

## Transition from higher education to work: are master graduates increasingly over-educated for their jobs?

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In this paper we address the transition from higher education to work among graduates with a master's degree, with a particular focus on over-education. We relate to an ongoing debate on whether too many students undertake a master's degree, and the consequences a surplus of graduates may have. Our data show that the transition from higher education to work has not become much more difficult during the period 1995–2013, despite a huge increase in the number of graduates. Unemployment rates fluctuate, but were lower at the end of the period than at the beginning. Regarding over-education, we find an increase at the beginning of the observation period, but a striking stability in years when the number of graduates rose sharply. When considering all educational groups together, we find no association between the number of graduates, business cycles and the prevalence of over-education. However, we find some exceptions when looking at different subject fields.

**Keywords:** over-education; employability; mismatch; credential inflation

### Background

The demand for – as well as the supply of – higher education has increased throughout the world in the recent decades. Educational systems have expanded, and higher education graduation rates in the member states of the Organisation for Economic Co-operation and Development (OECD) doubled in the period 1995–2012 (OECD, 2014, p. 83). A highly-educated population is viewed as essential for economic development and productivity (Barro, 2013; OECD, 2001), and is commonly perceived as a prerequisite for the emerging knowledge society (Allen & van der Velden, 2011). However, it has also been questioned whether the increasing number of graduates involves credential inflation (Wolbers, de Graaf, & Ultee, 2001). Questions have been raised about whether a 'point of saturation' has been reached regarding the number of higher education graduates in general, and master's degree graduates in particular. Employability of graduates has become a part of the policy agenda in higher education (Harvey, 2000).

If the number of graduates is substantially higher than the number of jobs that require the actual level of education, a mismatch problem arises. A process of occupational filtering down may allocate graduates to positions at lower levels in the occupational hierarchy than their qualifications suggest, and new entrants into the labour market are particularly vulnerable.

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Empirical evidence regarding the relation between educational expansion and mismatch of higher education graduates is mixed. In this paper, we analyse a unique data-set that allows us to look at the transition from higher education to work for Norwegian master graduates from 1995 to 2013. We investigate whether the transition has become more difficult over time, with a particular focus on over-education. If increasing proportions of master graduates experience problems in getting jobs corresponding to their education level, in periods of generally low unemployment, this would provide support for a hypothesis suggesting that the supply of graduates is too high.

In Norway, the public debate concerning a possible surplus of higher education graduates has been partly linked to the graduates' level of education ('a bachelor's degree is sufficient to do the job'), but also to fields of education ('too many choose humanities and social sciences'). However, we observe that public debates about over-education are often normative rather than fact-based; hence there is a need for investigating this question empirically.

### **Theoretical approaches and previous research**

Discussions about over-education, and the match or mismatch of graduates in the labour market have been going on for decades, and were particularly manifest in the USA in the aftermath of the expansion of higher education in the 1960s. Freeman (1975, 1976) claimed that the supply of graduates had become far higher than the demand, leading to reduced economic returns of education. His findings were contested by other economists. Smith and Welch (1978), for example, claimed that what Freeman saw as over-education could be interpreted as an over-crowded labour market due to large cohorts. Sociologists expressed concern about the increasing emphasis on diplomas and credentials in employers' recruitment strategies, and coined terms such as 'the diploma disease' (Dore, 1976) and 'the credential society' (Collins, 1979).

Duncan and Hoffman (1981) published an influential article analysing over-education at the level of the individual. They found that over-education was widespread, but that the payoff of a surplus of education was positive. They argued that over-education was a serious problem only if the changes in the relative supply of different attainment groups do not alter the skill composition demanded in the labour market. If jobs are upgraded as a result of increased supply of qualified graduates, a 'surplus' of skills is not necessarily a problem. This is in line with a literature review by Bijlsma and Van der Velden (2015), claiming that, when workers are over-educated for their jobs, they still have a productivity benefit. It is also in line with the findings of Barth, Røed, Schøne & Torp (2004), who emphasise technological change when they explain how the increased supply of academic labour has been absorbed into the Norwegian labour market. They refer to a hypothesis stating that the supply of graduate labour creates its own demand. An ample supply of graduate labour will help companies decide to develop and invest in technology which makes more use of the abilities of the graduate workforce.

A contribution by Thurow (1975) is also relevant for understanding the labour market position of higher educated graduates in a situation of sharp increase in the supply of highly-educated workers. Job seekers are in a job search queue and compete for jobs. Employers seek to hire candidates involving the lowest training costs. If there are more highly-educated job seekers than relevant jobs, many will be offered – and take – jobs for which they are over-educated.

In a study of over-education in several countries Hartog (2000) found that, in the Netherlands, Spain and Portugal, the strong expansion of participation in education had

outpaced the increase in the demanded levels of education (p. 134). This concerned a period that stretched from 1960 to 1995 for the Dutch data, and from 1985 to 1990/1992 for the Spanish and Portuguese data.

Wolbers et al. (2001) examined whether the returns to education were reduced in the Dutch labour market in the period 1960–1991. They found signs of inflation in the credentials (as measured by the types of occupation in relation to education), which particularly affected fresh graduates, and those with the lowest education. Other studies indicate that the wage level for higher education graduates has held up well in times of educational expansion (e.g. Barth et al., 2004 (Norway); Elias & Purcell, 2004 (UK); Green & McIntosh, 2007 (UK)) and do not indicate an inflation in degrees. A report by the Chartered Institute of Personnel and Development (CIPD) involving a number of European countries shows that, overall, under-qualification is as common as over-qualification, but that the vertical mismatch patterns vary substantially between countries (CIPD, 2015).

Verhaest & Van der Velden (2013) find differences between vocational and generic higher education regarding job match. Graduates from generic programmes have a lower probability of achieving a good match six months after graduation than those with a vocational education. The former group, however, is better able to utilise their situation as over-educated as a stepping stone in their careers. Yet, five years after graduation, graduates from generic programmes still had a less good match between their own education level and the education level required by the job, compared to higher education graduates from more vocationally oriented programmes.

Over-education is potentially costly both for the economy as a whole, employers and the graduates themselves. Seen from a macro perspective, it is costly to use tax revenues for providing education that graduates do not fully utilise. Further, a situation with many over-educated graduates leads to lower national welfare, compared to a situation where one is able to take advantage of the potential of all individuals with higher education. Moreover, it is found that over-education implies that companies are less productive (Tsang, 1987), that the over-educated are significantly less satisfied with their job, and that they are more likely to quit (Alba-Ramirez, 1993; Sloane, Battu, & Seaman, 1999; Tsang, Rumberger, & Levin, 1991). The consequence of over-education for the individual is frequently a reduced salary and less satisfaction. Also, those who are mismatched at the beginning of their career clearly have a higher risk of low pay and mismatch in the labour market later in their careers (Arnesen, 2006, 2009; Dolton & Vignoles, 1997; Støren & Arnesen, 2011).

International comparisons of overeducation reveal that the level of overeducation is more or less the same in Norway as in other countries, though the unemployment level is lower in Norway. This refers to master graduates five years after graduation (Støren & Arnesen, 2011) as well as the total population (OECD, 2013). The latter study, which is based on OECD's PIAAC-survey (Programme for International Assessment of Adult Competencies), showed that the rate of overeducated was 20% in Norway, whereas the OECD average was 21%. This study did however indicate that the proportion *under*-qualified for their job was somewhat higher in Norway (16%) than the corresponding OECD average (13%).

### **The Norwegian context**

There has been a substantial increase in the number of higher education graduates in Norway in recent decades, and particularly since 2003. They increased by 50% between

the academic years 2002–2003 and 2013–2014 (Statistics Norway, 2015a). The growth has been strongest for education at master's degree level, almost 100% since 2003 (Statistics Norway, 2015a; Støren, Næss, Reiling, & Wiers-Jenssen, 2014). The largest expansion of the student population in recent years is seen in the natural sciences and technology, and business and administration. In contrast, the student body in humanities and arts has stabilised (see Table 1).

There are no tuition fees in public higher educational institutions (where most students in Norway are enrolled), implying that economic costs related to studying are mainly living expenses (mostly covered by universal public support) and the absence of income while studying. The lack of direct cost may partially explain why many students spend many years in higher education. Another reason why more students undertake a master's degree course can be that the period required for a lower university degree in Norway was reduced from four to three years in 2003. Hence, a master's degree is only one more year than the lower degree.

The proportion of the adult population with higher education is not particularly high in Norway – 31% in 2014, and only 9% had an educational level at master's degree or higher. However, due to educational expansion, the proportion is higher in the age group 30–39 years – 16% (Statistics Norway, 2015c). The unemployment rate in Norway has generally been quite low compared to the European Union/OECD average. Among those with tertiary education, the unemployment rate was just 2.2% in Norway, while the EU average was 6.1% (Eurostat, 2015). According to forecast from Statistics Norway, higher education will still be in high demand in the coming years (Cappelen, Gjefsen, Gjelsvik, Holm, & Stølen, 2013). But vocational education from upper secondary school is perceived to be in even higher demand. This is a major political worry, and some stakeholders claim that 'too many' undertake higher education.

### Research questions and hypotheses

In this article, we address how labour market prospects for master's degree graduates in Norway have developed between 1995 and 2013. Our focus is over-education. Based on the review, we assume that the prevalence of over-education has increased in a period of substantial higher education expansion. The scope of over-education may, however, vary for different reasons.

- (1) If we consider over-education as a form of labour market mismatch more or less similar to unemployment, it is reasonable to expect that the percentage who are over-educated will vary according to business cycles, which are reflected in the overall unemployment rate.

Table 1. The number of students (all levels) in the largest broad fields.

Study programme	2007	2014
Health and welfare, and sports	44,523	52,372
Business and administration	37,339	46,946
Natural sciences and technology	32,848	46,354
Pedagogy and teacher training	30,677	38,227
Social science	28,446	32,851
Humanities and arts	24,874	25,892

Source: Statistics Norway (2015d).

- (2) If we consider that the scope of over-education varies because of credential inflation, i.e. too many master graduates are entering the labour market, we expect the percentage who are over-educated to vary according to the number of fresh graduates entering the labour market.
- (3) Finally, we expect that the percentage who are over-educated will vary according to subject field. This may occur because of varying labour market demands for different fields of education. But over-education may also vary between fields as a result of an uneven development in the graduate numbers in the different fields.

Based on these considerations, we have formulated two hypotheses:

*H1:* The proportion of graduates who are over-educated for the job is a consequence of labour market fluctuations and reflects the general unemployment levels.

As an *alternative* hypothesis, we suggest:

*H2:* Because of credential inflation, the proportion who are over-educated over time will reflect the changes in the number of graduates over time, i.e. the curve for the percentage of over-educated graduates will draw a parallel to the curve of the number of graduates.

H2 will be examined for various subject fields as well as for the total amount of graduates.

## **Data**

The data we analyse are drawn from the Norwegian Graduate Survey, conducted by the Nordic Institute for Studies in Innovation, Research and Education since 1972. Biennially, graduates with higher degrees (master or equivalent) are contacted six months after graduation. Data from 1995 until 2013 are included in our analyses. The number of respondents has varied between 2042 and 3254. A general challenge of declining response rates has also affected the Norwegian Graduate Survey. The response rate has fallen from 78% in 1995 to 48% in 2013.

The graduate surveys approach the vast majority of graduates completing a higher degree from Norwegian higher education institutions in the spring term. Two exceptions are graduates in medicine and graduates from the Norwegian Business School. Graduates receive an invitation to participate in the survey, and up to three reminders by post. Since 2003, it has been possible to complete the questionnaire on-line as an alternative method of response.

## **Definitions**

### *Unemployment*

To be defined as unemployed, the graduate is: (a) not in paid work in the reference week, (b) has actively searched for work during the four weeks prior to the reference week, and (c) could take up a job in the reference week. This definition corresponds to that of the International Labour Organisation (ILO).

### *Over-education*

To what extent the job matches the education level may be measured in several ways. We use the term 'over-education' to map vertical mismatch. This refers to having a

higher level of education than the job requires. However, the gap between actual and required education may be broad or narrow. Having a job that does not require higher education at all is a more severe form of mismatch than having a job that requires a bachelor's degree when holding a master's degree. We apply three different definitions:

- Broad definition: The job requires higher education, but at a lower level than a master's degree.
- Medium definition: The job does not require higher education, although it is advantageous.
- Narrow definition: The job does not require higher education which is irrelevant to the job.

### *Master degrees*

All graduates with a higher degree (level 7 in the International Standard Classification of Education (ISCED) from 2011, UNESCO, 2012) are referred to as masters for simplicity, although some have other titles, in particular for those who graduated before 2003.

## **Results**

### *Unemployment*

The proportion of master graduates who are unemployed six months after graduation has fluctuated substantially over time (Figure 1). The distribution has two high peaks, 1995 and 2003, when unemployment rates were 11–12% for higher education graduates. In contrast, the unemployment level was as low as 4% in 2007.

Figure 1 shows unemployment rates for the total labour force as well as for higher education degree holders. As expected, unemployment is less widespread in the latter group. Fluctuations for higher education graduates follow the same pattern as for the other groups, but the fluctuations are stronger for the fresh graduates. As newcomers in the labour market, they are clearly more exposed to unemployment.

The level of over-education among fresh graduates is also indicated in Figure 1 (the columns, referring to the right axis). Here, all forms of over-education are included. The columns show the proportions of employed graduates who have a job which does not require a master's degree. We observe that the level is high when using this broad definition (around 40% most years). This illustrates that many fresh graduates take jobs for which they are over-educated rather than be unemployed, while they most probably are looking for a better job match.

The proportion that is over-educated is very stable. It increased at the beginning of the period, but has remained more or less the same since 1997 despite the very large growth in the number of graduates and labour market fluctuations during the period. The large labour market fluctuations between 2001 and 2009 are not reflected at all in the proportions of higher education graduates who are over-educated for their job.

These results do not support H1. Neither do they support H2. However, the picture changes if we look at the situation for different subject fields. As the pace in the growth of graduates varies by subject field, and different study programmes recruit to different segments of the labour market, diverging patterns are expected.



Figure 1. Over-education and unemployment among fresh master graduates, and unemployment in the total population and the population with higher education. 1995–2013. Per cent. Source: The Norwegian graduate survey and Statistics Norway (2015b).

Table 2. Master graduates. Per cent unemployed graduates in the labour force. 1995–2013.

	Humanities and arts	Pedagogy and teacher training	Social science	Law	Business and administration <sup>a</sup>	Natural sciences and technology	Health and welfare
1995	5.4	3.8	14.5	16.8	18.9	14.3	1.1
1997	7.3	4.5	8.1	8.8	0.0	5.9	0.7
1999	4.4	4.8	6.1	7.6	8.0	6.3	0
2001	6.9	3.0	9.0	5.6	6.1	7.7	2.3
2003	6.6	4.9	9.7	13.5	0.0	17.5	2.2
2005	9.0	3.0	8.0	8.5	6.3	10.8	0.7
2007	5.5	2.5	3.8	1.7	6.3	4.0	1.0
2009	6.6	1.4	6.6	6.5	7.3	8.4	2.9
2011	7.0	2.5	7.4	7.9	4.3	7.4	3.7
2013	8.3	3.1	7.6	6.0	7.8	8.0	4.6

<sup>a</sup>After the HE reform in 2003, the four-years business education course ('siviløkonom') was transformed into a five-year master's degree programme. In Table A.2, only master graduates are included. Source: The Norwegian graduate surveys.

The unemployment rates for selected subject fields are shown in Table 2. In brief, the table shows that master's degree graduates in pedagogy and teacher training, and in health and welfare, have very low unemployment rates through the whole period. In other subject fields, unemployment rates are around 7–8% in the last three surveys (2009, 2011, 2013). We observe that graduates in welfare state professions are less exposed to unemployment than graduates in more generic study programmes.

Further, when comparing this with the general unemployment rate in Figure 1, we find that graduates in natural sciences and technology are more exposed to labour market fluctuations than other groups. To some extent, this also applies to graduates in law as well as business and administration. Graduates in business and administration and in natural science and technology are more likely to qualify for work in the private sector (Wiers-Jenssen, Støren, & Arnesen, 2014), where changes in the business cycles affect labour recruitment more quickly.

**Over-education**

We apply three different definitions of over-education. Figure 2 illustrates the level of these forms of over-education over time for the total pool of master’s degree graduates (lines, left axis) while the columns (right axis) show the number of graduates (spring term) in the same period.

We observe that the less severe form of over-education (broad definition) is the most common. About one in five graduates state that they have a job which requires higher education at a lower level than they hold. This proportion has been quite stable throughout the entire period. The proportion who are over-educated according to the medium definition increased from 10% in 1995 to 14% in 2013. Regarding the narrow definition of over-education, we find that the level was as low as 6% in 1995 but exceeded 13% in 2003 and 2005, declining again to around 8.5% from 2007. This indicates that the most severe form of over-education is somewhat related to business cycles.

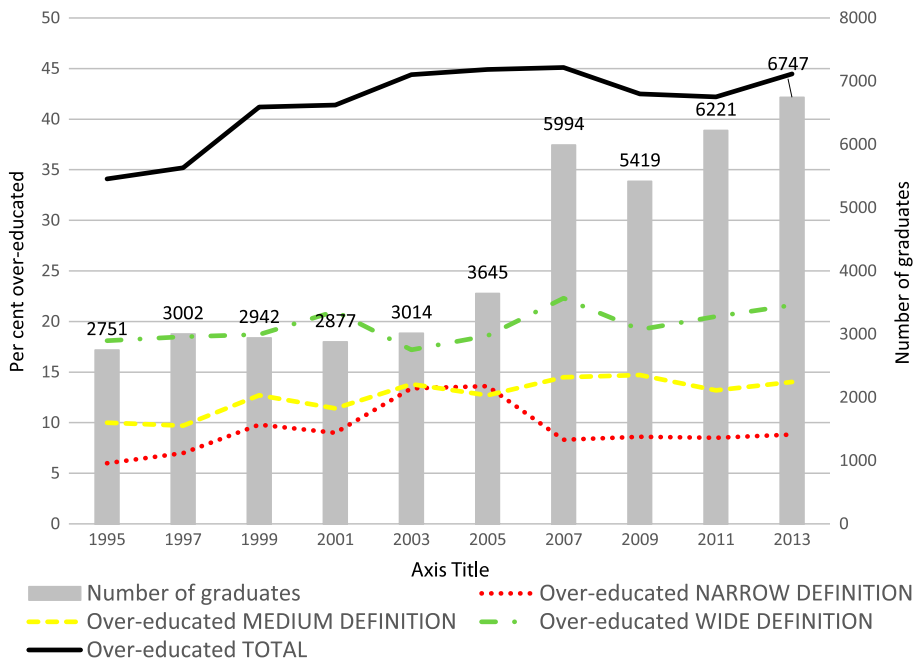


Figure 2. Proportion over-educated graduates and the number of graduates in the spring term 1995–2013.

Source: The Norwegian graduate surveys.



Aggregating the different forms of over-education, we find that that over-education overall increased by 11 percentage points, from 34% in 1995 to 45% in 2005. However, we also note that the increase took place *before* the number of graduates boomed, and that the proportion which is over-educated has been stable since 2003. The number of graduates was more than doubled in the same period.

### ***Over-education in different subject fields***

#### *Humanities*

Graduates in the humanities are more exposed to over-education than other groups, irrespective of the definition applied. When all types of over-education are aggregated, we find that the proportion has fluctuated between 60 and 65% since 1997 (Figure 3, upper left quadrant). There was an increase in the period 1995–1999, where the most severe forms of over-education increased the most. Since then, the proportion has been stable, despite the large increase in the number of graduates.

#### *Social sciences*

The total level of over-education is high also among graduates in the social sciences (Figure 3, lower left quadrant). The proportion increased substantially in the first part of the observation period when the total number of graduates was quite stable. The most severe forms of over-education increased the most. The overall proportion that was over-educated continued to increase from 2003 to 2005. In these years, the number of graduates also increased. Except for these years, there is very little association between the number of graduates and the proportion over-educated. Over-education decreased from 2005, while the number of graduates was much higher than hitherto.

#### *Science and technology*

For graduates in science and technology, over-education is generally less common than among for graduates in the humanities and social science. There is one peak in the proportion of over-educated in 2003 (Figure 3, upper right quadrant). In this year, the unemployment level of master's degree graduates in general also peaked (see Figure 1). Consequently, for this group the level of over-education reflects the unemployment rate. We also note that it was the most severe form of over-education which increased this year. However, we find no convergence between the number of graduates in science and technology and the proportion over-educated over time.

#### *Health and welfare studies*

Master's degree graduates in this field had a particularly low proportion of over-educated at the beginning of the period. But we observe an escalating proportion of over-education thereafter. This is particularly striking when looking at the broad and medium definitions. Aggregating all three forms of over-education, we find that the level has increased from around 10 to 45% from the beginning to the end of the period, reaching the average level of all higher education graduates. For this particular field we also observe that the increase in over-education occurs simultaneously with a sharp increase in the number of graduates. We assume that these developments are related, though we cannot specify a causal relationship.

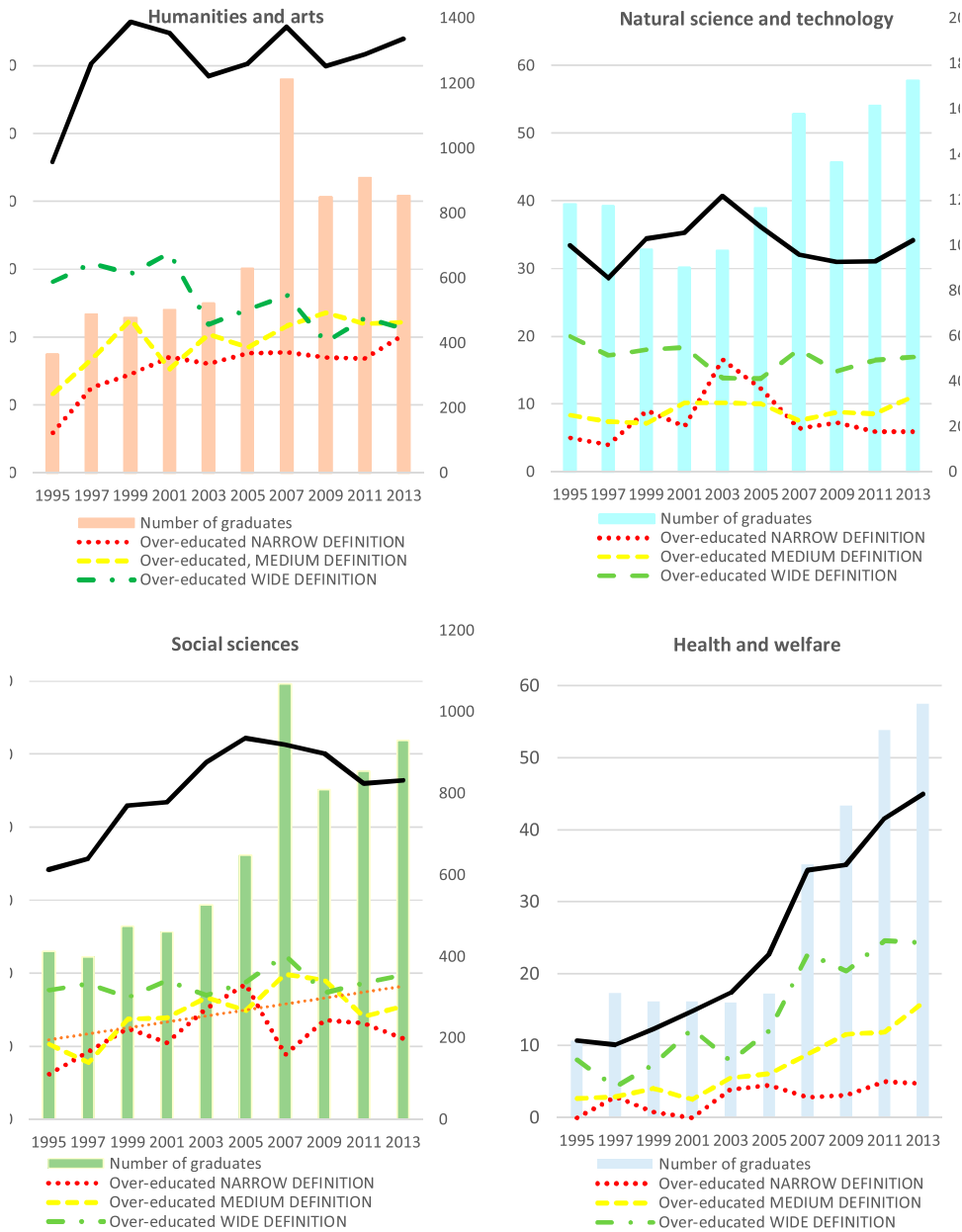


Figure 3. Master’s degree graduates in Humanities and arts, Social sciences, Natural science and technology, and Health and welfare. Per cent over-educated (left axes) and the number of graduates (right axes) in the spring term 1995–2013.

**Discussion**

*Stability over time*

Our results show that the transition from higher education to work for graduates with a master’s degree has generally not become much more difficult over the last 20 years, despite a wide expansion in the number of graduates. A slight increase in over-education

is observed, but this mostly took place in the beginning of the period prior to the increase in the total number of graduates.

Unemployment rates fluctuate, but these oscillations correspond to general trends in the labour market. When unemployment in the work force rises, so does unemployment among fresh graduates; when general unemployment declines, unemployment among fresh graduates also decreases.

Over-education is far less influenced by business cycles compared to unemployment. Our results indicate that such a relationship probably exists for graduates in science and technology; there is also a tendency whereby the most severe form of over-education is more widespread during economic downturns. An increase in the overall level of over-education is observed, but this occurred at the beginning of the period, *before* the number of master graduates started to increase. For all subject fields except health and welfare studies, it does not seem that the expansion in the number of graduates has affected the opportunities for acquiring a job commensurate with educational level. This is in accordance with previous studies from Norway. Barth et al. (2004) showed that the labour market was able to absorb those who graduated in the 1990s. Our study shows that graduates are absorbed in the labour market also in a period with stronger growth in the number of graduates than in the period analysed by Barth and his associates.

We found one exception from the main trend: master's degree graduates in health and welfare studies. In this group, the proportion of graduates that is over-educated has increased dramatically. Parallel to this, there has been a vast expansion of master programmes in this field, and the number of graduates has increased by a factor of five in the period studied. Hence, for this field, we cannot overlook that the increase in over-education may be related to the number of graduates. Further, we add that the results may also be influenced by the students in this field being somewhat special. Graduates are often mature students (predominantly women), who after graduation continue in jobs they already had (Wiers-Jenssen et al., 2014). Hence, their motives for undertaking a master's degree can be more related to a wish to achieve greater mastery of own subject field rather than getting a new job. We note that the main employer organisation in the health sector (Spekter) has claimed that the growth in master programmes in general, and in former nurses taking a master's degree in particular, is not in line with the needs of the labour market.

Regarding the hypotheses presented, we conclude that none of these is supported by our data on a general level, but they are supported for some of the subject fields. *H1* stated that the proportion of graduates who are over-educated for the job is a consequence of labour market fluctuations and reflects general unemployment levels. For one broad subject field – natural science and technology studies – we found support for this hypothesis. Also, it seems that the most severe form of over-education increases in times of economic downturn.

The alternative hypothesis, *H2*, stated that the proportion who are over-educated over time reflects changes in the number of graduates; i.e. the curve for the percentage of over-educated graduates will reflect the curve showing the number of graduates. For only one discipline, that of health and welfare studies, did the results provide support to the hypothesis.

### ***Substantial mismatch in certain fields***

Measured six months after graduation, the total proportion of over-educated graduates is very high in certain fields, particularly the humanities. This is not unique to Norway. In

a study of 13 European countries, Støren & Arnesen (2011) showed that mismatch between higher education and work is more widespread in the humanities than other fields. Based on the same data, Verhaest & Van der Velden (2013) showed that over-education is more prevalent in generic study programmes than in vocationally-oriented programmes, which is in line with our findings. They also showed that over-education is largely a transitional problem. This is also documented for Norway. Støren et al. (2014) found that over-education was significantly lower three years after graduation compared to six months after. Some groups, however, face challenges in finding employment in accordance with their education, even three years after graduation. The most severe forms of over-education are greatly reduced in all groups three years after graduation, but the milder forms of over-education are a persistent problem for a significant proportion of graduates in the humanities and social sciences.

### *Can the employability of over-educated groups be improved?*

It can be argued that students and higher education institutions could be more aware of the kinds of courses that may enhance employability. To some extent they are. The increase in student numbers in the humanities and social sciences is weaker than for other subjects (see Table 1). This may be seen as an indication that (prospective) students over time recognise labour market signals. On the other hand, in an era of increased marketization, higher education institutions may give priority to courses that are popular as well as to less resource-intensive courses, and where graduates are not necessarily those who are in highest demand in the labour market. However, the types of education that are (most) demanded varies. Study programmes that seem to be a smart choice at a certain time may prove not to be the ultimate choice by the time of graduation. As an example, we have seen that the demand for graduates in technology and natural sciences varies largely in accordance with business cycles.

Further, it is not given that more 'labour market oriented' educational choices at the overall level will improve the labour market opportunities of those who actually do choose higher education programmes with a history of considerable mismatch. As mentioned, the proportion of fresh graduates who are over-educated has proved to be high in some groups, also in times with fewer graduates. Thus, a relevant question is, why is there a constantly high percentage of graduates from generic programmes, particularly the humanities, who are over-educated? It must be accepted that graduates from certain programmes do not immediately get a job where they can fully make use of their master's degree. The job must be learnt and developed while they are in it; on-the-job training is probably more important for graduates in generic fields.

Simultaneously, challenges in making study programmes more relevant for working life do exist. Thune and Støren (2015) find that graduates in the humanities have little experience with collaboration with the world of work during study compared to other groups. However, this type of experience increased the probability of a good labour market match after graduation. Evidence from this research suggests that if study programmes within the humanities (in particular) had more project cooperation with partners in the world of work, the labour market situation of graduates in the humanities could be significantly improved. Another Norwegian study (Aamodt, Hovdhaugen & Prøitz, 2014) has shown that those who teach the humanities are less keen to educate for a working life outside academia, compared with those who teach other subjects. Hence there is room for improvement in this area as well.

## Conclusion

Despite the very considerable growth in the number of graduates, the transition from higher education to work for graduates with a master's degree has generally not become much more difficult over the last 20 years in Norway. Master graduates are, more or less, absorbed into the labour market to the same extent as at the end of the 1990s. This shows that there is weak empirical evidence for credential inflation and an increasing prevalence of over-education. Our findings support previous research from Norway suggesting that increased supply of master's degree graduates partly creates its own demand, and that technological developments contribute to an upgrading of jobs (Barth et al., 2004).

Graduates in health and welfare sciences constitute an exception from the major trend, whereby the number of master graduates within this subject field had a particularly large growth accompanied by a large increase in the proportion of the graduates in the field who were somewhat over-educated for their jobs. This illustrates that, if the supply of graduates grows clearly faster than the demand, increased prevalence of over-education is a consequence, and that trends in labour market adaptation may vary substantially by subject field.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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