# IN FOCUS

## YOUNG PEOPLE IN EDUCATION AND IN THE LABOUR MARKET

Edited by
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# INTRODUCTION

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The chapters of *In Focus* review the main stages of young people's entry into the labour market, from acquiring their education to getting their first job. The level of detail in each chapter is inevitably varied: those that rely on previous research can obviously offer a more thorough analysis, while others are more descriptive. Some chapters present completely new results based on research funded by the Hungarian Ministry of Finance.

The first chapter presents the main trends of the past fifteen years in education and youth employment. The second chapter analyses school choice and dropping out as well as the development of competences that can be attained at school. The third chapter examines the channels through which school-leavers can gain their first experience at work. Chapter four examines the scarring effects of troubled labour market entry on future careers and examines whether low levels of local labour demand and high commuting costs may contribute to youth unemployment. Chapter five explores the impact of employment policies and services on youth unemployment. Chapter six provides a short review of the disadvantages Roma youth face in education and the labour market. Chapter seven explores employers' skills requirements, the returns on tertiary education and the role of on-the-job training in supplementing the missing skills. Finally, chapter eight focuses on the occupational and geographical mobility of youth.

Considering the recent increase in employment and the decrease in the number of NEET (Not in Education, Employment, or Training) young people, the school to work transition seems smooth. However, the details depicted by the chapters of *In Focus* suggest that, these favourable developments cannot be attributed to the well-oiled operation of the relevant labour market institutions (see chapters 3 and 5). Instead, the underlying reason is more likely that, due to the high demand for skilled labour, the majority of skilled youth can find employment without support from public services. At the same time a significant share of unskilled youth only find short-term employment with wage subsidies or in public works. Many of the young people who drop out after finishing primary school end up in public works or unemployment, and receive little support for continuing their studies or entering the labour market.

Whilst the demand for employees with at least secondary education has further increased,[1] the rise in the average level of education has stalled among

1 This is indicated by the growing rate of employment of those with a secondary education (ISCED 3A or 3B) and higher education (see *Tables 4.15* and *4.16*).

new labour market entrants (see sub-chapters 2.3 and 8.2). Furthermore the recent policy measures related to public education and higher education (for instance the lowering of the school-leaving age, see sub-chapters 2.5 and 6.2; the reform of vocational education, see sub-chapters 2.4 and 2.2; or the cut in the number of state subsidised places in higher education) do not support the accumulation of general skills.

Further improvement of the situation of young people in the labour market over the long term may be curbed by two obstacles. On the one hand, as demand is shifting towards non-cognitive skills, an increasing share of entrants with secondary or tertiary education, and most of those with primary education will lack the skills required by employers (*Nedeloska–Quintini*, 2018, see sub-chapter 7.2). On the other hand, the youth with weak basic skills who could easily find employment during the economic expansion, will face the risk of losing their jobs during the next crisis or due to the advancement of technology, and lack the ability to adapt to such changes.[2] With its current, limited capacities, the public employment service will not be able to offer appropriate support in gaining skills or finding stable jobs (chapter 5). These problems could arise even more severely for those generations which may enter the labour market in an unfavourable economic situation (sub-chapters 4.1 and 4.2).

2 Those with a vocational education have weaker basic skills than those who completed secondary education (ISCED 3A or 3B). As they get older, they are more likely to work in unskilled jobs (*Varga, 2018*), even though they had no such disadvantage just after leaving school with freshly gained vocational skills (sub-chapter 8.1).

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# 1 YOUNG PEOPLE IN THE LABOUR MARKET AND IN EDUCATION – CHANGES BETWEEN 2002 AND 2018

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The educational attainment and labour opportunities of young people deserve significant attention for several reasons. First, the characteristics of the young generations predict future changes in the size, composition and quality of labour supply, which in turn affects economic growth. Their educational and career choices could support the adaptation of labour supply to the changing demands of employers. Second, school-leavers have less information and experience than older employees and require more support in finding a job. The EU's Youth Guarantee Programme requires (and finances) Member States to ensure this support (*EU Council*, 2013). The appropriate design of these services also requires thorough analysis. Finally, it is a well-established fact in the international literature that long-term unemployment experienced shortly after leaving school can lead to permanent losses in terms of employment opportunities and wages (e.g. *Bell–Blanchflower*, 2011, *Burgess et al*, 2003). In Hungary, in addition to the 2008 financial crisis and the subsequent increase in migration, public education and vocational training underwent a number of reforms after 2010: this makes the analysis of young people's labour market opportunities particularly important.

## Labour market trends in international comparison

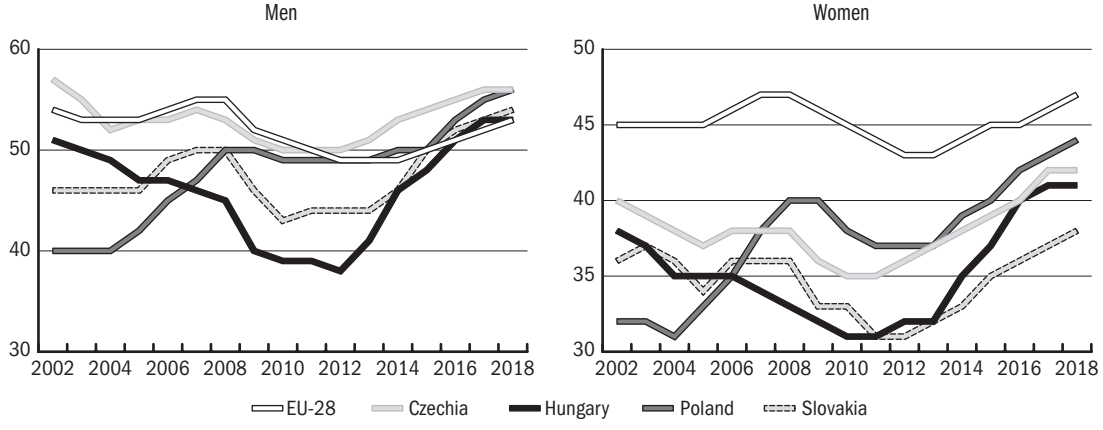
Recent trends in the employment and unemployment of young people have been more or less favourable, whilst indicators of educational attainment have somewhat worsened, particularly in comparison to the European Union.[1] The employment rate of 15–29 year-olds significantly decreased during the crisis of 2008–2011: way below the EU average, it was the lowest among the Visegrád Group countries (*Figure 1.1*). Due to the fast rate of growth observed in recent years, this gap essentially disappeared by 2016. These tendencies apply to both genders, but in the case of men, both the decrease during the crisis and the subsequent increase were more prominent. Some of this may be attributed to supply-side developments, as suggested by the fact that the increase after 2012 was faster for 15–29 year olds than among 30–34 year-olds.[2]

Unemployment followed the development of the economic cycle, i.e. it slowly increased before the crisis, soared during the crisis, and declined steadily during the subsequent recovery. There is little variation in this amongst the Visegrád Group (and the EU average), except for the Czech performance, which was of a somewhat more favourable nature than in other countries in the region.

1 We compared the Hungarian data to the Visegrád Group countries and the EU average: the international data is assumed to indicate improvement that can be attained in theory, and we can evaluate the developments in Hungary compared to these. The calculations described in the chapter are presented in more detail in *Csillag et al* (2019).

2 The employment rate of men aged 30–34 rose from 85 percent to 92 percent between 2012 and 2018, while the employment rate of those aged 15–29 rose from 38 percent to 53 percent.

Figure 1.1: Employment rate of men and women aged 15–29, 2002–2018




Note: The employed include public works participants.
Source: *Eurostat*.

The share of youth not in education, employment, or training (NEET) among men aged 15–29 years developed similarly to unemployment: during the crisis, it was above the averages of the European Union and the Visegrád Four, amounting to around 14 percent, while in more recent years it declined rapidly, even compared to other countries, reaching 7.5 percent by 2018. The effect of the economic cycle was visible in the case of women as well, it was albeit weaker, and the improvement in recent years was also smaller in their case, therefore the NEET-rate stayed high in regional comparison (*Mascherini et al*, 2017). In 2018, the female NEET rate was 18.6 percent in Hungary, whilst the EU28 average, as well as the Czech or the Polish indicators did not exceed 16.5 percent.

As for participation in full time education, recent trends vary both across the Visegrad countries and in the European Union. In Hungary and Slovakia, the share of youth in full time education followed the development of the economic cycle: during the recession it was high (around 67–68 percent), then throughout the economic boom it began to decrease. In Hungary it dropped to around 60–61 percent, and in Slovakia it began to increase again only in 2017. In Poland (where employment did not decline during the recession) the share of students was decreasing until 2018, whilst in Czechia and the European Union average, it increased continuously. The Hungarian indicator trailed behind the EU28 average (67 percent) by 7 percent, and also behind the Czech indicator (70 percent) by 10 percent. To summarise, whilst employment and unemployment developed favourably, the decrease in the share of students diverges from the EU trends in an unfavourable way.

### Factors shaping young people's labour market outcomes

The employment rate can increase for various reasons. It is a positive development if the increase is due to new entrants and young unemployed people finding work faster, or if mothers with small children return to the labour market sooner, as this implies that the unemployed or inactive period, which erodes ability to work, has shortened. The role of services assisting in job search is discussed in Chapter 5 of this volume.

The role of demographic trends influencing labour supply cannot be neglected either. The decrease of birth rates can increase employment, or if the cohort of youth in their 20ies is more numerous than the cohort of youth in their teens, who are typically less likely to participate in the labour market.

It is less favourable if employment grows because young people drop out of school, and fewer of them study further in secondary and higher education (see sub-chapter 2.5), as this reduces the human capital of the affected cohorts (and consequently their average productivity), which is expensive to correct in adult education.

Lastly, one should also consider the forms of work that are favoured by the expansion. If employment is growing in stable jobs that support skills development, that is favourable both for young people's careers and economic growth. If the expansion is mainly in casual, temporary jobs, fixed-term contracts or public works, that may be less favourable. This is because if young people spend a long time in a job where there is no opportunity for either career advancement or learning, this can result in lower productivity and wages throughout their entire future career – this is discussed in sub-chapters 3.3 and 5.5.

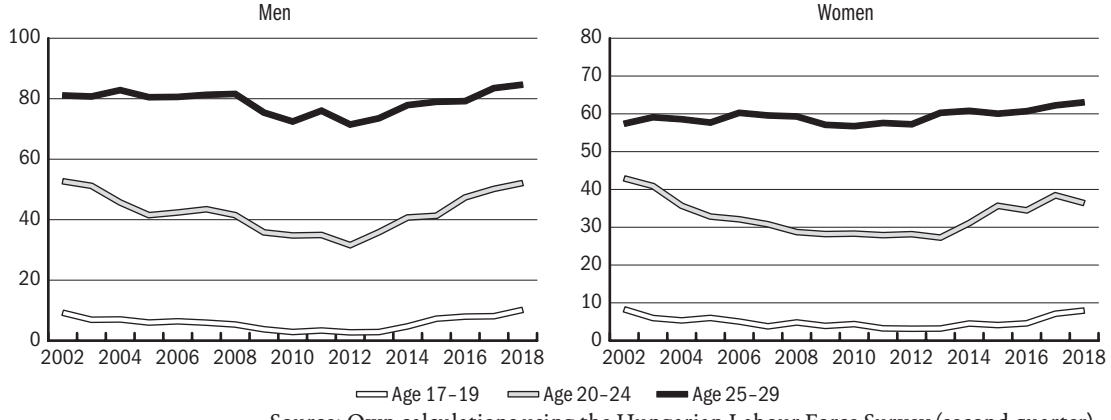
The drastic decrease of employment in the years of the recession deserves special attention, as that may have long lasting consequences for the generations that entered the labour market during the recession. Chapter 4 explores this scarring effect in more detail.

### Labour market status by age group

To get one step closer to understanding the observed trends, we examine the development of employment and education by gender and age group (*Figures 1.2, 1.3* and *1.4*). In order to more accurately assess the improvement of the employment indicator, we calculated the employment rate for the past 15 years using the labour force survey of the Hungarian Central Statistical Office (HCSO), excluding public works participants (as they do not work on the primary labour market),[3] as well as those who were in full-time education, and those receiving childcare who did not work. Youth not in employment, education, or training (NEET) were defined as those who were not employed (except if in public works), and did not participate in any form of education or training (full-time or part-time, within or out of the school system).

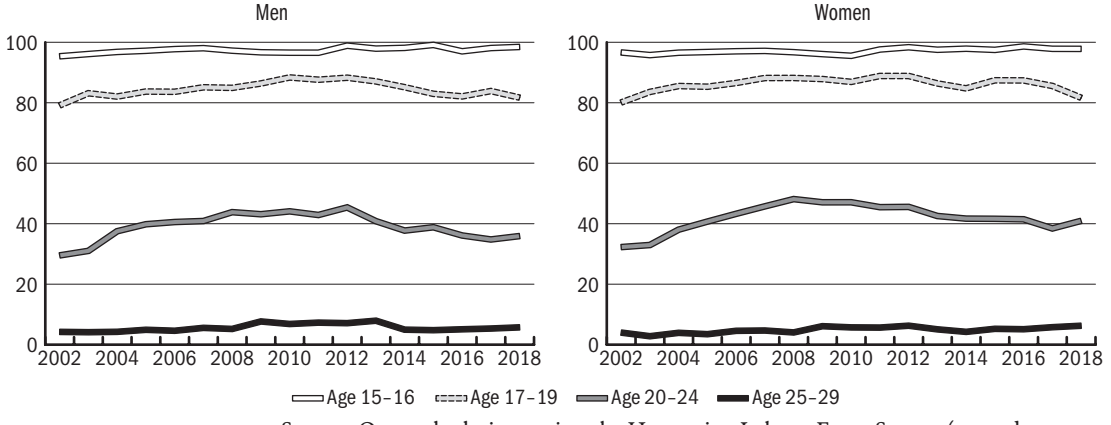
3 The proportion of youth in public employment is not significant. 1–1.5 percent of those aged 17–19 work in this form, it is the greatest among men aged 20–24, where the rate is around 3 percent.

Figure 1.2: Employment rate by age and gender, 2002–2018 (percent)




Source: Own calculations using the Hungarian Labour Force Survey (second quarter).

Figure 1.3: Share of full-time students, by age group, 2002–2018 (percent)



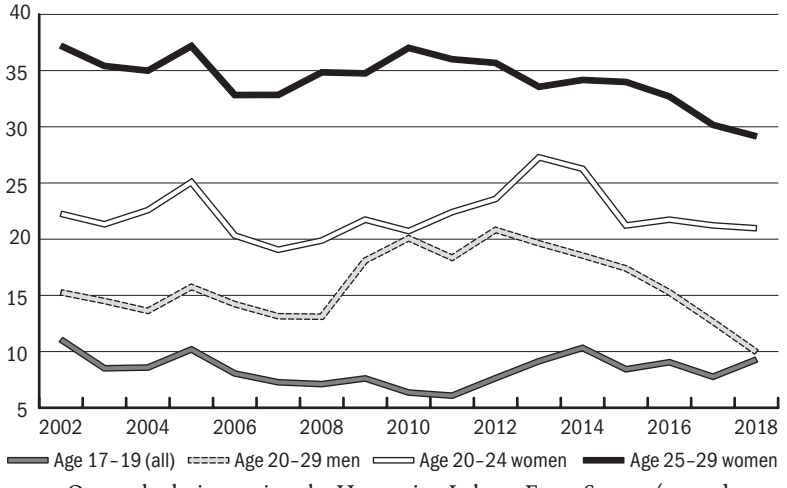

Source: Own calculations using the Hungarian Labour Force Survey (second quarter).

The time series shown by age group in *Figures 1.2, 1.3, and 1.4*, clearly depict the effect of the 2008 recession on the labour market, especially on the employment outcomes of men. During the recession, the employment rate of men aged 20–29 decreased, the share of full-time students stayed intact, while the NEET rate increased. In the following period of growth, the employment rate and the NEET-rate showed a rapid recovery. The indicators for women aged 20–29 developed similarly to those for men, except that during the recession their employment did not decrease as much. In the case of women aged 25–29 the effects of the recession are less significant on all indicators, which may be explained by the improvement of their educational attainment or delayed childbearing.

There is also a clear decline, and then a reversal of the prior, fast improvement in the level of schooling, which can be explained in part due to the booming

demand for labour, and in part due to policy measures (the centralization of education, the lowering of the compulsory school-leaving age, the reform of secondary education, the cut in publicly funded places in higher education). In recent years, the rate of full-time students decreased in the 17–19 and the 20–24 age groups, most significantly in the case of men aged 20–24, where the indicator dropped 10 percentage points between 2012 and 2017.

Figure 1.4: Share of youth not in employment, education or training (NEET) by age group and gender, 2002–2018 (percent)




Source: Own calculations using the Hungarian Labour Force Survey (second quarter).

The development in the composition of NEET youth also points to the effects of the recession: the share of those young people who have been searching for a job for some time as well as those young people who are discouraged[4] and inactive decreased by 25 percentage points between 2012 and 2017. In economically disadvantageous regions, however, the rate of long-term unemployed and (or) discouraged young people remained high. The reasons for this are discussed in sub-chapters 5.1 and 6.2.

### The wage returns of educational attainment and experience

There were some changes in the wage returns of education between 2002 and 2016, but the observed slight decline in returns are not large enough to explain the observed drop in enrolment in tertiary education after 2012. The wage premium of higher education decreased – especially in the case of new entrants – but it remained significant (*Table 1.1*). The relative wages of graduates were influenced by numerous factors in this period, which all pointed towards the narrowing of the wage premium. First, the previous expansion in higher education and the Bologna Process increased the supply of graduates, and the share of those entering the labour market after achieving a Bach-

4 The categorization follows the method of Eurofound (see also, in greater detail in sub-chapter 5.1) (*Mascherini–Ledermaier,* 2016).

elor's degree. Second, the minimum wage and the guaranteed wage minimum which essentially affects for those with primary and secondary education continued to increase (cf. sub-chapter 5.4). Finally, the removal of the top income tax bracket could also slow down the increase in the average *gross* wages of graduates.[5] The wage returns to experience, however, increased in the case of graduates (especially for men). Chapter 2 and sub-chapter 7.3 examine these developments in detail.

**Table 1.1: New entrants' monthly gross real wages in the business sector, by education, gender and work experience, 2012–2016**

| | Men | | Women | |
|---|---|---|---|---|
| | 0–1 years | 5 years | 0–1 years | 5 years |
| | of work experience | | | |
| **2012** | | | | |
| Primary | 102,896 | 108,438 (105%) | 98,238 | 103,161 (105%) |
| Vocational school | 106,785 | 115,290 (108%) | 100,451 | 105,162 (105%) |
| Secondary | 120,963 | 135,520 (112%) | 117,393 | 127,494 (109%) |
| Higher | 246,253 | 283,602 (115%) | 193,447 | 230,372 (119%) |
| **2016** | | | | |
| Primary | 151,854 | 157,430 (104%) | 155,887 | 157,099 (101%) |
| Lower secondary | 164,994 | 173,246 (105%) | 155,771 | 159,826 (103%) |
| Upper secondary | 179,216 | 194,712 (109%) | 159,898 | 172,331 (108%) |
| Higher | 244,920 | 323,837 (132%) | 214,871 | 264,046 (123%) |

Note: Percentages show the wage premia compared to new entrants (2016 = 1).
Source: *PES* Wage survey, own calculations.

### Decomposing changes in employment and the NEET rate

The above discussed aggregated changes in the labour market and education indicators are shaped by long-term demographical trends, policy actions and the economic environment as well. The growth of the employment rate and the recently seen significant decrease of the NEET-rate may be explained not only by the economic boom for instance, but also by the (slowing) rise in school participation.

We show the relative importance of these main processes via factor decomposition. We compare the later years to the labour market outcomes of youth recorded in 2002. We examine three pivotal years: 1) 2007, the last year before the recession; 2) 2012, the lowest point of the recession in terms of youth employment; 3) 2017, the last year for which we have data available.

To decompose the main factors, we used the quarterly waves of the Hungarian Labour Force Survey and we considered five levels of educational attainment,[6] three age groups, and finally the seven (NUTS2) regions, and we performed the analysis by gender. When analysing employment, we considered those in public works as unemployed (as they do not work in the labour market), but did not count them among the NEET youth. We used the

5 Before 2011, personal income tax was a progressive tax (in the top bracket, 32 percent above an annual salary of 5 million HUF), this was replaced by the flat rate tax at 19 percent.

6 The five categories are: primary education, vocational education, general secondary, secondary with vocational education, higher education.

Oaxaca-Blinder decomposition method, which decomposes the changes (in percentage points) between the given pair of years into two parts. The composition-effect shows to what extent the difference (across two years) in the population's composition in terms of age, educational attainment and residence explains the change observed in the NEET- and the employment rate. The parameter effect captures the effect of all other changes.

Findings are summarised in *Tables 1.2* and *1.3*, where we present the changes in the NEET rate and the employment rate calculated in percentage points. We portray, again in percentage points, the contribution of changes in the composition of youth, particularly the changes in the composition of young people's educational attainment, as well as what can be attributed to other economic factors (this is shown by the parameter effect).

**Tables 1.2: Decomposing the employment rate of the population aged 16–29, 2002–2017 (percentage points)**

| | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | 2007 | 2012 | 2017 | 2007 | 2012 | 2017 |
| Total difference | –3.91 | –14.06 | –0.42 | –4.36 | –7.52 | –0.09 |
| Composition effect | –2.93 | –6.25 | –4.55 | –0.89 | –1.69 | –1.26 |
| of which: education | –2.61 | –4.54 | –4.38 | –0.69 | –0.80 | –1.20 |
| Parameter effect | –0.98 | –7.82 | 4.13 | –3.47 | –5.84 | 1.17 |

Source: Own calculations using the Hungarian Labour Force Survey (second quarter).

**Table 1.3: Decomposing the NEET-rate of the population aged 15–29, 2002–2017 (percentage points)**

| | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | 2007 | 2012 | 2017 | 2007 | 2012 | 2017 |
| Total difference | –3.32 | 0.95 | –5.78 | –5.53 | –4.09 | –7.47 |
| Composition effect | –0.61 | –1.03 | –1.06 | –1.34 | –2.88 | –2.29 |
| of which: education | –0.34 | –0.61 | –1.04 | –1.13 | –1.81 | –2.22 |
| Parameter effect | 2.71 | –1.99 | –4.72 | –4.19 | –1.20 | –5.18 |

Source: Own calculations using the Hungarian Labour Force Survey (second quarter).

Changes in employment between 2002 and 2017 were governed primarily by economic processes, while – especially for women – changes in the educational composition of youth also played a minor role.[7]

In the decrease of the NEET-rate, however, the increase in young women's average education-levels (which in itself would have decreased the NEET-rate by 2 percentage points) had an important role, which grew over time. At the same time, out of the 7 percentage point decrease in the NEET-rate by 2017, economic and social processes account for more than 5 percentage points, which contributed to improving the NEET rate within particular educational and age groups as well. In the case of young men, the improvement of the

7 Throughout the observed period, the composition based on education continued to improve, albeit slowly, which decreased the employment rate amongst the youth through increasing the rate of those in further education (whilst it increases it in the age group following the completion of higher education).

educational composition only reduced the NEET-rate by around 1 percentage point. The labour market prospects of the NEET youth are examined in more detail in sub-chapters 5.1. and 5.2.

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# 2 SCHOOL EDUCATION

## 2.1 THE IMPACT OF READING AND MATHEMATICS TEST RESULTS ON FUTURE EARNINGS AND EMPLOYMENT

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### Introduction

Until the recent decades, *educational attainment* was measured by qualifications or completed years of schooling, when researchers tried to explore its impact on labour market prospects, because there were simply no other data comparable across time and space. This substantially distorted findings, since it was not possible to take into account differences in the quality of education, its efficacy and the knowledge gained outside school. Owing to the spreading of the standardised assessment of competences, enabling comparison across regions and over time, in recent decades it has become possible to measure the competence level of school leavers. As a result, later research has increasingly focused on the level of cognitive skills and their impact on labour market outcomes and earnings (cf. *Hanushek,* 2009).[1]

Studies typically find that higher test scores, implying better cognitive skills, are associated with an easily quantifiable wage advantage throughout working life. Research has also demonstrated that test results are strongly associated with future earnings, even after controlling for educational background, work experience and other typical explanatory variables. For example, the literature review by *Hanushek* compared several studies based on American data, and concluded that one standard deviation increase in test results at the end of upper-secondary school translates into 12 percent higher annual earnings in adulthood on average.[2]

One could say that although the association between test results and future earnings is undeniable, there is no causal relationship between them and the assumed positive impact of test results on earnings is in fact due to differences in innate abilities and intelligence. However, the findings of some studies (including *Lazear,* 2003) strongly suggest that general intelligence, that is the level of innate abilities, does not entirely determine subsequent labour market outcomes. Indeed, learning improves specific cognitive skills and in this way the results of intelligence tests, and even if it does not enhance general intelligence (cf. *Ritchie et al,* 2015), the improved specific cognitive skills are reflected in increasing earnings (*Finnie and Meng,* 2001; *Fazekas,* 2018).

Therefore it is crucial to investigate to what extent cognitive skills correlate with labour market success. This subchapter is the first in Hungary to ana-

1 Another major group of studies (inspired by *Bowles–Gintis,* 1976 and *Jencks,* 1979) explored the impacts of non-cognitive skills and abilities (also called personality traits) on labour market outcomes and wages, in addition to (or sometimes instead of) the impacts of cognitive skills. For more details see Subchapter 7.2.

2 Several other studies from developed and developing countries have come to similar conclusions: there is a statistically and economically significant association between skills and wages (and other labour market outcomes, such as employment). However, the size of the wage premium, attributed to a standard deviation increase in skills, varies a lot (from 5 per cent to 48 per cent), since the utilized model form and control variables affect the results considerably.

lyse how standardised test results of upper-secondary school students relate to subsequent wages in young adulthood and unemployment probabilities.

## Data and methods

We used a panel of linked administrative data (Admin3) compiled in 2019 by the Databank of the Centre for Economic and Regional Studies (*Sebők,* 2019), which contains individual-level, anonymized data of 50 percent of the Hungarian population between 2003 and 2017, stored in administrative databases. The database contains data indispensable for this study such as the reading and mathematics skills of individuals assessed during their school years, as well as their qualifications, age, wages and labour market status in early adulthood.

The sample includes those who were tested either for mathematics or reading or both in grade 10 during the National Assessment of Basic Competences (NABC) in 2008, provided that there is information available concerning their labour market status in 2017. This is one cohort of upper-secondary school students, aged 25–26 in 2017.

Inactive persons and students (including the ones working and studying simultaneously) were excluded from the sample, in addition to those whose labour market status was unknown at the time of the survey.[3] Therefore labour market chances are analysed from a narrow perspective (employed *versus* registered unemployed or unemployed receiving benefits).

Our earnings estimations refer to those who were employed on 15 October 2017 and whose actual wage data are available from the database. Our unemployment estimations are based on the sample including registered unemployed, recipients of unemployment benefits, participants of labour market programmes or public works and the number of employees, respectively, as of October 2017.

Mincer earnings functions (*Mincer,* 1974) were estimated first, with earnings regressed on mathematics and reading test scores in grade 10, and educational attainment, gender, estimated labour market experience[4] as well as the latter squared in 2017. Certain subsequent regressions were controlled for sectors, occupations and place of residence (district level). The dependent variable for the earnings regressions was the logarithm of monthly wages, thus the results can be interpreted as percentages.[5]

In addition, estimations on unemployment probabilities are also provided, where the dependent variable is a dummy variable taking the value 1 for registered unemployed and public works participants and 0 for employees.

The mathematics and reading scores of grade 10 pupils at the NABC in 2008 were standardised (i.e. converted into variables with means of 0 and variances of 1), therefore the coefficients in the estimations below can be interpreted as changes in standard deviation.

3 The latter group may include the unemployed or inactives not receiving social benefits and may also include those working or studying abroad. Thus it is not possible to identify the inactive population not in education accurately.

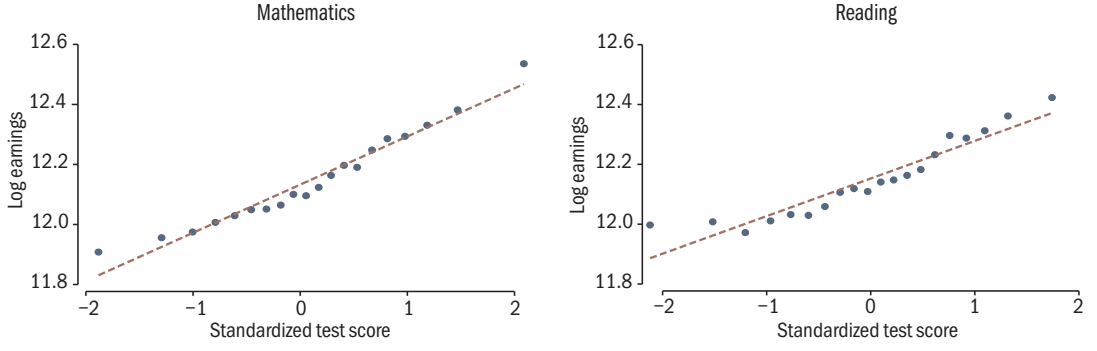
4 The estimated labour market experience is defined as the number of years between the time of obtaining the highest qualification (school attainment) and October 2017.

5 For those who did not work in their job throughout October 2017, a monthly wage was calculated from the wage observed, taking into account the number of days actually worked. Unfortunately, the database cannot at present differentiate between full-time and part-time workers.

### Results – total sample

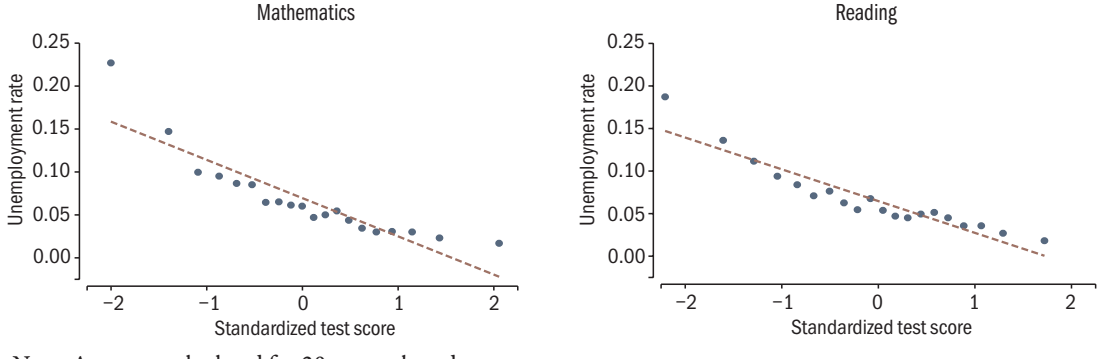
*Figures 2.1.1* and *2.1.2* show the raw association between standardised test scores and the logarithm of earnings, or unemployment probability, respectively. The Figures reveal, on the one hand, that both mathematics and reading are strongly associated with labour market outcomes, and, on the other hand, that the connection is almost linear, just slightly diverging from the straight line at the ends of the distribution, thus a linear form is adequate to use in the employment and wage equations.

**Figure 2.1.1: Association between test scores in grade 10 and the logarithm of earnings**




Note: Averages calculated for 20 groups based on test scores.
Source: Authors' compilation.

**Figure 2.1.2: Association between test scores in grade 10 and unemployment**




Note: Averages calculated for 20 groups based on test scores.
Source: Authors' compilation.

*Tables 2.1.1* and *2.1.2* show the Mincer regressions estimated for the entire sample described above. The impact of test scores in grade 10 on earnings is shown in *Table 2.1.1* and the impact of test scores on unemployment probability is presented in *Table 2.1.2*. The estimated coefficients are expected to be positive in the first case, and negative in the second.

Column (2) of *Table 2.1.1* relies on mathematics scores as the sole indicator of cognitive skills. It reveals that students achieving one standard deviation

higher scores in grade 10 are likely to have 8.5 per cent higher wages in the labour market. Estimates in Column (3) include both mathematics and reading test scores. The results indicate that mathematics scores are more strongly associated with wages than reading scores. For understanding the underlying reasons, a more thorough research is needed than the present descriptive study.[6]

**Table 2.1.1: Impact of test scores in grade 10 on the logarithm of earnings in young adulthood**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Vocational school | 0.122** | 0.137*** | 0.138*** | 0.0966** |
| | (0.0532) | (0.0529) | (0.0529) | (0.0471) |
| Secondary school (Matura) | 0.203*** | 0.144*** | 0.137*** | 0.0987** |
| | (0.0512) | (0.0510) | (0.0511) | (0.0454) |
| Higher education degree | 0.591*** | 0.454*** | 0.440*** | 0.280*** |
| | (0.0585) | (0.0588) | (0.0590) | (0.0528) |
| Mathematics scores | | 0.0850*** | 0.0752*** | 0.0448*** |
| | | (0.00499) | (0.00622) | (0.00561) |
| Reading scores | | | 0.0166*** | 0.00685 |
| | | | (0.00636) | (0.00571) |
| Constant | 11.71*** | 11.81*** | 11.82*** | 11.70*** |
| | (0.0628) | (0.0627) | (0.0628) | (0.0940) |
| Fixed effects | | | | |
| Sector | | | | Yes |
| Occupation | | | | Yes |
| District | | | | Yes |
| N | 28,188 | 28,188 | 28,188 | 28,136 |
| $R^2$ | 0.077 | 0.087 | 0.087 | 0.299 |

Note: OLS-estimations.
Dependent variable: logarithm of monthly wages. Control variables not shown in the table: gender, potential work experience and its square, dummy variables signifying missing values for experience and test scores.
The reference category for qualifications is lower secondary school (8-year general school).
Standard errors are indicated in brackets.
***Significant at a 1 per cent, **5 per cent, *10 per cent level.
Source: Authors' compilation.

The estimation in column (4) of *Table 2.1.1* contains further control variables that may have an impact on wages regardless of test scores, for example the sector and type of occupation and the location of work. The estimation in Column (4), including all control variables, shows a lower value for the coefficient of the mathematics test score achieved in grade 10, as compared to the figure in Column (3), but the connection is still significant and strong. The results of equation (4) indicate that better cognitive skills not only enable people to get jobs in better paid occupations, but persons with higher mathematics scores also tend to have higher earnings within a given occupation. It may be concluded that in Hungary cognitive skills in upper secondary school are strongly associated with subsequent wages in early adulthood.

6 Considering the rather strong association between the two test scores, it is difficult to separate the effect sizes. The correlation between the two test scores ranges between 0.7–0.8 in Grade 10 in the various years.

*Table 2.1.2* shows the association between cognitive skills and the probability of unemployment in the total sample. Similarly to wages, mathematics test scores achieved in grade 10 are strongly associated with the probability of becoming unemployed. Column (2) relies on mathematics test scores as the indicator of cognitive skills. Our results indicate that one standard deviation increase in results in grade 10 reduces the probability of unemployment by 2.7 percentage points in young adulthood. Column (3) includes both mathematics and reading scores. Similarly to wages, the explanatory power of mathematics test scores is stronger, but unemployment probabilities of individuals are also significantly explained by their reading skills. After taking local labour market control variables into account, coefficients in Column (4) are lower but still significant.

**Table 2.1.2: Impact of test scores in grade 10 on the probability of unemployment in young adulthood, marginal effects**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Vocational school | -0.0395*** | -0.0397*** | -0.0395*** | -0.0300*** |
| | (0.00842) | (0.00765) | (0.00761) | (0.00682) |
| Secondary school (Matura) | -0.0928*** | -0.0664*** | -0.0604*** | -0.0507*** |
| | (0.0159) | (0.0147) | (0.0145) | (0.0129) |
| Higher education degree | -0.0977*** | -0.0655*** | -0.0585*** | -0.0531*** |
| | (0.00992) | (0.0106) | (0.0110) | (0.00918) |
| Mathematics scores | | -0.0270*** | -0.0202*** | -0.0146*** |
| | | (0.00155) | (0.00195) | (0.00172) |
| Reading scores | | | -0.0112*** | -0.00481*** |
| | | | (0.00196) | (0.00173) |
| District fixed effect | | | | Yes |
| N | 31,855 | 31,855 | 31,843 | 31,326 |
| Estimated average probability | 0.0674 | 0.0674 | 0.0674 | 0.0683 |

Note: Probit estimates.
Dependent variable: Registered unemployed or public works participant (1) or employee (0). Control variables not shown in the table: gender, potential work experience and its square, dummy variables signifying missing values for experience and test scores.
The reference category for qualifications is lower secondary school.
Standard errors are indicated in brackets.
***Significant at a 1 per cent, **5 per cent, *10 per cent level.
Source: Authors' compilation.

### Results by school attainment

*Tables 2.1.3* and *2.1.4* show the last specifications of the tables above, containing all control variables, estimated for subgroups by school attainment. *Table 2.1.3* indicates that the association between cognitive skills and wages is stronger among higher education graduates, compared to those with lower qualifications, but the situation completely different for labour market chanc-

es: *Table 2.1.4* shows that cognitive skills at upper-secondary school are far more strongly associated with subsequent labour market outcomes (employment status, or the chance of becoming unemployed) among the low-qualified than among higher education graduates.

**Table 2.1.3: Impact of test scores in grade 10 on the logarithm of earnings in young adulthood by school attainment**

| | Low-education level (lower-secondary or vocational school) | Secondary level (Matura) | Higher education level (BA or above) |
|---|---|---|---|
| Mathematics scores | 0.0192 | 0.0370*** | 0.0758*** |
| | (0.0128) | (0.00808) | (0.00996) |
| Reading scores | 0.00673 | 0.0102 | 0.00650 |
| | (0.0123) | (0.00801) | (0.0112) |
| N | 4,948 | 14,644 | 8,544 |
| $R^2$ | 0.300 | 0.250 | 0.319 |

Note: OLS-estimation.
Dependent variable: logarithm of monthly wages. Control variables not shown in the table: gender, potential work experience and its square, dummy variables signifying missing values for experience and test scores as well as sector, occupation and district fixed effects.
Standard errors are indicated in brackets.
***Significant at a 1 per cent, **5 per cent, *10 per cent level.
Source: Authors' compilation.

**Table 2.1.4: Impact of test scores in grade 10 on the probability of unemployment in young adulthood by school attainment, marginal effects**

| | Low-education level (lower-secondary or vocational school) | Secondary level (Matura) | Higher education level (BA or above) |
|---|---|---|---|
| Mathematics scores | –0.0319*** | –0.0136*** | –0.0160*** |
| | (0.00618) | (0.00274) | (0.00305) |
| Reading scores | –0.0194*** | –0.00201 | –0.00301 |
| | (0.00609) | (0.00274) | (0.00337) |
| N | 5,624 | 15,642 | 6,615 |
| Estimated average probability | 0.141 | 0.0699 | 0.0385 |

Note: Probit estimates.
Dependent variable: Registered unemployed or public works participant (1) or employee (0). Control variables not shown in the table: gender, potential work experience and its square, dummy variables signifying missing values for experience and test scores.
Standard errors are indicated in brackets.
***Significant at a 1 per cent, **5 per cent, *10 per cent level.
Source: Authors' compilation.

The above findings reveal that in the case of the low-qualified better cognitive skills strongly contribute to avoiding unemployment; however, they do not substantially contribute to higher (observed) wages. By contrast, among

higher education graduates, better skills result in a smaller reduction in the probability of unemployment, but contribute more substantially to higher wages. Considering that the standard deviation of wages is smaller at the lower end of the qualification distribution than at the top, while the standard deviation of the probability of unemployment is much smaller at the top, the findings of this study are by no means surprising. Nevertheless, in order to better understand the mechanism behind the associations between cognitive skills assessed at upper-secondary school and labour market outcomes in early adulthood in Hungary, further research is warranted.

**Conclusion**

The impact of the quality of education on the level of cognitive skills has been well documented. Other factors also influencing their level include – among others – family environment, peer groups and health. The latter are not easily influenced by social policy instruments, while the quality of education, which may significantly improve the cognitive skills, and thus the labour market chances of the population, is much easier to raise.

This study is the first to show in Hungary that the cognitive skills of pupils assessed in grade 10 are strongly associated with labour market success in young adulthood. Our findings indicate that one standard deviation increment in mathematics test results may increase future earnings even by 8–9 per cent on the whole, but within a given occupation or sector, the increase is also about 5 per cent. Furthermore, better cognitive skills are likely to substantially reduce the risk of unemployment: overall, one standard deviation increase in mathematics test results decreases the probability of unemployment by approximately 2.7 percentage points. Accordingly, the likelihood of unemployment for adults with skills considerably (i.e. by about 2 standard deviation units) better than the average are negligible – between 1 and 2 per cent –, while those with substantially worse than average skills face a more than 10 per cent probability of becoming unemployed.

When analysing cognitive skills and labour market success by qualification level, it is seen that cognitive skills are more likely to have an impact on wages among the highly qualified, while they are more strongly associated with unemployment risks among the low-qualified. One of the reasons for this pattern is that better cognitive skills contribute to avoiding unemployment on the one hand (if this is an immediate threat, for example in the case of the low-qualified), and, on the other hand, they result in higher earnings through better occupations, higher positions and higher wages, which is mainly observed among the highly qualified.

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## 2.2 THE IMPACT OF SCHOOL TRACKS ON STUDENT PERFORMANCE IN UPPER-SECONDARY EDUCATION

ZOLTÁN HERMANN

The effects of school tracks on student performance and disparities between students have long been debated both in international and Hungarian literature alike. Some studies found the academic track to increase student performance (for example *Guyon et al,* 2010, *Pop-Eleches–Urquiola,* 2013, *Horn,* 2013), while others did not report a significant effect of tracks (for example *Malamud–Pop-Eleches,* 2010, *Dustmann et al,* 2012) or mainly attributed disparities between tracks to student selection on admission (*Manning–Pischke,* 2006).

This chapter explores the effects of the three upper-secondary educational tracks in Hungary: general secondary school which is a pure academic track, vocational secondary school which is a track with a mixed academic and vocational orientation and vocational school.

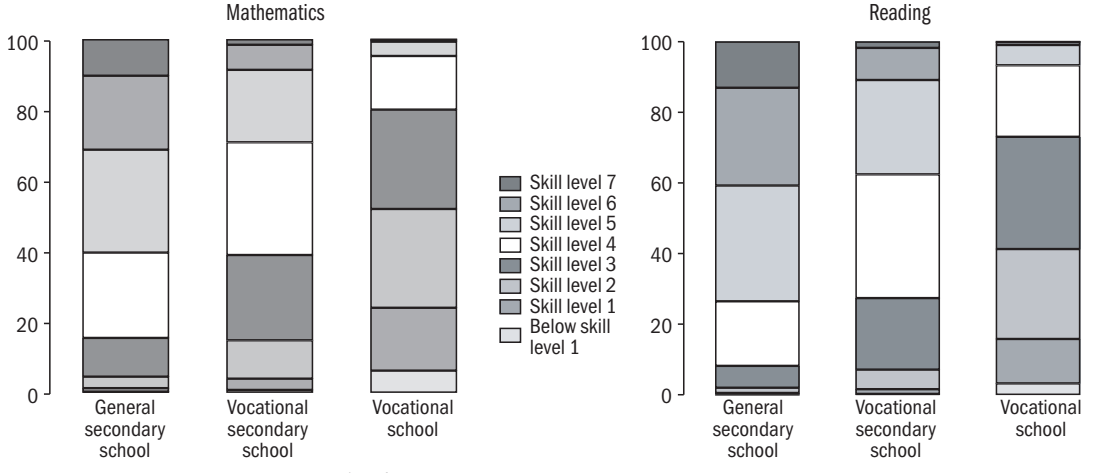
The analysis relies on data from the National Assessment of Basic Competences (NABC). NABC measures the mathematics and reading skills of all students in Grades 6, 8 and 10, except for students with special educational needs and those absent from school on the day of the assessment, using a scale that enables comparison across years and grades. Our analysis includes a single cohort (except for *Figure 2.2.1*): students in Grade 8 in 2014. The sample contains students progressing without grade repetition and those who repeated a grade only once between two assessments (Grades 8 and 10 or Grades 6 and 8), while those completing the two grades in more than three years were excluded from the analysis.

*Figure 2.2.1* presents the differences in test results in Grade 10 across school tracks in 2017 (for skill levels see *Balázsi et al,* 2014). The differences are huge. A quarter of vocational school students possess exceptionally poor skills and have difficulties solving the easiest exercises (skill levels 1 and below 1 on a 7-point scale), half of them perform very poorly (skill level 2 at most) and four-fifths of them poorly (skill level 3 at most). By contrast, 60 per cent of general secondary school students demonstrate fairly good (skill level 5 at least), one-third of them very good (levels 6 and 7) skills at the assessment, while poor assessment results are very rare. The majority of vocational secondary school students achieve average results.

*Figure 2.2.2* shows the test scores in Grade 10 of students achieving similar scores in Grade 8, broken down by track. It is obvious that students performing better in Grade 8 also achieved proportionately higher scores in Grade 10 in each of the three tracks. However, students achieving equal scores in Grade 8 performed better in secondary schools ending in a secondary school leaving examination (Matura) than in vocational schools. For example, students achiev-

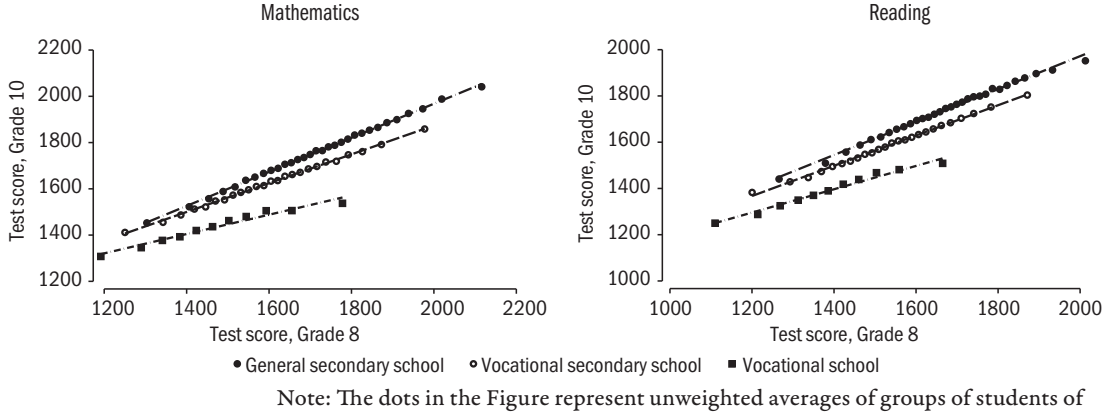
ing 1400 points in mathematics in Grade 8 also achieve about 1400 points in Grade 10 in vocational school on average, while those of them studying in general or vocational secondary schools obtain nearly 1500 points. This approximately 100-point difference amounts to half a standard deviation unit (the standard deviation of test scores in Grade 8 is 200 points). In another respect, the 100-point difference is somewhat smaller than the difference between the average students of two consecutive skill levels (skill levels cover ranges of about 140 points). The Figure reveals that there is also a slight difference in the performance of general and vocational secondary schools (to the advantage of the former) but this is much smaller than the lag of vocational schools.

**Figure 2.2.1: Skill levels of Grade 10 students by school track,[a] 2017 (percentage)**




[a] Unweighted proportions.
Source: Authors' calculations based on data from *NABC* 2017.

**Figure 2.2.2: Test scores in Grade 10 as a function of Grade 8 scores, by school track; students in Grade 8 in 2014**



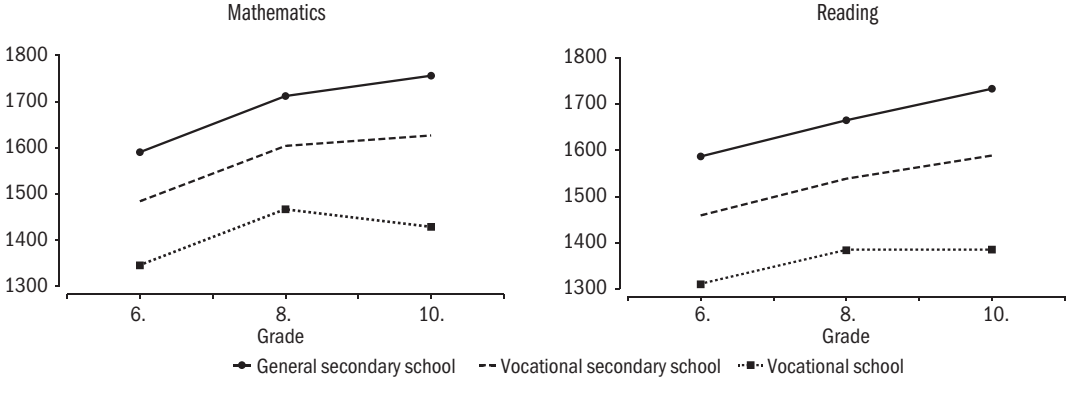

Note: The dots in the Figure represent unweighted averages of groups of students of about 1000.
Source: Authors' calculations based on data from *NABC* 2014–2017.

These disparities are of course not entirely attributable to upper-secondary education: they primarily emerge in primary and lower-secondary education and reflect the impact of selection on admission to upper-secondary school. The question is whether there is a significant difference in the performance of school tracks in addition to the effects of selection.

The differences revealed by *Figure 2.2.2* suggest that upper-secondary school tracks contribute to developing basic skills to varying degrees. However, these differences may be due to differences between students, since students studying in the various tracks may not only differ in earlier academic achievements. It is possible that vocational school students have more learning difficulties, develop more slowly or they are less motivated or diligent.

Based on *Figure 2.2.3*, indirect conclusions may be drawn about the effects of these factors. The Figure presents the average test scores of students attending one of the three tracks in Grade 10 and their scores in Grade 6 and 8. In the first two grades of upper-secondary school, between Grade 8 and Grade 10, the average test scores of students in general and vocational secondary schools increase, while vocational school students achieve equal reading score and lower mathematics score in Grade 10 than in Grade 8 on average. What is particularly interesting, is that the increase between Grades 6 and 8 is similar in the three groups. Although future vocational school students obtained lower scores in Grade 6 and 8 than students subsequently attending tracks concluding with a Matura, their average test score increased to the same extent over the two years. This suggests that it is not impossible to improve basic skills in this group.

**Figure 2.2.3: Changes in average test scores between Grades 6 and 10, by school track; students in Grade 8 in 2014**




Note: Unweighted averages.
Source: Authors' calculations based on data from *NABC* 2014–2017.

Estimates in *Table 2.2.1* quantify the effect of school tracks more accurately. These regression models include test scores in Grade 10 as dependent variables.

Estimates in Columns (1) and (3) include the following control variables: indicators of prior student performance (test scores in both competence areas in Grades 6 and 8 as well as grades at the end of Grades 8 and 6, the latter as dummy variables) and individual characteristics of students (gender, special education needs and severe disadvantage, educational attainment of mother and father and the number of books possessed, all as dummy variables). The missing values of control variables were substituted by average or typical values and missing values are denoted by independent dummy variables. Controlling for these factors, coefficients show how students are likely to perform in Grade 10 depending on the school track they attend.

**Table 2.2.1: Regression estimates of the effect of school tracks on student performance in Grade 10; students in Grade 8 in 2014**

| | Mathematics | | Reading | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| General secondary school | 18.59*** | 14.20*** | 26.65*** | 15.00*** |
| | (1.434) | (1.437) | (1.265) | (1.472) |
| Vocational school | -51.28*** | -71.09*** | -58.87*** | -63.94*** |
| | (2.138) | (2.581) | (1.803) | (2.730) |
| General secondary school × test score in Grade 8 | | 0.0924*** | | 0.0696*** |
| | | (0.00671) | | (0.00730) |
| Vocational school × score score in Grade 8 | | -0.108*** | | -0.0524*** |
| | | (0.0107) | | (0.0116) |
| Number of observations | 67,115 | 67,115 | 67,171 | 67,135 |
| Number of schools | 2,518 | 2,518 | 2,518 | 2,518 |
| $R^2$ | 0.702 | 0.706 | 0.729 | 0.703 |

Note: Unweighted *OLS* estimates.
Reference category for school track: vocational secondary school.
Control variables: test scores in both competence areas in Grades 6 and 8, the categories of grades at the end of Grades 8 and 6, gender, special education needs and severe disadvantage, the categories of educational attainment of mother and father, the categories of the number of books possessed as well as dummy variables denoting the missing values of control variables.
Standard errors clustered for upper-secondary schools are shown in parentheses.
***Significant at a 1 per cent, **5 per cent, *10 per cent level.
Source: Authors' calculations based on data from *NABC* 2014–2017.

The findings show that a vocational school student achieves 50 points less in mathematics and 60 points less in reading on average than a vocational secondary school student with equal performance in lower secondary school. The advantage of a general secondary school student is 20–25 points. The standard deviation of test scores is about 200 points, thus the lag of vocational school students increases by a quarter, while the advantage of general secondary school students increases by one-tenth of a standard deviation unit.

Estimates in Columns (2) and (4) of *Table 2.2.1* also include the interaction terms of school tracks and the test score in Grade 8 in the given competence area. The coefficients of the interaction terms indicate that the effect of track

is associated with performance in lower-secondary school: the better the test result of a student in Grade 8, the more advantage studying in a general secondary school is likely to entail compared to a vocational secondary school, and the more disadvantage results from studying in a vocational school. These findings are consistent with the trend seen in *Figure 2.2.2*, which reveals the difference between school tracks increases with test scores in Grade 8.

*Table 2.2.2* presents these correlations from another aspect. The models show how school track is associated with the probability of high or low performance in Grade 10, after controlling for individual factors. Since low performance levels are less frequent both in the total sample and among average students than high performance, the three lowest performance level together with below level 1 were defined as low performance, while levels 6 and 7 were regarded as high performance. Control variables are identical to those used in earlier estimates.

**Table 2.2.2: Regression estimates of the effects of school tracks on the probability of high and low student performance; students in Grade 8 in 2014, marginal effects**

| | Mathematics | | Reading | |
|---|---|---|---|---|
| | performance level | | | |
| | medium-low (level 0–3) | high (level 6–7) | medium-low (level 0–3) | high (level 6–7) |
| | (1) | (2) | (3) | (4) |
| General secondary school | -0.0451*** | 0.0130*** | -0.0432*** | 0.0409*** |
| | (0.00572) | (0.00143) | (0.00365) | (0.00278) |
| Vocational school | 0.142*** | -0.0159*** | 0.116*** | -0.0512*** |
| | (0.00901) | (0.00258) | (0.00620) | (0.00474) |
| Number of observations | 67,115 | 67,115 | 67,171 | 67,171 |
| Number of schools | 2,518 | 2,518 | 2,518 | 2,518 |
| Pseudo $R^2$ | 0.4497 | 0.5259 | 0.4851 | 0.5114 |
| P average | 0.3518 | 0.1797 | 0.2629 | 0.2447 |

Note: Unweighted *OLS* estimation.
Reference category for school track: vocational secondary school.
Control variables: test scores in both competence areas in Grades 6 and 8, the categories of grades at the end of Grades 8 and 6, gender, special education needs and severe disadvantage, the categories of educational attainment of mother and father, the categories of the number of books possessed as well as dummy variables denoting the missing values of control variables.
Standard errors clustered for upper-secondary schools are included in parentheses.
***Significant at a 1 per cent, **5 per cent, *10 per cent level.
Source: Authors' calculations based on data from *NABC* 2014–2017.

35 per cent of students achieved a low performance level in Grade 10 in mathematics, while 26 per cent of them did so in reading. Estimates in Column (1) and (3) indicate that if an average student goes on to study at vocational school instead of vocational secondary school, the probability of low performance increases significantly: by 14.2 percentage points in mathematics and

11.6 percentage points in reading. By contrast, if continuing their studies at general secondary school, this probability decreases by 4.5 and 4.3 percentage points respectively. The trend is just the opposite for high performance [Columns (2) and (4)]. The share of high performers is 18 per cent in mathematics and 24 per cent in reading. General secondary school, compared with vocational secondary school, increases the probability of high performance by 1.3 and 4.1 percentage points in Grade 10 respectively among average students, while vocational school decreases the probability by 1.6 and 5.1 percentage points respectively.

It is important to note that the above results are not exclusively attributable to the impact of school track, as it cannot be ruled out that for example students in vocational schools take the tests less seriously, which slightly increases the estimated effect of this track compared with its actual effect. Nevertheless, earlier estimates that compared the data of students "just admitted" and "just rejected" in order to control for unobserved characteristics such as students' motivation and aspirations found slightly weaker but very similar trends (*Hermann,* 2013).

In conclusion, the results indicate that the huge differences emerging by the end of lower-secondary education between students continuing their studies in one of the three school tracks increase further over the first two years of upper-secondary school. This increase is significant, especially between vocational school students and students studying in the other two tracks concluding with a Matura.

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## 2.3 APPLICATION TO AND ADMISSION INTO UPPER-SECONDARY EDUCATION

ZOLTÁN HERMANN & JÚLIA VARGA

The progression into secondary education has a fundamentally important effect on the future educational path of students, and consequently, their future career path in the labour market and their success (see for example *Kézdi et al,* 2008; *Horn,* 2014, *Makó–Bárdits,* 2014, *Hajdú et al,* 2015). In past years, significant changes have been made in the schedules and contents of vocational training schools,[1] which – combined with the changes in the labour market environment – may influence students' plans and opportunities regarding further education. In this subchapter, we present how the proportion of those applying to, and those admitted into, particular types of secondary schools changed between 2005 and 2017, and how the proportion of those applying to, and those admitted into, schools offering vocational training changed, by vocational groups.

The analysis is based on the data of the Information System – Secondary School Admission Database (KIFIR) on the period between 2005 and 2017. This database contains the application and admission data of students applying for secondary education having completed the eighth grade of elementary school (or the fourth or sixth grade, in the case of eight- and six-year secondary schools).

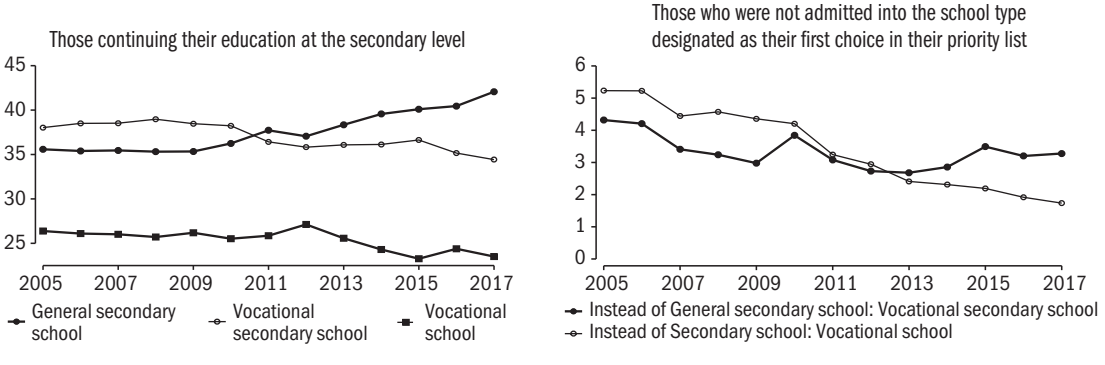
Secondary schools rank applicants based on their elementary school and entrance examination results. Taking these, and application priorities into consideration, a central admission algorithm determines which student gets admitted into which school. A small number of students do not get admitted into any of the schools via this application and admission process, because they applied only to schools that either rejected them outright or filled their numbers with applicants that ranked higher. These students will look for a school where they can continue their studies personally, but this database does not contain the results of that process. In the analysis, we presumed that these students would study in the school type with the lowest prestige in their application list, but at the same time, this group is not included in the analysis regarding the vocational groups. Their rate dropped from 8 percent in 2005 to 3 percent in 2017.

In the analysis, we present rates relative to the number of students studying in secondary education in the given school year. This is the sum of all applicants who had completed the eighth grade of secondary school (presuming that students who did not get admitted anywhere in the first round of the admission process would also continue to secondary education) and the number of students who gained admission to eight- or six-year secondary schools. We did not take into consideration students applying unsuccessfully to eight- or six-year secondary schools, as they will go into secondary education after completing the eighth grade of elementary school.

1 One change worth highlighting is that the length of training in vocational secondary schools (named vocational schools until 2016) has been reduced to three years in 2013, replacing the former 4- or 5-year training period. Since 2016, the proportion of vocational content in the training material and of professional practice/traineeship has increased significantly in vocational grammar schools (named vocational secondary schools until 2016), while the hours of general education subjects have seen a decrease. First, state-managed vocational training institutions were transferred to the Ministry of National Economy in 2015, which organised the various institutions into vocational training centres. Then in 2018, the Ministry of Innovation and Technology was appointed to be in charge of secondary vocational training institutions.

*Figure 2.3.1* shows the changes in the shares of school types in secondary education (figure on the left); the proportion of students who were not admitted into the school type designated as their first choice in their priority list; and the type of school they were admitted into instead of the school type designated as their first choice in their priority list (figure on the right). After 2012, the rate of applications to vocational schools started decreasing following the stagnation observed between 2005 and 2011, and by 2017, less than a quarter of students wanted to get admitted into this school type. The rate of applications to general secondary schools grew between 2009 and 2011, and then continued to grow after 2012; this is the school type in which the highest number of students wish to continue their studies. Vocational secondary schools are considered decreasingly popular among students. The rate of students applying to this type of school decreased both in 2016 and 2017. The majority of students can continue their studies in the school type of their choice (right side of *Figure 2.3.1*). The rate of those who only managed to gain admission into a vocational school instead of a general or vocational secondary school that provides a secondary school diploma decreased from 5 percent in 2005 to 2 percent in 2017, and the rate of those who had no choice but to study in a vocational secondary school instead of a general secondary school decreased from 4 percent to 2 percent.

**Figure 2.3.1: The proportion of those continuing their education at the secondary level and those who were not admitted into the school type designated as their first choice in their priority list, by school type, 2005–2017 (percentage)**

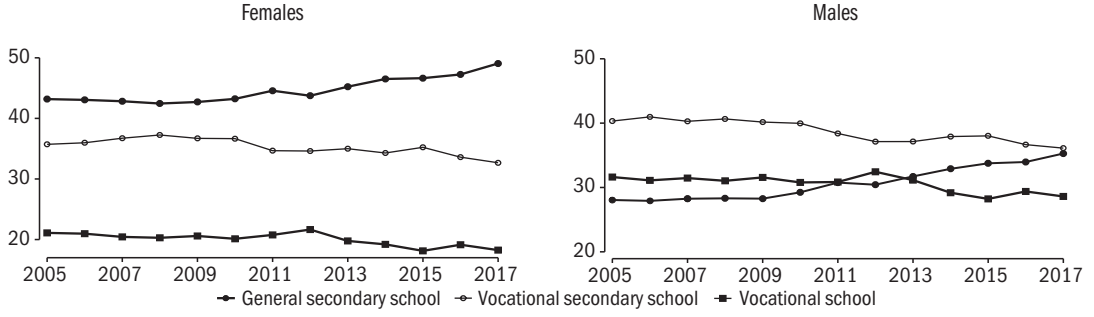



Source: Authors' compilation.

A significantly higher proportion of females study in general secondary schools than males, while a higher proportion of males continue their studies in vocational secondary schools and vocational schools. After 2012, the growth of the proportion of males continuing their studies in general secondary schools began to speed up, and the composition of the school types of males continuing their education after elementary school has been significantly rearranged. In 2017, the highest number of males continued their education in general

and vocational secondary schools, and the rate of those doing so in vocational schools dropped below 30 percent (*Figure 2.3.2*).

**Figure 2.3.2: The proportion of those continuing their studies in secondary education, by school type and gender, 2005–2017 (percentage)**




Source: Authors' compilation.

Secondary vocational applications (vocational secondary school, vocational school) were aggregated into 12 vocational groups. The changes in the proportions of these can be followed in *Table 2.3.1* both separately by school type and combined. In a few vocational groups, education or training is conducted *only* or *predominantly* in one of the school types (such as health care, IT, economics, administration).

**Table 2.3.1: The percentage of those continuing their studies in vocational secondary schools or vocational schools, among those continuing their education at a secondary level, by vocational groups, 2007, 2017**

| | Vocational secondary school | | Vocational school | | Combined | |
|---|---|---|---|---|---|---|
| Vocational group | 2007 | 2017 | 2007 | 2017 | 2007 | 2017 |
| Not classified | 1.0 | 0.0 | 0.3 | 0.0 | 1.3 | 0.0 |
| Health care | 1.7 | 2.0 | 0.2 | 0.0 | 1.9 | 2.0 |
| Social, education | 2.2 | 3.8 | 0.3 | 0.7 | 2.7 | 4.5 |
| Mechanical engineering | 5.3 | 3.4 | 4.4 | 4.8 | 9.6 | 8.1 |
| IT | 6.1 | 5.7 | 0.6 | 0.3 | 6.7 | 6.0 |
| Construction | 1.0 | 0.7 | 2.9 | 1.5 | 3.9 | 2.2 |
| Chemical and light industries | 2.3 | 1.2 | 3.0 | 1.8 | 5.4 | 3.0 |
| Economics, administration | 4.9 | 4.2 | 0.2 | 0.2 | 5.1 | 4.4 |
| Trade and commerce | 4.5 | 2.4 | 2.5 | 2.0 | 7.0 | 4.4 |
| Agriculture, food industry | 2.0 | 1.6 | 3.2 | 3.8 | 5.2 | 5.4 |
| Other services, public services | 1.1 | 4.2 | 1.2 | 0.3 | 2.3 | 4.5 |
| Transport | 1.8 | 1.6 | 0.5 | 0.8 | 2.3 | 2.3 |
| Vocations not listed in the Hungarian National Qualifications Register (OKJ) | 0.0 | 0.0 | 0.01 | 0.0 | 0.01 | 0.0 |
| Hospitality and tourism | 3.1 | 3.0 | 3.8 | 6.3 | 6.9 | 9.3 |

Source: Authors' compilation.

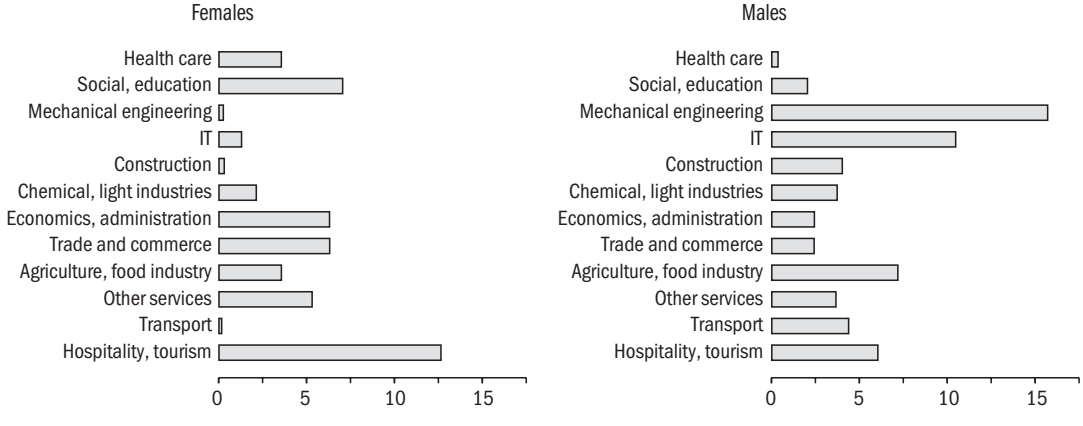
Participation rates decreased in the mechanical engineering-electrical engineering-electronics vocational group and the construction, chemical and light industries and trade and commerce vocational groups. Participation increased in the social and service industries, education, arts, hospitality, tourism and other services, and in public services vocational groups.

These changes occurred in certain vocational groups parallel to a rearrangement among school types. Thus, in the mechanical engineering, electrical engineering, electronics vocational group, the rate of training programmes offering a secondary school diploma shrank, just as in the trade and commerce vocational group. In other vocational groups, such as in the social services, education and arts vocational group, the rate of training programmes offering a secondary school diploma increased.

Overall, the rate of those continuing their studies in vocational secondary schools decreased within the technical vocational groups, while the rate of the trade and commerce and economic services vocational groups increased. The share of technical vocational groups decreased in vocational schools as well, while the rate of those continuing their studies in a human services field increased.

Significant differences can be found between vocational groups by gender as well, which is shown in *Figure 2.3.3*. While the majority of females continue their studies in the fields of trade and commerce and services, the majority of males choose a vocation within the fields of industry or IT (see more in *Csillag et al,* 2019).

**Figure 2.3.3: The proportion of those continuing their studies after elementary school, by gender, 2017**




Source: Authors' compilation.

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## 2.4 THE EFFECT OF THE 2013 VOCATIONAL EDUCATION REFORM ON STUDENT ACHIEVEMENT

ZOLTÁN HERMANN, DÁNIEL HORN & DÁNIEL TORDAI

### Introduction

In the autumn of 2013 a reform of the Hungarian vocational education system took place, the main purpose of which was to make vocational education more practically oriented. The reform affected vocational schools, i.e. the upper-secondary track without the final maturity exam (*érettségi vizsga* in Hungarian). These changes came with the reduction in the number of theoretical classes, especially in the first two years. The higher tracks, general secondary education and vocational secondary education were only slightly or no affected by the reform.

The bill that established the reforms was passed in 2011 and started to have an effect from September 2013.[1] The earlier four or five years long vocational programmes which did not have the final maturity exam at the end of the programme were replaced by three year-long dual educational programmes, in which students had practical classes from the onset, and the opportunity of an apprenticeship contract with a firm from 9th grade was created.[2] Therefore, time spent in practical vocational training was increased. However, both vocational and general theoretical education has decreased, and especially the number of general education classes has lessened significantly (*Bükki et al*, 2014). Following the reform, the name of the vocationally oriented tracks was changed.

Before the 2013 reform, in the four year-long programme, general education subjects took place only in the first two years, but in those two years both 'Mathematics' and 'Hungarian Language and Literature' were taught in 3 classes of each per week, and foreign language and science were included in the curriculum as well. Following the 2013 reform in 9th grade both 'Mathematics' and 'Hungarian Language and Literature' had only 2 classes of each per week, 1 class of each per week in 10th grade, and in the final, 11th grade they were not included at all in the curriculum.[3] So, following the reform students had 1 less Maths and 1 less Literature class per week in 9th grade, and 2 less of each in 10th grade compared to the pre-2013 levels.

As communicated to the public, the primary goal of the reform was for the vocational students to gain more experience in real-life workplaces, so they can enter the labour market more easily after their education. During the planning of the reform the German vocational education system was taken as the example, where the number of general, academic classes is also minimal, and the emphasis is on practical training, which is mostly done by firms (*Dogossy*, 2016). It is important to note however, that while German students start their vocational education after attending 7155, but in certain regions even 7950

1 The CLXXXVII. Law of 2011 on vocational education.

2 The reform of 2013 was not unprecedented, in a share of vocational schools in 2010 the maintainer could have introduced so called "early vocational" programmes, which lasted also for 3 years and had a similar structure to the one that was introduced in the reform.

3 CXC law of 2011 on public education, 8th supplement of the 51/2012. (XII. 21.) EMMI regulation.

general education classes, this number in Hungary is only 5742 (*Hajdu et al*, 2015). So, a Hungarian student participating in vocational education spends about two or three years less with general education subjects, than his German counterparts. Another goal of the reform was to create an educational structure more in line with the demands of the economy, to have a more transparent and cost-effective operation, and to keep the unprivileged students in schools and to help them catch up. However, keeping the youth in schools was made harder by another reform, in which the government lowered the compulsory schooling age from 18 to 16 after 2012 for those who had completed 9th grade.[4]

According to the literature important differences might arise if they improve occupationally specific skills of students graduating from public education at the expense of their general skills. Although they may find a job that fits to their qualifications more easily when they enter the labour market (*Level et al,* 2014, *Ryan*, 2001, *van der Velden–Wolbers*, 2003), this advantage in the long run is overturned and those with a more general education find themselves in a better position (*Hanushek et al*, 2017). Due to the lack of general skills, graduates won't be able to adapt to the changing labour market environment, so they become unemployed more easily, or can obtain a job only for lower wages. However, the lengthening of the duration of secondary educational vocational programmes doesn't necessarily provide benefits even in a younger age group (*Oosterbeek–Webbink*, 2007, *Hall* 2016).

In this subsection we examine the effect of the 2013 reform on mathematics and reading by comparing the changes of test scores between the 8th and 10th grade of cohorts before and after the reform. Reading and mathematics competencies are important elements of general skills, so their decrease might mean – according to the literature – that in the long run the labour market position of the given students might worsen.

**Analysis**

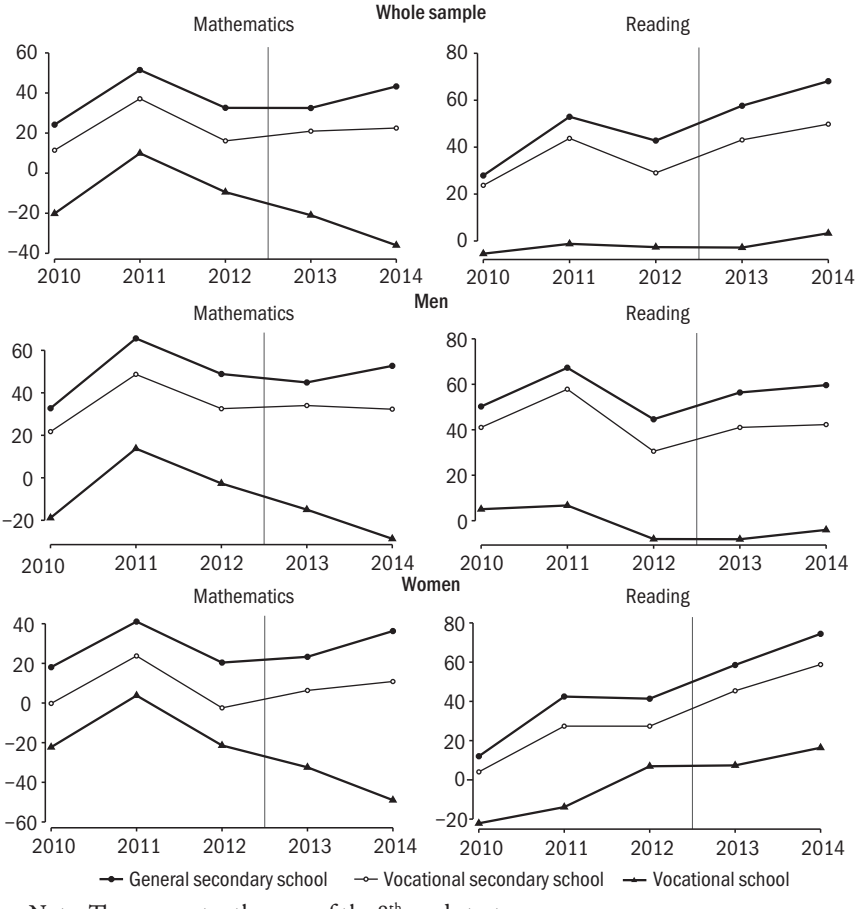
For our analysis we use 8th and 10th grade test scores from the National Assessment of Basic Competencies programme from 2010 until 2017. From 2010 the results were evaluated on the same scale, which makes the comparison of different years' results possible. The effect of the reform is examined on the cohorts which commenced their 8th grade between 2010 and 2014. The average score in the whole sample every year is around 1600, and the standard deviation is around 200.

Our independent variable is the change in mathematics and reading scores between 8th and 10th grade. Our sample also contains students who had to repeat a year on 9th or 10th grade and had to do it only once. In the case of students repeating a year in the 10th grade we considered their earlier test result. We excluded vocational education programmes for special education needs students from the sample.

4 CXC law of 2011 on public education.

*Figure* 2.4.1 shows the average score changes from 8th to 10th grade for both mathematics and reading for the whole sample, and then divided for men and women. After the introduction of the reform the difference between those, whose programme concludes with a maturity exam and those whose doesn't, grows already in the first year. The effect of the reform is more apparent with mathematics test scores, where the score change of those in a vocational school is not only smaller compared to students in the other two educational forms (vocational secondary and general secondary school), but it is becoming smaller even to previous values of this school type. It can be easily observed from the figure that reading and mathematics points of cohorts affected by the reform worsen compared to the students of the other two schools.

**Figure 2.4.1: Average test score change between the 8th and 10th grade for different school types. 2010–2014**




Note: The year notes the year of the 8th grade test.
Source: Authors' compilation.

We are going to estimate the effect of the reform by difference-in-differences method. In our analysis we are going to compare the vocational school students' (treated group) performance change between the pre and post-reform years with the performance change of the vocational secondary school students (control group) in the two periods. (We basically get the same results if we include general secondary school students in the sample.) Supposing that all other factors affecting the test scores – including all the other education policy changes – had a similar effect on the students in the two tracks, the estimates show the causal effect of the reform.

The dependent variable is the test score change, i.e. the difference of 10th and 8th grade points. The main explanatory variables are the dummy variables noting the vocational school, the after reform period, and the interaction of these two. As a control variable we use in our estimation the first, second, and third power of the 8th grade mathematics and reading test scores, the gender of the students, whether the students have special educational needs or have a disadvantageous status, schooling of mother and father, the number of books at home, and fixed effects concerning the cohorts and schools. Apart from the test scores every variable is a dummy variable in the model. Missing values were replaced by typical values and the missing values are noted by a separate dummy variable. The effect of the reform is shown by the interaction variable 'vocational school x reform' (Table 2.4.1).

**Table 2.4.1: The effect of the vocational school reform on test score change between the 8th and 10th grade**

| | Whole sample | | Men | | Women | |
|---|---|---|---|---|---|---|
| | mathematics | reading | mathematics | reading | mathematics | reading |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Vocational school × Reform | -19.48*** | -9.823*** | -15.40*** | -4.094** | -23.81*** | -13.28*** |
| | (1.733) | (1.494) | (2.068) | (1.852) | (2.581) | (2.105) |
| Reform | 14.17*** | 11.57*** | 8.638*** | -4.333*** | 22.19*** | 31.78*** |
| | (1.203) | (1.041) | (1.496) | (1.354) | (1.679) | (1.397) |
| Vocational school | -64.97*** | -73.41*** | -74.53*** | -81.11*** | -49.82*** | -62.53*** |
| | (1.160) | (1.012) | (1.372) | (1.258) | (1.643) | (1.343) |
| $R^2$ | 0.362 | 0.308 | 0.337 | 0.321 | 0.415 | 0.320 |
| Number of observations | 199,975 | 200,097 | 112,754 | 112,780 | 87,221 | 87,317 |
| Number of schools | 25,477 | 25,482 | 19,479 | 19,482 | 17,143 | 17,150 |

Note: Unweighted OLS estimates.
Control variables: first, second, and third power of the 8th grade test scores in both fields, gender, special educational need and disadvantageous status, categories of schooling of mother and father, categories of the number of books at home, categories of the 8th grade test's year, and the dummy variables noting the missing values of the control variables.
Standard errors clustered at the school level in parenthesis.
Significant at a ***1 per cent, **5 per cent, *10 per cent level.
Source: Authors' compilation based on *NABC* data for 2010–2017.

The results confirm our conclusion, drawn based on *Figure 2.4.1.* After the reform test scores decreased in both fields, but the reform had a bigger effect on maths score changes.

Test score change of vocational schoolers between 8th and 10th grade was 19.5 points smaller due to the 2013 reform. For men this change was slightly smaller (–15.4 points), for women it was bigger (–23.8). The reform had a smaller effect on the change of reading scores, –9.8 points on the entire sample, –4.1 for men, and –13.3 for women. The cause of this difference can be that students use their reading skills more outside the classroom than their mathematics skills, so supposedly school has a stronger effect on the latter.

According to the estimated effects we can say that before the reform the average difference between vocational schools and vocational secondary schools in mathematics was approximately 180, in reading 200 points. Our results suggest that due to the effect of the reform this difference grew by more than 10% in mathematics, and by 5% in reading.

The estimation of the reform's effect can be biased, since from 2012 the compulsory schooling age was decreased from 18 years to 16 years, and therefore the composition of students in 10th grade could have changed.[5] We can expect that mostly vocational school students older than 16 years old will fall out of school due to this change. Since students with worse skills have a higher chance of dropping out, we can expect the average scores of vocational schoolers to be better after 2012 than before. So, this change can distort the estimations.

However, data shows that this is not behind the results. The reduced compulsory schooling age was introduced first for those entering secondary education in 2012. So, the cohort that was in 8th grade in 2012 was affected by the lowered compulsory schooling age, but not by the vocational education reform. Recalculating the estimations for the sample including only 2012 and 2013 cohorts yields basically unchanged results, so the reform decreased students' performance even with the same age limit.

## Conclusions

To sum up, we can say that the 2013 reform worsened the mathematics and reading skills of those studying in vocational education concluding without the maturing exam, especially in mathematics and to a greater extent in the case of women. Although our analysis cannot answer the question whether these students can find a job more easily after school, we see that after two years of vocational education the general skills of students are worse after the reform than before, and that this effect is significant. Our interpretation is that this deterioration happened due to the decrease in general education classes. Furthermore, it is likely that even if the more practice-oriented education helps students to find a job quickly following graduation, the decreasing general skills will worsen their position on the labour market in the long run.

5 The estimation might be biased due to a change in changing school choice decisions, and therefore the composition of students in vocational and mixed schools changed significantly However, this is not very likely since none of the average values of individual characteristics changed to a notable extent.

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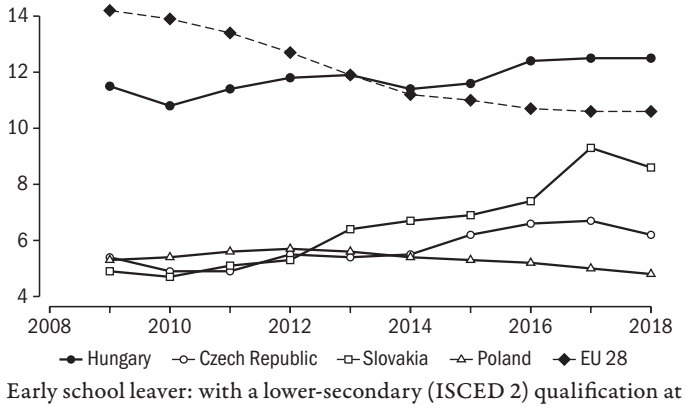
## 2.5 THE IMPACT OF DECREASING COMPULSORY SCHOOL-LEAVING AGE ON DROPPING OUT OF SCHOOL

ZOLTÁN HERMANN

Early school leaving has profound significance for both employment and equity since the lack of upper-secondary qualification (Matura and vocational training certificate in Hungary) results in immensely poor labour market prospects and often leads to persistent poverty. The proportion of early school leavers in Hungary is somewhat higher than the European average: in 2018 it was 12.5 per cent of the population aged 18–24, while the European average was 10.6 per cent (*EC,* 2019, p. 54). The 3.4 percentage point lag of girls is indeed significant, whereas for boys the difference is only 0.4 percentage points. Compared to the other Visegrad countries, Hungary has by far the highest proportion of early school leavers (*Figure 2.5.1*). Moreover, while the proportion of early school leavers decreased in most European countries between 2009 and 2018, in Hungary it started to grow after 2015, making it even more challenging to achieve the target of 10 per cent set by the European Union by 2020 and also adopted by the Hungarian government. This Subchapter explores what role the reduction of the school-leaving age from 18 to 16 in 2012 had in this increase.[1]

Figure 2.5.1: The share of early school leavers in the population aged 18–24 in Hungary, in the Visegrad countries and in the EU on average, 2009–2018




Note: Early school leaver: with a lower-secondary (ISCED 2) qualification at most and not in education.
Source: *Eurostat*.

This study analyses the process of dropping out but does not directly evaluate the dropout rate or early school leaving. This can only be reliably assessed when the majority of pupils have completed upper-secondary education and anyone who has not obtained an upper-secondary qualification is unlikely to obtain one. As in Hungary a significant proportion of pupils only complete

1 Act CXC of 2011 on School Education.

upper-secondary education at the age of 21–22 (*Varga,* ed., 2018), the impact of the 2012 reform cannot yet be assessed in this respect. This Subchapter examines changes in the proportion of those not in education and lacking an upper-secondary qualification at a specific point in time. Since some of the school leavers later return to continue their studies and some are not enrolled because of switching schools, this indicator cannot be regarded as a direct measure of the dropout rate. Thus the value of the indicator we use is not sufficiently informative in itself but changes to it reveal the impact of the school-leaving age reforms.

Earlier research suggests that it is advisable to examine the obtaining of qualifications and the process of dropping out together, because they may yield a different picture. After raising the compulsory school-leaving age to 18 in Hungary in the early 2000s, participation in education increased in the age group 17–18 (*Varga,* ed., 2018); however, the share of those acquiring an upper-secondary qualification did not increase as a result of the reform (*Adamecz-Völgyi,* 2018). There is no consensus in international literature regarding the impact of raising the school-leaving age. Several studies found that raising the school-leaving age increased participation rates but did not have an impact on obtaining an upper-secondary qualification (for example *Raimondi–Vergolini,* 2019, in Italy, *Mackey–Duncan,* 2013, in the United States), while others found a positive effect in both areas (for example *Wenger*, 2002, in the United States, *Cabus–De Witte,* 2011, in the Netherlands). Whereas these studies investigate the impact of raising the school-leaving age, the analysis below looks at the impact of lowering the school-leaving age.

**Data and methods**

The analysis is based on the Admin3 dataset of the Centre for Economic and Regional Studies containing linked administrative data, which contains individual-level data of 50 per cent of the Hungarian population in 2003 up to 2017 (*Sebők,* 2019). In the dataset school enrolment status is recorded on a monthly basis, the highest qualification of young people and the results of pupils in the National Assessment of Basic Competences (NABC). The sample includes participants of the assessment of Grade 8 pupils between 2010 and 2013. The descriptive analysis compares these four cohorts of pupils, while the econometric estimation only includes the 2011 and 2012 cohorts. The school-leaving age of 16 applied to those who did not attend upper-secondary school in the academic year of 2011/2012, that is they started upper-secondary studies in September 2012 or later. Consequently, the school-leaving age of 18 applied to 8$^{th}$ graders taking the test in 2010 or 2011 and the school-leaving age of 16 applied to those in Grade 8 in 2012 or 2013. At the same time, pupils in Grade 8 in 2013 were also affected by in the vocational education and training reform (see Subchapter 2.4). Moreover, they cannot be observed for

sufficiently long time in the database. Therefore the econometric estimation includes only two cohorts.

This study assesses how the proportion of young people not attending school (not enrolled at a school) and lacking an upper-secondary qualification changes in these cohorts of pupils one, two, ... and five years after the competence assessment in Grade 8. This essentially covers the educational trajectory of pupils after lower-secondary education, since the large majority of them complete their lower-secondary studies in the school year of the assessment in Grade 8: grade repetition rate at this point is below 1 per cent (*Varga,* ed., 2018). The sample comprises about 43–49 thousand pupils from each grade; the total number of cases at the time of the competence assessment in Grade 8 was 184,542.

In the following, a descriptive analysis of changes in the share of those not in education and without an upper-secondary qualification and the share of school leavers with an upper-secondary qualification is provided first. Then probit models are used to evaluate the probability of being not in education and without an upper-secondary qualification and that of acquiring an upper-secondary qualification before and after the changes to the school-leaving age, controlling for the observed characteristics of pupils. We performed an analysis on the total sample and on a subsample of pupils with a disadvantaged family background[2] because the latter are more likely to attend vocational education not ending in an upper-secondary school leaving examination (Matura) and to drop out of school (see for example *Fehérvári,* 2015).

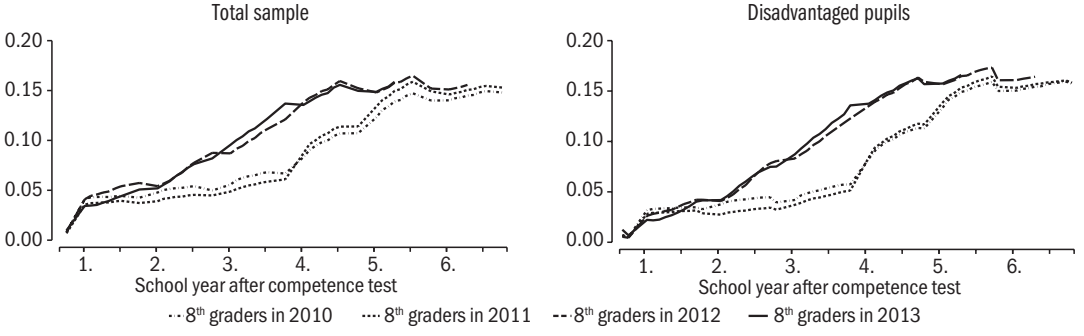
## The proportion of young people not in education and without a qualification and the proportion of school leavers with a qualification

*Figure 2.5.2* presents a monthly breakdown of the proportion of young people not in education and lacking a qualification, over the years after completing lower-secondary education, for two cohorts of lower-secondary pupils affected by the reforms of the school-leaving age and two cohorts not affected by the reforms. The starting date is the date of the competence test taken by 8th graders in May and the first months of subsequent school years are indicated on the horizontal axis. The left-hand Figure presents proportions in the total sample. It shows that approximately 4 per cent of pupils do not attend school in September following the competence assessment, and then the difference between the cohorts affected and not affected by the reform starts to grow. While before the reform the proportion of pupils not in education increases very slowly until the end of the third school year, a faster increase is observed from the beginning of the second school year after the school-leaving age is lowered to 16. At the end of the third school year, when the majority of pupils are aged 17–18, the share of those not enrolled in education is nearly twice as high after the reform than before it, the difference is 5–7 percentage points.

2 This sub-sample includes pupils whose mother or father has a lower-secondary qualification at most or they have fewer than 50 books in the household or they are officially classified as severely disadvantaged. Pupils defined as disadvantaged according to the above definition account for 30 per cent of the total sample.

However, the difference starts to decrease in the fourth and fifth school years and by 5–6 years after finishing lower-secondary education the proportion of young people not in education and lacking a qualification is equally about 15 per cent both in the cohorts before and after the reform.

**Figure 2.5.2: The proportion of those not in education and lacking a qualification after finishing lower-secondary education**




Note: The ordinal number of the school year signifies the month September.

The right-hand Figure shows the same pattern in the subsample of disadvantaged pupils. The trends observed are essentially identical to those in the total sample. The share of young people not attending school is much higher in this group: by the fifth school year it is over 30 per cent.

**Figure 2.5.3: The proportion of those with an upper-secondary qualification 4 and 5 years after completing lower-secondary education**

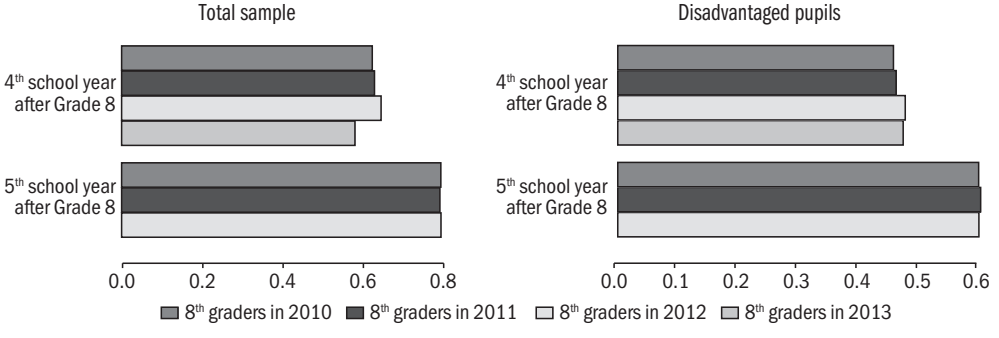



*Figure 2.5.3* presents the share of pupils at the end of the fourth and fifth school year who have already obtained an upper-secondary qualification. In the first cohort affected by the school-leaving age of 16, the proportion of those who obtained a qualification is similar to that of the preceding years. In the cohort of 2013, there is a slight decrease at the end of the fourth year in the total sample; however, that cohort was also affected by the vocational education and training reform (see Subchapter 2.4) – in the case of this cohort data about the end of the fifth year is not observed in the dataset.

On the whole, this suggests that lowering the school-leaving age resulted in considerably lower participation rates but it possibly did not have a major impact on obtaining an upper-secondary qualification and on the "ultimate" early school leaving rate, which is only observed after the completion of school education. In other words, apparently, dropping out following the reform primarily increased because it occurred earlier than in the cohorts preceding the reforms.

*Table 2.5.1* uses probit regression models to assess the differences seen in *Figures 2.5.2* and *2.5.3.* Each column of the table contains estimates, at a given date, for the difference between the last cohort before the reform and the first cohort after the reform in the probability of not attending school and lacking an upper-secondary qualification, controlling for the effect of observed individual characteristics such as gender, age at the end of Grade 8, family background (educational attainment of parents, severe disadvantage) and pupil performance in Grade 8 (NABC test results, mathematics grade). The "Reform" variable denotes the cohort in Grade 8 in 2012, while the reference category is the 2011 cohort. In the case of "not attending school", the third month of the school year is considered, because in the sixth school year this is the latest date the 2012 cohort can still be observed. As for obtaining a qualification, the last month of the school year is taken into account.

The estimates confirm the above description. The proportion of those not attending school increased in the third and fourth school year the most following the reform both in the total sample and among disadvantaged pupils, then the difference had disappeared by the sixth school year. The share of those acquiring a qualification did not decrease: the estimates even show an increase of 1–2 percentage points after controlling for individual factors.

The above analysis compared data from cohorts preceding and following the reform. The results may be interpreted as to show the impact of the reform but they are not conclusive. To what extent is this the impact of the school-leaving age? We can get closer to answering this question if taking into account that even in classes completing lower-secondary education in 2012 or later not all students were affected by the reform at each date. Pupils younger than 16 were not affected but those aged 16–17 were. Cohorts aged over 18 were indirectly affected, since some of them had already dropped out as a result of the reform. If the differences between the cohorts indicate the impact of the changes in the school-leaving age, it must be apparent in the 16–18 age group.

*Figure 2.5.4* shows the proportions of young people not attending school and lacking a qualification broken down by age. It is evident that in the cohorts not affected by the reform the proportion of those not attending school starts to grow after age 18, while after the reform it increases in the 16-year-old age group and continues to grow until age 19. By that time, most of the difference between the cohorts disappear. As all cohorts of 8$^{th}$ graders consist of pupils of different age, the database containing data up to the end of 2017 does not

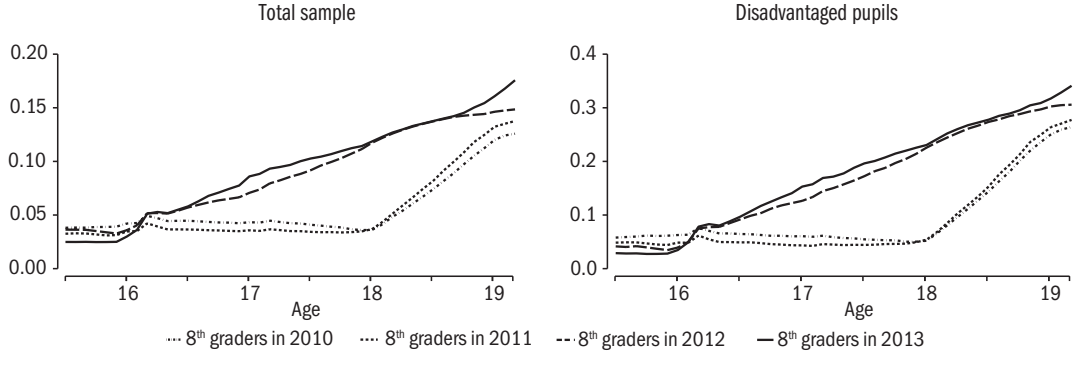
allow the cohorts affected by the reform to be followed beyond age 19. Nevertheless, *Figure 2.5.4* reveals a similar picture to *Figure 2.5.2* and *Table 2.5.1.*

**Table 2.5.1: The effect of the school-leaving age reform on the status "not attending school and lacking a qualification" and on acquiring an upper-secondary qualification, marginal effects**

| | Not attending school and lacking a qualification | | | | | Having an upper-secondary qualification | |
|---|---|---|---|---|---|---|---|
| | 2th school year | 3th school year | 4th school year | 5th school year | 6th school year | 4th school year | 5th school year |
| | at the end of November | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **Total sample** | | | | | | | |
| Reform | 0.012q*** | 0.0313*** | 0.0385*** | 0.00466*** | 0.00105 | 0.0196*** | 0.00512** |
| | (0.00123) | (0.00138) | (0.00174) | (0.00181) | (0.00182) | (0.00333) | (0.00242) |
| N | 91 310 | 91 295 | 91 280 | 91 262 | 91 240 | 91 268 | 91 251 |
| *p*-average | 0.0503 | 0.0728 | 0.121 | 0.147 | 0.150 | 0.641 | 0.790 |
| **Disadvantaged pupils** | | | | | | | |
| Reform | 0.0257*** | 0.0889*** | 0.0930*** | 0.0215*** | 0.0102 | 0.0236*** | 0.00320 |
| | (0.00304) | (0.00391) | (0.00559) | (0.00635) | (0.00643) | (0.00699) | (0.00693) |
| N | 22,114 | 22,109 | 22,110 | 22,103 | 22,096 | 22,106 | 22,101 |
| p-average | 0.0717 | 0.127 | 0.235 | 0.304 | 0.313 | 0.464 | 0.608 |

Note: Probit estimates.
Dependent variable: Not attending school and lacking a qualification at a given date (1–5) and having an upper-secondary qualification (6–7).
Control variables: Gender, age when taking the test in Grade 8, severe disadvantage, categories of parents' educational attainment, categories of numeracy and literacy performance levels in the competence test in Grade 8, categories of mathematics grades at the end of Grade 7 as well as the dummy variables for missing test results, parents' educational attainment and grades.
Standard errors are shown in parantheses.
Significant at a ***1 per cent, **5 per cent, *10 per cent level.

**Figure 2.5.4: The proportion of those not attending school and lacking a qualification, by age**




The tendency of a gradual increase after age 18 before the reform is easily explained by the fact that education was compulsory until the end of the school

year, that is somewhere between the age of 18 and 19, depending on the month of birth. After the reform, when the school-leaving age applies to the actual age of pupils, although there is a break at age 16, the proportion of those not attending school also increases gradually, suggesting that they do not drop out immediately after reaching the school-leaving age.

*Table 5.2.2* uses regression models similar to those in *Table 5.2.1* to assess the differences in the probability of not attending school between cohorts preceding and following the reform in age groups below 16 and 16–18. Estimates cover the period until the middle of the second school year because this is when both age groups may be observed in significant numbers. The proportion of those not attending school did not, in fact, increase as a result of the reform among pupils below 16, while in the directly affected 16–18 age group the proportion of those not in education increased. This is consistent with the interpretation that the difference between the two cohorts is due to the impact of the raised school-leaving age.

**Table 2.5.2: The impact of the school-leaving age reform on not attending school and lacking a qualification in two age groups, marginal effects**

| | Total sample | | | Disadvantaged pupils | | |
|---|---|---|---|---|---|---|
| | 1th school year | 2th school year | 2th school year | 1th school year | 2th school year | 2th school year |
| | April | November | February | April | November | February |
| Reform × below age 16 | 0.00610*** | 0.00189 | 0.00371 | –0.00542 | –0.00889 | 0.000234 |
| | (0.0150) | (0.00253) | (0.00408) | (0.00363) | (0.00586) | (0.00920) |
| Reform × 16–18 age group | 0.0356*** | 0.0186*** | 0.0276*** | 0.0516*** | 0.0409*** | 0.0628*** |
| | (0.00299) | (0.00160) | (0.00155) | (0.00635) | (0.00385) | (0.00389) |

Note: Probit estimates.
Dependent variables: Not attending school and lacking a qualification at a given date.
Control variables: Gender, age group, severe disadvantage, categories of parents' educational attainment, categories of numeracy and literacy performance levels in the competence test in Grade 8, categories of mathematics grades at the end of Grade 7 as well as the dummy variables for missing test results, parents' educational attainment and grades.
Standard errors are shown in parantheses.
Significant at a ***1 per cent, **5 per cent, *10 per cent level.

## Conclusion

The results suggest that lowering the school-leaving age increased the proportion of young people not attending school, particularly in the 16–18 age group. This, however, did not seem to coincide with a substantial decrease in the proportion of pupils acquiring an upper-secondary qualification, since most of the pupils who dropped out below the age of 18 as a result of the reform would have dropped out when reaching the age of 18 if compulsory schooling age had remained unchanged. This implies that a higher school-leaving age *in itself* is not sufficient to reduce early school leaving: this requires multiple education policy measures, with school-leaving age as one of the elements.

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### K2.5 What do 17-year-olds who don't go to school do?

JÁNOS KÖLLŐ & ANNA SEBŐK

As we have seen in subchapter 2.5, the rising trend of the share of those in formal education was broken in 2012, and participation dropped to the level of ten years before by 2016.

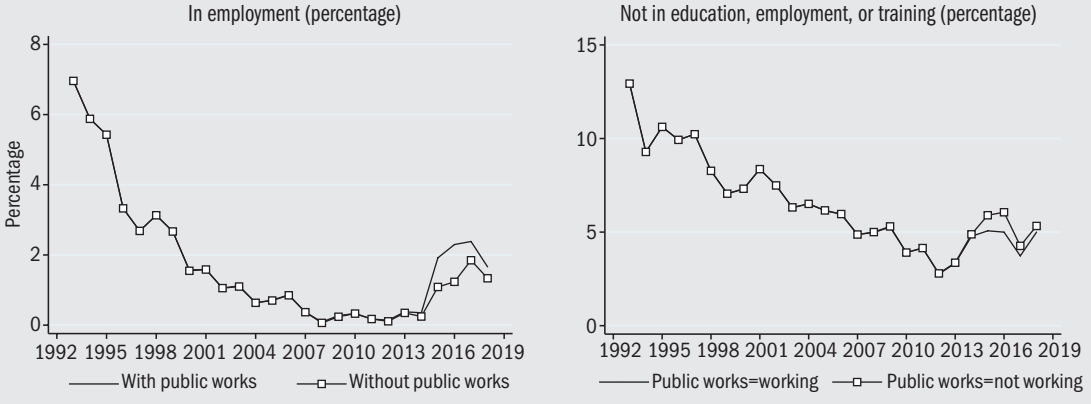
What do 17-year-olds who don't go to school do? It is shown in the two panels of *Figure K2.5.1.* The proportion of those in employment within the age group can be seen in the left panel, distinguishing (starting with May 2000) market-based employment from total employment that includes public works. It can be seen that employment rates do start to increase in parallel to the decrease of participation in education; it rose from a rate of just above zero to a rate of 1.5–2%, or 2–2.5%, including public works. However, this could not offset the decrease in educational participation: as it is shown in the right panel, the share of seventeen-year-olds not in education, employment, or training rose to a rate of 5–6 percent, from a rate of 3 percent observed before the lowering of the school leaving age.[1]

The rise in the share of passive 17-year-olds (NEETs) is a worrying development since the unemployment risk of this group is very high and stays so into adulthood, as early school leavers typically do not proceed with education at later ages either.[2] The average NEET rate of five percent cannot be deemed negligible, especially since it hides significant regional differences (see subchapter 6.2). The problem is not only that 17-year-olds who do not go to school do not acquire vocational or secondary school qualifications (significant numbers did not acquire them even when the school leaving age was 18 years), but the so-called "incapacitation effect" as well, that is, the fact that youth spend their time at school. See the works of *Machin et al* (2011) and *Adamecz–Scharle* (2018) on the preventive effects of this with regard to criminal activity and teenage pregnancy.

1 There is hardly any difference between the shares of the genders.

2 Also according to the data of the labour force survey, an average of less than six percent of seventeen-year-olds not in education, employment, or training participated in non-formal training between 2011–2018. (The rate was calculated for a longer period because of the low number of cases.) This is approximately 0.3 percent of the entire cohort, which does not influence the proportions shown in the figure significantly.

**Figure K2.5.1: The share of 17-year-olds in employment, and not in education, employment, or training (NEET), 1992–2018**




Note: The annual rate is calculated as the arithmetic mean of the rates of the first, second and fourth quarters. Because of the changes in the administration of the summer holidays, the data of the third quarter cannot be examined in a long time series model, and are a *priori* uncertain. The data are representative of those who reached the age of 17 by the date of the survey (but have not reached the age of 18), and have not attained a level of education higher than elementary.

In employment: employed as defined in the ILO-OECD convention.

Source: Authors' calculations, based on the version of the labour force survey of *KSH* handled in the Databank of *MTA KRTK*.

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# 3 GAINING WORK EXPERIENCE

## 3.1 STUDENT WORK

BORI GRESKOVICS & ÁGOTA SCHARLE

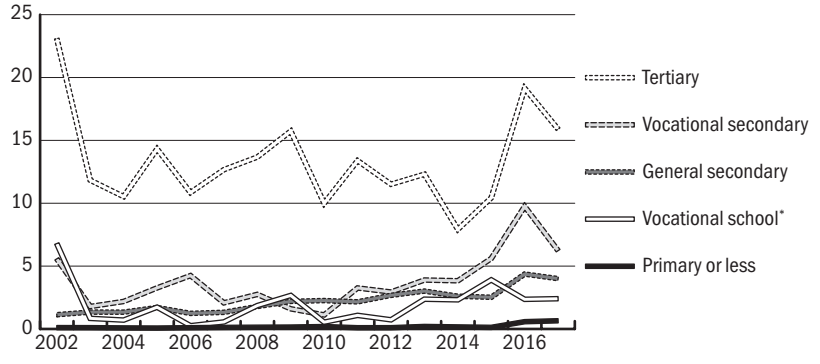
It usually takes some time for young people starting their careers to find their first job and sign their first employment contract (*Pastore-Zimmermann,* 2019). This can be explained by several factors. On the one hand, entrants tend to be less experienced in job search and have fewer acquaintances who can help them find the right job, than those who have been working for several years. On the other hand, they have little work experience, so their employment poses a greater risk to employers, especially if their expected productivity is around or below the (guaranteed) minimum wage. At the same time, not finding a job for a long time can also permanently worsen their future job opportunities. It is therefore particularly important to assess the forms of work where they can gain experience while studying or after leaving school. Full-time students can work while studying outside the framework provided by the school: in this subchapter, we examine its prevalence based on the data of the Hungarian Labour Force Survey.

Student work, as it can take time away from studying, does not necessarily improve future employment opportunities. However, according to international literature, working outside school hours, during breaks, or for a few hours, as well as working in a field related to their studies reduces students' school performance less, and according to certain estimates, it improves future employment opportunities (*Nevt et al,* 2018).

The share of those who work while studying is traditionally low in Hungary by European standards (*Bajnai et al*, 2009, p. 73). Between 2003 and 2010, 1 percent of full-time students aged 15–29 worked, in the following years 1.5 percent worked, and in recent years the proportion of those working while studying remained below 3 percent. Student work is more common only among those who have already obtained their first degree, but even in this special group (accounting for 2 percent of all full-time students), the proportion of employees is only 10–15 percent (*Figure 3.1.1*). Those directly entering into higher education after secondary school rarely start working before graduating: the share of employees in this group is barely 2–3 percent.

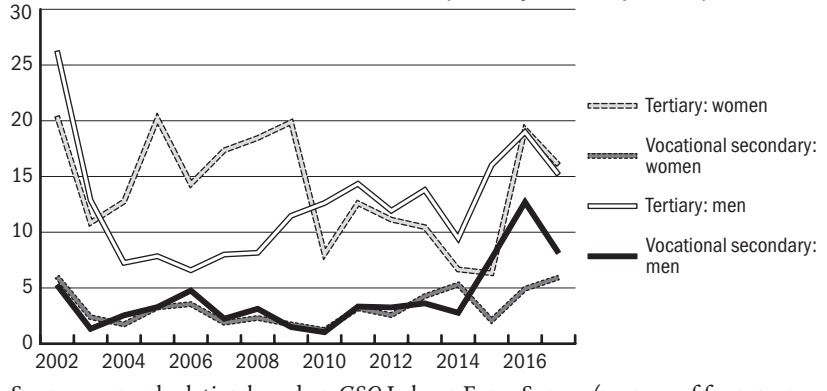
Working while studying shows a slow increase after 2011, especially among students staying in education after vocational secondary education (*Figure 3.1.1*). We do not find significant differences between the sexes in the prevalence of student work (*Figure 3.1.2*). Young women continuing their studies after their first degree worked at a higher rate than men before 2010, but between 2010 and 2016, the employment of female students declined, while that of men increased, so the difference between the sexes decreased to a minimum.

Figure 3.1.1: Share of those working while studying full-time by completed education, 2002–2017 (15–29 years old, per cent)




* ISCED3C.
Source: Own calculation based on *CSO* Labour Force Survey.

Figure 3.1.2: Share of those working while studying full-time by completed education and sex, 2002–2017 (15–29 years old, per cent)




Source: own calculation based on *CSO* Labour Force Survey (average of four quarters).

Among young people leaving school, while only a few have work experience, this experience is largely (81 per cent on average in the past 10 years) related to their intended profession which can make their transition to work easier.[1] In theory, the Labour Force Survey of the HCSO would allow a more detailed examination of this issue, if we compared the labour market outcomes after leaving school among the formerly employed and the non-employed. However, the low proportion of those working while studying also means that the sample of the Labour Force Survey includes very few student workers, only 150–200, per quarter. If we further narrow the group of working students to those who have just finished school (in 2017, this would be 18 percent of full-time students), the number of observations drops to a few dozen. Therefore, due to the low number of observations we are unable to examine how working while studying affects post-graduate employment.

1 *Geel–Backes-Gellner* (2012), for example, found in a Swiss survey on graduates' careers that only part-time work related to their field of studies has a positive effect on later employment and wages.

It is possible that student work is inaccurately measured by population surveys, especially in the case of those studying far from their homes, as in this case the student is usually absent when the survey is conducted, and the family member responding to the questionnaire may not be aware of the student working, especially if it is casual. This source of error can be checked by comparing the share of those in employment in cases where it was the student in full-time education herself who answered the questionnaire with those where another family member responded. Among those who answered the questionnaire about themselves, we found that one and a half to two percent were employed, but even these proportions are low (on average 3 percent of the total student population in the years examined), and the difference may be partially due to the fact that in this group the share of young people living separately from their parents is greater, and who therefore are presumably in greater need of labour income.

According to large-sample population surveys conducted between 2000 and 2016, specifically limited to 15–29 year-olds, the share of those working while studying is low as well, although the pre-2012 measurements among students in higher education showed a continuous increase (*Szőcs*, 2014).[2] According to the 2016 survey, 35 percent of students who stayed in education after their first degree worked, while 13.5 percent of students with a secondary education worked (*Szanyi-F.–Susánszky*, 2018). The former figure is much higher while the latter is similar to what we calculated based on the Labour Force Survey, but neither reaches the levels observed in other European countries.

2 According to the summary of *Szőcs* (2014), in the Youth 2000 survey, only 3–5 percent, in the 2008 survey 11 percent of university students worked regularly in addition to studying.

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## 3.2 THE SHORT-TERM LABOUR MARKET EFFECTS OF APPRENTICESHIP TRAINING IN VOCATIONAL SCHOOLS

DÁNIEL HORN

The main goal of apprenticeship training is the acquisition of vocation-specific knowledge, but it can also facilitate the employment of fresh graduates. According to the majority of studies examining primarily Western European education systems with a dual structure, apprenticeship training makes it easier for youth – especially youth with less favourable family backgrounds who do not apply for higher education – to enter the labour market (*Breen,* 2005, *Müller–Shavit,* 1998, *Wolter–Ryan,* 2011). These studies emphasise mostly the fact that in countries with dual education systems, that is, where school-based theoretical education is combined with practical education conducted at companies, the initial unemployment rate of students in vocational training is lower, and young employees do higher quality work than those in countries with non-dual vocational training. This is attributed to the fact that apprentices, essentially, step into the labour market sooner, and to the fact that it is easier to teach academically less successful youth the skills that are important for the labour market in real workplace conditions. From a public policy perspective, it would be important to know whether it is the early entry or the development of students' skills that leads to these initial differences.

This subchapter summarises the results of *Horn* (2014), which looked at the effects of Hungarian apprenticeship training using the Tárki–Educatio Life-course Survey on the 2006–2012 period (before the substantial rearrangements of the vocational training system that began in 2011).[1] After the years of initial training, students in vocational schools had to participate in compulsory, practical vocational training, which they could choose to undertake at the school, at training workshops outside of school, or at a company (organised individually or by the school). The primary focus of this study is to seek answers to the following question: do students of vocational schools who spent their practical vocational training at private companies (i.e. apprentices) have better labour market chances in the short term than their companions with similar characteristics who, instead of a company, spent their internship at school (i.e. those who did not take apprenticeships)?

### Data and methodology

The analysis uses the database of the Life-course Survey of the Tárki Social Research Institute, which followed a sample of 10,022 taken from the population of eighth-grade students in 2006 for six years.[2] These students were surveyed in every year of their school career, plus for an additional two years

1 During the period examined, the period of general education in typical Hungarian general grammar schools and vocational secondary schools was four years, while vocational schools only provided two years of general education (foundation training) to students, with the next (typically) two years being dedicated to preparation for the chosen vocation. This structure was modified significantly via Act CLXXXVII of 2011, under which the length of training in vocational schools has been decreased to three years, and students receive vocational training already from the 9th grade. In September 2016, former vocational schools were renamed to vocational secondary schools, and former vocational secondary schools were renamed to vocational grammar schools. This paper uses the former names of the schools, effective at the time of data recording.

2 In the sample, low performing students are over-represented. Both this and panel sampling losses are corrected for by weighing so that the survey can be representative for the entire population.

– in the years of their labour market entry or their further education following the secondary level. The responses contain the monthly data of any regular work carried out during the last school year and in the two years following graduation, thus providing us with a more or less continuous picture of the labour market integration of students. The 2006 scores of the eighth-grade mathematics and reading comprehension tests of the national survey on competences are available for all students participating in the panel survey, as well as data on their school careers and family backgrounds. Making use of the variance between the distribution of company and school based training placements, this subchapter attempts to estimate the effect of an internship spent at a company on initial labour market outcomes. As there was a significant number of students at vocational schools who conducted their internship at the school or at the school's training workshops, comparing similar students provides an opportunity for analysing the labour market effect of an apprenticeship spent at a company instead.

The distribution of training placements at companies among the applicant students was probably not arbitrary: companies could select from among students, in hopes of better labour force (cf. *Bertschy et al,* 2009). The analysis of the Life-course Survey suggests that application to the apprenticeship training was indeed not arbitrary, but was much more related to the characteristics of the local labour market than to the individual characteristics of students.[3] Consequently, the estimates presented below probably provide a good estimate of the labour market effect of the apprenticeship training.

### The relation of the apprenticeship to employment after graduation

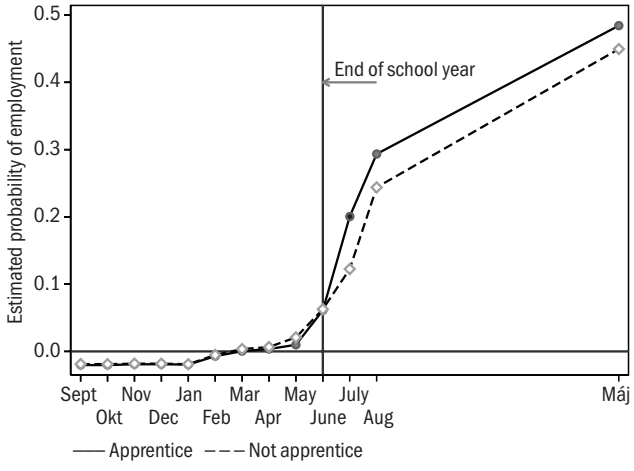
Even though in our analysis we applied various probability models in order to expose an association between the apprenticeship training and employment, there was no statistically significant difference in any of the cases between the employment probabilities of those who did and those who did not spend their internship at a company, one year after graduation. Although there was a minor difference between the students of the two groups, the estimated effect size was only 6 percentage points, and statistically was not significant. And as for students entering the labour market solely (in employment or unemployed), we not only got a statistically not significant result, but the result was less significant from a public policy perspective as well (~3 percentage points).

As can be seen in *Figure 3.2.1*, the probability of employment one year after the completion of school in June is approximately 6 percentage points higher in the case of apprentices compared to those who were not apprentices, but this is not significantly different from zero. Additionally, it has become clear that immediately after the end of the school year, the employment probability of both apprentices and those who did not apprentice increases significantly. Although directly after graduation the employment probability of appren-

3 The selection between training placements acquired individually versus those organised by the school can be examined in a similar way among apprentices. Results show that although a few individual characteristics do have an effect of minor significance, they disappear when the effect of the local labour market in considered (county × vocational group fixed effects).

tices is slightly higher, this significant difference disappears very quickly, one month after graduation, and the remaining difference continues to decrease.

Figure 3.2.1: The expected employment probability of students of vocational schools, 2011–2012




## The form of apprenticeship training placement and the size of the company

Examining the differences between apprentices and those who did not take apprenticeship on the basis of how the training placement was arranged and the size of the company, we gain insight into the mechanisms behind the correlations as well. Apprentices trained on site at medium and large companies (over 50 employees) who arranged their placements individually were much more likely to find a regular job directly after graduation – in July and August – than their peers with similar individual characteristics, within the same county and vocational group. This strong significant difference, in the case of large companies, can be explained by several factors. From one perspective, it is possible that large companies are much more committed to the training of apprentices than small companies, since they typically take a longer term view and are aware of the fact that their productivity depends substantially on the productivity potential of the local labour force. What contradicts this hypothesis of differing training efficiency by company size is the fact that these differences are not visible in the case of training placements organised by schools. What is much more likely is that within a given industry, the difference is not between training structures, but in selection mechanisms. A plausible explanation is that it was the more motivated vocational school students who applied to large companies on an individual initiative,[4] and the effect of their motivation is also visible in their labour market outcomes later on.

4 This is also confirmed by the observation that students completing their traineeship at training placements acquired individually are more likely to find a job directly after graduation than apprentices completing their traineeship at placements organised by the school, regardless of company size.

Overall, what is more likely suggested by the data is that in Hungary, there was – even in the very short term – no difference between the labour market success of vocational school students who did and those who did not spend their internship at a company.

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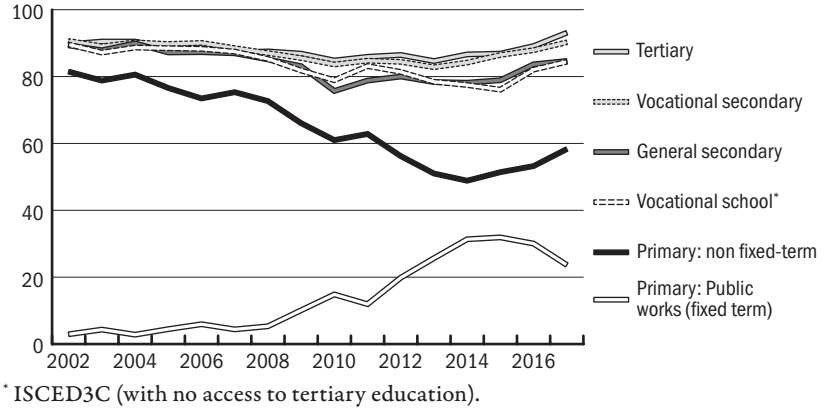
## 3.3 CASUAL AND OTHER FORMS OF WORK

BORI GRESKOVICS & ÁGOTA SCHARLE

In addition to the student work and apprenticeships examined in the previous two subchapters, forms of contracts that pose less of a risk to employers (casual work, temporary work, fixed-term contracts) and family businesses can also provide an opportunity to gain first experience on the labour market. Casual or fixed-term employment makes it easier for employers to obtain information on the performance of new entrants, but it can also be detrimental for employees if it makes it more difficult for them to move on to a more stable job. According to international literature, it depends on the institutional environment on the labour market whether flexible contracts act as a springboard or a trap (*Eichhorst*, 2014). In highly segmented, dual labour markets (where it is difficult to move from the secondary labour market which offers worse, less secure work, to the primary market which offers better paid, more secure jobs) the proliferation of fixed-term jobs is less favourable and may even lead to a decline in wages and employment opportunities (cf. *García-Pérez et al,* 2019).

The share of fixed-term contracts is low in Hungary in international comparison: according to the Labour Force Survey, 7–9 percent of employers had fixed-term contracts during the years of the crisis, their share decreased to 6.5 percent between 2014–2018 (*HCSO*, 2019).[1] Among young people, the share of those working with such contracts was much higher than average (17 percent) in 2018, while 83 percent worked with a non fixed-term contract (*Figure 3.3.1*).

Figure 3.3.1: The share of non fixed-term contracts among 15–29 years old employees, by education, 2002–2017 (percent)




* ISCED3C (with no access to tertiary education).

Source: Own calculation based on *CSO* Labour Force Survey (average of four quarters).

Before and during the Great Recession, the share of non fixed-term contracts in all education groups declined somewhat, but this trend has stopped or reversed in the past few years.[2] Among uneducated young people, the growing

1 *Eichhorst* (2014) mentions four European countries (Poland, Spain, Portugal, the Netherlands), where in 2012 the share of fixed-term contracts was around 20 percent or more among all employees; the Hungarian indicator of around 10 percent was in the lower third of the countries.

2 Public works is a non-negligible part of fixed-term contracts. In the waves of the Labour Force Survey before 2011, public workers can be identified less accurately, therefore we show the share of non fixed-term contracts in the long time series.

share of fixed-term contracts is clearly related to the expansion of public works: in this group, an increasing amount of fixed-term contracts were signed in the framework of public works (*Figure 3.3.1*).

However, the role of fixed-term contracts and other forms of contract with less risk for employers is not negligible: in the year of leaving school, a higher share of young workers enter into such a contract (*Table 3.3.1*). The share of young people in their first job entering a non fixed-term contract was 20–30 percentage points lower than average.[3] The difference is also related to the level of education: it seems that during the crisis (before 2013), employers concluded more fixed-term contracts with less educated entrants (at most with vocational training or with a general secondary education), while during the growth period they had more fixed-term contracts than those with vocational secondary education. Among women entrants, the share of those with fixed-term contracts is higher in both periods (and significant in almost all education groups).

**Table 3.3.1: Share of fixed-term contracts in the year of graduation among entrants (without public works, percentage)**

| | 2008–2012 | | 2013–2017 | |
|---|---|---|---|---|
| | men | women | men | women |
| Vocational school or less | 33 | 35 | 37 | 43 |
| General secondary | 44 | 42 | 24 | 44 |
| Vocational secondary | 29 | 37 | 44 | 42 |
| Tertiary | 20 | 32 | 18 | 29 |

Note: Public works participants were excluded from both fixed term contracts and total employment (this may induce a small upward bias in the share of fixed term contracts between 2008 and 2012).
Source: Own calculations based on the *CSO* Labour Force Survey.

Casual work occurred in 1–2 percent of first jobs during the period examined; the share of new entrants to work as entrepreneurs or in the family business was only around 2–4 percent as well (slightly higher for men and lower for women).

Based on the above, descriptive data, it seems that among flexible forms of work, primarily fixed-term contracts can play a significant role in facilitating the school-work transition. Even if there is segmentation, the share of secondary jobs that do not offer progression does not yet reach the critical level experienced in Spain or Portugal.[4] Although it is true that the share of fixed-term contracts increased among the less educated after the crisis, this is not necessarily the sign of increasing segmentation, even as the share of fixed-term contracts in the total working population has been declining since the recession. It is also possible that as labour shortages worsen, and possibly with an increase in the range of wage subsidies offered to encourage the employment of young people, employers become more open to giving a chance to jobseek-

3 The lower rate may also apply to newcomers to a given firm (but not as entrants), this was not examined.

4 *Huszár–Sik* (2019) find that the there is indeed a secondary labour market in Hungary, however, based on their calculations, it cannot be ascertained if it equals or expands beyond public works.

ers thought of as more risky (such as long-term unemployed or Roma) with whom they typically enter into fixed-term contracts.

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# 4 EARLY UNEMPLOYMENT AND LATER LABOUR MARKET OUTCOMES

## 4.1 DOES THE ECONOMIC RECESSION HAVE PERMANENT EFFECTS?

MÁRTON CSILLAG

What happens if a young person enters a particularly bad labour market after completing their studies? Can we trust that, once an economic recession has passed, these young people will benefit as much of the fruits of the economic recovery as their older counterparts? Or will they be in a permanently weaker position due to the erosion of their human capital – as they are out of work or in "bad jobs," or in positions that do not match their knowledge? This is the issue we are exploring here based on Hungarian data.

Throughout our analysis, we examined the trajectory of school graduation cohorts.[1] We included young men who entered the labour market between 2001 and 2015, and since we used data from 2002–2017, we followed their lives for up to 15 years. Our basic question is the following: if someone graduated in a year and/or county which has a high unemployment rate,[2] then how much more likely is it that they will be non-employed or have lower wages, than a similar young person, who graduated in a better year (or in a county with more favourable labour market conditions), even years after a negative labour market shock? We used the data of the 2002–2017 CSO Labour Force Survey for our analysis. Our sample included those men born between 1970 and 1999 who completed their studies between 2001 and 2015.[3] Although we know in which year the responder graduated, but we do not know where they lived at the time, therefore we assume that this corresponds with their current residence.[4]

On *Figure 4.1.1* we present the probability of the members of the cohorts[5] who finished their studies in different years – to be employed[6] – depending on labour market experience. Based on the figure it is clear that even though in the years of the recession the employment rate of young entrants was quite low, the current conditions of the labour market more strongly influence the labour market status than the unemployment rate characterizing market entry. Therefore, for instance the employment of the cohort finishing in 2003–2004 dropped significantly around 2008–2010 (after 4–7 years of work experience).

We present the results of our first, basic regression analysis on *Figure 4.1.2*. We used simple linear regression, where the key independent variable was the county unemployment rate in the year of graduating, as well as its interaction with (potential) labour market experience.[7] The figure illustrates, that if the young person left school in a year (or country) in which the unemployment

1 Although follow-up data exist at an individual level in the Admin3 database of the CERS Databank, however education level in that dataset can only be determined after 2009, and thus the time series available would have been too short.

2 Here, we used the registered unemployment rate of the National Employment Service in annual and county breakdown.

3 We did not include those in the analysis who did not finish primary school.

4 This has the consequence that if young people move to places with better labour market conditions after graduation, the estimate of the effect of unemployment on entry will be biased towards 0.

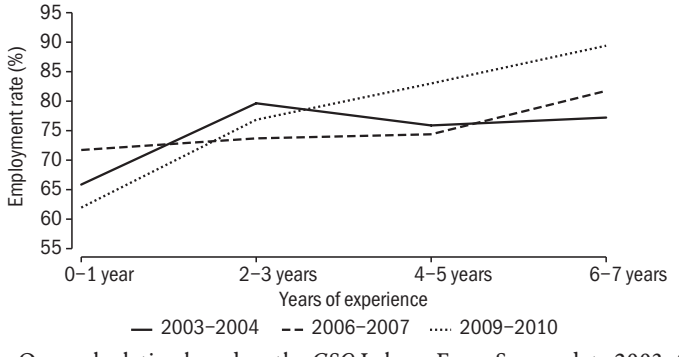
5 The average unemployment rate varied in three groups: 9.5 percent in 2002–2003, 10.6 percent in 2005–2006, 14.6 percent in 2009–2010.

6 In the following, we do not consider those in public works jobs to be employed, as we focus on primary labour market employment. Naturally, full-time students are not included in the sample either.

7 In addition, potential labour market experience, educational attainment, and micro-region of residence, as well as the calendar year and the month of the survey conducted were included as control variables.

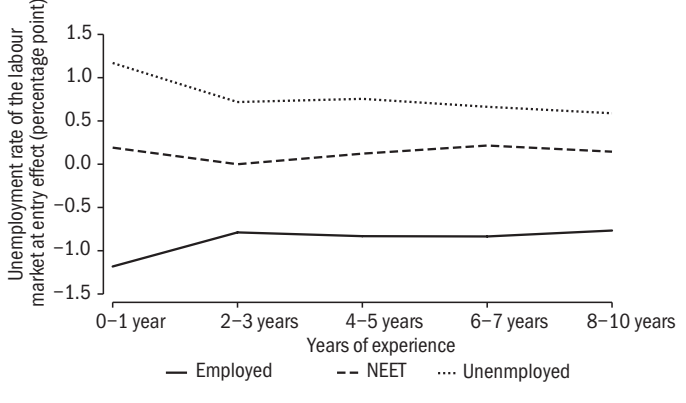
rate was 1 percentage point higher,[8] then how much do the labour outcomes of the youth change throughout the years spent on the labour market. Our results show that the unfavourable labour market situation quite significantly decreases the employment probability of new entrants, and although this unfavourable effect later subsides, it does not disappear. This means that if a young person entered the labour market during the recent recession, when unemployment was around 5 percentage points higher (than in previous years), then the probability of them being employment 6–7 years later was 4 percentage points lower. Similarly, the labour market shock increased the risk of unemployment as well[9] by roughly 3 percentage points even 8–10 years afterwards.

**Figure 4.1.1: Youth employment in terms of labour market experience, in three graduation cohorts (between 2003–2017)**




Source: Own calculation based on the *CSO* Labour Force Survey data 2003–2017.

**Figure 4.1.2: The effects of the unemployment rate in the year of graduation on youth labour market status in terms of labour market experience, 2002–2017 (percentage points)**




Source: Own calculation based on the *CSO* Labour Force Survey data 2003–2017.

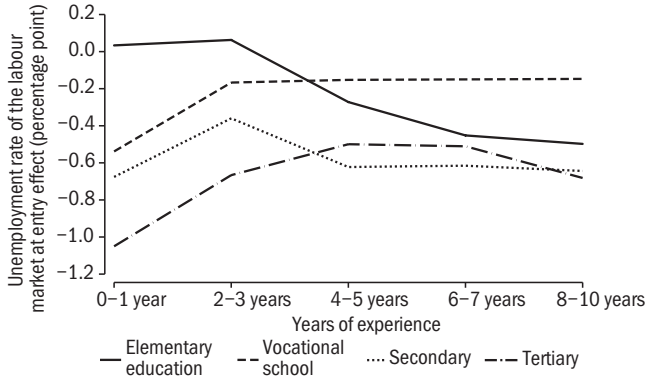
As the labour market is segmented by education level (amongst other things), we also examined the extent to which the lasting negative effects of the labour

8 It should be noted, that there is significant variance in our key variable (the county unemployment rate) both in terms of time and territory. That is, during the years of the crisis (between 2009–2012), the unemployment rate was on average 5.5 percent higher than in 2002. At the same time, the rate in Borsod-Abaúj-Zemplén or Jász-Nagykun-Szolnok countries was on average 16 percentage points higher than in Budapest.

9 We only included those active in the labour market.

market shock varies amongst young people with different levels of education. According to *Figure 4.2.3,* the so-called scarring effect which impacts subsequent employment, or even the whole career, appears mainly in the case of those with secondary or higher education, whilst the negative effects are less significant in the case of those with lower educational attainment.[10]

**Figure 4.1.3: The effects of the unemployment rate in the year graduation on youth employment, by educational attainment groups, 2002–2017 (percentage points)**




Source: Own calculation based on the *CSO* Labour Force Survey data 2003–2017.

Next, we examined another measure of labour market success, earnings, and we tried to draw conclusions regarding position and the quality of the company.[11] Our results demonstrate that in general, the lasting effects of a poor labour market start are negligible, as seen in the first column of *Table 4.1.1.* At the same time, those with higher education were paid around 5 percentage points less even 4–6 years after the recession, than those entering a favourable labour market (assuming that they entered the market in a year with a 5 percentage point higher unemployment rate).[12] Surprisingly, this is not due to lower position or that the young person "got stuck" at a low-wage company.[13] We also tried to find out whether those entering the labour market during the recession are "overqualified", i.e. if they are in an occupation which is characterized by lower education-levels than theirs. Similar to the above results, we did not find any indication that those youth leaving education in the years of the recession would get stuck at a low quality jobs.

Our results suggest that the scarring effects of entering the labour market in a recession in Hungary appeared mainly in permanently lower employment. Wage disadvantages emerged only for those with tertiary education.[14] It should also be noted that it is possible that the negatives effects on those with higher education could have been greater if the cohorts entering the labour market during the recession would not have been significantly smaller than the generations in the early 2000s.[15] Our results echo other European analyses which found the effects on wages to be smaller, but they showed that

10 In the case of unemployment probability, there is no such difference for those with different educational qualifications, only the negative effect on those with vocational education is exceptionally high.

11 We did this with the help of the 2001–2016 Wage Tariff Survey of NES. Sample selection was done similar to the above analysis. Our dependent variable was the logarithm of gross monthly real earnings (including 1/12 of non-regular income). The basic equation included educational attainment (7 categories), categories of experience, the country, the calendar year. In addition to the basic equation, we first included the occupation (three-digit FEOR code), and then indicator variables for the identity of the company.

12 At the same time, it is possible that because employment declined, selection intensified and therefore we can only give a lower estimate of the wage effect.

13 That is, in the models in which we included occupation and corporate fixed effects, the results did not change.

14 That is, it is possible that the short-term effects of the negative labour market shock will not become permanent for those with lower education, as in their case there is no serious depreciation of human capital.

15 These preliminary results further justify a closer examination of the careers of young people with higher education (see Chapter 8 of *In Focus*).

employment permanently decreases as a result of a poor labour market entry situation. (See Box 4.1 for more information.)

**Table 4.1.1: The effects of early-stage unemployment on wages**

| | Total Sample | Vocational school | Secondary | Tertiary educated |
|---|---|---|---|---|
| Unemployment rate (year or entry) | –0.007576** | –0.01099* | –0.006326 | –0.01395*** |
| | (0.003562) | (0.006086) | (0.004918) | (0.004507) |
| Unemployment rate× 2–3 experience | 0.004923* | 0.007763 | 0.007343* | 0.004012 |
| | (0.002521) | (0.005978) | (0.004131) | (0.003403) |
| Unemployment rate × 4–5 experience | 0.002816 | 0.006745 | 0.006205 | 0.003514 |
| | (0.002554) | (0.005959) | (0.004015) | (0.003353) |
| Unemployment rate × 6–7 experience | 0.001162 | 0.009388 | 0.002933 | 0.001706 |
| | (0.002616) | (0.005953) | (0.004070) | (0.003462) |
| Unemployment rate × 8–10 experience | 6.973e–04 | 0.009268 | 0.005014 | 0.001634 |
| | (0.002711) | (0.005974) | (0.004160) | (0.003595) |
| $R^2$ | 0.469 | 0.295 | 0.228 | 0.252 |
| N | 204,057 | 46,132 | 65,462 | 76,668 |

Note: The basic equation included educational attainment (7 categories), categories of experience, the country, the calendar year. Clustered (at the level of the firm) standard errors are displayed in brackets.
Significant at the ***1 percent level, **5 percent level, *10 percent level.
Source: Own calculation based on the *NES* Wage Survey data 2002–2016.

## K4.1 What are the consequences of young people entering the labour market during an economic crisis? International outlook

ENDRE TÓTH

The *scarring effect* refers to those negative consequences which affect young people who begin their careers with a potential period of unemployment. In labour economics, two different issues are examined under this term. First: whether young people who leave school during a recession and start their career therefore face higher risks of early-stage unemployment are permanently "scarred" by these circumstances. Second: for those young people who experience lasting unemployment when starting their career, does this episode have long-term negative effects on their later career? This topic re-emerged in the literature due to the severe economic and financial recession in 2008, and in order to eliminate these negative consequences, the European Union introduced their Youth Guarantee Programme in 2013.[1]

The majority of research on the scarring effect examines this phenomenon via regression model building, analysing young people belonging to different cohorts, where the key independent variable is the labour market situation of the youth's place of residence at the time of leaving school. In

1 For the implementation of this Hungary, see Subchapter 5.2.

their analysis, the researchers do not only have to properly filter out differences of other origins between the individuals, but they also have to deal with potentially distorting effects such as the endogenous relationship between unemployment and the place and year of graduation, and migration. In order to remedy the potentially distorting effects, researchers are including new control variables (for example: place of birth, unemployment measured at the start of the training). Every research paper[2] we examined drew the conclusion that young people entering a labour market in a recession with high unemployment must face lasting negative consequences. In their case, lower wages, fewer hours worked, lower quality job and higher risk of unemployment can be detected even 7–15 years after starting their career, compared to their counterparts who started working at a more fortunate time (*Kahn,* 2010). When the initial unemployment rate that is one percentage point higher, the rate of loss of income is estimated at 6–10 percent in the year of graduation by studies examining higher education degree-holders, which then slowly decreases, but stays around 2–3 percent even ten years later. (*Kahn,* 2010, *Altonji et al, 2014*). Several studies have pointed out that the negative effects may be more significant in the case of less educated young people, who experience a more significant decrease of employment (*Schwandt–von Wachter,* 2018, *Cockx*, 2016), and amongst graduates, those with lower abilities (*Oreopoulos et al,* 2012). It seems that stricter labour market regulation increases the persistence of the scarring effect, with young people getting "stuck" in low-paying jobs that do not match their qualifications in a more rigid labour market structure (*Kawaguchi–Murao*, 2014). Research based on individual-level data not only analysed the effect of early-stage unemployment,[3] but also the consequences of a young person accepting a job for which they are overqualified. Studies examining data from European countries with a relatively inflexible labour market show that accepting a job not compatible with their qualifications presents a trap for young people, because it has a long-term negative impact on most the careers of most young people (similar to unemployment).[4] Young people from vulnerable backgrounds experience lower upward mobility and slower wage growth that those who began their careers in jobs which match their qualifications.[5] There can be two main explanations for the lasting negative effects of early-stage unemployment or overqualification. The first is the negative signalling function of early unemployment, i.e., employers view it as a signal of lower productivity, which seriously affects the perception of job-seekers (*Cockx–Pichio*, 2011). Another possible explanation is the decline of professional knowledge and skills due to cognitive decline, or that the acquisition of new skills is rare in low-skilled jobs.

2 On the topic of the scarring effect, most of the research is based on North American data (*Schwandt–von Wachter,* 2018, *Kahn,* 2010, *Altonji et al,* 2014, *Speer,* 2016, *Oreopoulos et al,* 2012). But several excellent studies used data from European countries (*Cutler et al,* 2014, *Liu et al,* 2016, *Cockx–Ghirelli,* 2016), and there are also studies examining multiple continents and larger groups of countries (*Cutler et al,* 2014, *Liu et al,* 2016, *Cockx–Ghirelli,* 2016). Most research based on North American data analyses exclusively newly graduated young people (*Kahn*, 2010, *Altonji et al,* 2014, *Oreopoulos et al,* 2012), but there are also studies which exclusively include those with lower education (*Speer*, 2015), or those that examine all young people, regardless of their education.

3 This can have very significant negative consequences, for example, *Gregg–Tominey* (2005) found that young people who experienced long-term unemployment early in their career, had earnings around 12 percent lower than their luckier counterparts, even twenty years later.

4 See for example, *Büchel–Mertens,* 2004, *Mendes de Oliveira et al,* 2000, *Baert et al,* 2012, *Liu et al,* 2012.

5 This is in contrast to previous North American results, where accepting positions that did not match qualifications might have been a good choice in terms of subsequent higher than average mobility opportunities (i.e., it provided a kind of "springboard function"). See for example: *Sicherman* (1991) and *Rubb* (2003).

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# 4.2 UNEMPLOYMENT AMONG LABOUR MARKET ENTRANTS

MÁRTON CSILLAG

If a young person does not find a (suitable) job for a lengthy period of time at the beginning of their labour market career, it can significantly impact their further progress. This is due to the fact that a) their human capital is not developing – precisely at the time when their peers are learning the basics of the profession in practice, or that b) in the eyes of the employers their unemployment (or the fact that they began working in a job for which they were overqualified) is a negative sign. This issue has not been studied by many researchers in Hungary – mainly because individual-level longitudinal data was not available –, except in the case of young graduates (see, for example *Galasi–Varga*, 2001, *Varga,* 2013, and sub-chapter 7.3 in this *In Focus*). In this sub-chapter, we briefly present evidence on what is the labour market position five years after graduation of a young person spending a significant amount of time as a registered jobseeker (or public worker) in the two years after graduation, compared to their peers who had begun their careers "smoothly".

During the course of our analysis, we build on the linked public administration panel database of the CERS Databank (for more details, see *Sebők*, 2019). We are examining a specific group: those young men[1] who finished secondary education (ISCED 3A or 3B) in 2011–2012 and did not go on to higher education.[2] The database not only has the advantage that we are able to observe the labour market trajectory of the youth relatively accurately, but we also have data measuring their cognitive skills,[3] therefore we hope that the bias stemming from unobservable characteristics is relatively small. The key information upon which we build our analysis is how many months the young persons were registered jobseekers (or public workers) in the two calendar years after finishing secondary school.

We present some background characteristics on *Table 4.2.1:* reading comprehension and mathematics test scores as well as the district unemployment rate. Based on the length of registered job-seeking or public work, we placed the young people into six groups, distinguishing those who were (also) in public works.

*Table 4.2.1* shows first and foremost that roughly 85 percent of the young people in the cohort examined were unemployed for a short period of time, while 5 percent of them were in public works in the two years after entering the labour market. Additionally, it is evident that those who were long-term unemployed had significantly lower cognitive skills.[4] It is also clear that the length of unemployment is strongly influenced by the local labour market: young people who experienced long-term unemployment lived in a district

1 The labour market situation of young women is not addressed in this short piece because it would require the modelling of childbearing.

2 More specifically, the sample includes those who were born between 1990 and 1994 and who had their tenth grade competency test results; and those who attended full-time education for less than one year in the two calendar years after completing secondary school.

3 Tenth grade reading and mathematics test scores were used.

4 This is particularly evident at the bottom of the skills distribution, among those young people who were long-term unemployed and in public works the rate of those with weak or very weak skills is nearly three times more than among those who were not unemployed. (Reading comprehension: 14.3 percent compared to 5.5 percent; Maths: 21 percent compared to 7.6 percent.)

where unemployment was more than one and a half times higher than among those who did not experience unemployment. Another important lesson from the table is that those who were in public works (on top of unemployment), came from a particularly disadvantaged background in every respect.[5]

**Table 4.2.1: Characteristics of young men by categories based on time spent as registered jobseekers or in public works in the two calendar years after graduation**

| Length of time spent in registered unemployment or public works | Proportion (percent) | Reading comprehension | Mathematics | Unemployment rate |
|---|---|---|---|---|
| | | average score | | (percent) |
| None | 59.4 | 1608 | 1664 | 6.69 |
| 1–6 months | 25.2 | 1582 | 1639 | 8.24 |
| 7–12 months, no PW | 5.9 | 1578 | 1632 | 9.03 |
| 7–12 months and PW | 3.2 | 1561 | 1605 | 10.34 |
| 13–24 months, no PW | 3.7 | 1556 | 1603 | 10.35 |
| 13–24 months and PW | 2.6 | 1529 | 1568 | 11.95 |

Sample: those young men who finished secondary school (ISCED 3A or 3B) in 2011–2012 and did not go on to higher education.
Note: Data from the two calendar years after completing upper-secondary education, the length of registered unemployment or public works participation is summed up (and PW participation is noted separately).
Source: Own calculation based on linked public administration panel database of the *CERS* Databank.

In *Table 4.2.2*, we summarised the results of multiple regression analyses in which we measured the labour market situation of the young person in the fifth calendar year after finishing secondary school, depending on the number of months spent as a registered jobseeker (or in public works).[6] First, we were curious about how many more months those who experienced difficulty entering the labour market spent as registered unemployed or in public works (or less time employed in the primary labour market). Second, we examined whether, if a young person was employed in the primary labour market, they received lower (daily) wages, and whether it was more likely that they were overqualified[7] for their job if they had been previously unemployed/in public works. The key variables were divided into the six categories in *Table 4.2.1*.[8]

Estimation results show that shorter unemployment (not exceeding six months) does not significantly worsen the labour market outcomes of youth. Those who had been unemployed for a longer period of time and were (also) in public works were particularly unfortunate, while the labour market outcome of those who spent the 7–12 months as registered jobseekers (but not in public works) deteriorated only slightly.

First, an individual's participation in public works clearly predicts getting "stuck" in subsequent unemployment (or further public works): the long-term unemployed who were also in public works, spent nearly three months more

5 We note that those who continue their studies two years after finishing secondary school (although they did not complete higher education until 2019) have higher cognitive skills. In this short paper we do not deal with the fact that the current state of the labour market may also affect the continuation of studies.

6 In the analysis we use the entire calendar year, therefore we consider the average daily wages as well as the proportion of time spent as overqualified within employment. It is important to emphasise that when we talk about employment, we are looking at employment (and the earnings or occupational status) on the primary labour market.

7 Here we use the same approach as Júlia Varga in subchapter 7.3. Those who worked in occupations belonging to HSCO major group 8 or 9 were classified as overqualified.

8 Regressions included tenth grade test scores (and their squares), year of birth, region of residence, and how many months the young person studied as a full-time student in the two years after graduation.

in a similar status even in the fifth year after graduation. Similarly, members of this group spent about 1.3 months less on the primary labour market than those who had not been unemployed. All this suggests that in terms of employment status, those who are long-term unemployed *and* who were in public works are the worst off. If a young person was long-term unemployed but was *not* in public works or was a registered jobseeker and in public works but was able to get out of this situation *within a year* also had negative, but not so unfavourable, consequences.

**Table 4.2.2: The relationship between unemployment in the first two years of the career and the labour market outcomes in the fifth year after finishing secondary school, finished secondary school in 2011–2012**

| Length of time spent in registered unemployment or public works | Registered jobseeker or public works (months) | Employed on the primary labour market (month) | Daily earnings (logarithm) | Occupation overeducated (percent) |
|---|---|---|---|---|
| 1–6 months | 0.3534*** | 0.4214*** | 0.003006 | 7.0275*** |
| | (0.05196) | (0.1125) | (0.01434) | (1.1160) |
| 7–12 months, no PW | 0.5386*** | 0.2794 | –0.02838 | 12.992*** |
| | (0.1081) | (0.2016) | (0.02500) | (2.0245) |
| 7–12 months and PW | 2.0151*** | –0.5261* | –0.09400** | 8.1912*** |
| | (0.2311) | (0.2802) | (0.03794) | (2.6704) |
| 13–24 months, no PW | 1.3562*** | –0.6197** | –0.1067*** | 9.2666*** |
| | (0.2010) | (0.2686) | (0.03308) | (2.7348) |
| 13–24 months and PW | 2.9125*** | –1.3137*** | –0.1134*** | 16.300*** |
| | (0.2893) | (0.3183) | (0.03754) | (3.2424) |
| $R^2$ | 0.145 | 0.051 | 0.064 | 0.063 |
| N | 11,147 | 11,147 | 8,904 | 8,904 |
| Average of the outcome variable | 0.818 | 7.962 | 8.526 | 30.391 |

Key independent variable: number of months spent as registered jobseeker or public works participant in the two calendar years following secondary school graduation. Regressions included tenth grade test scores (and their squares), year of birth, region of residence, and how many months the young person studied as a full-time student in the two years after graduation.

Source: Own calculation based on linked public administration panel database of the *CERS* Databank.

Second, in terms of wages and the quality of work five years after labour market entry, the ranking based on the status immediately following entering the labour market is not so clear. Members of those three groups whose employment was negatively affected by the experiences of the first two years also received around 10 percent lower daily wages. In terms of jobs, all young people who had been unemployed for a significant period of time were about 10 percentage points more likely to be forced to accept a job for which they were overqualified. Those who were both long-term unemployed and in public works were particularly disadvantaged as they were about one and a half times more likely to be overqualified than young people who were not unemployed.

Based on our research, it cannot be ruled out that long-term unemployment after entering the labour market permanently worsens the labour market opportunities of young people, especially if it is associated with public works. Further research is required in two directions. On the one hand, it is appropriate to examine which of the differences identified here may be related to weakness in terms of unobservable skills. On the other hand, it should be examined as to what factors cause the lasting negative consequences: employer preferences, erosion of knowledge, or being stuck in a particularly disadvantaged place of residence.

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# 5 THE IMPACT OF EMPLOYMENT POLICIES

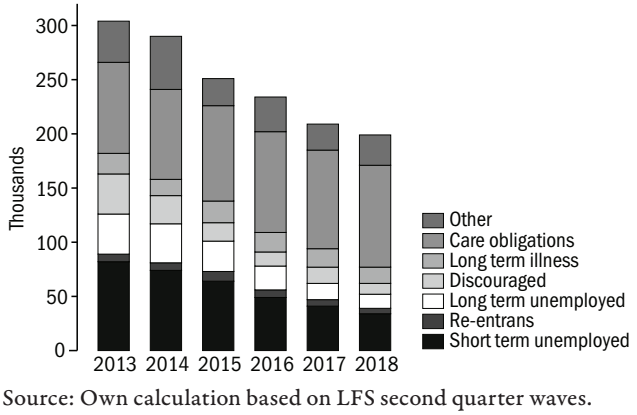
## 5.1 JOB SEARCH BEHAVIOUR OF YOUNG PEOPLE NOT IN EDUCATION, TRAINING OR EMPLOYMENT

TAMÁS MOLNÁR

Young people's unemployment at the start of their careers can cause long-term problems (see Chapter 4), thus, it is particularly important to see how quickly they find a job after leaving school and whether the public employment services can offer them effective help. In this subchapter, we look at how youth unemployment has changed over recent years and what factors affect the speed of finding employment, with particular emphasis on the role of public employment services.

In recent years, the number of young people not in education, employment or training (NEET) has decreased, and their composition has also changed significantly (*Figure 5.1.1*).[1] It can be clearly seen that the recovery from the crisis and the increasing demand for labor have absorbed those unemployed youth who were relatively close to the labor market: while in the second half of 2013 nearly 30% of NEET young people aged 16–29 were short-term unemployed, by the second quarter of 2018, only 17 percent of NEET youth were in this group. Similarly, the share of long-term unemployed and discouraged job-seekers (those who no longer actively look for a job) in the NEET youth group has decreased, indicating a particularly strong demand effect, as even those who had been looking for a job for more than a year previously can now find employment.

**Figure 5.1.1: Changes in the number of NEET groups in the 16–29 age group, 2013–2018 (thousands)**




Source: Own calculation based on LFS second quarter waves.

Parallel to this, the number of those who are unavailable due to family responsibilities has increased slightly and the number of people who are unavailable

1 Young people not in education, training or employment were divided into seven groups following the Eurofound method (*Mascherini–Ledermaier*, 2016). Re-entrants who will soon start to study or work at a particular job, short-term unemployed looking for a job for less than 1 year and long-term unemployed looking for a job for over a year. Discouraged workers who want to work but are not actively looking for work because they think they will not find a relevant job. Those unavailable due to illness or disability who are not able to go to work because of their illness, while those unavailable due to family responsibilities who cannot work because they are typically caring for children or other family members. The other category includes everyone who could not be classified in the above groups due to lack of data or for other reasons.

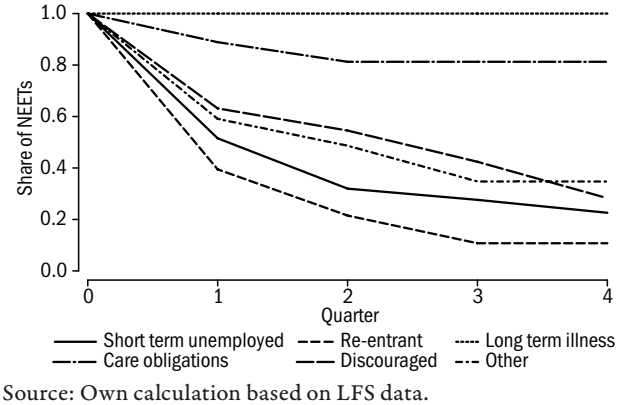
due to illness or disability has stagnated, resulting in a significant increase of their combined share in the overall NEET youth population, reaching over 60 percent by 2018. In other words, in 2018 more than half of the unemployed young people were unavailable for family or health reasons.

### Job search duration

Although the favorable economic situation in recent years has made it easier for young people to find employment, many people may still need help. And if growth rates decrease, it can become a critical issue – influencing the entire career path – for even more people, how effectively job centers can help them find their first jobs. We perform an analysis similar to the work of *Micklewright–Nagy* (1999), we used Labor Force Survey individual data from 2015 to 2018 to investigate the factors that influence the employment prospects of 15–29-year-old NEETs.[2]

The data on those who have recently become NEET also shows that almost everyone who wanted and was able to work could get a job relatively quickly in recent years. With the exception of unavailable NEETs (either due to family or health reasons), the proportion of those still in NEET status has fallen below 40 percent in each group within four quarters. Furthermore, most re-entrants (those waiting for a call-back) and job seekers (ILO unemployed) have found employment within six months (*Figure 5.1.2*).

**Figure 5.1.2: Number of year quarters until exit from NEET status to employment by type of unemployment, 2015–2018**




Source: Own calculation based on LFS data.

In addition to labor demand and individual motivation, help from the public employment services can also shorten the duration of job search through providing jobseekers with specific job offers, training or advice to improve the effectiveness of individual job search (see also section 5.2). Identifying the causal effect is difficult because there is a two-way relationship: registration can improve the efficiency of job search, but registration itself can be a step

2 We used a survival analysis, merging the waves of the Labor Force Survey 2015–2018. The sample included those who did not have NEET status in the first wave and then became NEET in one of the six quarters. As output variable we used the time until exiting the NEET status, and we controlled for – among others – level of education, age, gender, region, and quarter. Leaving NEET status to study has not been taken into account here.

in job search.[3] Therefore, our analysis is descriptive: in survival models, we estimated how motivation and job search affect the length of time to return to work or return to school.[4] The results are shown in *Table 5.1.1.*

**Table 5.1.1: Correlation of various factors with the time until exit from NEET status to employment and to education, 2015–2018**

| | Exit to employment | Exit to further education | Male, exit to employment | Female, exit to employment |
|---|---|---|---|---|
| Wants to work, not seeking a job actively, not available | 0.6480 | 1.0878 | 0.8562 | 0.5512 |
| | (0.2348) | (0.2157) | (0.4406) | (0.2831) |
| Wants to work, not seeking a job actively, available | 2.4735*** | 0.6922 | 2.3153*** | 2.7977*** |
| | (0.3800) | (0.1800) | (0.4520) | (0.7244) |
| Wants to work and actively seeks a job | 2.8805*** | 0.9875 | 2.6407*** | 3.5212*** |
| | (0.3943) | (0.2084) | (0.4864) | (0.7440) |
| Re-entrant | 3.6825*** | 1.0715 | 5.1245*** | 2.6285** |
| | (0.8888) | (0.5595) | (1.5977) | (1.0694) |
| Age | 1.0687*** | 0.8356*** | 1.0678*** | 1.0805*** |
| | (0.01386) | (0.01597) | (0.01871) | (0.02219) |
| Registered jobseeker in the previous period | 1.0970 | 0.4887*** | 1.1075 | 1.1237 |
| | (0.1432) | (0.1236) | (0.1890) | (0.2403) |
| Vocational school | 1.4640*** | 0.5450*** | 1.5463*** | 1.2131 |
| | (0.1763) | (0.1169) | (0.2235) | (0.2777) |
| Secondary or tertiary education | 1.1800 | 1.4030*** | 0.9851 | 1.4680** |
| | (0.1289) | (0.1742) | (0.1468) | (0.2535) |
| Female | 0.8537* | 1.1870* | | |
| | (0.08042) | (0.1227) | | |
| Constant | 0.002385*** | 0.4294 | 0.002882*** | 0.001040*** |
| | (0.001253) | (0.2977) | (0.001873) | (9.778e-04) |
| Number of observations | 2,578 | 2,452 | 1,429 | 1,149 |

Note: Coefficients express the effect on the logarithm of the odds ratio. Coefficients greater than 1 mean that this factor speeds up the placement process, while factors with a coefficient less than 1 impede it.
***Significant at a 1 per cent, **5 per cent, *10 per cent level.
Source: Own calculation from LFS data.

When looking at those who entered employment, not only the life situation, but also the self-reported willingness to work has a significant explanatory effect. Those who are available to work within two weeks will find a job significantly faster, even if they did not actively seek job opportunities in the previous year quarter.[5] However, contacting the employment office does not significantly reduce the duration of job search.

The role of the public employment services may be different for certain groups of young people not in education or training. Examining separately the groups created based on motivation, we find that registration with PES significantly reduces the duration of the NEET status for those who want to work but are not actively searching for a job themselves (*Table 5.1.2*). This implies that the support of the employment services is not significantly help-

3 In addition, registrants may be filtered by other features (that are not documented in population surveys): those who expect little from the job center because they have good connections, or are better informed, may have a lower registration rate; while those who already know which employer will provide them with an internship opportunity or (for different reasons) those who did not succeed in finding a job on their own might have a higher registration rate.

4 Time spent until leaving the NEET status to further education or training increases significantly with age, it is also slowed down by vocational education, but it is accelerated by secondary education or higher compared to having only primary education.

5 At the same time, re-entrants are the ones who start employment in the shortest time, in line with the results of *Micklewright–Nagy* (1999). Our results differ from this earlier research in that active jobseekers do not find a job faster than those who just want a job.

ful for those who are able to look for a job on their own (see Box K5.1), while those who themselves are not seeking employment for some reason may be activated by the help of PES.

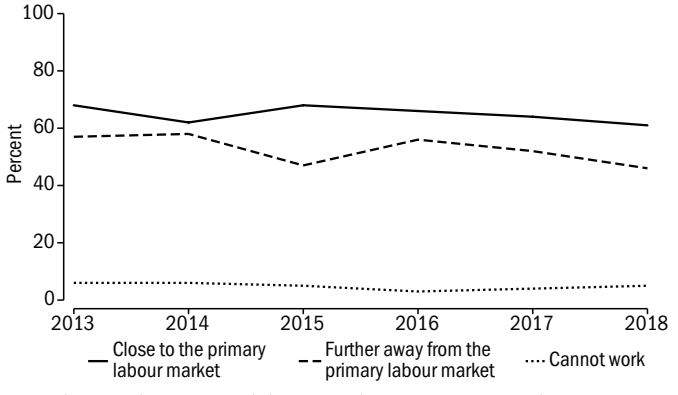
**Table 5.1.2: Relationship between motivational factors and registration with time until exit from NEET status to employment, 2015–2018**

| | Wants to work | Does not want to work | Wants to work and actively seeks a job | Wants to work but does not actively seek a job |
|---|---|---|---|---|
| Registered jobseeker in the previous period | 1.3582** | 1.2549 | 0.9139 | 1.9937*** |
| | (0.1812) | (0.6490) | (0.1654) | (0.4319) |
| Number of observations | 934 | 1,644 | 529 | 405 |

Note: Coefficients express the effect on the logarithm of the odds ratio. Coefficients greater than 1 mean that this factor speeds up the placement process, while factors with a coefficient less than 1 impede it.
***Significant at 1 percent, **5 percent, *10 percent level.
Source: Own calculation from LFS data.

Within the group of NEET young people, those who are the closest to the primary labor market (short-term unemployed and re-entrants) register with the employment services at the highest rate. The somewhat more problematic groups (long-term unemployed, discouraged jobseekers and other NEETs who want to work), for whom the services of the PES would likely be more helpful, register at a lower and, in recent years, declining rate. Not surprisingly, people who, for whatever reason, are unable to work are registered at a very low rate at PES offices.

**Figure 5.1.3: Registration rate by distance from the primary labor market, 2013–2018**




Note: Close to the primary labour market: re-entrant or short term unemployed. Further away from the primary labour market: long term unemployed or discouraged worker.
Source: Own calculation based on LFS second quarter waves.

Overall, we have found that young people not in education, training or employment face different opportunities in the labor market: a smaller and de-

clining portion finds work quickly, others remain unemployed for a more protracted period, while an increasing portion remain stuck in NEET status due to their care responsibilities or health issues. The employment service reaches no more than half of the second group and less than one in twenty young persons from the third group. From our descriptive analysis, it seems that registration at the job center can accelerate the employment of young people who are further away from the labor market and want to work. Therefore, in order to further reduce the number and proportion of young people not in education, employment or work, the access of vulnerable young people to employment services needs to be increased, and the efficiency of services for job-seekers (see section 5.2) and social services that can reduce (or compensate for) barriers related to illness or care should be improved.

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## K5.1 Job search channels

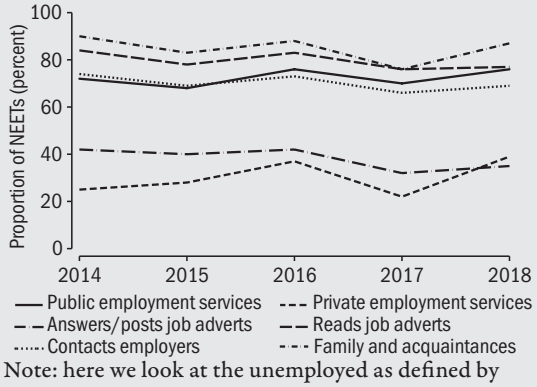
TAMÁS MOLNÁR

We examined the job search channels used by economically active, job-seeking young people aged 18–29 besides registering at the public employment services, and we also looked at the differences between job search channels used by young people with and without secondary education.

According to Labor Force Survey data, those who finished vocational school use the help of public employment services to find a job in a slightly higher proportion than those who completed secondary education (ISCED 3 A or B), while most people look for work with the help of acquaintances or read advertisements.

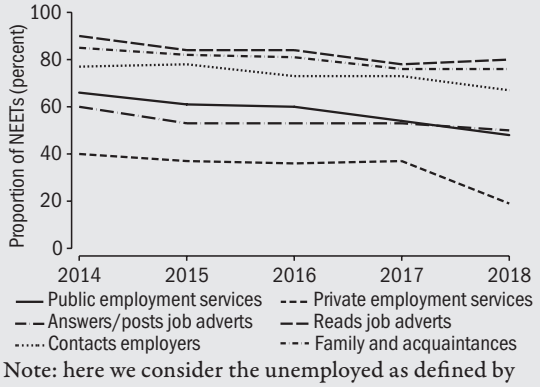
Roughly half of those who completed secondary education also use the help of public employment services, but this proportion has shown a declining trend in recent years, with most people reading advertisements and looking for jobs through acquaintances. In addition to this, graduates are more likely to actively post or respond to an ad than non-graduates.

Figure K5.1.1: Search tools used by unemployed young people who completed vocational school, 2014–2018




Note: here we look at the unemployed as defined by the ILO (not just registered jobseekers).
Source: LFS second quarter data.

Figure K5.1.2: Search tools used by ILO unemployed young people who completed secondary education, 2014–2018




Note: here we consider the unemployed as defined by the ILO (not just registered jobseekers).
Source: LFS second quarter data.

## 5.2 ACTIVE LABOUR MARKET INSTRUMENTS TARGETING YOUNG PEOPLE AND THE YOUTH GUARANTEE PROGRAMME

JUDIT KREKÓ, TAMÁS MOLNÁR & ÁGOTA SCHARLE

Recognising the long-term risks of youth unemployment, European Union countries established the Youth Guarantee (YG) scheme in 2014. Under the YG scheme, Member States have committed themselves to providing young people under the age of 25 with a specific, good quality offer from the organisation implementing the scheme (this is usually the public employment service) shortly after completing their studies or losing their job, starting in 2015.[1] The meaningful opportunity offered could be, for instance, a job supported by wage subsidies, training, participation in programmes promoting traineeship or entrepreneurship (*Tóth–Temesszentandrási*, 2019).

Most of the above mentioned labour market measures were on offer by the Hungarian labour offices before the YG scheme. The novelty of the YG primarily lies in the fact that the state guarantees that it will provide early, meaningful and personalised assistance to all young people not in employment, education or training (NEET), for the implementation of which EU funds will provide significant financial instruments. Most of the programme elements of the YG system are operated by employment services for registered jobseekers. In this subchapter, we evaluate these programme elements, we do not analyse traineeship and entrepreneurship programmes offered by other organisations.[2]

The results of the YG scheme can be evaluated on three levels. The first question is whether the employment services succeed in reaching and bringing the NEET youth into contact with employment services. The next question is in what proportion and within what timeframe young people already registered as jobseekers at the employment services[3] are given an offer, and whether their inclusion in the most appropriate active labour market programme will be successful. The final question of the effectiveness of the YG scheme is the extent to which the programme's tools improve the longer-term labour market prospects of young people.

For the time being, we do not have sufficient data available to examine the employment effects of the YG programme elements, therefore we do not deal with the impact assessment of the individual measures here either.[4]

In terms of the first level, reaching the NEET youth, the programme did not show significant results. The Council recommendations preparing the introduction of the YG prioritise addressing vulnerable, inactive young people facing multiple barriers by developing effective information strategies and strengthening cooperation with relevant partners (*EU*, 2013).

1 At the start of the programme in 2015, the commitment in Hungary was for an offer within six months after registration, currently an offer must be made to young jobseekers within four months.

2 The employment service operates the GINOP 5.2.1. and the VEKOP 8.2.1. programmes. The internship programme (GINOP 5.2.4.) is implemented by vocational training centres, and the programmes supporting entrepreneurship (GINOP 5.2.3., 5.1.9., 5.2.7.) are implemented by consortia of professional organisations.

3 The employment service has been part of government offices since 2015, and its branches operate as the employment department of the district offices.

4 The Youth Guarantee Programme is being evaluated at an early stage in a study by *Hétfa* Research Institute (*Ágnes Szabó-Morvai et al*, 2015).

Prior to the introduction of the Youth Guarantee Programme, the employment service reached nearly 60 percent of those NEET youth who would like to work, but certain barriers (such as weak motivation or lack of qualification) make it difficult for them to get a job, so they would be particularly in need of the assistance the programme could provide.[5] The rate of registrants in this group increased from 48 percent observed before the introduction of the programme to 58 percent in the first year, however in the following two years, it fell below the previous levels (see *Figure 5.1.5* in the previous subchapter). In the group of young people who are not hindered in their job hunt, the rate of registrants is 10–15 percent higher and has decreased less since the introduction of the programme. This indicates that the programme did not, or it only temporarily strengthened the partnerships or the inclusion tools which made it possible to reach inactive young people. A similar conclusion was reached by *Szabó-Morvai et al* (2015) based on data from the first months following the introduction of the programme, and this is supported by the interviews conducted in the labour organisation in the spring of 2019 (Budapest Institute, 2019).

On the second level, we analyse the timing and the types of programmes that the registered unemployed youth entered and evaluate the targeting and the relevance of the programmes. Based on the data of young people under the age of 25 entering active labour market programmes, the distribution of labour market programmes has significantly changed in recent years.

Based on individual level data of registered jobseekers, we examined where young people entering the labour register between January 2015 and June 2017 end up in the first six months after entry (*Figure 5.2.1*). According to this, since 2015, the chances of a young person entering the register to get into an active measure within half a year increased, and at the same time the probability of a young person entering public works or not to participate in any programme while remaining in the register decreased. More than half of all entrants are removed from the register within six months without entering either public works or an active programme. They either found work without help or became inactive.

The distribution of the active programmes by type is shown on *Figure 5.2.2*. Based on this, in addition to the dynamic increase of wage subsidies[6] of almost 70 percent, the number of entrants to training programmes stagnated between 2015 and 2018, so the weight of training within active programmes decreased overall.

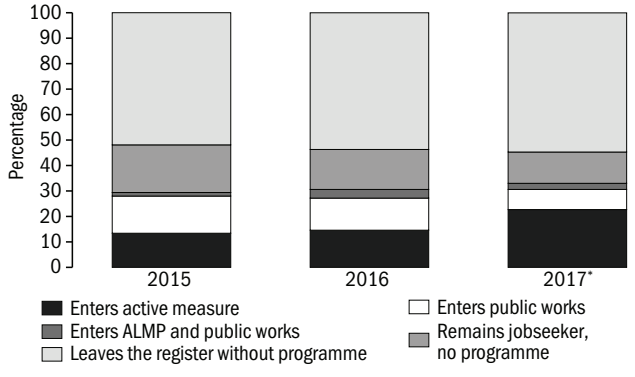
The fact that the labour market environment in Hungary has changed significantly in recent years also plays an important role in the transformation of the distribution of labour market instruments: besides the dynamic expansion of employment, unemployment, including youth unemployment, has also decreased. In any case, the reduction of the public works programme and the increase in the rate of wage subsidies are positive developments, as

5 Based on LFS data, see subchapter 5.1 for more details. We classified in separate groups those who could not work due to illness or family ties: the rate of registrants in this group is barely 5 percent.

6 Wage subsidies do not include subsidies provided by the Job Protection Act, the latter is discussed in subchapter 5.4.

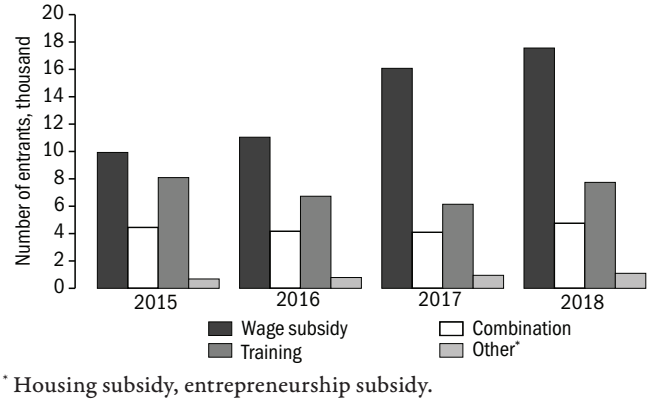
the recipients of wage subsidies work in the open labour market at a higher wage level than in public works. International analyses show that wage subsidy schemes providing employment in the private sector could improve post-programme employment opportunities to a greater extent than public employment schemes[7] (*Card et al,* 2018). The results of early analyses of the Hungarian public works scheme also demonstrate that public employment does not aid long-term employment (*Cseres-Gergely–Molnár*, 2015, *Köllő–Scharle*, 2012). At the same time, based on the significant increase in employment and the increase in labour shortages, it is likely that the wage subsidy instruments supported, in part, the employment of young people who could have found employment without support.

**Figure 5.2.1: What happens to young people under the age of 25 registered as jobseekers in the first six months after registration?**




* Until 30 June 2017. The horizontal axis shows the year of registration.
Source: Own calculation based on the Admin3 database of *Institute of Economics* Data bank. We would like to thank *István Boza* for his help in processing the database.

**Figure 5.2.2: The number of entrants into the Youth Guarantee Programme by active instruments**




* Housing subsidy, entrepreneurship subsidy.
Source: *Ministry of Finance.*

7 In fact, the employment impacts of the latter are typically negligible or negative.

Regarding the targeting of the programmes, we examine the extent to which vulnerable and low-educated groups in the labour market benefited from the expansion of active labour market programmes. In order to answer this question, we used a linear probability model to examine what factors influence whether the young people who registered as jobseekers between 30 June 2015 and 30 June 2017 are enrolled in the Youth Guarantee Programme within half a year. The results are shown in *Table 5.2.1.*

**Table 5.2.1: Regression estimate of the factors determining the entry of registered jobseekers under the age of 25 into the Youth Guarantee Programme**

| | Year of entry to unemployment registry | | | |
|---|---|---|---|---|
| | 2015–2017[a] | 2015 | 2016 | 2017[a] |
| Male | –0.003 | –0.010*** | 0.004 | 0.000 |
| | (0.002) | (0.003) | (0.004) | (0.007) |
| Max. primary education | –0.102*** | –0.092*** | –0.109*** | –0.122*** |
| | (0.003) | (0.004) | (0.004) | (0.008) |
| Below the age of 20 | –0.003 | 0.004 | –0.007 | –0.018** |
| | (0.003) | (0.004) | (0.005) | (0.009) |
| Number of unemployment spells | –0.018*** | –0.012*** | –0.013*** | –0.038*** |
| | (0.002) | (0.003) | (0.004) | (0.009) |
| With no work experience | 0.095*** | 0.092*** | 0.086*** | 0.126*** |
| | (0.003) | (0.004) | (0.005) | (0.009) |
| Constant | 0.252*** | 0.248*** | 0.211*** | 0.348*** |
| | (0.006) | (0.008) | (0.011) | (0.020) |
| Number of observations | 104,582 | 51,866 | 38,126 | 14,590 |
| $R^2$ | 0.039 | 0.049 | 0.032 | 0.052 |
| Average probability of entry | 0.21 | 0.20 | 0.21 | 0.28 |

[a] Until 30 June 2017.
Standard errors in parenthesis.
Dependent variable: binary variable with a value of 1 if the registered jobseeker below the age of 25 enters an active measure of the programme within half a year after registration.
Significant on ***1 percent, **5 percent, *10 percent level.
Source: Own calculation based on the Admin3 dataset of *KTI KRTK*.

The regression results show that those with no more than primary education and those re-entering the register are less likely to be included in an instrument of the Youth Guarantee Programme, and this disproportion did not decrease between 2015 and 2017. As a consequence, the labour market instruments are less likely to reach those young people who inherently have worse employment opportunities. This is probably mainly due to the fact that the low-skilled are more difficult to place in the labour market, even with wage subsidies.

In light of the results, the currently low and stagnant rate of training can be considered unfavourable, and more intensive involvement of young people with low educational attainment in training could presumably improve the situation. However, under the Young Guarantee Programme, young jobseekers can participate primarily in vocational training courses that directly pro-

mote employment, and training focusing on the development of basic competences is not included in the elements of the Programme in a significant portion of the districts. In the case of unskilled young people, in addition to the lack of vocational training, in many cases the lack of basic skills hinders employment. Furthermore, based on international experience (e.g. *Kluve et al*, 2019), the involvement of low-skilled, disadvantaged young people can be improved by more intensive use of personal counsellors and mentors, who can help young people choose an appropriate programme after registration based on personal abilities and needs.[8]

Therefore, overall the data show that active instruments, including wage subsidies, reach an increasingly high proportion of young people registered as jobseekers within an increasingly short period, in which, however, in addition to the Youth Guarantee Programme, the growth of demand for labour and the decrease in unemployment played a role as well. NEET youth further away from the labour market are less likely to be included in the register, while low-skilled people are less likely to be included in the scheme's active instruments than their better-off peers. Thus, in order to improve the Youth Guarantee Programme, greater efforts should be made to reach young people in need, and training programmes that improve general competencies and mentors should be used in greater proportion.

8 Although significant financial resources are available in the Youth Guarantee Programme, the regulation of the programme does not allow employment offices to account for internal mentors (PES-employees) within the programmes, so it can only be done through public procurement with the help of external suppliers, which is lengthy and usually involves a significant administrative burden.

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## 5.3 THE EFFECT OF THE JOB PROTECTION ACTION PLAN

ANDRÁS SVRAKA

From 2013, the employment of several labour market groups with a low employment rate was supported by reliefs on the social contribution tax, offered by the job protection action plan. The main relief types were given for the employment of individuals under the age of 25 and above the age of 55, and unskilled labourers (ISCO-08 category 9). The amount of the reliefs was half of the social contribution tax of 27 percent, but capped at HUF 100,000 per month (which was more or less equal to the amount of the minimum wage at the time of the introduction). A new feature of the reliefs was that they could be applied not only to new employees, but without a time limit and also to staff already in employment. Additionally, no authentications were needed for the reliefs, they could be deducted from tax liabilities via the monthly employers' contribution declaration.[1]

A generally available tax relief that is independent of income level and that targets groups in disadvantaged labour market positions has never before been available in Hungary. The reliefs were applied to approximately 600,000 individuals in 2013, which grew to 900,000 in 2018. Youth-specific reliefs were applied to 110,000 individuals in 2013, and 170,000 in 2018. The range of reliefs was slightly expanded during this time frame, but the increase could be connected primarily to a rise in employment. Thus, the extent to which the expansion can be attributed to the employment incentive effect of the reliefs, and how cost effective such a targeted relief system is, are important questions of economic policy.

The employment-related effect of the tax reliefs was examined by *Svraka* (2019a). The study estimated the employment-related effects for the main target groups using econometric tools, on the basis of individual level, anonymised tax authority micro data from the 2009–2015 period. It can be seen from the nature of the reliefs that entitlement was established along a criterion that draws a sharp cut-off: everyone under the age of 25 was entitled, but no one was entitled above the age of 25.[2] Thus, from among individuals who were similar based on other features and their labour market chances, some could be employed with lower costs, while others could not. Taking advantage of this quasi-experimental setup, we can compare the labour market output of those on the two sides of the cut-off – those that the reliefs applied to and the control group. Also controlling for the effects of the differing economic environments before and after the introduction of the reliefs, via a difference in differences type econometric method, the employment-related effect of the reliefs can be established and separated from any other factors.

The results show that the effect of the tax reliefs has proven to be significant: the rate of employment increased in the three main target groups already in

1 Additionally, the action plan also included reliefs related to new employment. Up to HUF 100,000 per month, social contribution tax was not payable in the first two years of employment for those returning after long-term unemployment or childcare leave, and for youth with a work experience of up to 180 days.

2 There were no data available for an in-depth analysis of the relief for youth with work experience of up to 180 days, thus the effect of this is also visible in the general relief for youth.

the year of introduction, and these effects rose continuously until 2015. By 2015, the employment probability of those under the age of 25 rose by 2.6 percent compared to a control group of similar individuals to whom the relief did not apply.[3] Making an estimate for those above the age of 55 using a similar method, this change was 0.8 percent, and among unskilled labourers – using occupations requiring low educational attainment and offering similar wages, to which the relief did not apply, as the control group – it was 2.7 percent. Among youth and the unskilled, there was no significant difference between the changes in the employment chances of males and females, but among older age groups, the whole effect can be attributed to the higher employment rate of females.

As a result of the reliefs, due to the change in relative labour costs, employers might have employed individuals that the relief applies to, instead of individuals who do not belong to any of the target groups. Among youth and older age groups, *Svraka* (2019a) did not find any signs indicating such potential substitution, but the employment rate of individuals with low educational attainment to whom the relief was not applicable did decrease slightly. Considering this, by 2015, the reliefs generated an expansion in employment by 53,000 individuals, 16,000 of which were under the age of 25.

The effect of the excess budgetary income generated by a higher employment rate manifesting through taxes and contributions, calculated based on the abovementioned partial equilibrium results, without broader macroeconomic consequences, was HUF 55 billion in 2015 – which is 40 percent of the cost of the reliefs that year. This cost efficiency indicator was, however, different for different target groups: 42 percent for youth, 70 percent for the undereducated, and only 14 percent for the older generations, in 2015.[4]

3 The Youth Guarantee Programme, which also targets youth aged under 25, was introduced in 2015: the effects estimated for the subsequent years may partly capture the impact of that Programme.

4 This indicator does not account for potential deadweight loss and measures short term returns. In the long run, as costs increase (as the subsidy is also available to those already in employment), cost efficiency is likely to deteriorate.

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## 5.4 THE ROLE OF THE MINIMUM WAGE IN THE EVOLUTION OF YOUNG PEOPLE'S EARNINGS

MÁRTON CSILLAG

Since the large-scale increase of the minimum wage in 2001–2002, the minimum wage has remained consistently high compared to the average wage, while additional minima for skilled workers and graduates[1] have also been introduced. According to the international literature, uneducated young people work at the minimum wage at the highest rate, and their employment is most sensitive to changes in the minimum wage (*Dolado et al,* 1996, *Neumark–Wascher*, 2004).[2] We did not have the opportunity to assess the impact of the development of the minimum wage. In this subchapter, we use data of the Wage and Earnings Survey to examine the proportion of young people working full-time in the private sector who worked near the minimum wage (or the guaranteed minimum wage), that is, 95–105 percent of the minimum wage.[3] We do this to show how effective the different wage minimums were and whether they became the cornerstones of wage formation. If a minimum wage is so low that it directly affects only a negligible proportion of workers, there is little chance that it could have an effect on employment.

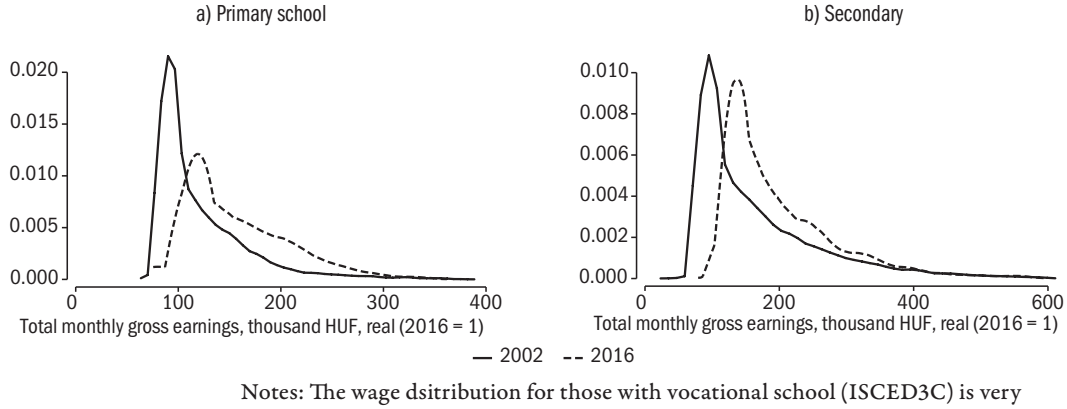
According to our data, those under 30 employed in the private sector indeed work at a higher proportion for the minimum wage (or guaranteed minimum wage) than workers over 30, the difference being 4–5 percentage points. *Figure 5.4.1* also shows that after the increase in the minimum wage in 2002, the share of young people employed for the minimum wage decreased. Although the guaranteed wage minimum has significantly changed the wage setting practices for young people, it has hardly changed the rate at which they are affected by one or another mandatory minimum wage.

1 The 'guaranteed minimum wage' was introduced from the 1st of July 2006. This minimum applies to all jobs which require (at least) a vocational degree. It means that in principle it applies to all workers with a level of education ISCED 3 (and above).

2 After a significant increase in the minimum wage in 2001–2002, the employment opportunities of certain groups – uneducated workers in small companies – have deteriorated (*Kertesi–Köllő,* 2004). At the same time, the authors point out that – in contrast to the situation in the United States or Western Europe – the minimum wage has had a significant effect on the wages of not only young people.

3 We did not examine whether the employee works in a job to which the guaranteed minimum wage applies or in a job where the minimum wage applies. (The guaranteed minimum wage applies to a worker employed in a job that requires at least a secondary education or a secondary vocational education.)

Figure 5.4.1: The distribution of wages of young people aged 16–25, by education, 2002, 2006 (thousand HUF)




Notes: The wage dsitribution for those with vocational school (ISCED3C) is very similar to that of those with secondary education (see: *Csillag et al*, 2019).
Source: Wage Survey (NES), private sector; own calculations.

The minimum wage (or the guaranteed wage minimum) can affect not only the low-educated, but also those who completed vocational school or secondary school (*Table 5.4.1*). It is also noteworthy that the guaranteed minimum wage has become the norm among young people who completed vocational school or secondary school (in the spirit of the law).

**Table 5.4.1: The percentage of 16–29 and 30–64 year-olds employed in the private sector who earn around the minimum wage or the guaranteed minimum wage**

| | 2002 | 2009 | | 2016 | |
|---|---|---|---|---|---|
| Level of Education | minimum wage | minimum wage | guaranteed minimum wage | minimum wage | guaranteed minimum wage |
| **Below age 30** | | | | | |
| Primary school | 25 | 17 | 13 | 17 | 10 |
| Vocational school | 30 | 10 | 20 | 8 | 23 |
| Secondary | 23 | 5 | 14 | 4 | 18 |
| Tertiary | 9 | 1 | 4 | 1 | 9 |
| Total | 24 | 7 | 13 | 6 | 16 |
| **Above age 30** | | | | | |
| Primary school | 21 | 15 | 12 | 15 | 13 |
| Vocational school | 22 | 6 | 16 | 6 | 19 |
| Secondary | 14 | 3 | 10 | 3 | 14 |
| Tertiary | 8 | 1 | 3 | 1 | 4 |
| Total | 17 | 5 | 11 | 5 | 14 |

Source: Wage Survey (NES), private sector; own calculations.

Examining the wage distribution of young people, several developments become apparent. On the one hand, the role of the minimum wage has somewhat decreased for unskilled workers and vocational school graduates, and wage differentiation has increased. On the other hand, the wage distribution of vocational school graduates and secondary school graduates is "truncated" from the bottom to a significant extent by compliance with the guaranteed wage minimum. That is, in the case of vocational school and secondary school graduates, the guaranteed wage minimum has become effective (i.e., a substantial portion of employees would have lower wages if paying the minimum wage were not mandatory). This may have contributed to the increase in real wages in the lower half of the wage distribution, but may have held back employment growth for some groups. For this reason, it may be justified to examine active instruments that provide tax incentives and wage subsidies for companies employing young people (see subchapter 5.3 for more details); and to conduct more detailed studies on the employment impact of the introduction of the guaranteed minimum wage.

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# 5.5 YOUTH IN PUBLIC EMPLOYMENT, WITH PARTICULAR EMPHASIS ON EARLY SECONDARY SCHOOL LEAVERS*

GYÖRGY MOLNÁR

Since the introduction of the Youth Guarantee scheme in 2015, youth registering as unemployed must be given, in principle, a substantial offer, which can be a training opportunity or an open labour market job (see subchapter 5.2). In previous years, especially since the school leaving age was lowered, there were no significant barriers to school-leaving youth gaining their first work experience in public employment. In this subchapter we examine the influence of the lowering of the school-leaving age[1] on the entry of youth between the ages of 16–19 into public employment, and how this changed upon the introduction of the Youth Guarantee scheme.

## The data

The analysis is based on the so-called Admin3 administrative database of the Centre for Economic and Regional Studies, which contains the data of 50 percent of the Hungarian population of 2003 at an individual level up to 2017. Our data on public employment starts with 2011. Our analysis focuses on those who were registered as unemployed and taken into public employment before the age of 20, between 2011 and 2017. At the beginning of each public employment episode, the educational attainment of the individual at the date of the registration is recorded. Wherever there were gaps in the educational attainment data received from the Hungarian Educational Authority, we remedied those with data from the public employment database to the extent possible.

In the presentation of the results, for the sake of better clarity, we provided absolute figures multiplied by two, and we did not wish to burden the reader with elaborating on the minor statistical errors resulting from a sample of 50 percent.

## Youth registered as unemployed or in public employment

While in 2011 and 2012 hardly any 16-year-olds and only a small number of 17-year-olds registered as unemployed, 2013 and 2014 saw a significant rise in these figures. The total number of registrants under the age of 20 rose dynamically both in 2012 and 2013, but it stagnated in 2014, while people registered at an increasingly young age – which is presumably in connection with the lowering of the school leaving age. The number of the youngest new entrants peaked in 2016 (*Table 5.5.1*).

The increase can be explained neither by the developments in unemployment (see *Table 5.7* of the chapter on Statistical data), nor demographic data.

* I would like to thank *Zsuzsanna Sinka-Grósz* for her invaluable help in the processing of the data.

1 As of 1 September 2012, the school-leaving age has been lowered from 18 to 16 years of age. The first group to whom this was relevant was those who had not yet commenced the 9th grade in the 2011/2012 school year.

These are relatively low figures: exactly 2 percent of 16-year-olds and 4 percent of 17-year-olds in 2016.

**Table 5.5.1: The number of youth between the ages of 16–19 registering as unemployed for the first time, 2011–2017**

| Age at the time of first registration | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| 16 | 44 | 106 | 738 | 1,980 | 1,716 | 1,948 | 1,670 |
| 17 | 284 | 472 | 1,412 | 2,660 | 3,676 | 3,924 | 3,718 |
| 18 | 6,796 | 9,360 | 10,196 | 9,714 | 8,562 | 7,742 | 6,754 |
| 19 | 10,660 | 12,902 | 12,728 | 10,482 | 9,344 | 8,240 | 7,306 |
| Total | 17,784 | 22,840 | 25,074 | 24,836 | 23,298 | 21,854 | 19,448 |
| The total number of the age group of 16–19 | 477,855 | 479,224 | 465,768 | 447,224 | 427,252 | 407,023 | 395,715 |

Note: The results obtained from the sample of 50 percent were multiplied by 2 in the table.

Source: Author's calculations, based on the Admin3 database; source of the demographic data: the demographic database of the *Hungarian Central Statistical Office*.

The increase can be explained neither by the developments in unemployment (see *Table 5.7* of the chapter on Statistical data), nor demographic data. These are relatively low figures: exactly 2 percent of 16-year-olds and 4 percent of 17-year-olds in 2016.

In the case of 18- and 19-year-olds, a more marked rise can only be seen between 2011 and 2012, which continued slightly in 2013 as well, in the case of 18-year-olds. In this year, the share within the age group of 18-year-olds who registered as unemployed for the first time during that year was 8.6 percent, while that of 19-year-olds was 10.5 percent; and it continuously decreases from then on.

*Table 5.5.2* shows the number of those entering public employment for the first time, broken down by age. In 2011 and 2012, there were essentially no 16- and 17-year-olds in public employment, and even the number of 18- and 19-year-olds was relatively low. The number of youth entering public employment suddenly increased in 2013, and peaked the next year at a figure of 8400. Even though the Youth Guarantee scheme was launched in 2015, eligible youth could still enter public employment if they initiated it themselves. Thus in the case of the two younger groups, the number of those entering public employment continued to grow after 2014, peaking in 2016. Their share also grew continuously within the group of those entering public employment for the first time, and reached 13.6 percent in 2016.

The entry of youth into public employment received substantial media coverage; numerous news articles reported on cases where children of poor families left school due to the lure of public workers' wages (see *Fülöp*, 2016).

In response to the phenomenon, the regulation was amended: Government Decree 1139/2017 (20th March) provided that those under the age of 25 "may

enter public employment schemes only if the Youth Guarantee labour market scheme does not offer them any other realistic opportunities". This resulted in a significant drop in the numbers of all age groups in 2017, and the share of those under the age of 20 within the number of new entrants also decreased somewhat (to 10.3 percent). In the course of the seven years reviewed, a total of nearly 40 thousand youth entered the public employment system.

**Table 5.5.2: The number of youth between the ages of 16–19 entering public employment for the first time, and their share within the group of all first entrants, 2011–2017**

| Age at the time of first entry into public employment | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Total |
|---|---|---|---|---|---|---|---|---|
| 16 | 2 | 6 | 190 | 630 | 500 | 744 | 352 | 2,424 |
| 17 | 8 | 60 | 398 | 1016 | 1132 | 1434 | 692 | 4,740 |
| 18 | 372 | 1,180 | 2,390 | 3,148 | 2,366 | 2,430 | 1,052 | 12,938 |
| 19 | 1,850 | 2,266 | 3,928 | 3,610 | 2,400 | 2,372 | 1,044 | 17,470 |
| Total | 2,232 | 3,512 | 6,906 | 8,404 | 6,398 | 6,980 | 3,140 | 37,572 |
| Share (percentage) | 1.0 | 3.6 | 6.1 | 10.0 | 10.8 | 13.6 | 10.3 | 5.7 |

Note: The public employment of a small section of those entering for the first time in 2011 already commenced in 2010. The results obtained from the sample of 50 percent were multiplied by 2 in the table.
Source: Author's calculations, based on the Admin3 database.

Nearly 30 percent of newly registered 16-year-olds became a public employee within 90 days (*Table 5.5.3*). The highest figure can be seen in 2016. The younger someone was, the more likely it was that they would become a public worker within 90 days. In 2013, the proportion of youth becoming public workers within three months rose significantly, and this trend kept growing in 2014, when it peaked at 21 percent. It may be an effect of the Youth Guarantee scheme that in 2015 the rate of those starting public work early decreased somewhat among the age group of 17–19-year-olds, but it stagnated among 16-year-olds, and then kept growing steadily in 2016. A marked decrease only occurred in 2017.

**Table 5.5.3: The share of those among the 16–19-year-olds registering ias unemployed for the first time who entered public employment within 90 days, 2011–2017 (percent)**

| Age at the time of first registration | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Average |
|---|---|---|---|---|---|---|---|---|
| 16 | 5 | 6 | 28 | 28 | 28 | 36 | 19 | 28 |
| 17 | 1 | 11 | 24 | 27 | 20 | 24 | 11 | 20 |
| 18 | 3 | 9 | 18 | 23 | 17 | 17 | 8 | 14 |
| 19 | 2 | 6 | 11 | 15 | 12 | 13 | 6 | 9 |
| Total | 2 | 8 | 15 | 21 | 16 | 19 | 9 | 13 |

Source: Author's calculations, based on the Admin3 database.

A similar trend emerges when we examine entering public works within 30 or 180 days. In 2016, 26 percent of those registering at the age of 16 became public workers within only 30 days, while 42 percent within 180 days.

It is worth reviewing this inversely as well – how much time youth entering public works spent in the registry before they become public workers. According to the figures, on average, nearly 60 percent of those becoming public workers at the age of 16 spent 30 days or less in the registry before entering the scheme: thus, presumably, they registered with the explicit aim of becoming public workers (*Table 5.5.4*). A similar situation is found in the case of 44 percent of 17-year-olds. With the increase of age, this value keeps decreasing somewhat. As we progress in time, a significant increase in the number of those becoming public workers within a very short period of time occurs in 2014, and their share essentially stagnates after that.

**Table 5.5.4: The share of those among youth entering public employment for the first time who, before doing so, spent not more than 30 days in the unemployment registry, 2012–2017 (percentage)**

| Age at the time of first entry into public employment | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Average |
|---|---|---|---|---|---|---|---|
| 16 | 67 | 63 | 53 | 56 | 63 | 59 | 58 |
| 17 | 40 | 46 | 41 | 45 | 45 | 43 | 44 |
| 18 | 41 | 35 | 44 | 41 | 37 | 37 | 39 |
| 19 | 20 | 18 | 28 | 33 | 34 | 31 | 26 |
| Total | 27 | 27 | 38 | 40 | 40 | 39 | 35 |

Note: In the case of those already in public employment on 1 January 2011, start date is known only for those who had previously done public works managed by the Public Employment System, thus we omitted that year.
Source: Author's calculations, based on the Admin3 database.

### Early school leaving

Approximately one tenth of the under 20 age group entering public employment have not even completed elementary education. Their share among 16-year-olds is more than 20 percent. The share of those entering public employment having completed vocational school or secondary school is also approximately 10–10 percent (*Table 5.5.5*).

Nearly 60 percent of those who had not completed elementary school at the time of entry into public employment did not complete the eighth grade of elementary school at a later time either, and whether they have completed it or not is unknown for a further 20 percent.

At least 80 percent of those under the age of 20 who entered public employment having completed the eighth grade of elementary school had also attended some type of secondary school (it is unclear for some of them). Progressing in time, the proportion of those who attended secondary school continuously increases (*Table 5.5.6*). Thus the proportion of those who become

public employees after leaving secondary school increases. A sharp increase occurred between 2013 and 2014, among 16-year-olds. While in 2013 "only" 52 percent of those entering public employment with the eighth grade of elementary school completed left secondary school, in 2014 this figure was 78 percent. Therefore the increase in numbers showed in *Table 5.5.2* was to a great extent due to those leaving secondary school.

**Table 5.5.5: The total distribution of educational attainment at the time of entry into public employment in the period between 2011 and 2016 (percentage)**

| | Educational attainment | | | | |
|---|---|---|---|---|---|
| Age at the time of first entry into public employment | lower than the eighth grade of elementary school | the eighth grade of elementary school | vocational school | secondary school | total |
| 16 | 23 | 77 | 0 | 0 | 100 |
| 17 | 18 | 78 | 4 | 0 | 100 |
| 18 | 11 | 70 | 11 | 8 | 100 |
| 19 | 6 | 60 | 15 | 18 | 100 |
| Total | 11 | 67 | 11 | 11 | 100 |

Source: Author's calculations, based on the Admin3 database.

**Table 5.5.6: The share of those among youth entering public employment with an educational attainment of the eighth grade of elementary school who also attended secondary school, broken down by the year of entry, 2011–2017**

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Total |
|---|---|---|---|---|---|---|---|---|
| Total no. of group | 766 | 1,834 | 3,626 | 4,482 | 3,638 | 4,128 | 1,780 | 20,254 |
| Share (percentage) | 49 | 71 | 75 | 84 | 89 | 90 | 91 | 81 |

Note: The number of the total group obtained from the sample of 50 percent was multiplied by 2.
Source: Author's calculations, based on the Admin3 database.

In 2011, 11 percent of those entering public employment with an educational attainment of the eighth grade of elementary school and having attempted attending secondary school became public employees within three months of leaving school. This rate rose to approximately 30 percent from 2012. These are those who became public employees essentially immediately after leaving school, or following a short "technical break".

Among those who entered public employment before 2016 having an educational attainment of the eighth grade of elementary school and having attended secondary school, the share of those who obtained secondary level qualification two years later[2] is only 3 percent (*Table 5.5.7*). Only 10 percent of this 3 percent obtained a secondary school diploma, while the rest attended vocational training. In 2011, the proportion of those completing secondary school within two years was somewhat higher than in the other years, and

2 The two years were calculated as calendar years, since the exact time of the completion of school is not known.

this proportion does rise to a minimal extent broken down by age at entry into public employment, but these differences are statistically not significant.

**Table 5.5.7: The share of those among youth entering public employment with an educational attainment of the eighth grade of elementary school and having started secondary school who obtained secondary-level qualification within two years, 2011–2015 (percentage)**

| Age at the time of first entry | 2011 | 2012 | 2013 | 2014 | 2015 | Average |
|---|---|---|---|---|---|---|
| 16 | 0 | 0 | 0 | 0 | 2 | 1 |
| 17 | 0 | 0 | 2 | 1 | 3 | 2 |
| 18 | 4 | 2 | 2 | 3 | 3 | 2 |
| 19 | 7 | 4 | 3 | 4 | 5 | 4 |
| Total | 6 | 3 | 3 | 3 | 4 | 3 |

Note: The data regarding educational attainment levels two years after entry into public employment are only known from the data of the Hungarian Educational Authority, thus the number of cases in this table is only 14,346.
Source: Author's calculations, based on the Admin3 database.

## Main conclusions

Overall, it can be concluded that the number of 16- and 17-year-olds entering public employment rose significantly after the lowering of the school leaving age: in the period under review, a total of approximately 7 thousand people under the age of 18, and 38 thousand people under the age of 20 became public employees. The rate of new labour market entrants entering public works did not decrease upon the launch of the Youth Guarantee scheme, only after the relevant government decree was issued in 2017. The educational attainment of nearly 80 percent of youth entering public works was not higher than the eighth grade of elementary school, and having entered public employment, their chance of completing secondary school within a few years is insignificant, even if they had started it before their entry into public employment.

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# 6 THE SITUATION OF ROMA YOUTH

## 6.1 SCHOOLING AND EMPLOYMENT OF ROMA YOUTH: CHANGES BETWEEN 2011 AND 2016

ÁGOTA SCHARLE

Roma youth complete fewer grades in school – and, closely connected to that, are less likely to get a job – than non-Roma youth (*Kemény–Janky,* 2005, *Kertesi*, 2005). The disadvantages that accumulate over generations (and are difficult to overcome), the discriminatory, segregating attitudes of mainstream society and policy measures (or the lack of intervention) all contribute to the disadvantages of the Roma. While the role of institutional factors in explaining the schooling gap has been examined in several recent studies (e.g. *Hajdu et al,* 2014, *Kertesi–Kézdi*, 2014, 2016, *Kiss,* 2018), there is very limited information and analysis available on the Roma non-Roma employment gap. This sub-chapter provides a descriptive overview of recent trends, based on the HCSO's population surveys, which measure Roma ethnicity more accurately than before.

### Education

For the sake of brevity, trends in schooling are portrayed by using two indicators, the share of those completing matriculation[1] and the share of full-time students. The share of matriculated youth by age (*Figure 6.1.1*)[2] is shaped mainly by developments in the period before 2011: those who were 29 years old in 2016 completed secondary school around 2005–2006, and those who were 19 years old at that time also acquired their basic skills in public education before the reform of 2011. In the non-Roma population, there is a significant change only in the case of men: in all cohorts over the age of 18 the share of matriculated boys is significantly higher (5–6 percentage points) in 2016 as compared to 2011 (*Figure 6.1.1*). In the Roma population, there is a significant improvement both among boys and girls. For Roma girls, the share of matriculated students starts to increase only in the younger cohorts, but the improvement is large – almost twice as large as for boys.

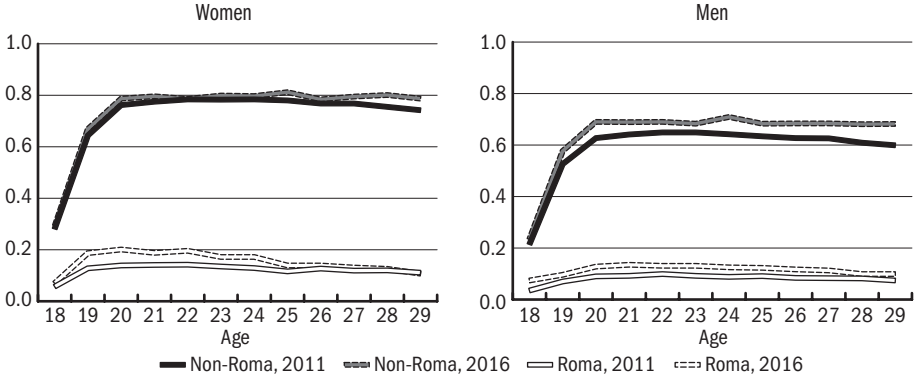
The importance of the improvement observed in the case of Roma youth is underlined by the fact that their schooling is hindered by several factors, according to previous research. Hajdu et al. (2014) estimate[3] that more than half of the Roma – non-Roma differences observed in the chances of dropping out of secondary education is explained by the level of knowledge acquired by the end of primary school, the quality of the secondary school, and the material and human resources available during secondary studies. A significant part of the remaining difference can be traced back to social isolation: the fact that Roma youth are much less likely to have close links with those who do well in school than non-Roma youth.

1 This is an exam (comparable to A levels in the United Kingdom) that closes the academic track of secondary education (ISCED 3A or 3B) and passing it is one of the conditions of entering tertiary education.

2 The employment opportunities and expected wages of matriculated students are significantly better than those of non-graduates (*Hajdu et al,* 2015).

3 The study examined the school performance and entry to tertiary education of a full higher secondary school cohort of Roma and non-Roma students based on data from the Career Tracking Survey between 2006–2012.

Figure 6.1.1: Share of matriculated youth by age, 2011, 2016 (percentage)



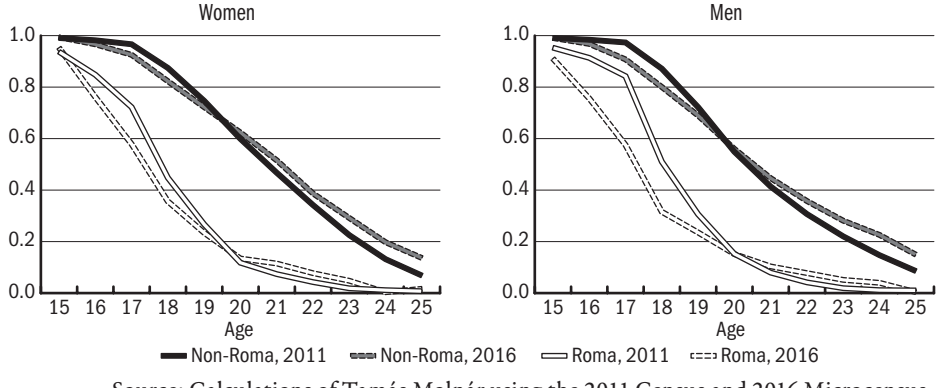

Source: Calculations of Tamás Molnár using the 2011 Census and 2016 Microcensus of the *Hungarian Statistical Office*.

Most recent developments are captured by the other indicator: the share of full-time students by cohort shows the share of young people who continue their education in secondary and higher education after primary school. The reduction of the compulsory school age introduced in 2011[4] increased the share of early school leavers among both Roma and non-Roma youth, but this effect was significantly higher for Roma, particularly Roma men (*Figure 6.2*). As discussed in subchapter 6.2, this effect was above the average in disadvantaged small regions. Comparing the data of the 2011 Census conducted before the reform and the 2016 Microcensus five years later,[5] the share of full-time students decreased by 4–7 percentage points for non-Roma, and by 14 (women) and 27 (men) percentage points for Roma youth in the 17 year-old cohort. The decrease is already significant among 16 year-olds in the case of Roma youth.

4 Act CXC of 2011 on National Public Education lowered the compulsory schooling age from 18 to 16. The age limit of 16 first applied to those who started eighth grade in the 2011/2012 school year.

5 The measurement of Roma identity was very similar in two surveys, but the census may include a higher rate of those who claim to be Roma for two reasons: on the one hand, the sample is comprehensive, while in the sample of the microcensus, Roma settlements are underrepresented, and on the other hand a special campaign encouraged the assumption of Roma identity at the time of the 2011 census.

Figure 6.1.2: The share of full-time students among Roma and non-Roma youth, 2011, 2016 (percentage)




Source: Calculations of Tamás Molnár using the 2011 Census and 2016 Microcensus of the *Hungarian Statistical Office*.

The comparison of the data for 2011 and 2016 also shows that Roma youth are less involved in the expansion of higher education: in the 21–23 cohort, the share of full-time students among non-Roma increased by an average 5 percentage points, while among Roma it increased by only 3 percentage points in five years. This also means that the disadvantage of Roma people has further increased in participation in higher education.

### Employment

According to the CSO Labour Force Survey, in 2017, 55 percent of men and 36 percent of women were employed in the Roma population aged 15–64, while within the non-Roma population, the proportion of the employed was 76 and 62 percent, respectively. The employment of Roma people increased more than that of non-Roma between 2014 (the first year when ethnicity was included in the Labour Force Survey) and 2017, so that the Roma employment gap has somewhat narrowed. At the same time, the already huge disadvantage of the Roma further increased regarding the rate of early school leavers and youth not in employment, education or training (NEET). These two indicators slightly improved in the non-Roma population between 2014 and 2017, while they worsened or remained unchanged in the case of Roma youth.[6] In the five years between the 2011 Census and the 2016 Microcensus (roughly corresponding to a period of steady economic growth), the employment rate increased from 16 to 25 percent for Roma men, and from 7 to 12 percent for Roma women aged 16–25 (excluding public works).

**Table 6.1.1: The 16–25 year-old population by ethnicity and labour market status, 2011 and 2016 (thousand people)**

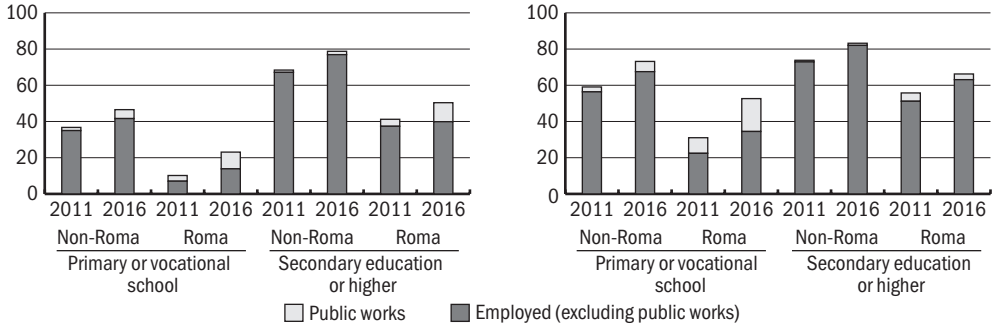
| | Roma | | Non-Roma | |
|---|---|---|---|---|
| | 2011 | 2016 | 2011 | 2016 |
| **Men** | | | | |
| Full time education | 9.8 | 7.9 | 311.1 | 261.6 |
| Employment | 5.0 | 9.2 | 184.2 | 213.8 |
| Public works | 1.7 | 4.3 | 5.1 | 9.1 |
| Parental leave | 0.3 | 0.1 | 0.3 | 0.3 |
| Other | 15.4 | 15.7 | 99.9 | 69.5 |
| Total | 32.2 | 37.2 | 600.6 | 554.3 |
| **Women** | | | | |
| Full time education | 8.3 | 6.9 | 303.8 | 258.8 |
| Employment | 2.1 | 3.6 | 149.0 | 171.6 |
| Public works | 0.7 | 2.0 | 3.7 | 7.4 |
| Parental leave | 9.2 | 7.6 | 29.7 | 30.6 |
| Other | 9.8 | 10.1 | 84.6 | 59.5 |
| Total | 30.1 | 30.2 | 570.8 | 527.9 |

Source: Own calculations using the 2011 Census and 2016 Microcensus of the *Hungarian Statistical Office*.

6 The rate of early school leavers increased from 57 to 65 percent (decreased from 10 to 9 percent among non-Roma), the NEET-rate was 38 percent in both years (decreased from 13 to 9 percent among non-Roma). The former indicator is published by the CSO on the 18–24 year-old age group, and the latter on the 15–24 year-old cohort (2018).

The large sample of the 2011 Census and the 2016 Microcensus also provides an opportunity to examine employment trends independently of education. Comparing the data of these two surveys, the disadvantage of the Roma is still large in employment, though it is significantly smaller for those completing at least secondary school (with matriculation, i.e. ISCED 3A or 3B) than for the unskilled (*Figure 6.1.3*). The disadvantage of young Roma women did not decrease between 2011 and 2016, despite an increase in the employment rate of both education categories. In the case of young Roma men, there is a significant decrease in the disadvantage of the unskilled, but this is largely due to public works. In 2016, 34 percent of low educated Roma men in employment participated in public works, while among the non-Roma, the corresponding ratio was only 8 percent. For working Roma women, the share of public workers is even higher: 40 percent of the unskilled and 21 percent even of those with at least secondary education were employed in public works in 2016.

**Figure 6.1.3: Employment rate of the 16–25 year-old, not in education population, 2011 and 2016 (percent)**




Source: Own calculations using the 2011 Census and 2016 Microcensus of the *Hungarian Statistical Office*.

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## 6.2 NEIGHBOURHOOD-RELATED DIFFERENCES IN THE SHARE OF YOUTH NOT IN EDUCATION, EMPLOYMENT OR TRAINING BEFORE AND AFTER LOWERING THE SCHOOL-LEAVING AGE

JÁNOS KÖLLŐ & ANNA SEBŐK

Unemployment among working-age minors (aged 15–18) continuously decreased after the first years of the political changeover and then fell to less than three percent as a result of raising the school-leaving age to 18.[1] This situation changed when Act CXC of 2011 took effect, which set the school-leaving age at 16 years again, enabling pupils older than that to exit to the labour market and (according to the plans of the decision makers) take up employment.

Using elementary methods, this short Subchapter aims at describing how the activity composition of the affected age group changed in disadvantaged and better off neighbourhoods of the country as a result of the measure. We focus on youth who have passed the age of 17 but have not yet reached 18, who, with a few exceptions, were subject to compulsory education before 2011 but not thereafter. We point out that participation in education decreased the most in the most disadvantaged neighbourhoods, while expansion in employment was unable to prevent, even in the most effective labour markets, an increase in the number of youth not in education, employment or training (NEET).

Our analysis is based on the total census population of ten million of the 2011 census and the random sample of one-million of the 2016 micro-census.[2] Data on the 17-year-olds are not possible to examine in a detailed geographical breakdown in this way: in order to reach an adequate sample size and grasp the characteristics of the micro-environment, the 45,500 Hungarian census tracts with an average population of 250 were divided into quartiles according to various dimensions, based on their data as observed in 2011. The dimensions considered are the employment and unemployment rate of the local population with a lower-secondary qualification; an indicator describing the size and quality of the labour market accessible for those with a lower-secondary qualification, and the proportion of the Roma within the population.[3]

The changing role of regional differences over time is measured using probabilistic regression. The outcome variable indicates whether the $i^{th}$ 17-year old living in the $j^{th}$ census district was in education or was NEET in 2011 and 2016. The estimated coefficients in the first three columns of figures in *Table 6.2.1* show how likely the individual belonging to a given group (Roma boy, Roma girl, non-Roma girl) was employed in the given year compared with *non-Roma boys*. In the 4–6$^{th}$ columns of figures, the coefficients indicate how the probability of the outcome is influenced by the immediate neigh-

1 For the impact of the School Education Act of 1996, see Subchapter 2.5.

2 The calculations were carried out in the research lab operated jointly by the Central Statistical Office and CERS HAS.

3 For the detailed calculation method of indicators see the *Appendix* at the end of the Subchapter.

bourhood belonging to the second, third or fourth worst census tract quartile ($Q_2$ –$Q_4$) instead of the best quartile ($Q_1$) determined by the 2011 indicator (employment rate, unemployment rate, etc.).

**Table 6.2.1: The impact of gender, ethnic group and neighbourhood characteristics on participation in education, 2011, 2016 (probabilistic regression)**

| Census tract indicator | Roma boy | Non-Roma girl | Roma girl | Census tract quartiles | | | Constant | $R^2$ | N |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 2. | 3. | 4. | | | |
| **Employment rate** | | | | | | | | | |
| 2011 | –10.8 | –0.4 | –29.2 | –0.0 | –0.4 | –4.0 | 99.2 | 0.11 | 9358 |
| | (4.5) | (1.5) | (9.3) | (0.1) | (1.5) | (5.8) | | | |
| 2016 | –25.4 | 0.0 | –26.0 | 0.1 | –3.0 | –12.7 | 97.6 | 0.14 | 7464 |
| | (9.6) | (1.2) | (8.9) | (0.2) | (4.5) | (12.5) | | | |
| **Unemployment rate** | | | | | | | | | |
| 2011 | –12.1 | –0.4 | –30.3 | –0.5 | –1.0 | –3.0 | 99.5 | 0.10 | 9358 |
| | (5.1) | (1.5) | (9.6) | (1.5) | (2.6) | (4.5) | | | |
| 2016 | –29.3 | 0.1 | –30.3 | –2.3 | –4.3 | –10.1 | 98.3 | 0.12 | 7464 |
| | (11.3) | (0.3) | (10.5) | (3.7) | (6.1) | (10.4) | | | |
| **Quality of the labour market**[a] | | | | | | | | | |
| 2011 | –12.8 | –0.4 | –30.8 | –0.5 | –0.9 | –1.9 | 99.6 | 0.10 | 9358 |
| | (5.4) | (1.8) | (9.8) | (1.4) | (2.5) | (4.4) | | | |
| 2016 | –30.7 | 0.1 | –31.4 | –1.7 | –3.9 | –7.1 | 98.2 | 0.11 | 7464 |
| | (11.9) | (0.2) | (10.9) | (2.2) | (5.1) | (8.8) | | | |
| **Proportion of the Roma** | | | | | | | | | |
| 2011 | –10.3 | –0.4 | –28.5 | –3.6 | –3.6 | –4.1 | 95.2 | 0.11 | 9358 |
| | (4.3) | (1.5) | (9.0) | (4.9) | (5.1) | (6.5) | | | |
| 2016 | –25.6 | 0.2 | –26.3 | –7.2 | –10.1 | –10.8 | 86.1 | 0.13 | 7464 |
| | (9.6) | (0.4) | (8.9) | (6.0) | (9.2) | (10.8) | | | |

[a] See the *Appendix* at the end of the Subchapter.

Sample: 17-year-old residents of the census tracts observed in both the 2011 census and the 2016 micro-census. A Roma is defined as someone who identifies themselves as Roma first or secondly when asked about ethnicity or speaks Roma, Boyash or Romani as a first or second language.

*N* = the number of individuals observed. Coefficients were multiplied by one-hundred, *t*-values are provided in brackets.

Roma and non-Roma youngsters are differentiated between because the former attend much worse basic and secondary schools on average compared with the non-Roma, their immediate neighbourhood is less likely to encourage them to complete their education, or their families are less likely to afford the additional costs of learning and thus they are more inclined or forced to drop out of education. In the strongly segregated and typically bad quality "Roma schools" these effects are further magnified.

Please note that, for 2011 the equations are estimated only for the subset of census tracts also observed in the micro-census. $Q_1$ – $Q_4$ groups contain *the same* census tracts in 2011 as in 2016. (Results concerning the total sample of the census are similar.)

Apparently, there is no significant difference in the participation of non-Roma boys and non-Roma girls either in 2011 or in 2016. A much (about thirty percentage points) smaller proportion of Roma girls attended school in 2011 but their situation did not change until 2016 and even slightly improved compared with non-Roma girls. However, there is an enormous decline among Roma boys, who were 10–13 percentage points less likely to attend school in 2011 and their disadvantage had increased to 25–31 percentage points by 2016.[4]

Considering neighbourhood characteristics, a similar pattern is seen in the first three blocks of the Table: participation in education was already (2–4 percentage points) lower in 2011 in the quartile the most disadvantaged, based on the given indicator, than in the best quartile. However, this lag had become much more dramatic (7–13 percentage points, depending on the neighbourhood indicator considered) by 2016, when comparing individuals of the same gender and ethnicity.

The constants of the equations measure the participation in education of non-Roma boys living in the best neighbourhood: even this indicator deteriorated by one to one and a half percentage points.

In the lowest block of the Table, census tracts were divided into quartiles according to the proportion of the Roma in the population in 2011. This does not have an impact on the coefficients obtained with individual variables. Participation in education was increasingly low towards the fourth quartile in 2011 and also – to a far greater extent – in 2016. Controlled for ethnicity, these results suggest participation of non-Roma youth also decreased significantly in census tracts with a high proportion of the Roma.

The values of constants in the equations are also different from those in the first three blocks. The low share (practically zero in the first quartile) of the Roma does not, in itself, guarantee high participation in education and the share of boys attending school also declined in these (primarily rural) quartiles.

The dependent variable of the similarly structured *Table 6.2.2* is NEET (not in education, employment or training) status. The estimations using the four indicators, yielding similar results are not described, only the calculation relying on quartiles based on the 2011 employment rate is presented, this time focusing more on NEET levels in 2016.

The probability of a 17-year-old Roma boy living in the worst census tract quartile not being in education, employment or training is estimated at 14.8 per cent (11.3 + 3.0 + 0.5) in 2011. Calculated similarly, the probability is at 38.7 per cent in 2016, which is essentially the same as the actually observed figure in the given population (38.5 per cent).[5] Although our estimations are not pinpoint accurate (as revealed by the relatively low explanatory power of the equations), they are sufficiently reliable to show that the proportion of the 17-year-olds attending school decreased significantly between 2011 and

4 The estimated value depends on which census tract indicators were controlled for when assessing individual effects.

5 Please note that estimations using weighted and unweighted population figures hardly differ, which is explained by the fact that the census tracts were defined by taking into account the workload of census takers and thus their size is fairly similar.

2016, which was hardly offset by the increase in employment. As regards the social consequences, it is especially worrying that by 2016 the proportion of Roma boys living in a disadvantaged neighbourhood, not in education, employment or training had increased to an alarmingly high level (at least double the 2011 level). In 2016, four out of ten such youth were not in education, employment or training.

**Table 6.2.2: The effect of gender, ethnicity and certain neighbourhood characteristics on NEET status (not in education, employment or training), 2011, 2016 (probabilistic regression)**

| Census tract indicator | Roma boy | Non-Roma girl | Roma girl | Census tract quartiles | | | Constant | $R^2$ | N |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 2. | 3. | 4. | | | |
| **Employment rate** | | | | | | | | | |
| 2011 | 11.3 | 0.5 | 30.4 | 0.4 | 0.9 | 3.0 | 0.5 | 0.10 | 9358 |
| | (4.9) | (1.8) | (9.7) | (1.5) | (2.3) | (4.4) | | | |
| 2016 | 28.5 | 0.5 | 31.3 | 2.1 | 3.7 | 9.3 | 0.9 | 0.13 | 7464 |
| | (11.2) | (0.9) | (10.9) | (3.8) | (5.7) | (10.2) | | | |

Sample: 17-year-old residents of the census tracts observed in both the 2011 census and the 2016 micro-census. A Roma is defined as someone who identifies themselves as Roma first or secondly when asked about ethnicity or speaks Roma, Boyash or Romani as a first or second language.
*N* = the number of individuals observed. Coefficients were multiplied by one-hundred, *t*-values are provided in brackets.

## Appendix

### Definition of the census tract indicators

*Employment rate.* The proportion of those engaged in a gainful activity during the week preceding the interview within the working age population. Those who were not working that week but were temporarily away from work are also regarded as employed.
*Unemployment rate.* Unemployed is defined as someone who does not work, were actively seeking employment during the month preceding the interview and would be able to take up a job if found. Their number is compared with the active age population.
*The proportion of the Roma.* A Roma is defined as someone who identifies themselves as Roma first or secondly when asked about ethnicity or speaks Roma, Boyash or Romani as a first or second language. Their number is compared with the active age population.
*Indicator for the quality of the labour market.* The labour market for a census tract population with certain educational attainment is described with an indicator ($Q = V/A$), where $V$ is the number of jobs profitably accessible for an individual from their census tract and A is the number of competitors for whom these jobs are also accessible. A job is considered accessible if

the net wages less travel-related monetary and time costs are higher than the expected amount of available benefits and public works wages. The related estimation was undertaken by *Melinda Tir* and *János Köllő,* using the GEO-database of the Hungarian Academy of Sciences (http://adatbank.krtk.mta.hu/adatbazisok___geo).

# 7 ADULT EDUCATION AND TRAINING AND OVER-QUALIFICATION

## 7.1 WORKPLACE AND NON-FORMAL EDUCATION AND TRAINING OF YOUTH

JÚLIA VARGA

Participation in non-formal education and training may play an important role in the adaptation of individuals to changing labour market demands. In this subchapter, we will examine a subject that is under-researched in Hungary: changes in the rates of participation of youth in non-formal education and training, and the differences in the probability of participation observable based on various characteristics.

Information on the participation in non-formal education and training is available from three statistical data collections. The first one is the Adult Education Survey of Eurostat (AES), which collects data in the countries of the European Union on the 12 months before surveying, about the participation of adults in formal and non-formal education and training and the characteristics of these.[1] The second is also a Eurostat survey.[2] The third data source is the labour force surveys of the HCSO, the regular quarterly surveys of which include the question whether the respondent had participated in non-formal education and training during the four weeks preceding the survey.

In the various waves of the labour force surveys, the extent of the detailedness of the questions regarding participation in non-formal education and training changed several times; until 2014, questions about participation were asked in more aggregated groups, while since then, 12–13 different groups of non-formal education and training have been distinguished for data collection about the participation in these. The data collection process increasingly intends to map all non-formal forms of education and training.[3]

The three types of data sources show substantially different participation rates. We have not been able to establish a reason for this based on the information available to us. According to the AES surveys, the participation rate of youth between the ages of 25–34 in non-formal education and training in Hungary has grown from 9.7 per cent in 2007 to 44.3 per cent in 2011, and then to 56.6 per cent in 2016.[4] The value recorded in 2016 was higher than the average of the EU-28 or the eurozone (*Figure 7.1.1*).

The labour force survey has documented significantly lower participation rates. In 2018, 10.1 per cent of 25–34-year-olds participated in training, while this is 17.8 per cent on average in EU-28 countries, and 19.5 percent[5] in eurozone countries.

1 There have been three surveys so far (in 2007, 2011/2012 and 2016/2017). The first pilot survey was conducted in Hungary in 2007 as a complementary survey to the labour force survey of the HCSO, and then the subsequent surveys were independent ones. The sample size was 5800–6500 people.

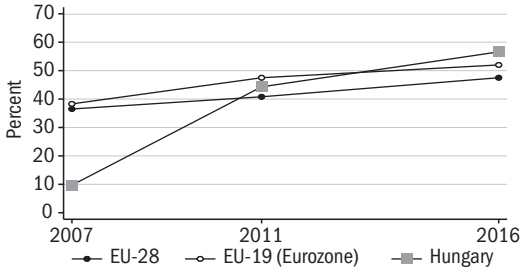
2 The survey, named Continuing Vocational Training of Enterprises (CVTS), collects data on vocational trainings supported in some form by enterprises/companies in organisations that employ at least 10 people. The CVTS survey has also been conducted three times so far, in 2005, 2010 and 2015.

3 The surveys collect data on participation in the following non-formal forms of education and training: vocational courses that do not provide qualification, non-formal trainings within the National Qualification Register (OKJ) system, participation in various seminars and conferences, work-related and team-building trainings at the workplace, language courses, computer courses, IT trainings, courses organised within distance learning. All forms of e-learning, webinars, private lessons, health-related courses, trainings held by authorities, driver training, lectures and courses related to sports, music, and other hobbies.

4 The Eurostat explicitly notes that due to changes in methodologies, the AES-results of 2007, 2011, and 2016 are not comparable directly, and thus "the results cannot be used for interpreting the changes in lifelong learning participation rates between 2007 and 2016". [Eurostat Eurostat Adult Education Survey. Reference Metadata in Euro SDMX Metadata Structure (ESMS) 15.2. Comparability – over time].

5 Eurostat.

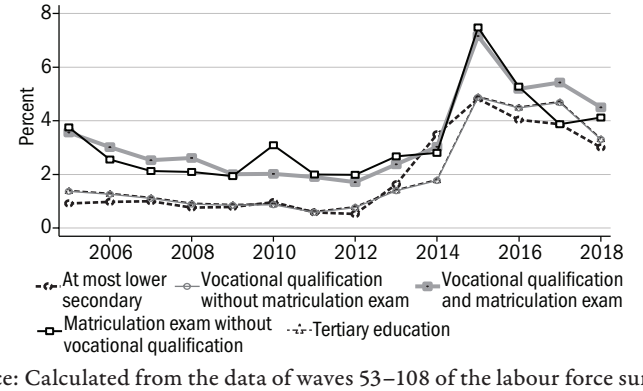
**Figure 7.1.1: The participation rates of 25–34-year-olds in non-formal education and training, according to the data of the AES surveys**




Source: Author's compilation based on the *Eurostat* AES surveys.

Figure 7.1.2 shows the changes in the participation of 25–34-year-olds by educational attainment groups between 2005 and 2018.[6] Between 2005 and 2012, the already very low participation rates of 25–34-year-olds decreased continuously in all educational attainment groups, and then between 2013 and 2015, a higher rate of youth reported participation in training. A part of the increase may be due to the rearrangement of the classification system (see footnote 3). Participation rates started declining again after 2015. Throughout the entire period, participation rates were the highest in the "secondary school diploma with vocational qualification" and "secondary school diploma without vocational qualification" groups. After 2014, the lowest rates of participation in education and training were found in "the eighth grade of elementary school or less as educational attainment" category.

**Figure 7.1.2: The participation rates of 25–34-year-olds in non-formal education and training, according to the data of the labour force survey, broken down by educational attainment**




Source: Calculated from the data of waves 53–108 of the labour force survey.

Aggregating the data of the four waves of the labour force survey of 2018, we examined the probability of the participation of 16–34-year-olds in non-formal education and training with a simple probability model as well.[7] The results – the significant marginal effects – are summarised in *Table 7.1.1*.

6 The annual data are the average of the quarterly data.

7 Binary outcome probit model, whether they participated in education or training (yes/no).

**Table 7.1.1: The determinants of the probability of non-formal training among 16–34-year-olds, 2018**

| Variable | Marginal effect dy/dx |
|---|---|
| Educational attainment level | |
| Vocational school (vocational qualification without a secondary school diploma) | 0.031** |
| | (0.01529) |
| Secondary school diploma without vocational qualification | 0.042*** |
| | (0.01304) |
| Higher education | 0.057*** |
| | (0.01548) |
| Labour market status | |
| Employed | 0.049*** |
| | (0.00948) |
| Sector | |
| Agriculture | –0.042*** |
| | (0.00733) |
| Industry | –0.032*** |
| | (0.00867) |
| Machinery | –0.036*** |
| | (0.01006) |
| Construction | –0.048*** |
| | (0.00534) |
| Other | –0.037*** |
| | (0.01022) |

The other control variables used in the model were: Gender, Educational attainment: vocational qualification with a secondary school diploma, Labour market status: unemployed, Region binary variables, Place of residence: village, Budapest.
Reference category: Female, the eighth grade of elementary school or less as educational attainment; inactive, city or town, Southern Transdanubia, vehicle industry.
Standard errors in brackets.
Significant at the ***1 per cent, **5 per cent, *10 per cent levels.
Source: Author's compilation.

Youth with a vocational qualification were 3.1 per cent more likely, youth who obtained a secondary school diploma in a grammar school (secondary school diploma without vocational qualification) was 4.2 per cent more likely, and youth with a higher education diploma was 5.7 per cent more likely to participate in training in 2018 than the reference category of youth with the eighth grade of elementary school or less as educational attainment. Youth in employment were 5 per cent more likely to participate in non-formal education and training than inactive youth. Those working in certain sectors (industry, construction, agriculture) were less likely to participate in non-formal education and training than the reference category of those working in the vehicle industry. We did not find significant variabilities in the probability of participation in education and training based on the rest of the characteristics recorded (gender, the region of residence, type of municipality, other sectors).

## 7.2 THE GROWING IMPORTANCE OF NON-COGNITIVE SKILLS IN JOB SEARCH AND AT WORK

KÁROLY FAZEKAS

It is not only the sectoral and occupational structure of the economy that changes during technological development and transformation of the international, regional and social division of labour. There is a substantial shift in the task content within an occupation, in terms of what skills are required to accomplish them. Over the past decades the share of jobs requiring mathematical and social skills has seen the fastest increase, while the share of jobs requiring neither mathematical nor social skills has declined the most (*Deming,* 2017).

Social (non-cognitive) skills are primarily needed for effective cooperation with others at work. They include the elements of the skill group termed *Big Five* in personality psychology: extraversion, agreeableness, conscientiousness, emotional stability, openness. They also include the theory of mind, which is the ability to place oneself in another's position when observing others, to understand the reasons for other people's actions and judge their state of mind from the viewpoint of our goals and actions. The theory of mind capacity is highly important for the success of cooperation with another person and within a group in both education and the labour market (*DeAngelo–McCannon,* 2015).[1]

The increasing importance of non-cognitive skills observed in the past decades are due to closely related technological, social and demographic reasons. As a result of technological development (robotization, the spread of production and service systems consisting of continuously communicating elements and the expanding use of artificial intelligence) an increasing proportion of tasks requiring high-level cognitive skills can be performed by intelligent, computer-controlled equipment. By contrast, the expansion of robotisation has so far not taken place in occupations requiring non-cognitive skills (*Deming–Kahn,* 2018). At the same time, the proportion of these occupations in the labour market has been steadily increasing partly due to an increase in the share of employees in the service sector and partly due to the increasing share of nursing and healthcare jobs, and also because tasks requiring group work, trust, intuition and social skills play an increasingly important role in modern business management (*Schanzenbach et al,* 2016).

Some traditional occupations and jobs will likely disappear, even within a few years, but new jobs and occupations may emerge in the meantime and demand for labour in certain occupations, primarily those requiring non-cognitive skills, is continuously growing. For a long time it seemed that artificial intelligence is not capable of acquiring or learning non-cognitive skills. However, there has also been significant progress in this field recently. According

1 Previous volumes of The Hungarian Labour Market have covered the definition and measuring of cognitive and non-cognitive skills in more detail (*Fazekas,* 2018a, 2018b).

to forecasts based on results of the most recent developments, robots with non-cognitive skills will increasingly be able to undertake the necessary tasks in a wide range of personal services, nursing, elderly care, healthcare, trade and the creative industries (*Morgan et al,* 2019).

Considering the expansion of robotization, it is essential that young people possess the motivation and abilities necessary for learning the latest skills. Furthermore, it will be necessary to undertake continuous analysis to reveal changes in the content of occupations in a labour market and support teachers and educational policy makers in adapting to changes by developing curricula and methodology (*Alabdulkareem et al,* 2018).

Although the majority of non-cognitive skills are linked to hereditary traits, several empirical studies report that parents, the environment and school are able to develop or modify them to a large extent (*Zhou,* 2016). Methods aimed at developing non-cognitive skills (such as project-based groupwork) are increasingly utilised in educational systems all over the world.[2] Several non-cognitive skills may also be developed in later life, in adult education or on-the-job training (*Hoeschler et al,* 2018*, Hoeschler–Backes-Gellner,* 2018).[3]

Analysis of job advertisements and recruitment practices shows that the level of non-cognitive skills is a significant predictor of successful job search (*Hoeschler–Backes-Gellner,* 2018). This is supported by impact assessments reporting that programmes for the integration of inactive youth are more successful if they also include the development of non-cognitive skills (*Guerra et al,* 2014).[4] Numerous examples show that at companies which included the development of non-cognitive skills in their in-company training, investment into training yielded significant productivity gains (*Adhvaryu et al,* 2017*, Groh et al,* 2012).

In addition to skills development, it is important that employees and employers possess relevant information about their skill levels and the yield of these skills. This information both strengthens the motivation of employees to improve their skills and increases the willingness of employers to reward high-level non-cognitive skills (*Bassi–Nansamba,* 2019).

2 The PISA assessment by the OECD and STEP by the World Bank have contained items assessing the non-cognitive skills of pupils since 2012 (*Kautz et al,* 2017, *Gaelle et al,* 2014).

3 *Guerra et al* (2014), based on the PRACTICE model developed by the World Bank specifically for improving non-cognitive skills needed by the labour market, describe what methods are best suited for developing these skills in different age groups.

4 For example: *Job Corps, Youth Build* and *Big Brothers Big Sisters* in the United States or EPIDE (Etablissments pour l'Insertion dans l'Emploi) in France (*Quintini,* 2015).

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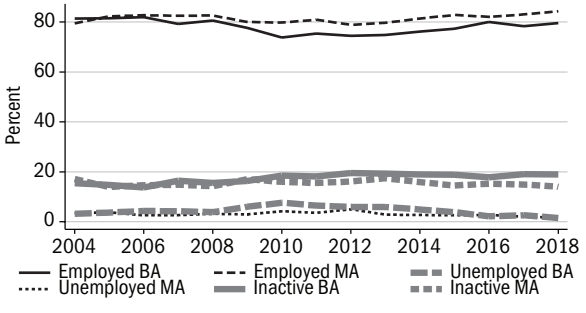
# 7.3 THE LABOUR MARKET SITUATION OF YOUNG GRADUATES, OVERQUALIFICATION AND THE VALUE OF HIGHER EDUCATION DEGREES

JÚLIA VARGA

This Chapter overviews how the labour market situation of young graduates (aged 35 at most) has been changing recently. The expansion of higher education, which was typical of the 1990s and the early 2000s, came to a halt after 2012. From 2012 onwards, fewer students entered higher education than earlier[1] and from 2015 the share of graduates has been decreasing in the young population.[2] Nevertheless, their share in the total adult population aged 25–64 continued to grow until 2018[3] because the more populous working-age generations had a lower share of graduates. Despite the increase in the number and proportion of higher education graduates, young graduates continued to be very successful in the labour market overall.

*Figure 7.3.1* shows how the proportion of young graduates from bachelor's (BA) and master's (MA) programmes have changed in the three labour market status groups (employees, unemployed and inactive). More than 80 per cent of MA degree holders were employed over the entire period. BA degree holders were employed at the start of the period in the same proportion as MA degree holders, then (probably as a result of the economic crisis) their employment rate decreased between 2006 and 2010 by 7 percentage points but this indicator started to increase again after 2010 and by 2016 it had reached 80 per cent. The share of the unemployed grew temporarily around the economic crisis but since then has steadily diminished to a very low level of about 1–2 per cent. Changes in the distribution of young graduates by labour market status indicate that their chances of employment did not deteriorate but even improved after the effects of the crisis had worn off.

Figure 7.3.1: The distribution of young (younger than 36) graduates by labour market status and the level of qualification (MA/BA), 2004–2018 (percentage)




Source: Calculated from the Labour Force Survey of the *Central Statistical Office*.

1 The indicators of school education, Indicator D1.10. (*Varga,* ed., 2018).

2 See: Eurostat.

3 See: Eurostat.

Another key indicator of labour market success is wage return. Young graduates realized very high wage returns on average. The average wage return of BA/college degree holders younger than 36, *compared with those with a lower-secondary qualification* was 130–140 per cent at the beginning of the period.[4] It decreased between 2010 and 2012 then started to increase and returned to the earlier high level, suggesting that the temporary decline was probably due to the economic crisis. The average wage return of MA degree holders only slightly changed between 2003 and 2016: it ranged between 200–220 per cent.[5]

The average change in the wage return is driven by various trends: it may be a result of returns at all points of the wage distribution changing similarly or also because primarily the well-paid and badly paid graduates experience changes in their wage returns.

*Figure 7.3.2* presents changes, over time, in the wage returns (the estimated parameters of the quantile regressions)[6] of young BA and MA degree holders *compared with those with an upper-secondary qualification* (*Matura*). Quantile regressions were run for various points of the wage distribution for each year between 2006 and 2016. Wage returns were estimated for each point of the wage distribution by quantile regression method.[7] The Figure shows changes in the wage returns estimated at the 10th, 25th, 50th, 75th and the 90th percentiles between 2006 and 2016.

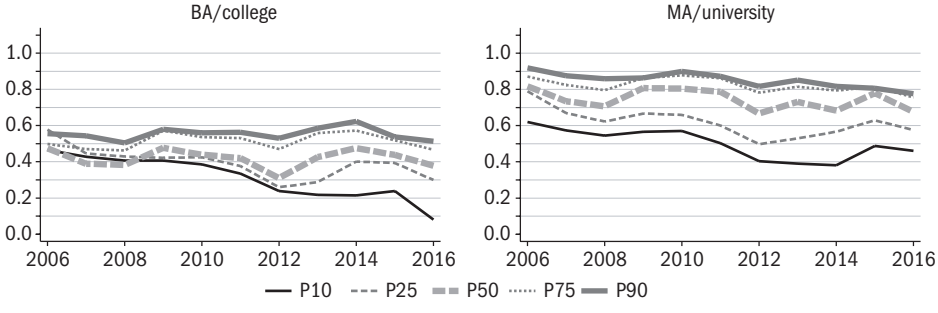
4 The indicators of school education, Indicator D2.2., D2.8. (*Varga,* ed., 2018).

5 The indicators of school education, Indicator D2.8., Table D2.8.2. (*Varga,* ed., 2018).

6 Quantile regression estimates were based on a subsample of the Wage Survey containing those with at least an upper-secondary qualification (Matura). The dependent variable was the logarithm of earnings, while the explanatory variables were qualification categories as well as potential labour market experience and its square and a binary variable for gender.

7 See for example *Chamberlain* (1994), *Martins–Pereira* (2004).

**Figure 7.3.2: Wage return to BA/college and MA/university degrees compared with a Matura, by quantiles, 2006–2016**




Source: Calculated from data from the Wage Survey.

Differences within the educational attainment groups increased between 2008 and 2012 and returns in the various percentiles diverged during this period. The return realized by the best-paid graduates belonging to the 90th and 75th percentile did not change; however, it declined at other points of the distribution: the decrease was increasingly conspicuous towards the bottom. The previously lagging percentiles started to catch up with returns measured at the top of the distribution after 2012, except for the lowest, the 10th percentile. The wage return of the bottom ten percentage diminished steadily

and to a large extent after 2012: from about 50 per cent in 2006 to below 10 per cent in 2016. The wage return of MA degree holders slightly dropped as a result of the crisis at the bottom of the distribution, at the 10th and 25th percentile, although it started to improve again at the 25th percentile after 2012 and at the 10th percentile after 2014.

The wage return of youth with either a BA or MA qualification at the top of the distribution, belonging to the 75th and 90th percentile, was high throughout the period, whereas the return of those belonging to the 50th and 25th percentile temporarily declined for a few years, probably as a result of the crisis, then started to grow again and returned to earlier levels. The bottom ten per cent of BA degree holders, however, permanently fell behind the other groups. This may be due to skills, differences in the quality of higher education institutions and departments or mismatch problems. It is possible that some young graduates can only find a job which does not require a higher education qualification.

However, it is not easy to determine which jobs are for higher education graduates. There are three methods in use. The first create categories based on the subjective judgement of graduates, relying on interviews. Since there is no long time series of this available, we did not apply this method.

The second method classifies occupations into categories of graduate and other occupations according to their task content. Occupational classification systems, such as the international ISCO system[8] or the Hungarian Standard Classification of Occupations (HSCO), are also based on this; they consider the content of the actual activity undertaken in an occupation and the key criterion for grouping is the level of expertise, knowledge and skills necessary to follow an occupation.

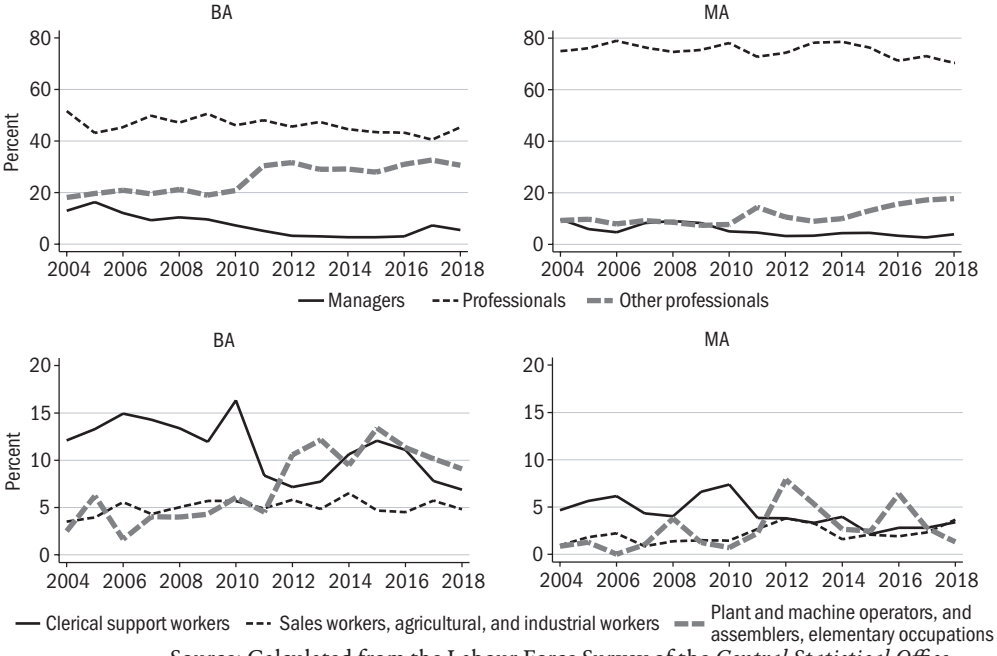
*Figure 7.3.3* shows how the proportion of young graduates changed in the groups formed using HSCO categories.[9] Those working in the groups of trade, agriculture, industry, semi-skilled and unskilled work of the Figure are very likely to work in occupations not requiring a degree. Those belonging to the first three groups (managers; professionals; other professionals) obviously work in occupations requiring a higher education degree. It is difficult to judge what qualification the group "office and management (customer services)" requires since it contains heterogeneous occupations in terms of qualification requirements and therefore they are possible to hold with various qualifications.

Changes in the proportions of workers within the occupational groups do not indicate that MA degree holders cannot find a job in occupations requiring a higher education qualification. Among BA degree holders, however, the share of those working in semi-skilled or unskilled jobs increased to 10 per cent after 2011, which suggests that 10–15 per cent of these young graduates do not find a job suitable to their qualifications.

8 See: ILO.

9 Occupations were classified into six groups on the basis of the main categories of the Hungarian Standard Classification of Occupations (HSCO): 1) occupations in HSCO category 1 containing managers, senior officials of public administration and interest organisations, legislators; 2) HSCO category 2: professionals – occupations requiring the autonomous use of higher education qualifications; 3) HSCO category 3: occupations with other higher education or upper-secondary qualifications, 4) HSCO category 4: office and management (customer service) occupations; 5) HSCO categories 5, 6 and 7: occupations mostly with upper-secondary qualifications – commercial, services, agricultural, forestry, industry and construction industry; 6) HSCO categories 7 and 8: semi-skilled and unskilled occupations.

Figure 7.3.3: The proportions of those employed in occupational groups among young graduates, by qualification level, 2004–2018 (percentage)




Source: Calculated from the Labour Force Survey of the *Central Statistical Office*.

It is often misleading to examine changes in the proportions of employees in graduate and "non-graduate" jobs based on occupational classification systems, on the one hand, because there may be diverse requirements even within occupations, and on the other hand because they are rarely updated, as that is an extremely time-consuming process. At the same time, the task content of occupations changes constantly, for example as a result of technological changes or changes in the labour supply, therefore the "required" qualification level also changes regularly.

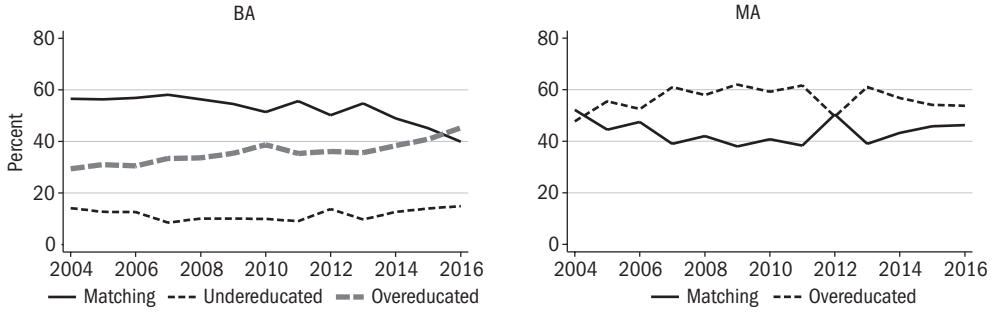
The third method used for defining the qualification level required for an occupation addresses the above problem by assessing the qualification distribution of actual jobholders in occupation and its certain value or its mean (*Verdugo–Verdugo,* 1988) or mode (*Duncan–Hoffman,* 1981, *Mendes de Oliveira et al,* 2000, *Galasi*, 2004, 2008) is regarded as the qualification necessary for the occupation. Nevertheless, the fit measured by this method may also be distorted because the actual occupation–qualification matches observed are partly due to supply and demand and do not only reflect qualification requirements and changes thereof.

Based on calculations relying on actual occupation–qualification matches,[10] *Figure 7.3.4* presents changes in the proportions of well-matched, underqualified and, in the case of BA/college degree holders, overqualified graduates of

10 The estimates regarded modal educational attainment as required qualification. Required qualification was defined by differentiating between BA/college and MA/university degrees for four-digit occupational groups for each year. In the case of multimodal distributions the higher qualification was regarded as required qualification. We assessed whether young people with a higher education degree have the required, higher or lower qualification and based on this we determined if someone has adequate qualification (works in a well-matched occupation), is overqualified or underqualified. (MA graduates cannot be regarded as underqualified, since this is the highest qualification category.)

the two qualification levels. The required qualification level is re-defined for each year, which makes it possible to take into account potential changes in qualification requirements.

Figure 7.3.4: The proportion of well-matched, overqualified and underqualified graduates, by qualification level, 2004–2016 (percentage)




Source: Calculated from data from the Wage Survey.

The proportion of those in a well-matched job dropped slightly first between 2007 and 2010 among BA degree holders, then declined more rapidly between 2013 and 2016, while the proportion of the overqualified increased. In 2016, about 40 per cent of BA degree holders aged younger than 36 were working in a well-matched job, 42 per cent of them were overqualified in their job and 18 per cent of them were underqualified. At the beginning of the period, 57 per cent of young MA graduates were working in a well-matched job, while 43 per cent of them were overqualified. By the end of the period, these proportions were roughly the opposite: in 2016, 54 per cent of the graduates were overqualified and 46 per cent of them were working in a well-matched job, which may indicate that during the transition from education to work, an increasing share of young graduates starts their career in a job requiring a lower level qualification.

Overqualification, underqualification and working in a well-matched job may have an impact on the wage return of young graduates. Relying on Hungarian data, *Galasi* (2004, 2008) assessed the influence of over- and underqualification on wage return. His analysis included all qualification levels and covered the entire working-age population. In the following we present changes in the impact of overqualification, underqualification and adequate qualification level on wage returns,[11] using the model of *Duncan–Hoffman* (1981).[12] Similarly to findings of other studies using this method [see the summary of *Leuven et al* (2011)], the results show that the return on "required" and "surplus" years in higher education is positive, while the return on "missing" years is negative. The return on required years is higher than that of surplus years. The

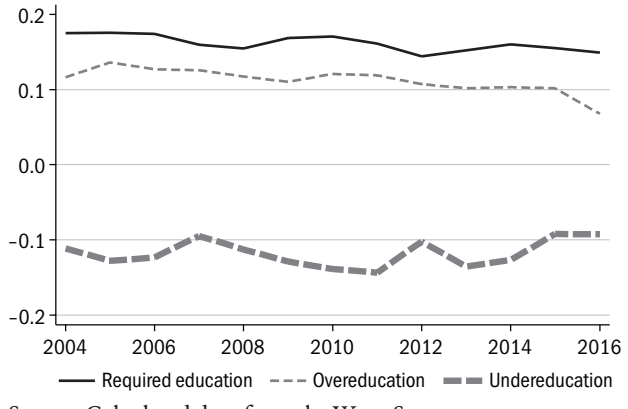
11 The results are not to be compared directly with the results of *Galasi* (2004, 2008), on the one hand because our sample only includes young people below 36 with at least an upper-secondary qualification (Matura) and Galasi carried out the estimation for the entire adult population and all qualification categories, and on the hand because those studies also contained variables for the interaction between labour market experience and overqualification, underqualification and well-matched qualification. As our sample only includes those aged below 36 and we have no information on how many years of labour market experience these individuals have spent as overqualified, underqualified or well-matched employees, our study does not use such interaction variables.

12 Based on *Duncan–Hoffman* (1981), we investigated the effects of overqualification and underqualification using Mincer earnings functions by breaking down the number of years in education ($S$) into three elements: number of required years ($R$), overqualification years ($O$) and underqualification years ($U$) ($S = R + O - U$). We estimated the following extended Mincer earnings function: $\log(W_i) = \beta_0 + \beta_1 R_i + \beta_2 O_i + \beta_3 U_i + \beta_4 EXP_i + \beta_5 EXP_i^2 + \beta_6 GEN_i + \mu_i$, where $W_i$ is earnings, $EXP$ is potential labour market experience and $GEN$ is binary variable for gender. The Figures show coefficients $\beta_1$, $\beta_1$ and $\beta_2$ obtained from the cross-sectional regressions estimated for each year.

wage return on required higher education years was excessively high, 15–17 per cent, over the entire period. Each surplus year in addition to the required qualification yielded 10–12 per cent, that is less than the required years but still a substantial positive return. The return on the surplus years started to decrease after 2012 and had declined to 7 per cent by 2016. Those who were underqualified for their jobs (in this case BA graduates who undertook tasks typically performed by MA graduates), realized 10–12 per cent lower wage returns with each missing higher education year.

However, this model does not take into account the varying skills and competences of young graduates. Firstly, it is not accidental as to which young graduate has a BA or MA level qualification: it may be related to their unobserved skills, which may also change over time due to changes in the proportions of applicants and entrants to higher education. Secondly, they do not randomly take well-matched or mismatched jobs: this may also be related to unobserved skills. Thus the estimated return on overqualification and underqualification may be associated with other unobserved characteristics of the human capital stock of young graduates.

**Figure 7.3.5: Wage return on required, surplus and missing years, 2004–2016**




Source: Calculated data from the Wage Survey.

As presented in Subchapter 8.1 on youth employment mobility, the over- or underqualification of young graduates may be temporary. It may be reasonable for the talented and highly qualified to start working in jobs inferior to their skills if it is compensated by faster promotion prospects (*Sicherman–Galor*, 1990). Subchapter 8.1 presents how the frequency of occupational change among young graduates increased after 2010 and that in the case of occupational change, they are less likely to move downwards or switch to another occupation of the same level than members of other qualification groups. It

warrants further analysis of why young graduates are more likely to choose this way of entering the labour market.

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# 8 GEOGRAPHIC AND OCCUPATIONAL MOBILITY

## 8.1 OCCUPATIONAL MOBILITY AMONG YOUTH WITH DIFFERENT EDUCATIONAL ATTAINMENT LEVELS

JÚLIA VARGA

During the period that follows the entry into the labour market, at the beginning of the career path, job changes and occupational changes are usually more common than in the later stages of the career path. This is a natural feature of the transition from study to work, since – as the so-called *job shopping* models describing occupational change pinpoint, at the time of the entry into the labour market – at the beginning of the career path, individuals are not yet aware either of their own competencies or their preferences regarding a job or occupation, which one can only discover through a certain amount of experience in the labour market. During this job shopping period, young workers experiment with different occupations and jobs. They learn about their own competencies and the requirements and characteristics of occupations and jobs during this period of experimentation and "shopping around", and this is how eventually they find the occupation that suits or 'fits' them (*Johnson,* 1978, *Topel–Ward,* 1992, *Longhi–Taylor,* 2013). The higher frequency of occupational changes at the beginning of the career path may also be in connection with the fact that many young people[1] who enter the labour market accept positions and occupations whose requirements do not match their qualifications (their educational attainment or specialisation), in the hope of getting promoted into a different position or occupation at a later point in time (*Sicherman–Galor,* 1990). Some of the studies examining the occupational changes that occur at the beginning of the career path indeed found that the more frequent changes in occupation characteristic of this period do serve one's progression on the career ladder (*Sichermann,* 1990), while other studies highlighted the fact that some of the less favourable occupations accepted at the beginning of one's career path, intended as only temporary, do not necessarily serve as a stepping stone for the further progression, but can entrap young workers (*Scherer,* 2004, *Buchs–Helbing*, 2016).

In this subchapter, the changes in the frequency of the occupational changes[2] of youth and the determinants of the probability of occupational mobility are analysed[3] using an individual-level panel data set extracted from the 1998–2018 waves of the Labour Force Survey conducted by the HCSO. Occupational mobility is measured through the changes in HSCO classifications[4] occurring in two consecutive quarters. Mobility is examined based on movements between the detailed, four-digit HSCO categories; the aggregated occupational groups – the two-digit HSCO categories; as well as the main occupational groups – the one-digit HSCO groups. Quarterly occupation-

1 Throughout this paper 'youth' is defined as individuals between the ages of 16 and 35. It is appreciated that this may not correspond with the general English understanding of 'youth'.

2 An occupational change may mean that an individual switches to a different workplace and a different occupation, but can also mean that they stay at the same workplace, while their position or occupation changes. This analysis encompasses both cases, it does not differentiate between occupational changes that do and do not involve a change in workplace as well.

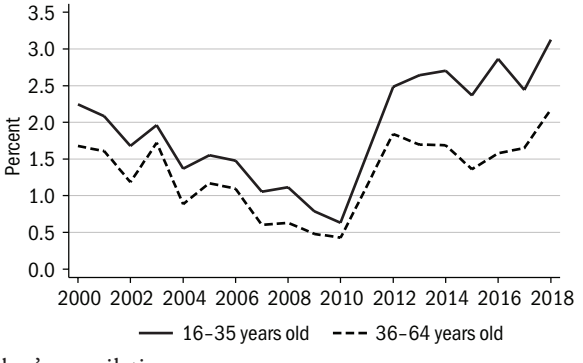
3 The labour survey of the HCSO is a representative quarterly survey, with the individual observations of approximately 70,000 people in each quarter. The sample is replaced through a rotation procedure. The individuals that belong to the households included in the sample are observed through six successive quarters, thus the data of individuals observed through successive quarters can be connected into a panel, and the occupational changes of individuals can be observed.

4 Hungarian Standard Classification of Occupations – the occupational classification system used by the HCSO.

al changes have been aggregated on an annual level, and the development of mobility is presented on an annual basis.

International comparisons indicate that the frequency of occupational changes is low in Hungary (*Boeri–Flinn,* 1997, *Berde–Scharle,* 2004, *Varga,* 2018a, 2018b). The mobility of youth (not older than 35 years) is higher in the job shopping period and much lower in the later stages of the career path, but even the mobility occurring at the beginning of the career path is low by international standards. *Figure 8.1.1* shows that between 2004 and 2010, the frequency of occupational changes decreased continuously, and the mobility of youth hardly surpassed that of older groups. For a part of the period, the continuous decrease was probably related to the economic recession, as occupational mobility is pro-cyclical – as demonstrated by numerous studies (*Murphy–Topel,* 1987, *Carrillo-Tudela–Visschers* (2016). After 2010, occupational changes became more frequent both among youth and among older groups, but the mobility of youth increased at a higher rate, increasing the difference between age categories. In 2018, somewhat more than 3 per cent of 16–35-olds changed occupations, which is still extremely low in international comparison (*Varga,* 2018b).

**Figure 8.1.1: The share of those changing occupations among youth in employment (between the ages of 16–35) and among older groups in employment (36–64), 2000–2004, (four-digit HSCO groups, percentage)**



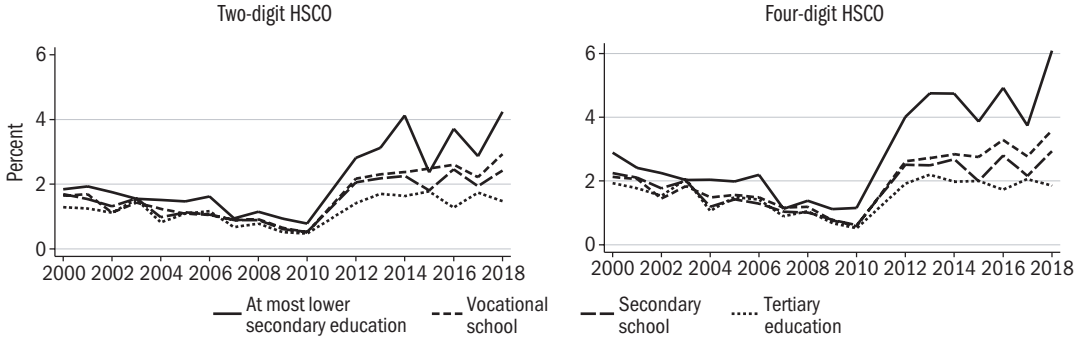

Source: Author's compilation.

The low level of occupational mobility is partly explained by the labour market institutions, the high proportion – in international comparison – of occupations that require specific qualifications (*Varga*, 2018b), and the particularities of the education system as well. The intensity of occupational mobility is also related to the extent to which the education system provides specialised knowledge or general knowledge (*Lindberg,* 2009). This is because one of the preconditions of occupational mobility is the transferability of (at least a part of) workers' competencies and knowledge from one occupation to the other. In countries where the education policy emphasises the acquisition of general

knowledge and encourages participation in lifelong learning, occupational mobility is typically higher, and adaptation to the changing demands of the labour market is easier; while in countries where the intended primary function of the education system is the transference of vocation-specific knowledge, mobility is typically lower.

Comparing the changes in youth's occupational mobility by educational attainment categories (*Figure 8.1.2*), what emerges is that after 2010, with the strengthening of mobility, the differences established based on educational attainment categories increased. Both on the level of occupational groups (two-digit HSCO group) and detailed occupational categories (four-digit HSCO group), those with the eighth grade of elementary school or less as their attainment level changed occupations the most frequently, while those with a higher education diploma changed occupations the least frequently. There are no significant differences between those with a secondary school diploma and those with a vocational qualification but no secondary school diploma (skilled worker or vocational school graduate).

**Figure 8.1.2: The share of youth (between the ages of 16–35) changing occupations among youth in employment, by educational attainment categories, 2000–2018**




Source: Author's compilation.

We examined the probability of the occupational changes of youth via simple probability models as well. On the one hand, via binary outcome models, which examine the probability of an occupational change on the levels of two-digit and four-digit HSCOs (yes/no), whose results are shown in *Table 8.1.1.* On the other hand, via multiple outcome models, which distinguished between the individual moving upwards or downwards within the occupational hierarchy,[5] or remaining at the same level, as a result of the occupational change. The results of this are presented in *Table 8.1.2.*

5 The direction of the occupational change was defined based on switches between one-digit HSCO-groups, omitting the "Occupations of the armed authorities" occupational group from the analysis, and creating a separate group for those working as public workers, regardless of the occupation they work in. I considered the position of the public workers' group to be at the bottom of the hierarchy. The HSCO classification system is established on the basis of a hierarchy: proceeding through the levels by the main groups, the level of formal qualifications and other skills needed for the occupations keeps increasing. I considered an occupational change as upward mobility if the classification of the new occupation by one-digit HSCO-group had a lower value; I considered it downward mobility if the value become higher; and if its value remained unchanged, I considered its position unchanged within the occupational hierarchy.

**Table 8.1.1: Factors influencing the probability of occupational change, binary outcome probit estimates (changes occupation: yes/ no)**

| | Two-digit HSCO | Four digit HSCO |
|---|---|---|
| Variable | marginal effect dy/dx | |
| Male | 0.0009** | 0.0013*** |
| | (0.0003) | (0.0034) |
| Eighth grade of elementary school | –0.0000 | 0.0015 |
| | (0.00049) | (0.0006) |
| Vocational qualification but no secondary school diploma (skilled worker or vocational school graduate) | –0.00003 | –0.0002 |
| | (0.00036) | (0.00042) |
| Higher education diploma | –0.0019*** | –0.0015** |
| | (0.0004) | (0.00048) |
| Number of years of experience | 0.0004** | 0.0006*** |
| | (0.00013) | (0.00015) |
| Number of years of experience squared | –9.81E-06 | –0.0000 |
| | (0.00001) | (0.00001) |
| Number of years spent at a particular employer | –0.0026*** | –0.0031*** |
| | (0.00007) | 0.00008 |
| Public worker | 0.0044*** | 0.0098*** |
| | (0.00092) | (0.00119) |
| Working abroad | 0.0051*** | 0.0068*** |
| | (0.00122) | (0.00143) |
| Year | Yes | Yes |

Reference category: Females, with a secondary school diploma, year: 1998.
Standard errors in brackets.
Significant at the ***1 per cent, **5 per cent, *10 per cent levels.
Source: Author's compilation.

Males are more likely to change occupations both by two-digit and four digit categories than females, and are also more likely to move downwards within the occupational hierarchy. Those with a higher education diploma are significantly less likely to change occupations, but if they do, they are less likely to move downwards or stay within the same occupational level than the reference category of those with a secondary school diploma. Between the other educational attainment categories, there are no differences in the probability of an occupational change.

Those with the eighth grade of elementary school as their educational attainment are more likely to move upwards, which could be explained by the fact that a great proportion of these has public worker status, which is considered the lowest in the hierarchy. Youth with a vocational qualification but no secondary school diploma are more likely to stay within the same main occupational category. The longer time someone has spent at a certain employer, the less likely they are to switch to a different occupation. Those working as public workers or working abroad are more likely to switch.

Table 8.1.2: Factors influencing the direction of occupational change, multinomial logit estimates[a]

| Variable | Switches within the same main occupational category | Moves upwards | Moves downwards |
|---|---|---|---|
| | marginal effect dy/dx | | |
| Male | –0.0003 | 0.0010*** | 0.0003 |
| | (0.00022) | (0.00014) | (0.00011) |
| Eighth grade of elementary school | –0.0000 | 0.0009*** | 0.0001 |
| | (0.00035) | (0.00027) | (0.00019) |
| Vocational qualification but no secondary school diploma (skilled worker or vocational school graduate) | –0.0007** | 0.0007 | –0.0001 |
| | (0.00025) | (0.00019) | (0.00013) |
| Higher education diploma | –0.0010*** | 0.0005 | –0.0005*** |
| | (0.00029) | (0.00026) | (0.00015) |
| Number of years of experience | 0.000** | 0.0003*** | 0.0005 |
| | (0.0001) | (0.00006) | (0.00005) |
| Number of years of experience squared | –9.81e-06 | –0.0000*** | –9.36e-07 |
| | (0.00000) | (0.00000) | (0.00000) |
| Number of years spent at a particular employer | –0.0017*** | –0.0010*** | –0.0004*** |
| | (0.00005) | (0.00003) | (0.00003) |
| Public worker | –0.0067*** | 0.0099*** | 0.0008 |
| | (0.0002) | 0.00096 | (0.00031) |
| Working abroad | 0.0015 | 0.0020*** | 0.0014* |
| | (0.00075) | (0.0006) | (0.00053) |
| Year | Yes | Yes | Yes |

[a] Switches to occupation within the same level = 1, moves upwards = 2, moves downwards = 3, reference outcome (does not change occupations) = 0.
Reference category: Females, with a secondary school diploma, year: 1998.
Standard errors in brackets.
Significant at the ***1 per cent, **5 per cent, *10 per cent levels.
Source: Author's compilation.

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## 8.2 OUTWARD MIGRATION OF YOUTH – YOUNG PEOPLE WORKING ABROAD

ÁGNES HÁRS & DÁVID SIMON

The young and entrepreneurial are assumed to be more mobile and more likely to migrate. This seems to be evident, and, based on human capital theory, outward migration during a long career is a better investment for younger people (*Becker,* 1975). At the same time, their entrance to the labour market, their initial insecure and marginal situation and their exploration within the labour market may also encourage them to take up employment abroad (*Osterman,* 1979). If the prospects of young people finding a good job in Hungary are poor, an alternative may be to work abroad for some time. However, in the case of job search abroad, often only secondary workplaces are accessible for new arrivals (*Piore,* 1979). Finding employment abroad may also be a response to social-political dissatisfaction and despair at home. The nature of finding employment abroad varies over time according to the combination of these factors.

This subchapter investigates who among young people look for employment abroad and how this has changed in the past more than ten years since Hungary's EU accession, when working abroad became easier and more frequent, and then accelerated and became part of everyday life after 2011 (*Hárs,* 2018). The analysis includes young people aged 18–29 who work in Hungary vs. those who have worked in Hungary and work abroad in the next quarter, according to the Labour Force Survey (LFS) and it covers the time period 2006–2017.[1] The sample shows that nearly half of the active age workers (aged 18–64) taking up employment abroad are below age 30 (48.5 per cent), while more than one-third of them (35 per cent) are of prime working age (aged 30–44).[2] This study does not look into their return but according to the relevant literature we assume that migration is not unidirectional. The proportion of returnees and repeated leavers is also considerable (*Horváth,* 2016, *Hárs–Simon,* 2018).

### The empirical study of young people finding employment abroad

Based on LFS data, we measured factors that influence outward migration using demographic, family status, labour market activity and regional explanatory variables. In addition to the usual impact of gender and age on working abroad, the family situation is also expected to reveal motivations: in the case of youth living together with their parents it may indicate difficulties in entering the labour market, while in the case of those living independently or with a partner (or especially those raising children) it may indicate a lack of subsistence and prospects. The impact of educational attainment depends on the domestic and host country labour market, where educational attainment

1 Data from the LFS are weighted based on mirror statistics, using the characteristics of the main host countries, assuming that the characteristics of leavers closely match those of the sub-population defined by the variable "place of work abroad". Estimation concerning outward migration is made using the weighted database. Weighting was based on the annual population data of the mirror statistics of major host countries, broken down by gender, which enabled us to estimate changes in the number of Hungarians working abroad (relying on Eurostat EU LFS employment data on Hungarians living abroad) during the periods 2006–2010 and 2011–2017 in the major host countries (Germany, Austria, United Kingdom and other countries). Data on outward migration were fit to the above estimated change, using the flow data from the LFS.

2 Recent estimates of migration intentions reveal similar proportions. The probability of young people aged 18–28 taking up employment abroad is especially high: it is nearly two and a half times higher for short-term intentions, compared with the age group of 29–38, and nearly the same for long-term intentions (*Sik–Szeitl,* 2016).

does not necessarily yield the expected status and income. The labour market activity prior to migration may reveal motivations: it may suggest exploration in the case of students and young graduates, unfavourable prospects at home in the case of the unemployed, while the migration of those permanently in employment may point to labour market causes. The region of residence and type of municipality primarily reveal the impact of labour market opportunities in the Hungarian labour market.

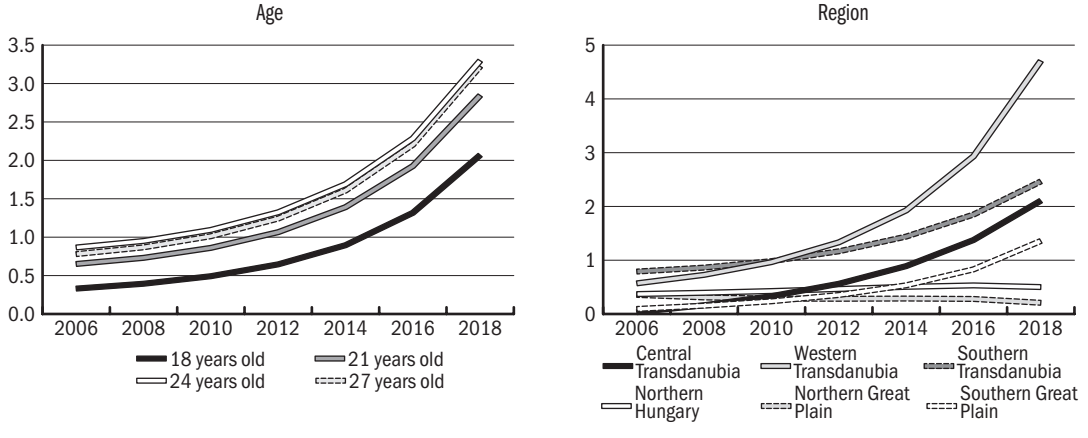
Logistic regression was used to explain employment abroad, with the output variable of entering the labour market abroad (a young person not living abroad in one quarter and working abroad in the next quarter as opposed to those who did not enter the labour market abroad). The model tested quarterly effects, which were expressed as annual effects for better interpretability. Based on the applied fit test, the model proved satisfactory.[3]

Independent effects were evaluated and the marginal effect of each variable (or estimated marginal probability for continuous variables), and their change over time, on the employment of youth aged 18–29 abroad is presented.[4] Results are shown in *Figure 8.2.1* (the effects of gender and municipality type are included in the analysis but not in the Figure).

3 The analysis included C-statistic and link test instead of the usual Hosmer–Lemeshow test because with a large number of items a small difference from the expected distribution would have been significant, while it would not have influenced the readability of the model. The value of C-statistic was 0.8, which is satisfactory; the linear term of the link was significant ($p = 0.001$), while the squared term was not ($p = 0.751$).

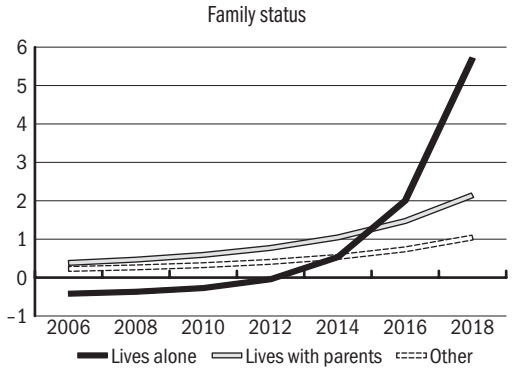
4 Change over time was measured by including an interaction using a variable in quarterly breakdown and it is presented by marginal estimates given for the first quarters of 7 selected years at evenly spaced intervals. The significance of the marginal effect was estimated at certain selected dates.

**Figure 8.2.1: The effect of factors influencing the employment of youth abroad**

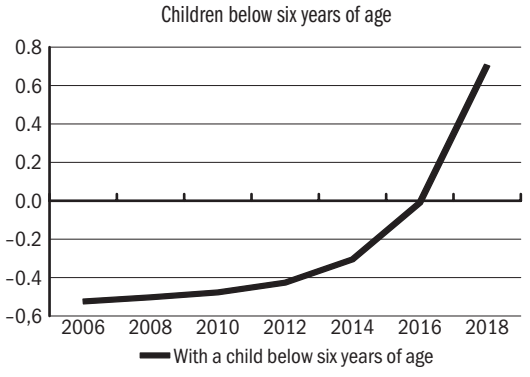



Note: A variable estimated for single-year of age. It is not significant at the measurement point for the 18-year-olds in the first quarter of 2006. The effect of the variable does not change significantly over time.

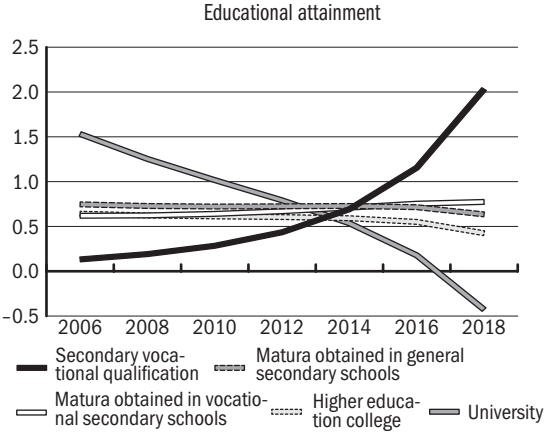
Note: Reference category: *Central Hungary*. The Region variable is not significant at the measurement points of the first quarters of 2006–2010 in Central Transdanubia, the first quarter of 2006 in Western Transdanubia, the first quarters of 2006–2008 in Northern Hungary, the first quarters of 2014–2018, at any of the measurement points of the Northern Great Plain and the first quarters of 2006–2012 and 2016–2018 of the Southern Great Plain. The effect of the variable does not change significantly over time.



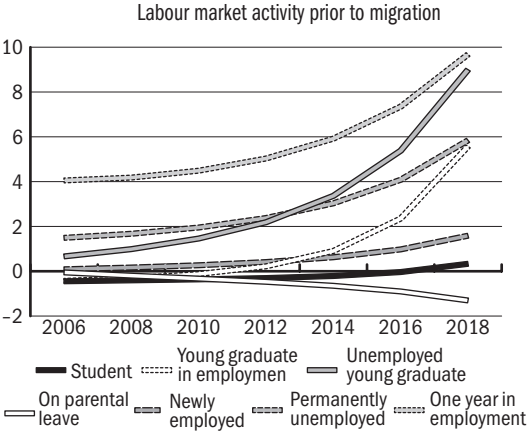

Note: Reference category: *lives with a partner.* The Family status variable is not significant in the first quarters of 2010–2014 of the *Lives alone* category, in the first quarter of 2006 of the *Lives with parents* category and at any of the measurement points of the *Other* category.




Note: Reference category: *no children.* The variable Having a child below six years of age is not significant at the measurement points of the first quarters of 2014–2018 in the category *With a child below six years of age*. The effect of the variable does not change significantly over time.




Note: Reference category: *lower-secondary qualification at most.* The Educational attainment variable is not significant at the measurement points in the first quarters of 2006–2008 in the category *Secondary vocational qualification*, in the first quarters of 2016–2018 in the category *Matura obtained in general or vocational secondary schools* and in the first quarters of 2006 and 2014–2018 in the category *University or higher education college.*




Note: Reference category: *uninterrupted employment.* The Labour market activity prior to migration variable is not significant at the measurement points in the first quarters of 2014–2018 in the category *Student*, in the first quarters of 2006–2014 and 2018 in the category *Young graduate in employment*, in the first quarter of 2006 in the category *Unemployed young graduate*, in the first quarters of 2006–2010 in the category *On parental leave* and at any of the measurement points in the category *Newly employed*.

The acceleration of outward migration after 2010 was due to several factors, including the prolonged impact of the economic crisis and the measures

adopted after the change of government in 2010, gradually modifying the probability of youth taking up employment abroad. The effect of age did not change over time: this variable increases the impact of migration below 24 but above this age there is no difference between the age groups and this is significant throughout the period. The effect of gender is not relevant among youth. Overall, the significance of socio-demographic factors decreases with the acceleration of migration, that is the population of outward migrants is wider and more diverse. At the same time, the effect of labour market activity has increased.

*Before the acceleration of outward migration,* the effect of the region of residence was relatively strong: compared with a residence in Central Hungary, living in Western or Southern Transdanubia significantly and to a large extent increased the probability of taking up employment abroad, while living in a county town or Budapest slightly decreased it relative to living in a village (during 2006–2012), whereas the effect of a residence in other towns was not significant. The effect of family status was also of relevance: compared with those living with a partner, those living with parents were slightly but significantly more likely to find employment abroad, which may be due to young people wishing to gain experience, while those living alone were significantly less likely to work abroad during 2006–2008. A child below six living in the family also significantly reduced the probability of working abroad (until 2012), which suggests a more stable family background. The labour market influences the probability of working abroad through educational attainment and labour market activity. Compared with lower-secondary education (ISCED2), the effect of university qualification in this period was significant and strong, while the effect of college and upper-secondary qualifications was less marked but still significant. However, vocational school qualification (ISCED3C) had no significant effect prior to 2010. Compared to those permanently in employment, those who recently lost or quit their jobs were more likely to work abroad,[5] followed by unemployed fresh graduates probably motivated by gaining experience and looking for the right career. The probability of finding employment abroad was similar in the case of the long-term unemployed, presumably because of looking for a labour market alternative. The effect of being in education was significantly negative, whereas being on parental leave and having found a job after graduation had no significant effect.

*Following the acceleration of migration* the significance of the region of one's residence barely changed. After 2010, compared with Central Hungary, a residence in Central Transdanubia or in Western Hungary significantly increased the probability of working abroad. During the increasing intensity of migration in the period 2010–2012, living in Northern Hungary, the most disadvantaged region, also significantly increased the probability but living in the other regions did not and the type of municipality also lost its significance.

5 Persons who were not in employment in Hungary in the quarter prior to starting a job abroad but had been in employment a year prior.

The effect of family status changed markedly: compared with those living with a partner, those living with their parents have been significantly and increasingly more likely to take up employment abroad possibly due to labour market pressure in addition to wishing to gain experience, while there has been a significant increase among those living alone (since 2016).[6] Having a child below six years of age does not significantly hold back employment abroad any more, probably due to labour market reasons and unfavourable prospects as well as social and political dissatisfaction. The impact of educational attainment on labour market significance has also altered considerably: compared with primary education, the effect of tertiary education (after 2012) and secondary education (after 2014) has not been significant, while having vocational school qualifications has significantly and steeply increased the probability of working abroad since 2010. At the end of the period only vocational school qualifications have a significant effect, indicating that educational attainment hardly influences employment abroad.

Overall, labour market activity prior to migration had the strongest effect: those unemployed in Hungary are increasingly more likely to go abroad and fresh graduates also leave at an increasing rate. Compared with those permanently in employment, the strongest significant effect was seen among those who had been working a year prior but had become unemployed or inactive, followed by those permanently unemployed. After 2012 young graduates unable or unwilling to find a job in Hungary found employment abroad at a rapidly increasing rate and at the end of the period this effect was nearly as strong as that of quitting a job. We suspect that the motivation of young people has changed: the effect of deteriorating labour market prospects and expectations has grown. Since 2012, being on parental leave has significantly reduced the probability of working abroad but being in education has not and neither has taking up employment in Hungary after graduation.

6 Results concerning people living alone need to be interpreted with caution, since reaching this group is uncertain due to the nature of the survey. Nevertheless, looking at those dropping out of the Labour Force Survey due to panel attrition, we found that although the survey underestimates this group, the association found is relevant.

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