performed less well than earlier cohorts in e.g. the international PISA tests. Among the reforms decided upon or underway to achieve better outcomes are earlier monitoring of learning outcomes (combined with additional resources for subsequent compensatory measures), more and earlier national achievement tests, earlier awarding of formal marks (which are now only given during the last two years in compulsory school), increased resources for further education of teachers, and future changes in basic teacher training. The goal here is that in principle everybody in a youth cohort shall complete compulsory schooling with enough skills and course results to have a sufficient and satisfactory basis for continuing in upper secondary school (as well as for their future life as adults and citizens). There is likely to be political consensus on the main thrust, even if not on the specific details, of the reforms of compulsory school since the social democrats are currently revising parts of their earlier standpoints.

The new design of the upper secondary school system (see chapter 6 above) has now been in place for over a decade so its strengths as well as its weaknesses can be discerned. Here, too, a major problem has turned out to be non-completion. The troubles start already in the transition from compulsory school to upper secondary

school, where too many youths (about 15 percent of the first-year students) end up in the individual programme. The completion rate for these students (within four years of their entrance) is much lower than for those students who enter other programmes (about 20 percent as compared to about 80 percent). This is one of the reasons for the reforms of compulsory school described above. But problems of study-breaks and non-completion are also present for the other programmes and particularly so for the vocational programmes. There is also a gender gap, with male students having a markedly lower completion rate (within four years) than female students, as well as an immigrant gap. Completion rates of 75 % for male students and 80 % for female students with a Swedish background can be compared to completion rates of 55 % respectively 63 % for students with a foreign background. It seems that the relatively high requirements (common for all programmes) in terms of compulsory "core" courses in theoretical subjects has turned to be a particular problem. These requirements have become an obstacle to completion and/or a particular source of discouragement and boredom for a significant number of the students in the vocational programmes. As a consequence, the benign intention, namely to prepare for and provide everybody with the basic qualifications needed for admittance to universities and university colleges, might in reality have turned out to be counterproductive. Another type of problem is that some of the vocational programmes, for those students who do complete them, have turned out to be badly matched to the needs of the labour market, i.e. there are signs of horizontal mismatch.

In view of these problems the new government has recently (in February 2007) appointed, and issued directives for, a special investigator who is to propose a new structure for the Swedish upper secondary school. The proposal should be delivered in the spring of 2008 and is likely to provide the basis for a major new reform of the upper secondary school. The directives say that the "gymnasieskolan" should remain voluntary and provide its students with opportunities to choose their schooling according to individual aptitudes and interests. Among the main directives are further that the reformed upper secondary school structure should be divided into three types of programmes, those preparing for further studies at universities and university colleges ("studieförberedande"), those preparing for vocations and higher vocational

education (“yrkesförberedande”), and “a modern, flexible apprentice education”, all three of them leading to a “gymnasium-degree”. The investigator will also propose which (national) programmes and specializations are to exist in the future school system.

It is clear that a controversial issue in the reform of upper secondary school can be expected to be the extent to which the common, (theoretical) core requirements for all students in upper secondary school will be upheld. This, in turn, will affect how many of the graduates (automatically) acquire the basic (formal) competencies required for admittance to universities and university colleges. The political opposition has demanded that possibilities must be provided for the students in all programmes to include the courses required to fulfill the basic admittance requirements in their education and, also, that generous opportunities to complement an initial “gymnasium degree” with such courses must be provided within the adult education system. Thus, they want to safeguard the openness and flexibility of the Swedish educational system for the individuals and see to it that there are no dead-ends in the system. On the other hand, there is agreement that the individual programme is a failure and needs to be changed. The social democrats have, for example, proposed that it be replaced by an extra 10th year of schooling (a “basic year”) devoted to catching-up for those students who need this to complete their compulsory schooling satisfactorily. There is also agreement that the quality and work-life connection of the vocational programmes need to be improved and issues of horizontal mismatch addressed, and that this requires closer co-operation with employers and trade unions. A special government-appointed delegation (the Delegation for Vocational Education), comprising individuals representing employers and trade unions, has been charged with investigating, testing and advising on how the quality and work-life connection of the vocational programmes can be improved.

How about tertiary education? Here, too, there are changes underway, when it comes to higher vocational education and universities and university colleges. The system for tertiary vocational education in Sweden has been characterized by a high degree of diversity, with many different types of providers and many different types of training (length, quality etc.). In a way, one could say that there has been no system, at

least not a coherent and transparent one. This state of affairs has been considered unsatisfactory and various attempts to reform it have taken place during the last decade. A pilot project involving advanced vocational education and training (so-called KY-education) was carried out during the period 1996-2001. KY-education is advanced vocational education of 1-3 years length where 1/3 of the education time is spent at a workplace. Since the results of the pilot project were favorable, this form of vocational education was made permanent in 2002 and put under the aegis of a new special agency, the Swedish Agency for Advanced Vocational Education. The agency is responsible for drawing up common guidelines, for selecting and making public grants to applying KY-providers, and for supervision and follow-up. But the initiation and actual provision of KY-education are still decentralized and characterized by a large variety of actors, both public and private. The new organization has, however, led to a more transparent and common structure for how advanced vocational education should be built up and evaluated, with specific degrees granted etc.

In March 2007 the new government initiated a further step towards a separate structure for tertiary vocational education in Sweden by presenting the directives for a committee that is to investigate and put forward a proposal about how tertiary vocational education (outside the universities and university colleges) can be put together into one common framework "a Vocational College". The goal is that Sweden should have a Vocational College in place at the latest in 2010. The Vocational College will constitute a common umbrella structure that will contribute to making the tertiary vocational educations better defined and more transparent, and that will also be responsible for follow-up, evaluation and quality control. There will still, however, be a variety of providers, both private and public. The new Vocational College is also likely to be assigned the responsibility for Swedish participation in the Copenhagen process (the vocational education correspondence to the Bologna process for academic education), as well as for the development of the Swedish part of the ECVET (the European Credit Transfer System for Vocational Education and Training). The proposed Vocational College, in combination with the proposed reform of upper-secondary school, will mean that in a few years' time there is likely to be a vocational path to tertiary education attainment in Sweden. Such a development is, however, not

uncontested, running somewhat counter to earlier Swedish policies to avoid streaming and a dual education structure.

As we have shown, there has been a massive increase in the number of students enrolled at Swedish universities and university colleges. Thus, it is no wonder that the time has now come for consolidation and pruning. The expansion has been very rapid, taking place within little more than a decade and concentrated to the university colleges. This has not been without consequences for the quality of education. A number of problems can be identified. First, the economic resources devoted to higher education have been increased less than proportionally to the increase in the number of students, making for less hours of teaching per course and for more students per teacher. Second, the national system for allocating resources to the universities and university colleges has been based on attracting a sufficient number of students, which has meant a certain temptation to design attractive, but not necessarily high-quality and labour market-oriented educations. Third, also in a more general way, the rapid and rather uncontrolled character of the expansion has raised the question of horizontal mismatch and the extent to which employability and labour market considerations have been taken into account by the universities and university colleges when designing their higher education programmes. The reforms and changes currently underway in Sweden attempt to address these kinds of problems.

Total enrolment (measured in full-time student equivalents) peaked in 2004 and then decreased somewhat in 2005 and 2006, as a result of decreased student demand. But this demand-driven stop to the expansion has then been confirmed by political decisions to halt the expansion (at least for the time being) and instead direct increased economic resources towards quality improvements. Thus, the economic resources per enrolled student, allocated to the universities and university colleges by parliament, have been increased in recent state budgets, particularly for students enrolled in the fields of humanities and social sciences. At the same time more radical changes to the system of resource allocation to the universities and university colleges are being prepared for. A government-appointed special investigator will shortly present a proposal for how the funding system should be changed, both for teaching and research. It is already known that it will be proposed that a certain part of the total

national economic resources for both teaching and research should be allocated according to quality indicators. Such a change is likely to favour the universities, but will also provide incentives for quality improvements everywhere in the system. Other reform efforts are directed towards the labour market connection of higher education, and may probably be viewed as an attempt to deal with horizontal mismatch (while preserving student choice). Thus the new government has instructed the universities and university colleges to improve and put more resources into information and guidance activities for their students, e.g. by creating so-called career centres, co-operating closer with business and other employers etc. Also, the Swedish National Agency for Higher Education has recently been instructed to (in cooperation with the universities and university colleges) develop a comprehensive system for follow-up of the labour market outcomes for recent higher education graduates. The results of these future follow-ups are to be made publicly available, as a source of information for educational choice.

References

Abrahamsson, K. et al. (eds) (2002), *Utbildning, kompetens och arbete*, Lund: Studentlitteratur.

Asplund, R. and Lilja, R. (2000), "Has the Finnish Labour Market Bumped the Least Educated?", in Borghans and de Grip (eds), (2000), pp. 57-75.

Barth, E. and Lucifora, C. (2006), Wage Dispersion, Markets and Institutions: The Effects of the Boom in Education on the Wage Structure, *IZA Discussion Paper*, no. 2182.

Battu, H. and Sloane, P.J. (2003), "Educational Mismatch and Ethnic Minorities in England and Wales" in Büchel et al. (eds) (2003), pp. 217-235.

Borghans, L. and de Grip, A. (eds) (2000), *The Overeducated Worker? The Economics of Skill Utilization*, Cheltenham: Edward Elgar.

Büchel, F., de Grip, A. and Mertens, A. (eds) (2003), *Overeducation in Europe. Current Issues in Theory and Policy*, Cheltenham: Edward Elgar.

Cohn, E. and Khan, S. P. (1995), "The wage effects of overschooling revisited", *Labour Economics,* vol. 2, no. 1, pp. 67-76.

Daly, M.C., Büchel, F. and Duncan, G.J. (2000), "Premiums and penalties for surplus and deficit education. Evidence from the United States and Germany", *Economics of Education Review*, vol. 19, pp. 169-178.

Dolton, P. and Silles, M. (2003), "The Determinants and Consequences of Graduate Overeducation" in Büchel et al. (eds) (2003), pp. 189-216.

Dolton, P. and Vignoles, A. (2000), "The Incidence and Effects of Overeducation in the U.K. Graduate Labour Market", *Economics of Education Review*, vol. 19, no. 2, pp. 179-198.

Dwyer, R.E. and Wright, E.O. (2003), "The patterns of job expansions in the USA: a comparison of the 1960s and 1990s", *Socio-Economic Review*, no. 1, pp. 289-325.

Ekberg, J. and Rooth, D-O. (2005), "Invandring till Sverige ger lägre yrkesstatus", *Ekonomisk Debatt*, vol. 33, no. 3, pp. 18-23.

Fondeur, Y. (1999), *Le "déclassement" à l'embauche*, IRES, Paris.

Fondeur, Y. and Lefresne, F. (2006), Le déclassement des jeunes : une comparaison France – Suède, Note d'étape no. 2, IRES, Paris.

Freeman, R. B. (1976), *The Overeducated American*, Academic Press, New York.

Gartell, M., Jans, A-C. and Persson, H. (2007), "The importance of education for the reallocation of labor: evidence from Swedish linked employer-employee data 1986-2002", *IFAU Working Paper* 2007:14, Institute for Labour Market Policy Evaluation (IFAU), Uppsala.

le Grand, C., Szulkin, R. and Tåhlin, M. (2001a), "Har jobben blivit bättre? En analys av arbetsinnehållet under tre decennier", in *Välfärd och arbete i arbetslöshetens årtionde*, Stockholm: Fritzes (SOU 2001:53), pp. 79-119.

le Grand, C., Szulkin, R. and Tåhlin, M. (2001b), "Lönestrukturens förändring i Sverige", in *Välfärd och arbete i arbetslöshetens årtionde*, Stockholm: Fritzes (SOU 2001:53), pp. 121-173.

le Grand, C., Szulkin, R. and Tåhlin, M. (2004) "Överutbildning eller kompetensbrist? Matchning på den svenska arbetsmarknaden 1974-2000" in M. Bygren, M. Gähler and M. Nermo (eds) (2004), *Familj och arbete – vardagsliv i förändring*, Stockholm: SNS Förlag, pp. 283-321.

le Grand, C., Szulkin, R. and Tåhlin, M. (2005) "Education and Inequality in Sweden: A Literature Review" in R. Asplund and E. Barth, *Education and Wage Inequality in Europe*. Helsinki: ETLA / EDWIN, pp. 321-360.

Groot, W. and Maassen van den Brink, H. (2000), "Overeducation in the Labor Market: A Meta-Analysis", *Economics of Education Review*, vol. 19, no. 2, pp. 149-158.

Hartog, J. (1977), "On the multicapability theory of economic distribution", *European Economic Review*, vol. 10, pp. 157-171.

Holzer, S. (2006), *The Expansion of Higher Education in Sweden and the Issue of Equality of Opportunity*, Licentiate thesis, Department of Economics, Växjö University.

IRES (2005), *Les mutations de l'emploi en France*, La Découverte, Paris.

Johansson, M. and Katz, K. (2007), "Wage differences between women and men in Sweden - the impact of skill mismatch", *IFAU Working Paper* 2007:13, Institute for Labour Market Policy Evaluation (IFAU), Uppsala.

Korpi, T. and Tåhlin, M. (2006), "Skill mismatch, wages, and wage growth: Overeducation in Sweden 1974-2000", Working Paper, Swedish Institute for Social Research (SOFI), Stockholm University.

Lefresne, F. (2003), *Les jeunes et l'emploi*, Paris: La Découverte.

Lefresne, F. (2005), *Les jeunes non qualifiés*, Problèmes politiques et sociaux, Paris: La documentation française.

Lemistre, P. (2008), "Un déclassement surévalué aux causes et conséquences sous estimées?", forthcoming in *Économie et Société*.

Lindell M. and Johansson, J. (2002), "Den svenska yrkesutbildningen – ett spänningsfält mellan skola och näringsliv" in Abrahamsson et al. (2002), pp. 133-153.

McGoldrick, K. and Robst, J. (1996), "Gender Differences in Overeducation: A Test of the Theory of Differential Overqualification", *American Economic Review*, vol. 86, no. 2, pp. 280-284.

McGuinness, S. (2006), "Overeducation in the Labour Market", *Journal of Economic Surveys*, vol. 20, no. 3, pp. 387-418.

Nordin, M. and Rooth, D-O. (2007), "The Income Gap between Natives and Second Generation Immigrants in Sweden: Is Skill the Explanation?", Chapter 4 in Nordin. M., *Studies in Human Capital, Ability and Migration*, Lund Economic Studies no. 141, doctoral thesis, Department of Economics, Lund University.

Oscarsson, E. and Grannas, D. (2002), "Under- och överutbildning på 2000-talets arbetsmarknad" in Abrahamsson et al. (2002), pp. 63-92.

Roy, A. D. (1951), "Some thoughts on the distribution of earnings", *Oxford Economic Papers*, vol. 3, pp. 135-146.

Rubb, S. (2003), "Overeducation in the Labor Market: A Comment and Re-analysis of a Meta-analysis", *Economics of Education Review*, vol. 22, no. 6, pp. 621-629.

Sattinger, M. (1993), "Assignment models of the distribution of earnings", *Journal of Economic Literature*, vol. 31, no. 2, pp. 831-880.

SCB (1998), Sysselsättning, arbetstider och arbetsmiljö, *Levnadsförhållanden*, no. 92, Stockholm: Statistics Sweden.

SCB (2005), Sysselsättning, arbetstider och arbetsmiljö, *Levnadsförhållanden*, no. 109, Stockholm: Statistics Sweden.

Sloane, P. J. (2003), "Much ado About Nothing? What does the Overeducation Literature Really Tell us?" in Büchel et al. (eds) (2003), pp. 11-45.

Thurow, L. C. (1975), *Generating Inequality*, New York: Basic Books.

Thålin, M. (2006), Skill change and skill matching in the labor market: A cross-national overview, State-of-the-art report, EQUALSOC network, Swedish Institute for Social Research (SOFI), Stockholm university.

Thålin, M. (2007), "Överutbildningen i Sverige - utveckling och konsekvenser" in Olofsson, J. (ed.), *Utbildningsvägen – vart leder den? Om ungdomar, yrkesutbildning och försörjning*, Stockholm: SNS Förlag, pp. 70-89.

Tinbergen, J. (1956), "On the theory of income distribution", *Weltwirtschaftliches Archiv*, vol. 77, pp. 156-175.

Walker, I. and Zhu, Y. (2005), "The College Wage Premium, Overeducation, and the Expansion of Higher Education in the UK", *IZA Discussion Paper*, no. 1627.

Wright, E. O. (2004) Patterns of Job Expansion in Developed Capitalist Economies: some preliminary descriptive results, mimeo, Department of Sociology, University of Wisconsin.

Åberg, R. (2002), "Överutbildning – ett arbetsmarknadspolitiskt problem?" in Abrahamsson et al. (eds) (2002), *Utbildning, kompetens och arbete*, Lund: Studentlitteratur, pp. 41-61.

Åberg, R. (2003), "Unemployment Persistency, Overeducation and the Employment Chances of the Less Educated", *European Sociological Review*, vol. 19, no. 2, pp. 199-216.

Åberg, R. (2004), "Vilka jobb har skapats på den svenska arbetsmarknaden de senaste decennierna?", *Ekonomisk Debatt*, vol. 32, no. 7, pp. 37-46.