

# **Completion and dropout in upper secondary education in Norway: Causes and consequences**

Torberg Falch

Lars-Erik Borge

Päivi Lujala

Ole Henning Nyhus

Bjarne Strøm

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## **Preface**

This note is a short version of the report “Årsaker til og konsekvenser av manglende fullføring av videregående opplæring” (Causes and consequences of lack of completion of upper secondary education). The original study was financed by the Norwegian Ministry of Labour and the Ministry of Education and Research, while this note is financed by the Ministry of Education and Research. The authors alone are responsible for the views expressed in the note and for any errors that may remain.

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Torberg Falch (project leader), Lars-Erik Borge, Päivi Lujala, Ole Henning Nyhus and Bjarne Strøm

## 1. Introduction

Why does a significant share of the youth drop out of upper secondary education? What are the impacts on outcomes later in life for those who drop out? In most OECD countries, reducing the number of early school leavers is an important policy area. For example, as a response to the European Union's Lisbon strategy, explicit benchmarks were established to reduce the share of early school leavers and to increase completion of upper secondary education in EU member countries (EU, 2002). Yet, there is little evidence on causes and consequences of dropout from upper secondary education, in particular from European countries. This note reports the most important findings from a research study on causes and consequences of school dropout using Norwegian longitudinal register data.<sup>1</sup>

## 2. Norwegian institutional features

The Norwegian school system consists of compulsory 7-year primary and 3-year lower secondary education. After graduating from compulsory lower secondary education, normally the year individuals turn 16 years of age, the students can either choose to leave school or enrol into upper secondary education. The latter alternative is chosen by over 95 percent of each cohort. After completing the education program, students get an upper secondary school diploma qualifying for further studies or certifying for work in a number of occupations.

Students enrol in different study tracks in upper secondary education. The study tracks are divided into two broad categories: Academic tracks and vocational tracks. Academic study tracks are 3-year programs and qualify for studies at universities or other higher education institutions. About 45 percent enrolls into academic study tracks, mainly the general academic track.<sup>2</sup> Vocational study tracks certify for work in a number of jobs, such as carpenter, electrician, etc.<sup>3</sup> They are 3 or 4 year programs and most of them include an apprentice system, where training in schools is combined with work in private firms or public sector institutions.

While municipalities are responsible for compulsory education, provision of upper secondary education is a county responsibility. Upper secondary education is the most important service provided by the 19 counties in the country, and accounts for over 50 percent of total county

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<sup>1</sup> The original study is Falch et al. (2010).

<sup>2</sup> There are 2 additional minor academic study tracks; "Sports and physical education" and "Music, dance and drama".

<sup>3</sup> In 2006 the number of vocational study tracks was reduced from 12 to 9. Industrial design, health and social work, mechanics, and electrical trades are the largest vocational study tracks and enrol each about 8 percent of the student cohort.

spending. The counties are financed by grants from the central government. Youths with completed lower secondary education have a legal right to enrol in upper secondary education in one out of three individually ranked study tracks, a rule that is followed without exceptions by each county. Students have the right to complete upper secondary education within a period of 5 years after being enrolled. Students can apply for transfer to another study track, but transfer is likely to delay progression because transferred students most often have to repeat grades.

Students from the same lower secondary school enrol in different upper secondary schools, depending on preferred study track and grades from lower secondary education. Most schools offer several study tracks. When the number of applicants exceeds enrolment in a study track, students are ranked strictly based on the grades from lower secondary education.<sup>4</sup> In about half of the counties, there is free school choice (no school catchment area), but the students have to enrol in a school within their county of residence. At the end of lower secondary education, the students are given grades set by the teachers in 10 subjects on a scale from 1 (low) to 6 (high). The average grade varies slightly between subjects, from about 3.5 in mathematics to 4.3 in physical education. In addition, the students have to conduct a central exit exam in either mathematics, Norwegian language, or English language. The overall grade used for ranking of applicants to upper secondary education is the average grade across all subjects, including exams. We present evidence below that the average grade has a major impact on completion of upper secondary education and outcomes later in life.

The analyses presented below are based on data including the complete cohort graduating from compulsory lower secondary education in Norway in 2002 (approximately 50,000 individuals). We utilize information on upper secondary school attainment and register data on their grades and family background to analyse the propensity to complete upper secondary education. To study the consequences of completion and dropout, we exploit information for the same individuals from different registers at age 21.

### **3. Causes of upper secondary education completion**

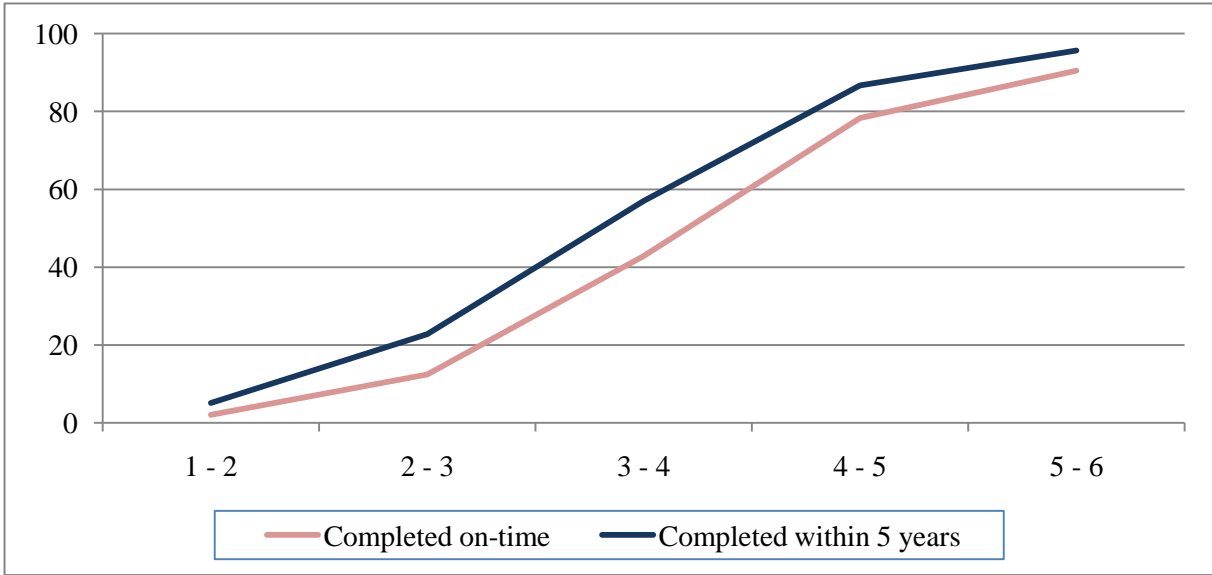
While more than 95 percent of students graduating from compulsory education in the spring term 2002 enrolled in upper secondary education the same year, only 66 percent of the students had completed upper secondary education 5 years later. Further, only 55 percent had completed on-time (3 years for academic study tracks and 3 or 4 years for vocational study tracks).

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<sup>4</sup> In addition, the algorithm takes into account that each student must be enrolled in one of the three study tracks on their priority list.

International research has documented that prior academic achievement is a strong determinant of post-compulsory school completion. Consistent with this evidence, the results for Norway show that the propensity to complete upper secondary education is strongly related to prior achievement measured by average grade from lower secondary education.

Figure 1 shows the strong relationship between average grade in lower secondary education and the probability to complete upper secondary education on-time and to complete upper secondary education within 5 years. Students with average grade below 3 have very low completion probability (below 20 percent), while students with average grade above 5 have very high completion probability (above 90 percent). The probability of completion is close to linear in average grade.



**Figure 1. Completion of upper secondary education (percent) and average grade (from 1 to 6) from lower secondary education**

Regression models, conditioning on parents’ education, gender, immigration background, and regional variables, reveal a similar effect of average grade on completion; achievement from lower secondary education greatly affects the probability to complete upper secondary education on-time or within 5 years.<sup>5</sup>

<sup>5</sup> Individual and family background variables included in the empirical models are: Average grade from lower secondary education, 8 indicators for parents’ education, student gender, indicators for first and second generation immigrants, the need for support related to disabilities, and the study track in which the student enrolled in 2002. Regional variables included are: The number of upper secondary schools and unique study tracks within 50 km driving distance from home, county indicators, and 4 regional labour market variables (share of employees with only compulsory education, unemployment rate, share of employees in agriculture, fishery, manufacturing and building and construction industries, and predicted wage premium for employees with completed upper secondary education).

There are several other interesting findings in the regression models. Regarding gender, the overall completion rate is higher for girls than for boys. This is, however, due to the fact that girls on average have better grades than boys from lower secondary education. In the regression models the completion probabilities for boys is in fact slightly larger than for girls. The same pattern is prevalent for second generation immigrants. Controlling for average grade from lower secondary education, parental education, etc., completion of upper secondary education is actually higher among second generation immigrants than among non-immigrants. For parental education level, the regression models also strongly reduce the effect compared to the overall differences. However, students with parents with only compulsory education are somewhat less likely to complete even when they have the same average grade from lower secondary education as students for which the parents have more education.

As to the role of regional labour market variables, the higher the share of employees with only compulsory education in the region, the lower is the propensity to complete upper secondary education. This finding may indicate that a strong labour market for low-skilled workers weakens incentives to complete upper secondary education. On the other hand, the regional unemployment rate does not affect completion. Somewhat surprisingly, higher predicted regional wage premium of completing upper secondary education has a statistically significant negative impact on completion, although small in magnitude.

A particular innovation in this analysis is the construction of measures of proximity to upper secondary schools and study tracks in the geographical area where the individual student lives. Geographical proximity is measured by the number of upper secondary schools and unique study tracks within 50 km driving distance from the students' home. The estimation results indicate that the higher the number of unique study tracks nearby, the higher the propensity to complete upper secondary school. The number of schools within 50 km distance is relevant only to the extent that it also implies a higher number of study tracks.

The propensity to complete on-time and within 5 years are significantly lower in Northern Norway than in Southern Norway, even when students' prior achievement and family background are held constant. An interesting question is to what extent this difference can be attributed to regional labour market conditions and long travel distances to schools. The model results indicate that such conditions only can explain a minor part of the geographical gap. Controlling for regional labour market conditions and the constructed measures for proximity to unique study tracks and upper secondary schools, students in Northern Norway still have a significantly lower completion propensity than other students.

Regarding the overall importance of study tracks, completion is higher among students enrolled in academic tracks than in vocational tracks. This difference is strongly reduced

when controlling for prior achievement represented by average grade from lower secondary education, suggesting that the problems with large dropout in some vocational study tracks to a large extent reflects the student composition in these tracks.

#### **4. Consequences of upper secondary education completion**

To investigate effects of completed upper secondary education on later outcomes, the cohort graduating from lower secondary education in the spring 2002 is followed in the fall 2007, over 5 years after graduating from lower secondary education.

Four outcomes are considered:

- i) The probability to be job-seeker, fall 2007
- ii) The probability to receive public welfare benefits, fall 2007
- iii) The probability to be enrolled in education, fall 2007
- iv) The probability of imprisonment during the period September 2007-December 2008

In the fall 2007 (defined as September-December), on average 2.6 percent of the cohort were job-seekers (mostly unemployed), 4.6 percent received public welfare benefits, and 47.8 percent were in education. 1.2 percent of the cohort was in prison at least one day during the 16-month period September 2007-December 2008.

The first row in Table 1 presents the differences between those who have completed upper secondary education within 5 years after graduation from compulsory education and those who have not completed within this time frame. The table shows that there are major differences between the groups. Individuals without completed upper secondary education are 4.0 percentage points more likely to be job-seekers, 9.2 percentage points more likely to receive welfare benefits, 33.7 percentage points less likely to be in education, and 2.4 percentage points more likely to have been in prison.

**Table 1. Consequences of completing upper secondary education, percentage points**

	Job-seeker	Receive welfare benefits	In education	Imprisonment
Difference between completed vs. non-completed upper secondary education	-4.01	-9.17	33.7	-2.38
Estimated effect of completed upper secondary education, regression model	-2.59	-5.67	9.47	-0.95
Estimated effect of completed upper secondary education, “matching” approach	-1.79	-3.09	25.3	-0.62

Note: All effects are statistically significant at 1 percent level.

However, these numbers cannot be interpreted as causal effects of upper secondary education. The relationships can just reflect that the students would have ended up in these outcomes in any case. The methodological challenge is that we cannot observe the counterfactual outcomes for the individuals and have to rely on a comparison of outcomes for different individuals that may differ systematically along both observable and non-observable dimensions. This challenge is approached in two ways.

The first approach is to control for observational variables affecting the probability to complete upper secondary education using multiple regression analysis. The control variables are those used in the analyses of school completion above, see footnote 5. The effects of completed upper secondary education from these models are presented in the second row in Table 1. Compared to the raw differences in the first row, the effects of completed upper secondary education are clearly lower, in particular for the states “In education” and “Imprisonment”, but still highly significant. The estimated effects are lower than the raw differences mainly because average grade from lower secondary education has a strong independent impact, in addition to the effect on the probability to complete upper secondary education.

The second approach is to compare outcomes for individuals just “above” and just “below” the margin of completing upper secondary education. The group just “above” the margin of completing is defined as students completing upper secondary education with weak results (defined by low average grade in upper secondary education).<sup>6</sup> This implies that we can only include students in academic study tracks in the analysis since grade information is only available for these students. The group of students just below the margin is defined as students that have spent at least 3 years in an academic study track without completion, and with average grade from lower secondary education above the first quartile.

<sup>6</sup> Weak results from upper secondary education are defined as having grades in the quartile with lowest grades from upper secondary school.



The results from this “matching” approach are presented in the last row in Table 1. The table shows that the estimated effects of completing upper secondary education is lower than for the regression model (except for the state “In education”), but they are still clearly statistically significant. These more conservative estimates suggest that completion of upper secondary education, all else equal, reduces the probability to be job-seeker by 1.8 percentage points, reduces the probability to receive welfare benefits by 3.1 percentage points, increases the probability to be in education by 25.3 percent, and decreases the probability to have been in prison by 0.6 percentage points. Compared to the average values, this is large effects.

The analyses reveal that high average grade from lower secondary education not only increases the probability to complete upper secondary education, but has separate positive effects on later outcomes. Better grades decrease the probabilities to be job-seeker, to receive welfare benefits, and imprisonment. Of particular interest is the result that the impact of average grades from lower secondary education is strongest for the individuals that have not completed upper secondary education. This implies that the potential gain from completing upper secondary education is largest for students with the poorest conditions for completion.

While the analysis in the previous section indicates that the probability to complete upper secondary education is systematically lower in Northern Norway than in Southern Norway, the analyses of the effects of completion on later outcomes do not reveal any statistical significant effect of living in Northern Norway. However, the low completion rate in Northern Norway implies that a larger share of the cohort is job-seekers and receives public welfare benefits simply because low completion increases the propensity of these outcomes.

A weakness of analyses using data on the 2002-cohort is that only short-term outcomes can be revealed. In order to get some impression of medium-term effects, additional analyses using the cohorts graduating from lower secondary education in the period 1994-2002 have been conducted. Using information on outcomes in the fall 2007 for these cohorts makes it possible to study effects of completion when the individuals are between 21 and 29 years old. However, information on average grades from lower secondary education is only available for the 2002-cohort. The fact that it is not possible to control for students prior achievement in this part of the analysis represents an important weakness that should be taken into account when interpreting the results.

Nevertheless, the analyses on multiple cohorts clearly indicate that completing upper secondary education decreases the probability to be job-seeker, receiving public welfare benefits, and imprisonment also in the medium-term. There is some weak evidence that the effects in the medium-term are somewhat lower than the short-term effects, but the differences between the young and “old” cohorts are relatively small.

## 5. Conclusions

We have studied causes and consequences of upper secondary school completion in Norway. The four most important results are:

- 1) High initial enrolment rate in non-compulsory upper secondary education is not equivalent with a high rate of students actually completing this level of education. Register data show that while more than 95 percent of a cohort enrolls in upper secondary education in Norway, only about 2/3 actually complete this educational level within a time period of 5 years.
- 2) Initial achievement in terms of average grades from compulsory lower secondary education is the most important variable explaining individual variation in completion propensity.
- 3) Completing upper secondary education has positive effects on later outcomes in terms of better labour market prospects, lower use of public welfare benefits, and lower crime rates. Average grade from lower secondary education has independent positive effects on these outcomes.
- 4) Completion rates are significantly lower in Northern Norway than in Southern Norway, but there are no independent effect of living in Northern Norway on later outcomes, given completed upper secondary education or not. Low educational level, however, explains high incidence of job seeking status and welfare benefits in Northern Norway.

## References

- EU (2002): "European benchmarks in education and training: Follow-up to the Lisbon European council". Communication from the commission 629.
- Falch, T., L.-E. Borge, P. Lujala, O.H. Nyhus and B. Strøm (2010): "Årsaker til og konsekvenser av manglende fullføring av videregående opplæring". SØF-rapport 03/10, Centre for Economic Research at NTNU.