

Choice of Study and Persistence in Higher Education by Immigrant Background, Gender, and Social Background

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Preface

The aim of this report is to present documentation of new analyses carried out at NIFU STEP concerning differences by immigrant background, gender and social background with regard to choice of type study programme in higher education, as well as educational attainment and persistence in higher education. Many studies have been undertaken concerning completion of upper secondary education and enrolment into higher education in relation to immigrant background. Little is known, however, about persistence in higher education by immigrant background. Neither is there much new information on how persistence varies by fields and types of study, gender and social background. A lack of documentation also applies to questions concerning the extent to which choice of study varies by immigrant background. In addition, information on the recruitment to different fields of study by social background and gender, need to be updated. We have experienced great interest and demand for such information. This report is, among other things, a response to this demand.

The work has been carried out as a part of a three-years broad research programme “Knowledge and quality in new contexts – Trends in research, higher education and innovation in the HE sector” financed by the Ministry of Education and Research. This is the first report on subprojects on recruitment and persistence in higher education. NIFU STEP researchers Elisabeth Hovdhaugen and Per Olaf Aamodt have given constructive comments to a draft version of the report.

Oslo, November 2009

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Summary

The aim of this report is to present documentation concerning choices of study and persistence in higher education with focus on differences by students' immigrant background, gender and social background.

Data

A register data set on former students in upper secondary education who entered upper secondary in 1999 or 2000 is employed. The data set was originally compiled in order to study persistence and completion of upper secondary education. In this report the focus is on educational careers among those of the group who have enrolled into higher education (HE) in 2002 or 2003. The observation period extends to 2008. Those who entered HE later than 2003 will not have had the opportunity to graduate from master studies within our observation period.

Choice of study

Students with non-Western immigrant background choose medicine/odontology, science and technology/engineering and business and administration more frequently than ethnic Norwegians, and teacher training rather infrequently.

Another finding is that students with non-Western immigrant background choose the prestigious study programmes much more frequently than ethnic Norwegians. These results are evident also when controlling for grades. Prestigious programmes are study programmes such as law, medicine, graduate engineering and business and economics graduate programme (siviløkonomi).

Gender

There are large gender differences in the choice of type and field of study, also when controlling for parental education level, immigrant background, and grades. The choice of a prestigious study programmes (relative to the choice of other programmes) occurs less frequently among females than males, and girls choose teacher training and social sciences more frequently than boys. The gender differences concerning the choices of type of study programmes tend to be the same among immigrants and ethnic Norwegians.

Grades

Choice of study programme depends partly on grades achieved in upper secondary education. A general finding is that the probability of entering the most prestigious study programmes increases considerably with improving grades, and the probability of entering teacher training and business and administration decreases with improving grades.

One of our questions concerns whether grades achieved in upper secondary education affect the differences between the immigrants and the ethnic Norwegians in the choice of study programmes. The different pattern in study choice between immigrants and ethnic

Norwegians does not seem to be notably influenced by differences in grades achieved in upper secondary education, with one exception: the high proportion of immigrants on business and administration seem to be connected with low entry grades. Concurrently, within each layer of grades, immigrants choose elite educations far more often than ethnic Norwegians.

In general students with immigrant background emerge as more ambitious than the ethnic Norwegian students.

Social background

Students' social background is measured as parents' education level. High parental educational level increases the tendency to enter the most prestigious study programmes, also when controlling for grades in upper secondary education. On the other hand, the probability of choosing teacher training, as well as business and administration decreases with increasing parental education level.

Based on previous research revealing that the effects of social background on completion of upper secondary education differs between youth with immigrant background and ethnic Norwegian youth, a question is raised whether the effects of social background variables on choice of study are the same for immigrants and non-immigrants. A general result is that the effects of parental education on the choice of study programmes are stronger among ethnic Norwegians than among immigrants.

Persistence

The data allow us to examine persistence and completion in two ways; a) the attained academic level within 2008; b) the number of credit points achieved. Information on the attained academic level is used as a measure for completion, and the number of credit points as a measure of study efficiency. Both measures are here regarded as indicators of 'persistence'.

The number of credit points refers to the exams that are passed during a specific period. Sixty credit points is equivalent to one year of full-time studies, or 60 ECTS (European Credit Transfer System). The number of credit points achieved *per year* is used as an indicator of study efficiency. The latter makes it possible to include all the students in multivariate analyses. Concerning completion, we had to separate the students according to the degree levels of the study programmes they have embarked upon.

Completion rates

Of those in the group of students who have not been enrolled in master programmes and who entered HE in 2002, in total 29 per cent have *not* completed a bachelor programme or attained 180 credit points during the six-years period. Male students are highly over-represented in the non-completion group, as are students with immigrant background relative to ethnic Norwegian students.

Among those who entered higher education in 2002 and who have enrolled into a *master* programme, 43 per cent had not attained a master degree or equivalent within the six-years period. *Ethnic Norwegians* are over-represented among the *non-completers* in this group. Here, the gender difference is minor.

When looking at those who of the total group who have not completed the destined degree and were not registered in higher education in October 2008, we find that those who are over-represented among this group of *non-completers* are:

- males relative to females, this refers to both ethnic Norwegians and first-generation immigrants
- students whose parents do not have higher education, especially among males
- first-generation non-Western immigrants, especially male students in this group.

Second-generation non-Western immigrants are *not* overrepresented among the *non-completers* relative to ethnic Norwegians.

Study efficiency – differences by gender and parental education level

There are significant gender differences in study efficiency measured as credit points achieved per year also when controlling for fields and type of study. Female students (without children) are the most efficient.

There is practically no effect of parental education level on persistence measured as study efficiency when controlling for fields and type of study and academic ability. For females there is a small *negative* effect of having parents with higher education, and for males there is a small positive effect of father having higher education.

Study efficiency – differences by type and fields of study

Master students have higher study efficiency than those who have not entered a master programme with some exceptions. Students within health and welfare have the highest study efficiency, and within this field also the bachelor students have very high study efficiency. Bachelor students in science and technology, social science, humanities, and business and administration have the lowest study efficiency.

Study efficiency and academic ability

Academic ability (grades achieved in upper secondary education) affects the difference in study efficiency between the immigrants and the ethnic Norwegians. When controlling for grades, the difference between the immigrant and ethnic Norwegian students at bachelor level is reduced.

Study efficiency – differences by immigrant background

When controlling for parental education level, a complex pattern is found: Second-generation immigrants have the highest study efficiency, followed by ethnic Norwegians close behind. This refers to master studies. However, more second-generation immigrants than ethnic Norwegians stay on in master programmes.

On study programmes below master level studies (where the study efficiency is overall lower), ethnic Norwegians have the highest study efficiency, followed by second-generation immigrants. Among students on study programmes below master level first-generation immigrants had the lowest study efficiency.

The overall results indicate a polarization within immigrant group of students. Immigrant students who started on master programmes fare better than ethnic Norwegians (second-generation immigrants), or close to ethnic Norwegians (first-generation immigrants) with regard to study efficiency. Among those who have not entered master programmes, but take lower degree programmes in engineering and business and administration for example, the situation is contrary, and many *first-generation* immigrants in particular have low study efficiency. When not controlling for parental education level, the difference would be even larger.

Female students and persistence

Overall, we find positive results for female students – which *apply to both immigrant and ethnic Norwegian students*. More females than males enter higher education; the social background of the female student population is more diverse than that of males; their intake grades are somewhat better; they have a lower rate of drop-out, and they have higher study efficiency than male students.

1 Introduction

It has been documented in recent years that young persons with non-Western immigrant background are well-represented in Norwegian higher education (see for example Støren 2005; Støren, Helland and Grøgaard, 2007). Less is known about the choices of higher education, and even less is known about persistence in higher education among students with immigrant background.

Many studies have focused on achievements and completion rates in upper secondary education (Fekjær and Birkelund, 2007; Fekjær, 2007; Støren, 2006; Støren and Helland, 2009). Examples of findings concerning completion of the general, academic track in upper secondary education are that there exist differences in completion rates between the ethnic minority and majority in favour of the latter. However, in analyses including control for parental social background variables this initially observed difference result in no difference in the completion rate between the ethnic majority and most of the non-Western groups. In some cases the difference is in favour of the non-Western immigrants (Støren and Helland, 2009). Still, the non-Western students, in particular the *males*, gain less from having highly educated parents than the Scandinavian students. Another finding is that among female students with a *low* parental education level the difference between the ethnic majority and minority goes *in* favour of the ethnic minority.

Although many studies, both in Norway and internationally (for instance Dekkers, Bosker and Driessen, 2000; Driessen and Smit, 2007; Heath, Rotheron and Kilpi, 2008), have examined school achievements at *secondary* level (upper or lower secondary level), and many also have studied the decisions to enrol into higher education (f. i. Connor et al., 2004; Leslie and Drinkwater, 1998; Perna, 2000), information on what happens *after* enrolment HE is scarce, in any case in Norway.

1.1 Data and definitions

A register data set on former students in upper secondary education who *entered upper secondary education in 1999 or 2000* is employed. The data set was originally compiled in order to study persistence and completion of upper secondary education.¹ However, the focus in this report is on educational careers among those of the group who have enrolled into higher education (HE). Because the focus is to examine differences between the ethnic majority (ethnic Norwegians) and minority students with non-Western immigrant background, in addition to gender and social background, persons with *Western* immigrant background, who represent only 0.6 per cent of the cohorts, are excluded.

Students with *non-Western origin* or their parents are born in Asia, Africa, Latin-America or Eastern Europe. They are divided into *first-generation immigrants*, who are born outside Norway where both parents are born abroad, and *second-generation immigrants*, who are born in Norway but where *both parents are born abroad*. The term most often used in

recent years for the last mentioned group in Norwegian official reports is ‘descendants’. This term is commonly not used in international studies, and it *may* internationally be misunderstood as referring to third (or fourth) generation, especially in countries such as UK with a longer immigration history. Thus, in this report the term ‘second-generation’ will be used, although in Norway it has been pointed out that this term, when applied to persons *born* in Norway, may have unintended connotations. Since those with Western background (first- and second generation) are excluded from the analyses, the terms first- and second generation in this report only refer to students with non-Western background.

Students’ social background is measured as parents’ educational level. The data set contains much background information such as parental education level, immigrant background, and grades achieved in upper secondary education.

The observation period extends to 2008. Those who entered HE later than 2003 will not have had the opportunity to graduate from master studies within our observation period. Therefore, the persistence in HE as well as educational choices are examined for students from the upper secondary 1999 and 2000 cohorts *who entered higher education in 2002 or 2003*. Thus, the data refer to students who entered higher education directly after upper secondary education, or, for a part of the 1999-cohort, persons who enrolled into HE one year after the completion of upper secondary education.

1.2 Enrolment into higher education among immigrant youth in Norway – some background information

Results from several studies, both in Norway and internationally, suggest that youth with immigrant background have high educational aspirations. In Norway *second-generation* immigrants have a high participation rate in higher education (Støren et al., 2007), and Connor et al. (2004) find for example that ethnic minority groups in the UK are over-represented in undergraduate level of higher education. This is explained (among other things) by high aspirations and expectations. Leslie and Drinkwater (1998, p. 75) show that “a mixture of push (lower current opportunities) and pull (larger expected future benefits) factors” are responsible for the greater tendency among ethnic minorities to stay on in further education. High participation rates among ethnic minorities in post-compulsory education are found despite findings of lower achievement among most ethnic minority groups at lower education levels (Connor et al., 2004; Gilborn and Mirza, 2000; Støren et al., 2007). This indicates a stronger motivation for higher education within each layer of grades.

The great tendency to study among young people with an immigrant background in Norway is present despite the fact that this group scores lower in all respects relating to social background than the majority group. Previous studies (Støren, 2005, Støren et al., 2007) have shown that the difference between young people with and without an immigrant background is much greater in favour of the minority group, with controls applied for such social background conditions. At the same time, *first-generation*

immigrants are still under-represented in higher education if we look at percentages of birth cohorts (Støren et al., 2007). This is because they participate less frequently in upper secondary education than young people in the majority group, and they also complete it less frequently.

In this report we focus on new students from two particular upper-secondary education cohorts who entered higher education directly after upper secondary education, or one year following completion of upper secondary. It is important to be aware that it is quite common in Norway to postpone the enrolment into HE two years or more after completing upper secondary education (Støren et al., 2007). This happens much more frequently among the ethnic Norwegians than among those with immigrant background. Table 1.1 shows a high enrolment rate among those with non-Western immigrant background compared to the ethnic Norwegians in the cohorts studied in this report. This difference is neutralised after some years (Støren et al., 2007); those with immigrant background proceed to HE much quicker than the ethnic Norwegians. The latter group of young people tend to postpone starting their HE studies more frequently than immigrants.

As seen in Table 1.1 below, the 23,894 students from the two cohorts examined in this report represent only 24 per cent of the total cohorts; that is when students who had started on vocational and general academic courses in upper secondary all together serve as the reference for the calculation. The main reason why the proportion is not higher is, as mentioned above, the tendency to delay HE enrolment. This is seen in the following:

If we look at the oldest cohort (embarked on upper secondary in 1999) only 15 per cent of the total cohort had enrolled into HE in 2002, 34 per cent in 2003 (or earlier) and 47 per cent in 2005 (or earlier) – that is within six years after starting upper secondary education.

Those who entered HE in 2002/2003 have slightly better average grades from upper secondary school than those who start later,² and we can assume that the first group are generally slightly more motivated for HE than those who enter later. The purpose in this report is to examine differences by immigrant background, gender, and social background among groups with similar educational characteristics, including equal levels of performance. The opportunity to analyse such differences in a group of students who have all entered upper secondary education at the same time, and who have all also entered HE at the same time is a good starting point for comparisons, although this means that we do not have the possibility to look at *all* the new students who enrolled into HE a particular year. The latter body of students would be more heterogeneous, including a high number of older students.

The enrolment rate varies with social background (parental education level) as well as gender, as depicted in Table 1.1, a fact that is well known from a number of international as well as Norwegian studies.

Table 1.1 Enrolment into higher education in 2002 or 2003 among students from 1999/2000 upper secondary education cohorts, by background characteristics. Per cent of total cohorts, and of those who had achieved a university admission certification in 2002 or 2003.

	The total 1999- and 2000 cohorts		Achieved university admission certification in 2002 or 2003	
	Per cent enrolled in HE	N	Per cent enrolled in HE	N
Ethnic Norwegian	24.2	92970	48.5	44722
1. generation, non-Western	26.0	3577	66.2	1320
2. generation, non-Western	33.0	1326	65.5	611
Males	16.4	50215	40.0	19401
Females	32.9	47658	55.8	27252
Mother less than higher education	20.0	71969	48.1	28666
Mother higher education	36.6	25904	50.9	17987
Father less than higher education	19.6	71922	47.6	28260
Father higher education	37.8	25951	51.7	18393
Total	24.4	97873	49.2	46653

When looking at percentages of the total cohorts, there is a large difference in the HE enrolment rate between those with mother or father having higher education and those whose parents do not have this educational level. If the basis for the percentage is those who have completed the general, academic track in upper secondary education with university/college admission certification, the differences in enrolment rate by parental education level is very small. Thus, the difference in HE enrolment depending on parental education level arises at earlier stages, and concerns the choice of vocational versus academic track in upper secondary as well as persistence and completion of upper secondary education. There are large social differences in both the two last-mentioned aspects (Støren et al., 2007).

1.3 Previous research, theoretical issues and research questions

Choice of study and educational attainment is often studied with a focus on social differences. This has attracted considerable attention, both theoretically and empirically. Differences according to social background characteristics are also a major concern in this report. Therefore, some of these theoretical considerations are (briefly) mentioned below and recent relevant studies are sketched. In the first part, the *choice* of type of higher education will be in focus, and in the next part *persistence and completion* – as opposed to departure and lack of academic success, will be focused.

1.3.1 Choice of study

Variation between different social groups in the choice of type and field of study may be understood in the light of Boudon's social position theory (1974). The choice may be seen

as a 'secondary effect' of stratification. Whereas the 'primary effect' of social stratification in the theory of Boudon is seen in the social differences in *achievements* in primary and upper secondary education, the secondary effect is the effect of the different *choices* observed with regard to the entry of higher education. Young persons whose parents have higher education will try to avoid downward social class mobility. This is also in accordance with Breen and Goldthorpe's (1997) theory of rational action, which is particularly concerned with *risk* ("relative risk aversion"), and predicts that the desire to avoid social degradation is stronger than the desire for upward mobility.³ Such calculations may influence not only the decision to enter HE or not, but possibly to a larger extent the preference for a specific education. The returns to education differ by type of study, and so does social prestige. Many studies (see Jackson et al., 2008, p. 372) show that professional fields such as medicine, business and law usually have higher wage returns than fields in social studies and humanities. The European REFLEX graduate survey including 13 countries (Allen and van der Velden, 2007) show the highest wage returns within engineering, computing and business (Støren and Arnesen, 2007a). Further, a new Norwegian study (not including medicine) showed the highest wage returns in business, law, and science and technology (Arnesen, 2009). Thus, it will be expected here that high educational level of the parents will increase the probability of entering study programmes within medicine, law, business and graduate engineering, here labelled prestigious (or elite) educations.

Such expectations – although explained differently – are also in accordance with Bourdieu's theory (Bourdieu and Passeron, 1977) and concepts about social and cultural capital. Students with a specific social capital acquired through their parents' education level (resources based on networks and support) may have higher probability of choosing certain HE educational programmes than other students. In addition, cultural capital obtained at home (knowledge, skill, cultural codes) will affect the study choices.

The effect of social background characteristics on the choice of educational field in the perspective of (both) Bourdieu and Boudon is examined in an interesting and thorough way by van de Werfhorst, de Graf and Kraaykamp (2001). They investigate both the effects of the parental education level and the educational fields of the parents on the children's educational choices in the Netherlands. Their study includes choice of field among youth at all educational levels. They find, among other things, that the parents' educational fields are of considerable importance (not distinguishing between girls and boys). Based on Boudon's (1974) model they argue that children take their parents' education as a reference for their own aspirations. "[..] the perception of costs and benefits of a specific field [..] will be evaluated to the most reliable extent when the parents are educated in this field" (van de Werfhorst et. al., p. 289). Their results are also in accordance with the theory of Bourdieu (1984) and Bourdieu and Passeron (1977); tastes and preferences are transmitted from parents to children. Further, they argue (among other things) that "Children of the cultural élite are not so much inclined to make educational choices that directly affect their opportunities in the labour market. Rather, they tend to

reproduce their family capital by choosing cultural fields” (ibid, p. 290). An example of other findings of Werfhorst et al (2003) is that lower-class children were over-represented in engineering, economics and caring subjects, thus, to some extent, in fields with favourable labour market opportunities. This study brings about nuances in the traditional picture of the effects of parental educational level on the children’s choices, arguing that looking at effects of parental educational level alone does not yield complete information.

A study of Davies and Guppy (1997) in the United States has a different approach when studying the effect of parental educational capital on field choice. Guppy and Davies examine how the tendency to choose lucrative fields varies. The fields are scaled according to the monthly income among workers in 15 different fields, with the most lucrative fields being those with highest income. Engineering was at the top of the ranking, followed by agriculture and forestry, economics, mathematics and statistics, and business and management. The four *least* lucrative fields (ranked from the bottom) were home economics, education, English and journalism, and nursing and other health technologies. Social sciences, psychology, humanities, and physical sciences were in the middle. Although such a ranking will differ between countries (yet, also similarities will be found), the results may be transferable to other countries. One of their findings was that socio-economic status (a measure including parents’ educational level) did *not* affect the chances of entry into lucrative fields with high economic returns (only the entry into selective colleges). Two ethnic-minority variables (African American and Hispanic) were *not* statistically significant, and neither was a variable labelled “cultural resources” (measuring whether the family subscribed to magazines, newspapers and owned a library card, used as a proxy for family-transmitted cultural capital) significant. Academic ability had a large and significant effect, and when controlling for academic ability, university students of lower socio-economic status families enrol in lucrative fields of studies more frequently. However, the effects of ethnic background and cultural resources were still not significant. Davies and Guppy (ibid, p. 1427) argue that the results “may reflect that able working-class students who have reached college are more likely to view their undergraduate education instrumentally as a route to upward mobility, and are more likely to enroll in lucrative fields that are of relatively technical nature, such as engineering and business.”

In addition to (possible) effects of parents’ social status, being an ethnic minority which in European countries generally means having non-Western immigrant background, may affect the choice of study. In Norway, it is well-known that immigrant students are over-represented in engineering and under-represented in the field of education (Opheim and Støren, 2001). Otherwise, to our knowledge, little else is documented about how field choice is affected by having an immigrant background. This group of students has a lower social background than the majority students, and according to the finding of Davis and Guppy (1997) referred to above, it is reasonable to suppose that when controlling for academic ability, they will be over-represented on prestigious study programmes. Another finding that underpins such an expectation is the finding of OECD (2007), which says that in most OECD-countries, 15-year-old students from immigrant backgrounds have more

ambitious plans concerning higher education than their native counterparts, particularly when socio-economic backgrounds are taken into account.

In the analyses in Chapter 2, the extent to which the study programme is prestigious is one of the dimensions in the categorization of the study programme. Based on the above studies, it is not obvious that differences based on social background and by immigrant background in choice of study programme will be found. Therefore, our first research questions are:

Choice, 1: To what extent do we find differences according to social background measured as parental educational level regarding the choice of study programmes?

Choice, 2: To what extent do we find differences according to immigrant background regarding the choice of field of study?

Choice, 3: To what extent do we find differences according to immigrant background regarding the choice of the most prestigious study programmes?

Choice, 4: Are the effects of social background variables the same for immigrants and non-immigrants?

Choice, 5: To what extent do the differences in choice of study programme depend on grades achieved in upper secondary education? How do grades possibly affect the differences between the immigrants and the ethnic Norwegians in the choice of study programmes?

Gender

In addition to social differences, there exist large gender differences in the choice of field of study: male students choose science and technology far more frequently than females, and female students study programmes within health and welfare and education choose far more frequently than males (Davies and Guppy, 1997; Hansen, 1993; Jacobs, 1996; OECD, 2006; Støren and Arnesen, 2007b, van de Werfhorst et al., 2001). A common view is that the gendered choices are related to socialization (Bradley, 2000, Dryler, 1998; Jacobs, 1996; Støren and Arnesen, 2007b); still, other perspectives are also relevant.

The gender effect on choice of study may interact with social background characteristics, in different ways. One concerns the fact that females are in a majority in higher education. Thus the distribution of social background characteristics (such as parental education level) in the male student population differs from that of the female student population. The latter includes more students with parents with low or medium education level than the first (see for example Table A.1). This indicates that social background characteristics may affect the study choices as well as persistence in different ways in the male and female student population. Another aspect concerns the possibility that girls and boys are affected differently by mother's and father's educational level respectively.⁴ Støren and Arnesen

(2007b) found, among other things, that among female students, *mother's* higher education (but not that of the father) had a positive effect on unconventional (male-dominated) educational choices of higher education, whereas among young men the *father's* higher education had a positive effect on male-dominated (conventional) and gender-neutral educational choices (and mother's higher education had the opposite effect). It is in accordance with the theory of rational choice (Breen and Goldhorpe, 1997) that female students with highly educated parents or coming from higher social class will choose male-dominated (unconventional) education more often than female students from lower social classes. This is because male-dominated educations more frequently lead to higher salaries than do female-dominated educations. Davies and Guppy (1997), for example, find that males are more likely to enter fields of study with higher economic returns than are females.

A rational-choice perspective is used in some studies to explain the sex-segregation within education, for example Jonsson (1999) and van de Werfhorst, Sullivan and Cheung (2003). Both studies examine the extent to which an unequal distribution of comparative advantages in skills between male and female students is of importance to gender differences in educational choices. Both studies find small effects.

Concerning gendered choices, this report we will deal mainly with broad categories focusing more on possible gender differences concerning the choice of prestigious educations than on gender differences in the choice of subjects/fields of study, which have been documented in many previous studies, as mentioned above. When examining the (possible) gendered choices, a control will be made for social background characteristics. Then two subsequent research questions are as follows:

Choice, 6: To what extent do we find gender differences in the choice of type of study, when controlling for parental education level, immigrant background, and grades?

Choice, 7: Are the gender differences concerning the choices of type of study programmes the same among immigrants and ethnic Norwegians?

1.3.2 Persistence

Persistence in higher education is partly related to type and field of study, of several reasons. One reason can be that students in vocationally oriented programmes are likely to have relatively high completion rates, particularly if the programmes are of short duration (bachelor programmes). It is also reasonable to expect that we will find high study efficiency in vocationally oriented programmes because the students are more closely followed up by teachers and instructors and the bonds to the labour market through internships and so forth are tighter than in general programmes. More broadly speaking, this aspect refers to the fact that modes of teaching and learning vary between study programmes, and that this may affect persistence.

Another factor relates to academic ability. The extent to which students in different types of study differ according to academic ability (entry qualifications), it is reasonable to expect that study persistence will vary accordingly. A third reason concerns the relationship between choice of field of study and gender, social background and immigrant background. It is possible that variation in persistence according to gender, social background and immigrant background reflects differences according to the same factors in the choice of fields and type of study. If this is so, we would expect to find no or small differences in persistence by gender, social background and immigrant background, when controlling for fields of study. On the other hand, it is also possible that gender, social background, immigrant background and academic ability are more important predictors than fields of study, causing no difference in persistence by fields of study when controlling for the mentioned background characteristics.

The theories of Bourdieu (Bourdieu and Passeron, 1977) and Boudon (1974), as well as the rational choice theory developed by Breen and Goldthorpe (1997) referred to above are relevant (also) for research questions on *persistence*. Students who evaluate whether they want to continue an education, will assess the costs and benefits of continuing, and according to Boudon's social position theory as well as the rational choice theory, such calculations will be influenced by their social background. The risk of downward mobility when dropping out is larger for the upper social class youth than for the lower social class, causing lower dropout rate among the former.

In line with this; cultural capital (Bourdieu) relevant for academic studies and transmitted to the children will increase the probability of academic success and high persistence. This is discussed in a study of Hansen and Mastekaasa (2006). From one perspective, they argue that the much stronger selection of lower-class students to higher education makes it unlikely that they should be less talented than students from higher-class backgrounds. Thus, one should expect that lower class students would succeed in higher education to the same extent as upper class students. However, they also argue that according to cultural capital theory, it is reasonable to expect that students from families who are closest to the academic culture would have the greatest success. Hansen and Mastekaasa (2006) examine the grades achieved in higher education (and not persistence), but the close relationship between grades and student departure (Mastekaasa and Hansen, 2005), makes their results relevant also for questions concerning persistence. Hansen and Mastekaasa (2006) find that there is an association between class origin and academic performance. Students originating in classes that score high with respect to cultural capital tend to receive the highest grades. This is true in the majority of fields examined.

Economic family resources may also have an impact. In Norway, Mastekaasa and Hansen (2005) found no effects on attrition (student departure) of parental *income*, and argue that this may be explained in two ways: (i) Grants through the Norwegian State Educational Loan Fund and the access to free higher education have had the intended equalizing effect; (ii) The effect of economic capital asserts itself first and foremost with regard to the

recruitment to higher education. Thus, the lack of relationship between parental income and attrition may be caused by a selection effect.

HE students whose parents have low education may also be seen as a selected group of students. Mastekaasa and Hansen (2005) find a relationship between parental educational level and student departure. This relationship is very much weakened when controlling for academic ability. Hovdhaugen and Aamodt (2005) and Hovdhaugen (2009) also find a relationship between parental education level and student departure (that is: for dropout, not for transfer to another type of study). In this study, which was based on survey data and included students entering undergraduate studies in 1999 at three universities only (and not students at university colleges), this relationship was stronger than that found in the study of Mastekaasa and Hansen (2005), also when controlling for grades achieved in upper secondary education.

The above-mentioned studies and theoretical considerations make it reasonable to expect that the analyses of persistence in this report (Chapter 3) will show a positive effect of high parental education level. A different approach than in the studies mentioned above will be used, using completion and study efficiency as measures of persistence. Unlike Hovdhaugen (2009), register data will be used. We will also have a particular focus on *gender*, which was not focused in Mastekaasa and Hansen (2005). Hovdhaugen (2009) finds that male students have a higher dropout rate than female students. Thus, it is expected here that female students will have higher persistence rate than male students. Furthermore, because female students are in the majority, and (thus) are generally characterized by greater diversity in social background than male students, it is investigated whether parental education level has the same effect on study efficiency among women and men.

Parental education, and gender

Based on the considerations above, the first two research questions concerning persistence are raised:

Persistence, 1: Are there gender differences in persistence, when controlling for fields and type of study?

Persistence, 2: What is the effect of parental education on persistence, when controlling for fields and type of study and academic ability? Are there differences between male and female students concerning the effect of parental education level?

Fields of study

Hovdhaugen (2009) did not find differences in the dropout rate between the three fields of study that were examined in her study, concerning the probability of dropout among the university students. It is reasonable to believe that when looking at a much broader group of students, we will find such differences, and especially when persistence is measured as study efficiency. (The study of Mastekaasa and Hansen (2005) controlled for fields of

study, but the possible effects are not shown.) Thus, the third research question concerning persistence is:

Persistence, 3: Are differences in persistence related to differences in the choice of fields and type of study?

Immigrant background

The most famous theory concerning student departure and persistence is that of Tinto (see for example Tinto, 1993). According to Tinto (1993) the social and academic integration of the students at the universities is the crucial factor. What happens after enrolment is more important than background characteristics. The analyses in this report are based on register data, and we have no information on the institutional context or on individual experiences or assessments, thus we are not able to take such important variables into account.

However, with reference to the factor 'social integration', we may expect that this is of particular importance for immigrant students, especially for those of non-Western origin. In previous Norwegian studies the effect of having non-Western immigrant background on student departure has *not* been found. In Hovdhaugen's (2009) analyses there were no difference in the dropout rate between non-Western immigrant university students and ethnic majority students. In a recent study of Reisel and Brekke (2009) comparing Norway and the United States and where the relative year-to-year risk of dropping out from higher education among minority and majority students was assessed, such a difference was found for USA but not for Norway. Reisel and Brekke found that initial socio-economic inequalities between minority and majority students were aggravated in the educational system of USA, but there was no difference in the dropout risk among minority and majority students in Norway. The study indicates that minority students in Norway encounter fewer obstacles in higher education than minority students in the United States, even though minority students in Norway also have socio-economically disadvantaged backgrounds more frequently than the majority students.

Wakeling (2009, p. 86) describes British undergraduate education as "a qualified success story for the assimilation of the UK's ethnic minorities." He examines ethnic minorities' representation among postgraduate students. Thus, persistence in terms of staying on in education from undergraduate to postgraduate studies is examined. One of the findings is that there are fewer ethnic minority students at postgraduate level than among first-degree graduates, however – a diverse picture is found concerning type of postgraduate study and type of ethnic origin. A general conclusion is: "Overall comparison of first degree and postgraduate ethnic minority population suggests neither underrepresentation nor overrepresentation of ethnic minorities, with the trend being an increase in participation over time" (Wakeling, 2009, p.108).

According to prevailing theories mentioned above concerning the effects of social background on educational achievements, it should be expected that non-Western immigrant students (who overall have parents with lower educational level than majority students) will have lower persistence in HE than the majority group. Nevertheless, many

studies mentioned in the introduction have indicated high educational aspirations among immigrant youth. Moreover, the three above-mentioned studies indicate that there is little reason to believe that large differences in persistence between students with immigrant background and the majority students will be found. There may nevertheless be differences between first-generation and second-generation immigrants. Few studies focus on this distinction. The minority students in Norway in the study of Reisel and Brekke (2009) are represented only by *second*-generation immigrants (commencing undergraduate studies 1990–1998, that is 4 to 12 years earlier than the students in this paper). In the study of Hovdhaugen, a distinction between first- and second-generation was not made because of few observations.

In Norway, the majority of students with immigrant background are born outside Norway; that is first-generation immigrants, contrary to the situation in the UK where the descendants (second-generation and third-generation immigrants) constitute the majority. There is good reason to believe that the proficiency in the language of the immigration country is not as good among first-generation immigrants as second-generation immigrant youth, accordingly making educational success more difficult for the first group. Thus, a distinction between first- and second-generation immigrants is important.

In addition, preliminary analyses of the data used in this paper indicate that there possibly exist large differences in persistence between immigrant and majority students when taking differences by fields and type of study, as well as gender, into account. In some types of study programmes youth with immigrant background tend to have higher persistence rate than majority students (ethnic Norwegians), and in some types of study programmes lower. This may, on average, result in no difference between the minority and majority group. Furthermore, academic ability tend to vary more among the immigrant students than among the majority students, and this may result in a polarity with regard to success in HE among the immigrant students to a larger extent than among the majority students. Thus, our last research questions are:

Persistence, 4: To what extent do we find differences between first- and second-generation non-Western immigrants and ethnic Norwegians in persistence in HE when controlling for parental education level?

Persistence, 5: To what extent do we find differences between non-Western immigrants and ethnic Norwegians in persistence in different types of studies? Do immigrants more seldom than ethnic Norwegians stay on in master (postgraduate) programmes?

Persistence, 6: How does academic ability (grades achieved in upper secondary education) affect the possible difference in persistence between the immigrants and the ethnic Norwegians?

2 Choice of study

The persistence in HE, as well as the attained level of HE, varies between fields and type of study. This may affect the differences by gender and immigrant background in educational attainment because there are large differences between the groups with regard to choice of field and type of study.

The term '*choice*' may be questioned. We have information on the study programme when entering HE, but we have no information on whether this study programme was their first, second or third choice. Some students may have had other choices as their first choice, but they did not have good enough grades to get access to the particular study programme at the particular HE institution. However, all the students to be examined in this report have actually accepted the offer of a student place and have chosen to commence studying at the particular programme. In this sense, the study programme on which they are registered represents their choice, and this is the meaning of '*choice*' in this report.

The distribution of fields and type of study among the new students in our cohorts is shown in the next section (Table 2.1). Before commenting upon this distributions, it is appropriate to explain the categories.

2.1 Classifications of study programmes

The categorization of field of study is based on the Norwegian Standard Classification of Education (Statistics Norway, 2006). We have used broad fields; else the categories would be too many. Some broad fields, such as teacher training and pedagogy, and social sciences and law, are separated into narrow fields (see Table 2.1).

In addition, the duration of the study programme is taken into account when categorizing; that is the destination level of the study programme; whether it refers to master level or not. However, only students registered in continuing study programmes with a duration of five years or more when starting HE, are categorized as master level students. These study programmes are marked with an asterisk in Table 2.1.⁵

Study programmes in humanities, social sciences etc. may lead to both bachelor and master's degree, thus, for students starting in such programmes we do not know whether their aim is to take a master or a bachelor degree. Teacher training lasts for four years, and pre-school teacher training, engineering, nursing and all other health and welfare bachelor educations last for three years. In addition there are courses within business and administration, and a few study courses within engineering, that last for less than three years (i.e. are below bachelor level). Such courses may constitute a basis for, when taking extra year(s) of education, a bachelor degree. All students with a bachelor degree, in all types of programmes, may proceed to master studies, but the admittance to master studies are restricted according to previous achievements.

Table 2.1 Students from the 1999- and 2000 cohorts entering HE in 2002 or 2003, by type of study programme when entering HE, and gender and immigrant background. Per cent

	Females, total	Males, total	Ethnic Norwegian	First generation	Second generation	Total
Humanities	12.2	9.8	11.6	8.8	5.0	11.4
Teacher training	4.9	2.3	4.2	1.3	0.9	4.0
Pre-school teacher training	3.9	0.4	2.8	2.0	2.1	2.7
Pedagogies/education, else	3.9	2.0	3.4	1.7	1.4	3.3
Social sciences	20.5	13.9	18.5	14.7	11.4	18.2
Law (master level)*	1.5	1.5	1.5	1.4	1.8	1.5
Business and economics graduate (master level) *	0.9	1.8	1.2	0.8	3.7	1.2
Business and administration, <i>except</i> business and economics graduate	13.6	21.5	16.0	20.5	24.9	16.3
Science and technology, bachelor level	6.4	23.1	11.7	18.6	18.9	12.1
Science and technology (graduate engineering), master level*	2.9	9.7	5.2	6.3	4.6	5.2
Nursing and other health and welfare education (bachelor level)	20.6	5.3	15.5	13.4	9.4	15.3
Medicine and other health and welfare educations, master level*	2.6	2.5	2.3	5.8	12.6	2.6
Agriculture, forestry, fisheries and aquaculture	0.4	0.5	0.5	0	0.2	0.5
Transport, communications, safety, security, services	0.3	1.0	0.6	0.5	0.5	0.5
Introductory courses; Examen filos./Examen facult., or Unknown	5.3	4.9	5.3	4.1	2.7	5.2
Number of observations (=100 per cent)	15681	8213	22525	931	438	23894

The last category in Table 2.1 ('Introductory courses') needs an explanation. Many Norwegian HE students, especially at universities, start their higher education by entering introductory courses called Examen philosophicum/Examen facultatum. This applies more frequently to students who enrolled previous to the implementation of the Quality Reform of 2003. The reform introduced a new degree structure and grading system, and a quality assurance system in line with the Bologna Process (cf. Ministry of Education and

Research, 2009). As a consequence of this reform the introductory courses were incorporated in the new bachelor programmes. Many students who enter HE by enrolling in this course, are registered with a special code when commencing. The code for this course belongs to the broad field 'humanities' in the Norwegian Standard Classification of Education. To avoid having too many students in the humanities category, students with the code for this course are separated from the rest of the humanities group. Students who are registered with this code as their first study programme but who are registered with a new code the next year, are assigned the new code. Thus, the category 'introductory courses' (etc.) constitutes a 'rest group' that could not be categorized in other fields, together with a group who are registered by Statistics Norway with a code for 'other' (unspecified) study programme.

2.2 Choice of higher education by gender, and immigrant background

A typical gendered pattern in the choice of study is revealed in Table 2.1. See for instance the percentage of males versus females in science and technology, and in nursing and other health and welfare educations. Also between immigrants and ethnic Norwegians large differences exist. Students with non-Western background choose teacher training and other study programmes within pedagogies and education far less frequently than ethnic Norwegians. The same applies to humanities (see Table 2.1). Students with non-Western background also choose bachelor level study programmes within health and welfare less frequently than the ethnic Norwegians. This applies in particular to second generation non-Western immigrants. On the other hand, the non-Western students choose *master* level study programmes within health and welfare more frequently than the ethnic Norwegians; and this applies in particular to the second generation non-Western immigrants. In addition, those with non-Western background enter business and administration, as well as bachelor level study programmes within science and technology (which to a large extent refers to engineering) far more frequently than the ethnic Norwegians.

Some study programmes are commonly viewed as more prestigious than others, and the entry requirements are also higher (see Table 2.2 below). These programmes are marked with an asterisk in Table 2.1, i.e. law; business and economics graduate programmes; science and technology at master level; and master-level study programmes within health and welfare, such as medicine, veterinary science and odontology. Of these types of study programmes non-Western students are clearly over-represented in health and welfare, and the second-generation immigrants are also overrepresented in business and economics graduate programmes. Otherwise, non-Western students are similarly represented with ethnic Norwegians on the most prestigious study programmes.

In total, the non-Western students are over-represented in prestigious study programmes as well as in some of the less prestigious study programmes such as bachelor (or lower) level programmes within business and administration and engineering.

2.3 Grades achieved in upper secondary education and choice of field of study in HE

We have information on grades by the end of the first and second year of upper secondary education for the HE students. This means that we do not have such information regarding the third and final year (the latter information is unsatisfactory). The correlation between grades at the different stages of upper secondary education is, however, high (Støren et al., 2007). Below, we use the information from the second year of upper secondary education. We do not have information on the intake grades on the different programmes for the students in the data set, so the information on grades from the second year of upper secondary school will serve as a proxy for intake grades. The existing official data⁶ on intake requirements are not at individual level and cannot be used in analyses by immigrant background etc. These official data confirm the picture concerning prestige educations etc.

In Table 2.2 the different types of HE educations are ranked low–high by average grades at the end of the second year of upper secondary education among the total group of students. Students with missing information on grades (8 per cent of the total) are excluded. Those who entered business and economics graduate programme, law school, graduate engineering studies and medicine, had the best grades.

Table 2.2 Average grades at the end of the second year of upper secondary, by gender, immigrant background and field and type of study when entering higher education

	Females, total	Males, total	Ethnic Norwegian	First generation	Second generation	Total	N (Total, in each education category)
Pre-school teacher	3.74	3.36	3.72	3.79	3.51	3.72	624
Transport, communications, safety, security, services	4.17	3.88	4.00	3.78	–	3.99	113
Teacher training	4.10	3.77	4.04	3.58	4.10	4.04	904
Business and administration <i>except</i> business and economics graduate programmes	4.17	4.00	4.13	3.68	3.77	4.10	3514
Science and technology, bachelor level	4.39	3.96	4.12	3.95	3.91	4.11	2689
Pedagogies/education, else	4.17	3.98	4.14	3.78	4.08	4.13	737
Nursing and other health and welfare education (bachelor level)	4.21	3.96	4.19	3.95	4.00	4.18	3447
Introductory courses (Examen philos./ Examen fac.,) or unknown	4.26	4.12	4.23	3.74	3.82	4.21	1125
Humanities	4.33	4.14	4.29	4.01	3.93	4.28	2430
Social sciences	4.35	4.15	4.31	4.13	4.20	4.30	3974
Agriculture, forestry, fisheries and aquaculture (primary industries)	4.42	4.14	4.33	–	–	4.32	98
Business and economics graduate (master level)*	4.74	4.47	4.62	4.61	4.24	4.60	264
Law (master level)*	4.65	4.52	4.60	4.76	4.49	4.60	321
Science and technology (graduate engineering), master level*	4.83	4.65	4.72	4.67	4.34	4.71	1163
Medicine and other health and welfare educations, master level*	5.02	4.96	5.11	4.56	4.38	5.00	545
Mean, total in each group	4.29	4.13	4.25	4.00	4.01	4.23	21948

Note: A dash [–] indicates no observations or too few to be reported.

Overall, girls have better grades in upper secondary education (proxy for intake grades) than boys. The difference is small in many of the study programmes, but it is striking that there are no exceptions. In all programmes girls have better grades than boys.

As commented above, the immigrant students are well represented, and to some extent over-represented, in the most prestigious study programmes – that is the programmes with the highest intake score requirements. Still, this does *not* imply that the grades among immigrant students are better than among ethnic Norwegians, as shown in Table 2.2.

The overall trend is that the ethnic Norwegians had better grades in upper secondary education than non-Western immigrant students. However, there are several exceptions: *First* generation immigrants who study *law* have better grades than their ethnic Norwegian

student fellows; *second* generation non-Western students in teacher training have somewhat better grades than their ethnic Norwegian counterparts; *first*-generation immigrant students and ethnic Norwegians in business and economics graduate programmes, as well as in pre-school teacher training, had equivalent grades; and *first*-generation immigrant students and ethnic Norwegians in science and technology master level programmes had practically equivalent grades. Further, the difference in grades is not large in the category ‘science and technology, bachelor level’.

Among the students in medicine and allied fields ethnic Norwegians have better grades than those with non-Western immigrant background. This is related to the distribution of students with regard to narrow and detailed fields within this broad field category. A higher proportion of ethnic Norwegian students than immigrant students within this category (health and welfare, master level) are registered as studying medicine. Together with students of veterinary science (in which field there are practically no immigrants), those who study medicine have best grades. By contrast, immigrants are over-represented in a group coded as ‘unspecified health and welfare master programmes’, a category with lower grades than the average in this broad field (at master level). Most probably, this ‘unspecified’ group largely includes students studying medicine abroad. Studying medicine abroad, where the intake requirements in terms of grades often are less demanding than in the corresponding Norwegian programmes, is quite popular among Norwegian students, both among ethnic Norwegians and first- and second generation immigrants residing in Norway. Students studying abroad are registered as HE students in our data set, but we have no information in this data set on the location of the higher education institution. Further, Statistics Norway does not have the same information on these students as for students in Norwegian higher education institutions concerning narrow or detailed fields of study. Thus, our conclusion is that the main reason why grades from upper secondary school are lower for immigrant students than for ethnic Norwegians in the category ‘medicine and other health and welfare education, master level’ – is that the immigrant students in this category often are studying medicine abroad.

2.4 Choice of study – results of multinomial regression analysis

Grades achieved in upper secondary education serve an indicator of the individual’s academic ability and is probably an important predictor of persistence and completion of HE. This is one reason for the focus above on grades. On the other hand, grades interact with choice of study and ambitions. Choice of study may be seen as intermediary variables concerning persistence. Below, analysis of variables regarded as important for the distribution of the students on different types of HE (i.e. the students’ choices), is presented. The analysis is undertaken using of multinomial logistic regression, where the dependent variable may have several outcomes. The higher number of outcomes, the more difficult it will be to comprehend the results. Thus, the number of possible outcomes is restricted to five; that means that we have aggregated many of the 15 possible outcomes shown in Tables 2.1 and 2.2.

We are particularly interested in the probability of choosing the most prestigious educations (elite educations). These are the four last-mentioned categories in Table 2.2. They constitute the first outcome on the new dependent variable.

Secondly; we are also particularly interested in types of study where the immigrants constitute a very small group and are *under*-represented, such as teacher training and pedagogies. These educations constitute the second outcome on the dependent variable. Another reason for focusing on teacher training is that the recruitment to teacher training in general – and among ethnic minorities in particular – is of great concern to the political educational authorities.

Thirdly, we are particularly interested in study programmes where the immigrants make up a large group and are *over*-represented, such as science and technology at bachelor level. This constitutes the *third* outcome.

Business and administration is also a field where the immigrants are over-represented. This field (at bachelor level) *excluding* business and economics graduate programmes (which are included in the first category, that is the elite educations) constitutes the *forth* outcome.

Finally, we have a rest category – that is all the fields that do not fit the above-mentioned criteria (social sciences, humanities etc.). The ‘rest’ constitutes the fifth category, and is a heterogeneous group. However, the number of outcomes on the dependent variable would be excessive if this group is split up further.

In the analysis presented in Table 2.3 the probability of each of the four first-mentioned outcomes is estimated in relation to the last (the fifth) outcome. The results of multinomial regression analyses are not intuitively comprehensible, but in the Figures 2.1 – 2.3 below, the results of the analyses in Table 2.3 will be exemplified and illustrated.

Table 2.3 includes two different analyses, one for non-Western students, and one for ethnic Norwegians. The reason is that we want to examine the extent to which the effects of grades, gender and social background measured as parental education level vary between the groups. The difference by immigrant status, based on the two regression analyses, is illustrated in the graphs below.

Table 2.3 Multinomial logistic regression predicting choice of type of study. Separate analyses for the non-Western immigrants⁽ⁱ⁾ and the ethnic Norwegians⁽ⁱⁱ⁾

	Non-Western		Ethnic Norwegians	
	B	S. E.	B	S. E.
Prestigious (elite) versus "rest"				
Intercept	-5.057	0.663	-9.176	0.240
Non-Western, 1. generation ⁽ⁱ⁾	-0.883	0.195		
Female(=1, else 0)	-1.402	0.193	-1.522	0.054
Average grades, second year of upper secondary	1.353	0.152	1.820	0.053
Mother unknown education level (or no education)	-0.321	0.279	-0.810	0.765
Father unknown education level (or no education)	-0.429	0.268	-0.367	0.354
Mother higher education	0.092	0.226	0.037	0.058
Father higher education	0.120	0.225	0.457	0.058
Teacher training etc. versus "rest"				
Intercept	0.107	0.858	1.079	0.161
Non-Western, 1. generation	-0.136	0.307		
Female(=1, else 0)	0.745	0.384	0.602	0.064
Average grades, second year of upper secondary	-0.656	0.212	-0.707	0.040
Mother unknown education level (or no education)	0.335	0.358	0.041	0.463
Father unknown education level (or no education)	-0.734	0.386	-0.710	0.311
Mother higher education	0.375	0.370	-0.290	0.056
Father higher education	-0.644	0.399	-0.360	0.056
Science and technology, bachelor level versus "rest"				
Intercept	0.407	0.529	-0.036	0.161
Non-Western, 1. generation	-0.378	0.191		
Female(=1, else 0)	-2.008	0.181	-1.838	0.050
Average grades, second year of upper secondary	0.089	0.129	-0.076	0.040
Mother unknown education level (or no education)	0.082	0.223	0.542	0.400
Father unknown education level (or no education)	-0.108	0.218	-0.438	0.289
Mother higher education	0.054	0.234	-0.241	0.053
Father higher education	-0.582	0.247	0.016	0.052
Business and administration, lower level, versus "rest"				
Intercept	2.641	0.483	0.332	0.141
Non-Western, 1. generation	-0.502	0.174		
Female(=1, else 0)	-0.895	0.168	-0.988	0.043
Average grades, second year of upper secondary	-0.550	0.121	-0.161	0.035
Mother unknown education level (or no education)	-0.141	0.211	-0.216	0.433
Father unknown education level (or no education)	-0.141	0.209	-0.039	0.212
Mother higher education	-0.451	0.230	-0.419	0.047
Father higher education	-0.008	0.211	-0.122	0.046
Nagelkerke R-Square	0.295		0.241	
Number of observations	1257		20691	

(i) Second-generation immigrants are the reference group in the regression analyses of the non-Western immigrants

(ii) Coefficients in bold type are significant at level $p < 0.05$. Coefficients in bold type and in italics are significant at level $p < 0.10$.

Parental education level is divided into three groups:

- a) None or unknown education (mother and father respectively). This category is chosen because information on parental education is lacking for a large part of the immigrant students (see Table A.1).
- b) Low or medium education level. This category serves as the reference group in the regression.
- c) Higher education (mother and father respectively).

The results of Table 2.3 show that the effect of gender is quite similar in the ethnic Norwegian and in the non-Western groups. The effects of grades differ somewhat more between the groups. For instance, the positive effect of grades is larger among ethnic Norwegians than for the non-Western immigrants with regard to the probability of enrolling into the elite educations. Conversely, the negative effect of grades on the probability of being enrolled into business and administration, lower level programmes, are larger for non-Western immigrants than for ethnic Norwegians. Negative effect of grades implies that the better the grades, the lesser is the probability of enrolling in this type of study relative to other types of study programmes.

The effects of parents' educational level also differ between non-Western immigrants and ethnic Norwegians. These effects vary un-systemically and some of the effects of parental education level for the immigrant group are not significant although the coefficient is high because of high standard errors, due to a restricted number of observations.

All the effects (of e.g. mother or father having higher education) on the four outcomes must be assessed in relation to the probability of choosing the rest (fifth) category of study programmes. This implies, for example, that an ethnic Norwegian student with a highly educated father chooses an elite education rather than choosing a study programmes in the "rest" group far more frequently than if he/she had a lower-educated father. A corresponding effect is *not* found among the immigrants. Further, an ethnic Norwegian student with highly educated parents (especially where the mother is highly educated) prefers business and administration to the study programmes in the "rest" group less frequently than if he/she had a lower educated parents. Here, the tendency is the same among the immigrants.

Among the ethnic Norwegians there is a negative effect of high parental education level on the tendency to choose teacher training (relative to the choice of study programmes in the rest-group), but this is not found among the immigrants. Overall, the effects of parental education level on the choice of study programme are larger among ethnic Norwegians than among immigrants. We remind that it is after control for grades achieved in upper secondary education. The results are more clearly seen in Figures 2.1 – 2.3.⁷

2.4.1 Differences by gender and immigrant background

Figure 2.1 shows differences by gender and immigrant background when grades and parental education level are kept constant. Both females of non-Western origin and ethnic Norwegian females choose the elite educations less frequently than males. The (relative) gender difference is, however, largest among the ethnic Norwegians.

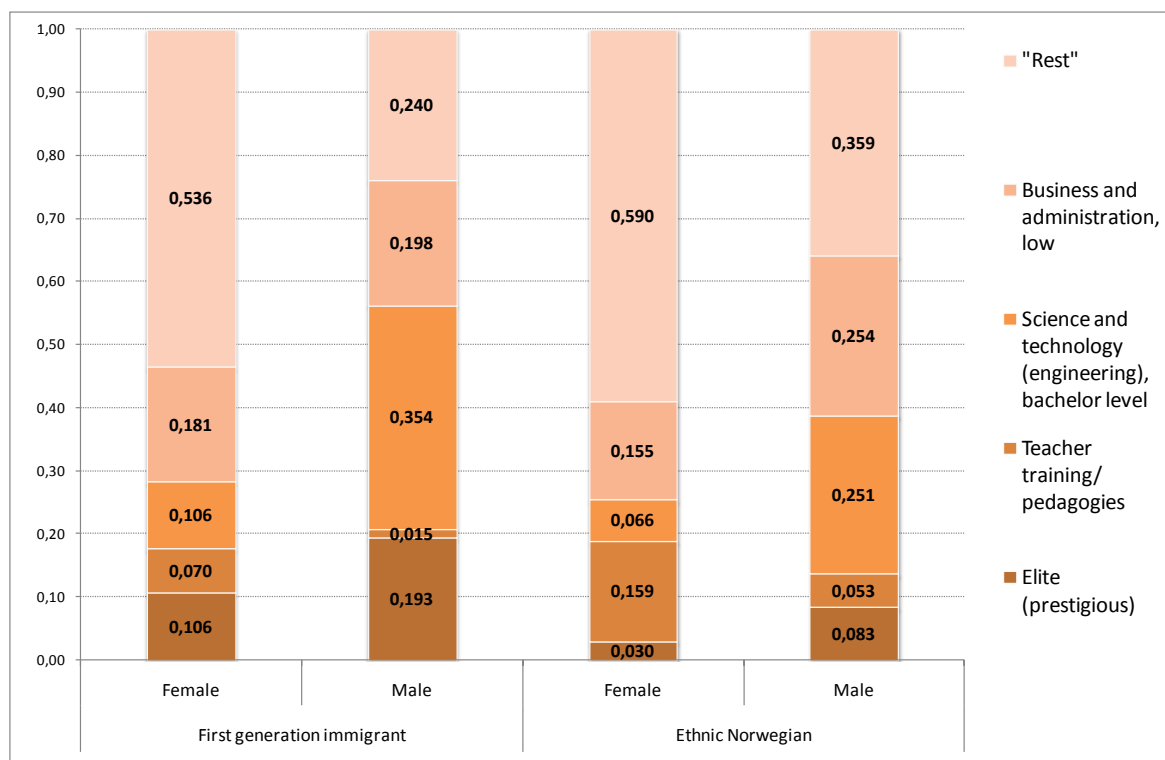


Figure 2.1 Choice of study by gender and immigrant background. Estimated probabilities*

* Based on Table 2.3. The reference person for the estimates has average grades and both his/her parents have low/medium education level.

The gender difference concerning the choice of elite education must be interpreted in *relative terms*, that is, in relation to the choice of *other* types of studies, within the male and female student population. Because more females than males enter higher education, females are not in a minority in absolute numbers on the elite educations grouped together. The actual distribution is 50–50. In absolute figures females are in the majority in law and medicine, but not in science and technology (where they represent a minority), and neither in business and economic graduate studies (where the female percentage is 48 per cent). But *among* the female students, there is a clear weaker tendency to choose elite educations than among the male students. This is clearly illustrated in Figure 2.1.

The broad 'rest' category includes humanities, social science as well as health and welfare bachelor education. This category is clearly female dominated, both among immigrants and ethnic Norwegian students. Here, the gender difference is largest among immigrants.

Teacher training and pedagogy is also female dominated in both groups, but is rather unpopular among the immigrants. Engineering (included in science and technology,

bachelor level), is very popular among male immigrants, and although it seems to be more popular among female immigrants than among female ethnic Norwegians, the gender difference for this type of study is even higher among immigrants than among ethnic Norwegians.

We find the opposite tendency regarding the choice of business and administration (bachelor level). Here, the gender difference is largest among ethnic Norwegians. Controlled for grades, in Figure 2.1 when grades are assigned average values, male ethnic Norwegians choose this kind of study more frequently than first-generation immigrant males. Among females there is a smaller difference, in this case in favour of immigrants, concerning the proportions that choose business and administration.

Thus, the initial finding (see Table 2.1) of the immigrants' stronger tendency to choose business and administration is associated with the fact that a large group of immigrants with poor grades choose this type of study programme quite frequently. When we assign average grades to the reference group, more male ethnic Norwegians than male immigrants choose business and administration (bachelor level).

Secondly, the initial finding (see Table 2.1) of the immigrants' tendency to choose business and administration more frequently than the ethnic Norwegians is associated with the fact that female immigrants choose this type of education more often than the female Norwegians.

The effect of grades is discussed further below, and is seen more clearly in Figure 2.2.

2.4.2 The effect of grades

Figure 2.2 illustrates that the tendency to choose the broad 'rest'-category does not vary much according to grades, neither among immigrants nor among ethnic Norwegians. The probability of choosing business and administration (we remind: *except* business and economics graduate programmes; 'siviløkonomi' in Norwegian) declines with improving grades. This tendency is much stronger among immigrants than among ethnic Norwegians. Further, Figure 2.2 shows that the choice of elite educations is more common among first-generation immigrants than ethnic Norwegians (and even more widespread among second-generation immigrants, as will be illustrated later).

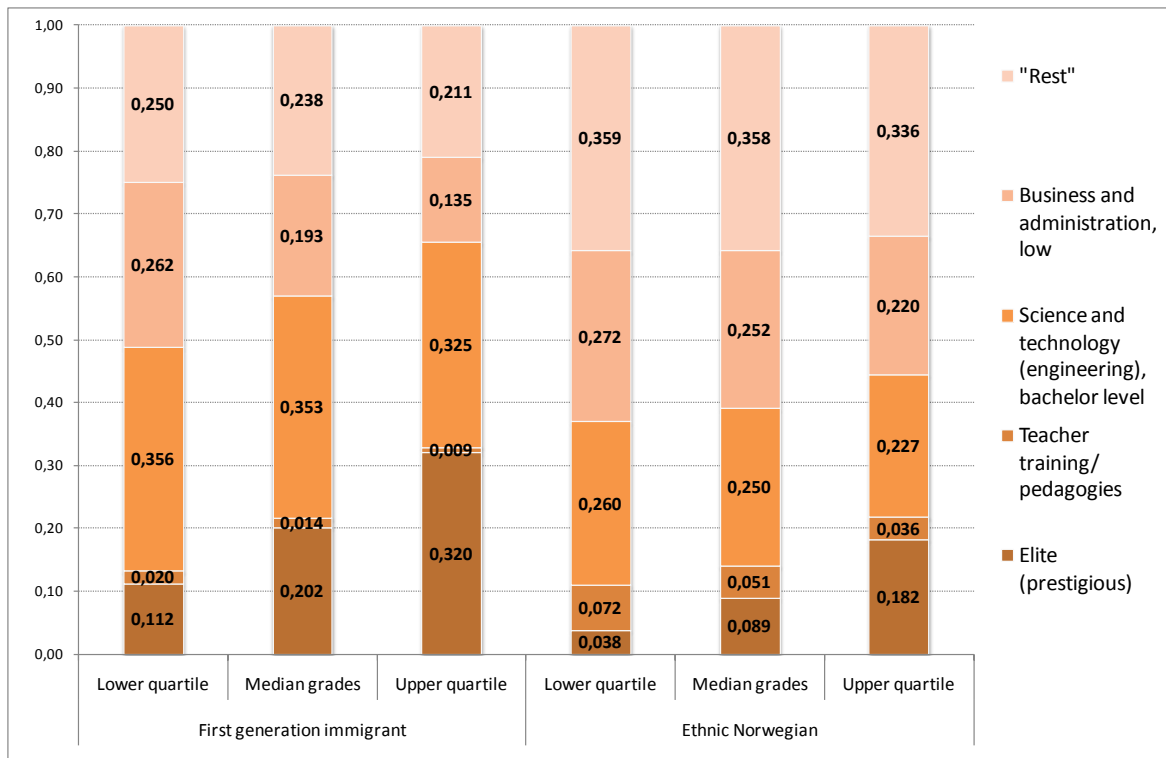


Figure 2.2 Choice of study by grades and immigrant background. Estimated probabilities*

* Based on Table 2.3. The reference person for the estimates is a male and both his parents have low/medium education level.

The probability of being enrolled into engineering/science and technology, lower level, tends to decrease with improving grades in both groups, but the effect is rather small. Figure 2.2 also shows that within each grades level, the immigrants choose this type of study more frequently than the ethnic Norwegians.

It is also a clear tendency that the probability of choosing teacher training decreases with decreasing grades. However, this is not seen very clearly in Figure 2.2 because the reference case for the estimates is a male who seldomly chooses teacher training.

What is very clear, is that the probability of being enrolled into an elite education increases with improving grades in both groups. Equally striking is that within each layer of grades, immigrants choose such type of educations far more frequently than ethnic Norwegians. Also, the probability to choose business and administration, lower level, decrease a lot with improving grades, and this applies primarily to immigrant students. This can indicate that many immigrants aspire to taking a business and economics graduate programme, but when the grades are not good enough, they embark on business and administration study programmes at bachelor (or lower) level as the second best choice.

2.4.3 The effects of parental education level

Figure 2.3 illustrates the effects of parental education level and it also shows the very strong tendency among immigrant students, particularly *second-generation immigrants*, to choose the most prestigious educations, regardless of parental education level.

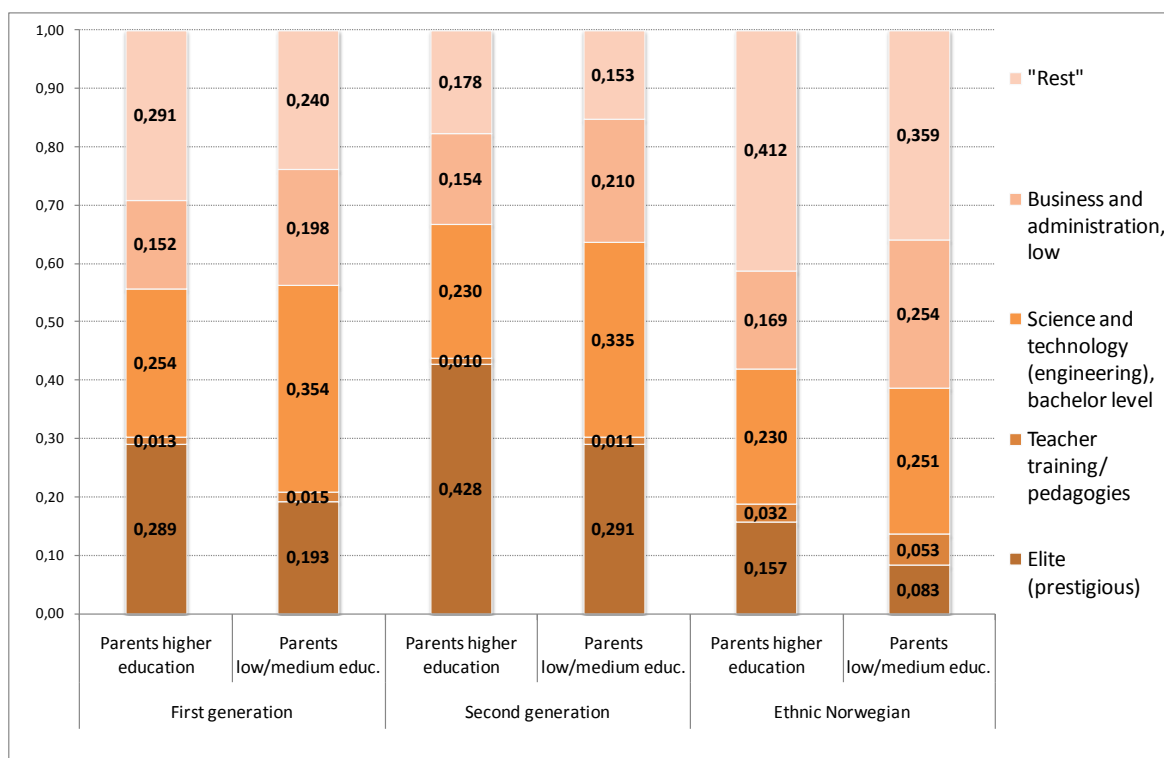


Figure 2.3. Choice of study by parental education level and immigrant background. Estimated probabilities*

* Based on Table 2.3. The reference person for the estimates is a male with average grades.

The graph illustrates that the tendency to choose elite educations increases with higher parental education level, both among immigrants and ethnic Norwegians. Although the percentage choosing an elite education is higher among immigrants with highly educated parents than among ethnic Norwegians with highly educated parents, the effect of parental education level is highest among ethnic Norwegians.

The probability of choosing teacher training as well as business and administration decreases with increasing parental education level. Further, among ethnic Norwegians there is no clear effect of parental education level concerning the choice of engineering/science and technology (lower level) relative to choosing other types of study, whereas among immigrant groups there is a clear negative effect of having highly educated parents on this choice (relative to choosing other types of HE).

2.5 Summary – choice of field and type of study

Returning to the research questions on choice of study in Chapter 1.3, these can be summarized:

- 1) High parental educational level increases the tendency to enter the most prestigious study programmes, also when controlling for grades in upper secondary education. The probability of choosing teacher training, as well as business and administration decreases with increasing parental education level.
- 2) Students with non-Western immigrant background choose medicine/odontology and science and technology/engineering more frequently than ethnic Norwegians, and teacher training rather infrequently.
- 3) Students with non-Western immigrant background choose the prestigious study programme much more frequently than ethnic Norwegians. These results are evident also when controlling for grades.
- 4) The effects of parental education on the choice of study programmes are stronger among ethnic Norwegians than among immigrants.
- 5) The probability of entering the most prestigious study programmes increases considerably with improving grades, and the probability of entering teacher training and business and administration decreases with improving grades. The different pattern in study choice between immigrants and ethnic Norwegians does not seem to be notably influenced by differences in grades achieved in upper secondary education, with one exception: the high proportion of immigrants on business and administration seem to be connected with low entry grades. Concurrently, within each layer of grades, immigrants choose elite educations far more often than ethnic Norwegians.
- 6) There are large gender differences in the choice of type of study, also when controlling for parental education level, immigrant background, and grades. The choice of prestigious study programmes (relative to the choice of other programmes) occurs less frequently among females than males, and girls choose teacher training and social sciences more frequently than boys.
- 7) The gender differences concerning the choices of type of study programmes tend to be the same among immigrants and ethnic Norwegians.

In the introduction reference was made to studies indicating that immigrant students have higher aspirations than the majority students. This is confirmed in the analyses above. In general the immigrants emerge as more ambitious than the ethnic Norwegian students, but this is manifest in two different ways:

- Immigrant youth choose prestige programmes more frequently than ethnic Norwegians, in most cases with equivalent grades as ethnic Norwegians, and if this is not the case, they go abroad to study medicine.
- They enrol into higher education in the less prestigious study programmes with somewhat poorer grades than ethnic Norwegians indicating high motivation to take a higher education course.

One interesting aspect is whether their ambitions and motivation results in high persistence. This will be the topic of the next chapter.

3 Completion, persistence and study efficiency

The data allow us to examine persistence and completion in two ways; a) the attained academic level within 2008; b) the number of credit points achieved. Information on the attained academic level is used as a measure for completion, and the number of credit points as a measure of study efficiency. Both measures are here regarded as indicators of ‘persistence’.

The number of credit points refers to the exams that are passed during a specific period. Sixty credit points is equivalent to one year of full-time studies, or 60 ECTS (European Credit Transfer System). The number of credit points achieved *per year* is used as an indicator of study efficiency. The latter makes it possible to include all the students in multivariate analyses, see the section ‘study efficiency’ below. But, concerning completion, we have to separate the students according to the degree levels of the study programmes they have embarked upon.

3.1 Completion rates

The attained educational level (completion) is examined separately for those who have enrolled into study programmes at master level, and those who have not. When examining persistence in terms of attained educational level, account is taken of the fact that it is a great variety among students regarding their aspirations. Many of the students have entered a vocationally oriented bachelor programme with a clear destination, and most of them do not aspire to a master’s degree. In addition, many students on generic bachelor programmes have not enrolled into a (possible) subsequent two years master programme, and may have had no aspirations for doing so. Thus, most of the students in our data set have not started on a master level programme (see the number of observations in Tables 2 and 3), at least not in the course of the observation period.

When examining the completion rate it has been necessary to combine information on the attained academic level with information on the total sum of achieved credit points, because the available information on the attained academic level is insufficient. According to the Norwegian Standard Classification of Education, level 6 to level 8 programmes classify as higher education, of which level 8 is PhD level; level 7 is master level (or higher, but below PhD level); and level 6 refers to bachelor level *and all other HE courses and programmes below master level*. This implies that among persons who have a level 6 code for the attained level, the educational level vary widely, from having achieved 30 points to having achieved more than 300 credit points. The reason why some students at education level 6 may have more than 300 credit points without having a master’s degree is that many students change subject field, or take extra subjects, at the same education level. The main point here is the aim to single out those at level 6 who had achieved a bachelor degree, or equivalent, and those who have not. This is done partly by identifying all the students with a defined bachelor degree, and by finding students with ambiguous

codes at level 6 who had achieved at least 180 credit points during the observations period. This group of students is labelled ‘bachelor degree/180 points or more’ in Table 2 below. In addition, we have made a separate category for having completed teacher training, because this is a four years study programmes (240 credit points); however, below master level.

When examining completion rates, we also take into account that some of the students in our data set entered HE in 2002, and the major part in 2003. Tables 2 and 3 give an overview of the completion rate by September 2008 for each cohort. Table 2 includes only persons who had *not* entered a master programme during the period 2002/2003–2007. The chances that they have completed a three-years bachelor programme, or a four-years teacher training programme, should have been quite good. For the sake of simplicity field of study is not taken into account and which *may* have changed during the period 2002/2003–2008.

Table 3.1 Completion rates among students who have not entered a master programme

	Entered HE in 2002				Entered HE in 2003			
	Less than 180 credit points	Bachelor degree/ 180 points or more	Completed teacher training (240 credit points or more)	Number of observations (=100%)	Less than 180 credit points	Bachelor degree/ 180 points or more	Completed teacher training (240 credit points or more)	Number of observations (=100%)
Male	48.1	48.1	3.8	956	47.6	49.5	3.0	3170
Female	22.8	68.9	8.2	3139	26.9	66.9	6.3	6905
Ethnic								
Norwegian	27.9	64.6	7.5	3861	32.6	61.9	5.5	9589
1. generation, non-Western	41.0	57.9	1.1	178	49.2	49.8	0.9	331
2. generation, non-Western	46.4	50.0	3.6	56	44.5	55.5	0.0	155
Total	28.7	64.1	7.2	4095	33.4	61.4	5.2	10075

* Students for whom we lack reliable information on credit points or achieved degrees are excluded from the analyses in Tables 3.1 – 3.5.

Of those in the group of students covered in Table 3.1 and who entered HE in 2002, 29 per cent have *not* completed a bachelor programme or attained 180 credit points during the six-years period. This group may be called the non-completion group, although some persons in this group may not have had the intention to complete more than 1–2 years. Non-Western immigrants are highly over-represented in the non-completion group, as are male students relative to female students. The proportion that has not completed is somewhat higher among those who started one year later (in 2003); yet, the difference is quite small. Among male students there is practically no difference between the two cohorts. The small differences between the two cohorts indicate that one year extra does not increase the chance of completion very much for this group of students, with an exception for the first-generation non-Western immigrants.

Table 3.2 shows the completion rates by September 2008 among those who have enrolled into a *master* programme. This category of students include those who have started on a five–six years master programme when they entered HE (indicated with an asterisk in Table 2.1), and students who have started on a two years master programme (during the 2003–2007 period) after the completion of a bachelor programme.

Table 3.2. Completion rates among students who have started on a master programme.

	Entered HE in 2002			Entered HE in 2003		
	Less than 300 credit points	Completed master level (300 points) or more	Number of observations (=100%)	Less than 300 credit points	Completed master level (300 points) or more	Number of observations (=100%)
Males	42.4	57.6	865	64.7	35.3	2193
Females	43.5	56.5	1772	71.0	29.0	2540
Ethnic Norwegian	43.7	56.3	2422	67.6	32.4	4459
1. generation, non-Western	37.2	62.8	129	76.0	24.0	183
2. generation, non-Western	37.2	62.8	86	73.6	26.4	91
Total	43.2	56.8	2637	68.1	31.9	4733

For this group (master level students), one year extra adds much to the chance of completion. For the 2002-cohort, the total observation period lasts for six years, and for the 2003-cohort only five years. In the latter group only 32 per cent had attained the degree. This must also be viewed in the light of the fact that a few programmes, for instance in medicine (cand.med. degree) lasts for 6 years. Of the 2002-cohort, 57 per cent had attained the degree. What is interesting is that among the master students, the non-Western immigrants have the *highest* completion rate. This refers to the 2002-cohort. If the students do not have one year extra, the tendency is that the completion rate is somewhat lower among the non-Western immigrants. Further, we see minor gender differences in the completion rate among the master students.

3.1.1 Business and economics graduates and the Quality Reform of 2003

One reservation has to be taken concerning the completion rate for the master students who embarked on HE in 2002 – the completion rate should possibly be increased from 56.8 to 57.7 per cent in this group, in other words just a small increase. This concerns students on the study programme business and economics graduate ('siviløkonomi'). The duration of this study programme changed after the implementation of the 'Quality Reform' in Norwegian HE in 2003. As mentioned in Chapter 2, the reform introduced (among other things) a new degree structure.⁸ One of the consequences was that the duration of the business and economics graduate programme was increased from a four-years programme to a five-years master programme. We have treated all the students who have enrolled into this programme as master students. Some of those who started in 2002 may not have had the intention to take a (300 credit points) master programme. The underlying data shows that of those who entered the business and economics graduate programme in 2002, a few have, according to our data, completed the four years programme (240 credit points). Here, they are not considered as having completed a master degree. This group of students

constitute only 0.9 per cent of all the 2637 persons who embarked upon HE in 2002 and who have been registered on what is defined as a HE master programme covered in Table 3.2. They make up higher proportions of the first- and second-generation immigrants; 1.6 and 1.2 per cent respectively. This implies that the difference in favour of those with immigrant background is about 1 per cent more than what is depicted in Table 3.2 (for the 2002-cohort).

This reservation does not affect our analyses in the section below concerning study efficiency, because we employ here the indicator ‘credit points per year’. The group of students on business and economics graduate programme have relatively high study efficiency, but they have quite low completion rates. Only to a very small extent is this due to the problem mentioned above concerning how to measure those who started in 2002 on the four years study programme within this field. We assume that the low completion rate among the business and economic graduate students has two reasons: 1) The labour market in Norway was in a boost in 2007 and the first half of 2008, and it was very easy for the business and economics graduate students to get a job, even if they had not finished their final exams/master thesis. 2) Some of those who left this study programme because of job offers without having completed their master thesis, complete, or plan to complete, their thesis while having employment, and – probably – many of these theses were not completed in 2008, that is within our observation period.

3.1.2 “Dropouts”?

Those who have *not* completed master’s degree (Table 3.2), or a bachelor degree or equivalent (Table 3.1) are not necessarily ‘dropouts’. Some are, but others have simply low study progression. About 40 per cent of them are still registered in HE in October 2008, and others will probably return to education later.

Some examples may illustrate this. The total sum of achieved credit points among those who have *not* completed a master’s degree in Table 3.2 varies widely. The median credit points in this group is 235; 16 per cent have achieved less than 180 credit points, and 25 per cent have more than 265 credit points (only 1 per cent have 300 points or more without being registered with a master’s degree). If we narrow the group and look at students who have been registered on a master programme and who *were not registered as students in 2008*, and who have not completed master’s degree, most of them (77 per cent) had achieved at least 180 credit points. This group can be labelled ‘non-completers’ in relation to the attainment of a master degree, but they have achieved a bachelor’s degree (or equivalent).

The following group may be defined as non-completers:

1. The students covered in Table 3.2 (master students) who are *not* registered in HE in October 2008 *and* who have *not* completed master’s degree
2. The students covered in Table 3.1 (bachelor students) who are *not* registered in HE in October 2008 *and* who have *not* completed a bachelor degree or equivalent.

These persons constitute an interesting group because belonging to this group does not seem to be coincidental. See Table 3.3.

Table 3.3. Not completed the destined degree, and not registered in higher education in October 2008, by gender, immigrant background and parental education level. Per cent of all persons in each group.

	Males	Females	Total
Ethnic Norwegian	22.9	13.2	16.4 (N=20331)
1. generation, non-Western	28.8	16.8	21.3 (N=821)
2. generation, non-Western	17.8	16.4	17.0 (N=388)
Mother lower than higher education	27.4	15.1	18.8 (N=13045)
Mother higher education	17.7	10.4	13.1 (N=8495)
Father lower than higher education	28.4	14.7	18.8 (N=12723)
Father higher education	17.2	11.0	13.4 (N=8817)
	23.1	13.3	16.6 (N=21540)
Total	(N=7184)	(N=14356)	

Those who are over-represented among the non-completers are:

- males relative to females, this refers to both ethnic Norwegians and first-generation immigrants
- students whose parents do not have higher education, especially among males
- first-generation non-Western immigrants, especially male students in this group.

Parental education level is less important among females than males, and this applies to both mother's and father's education level. Further, second-generation non-Western immigrants are *not* overrepresented among the non-completers relative to ethnic Norwegians when we look at male and female students together. If we compare male ethnic Norwegian students with male second-generation students, the highest dropout rate is found in the former group, whereas the tendency is opposite among the females.

In the next section persistence is examined using of multivariate techniques. Account is taken of variables for fields and type of study, as well as individual background characteristics.

3.2 Study efficiency

The completion rates depicted above indicate a great variety concerning study efficiency. Below, persistence is measured as the sum of achieved credit points *per year*. This is a better indicator when multivariate techniques are used than the completion rates described above, because of the uncertainty concerning the students' ambitions and aspirations, and because of the uncertainties mentioned above with regard to the students on business and economics graduate programme. More important; the use of an indicator for study efficiency per year, makes it possible to include the total student cohorts, and not separate between bachelor students and master students, and not between the 2002 and the 2003-cohorts.

Information on the total sum of credit points attained by September 2008,⁹ and information on whether or not the student was registered as a student in October each year, is available. The total sum of credit points is divided by the number of years the person has been registered as a student (we do not have exact information on the number of credit points attained each year, only the total sum by September 2008). The last year included in the equation is 2007, that is the academic year 2007–2008.

The measure is not exact although is the best measure available (at least for the time being). We assume that the extent to which it is not exact, will not vary systematically between the groups. There are several reasons why the measure is not exact. Some students may have been studying in the autumn term but not in the spring term. Some students may have been at home caring for children/having maternity leave etc. but simultaneously registered as students. This will influence the possible differences between male and female students, however, we have the possibility of controlling for childbirth. ‘Having children’ is included in the regression analysis below.

Some students may have been part-time students, at least temporarily, yet others repeat their exams in order to improve their grades and thus spend more than one year on taking exams that equate to 60 points. There are thus several reasons why the average number of credit points per year will be less than 60 points in addition to the important reason connected to academic failure. Some students do not pass all their exams.

Keeping the reservations concerning part-time studies and other factors in mind, it is interesting to note that the number of credit points per year differs according to fields and type of study programme, as well as by gender and immigrant background. See Table 3.4.

Table 3.4 Number of credit points per year by immigrant background, gender, field of study when entering HE, and whether a master level study programme has been attended during the observation period. *The total number of observations in each group in parentheses.**

	Registered in master level studies		Total, both levels
	No	Yes	
Ethnic Norwegians	45.3 (13450)	51.0 (6881)	47.2 (20331)
First-generation immigrants	38.6 (509)	48.9 (312)	42.5 (821)
Second-generation immigrants	40.5 (211)	51.3 (177)	45.0 (388)
Females	47.1 (10044)	51.0 (4312)	48.2 (14356)
Males	40.0 (4126)	50.9 (3058)	44.6 (7184)
Field of study:			
Humanities	42.7 (1661)	51.2 (667)	45.1 (2328)
Teacher training	49.6 (852)	57.3 (39)	49.9 (891)
Pre-school teacher training	49.8 (592)	54.2 (19)	49.9 (611)
Pedagogies/education, else	47.3 (545)	49.9 (181)	48.0 (726)
Social sciences	42.4 (2360)	49.6 (1578)	45.3 (3938)
Law		47.5 (350)	47.5 (350)
Business and economics graduate, 5 years master programme		50.5 (270)	50.5 (270)
Business and administration, other	42.7 (2612)	51.6 (984)	45.1 (3596)
Science and technology, bachelor programme	39.9 (1530)	51.4 (1049)	44.6 (2579)
Science and technology (graduate engineering), 5 years master programme		52.5 (1038)	52.5 (1038)
Nursing and other health and welfare education (bachelor programme)	52.1 (3129)	52.4 (321)	52.2 (3450)
Medicine and other health and welfare educations, 5–6 years master programmes		53.1 (482)	53.1 (482)
Agriculture, forestry, fisheries and aquaculture	46.7 (45)	54.7 (53)	51.0 (98)
Transport, communications, safety, security, and services	43.7 (84)	55.5 (20)	46.0 (104)
Introductory courses (Examen philosophicum/Examen facultatum) or unknown	36.5 (760)	46.7 (319)	39.5 (1079)
Total	45.0 (14170)	50.9 (7370)	47.0 (21540)

* Students for whom we lack reliable information on credit points are excluded from the analysis.

Students who commenced on a master level programme (either immediately after upper secondary education on a five years master study programme, or proceeding from a bachelor degree during the period) achieve more credit points per year than those who have not, something which probably reflects both higher study motivation and greater academic ability in the first-mentioned group. An assumption concerning the ‘ability component’ is to some extent confirmed by information on grades from upper secondary education. In the first mentioned group (those who have started on master level programmes) the average grades in upper secondary education is 4.6, versus 4.1 in the other group. Table 3.4 also shows that there is a difference between immigrants and ethnic Norwegians in favour of the latter among those who have *not* started on a master level programme. Still, among those who *have* started on a master programme there are no or minor differences by immigrant background in study efficiency measured as credit pints per year.

The number of achieved credit points also differs between fields and type of study, but this finding does not necessarily reflect the differences in grades from upper secondary education between the students on the different HE study programme. Student nurses, who have mediocre grades in upper secondary, produce a high number of credit points per year. Conversely, law students, who have good grades from upper secondary (Støren, 2009), produce less credit points than the average master programme students. The reason for the latter is probably that many of the law school students repeat their exams in order to improve their grades. The grades from law school is commonly viewed as a stronger predictor for career opportunities in the Norwegian labour market than what is the case for other type of HE study programmes, something which is also confirmed in labour market graduate surveys (Arnesen and Try, 2001).

3.2.1 Results of regression analyses

The next step is to see whether the achieved credit points vary by immigrant background, gender and social background, when controlling for other variables. This is examined in Table 6 with the use of linear regression (OLS) model. The effects of the different independent variables are shown in four different models. Model 1 includes only demographic variables. The next models show to what extent the effects of gender, immigrant background and social background are affected when controls for fields and type of study programme and grades achieved in upper secondary education are included in the model.

Mean values of the independent variables used in Table 3.5 are shown in the Appendix (Table A.1). With regard to the variables for field and type of study, we have used dummy-variables for broad fields in the regression rather than dummy-variables for the more detailed categorization used in Tables 2.1 and 3.4, because control for *level* (type of study) is included in the regression.

Table 3.5. Linear regression predicting average credit points per year.^a

	Model 1		Model 2		Model 3		Model 4	
	B	S. E.	B	S. E.	B	S. E.	B	S. E.
Constant	38.556	3.691	34.749	3.717	31.055	3.619	24.171	3.587
Age when starting HE	0.324	0.189	0.426	0.190	0.441	0.183	0.835	0.181
Female(=1, else 0)	3.800	0.226	5.633	0.324	4.862	0.326	4.023	0.322
Have children	-2.578	1.696	-1.986	1.694	-1.366	1.620	-1.416	1.596
Female * have children	-4.192	1.876	-4.782	1.874	-5.273	1.792	-4.803	1.765
Non-Western, 1. generation	-4.561	0.544	-3.412	0.613	-5.391	0.724	-4.063	0.715
Non-Western, 2. generation	-1.503	0.783	-0.628	0.800	-3.406	1.028	-2.364	1.013
Mother unknown education level (or no education)			-2.048	1.006	-2.000	0.963	-2.054	0.948
Father unknown education level (or no education)			-1.118	0.839	-0.498	0.803	-0.615	0.791
Mother higher education			1.387	0.399	0.901	0.383	0.371	0.378
Father higher education			2.437	0.398	1.507	0.382	1.226	0.377
Female* Mother higher educ.			-1.470	0.492	-1.276	0.471	-1.253	0.464
Female* Father higher educ.			-2.403	0.490	-1.683	0.469	-1.730	0.462
Pedagogies/education ^b					5.161	0.438	6.059	0.433
Social sciences and law					-0.911	0.378	-0.791	0.372
Business and administration					0.942	0.387	1.398	0.382
Science and technology					1.009	0.402	1.163	0.396
Medicine, health and welfare					7.412	0.386	7.216	0.380
Agriculture, forestry, fisheries and aquaculture					4.481	1.506	4.565	1.483
Transport, communications, safety, security, services					2.878	1.463	3.308	1.441
Introductory courses (Examen philos./ Examen fac.) or unknown ^c					-5.444	0.540	-5.172	0.532
Master programme (1, else 0)					7.263	0.234	5.440	0.241
Non-Western, 1. generation *master programme					3.557	1.075	2.547	1.059
Non-Western, 2. generation *master programme					3.189	1.504	3.128	1.481
Average grades, second year of upper secondary (0-6)							4.630	0.180
Have information on grades (1, else 0)							-19.102	0.854
Adjusted R ²	0.019		0.023		0.107		0.134	
Number of observations	21540		21540		21540		21540	

^a Coefficients in bold type are significant at level $p < 0.05$. Coefficients in bold type and in italics are significant at level $p < 0.10$.

^b Fields of study refer to field of study when enrolling into higher education. 'Humanities' serves as the reference category in the regression.

^c This category constitutes a rest group that could not be categorized in other fields,¹⁰ together with a group who are registered by Statistics Norway with a code for 'other' (unspecified) study programme.

Model 1 shows negative effects of having non-Western origin. This effect is much larger for first-generation than for second-generation immigrants. The difference may be understood as an effect of poorer language proficiency and possibly lesser amount of relevant social capital due to the fact that their families have resided shorter time in

Norway. Another finding is that female students *who do not have children*¹¹ have greater study efficiency than male students.

Model 2 includes control for parental education level. As mentioned in the introductory part, the effects of parental education are found primarily in the earlier stages in the youth's educational career (concerning choice of type of programme in upper secondary education and completion of upper secondary education), and not regarding *enrolment* into higher education among those who have completed the academic track of upper secondary. However, in Model 2 parental education level has an effect on study efficiency. The effect of parental education level applies mainly to the males. Interaction terms of gender and having highly educated mother or father, are included in Models 2, 3 and 4, since the result of Table 3.3 gave reason to expect that the effects of these variables are different among female and male students. The results of Table 3.5 confirm this expectation. Among female students there is no difference (in Model 2) between those who have parents with low or medium education level and those who have highly educated parents. Among male students, there is a difference. Moreover, when controls for parental education level are included (Model 2), there is no longer an effect of being second-generation immigrant, and the negative effect of being first-generation immigrant is reduced.

In Model 3 control for fields and type of study is included (humanities, and bachelor level, serve as the reference). The inclusion of these control variables reduces the effects of parental education level. The reason is also that the choice of field and type of study varies by parental education level.

Among other things, the results of Model 3 show that the students on master programmes are much more efficient in terms of producing credit points per year than the rest of the students, as also indicated in Table 3.4. Thus, this result is robust when controlling for fields of study and background characteristics.

Interaction terms for master studies and being a first-generation immigrant or second-generation non-Western immigrant respectively, are also included in Model 3. The reason for the interaction terms is, as shown in Table 3.2, the high completion rate among immigrants on master studies, while this was not the case for study programmes at lower levels (cf. Table 3.1). We also see high positive coefficients for these interaction terms. The consequence is an increase in the negative (isolated) effects of having non-Western immigrant background, indicating low study efficiency among immigrant students at lower degree (bachelor) programmes.

Model 4 includes control for grades in upper secondary education. The large negative effect of the dummy-variable 'have information on grades' at first sight may be confusing. The substantial meaning of this coefficient is that students for whom we lack information on grades have more or less equivalent study efficiency as those with average grades ($4.2 * 4.630 = 19.466$).

The control for grades changes the effects of parental education level. The reason for this is the strong relationship between grades in upper secondary education and parental education level, which exist for both male and female students (Støren et al., 2007). In Model 4, when controlling for grades, there is no longer an effect of mother having higher education for the male students on study efficiency, and the effect when father has higher education is reduced among the male students, although still significant. For females the effects of having parents with higher education in total are *negative* in Model 4, when controlling for grades in upper secondary education.

The inclusion of control for grades in Model 4 also causes a decrease in the effects of being a master student. This is natural because those who have become master students are over-represented among those who had achieved the best grades in upper secondary. We also see a small decrease in the (isolated) effects of having non-Western immigrant background, reflecting the fact that this group on average had poorer grades in upper secondary.

Parental education level and gender

More girls than boys enter higher education, and a higher proportion of male than female students have parents with high parental education level (for instance, 47 per cent of the male students have a father with higher education, whereas this applies to 38 per cent of the female students. See Table A.1). Thus, male students constitute a more selected group than the female students. Based on traditional theories (see Chapter 1) of the effects of social background on educational achievements, we would expect that in total this would predict *higher* study efficiency and persistence among the male than the female students. Our observation is contrary to this expectation. See Table 3.4. Likewise, Table 3.1 (bachelor students) indicated higher completion rate among females than males, and Table 3.3 indicated fewer non-completers among females than males. Table 3.4 displayed no gender differences in study efficiency among master level students, but a relatively large difference in favour of the girls among bachelor students.

The results concerning the different effects of parental education level for male and female students depicted in Models 2, 3 and 4 (Table 3.5) might be of special interest in light of the fact that more female than males students have low social background. Among males, having a father with higher education predicts higher study efficiency, also when controlling for grades in upper secondary, than where the father has lower education (cf. Table 3.5). The effect is, nonetheless, minor. To *some* extent these males may have benefited from a higher amount of cultural and study-relevant social capital because of their father's education level, or they may represent an example of the theory that the main purpose of educating oneself is to maintain the parents' social position (see the references to Bourdieu and Boudon in Chapter 1). However, this does *not* apply to the results for the females who appear as 'pattern breakers'. The results indicate that among students with low or medium-educated parents there is a particular high study motivation among the female students compared to males in the same group.

The results concerning gender and parental education level are illustrated in Figure 3.1.

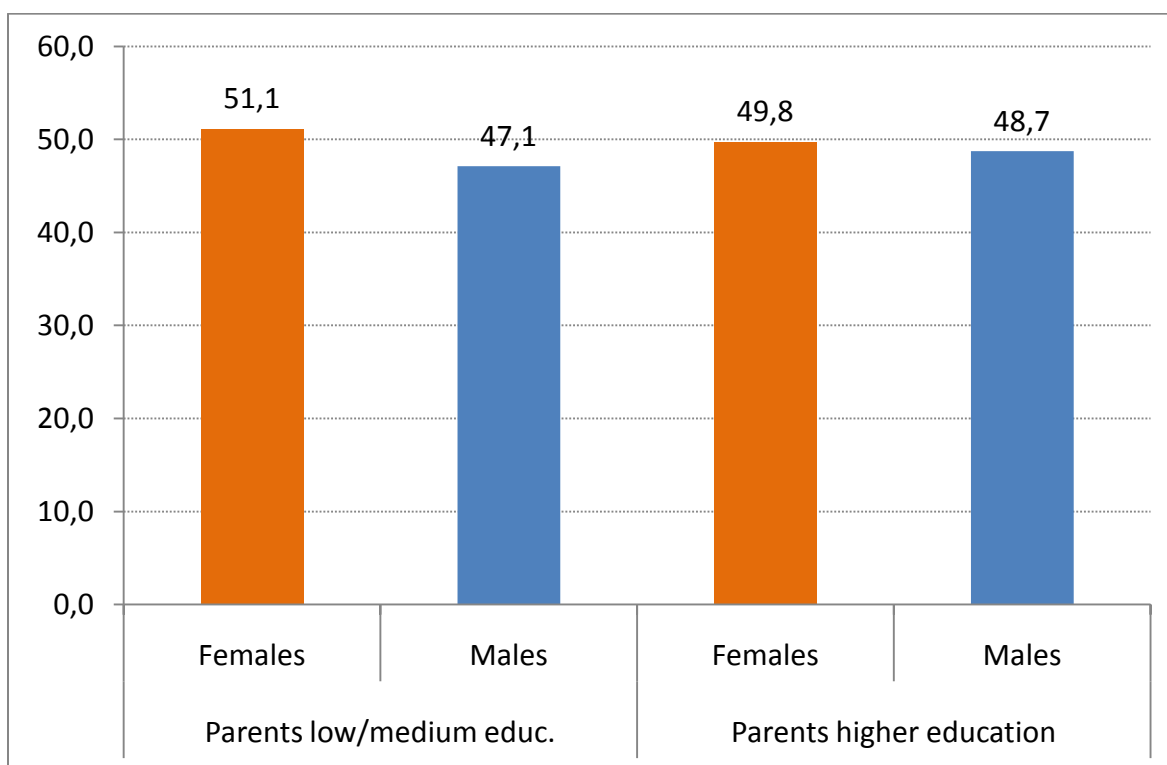


Figure 3.1 Estimated sum of credit points produced per year, by gender and parental education level.

The graph shows that the effects of parental education level are essentially minor. The estimations are based on Model 4, that is when controlling for grades etc. However, there is no positive effect of parents having higher education among the female students when a control for grades is not included (Model 3). The field science and technology is used as the reference category for the estimates in Figure 3.1. In addition, the reference person had average grades in upper secondary, has no children, and was 19 years of age when entering higher education.

With regard to the male students the result accord well with the results of Mastekaasa and Hansen (2005); that is small effects of parental education level when controlling for grades. Still, the results for the female students are surprising and are to our knowledge not observed before.

Fields of study and immigrant background

Figures 3.2 and 3.3 present further illustrations of the results of the regression analyses in table 3.5. The estimates are based on Model 4. Figure 3.2 shows differences by field and type of study without consideration of immigrant background, and Figure 3.3 shows differences by immigrant background, and gender.

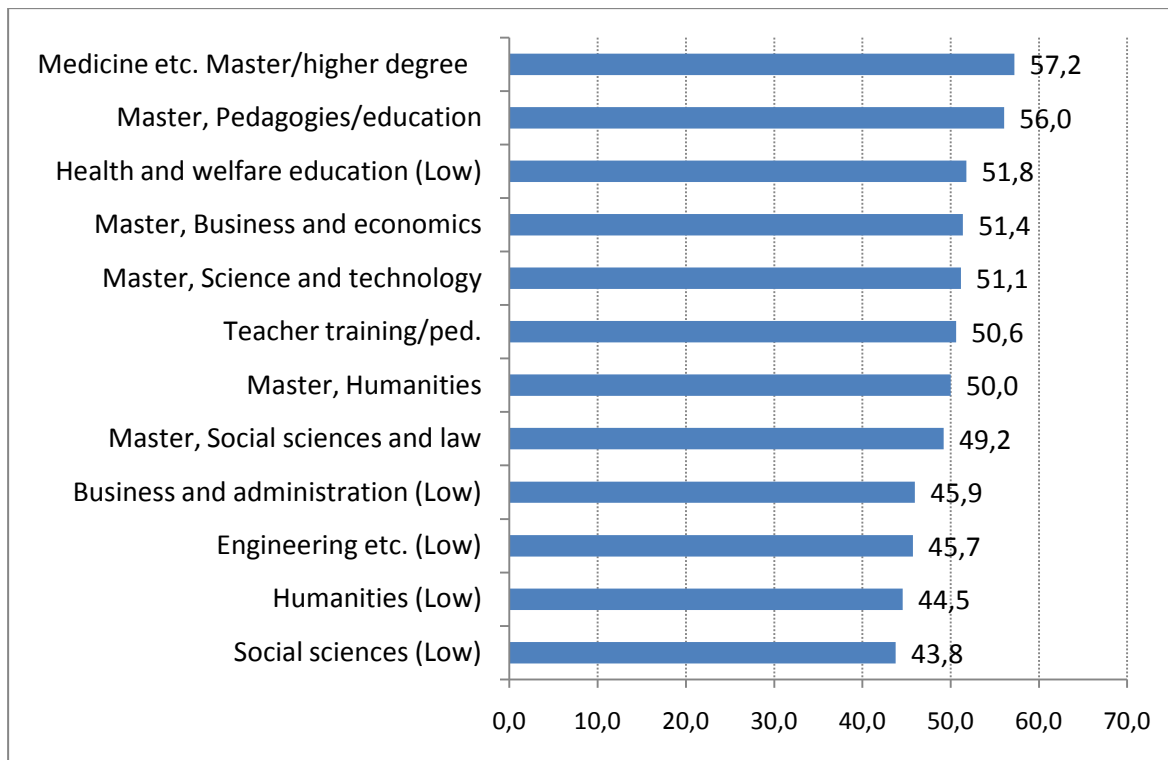


Figure 3.2 Estimated sum of credit points produced per year, by field and type of study.

The reference category for the estimates in Figure 3.2 is an ethnic Norwegian female student 19 years of age when embarking on HE; with average grades in upper secondary education (which is 4.2), and parents with low/medium education level, and no children. The graph shows that according to our data students within social sciences and humanities who have not enrolled into a master programme (labelled 'low' in the graph, including HE students on bachelor programmes or possibly lower level), have the lowest study efficiency. Those who are enrolled into a master programme are the most efficient, with one exception; students on health and welfare bachelor programmes have high study efficiency.

When keeping field and type of study constant the differences by immigrant background is illustrated in Figure 3.3.

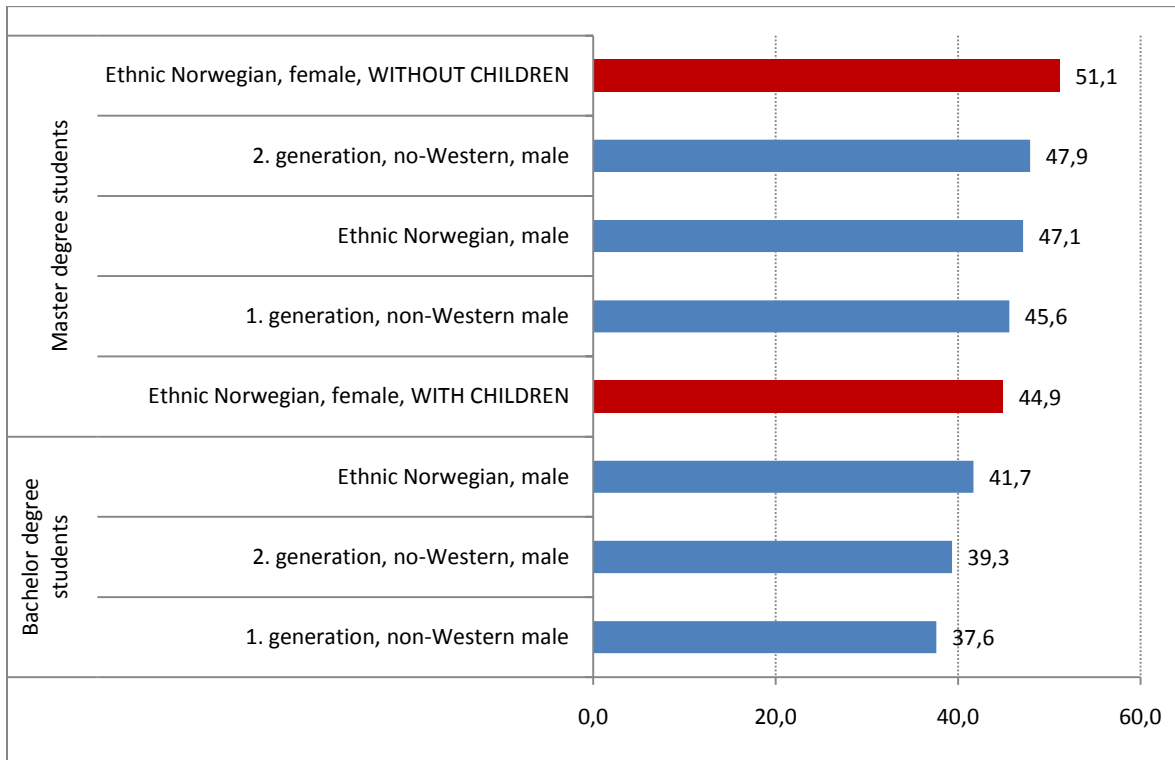


Figure 3.3 Estimated sum of credit points produced per year, by gender, immigrant background and type of study.

The field science and technology is used as the reference category for the estimations in Figure 3.3. In addition, the reference person had average grades in upper secondary, was 19 years of age when commencing higher education; the parental education level is below tertiary level (but known). What varies is the educational level of the study programme (master level or not), immigrant background, gender and whether or not the student has got children. The latter is exemplified only for the girls. All the estimates for *males* in Figure 3.3 refer to persons *without children*.

The figure does not include estimates for female immigrant students, because an interaction term for being a female and having non-Western immigrant background was not included in the regression analyses in Table 3.5. This interaction term was included in preliminary analyses, but was then excluded because it was not significant in any of the models. Therefore, *the gender effect can be interpreted as being equal for ethnic Norwegians and immigrants*, and thus not shown in the graph (Figure 3.3). The corresponding estimates for female immigrants without children is thus found by adding the coefficient for being female (4.023 in Model 4) to the estimates in Figure 3 for the male immigrants. This results (more or less) in equivalent study efficiency among female second-generation immigrants and female ethnic Norwegians, and somewhat lower study efficiency (49.6 credit points per year among master students) for female first-generation immigrants than for female ethnic Norwegians.

Female master students without children have the highest study efficiency. Among males, the second-generation master students have the highest study efficiency, followed by ethnic Norwegian male master students.

Male first-generation non-Western immigrants on bachelor/lower degree study programmes are the least efficient. The difference between master students and lower degree students is in reality even larger than illustrated in Figure 3.3. This is because we have assigned average values for grades to both groups. However, in reality the master students have, on average, better grades.

One of the reasons why the non-Western immigrant bachelor students have lower study efficiency than ethnic Norwegians, might be that they more often have paid employment while studying than ethnic Norwegians, possibly because of a more severe financial situation. According to additional analyses, this does not seem to be the case. It is very common to have part-time work when studying in Norway, both among ethnic Norwegians and immigrant students. The data set includes information on the students' labour market affiliation in November 2003, 2004 and 2005. We do not have information on this matter referring to the period 2006–2008. More important, we do not have information on the exact number of hours per week that the students were in paid employment. Therefore, this information is not included in the analyses shown in Table 3.5. In additional analyses we have included the 'rough' information on whether the student was in paid employment at the three mentioned points of time (2003, 2004 and 2005). However, inclusion of control for these dummy-variables did not affect the differences between immigrant students and ethnic Norwegian students which are displayed in Table 3.5.

3.3 Summary – persistence

Returning to the research questions on persistence in Chapter 1.3, these may be summarized:

- There are significant gender differences in study efficiency, also when controlling for fields and type of study. Female students without children are the most efficient.
- There is practically no effect of parental education level on persistence measured as study efficiency when controlling for fields and type of study and academic ability. For females there is a small negative effect of having parents with higher education, and for males there is a small positive effect of father having higher education.
- Differences in persistence are related to fields and type of study. Master students have higher study efficiency than those who have not entered a master programme with some exceptions. Students within health and welfare have the highest study efficiency, and within this field also the bachelor students have very high study efficiency. Bachelor students in science and technology, social science, humanities, and business and administration have the lowest study efficiency.
- There are both similarities and differences between first- and second-generation non-Western immigrants and ethnic Norwegians in persistence in HE. Students on master

programmes with immigrant background have equally high completion rate as the ethnic Norwegian, but the immigrants' completion rate is lower among students on bachelor programmes. However, more second-generation immigrants than ethnic Norwegians stay on in master programmes. When controlling for parental education level, a complex pattern is found:

- Second-generation immigrants have the highest study efficiency, followed by ethnic Norwegians close behind. This refers to master studies. On study programmes below master level studies (where the study efficiency is overall lower), ethnic Norwegians have the highest study efficiency, followed by second-generation immigrants. Among students on study programmes below master level first-generation immigrants had the lowest study efficiency.
- Academic ability (grades achieved in upper secondary education) affects the difference in study efficiency between the immigrants and the ethnic Norwegians. When controlling for grades, the difference between the immigrant and ethnic Norwegian students at bachelor level is reduced.

The results indicate a polarization within immigrant group of students. Immigrant students who started on master programmes fare better than ethnic Norwegians (second-generation immigrants), or close to ethnic Norwegians (first-generation immigrants) with regard to study efficiency. Among those who have not entered master programmes, but take lower degree programmes in engineering and business and administration for example, the situation is contrary, and many *first-generation* immigrants in particular have low study efficiency. When not controlling for parental education level, the difference would be even larger.

Still, another result is worth noting. This is the positive results for female students – which apply to both immigrant and ethnic Norwegian students. More females than males enter higher education; the social background of the female student population is more diverse than that of males; their intake grades are somewhat better; they have a lower rate of drop-out, and they have higher study efficiency than male students.

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Appendix

Table A.1. Mean sample values by gender, and immigrant background

	Girls	Boys	Ethnic Norwegian	Non- Western, 1. generation	Non- Western, 2. generation	Total
Age when starting HE	19.322	19.528	19.392	19.455	19.301	19.393
Female			0.660	0.610	0.578	0.656
Have children	0.027	0.011	0.021	0.033	0.014	0.022
Average grades, second year of upper secondary (0-6)*	4.287	4.125	4.245	3.998	4.009	4.231
Have information on grades	0.919	0.919	0.919	0.921	0.913	0.919
Mother unknown education level (or no education)	0.012	0.016	0.003	0.219	0.151	0.014
Mother low or medium education	0.617	0.536	0.589	0.564	0.646	0.589
Mother higher education	0.370	0.448	0.408	0.217	0.203	0.397
Father unknown education level (or no education)	0.020	0.022	0.008	0.287	0.094	0.021
Father low or medium education	0.602	0.504	0.570	0.472	0.696	0.568
Father higher education	0.377	0.474	0.422	0.242	0.210	0.411
Humanities**	0.122	0.098	0.116	0.088	0.050	0.114
Pedagogies/education	0.128	0.047	0.103	0.050	0.043	0.100
Social sciences and law	0.220	0.153	0.200	0.161	0.132	0.197
Business and administration	0.145	0.233	0.171	0.213	0.285	0.175
Science and technology	0.093	0.328	0.169	0.249	0.235	0.174
Medicine, health and welfare	0.232	0.077	0.177	0.192	0.219	0.179
Agriculture, forestry, fisheries and aquaculture	0.004	0.005	0.005	0.000	0.002	0.005
Transport, communications, safety, security, services	0.003	0.010	0.006	0.005	0.005	0.005
Introductory courses (Examen philos./ Examen fac.,) or unknown	0.053	0.049	0.053	0.041	0.027	0.052
Started on a master programme in the observation period	0.301	0.419	0.337	0.389	0.461	0.342
Number of observations	15681	8213	22525	931	438	23894*

* For average grades, the number of observations is 21,948.

** Fields of study refer to field of study when entering higher education.

¹ The data set is compiled from raw data from Statistics Norway (background characteristics, and HE enrolment and HE attainment), and from Norwegian county municipalities (data on upper secondary education). The latter were originally delivered by the county municipalities on behalf of the Norwegian Directorate for Education and Training. The data were anonymized before they were delivered from Statistics Norway to the author.

² When looking at the 1999-cohort, we find that the average grades among those who entered HE in 2002 was 4.28, among those who started one year later (who are also included in the analyses in this paper) it is 4.14, and if we include all those who started within 2005, the average grades is 4.11.

³ There are, though, clear distinctions between the theories, Boudon emphasizing the different *social* costs, while Breen and Goldthorpe argue that the social differences in education depend on academic ability and economic resources; and, according to Goldthorpe (2007) people's *values* concerning education do not vary among social classes (Opheim, 2008, pp.38 – 40). See Opheim (2008) and Hansen (2008) for further elaboration and discussion.

⁴ In addition the educational fields/type of sector/occupation of mother and father may have an impact, see for instance Dryler (1998), Hansen (1993), and Støren and Arnesen (2007b) for a discussion.

⁵ This does not imply that study programmes marked with an asterisk in Table 2.1 includes *all* the students who started on a five-years master-programme; however additional groups not included in categories marked with an asterisk are too small to constitute separate categories.

⁶ This refers to statistics from The Norwegian Universities and Colleges Admission Service (NUCAS).

⁷ The estimations displayed in the graphs are based on the results of Table 2.3 and are made according to the formula

$$P = \frac{e^{Z_j}}{1 + \sum e^{Z_j}}$$

where $Z =$ the intercept plus the effects of the control variables ($Z = B_0 + B_1X_1 + B_2X_2 \dots$), and j is an expression of the different outcomes on the dependent variable (the logit has $j - 1$ different sets of parameters).

⁸ The reform has been evaluated, see e.g. Michelsen and Aamodt (2007); it is however beyond the scope of this report to go into the results of this evaluation.

⁹ The information on credit points was not complete for all students. If the information on credit points is lacking or lower than the attained academic level implies (this applies for instance to students who have been studying abroad, for a part of or the total period), we have assigned the number of credit points *that equate the academic level of the completed study programme*, for instance 180 credit points for completed bachelor level, 240 credit points for completed teacher training, 300 credit points for completed master level, and 360 for doctors (Cand.med. degrees).

¹⁰ Many Norwegian HE students, especially at the universities, start their higher education by entering introductory courses called Examen philosophicum/Examen facultatum. This applies more frequently to students who enrolled previous to the implementation of the Quality reform in 2003, because as a consequence of this reform this course was incorporated in the new bachelor programmes. Many students who enter HE by enrolling in this course are registered with a special code when embarking. The code for this course belongs to the broad field 'humanities' in the Norwegian Standard Classification of Education. To avoid having too many students in the humanities category, students with the code for this course are separated from the rest of the humanities group. Students who are registered with this code as their first study programme, but who are registered with a new code the next year, are assigned the new code.

¹¹ The data set contains information on whether the students had got children in 2005 or earlier. This means that the net positive effect of being female would have been larger if also childbirths in 2006/2007 could have been taken into account.

