

**The social costs of dropouts  
in upper secondary education in Norway**

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## **Preface**

This note is a short version of the report “Kostnader av frafall i videregående opplæring” (Costs of dropouts in upper secondary education). The project is financed by the Norwegian 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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## **1. Introduction**

In Norway, upper secondary education consists of 3 and 4 years study programs. Completed studies are required for admission to higher education and certification in several occupations. However, while almost the complete cohorts enrol in upper secondary education, only about 2/3 actually complete this educational level within a time period of 5 years. The high dropout rate might have large costs for the individuals and the society in terms of loss of income, weaker attachment to the labour market, and greater utilization of different social security and welfare arrangements.

This note presents calculations of net social costs of dropouts in Norway using a cost-benefit analysis.<sup>1</sup> The analysis takes into account that both private earnings and public expenditures are related to educational level.<sup>2</sup> For example, the shares of job-seekers and welfare benefit recipients are significantly higher among dropouts. In addition to reduced government spending related to welfare benefits, the analysis also takes into account that a higher completion rate requires higher education expenditures. However, the analysis presented is not a complete social cost analysis since many potential effects of completion are left out of the analysis because they are very difficult to measure with reasonable precision.

Our baseline calculation indicates that the total net cost of an additional student dropping out of upper secondary education equals about 900,000 NOK (about 110,000 Euro) over the lifetime. This implies that the total net social gain of a reduction in dropouts by 1/3 compared to the current level equals about 5.4 billion NOK (about 750 million Euro) per cohort. The individual income loss is the largest cost component of dropouts.

## **2. Dropout in upper secondary education in Norway**

The Norwegian educational system consists of 10 years of compulsory education, 3-4 years of upper secondary education, and higher education at colleges and universities. Students graduate from compulsory education the year they turn 16 years of age. Over 95 % of each cohort subsequently enrolls in upper secondary education. The study tracks in upper secondary education can be divided into two broad categories. Academic study tracks are 3 years programs and qualify for higher education studies. About 45 % enrolls in academic study

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<sup>1</sup> The original study, Falch, Johannesen and Strøm (2009), includes a more detailed discussion than this note of the assumptions made in the analysis.

<sup>2</sup> One example of a similar analysis is Levin et al. (2006) for the US.

tracks. Vocational study tracks certify for work in a number of occupations.<sup>3</sup> They are 3- or 4-year programs and most of them include an apprentice system where the training is combined with commercial work in firms.

We define dropout in upper secondary education as non-completed education 5 years after graduating from compulsory education. This definition corresponds well with the school law, which states that youths have the right to access upper secondary education as long as this right is utilized during a continuous period of 5 years. Youths have a legal right to enrol in upper secondary education in one out of three individually ranked study tracks. Students can apply for transfer to another study track, but transfers are likely to delay progression because transferred students most often have to repeat grades.

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 % of total county spending. The counties are financed by grants from the central government.

Table 1 gives an overview of completion rates in upper secondary education over the past few years. In addition to completion within 5 years after enrolment, the table also provide the ratio of students completing on-time, i.e., within expected time according to the actual study track (3 years for academic tracks and 3-4 years for vocational tracks). The majority of the students complete on-time, while about 2/3 of the students complete within 5 years. There is large variation across counties. Completion within 5 years varies from about 50 % to about 73 %. The table also shows that completion rates are quite stable over time.

**Table 1. Percent who completed upper secondary education on-time and within 5 years**

Year enrolled	Completed on-time			Completed within 5 years		
	Mean	Min. county level	Max. county level	Mean	Min. county level	Max. county level
1999	58,4	38,1	64,8	69,8	51,9	75,5
2000	55,1	34,7	60,5	66,9	48,8	73,2
2001	56,4	35,8	62,1	68,2	49,4	72,8
2002	55,5	38,4	63,1	67,4	52,5	73,1

The completion rate also varies across study tracks. While about 80 % of the students enrolling in an academic study track complete within 5 years, the corresponding rate for vocational study tracks is only slightly above 50 %.

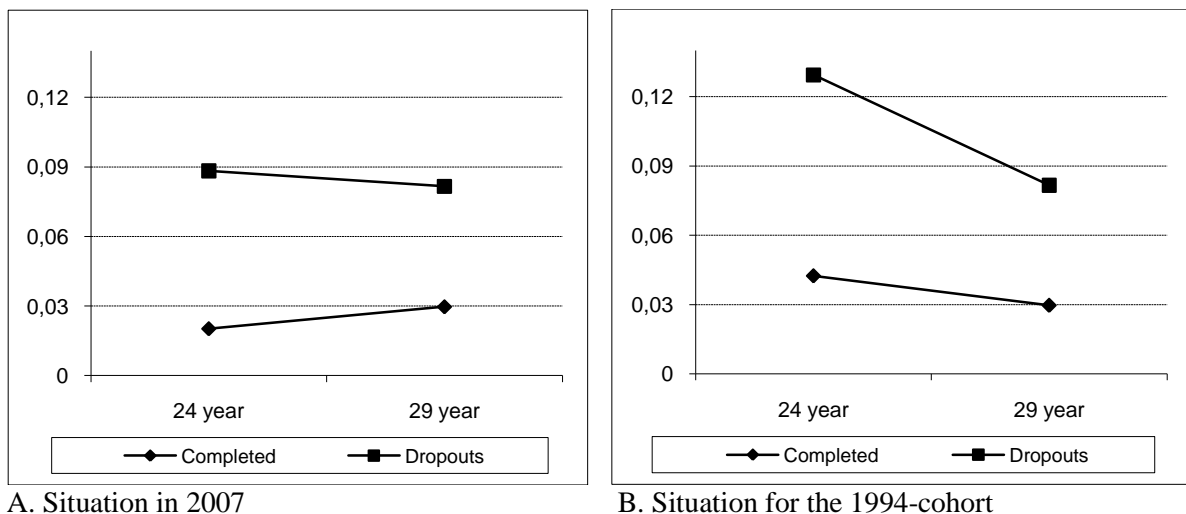
<sup>3</sup> Industrial design, health and social work, mechanics, and electrical trades are the largest vocational study tracks and enrol each about 8 % of the student cohort.

### 3. Dropout in upper secondary education – what happens later?

This section considers the relationship between completion of upper secondary education and the probability of using different welfare benefits. Since the use of welfare benefits are closely related to the individuals' connection to the labour market, we first present the relationship between the probability of being job-seeker and completion of upper secondary education. The figures are taken from Falch and Nyhus (2009), who base their calculations on register data from Statistics Norway. Data for all individuals graduating from compulsory education is matched with information on upper secondary school attainment, information on different welfare benefits, and earnings. Data for the 1994- and 1999-cohort are presented when they are 24 years old (in 2002 and 2007) and 29 years old (the 1994-cohort in 2007).

#### 3.1. The probability of being job-seeker

Figure 1 presents the probability of being a job-seeker at age 24 and 29.<sup>4</sup> Panel A presents the situation in 2007. At age 24, 9 % of the dropouts are job-seekers while this is the case for only 2 % that have completed upper secondary education. The difference is smaller at age 29, and this likely reflects that fewer individuals are students at this age.



**Figure 1. Share of job-seekers**

Panel B of Figure 1 focuses on those who graduated from compulsory education in 1994. Both Panel A and B suggest that the difference between the groups decreases with age. Nevertheless, the figure clearly shows that those who have completed upper secondary education have a much stronger connection to the labour market than dropouts.

<sup>4</sup> Job-seekers are defined as individuals registered at the Public Employment Offices as searching for work. A majority of the job-seekers receive unemployment benefits, but job-seekers also include individuals without unemployment benefits rights and individuals in part-time position that search for full-time positions.

### 3.2 The use of welfare benefits

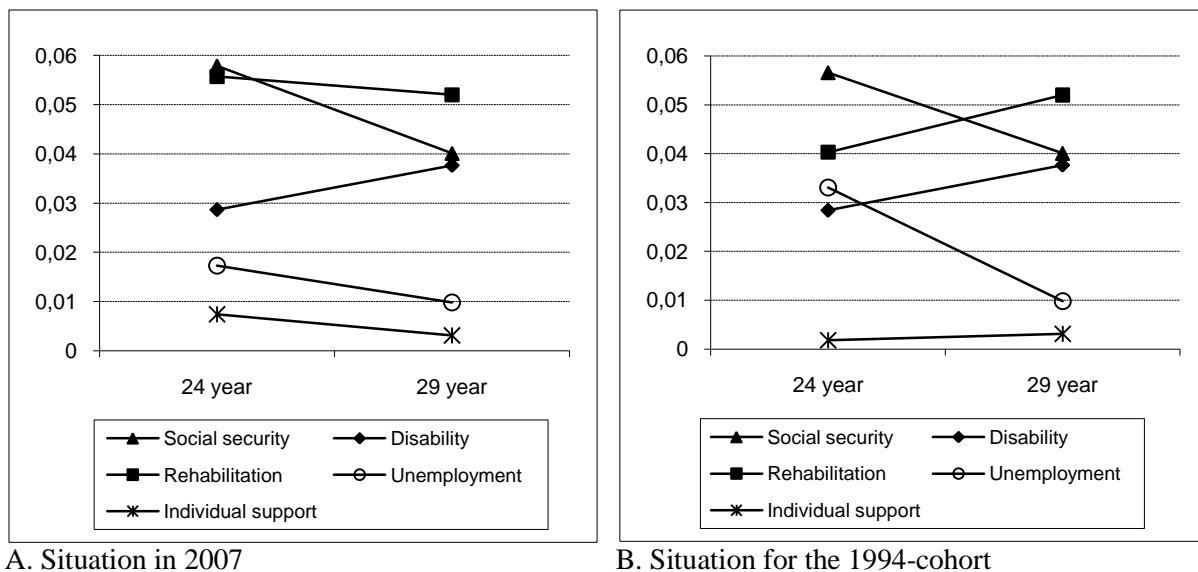
Table 2 reports the average % of welfare benefit recipients for different welfare benefit arrangements. We focus on disability benefits, rehabilitation benefits, unemployment benefits, individual support during participation on active labour market programs, and social security. Receiving unemployment benefits requires a certain level of labour income during the past 3 years. Rehabilitation includes measures aimed at improving the receivers' ability to work. Disability benefits require a long-term medical diagnosis, and social security is designed for poor individuals who are not qualified for other welfare benefits.

Table 2 shows that individuals who have completed upper secondary education are unlikely to receive welfare benefits, while a sizable share of dropouts are benefit recipients. For example, among 29 year old dropouts in 2007, 4.1 % received disability benefits, 4.5 % received social security benefits, and 7.6 received benefits while participating in a rehabilitation program.

**Table 2. Percent using different welfare benefit arrangements**

	1999-cohort		1994-cohort			
	Situation in 2007, age 24 years		Situation in 2007, age 29 years		Situation in 2002, age 24 years	
	Completed	Dropout	Completed	Dropout	Completed	Dropout
Disability benefits	0.1	3.0	0.3	4.1	0.1	2.9
Social security	0.4	6.2	0.5	4.5	0.7	6.3
Rehabilitation benefits	1.5	7.1	2.4	7.6	1.8	5.8
Unemployment benefits	0.7	2.4	1.1	2.1	2.0	5.4
Individual support	0.1	0.8	0.05	0.4	0.04	0.2
Number of individuals	35 969	15 036	36 479	15 748	36 479	15 748

Figure 2 gives a graphical illustration of the difference in the propensity to be welfare benefit recipient between dropouts and completers as reported in Table 2. Panel A shows the situation at age 24 and 29 in 2007. At age 29, the largest differences are for disability, social security, and rehabilitation. The shares of dropouts using these benefits are 4-6 percentage points higher than the corresponding shares of completers.



**Figure 2. Differences in utilization between dropouts and completers, different welfare benefits**

Figure 2 also indicates some trends in the use of welfare benefits from age 24 to age 29. In both panels, the difference for social security is reduced from about 6 percentage points at age 24 to about 4 percentage points at age 29. The large reduction for unemployment benefits for the 1994-cohort in panel B is likely to reflect the improved business conditions over the 5 year period from 2002 to 2007. On the other hand, the share of individuals with disability benefits is increasing. For the other categories there is no clear trend.

### 3.3 Private income

The typical estimate of the return to one year of extra education in Norway is 4-5 %, fairly low by international standards. However, the evidence also indicates that the return is substantially higher for completion of upper secondary education. Indeed, Falch and Nyhus (2009) find that the full-time earnings gap between dropouts and completers is about 6 % for 24 year olds and about 9 % for 28 year olds.

## 4. Public sector expenditures

The figures above suggest that a lower dropout rate in upper secondary education may reduce spending on welfare benefits. At the same time, reduction in the number of dropouts may increase public educational expenditures.<sup>5</sup> However, correct estimates on net social cost require that the effects are causal. We have to ask the contra-factual question: What would be

<sup>5</sup> We do not provide a complete analysis of the budgetary consequences for the public sector because we do not discuss the effect of reduced dropout rate on taxes. The income effect of reduced dropout rate reported below is related to gross income, and we do not discuss how the income effect is divided between the public sector (taxes) and the individuals (net after tax income).

the situation if an individual actually dropping out of upper secondary education instead completed the education? This question is very difficult to answer, and we therefore present calculations below based on different assumptions of the size of the causal effects of dropout.

*4.1 Public spending on welfare benefits*

As demonstrated above, the relationship between dropout and the use of welfare benefits varies between different benefit arrangements. Our baseline estimates are presented in Table 3. Regarding the use of disability benefits, the difference between those who drop out and those who complete seems to increase with age. In order to capture this trend, we use the difference in probability at age 29 as our baseline estimate of the impact of dropping out. The difference in the propensity to receive unemployment benefits and social security are declining in age. We therefore use 50 % of the difference at age 29 as our baseline estimates. Regarding rehabilitation and individual support related to active labour market programs, there is no clear trend related to age.

Table 3 also presents annual benefits in Norwegian kroner for a typical recipient at the different benefit arrangements. They are calculated based on the relevant benefit rates.

**Table 3. Estimates of the effects of dropout on the probability of using different welfare benefits in percent, and annual benefit level in NOK**

Benefit	Estimated effect of dropout			Annual benefit in 2008-NOK
	Baseline	High estimate	Low estimate	
Disability benefits	3.8	7.0	0	136,300
Rehabilitation	3.5	3.5	0	139,700
Social security benefits	2.0	4.0	0	61,300
Unemployment benefits	0.5	1.0	0	221,000
Individual support	0.3	0.3	0	75,400

By combining the annual benefit levels with the corresponding estimates on probabilities, we calculate the expected change in welfare spending related to one extra individual dropping out of upper secondary education. In the baseline scenario, the expected total annual spending equals 12,600 NOK. This means that if a random individual completes upper secondary education instead of dropping out, the public expenditures on welfare benefits is expected to be reduced by 12,600 NOK.

*4.2 Public expenditures on education*

Reduced dropout rate will increase public expenditures on upper secondary education as the number of enrolled students rises. The expenditures on upper secondary education vary between academic study tracks, in-school studies in vocational tracks, and apprenticeship in



firms. Expenditure differences between tracks are relevant since the dropout rate is significantly higher in vocational study tracks than in academic study tracks. However it is not straightforward to calculate expenditures per student in different study tracks because the schools typically offer studies in several different study tracks and a significant part of total school expenditures are so-called joint expenditures (maintenance of school buildings, administration, and some teaching). It has been argued that a higher share of the joint expenditures arises from vocational study tracks because these are most space consuming and requires more administrative resources than academic tracks.

Table 4 presents expenditures based on the counties' expenditure accounts. The first two columns show that expenditures per student are highest in vocational study tracks, especially when the distribution of joint expenditures is assumed to be biased towards vocational tracks. The estimated weighted average expenditures in the last column take into account the distribution across study tracks of the students that drop out. Thus, this is an estimate of expenditures for the typical student dropping out. Based on these estimates, we use 100,000 NOK as a baseline estimate for the annual education expenditures per student.

**Table 4. Operational expenditures per student, 2008-NOK**

	Academic study tracks	Vocational study tracks		Weighted average expenditures
		In school	Apprenticeship in firms	
Joint costs distributed by number of students	113,415	135,937	50,000	99,800
Joint costs distributed 40 - 60	97,607	160,041	50,000	102,500

Dropouts typically stay about 3 years in upper secondary education (Falch and Nyhus, 2009). On average, dropouts spend only half a year less in upper secondary education than completers. However, because expected progression for students in the apprenticeship system is typically 4 years and the dropout rate is highest in these study tracks, the average time left to completion is more than half a year. In addition, the fact that students who do not complete are more likely than others to transfer from one study track to another, adds to the argument that they need more than half a year to complete. Thus, we assume in the calculations below that completion of those who currently drop out requires one more year in upper secondary education on average.

## 5. Calculation of net social costs

Because education may affect the working career of an individual at any point in time, one must calculate the total costs of dropouts by using a lifetime perspective. Future effects are discounted using an interest rate of 4 %, as is the general recommendation for cost-benefit analysis made by the Ministry of Finance. The other assumptions made are summarized in Table 5.

Regarding loss of income, the baseline average over the lifetime is set to 12 % of the average wage in manufacturing. Since we observe a smaller difference in earnings at age 28, we also present results using a low estimate of 6 %.

The assumption that completion of upper secondary education requires one more year in school converts into higher educational expenditures, and, in addition, foregone private income this particular year for the student, typically at age 19. Regarding the latter, the wage level in manufacturing seems too high when compared to other unskilled groups in, for example, the service industry. Furthermore, there is a relatively high probability that these individuals will not be working this particular year. We therefore assume that foregone income at age 19 is 150,000 NOK.

**Table 5. Assumptions for the net social cost analysis. Amounts per year in 2008-NOK**

	Age	Baseline		Low estimate		High estimate	
		Assumption	Amount	Assumption	Amount	Assumption	Amount
Loss of income	20-65 years	12 % of average wage in manufacturing	42,500	50 % of baseline	21,200	150 % of baseline	63,700
Alternative income	19 years	Low wage and welfare benefits	150,000	Baseline	150,000	Baseline	150,000
Spending on welfare benefits	20-65 years	Baseline probabilities in Table 3	12,600	No effect	0	High estimate of probabilities in Table 3	19,300
Educational expenditures	19 years	Average expenditures per student	100,000	Baseline	100,000	Baseline	100,000

Table 6 presents the total net social cost of dropouts under the different assumptions laid out in Table 5. In the baseline scenario, the net social cost per individual who does not complete upper secondary education is estimated to 900,000 NOK over the lifecycle of the individual, measured in present value. This is a substantial amount. It is therefore of interest to calculate aggregated costs. A representative cohort in Norway consists of 55,000 students, and the

dropout rate is at present slightly above 30 %. Thus, about 18 000 individuals do not complete upper secondary education. If 1/3 of these complete, that is, the drop-out rate is reduced by 10 percentage points, the gain for the society will be about 5.4 billion NOK per cohort.

**Table 6. Total net social cost of dropouts. Present value per individual in 2008-NOK**

Assumptions	Income effect	Reduced welfare benefits	Increased educational expenditures	SUM
Baseline	730,000	270,000	100,000	900,000
Baseline income effect, low estimate welfare benefits	730,000	0	100,000	630,000
Baseline income effect, high estimate welfare benefits	730,000	400,000	100,000	1030,000
Low income effect, low estimate welfare benefits	290,000	0	100,000	190,000
High income effect, high estimate welfare benefits	1170,000	400,000	100,000	1470,000

When using the low estimate of reduced welfare benefits (no causal effect of dropout on utilization of welfare benefits), the cost of dropout is reduced to 630,000 NOK per individual. With the high estimate for welfare benefits, the cost of dropout is 1030,000 NOK.

Table 6 shows that the largest component in the analysis is the private gross income effect (including taxes). Thus, the estimated net social cost is sensitive to the assumption regarding the income effect. For low estimates on the income and welfare benefit effects, the cost is 190,000 NOK per individual, while for the high estimates, the cost is 1500,000 NOK.

## 6. Conclusion

We find that dropouts from upper secondary education have a high net cost for society. Our analysis suggests that the cost in Norway is in the range 190,000–1500,000 NOK per individual over the lifecycle. Our best estimate is 900,000 NOK (about 110,000 Euro), which implies that a reduction in the dropout rate by 1/3, that is a reduction by 10 percentage points, represents a gain for the society by 5.4 billion NOK (about 680 million Euro) per cohort. These estimates are based on specific assumptions of the effect of dropout on income, utilization of welfare benefits, and educational expenditures. They are probably conservative estimates since some evidence indicates that education has a positive impact on other outcomes, such as for example better health and reduced crime.

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