

CENTAR

Eesti Rakendusuuringute Keskus

The Cost of School Failure in Estonia

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Short version



Euroopa Liit
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Eesti tuleviku heaks

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Preface

The catalytic role of education for economic and social development is very recent in the history of scientific thought. It was formalized in academia in the 1960s and slowly embraced by international organizations and governments to the present day.

One basic metric of educational underdevelopment in a given country is the number of students who fail to complete studies beyond lower secondary education. The cost to society of such failure has been estimated to be huge in the United States where such cost was first estimated.

The international research community should welcome Estonia's effort to add new estimates of the cost of school failure. Utilizing a diversity of available data, if only one half of what is defined as school failure could be avoided, the country would gain about 0.7 percent of GDP¹. Consistent with the findings of other studies, this is a huge number calling for policies to reduce school failure.

Two remarks are in order regarding the many policies that have been proposed in the literature to combat school failure.

First, the roots of school failure are complex and are not limited to what is happening in schools. The family has a role to play, in the sense that an adverse socioeconomic background can have ill effects on a child's educational development. Acting at the school level might be too late to reverse school failure. Thus, preschool programs that compensate for adverse family background might be the most promising policy.

Second, having too many policy instruments to address a given problem, such as school failure, can dilute the implementation and monitoring capacity of any educational system. Based on the particular initial country conditions, only the most effective policy measures should be adopted, implemented and consistently monitored over time.

Let me express the hope that this report will mark a new era of educational development in Estonia.

George Psacharopoulos

¹ Using 3% discount rate.

Executive summary

School failure

School failure is the failure of the student to achieve the **minimum standard of cognitive skills** deemed necessary for productive participation in the labour market and society in general, and at the same time the failure of the school system to provide services leading to successful learning.

The concept is regularly simplified to **the failure to complete some minimum level of education**. In the European Union, this **minimum standard of education is considered to be the completion of upper secondary education**.

In Estonia the number of people who failed to reach **at least upper secondary education** by their early 20's was around **11.6% in 2010**, which is less than EU average, but there are 13 member states who are performing better than Estonia in this respect. Early school leaving has also a strong gender aspect with **every seventh male in the age group of 18-24** being an early school leaver (15%).

European Union has made reducing the share of early school leavers **to less than 10%** by 2020 **one of the headline targets of the European growth strategy for current decade – Europe 2020**.

Costs of school failure

Inadequate education is associated with:

- **Costs for individuals** – direct monetary costs through lower wages and lower probability of being employed, lower health;
- **Fiscal costs** for government like foregone tax earnings and higher need for welfare payments;
- Wider **social costs** like higher crime rates, lower participation in civic society.

The **costs of early school leaving cannot be measured with the precision known from natural sciences** as they extend into a half of century (and more) of uncertain future. It is also not conceivable to set up experiments to really separate the **causal effect of education** on life outcomes from confounding factors like innate abilities or parental nurture. On the other hand **there are also indications that education can have the highest returns for the ones with highest risk of failure** even if talent is the main factor for others.

Acknowledging the limits of our knowledge, **we can and should make educated guesses as the stakes are high**. To get an understanding of the **order of magnitude of the costs** due to early school leaving, we compare life outcomes of people with and without upper secondary education, starting from what is the difference between lower and upper secondary education today and extending it to the future using probable scenarios where available.

Education is treated **as an investment by the society** – there are immediate costs involved in alleviating school failure but resources are scarce and society has to choose between a number of competing investment opportunities. It is thus important to have a good overview of the **costs and benefits** for the society from this kind of investment.

Findings from Estonia

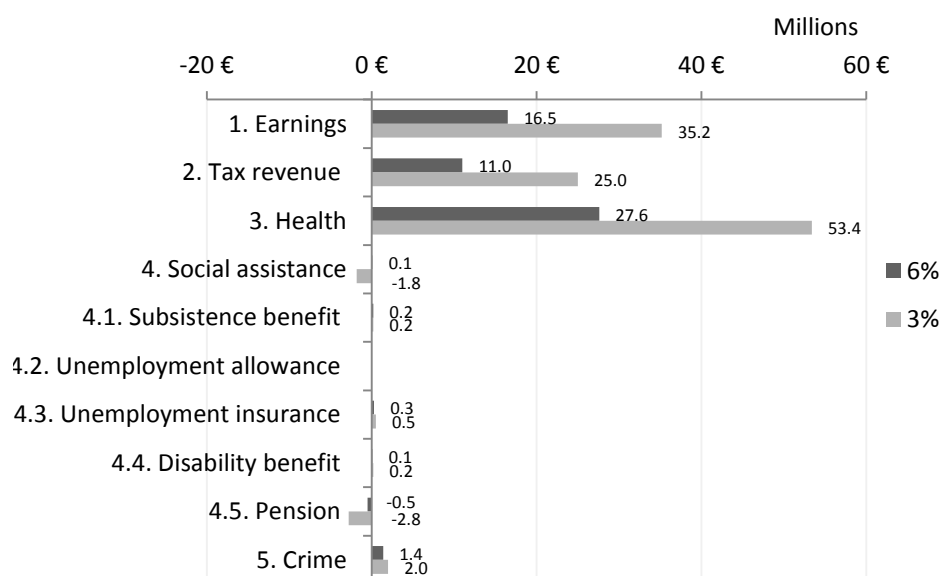
In Estonian policymaking, large investments are usually evaluated using 6% as the discount rate for all costs and benefits occurring in the future. If we could reduce early school leaving by 50% and improve the cognitive and social skills and preferences of the 725 people currently staying at the level of lower secondary education to the average level of what we observe in the people who have finished higher secondary education, the benefits for the society would be the following:

- The net present value (future revenue discounted by 6%) of the **additional earnings** for these people would be **EUR 16.5 million**.
- The net present value of **payroll taxes** for the government would be **EUR 11.0 million**.
- Additional **health** would be valued by **EUR 27.6 million**.
- We would gain **EUR 1.4 million** from uncommitted crime
- We would benefit **EUR 0.1 million** from reduced costs of social entitlements.

The total costs of school failure would be EUR 56.6 million.

The wider international audience is probably more accustomed to calculations that use discount rates that are close to 3%. When discounted at 3%, the **total costs of school failure would stand at EUR 113.8 million**. Calculations presented later in this report use 6% discount rate.

Figure 1. Total costs of school failure at discount rates of 6% and 3%, EUR



Source: authors' calculations

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1 School failure and its costs

1.1 What is school failure?

There are a variety of definitions of school failure, but they share the notion that **students fail to achieve some minimum objectives**. These minimum objectives, which often grow out of the **needs of the civic society and labor market**, can be defined differently depending on the context – they can be easily countable like occurrences of class repetitions and dropouts, or quality-oriented like some level of cognitive achievement.²

One of the leading international organizations actively involved in combating school failure, OECD, discusses school failure and its implications in the following way (OECD 2010):

“School failure can be seen as twofold. On the one hand, from a systemic perspective, school failure is the failure of an educational system, which is unable to provide an education of quality to all. In this case, overcoming school failure implies assuring inclusion: ensuring a basic minimum standard education for each and every student. Secondly, not all individuals are equal facing failure, and consequently, to reduce school failure in a targeted way allows to strengthen equality of opportunities, and to make education system fairer. Therefore, to reduce school failure implies improving both dimension of equity: inclusion and fairness.

On the other hand, school failure can also be apprehended from an individual perspective, as failure of a student in obtaining a minimum necessary standard or, in the extreme, dropping out.”

As quality-oriented objectives are difficult to measure, policies tend to target readily available countable indicators like the **failure to complete some minimum level of education** or **early school leaving**. This is also the key measure for the European Commission who defines early school leaving as the percentage of people in the age group 18-24 having attained at most lower secondary education and are not being involved in further education and training. We will be using these terms – school failure and early school leaving – interchangeably, but one has to keep in mind that this is not a perfect measure of underlying qualitative indicators.

In Estonia, the percentage of early school leavers was **11.6% in 2010**, having been between 13 and 15% for the last decade. This is **slightly better than EU average** (which has shown constantly declining trend from 17% at the start of the century), but as EU average is heavily affected by some countries with very high level of early school leaving (Spain and Portugal have levels slightly below 30%), Estonia still performs worse than 13 other member states. One also has to keep in mind, that the fast drop from 13.9% to 11.6% in 2010 has been a sharp one and considering the earlier fluctuation in the data, a part of this improvement could be incriminated to measurement error.

European Union has made reducing the share of early school leavers to **less than 10% Europe-wide by 2020** to be one of the headline targets of the European growth strategy for current decade – **Europe 2020**.

²Psacharopoulos (2007) discusses different definitions and their critique in more detail.

1.2 The costs associated with school failure

Schooling is highly correlated with a number of life outcomes from wages earned to general happiness level reported. The costs associated with school failure can be borne by the private individual (foregone earnings, worse health) or by society in general, either through direct financial costs (foregone taxes and higher costs of social security) or reduced life quality in general (higher crime rates, lower civic participation).

There are two possible explanations of how education can alter the wages – through **signalling the innate abilities** and through **increasing the productivity of individuals**. In case of pure signalling, education itself would not have any independent effect and the correlation between education and wages would all be due to able people getting more education. If, on the other hand, education is instrumental in building up human capital, then we can alter people's life outcomes through education policy. This has perhaps been one of the most researched questions in economics and while the signalling effect has indeed been shown to contribute, there is a firmly established consensus that there are causal effects of education on productivity, with the **rate of return of an additional year of schooling being around 10%** (Card 1999 is a good starting point on research on this topic).

Health is one of the most important concerns on the individual level and it is also highly correlated with education. While there are also relatively intense discussions about explanations for this correlation, literature reviews (e.g. Grossman 2004) suggest that there is a strong causal relationship between schooling and health. Education provides either knowledge about or additional incentives for investments in health.

There are two broad economic interpretations of why people with different education levels differ also in **criminal behaviour** – differences in **opportunity costs** and **differences in preference**. Higher education is strongly linked with higher earnings and probability of employment. For persons with higher wages, the cost of imprisonment is higher than for people who earn less because, while being away from the labour market, they could have earned more than their low-paid colleagues (Lochner 2004). Differences in preferences can work through several mechanisms. If people's time preferences are altered by education, then this can lead to less criminal behaviour among the more educated as they can postpone their consumption needs more effectively to the future. The discussion of causality vs. correlation is evidently also present here. Lochner (2004) argues that education has a causal effect on crime, a similar conclusion is made by Groot *et al.* (2010).

Numerous analyses have also found a strong **causal relationship between civic participation, social trust and educational attainment**. The supporters of the social capital theory generally agree that schooling is the best way to increase the amount of social capital generated (e.g. Fukuyama, 2001; Putnam, 1993).

Altogether these channels affect directly the **fiscal costs for government** – people who earn more pay more in taxes and are less probable to require social assistance. Diminishing crime rates and better health behaviour will free some resources for providing additional benefits.

1.3 How we evaluate the cost of school failure?

We follow the general methodology outlined in *The Costs of School Failure: A Feasibility Study* (Psacharopoulos 2007). In line with previous comparable studies (e.g. Levine *et al* 2007), we will assess the benefits from completing upper secondary education compared to failing to do so. Levels of education are first grouped as shown in Table 1. The differences between group B and C are considered to reflect the cost of school failure.

Table 1. Education levels³

Group	Education level	Containing:	ISCED
A	Basic education	Without basic education; Basic education (6 grades); Vocational training without basic education (older than 17 y).	0, 1, 2A, 2C.
B	Lower secondary education	Basic education (9 grades); Vocational training based on basic training (short).	2A, 2B.
C	Upper secondary education	General secondary education; Secondary vocational education; Vocational training based on basic training (long).	3A, 3B, 2B.
D	Higher education	Vocational training based on secondary education, Bachelor studies, professional higher education, Master studies, Doctoral studies	4B, 5A, 5B, 6

We use recent data to evaluate the effect of education on various outcomes, which means we must opt for the pseudo-cohort method (as we cannot follow a single cohort through their lifetime we assume that the current 40 year olds are an approximation of what will happen to current 30 year olds in 10 years etc). We also use the long term forecasts of macroeconomic variables like nominal wage growth, productivity growth and GDP growth provided by the Estonian Ministry of Finance and used regularly in cost-benefit analysis.

We calculate the net present value (NPV) associated with failing to complete upper secondary education (the same for tertiary education compared to upper secondary education is usually added as a comparison). Net present value is the current value of future costs and revenues discounted by either 6%, which is the discount factor used in other governmental cost-benefit analyses in Estonia, or 3%, which is usual in international practice.

This data is presented:

- **On a per-person basis, indicating** what would be the average benefit if we could convert one person with lower secondary education to the level of the average person with upper secondary education.

³This detailed classification will only be used if the data allows making the distinction between levels with such precision. If not, the appropriate level of aggregation is used.

- As the **total benefit from reducing early school leaving by half** (i.e. by 725 persons, of whom 497 are male and 228 female), in line with approximate estimates for the number of early school leavers by gender from the birth cohorts currently in lower secondary school.

The total benefit from halving early school leaving for one cohort has a useful interpretation, being the maximum yearly amount of investment that could be dedicated to the objective of reducing early school leaving by 50% while achieving positive NPV.

1.4 Main constraints of our approach

The study is purely observational and concerns costs occurring up to more than 50 years in the future. This means that our analysis comes with important caveats.

The problem of selection: people are not falling out of school randomly. Heterogeneity between people can arise from genetically or environmentally induced ability differences, personality traits etc. If these differences have a simultaneous effect on both education and the costs associated with school failure (early school-leavers tend to have lower cognitive abilities to begin with and would thus earn less than non-leavers even if they completed their education), then if these are not taken into account, the estimates of the social costs of school failure would be biased.

It is important to note that the error can be made in both directions – it may be that education is most beneficial for those who are the least likely to complete secondary school, or it may be that the ability to complete schooling has a high correlation with some general ability also valued highly in the workplace, in which case the observed wage difference would overestimate the benefits of additional education for a school leaver.

It is this heterogeneity which makes the precise estimation of benefits (or the causal effect of education to any variable of interest) impossible without experiments, which are not conceivable.

The uncertainty of the future. The need to account for social costs of school failure during the entire working life introduces another difficulty – the uncertainty of cost trajectories in the future. A person's work life can last for more than 45 years and some costs of school failure will arise after the end of active work life. It is obvious that the events that will shape e.g. earnings or health behaviour of people after half a century are impossible to predict with much precision. This is usually solved by taking the current age-earning profiles as the basis of the estimate – if we do not know what the future looks like, we just assume that it will be similar to the present day.

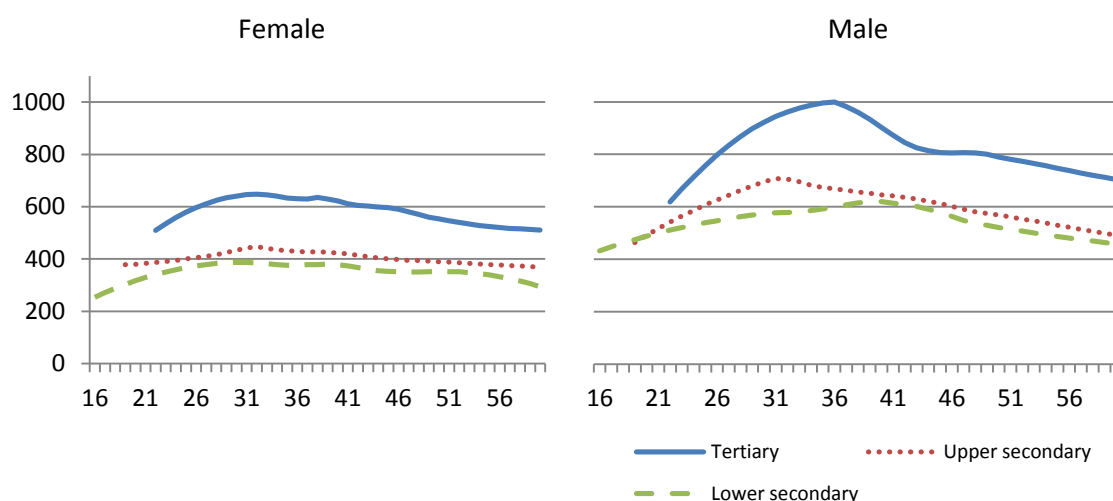
These results should thus be taken as educated guesses hinting towards the order of magnitude of the costs and not as the actual values. The problem is somewhat alleviated, though, through the discounting of future values – the costs and benefits in the near future influence NPV more than costs or benefits that arise in more distant (and more uncertain) future.

2 Labour market – earnings and payroll taxes

We find the expected net present value of net wages from the labour market for each education level by gender. For this we have first estimated the empirical age-earnings profiles using data from the Estonian Labour Force Survey. Figure 2 shows the net wage levels – top earners are relatively young (each young generation tends to be on a higher earning trajectory than previous one), there is

a considerable gender wage gap, tertiary education has high returns, upper secondary education provides higher wages than lower secondary, but not by very much (the lifetime relative gain from upper secondary education compared to lower secondary is 10% for females and 4% for males, while it is more than 30% for tertiary education).

Figure 2. Average monthly net wages for persons employed, EUR (2009)



Source: Estonian Labour Force Survey, author's calculations

The wage level for the employed is only part of the story, as there are large differences in employment rates. Table 2 gives the average employment rate for 25 to 60 year olds during the years 2002-2009 – the difference between people with upper secondary and lower secondary education is considerable.

Table 2. Employment by gender and education, 25-60 years old, 2002-2009

Gender	Education levels	Share of employed in population
Man	Lower secondary	67%
	Upper secondary	81%
	Tertiary	89%
Woman	Lower secondary	57%
	Upper secondary	72%
	Tertiary	82%

Source: authors' calculations

If we expect these differences in labour market behaviour to persist and the economy to grow in accordance with the long term forecast of the Ministry of Finance of Estonia then the net present value of the next level of education in terms of net wages for the person and payroll taxes for the government are given in Table 3. Payroll taxes are computed from the same dataset using the current tax rates and estimating the taxes for each person from their net wage.

Table 3. Costs of school failure – wages and foregone taxes (EUR, per person)

Gender	Education levels	NPV of difference in wage income	NPV of difference in payroll taxes
Man	Upper sec. over lower sec.	24,000	17,000
	Tertiary over upper sec.	55,000	39,000
Woman	Upper sec. over lower sec.	20,000	13,000
	Tertiary over upper sec.	42,000	29,000

Source: authors' calculations

Rising from the average level of someone with lower secondary education to the average level of someone with upper secondary education has the average private value of **20-24 thousand euro** (depending on gender) at a 6% discount rate; the net present value of payroll taxes at the same discount rate would be **13-17 thousand euro per person**.

3 Health

In order to assign monetary value to different health conditions, we use Grossman's (1972) concept of **health capital**. Health is treated as a stock that degrades over time but can be influenced by making investments into health (e.g. regular exercise, healthy nutrition, proper medical treatment). Education will either provide knowledge of or additional incentives for these investments.

We first estimate the mortality rates and the distribution of expected length of life by gender and education level.⁴ We then estimate the expected health capital at age 25, first finding the probabilities of diseases by education level from the Estonian Health Survey,⁵ then assigning the diseases quality adjusted life years (QALY) weights in line with Groot and van den Brink (2007). QALY weights range from 0 (death) to 1 (perfect health), taking into account the severity of the health condition the person is facing. It allows us to compare the diseases between each other and with the situation in which the person is completely healthy. In addition to QALY weights, a monetary measure (controversial and arbitrary but still unavoidable if one has to compare different investment opportunities) is needed. We derive this from the value used in several cost-benefit analyses of large

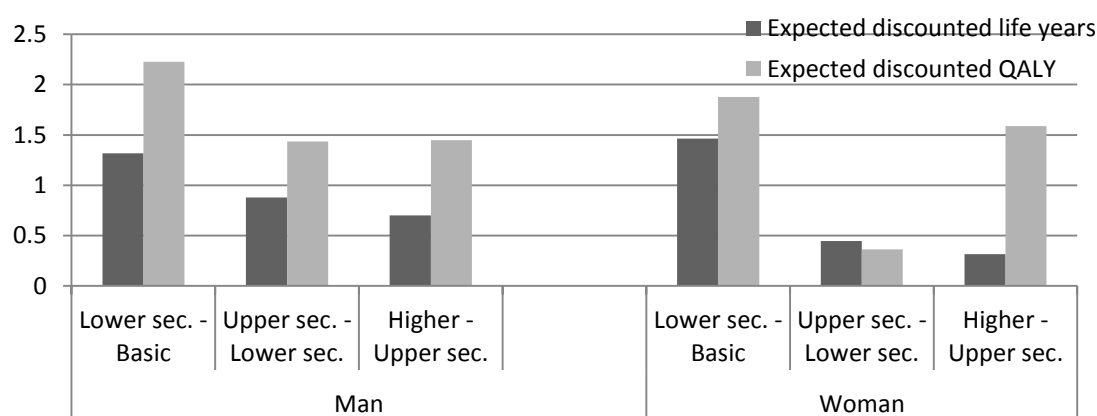
⁴ The current analysis uses data from the Estonian Social Survey (from the years 2004-2008) for estimating the distribution of the population by education levels and, combining this data with the number of deaths for specific socio-demographic groups (obtained from the Estonian Causes of Death Registry) constructs mortality rates and expected life years. In calculating life expectancy, only people up to 84 years are included, which takes a toll on the accuracy of these numbers. The reason for this is that in the Estonian Social Survey, the number of observations of people older than 85 year is low and mortality rates become unreliable. The number of people with basic education or less is also very small. The estimates are based on current mortality rates, without taking into account potential changes in the future.

⁵We would like to thank the Estonian National Institute for Health Development for making available the database of the Estonian Health Survey 2006.

transport infrastructure projects in Estonia as the benefit from additional death avoided in the traffic. This will keep the investment options into education or infrastructure more comparable with each other.

Figure 3 shows the differences in expected discounted life years and quality-adjusted life years by education levels – taking into account the quality of life obtained from better health will increase the difference between education levels.⁶

Figure 3. Differences in discounted life years and in discounted quality-adjusted life years at age 25, by gender and education level, discount rate 6%



Source: Estonian Health Survey, authors' calculations

The monetary values found for expected differences in health capital per person between levels of education for the current generation are given in Table 4. The per person health costs of school failure fall between **12.6 - 49.7 thousand euro**, depending on gender. The health returns to upper secondary education are especially relevant for men, for whom it is comparable to the returns of tertiary education.

Table 4. Costs of school failure – health capital (EUR, per person)

Gender	Education levels	Difference in quality adjusted life years	Difference in health capital, EUR
Man	Upper sec. over lower sec.	1.4	49,700
	Tertiary over upper sec.	1.4	59,800
Woman	Upper sec. over lower sec.	0.4	12,600
	Tertiary over upper sec.	1.6	65,600

Source: authors' calculations

⁶Apart from women with lower secondary education compared to upper secondary education, where the point estimate is negative, most probably due to statistical error as the margins of errors are rather large (the result is not statistically significant).

4 Unemployment and social assistance

We consider the connection between education and unemployment allowance, unemployment insurance benefit, subsistence benefit, disability benefits and pensions.

For **pensions** only the state provided Pay-As-You-Go component is considered, as the costs of the other two pillars of the pension system (compulsory and supplementary voluntarily funded component) are borne solely by the person herself and do not constitute costs for the society. The probability of being employed and the wage relative to the national average is first predicted⁷ and the net present value of future pension costs is found. The current pension system is assumed (with retirement age extended to 65 years) and the pension is expected to rise in line with GDP growth in the long term.

The resulting costs are negative (net present value of total social costs for reducing the school failure is provided in Table 5) – people with higher education cost more to the government when they are receiving pensions. The cost is offset by taxes received during their working age. However, the costs, from the point of view of the generation currently at school age, are far in the future and are thus heavily discounted.

For **disability benefits** we use the current distribution of disabilities and level of benefits to estimate the expected benefit receipt for each age group, sex, ethnicity and educational attainment combination.⁸ The benefits are expected to rise in line with GDP growth in the long term. Although the costs are higher for people with lower level of education, the amount of expected cost is relatively small.

For **unemployment insurance benefits** we estimate the probability of entering registered unemployment and the expected duration of the unemployment spell and predict the expected number of months at 50% and 40% benefit levels (expecting the current system to continue) using the ELFS data.⁹ We additionally use average unemployment benefit amounts from the Unemployment Insurance Fund's data in 2010 for each combination of age (five-year groups), education, and gender to account for pre-unemployment wages. We also construct a model to predict expected **unemployment allowance**. However, these costs are also negligible.

Unlike the previous benefits, **subsistence allowance** is household based. We estimate the effect of all possible educational combinations of the two household members with the highest educational attainment, predicting the probability of receipt and amount of the benefit.¹⁰

⁷Data comes from Estonian Labor Force Survey 2004-2008.

⁸Estonian Social Survey is used.

⁹Estonian Labour Force Survey.

¹⁰ Estonian Social Survey years 2005-2008 are used as a data source.

Table 5. Costs of school failure – social entitlements (EUR, per person)

	Men		Woman	
	Upper sec. over lower sec.	Tertiary over upper sec.	Upper sec. over lower sec.	Tertiary over upper sec.
Subsistence benefit costs due to school failure	211	70	224	60
Unemployment allowance costs due to school failure	31	30	36	40
Unemployment insurance benefit costs due to school failure	702	150	463	130
Disability benefit cost due to school failure	109	30	117	30
Pension costs due to school failure	-753	-730	-676	-490
TOTAL	300	-450	164	-230

Source: authors' calculations

The total effect of school failure on unemployment and social assistance depends to a large extent on whether pension costs are taken into account or not. If pension costs are excluded, then addressing school failure would allow substantial saving of costs of unemployment and social assistance benefits. If pension costs are included, the savings are lower (only regarding social benefit costs – tax revenue gains are considered separately). Depending on gender, per person all this results approximately in a surplus of **300 or 100 euros of net cost savings**.

5 Crime

We use an extract of data from the database including information on prisoners, persons in detention after service of the sentence, detained persons and persons in custody, and from the database including information on probation supervision for deriving the probability of committing a crime. The data includes incidents of the beginnings of incarceration or probation supervision from 2008 to 2010. This means that only crimes that have ended with the punishment of incarceration or probation supervision are taken into account in the analysis. The total number of crimes is underestimated, as the punishment might be in some cases restricted only to pecuniary punishment for example or not registered at all, because of the underreporting of crimes. We use the data to derive the number of different types of crimes that are committed by the specific demographic groups of people.¹¹

We find the probability of committing a specific type of crime (over the life cycle) and multiply it with the cost of the respective crime. The real cost of each crime is expected to remain the same and the calculations are made in constant prices. Costs occurring up to age 82 are considered.

Estimates of costs related to each type of crime were provided by the Ministry of Justice (2010) and include the costs of crime prevention, insurance, pre-trial and trial costs, costs of punishment

¹¹ There are a number of constraints and potential sources of error with the data which are fully discussed in the technical report, the results should just be used as indications of costs and not the precise measurements.

(staying in the penal institutions, pecuniary punishment, coercive treatment), and direct costs of damage (lost lives, lost property).

Table 6. Costs of school failure – costs of crime (EUR, per person)

Gender	Education levels	NPV of difference in cost of crime
Man	Upper sec. over lower sec.	2,410
	Tertiary over upper sec.	3,400
Woman	Upper sec. over lower sec.	810
	Tertiary over upper sec.	1,160

Source: Ministry of Justice, authors' calculations

The school failure cost of crime per person is between **0.81 and 2.4 thousand euros**, depending on gender.

6 Additional topics

There are a number of additional effects of education which it is only possible to assess qualitatively. We cover two of the topics frequently associated with education: civic society and inequality.

6.1 Civic costs

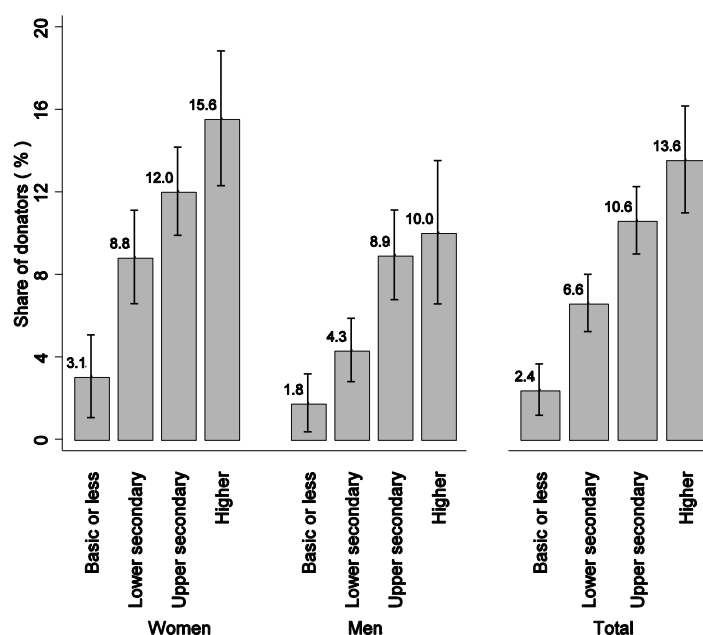
The civic costs due to inadequate education are measured by losses in social capital, which is an “aggregate concept that encompasses the association networks, norms and trust that facilitate collective interactions for mutual economic and social benefits” (Putnam 1993). Social capital has been called one of the fundamental parts of a well functioning democratic society.

The mechanism of how education influences social capital has been explained in various ways. Schooling is thought to reduce the costs of civic participation through increased cognitive abilities, making information processing easier. But education also raises awareness about the benefits of social involvement, making it more desirable. Education may also shape civic preferences through shared social norms and specific peer groups.

It is impossible to measure the added value by particular group for democratic society; however we were able to show with Estonian data¹² that education is indeed a good predictor for a number of measures characterizing civic participation and social capital. Figure 4 shows the relationship of donating behaviour with education. The same is true for participation in elections and donating blood. Concerning engaging in NGO’s and voluntary work, there is a correlation between education and participation in these activities, however, differences in the behaviour of people with upper secondary education when compared to those with lower secondary education are statistically insignificant.

¹²Time Use Survey by Statistics Estonia, years 2009-2010.

Figure 4. Donations in Estonia, 2009



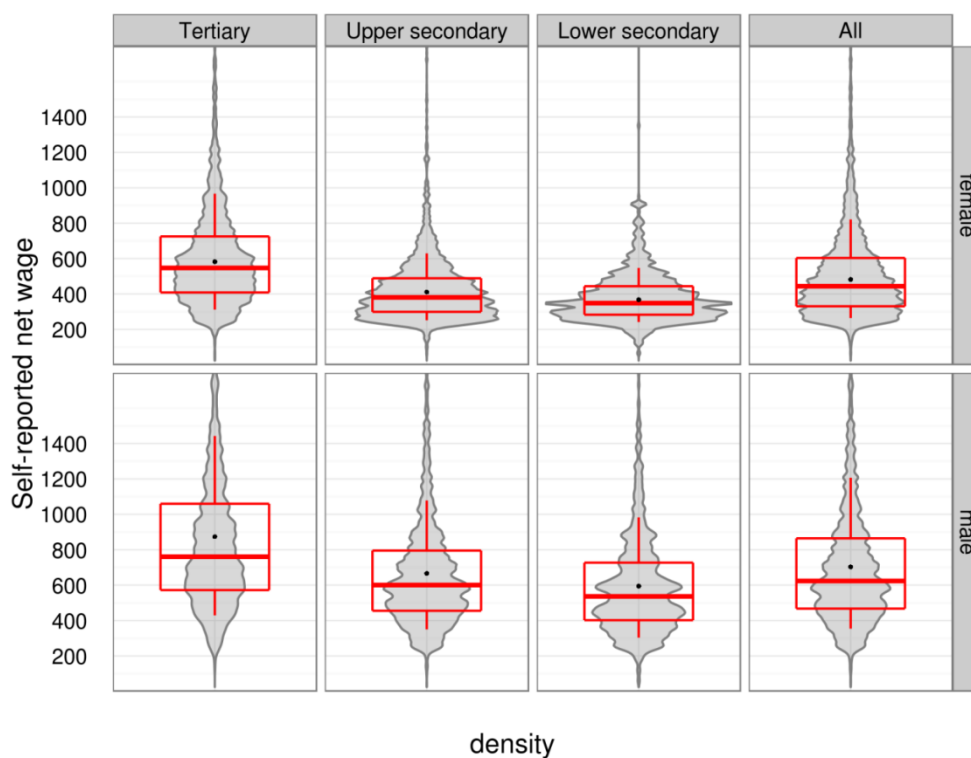
Source: Statistics Estonia Time Use Survey 2009/2010, authors' calculations

6.2 Inequality

Differences in the level of education in the population are one of the sources of income inequality. By definition, school failure affects the least-educated people who tend to be the least compensated in the workplace. Raising the minimum level of education thus has potential to lower income inequality by compressing wages from below.

For understanding the impact of education on inequality, we can decompose the inequality in the society to between group inequality and in-group inequality by educational attainment. Figure 5 gives an overview of wage dispersion by groups and the difference of wages between educational groups for 25-45 year old full-time workers. It is clear that while education plays a role, most of the total inequality comes from within groups. In this figure, only wages for people who are employed are depicted, the differences between groups are larger if unemployment and inactivity is taken into account but as the number of early school leavers is comparatively small and inequality measures are affected more by the top of the earnings distribution, this will not have a big impact on overall inequality – the Gini coefficient would be lowered by couple of tenths of percentage points by halving the number of school leavers.

Figure 5. Wages of 25-45 year old full-time workers by education and gender, pooled data from 2004-2009, wages adjusted to the level of 4-th quarter in 2009¹³



Source: authors' calculations

While the magnitude of the impact of early school leaving on total inequality is small, this does not mean that there are no distributional considerations in combating school failure. On the contrary – distributional aspects are important, as the policies minimizing school failure will be targeted towards people in the lower end of income distribution, compressing the wages from below. These are the very people social policy is concerned with the most.

7 Total costs of school failure

The total costs of school failure or rather **potential benefits** achievable by reducing school failure by half for one birth cohort are listed in Table 7 per person and for half of early school leavers (725 persons). Figure 6 represents the numbers for half of early school leavers graphically.

The most important component by far is private earnings, followed by tax revenues. From social entitlements costs, pensions stand out as an important source of additional cost from better education due to longer life expectancy and higher wages (which affect the size of pensions) for the better educated. These are offset by payroll tax revenues.

¹³The figure shows the median (the line inside the box) and the 25th and 75th percentiles (lower and upper bounds of the box) of wage income. The 10th and 90th percentiles are marked by the ends of the lines coming out of the box. The violin plot in the background shows the distribution of the wages in more detail (the plot is cut at EUR 1,800). 50% of the earners are inside the box, 25% below and 25% over it. The black dot shows the average wage for our sample.

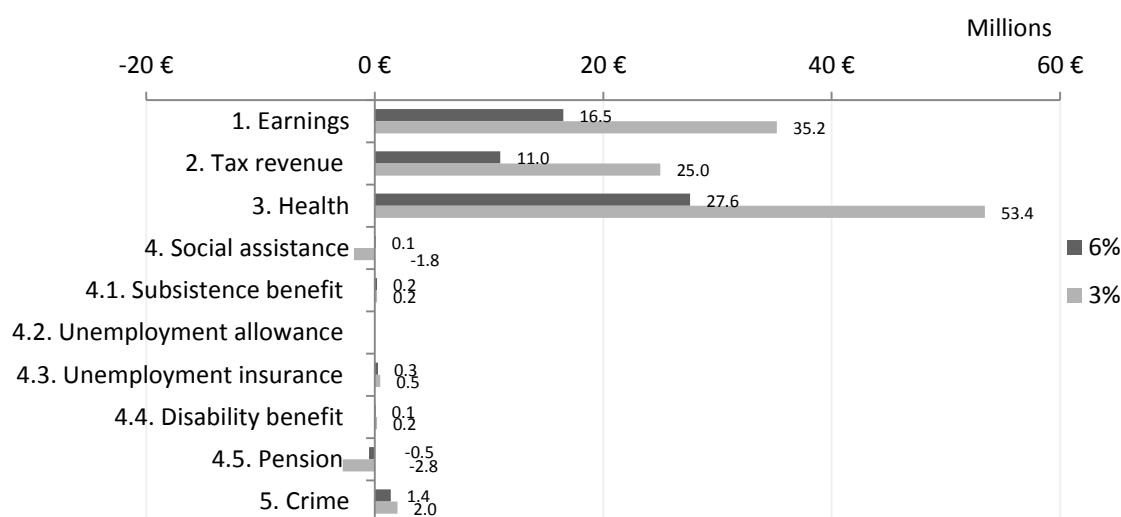
Table 7. Total costs of school failure per person and for 50% of early school leavers (725 persons), EUR

	Per person		For 50% of early school leavers	
	6%	3%	6%	3%
discount rate:	6%	3%	6%	3%
1. Earnings	23,000	49,000	16,500,000	35,200,000
2. Tax revenues (payroll taxes)	15,000	34,000	11,000,000	25,000,000
3. Health capital	38,000	74,000	27,600,000	53,400,000
4. Social assistance	<1000	-2,000	100,000	-1,800,000
4.1. Subsistence benefit	<1000	<1000	200,000	200,000
4.2. Unemployment allowance	<1000	<1000	0	0
4.3. Unemployment insurance	<1000	1,000	300,000	500,000
4.4. Disability benefit	<1000	<1000	100,000	200,000
4.5. Pension	-1,000	-4,000	-500,000	-2,800,000
5. Crime	2,000	3,000	1,400,000	2,000,000
TOTAL	78,000	157,000	56,600,000	113,800,000

Source: authors' calculations

Altogether, the potential benefit from reducing school failure by half for one birth cohort ranges from **EUR 113.8mil (at a 3% discount rate) to EUR 56.6mil (at a 6% discount rate)**. As a percentage of Estonian 2011 GDP, the respective figures would be 0.71% and 0.35%.

Figure 6. Total costs of school failure, EUR



Source: authors' calculations

There are number of assumptions behind these values and a lot of them will certainly turn out to be incorrect in retrospect – we cannot know the actual wage growth in the future; changes in technology or tax code can alter wages and employment opportunities for people with different educational attainments; and changes in social assistance system affect the burden on government. There will certainly be advances in medicine and developments in crime and judicial practice.

We also expect early school leavers to behave exactly like current high school graduates when attaining this level, but if it is the case that their innate abilities – which cannot be affected by education – are inferior, this may not be the outcome. There probably is a share of people who will find it hard to adapt to both the demands of schooling and successful employment. The interventions that will help them to finish upper secondary education may or may not be sufficient to make them equal in terms of job prospects and general values to other high school graduates.

On the other hand, we do not take into account the possibility of continuing towards tertiary education after completing the upper secondary. The potential benefits from tertiary education are large and would affect the results even if a small proportion of current early school leavers went on to attain that level of education. Furthermore, policies towards reducing early school leaving will also benefit people who, even in the absence of the policies, would not leave school, as well as those who leave school despite the policies but stay in school longer than they otherwise would have. It may raise the aspirations of many to continue towards tertiary education, or just allowing them to fulfill their potential for achieving higher cognitive abilities at the same level of education. We only account for payroll taxes, though people with higher productivity and wages will benefit both the economy and tax revenues in multiple ways.

There is room for error in both directions in our estimates, but even as educated guesses, they contain a lot of information that can be considered actionable.

8 Policy recommendations

Education plays a very important role in shaping our future both at the individual level as well as in impacting the overall economic performance of the country. Despite the recent decline in the share of early school leavers amongst 18-24 year olds, in 2010 11.6% of the people in this age group had neither achieved upper secondary education nor were striving towards it. This figure is higher than the Lisbon target (10%) agreed at the European level.

The first policy suggestion rising from this report is that it is important to tackle school failure because it's costly for Estonian society. When using 6% interest rate, Estonia loses ca 78 thousand EUR over each person's lifecycle who has obtained lower secondary education, but has not graduated from upper secondary programme. If half of the persons stopping their studies at lower secondary level in 2011 could be brought to graduation at the upper secondary level, the school failure costs that could be avoided over their lifetime would amount to 0.35% of GDP. This is a large amount of money. Thus, from a very pragmatic point of view **reducing the school failure should be high in every government's agenda.**

Estonia has introduced a new Basic Schools and Upper Secondary Schools Act that provides a lengthy list of possible intervention measures as well as general principles for addressing school failure. In principle, the **approach chosen in this act is reasonable**, emphasizing continuous work from the early stages with both students and their parents and describing how the problem is to be solved through teamwork with extra competences being brought in, depending on the severity of the problems that need to be addressed. However, the devil is usually in the details and quite often in the implementation details. As the new act stepped into force only in the beginning of 2011, it is very difficult to say anything about the effectiveness of implementation of the measures listed in the Act.

There are, however, some lessons that can be drawn from the period before the new Act stepped into force.

First, it is unclear **how accurate the information in the Estonian Educational Information System is regarding the measures taken for combating school failure**. The teachers must file in the system the student's special educational needs (SEN) and measures that have been taken to address them. In case of such a large system as the general education system, special care has to be devoted if one wants to achieve a coherent approach to students' educational needs all over the country. Often the problem is not so much in reporting data but in differences in teachers' understanding of what constitutes a SEN and when special treatment is needed. We would recommend **a training programme specifically aimed toward unifying the practices** of how to spot early signs of problems that can lead to dropping out of the school and how to address special educational needs. The emphasis of this training programme should be not so much on how to approach specific severe SENs but rather on how to spot less severe learning and behavioural problems and how to benefit from the network of specialists both inside and outside the school to solve these problems already at the root. SEN issues are a component of teachers' base training (maybe with slightly lesser intensity than the topic actually requires), but the average age of a teacher in the Estonian general school being 47 years, for most of the teachers the base training is long in the past. If the new system is really to have some tangible impact then a refreshment of the knowledge of SEN issues for most of the teachers is of vital importance.

In addition to training, **tools for picking up first signs of potential problems** should be made available for teachers. Today, there exists the example of the individual development card – a tool that can be used by all teachers for recording SEN and keeping track of the measures that have been implemented. However, according to our interviews, use of this tool is not very widespread and each school can use a different kind of tool. In order to give the topic of SEN a kick-start, we propose that a standardized form of individual development card should be used. Also, it should be more user-friendly and, what's most important, already integrated to the currently used "e-kool" IT solution. The individual development card could be something in line with "early warning systems" that have been designed in several other developed countries.¹⁴

Some improvements could also be made in the **exchange of information between schools in case of transfer from one school to another**. At present, the information on SEN as well as measures implemented by the school will only become available to the new school if the parent of the student agrees to pass this information on. It is not unusual that the reasons for dropping out of the school are linked to problems at home. In some cases, the parents are not sufficiently interested in how their child is doing at the school or what the nature of the problems at the school is. It might even be that the parent's personal characteristics become an obstacle in passing the relevant information on to the new school. Eventually, teachers in the new school will also rediscover the special educational needs and design new measures, but meanwhile valuable time is lost. One could redesign the system so that under special circumstances (e.g. strong emotional level conflicts between teacher and student), a parent can demand that the information on SEN and applied measures will not be sent to the new school but otherwise the relevant information is passed on without any obstacles.

¹⁴A nice example is the Early Warning System (<http://www.betterhighschools.org/EWIMSTool.aspx>) that has been developed by National High School Centre that was established by U.S. Department of Education.

Finally, it is fair to say that **the data that is currently available does not allow for good quality impact evaluation** of the new components of school failure prevention that were introduced with the new Basic and Primary School Act. Striving towards the comparison of two otherwise equal groups – one that has been exposed to the measure under evaluation and the other that has not – is at the heart of a good impact evaluation. The implementation of new measures should thus be carefully planned, starting with adequate data collection and choosing the treatment and control groups. A better understanding of the actual impact of the measures is the cornerstone of well-functioning policy. Unfortunately, these necessary steps of planning have not been implemented in the case of this specific reform. Hopefully, this can be corrected next time a larger policy initiative is launched.

In addition to suggestions arising purely from Estonia-specific experience, there are also some **general results from international experience** that are worth keeping in mind for potential further adjustments in policy. There is at least one OECD paper (Lyche 2010) that gives a quite recent overview of international experience with different policy measures. The following list is not composed with the intention to duplicate the results of this excellent report. It only highlights some more important general aspects that could come handy in further policy design (Lyche 2010):

- **The intervention must start early** – in early stages, broad measures can target larger groups of students. Later, where problems become more intense, each intervention has to be more specific.
- At **pre-primary and primary levels**, focus should be on **broader development of cognitive and non-cognitive skills**. The measures must be capable of **picking up risk behaviour**, and adequate **social support** has to be accessible for both children as well as their parents.
- At **lower secondary school, smooth transition** is important. Where necessary, substance-abuse curricula should be introduced. Schools where demands are higher have a higher completion rate, meaning more course requirements and higher demands lead to fewer students dropping out. **It is suggested to challenge low performing unmotivated students by placing them in advanced programmes instead of reducing their study load or simplifying their tasks**. In combination with a few other support measures, it has been shown to be effective in preventing dropping out. Extra-curricular activities (preferably involving families) are important.
- At **upper secondary level, recuperative courses before school begins should be introduced**, along with mentoring and tutoring courses if additional help is needed. Extra-curricular activities are also relevant, as well as providing high-quality vocational education tracks for those who are not interested in academic studies.

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