Research Article

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Inequality in Higher Education: Why Did Expanding Access Not Reduce Skill Inequality?

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Abstract: Lack of comparable cross-country data on access to and participation into higher education (HE) among disadvantaged and marginalised communities prevents a comprehensive examination of the role of education in shaping social mobility and how this has changed following educational expansions. We use data from the OECD Survey of Adult Skills, the Programme for International Student Assessment as well as administrative and census data from several countries to provide a comprehensive cross-country overview of the relationship between, on the one hand, socio-economic background, migrant background, and place of residence, and on the other hand, HE expectations, participation and completion. We find that when a higher share of the population has access to higher education, inequalities in access and completion are lower, but inequalities in skill levels remain unchanged. This could be due to the varying degree of inequality observed at different levels of higher education; as well as to the differences in the aspirations secondary school students express of enrolling and completing HE. We discuss implications for research and policy.

Keywords: higher education; inequality; access; socio-economic background; international data; geography; migration; skills.

1 Introduction

Many countries have experienced increasing income and wealth inequality in the past decades. For example, available data show that wealth is unevenly distributed and income inequality within countries is at its highest level in over 30 years (OECD, 2015; Saez & Zucman, 2016). Increases in inequality harm economic growth and undermine social cohesion (Alesina and La Ferrara, 2002; Barro, 2000; Kawachi et al., 1997). Inequality also limits social mobility, meaning that individuals from low-income families have few chances of moving up the social ladder while those from privileged families keep their wealth and privilege (Corak, 2013).

Large increases in income and wealth inequality occurred at a time when in most OECD countries educational opportunities were greatly expanded. The expansion in educational opportunities in the past decades in OECD countries was driven by the recognition that higher levels of skills increase productivity and therefore educational investments can promote economic growth (Hanushek & Wössmann, 2010). However, such expansions were also driven by the belief that increases in educational opportunities would reduce socio-economic differentials in labour market outcomes and life chances, thus promoting social mobility (Marks & McMillan, 2004).

The contribution of this paper is twofold. It maps inequalities on access and completion of higher education across countries by parental education, immigrant status and place of residence (rural vs. urban), both using new data and exploring existing data in new ways. In addition, it puts these inequalities in relation to the expansion of participation in higher education that occurred in the past in many countries.

The expansion of educational opportunities that occurred in recent decades does not appear to have benefited socio-economically disadvantaged individuals and, in fact, may have exacerbated disparities. Explaining the coexistence of growing inequality and expansions in educational participation has been the focus of theoretical and applied research. Such research has examined
differences in the incentives different socio-economic groups have when making educational decisions and the extent to which such decisions consider foreseen decisions on the part of others or not.

Life course studies consider cumulative advantage mechanisms to explain inequalities in educational attainment and labour market performance, tracing large differences in educational attainment to the accumulation of disadvantage following differences in the early years (DiPrete & Eirich, 2006). In particular, compensatory advantage theory maintains that socio-economic differentials can determine different developmental trajectories by shaping the resources and stimulation parents invest in their offspring. More specifically, compensatory advantage theory predicts that the life course trajectories of socio-economically disadvantaged individuals will be more dependent on prior negative outcomes than those of socio-economically advantaged individuals (Bernardi, 2014). This could occur because socio-economically advantaged parents are prepared to invest resources as a way to reduce their children’s early failure, as a way to avoid downward social mobility, as suggested in risk aversion theory (Breen & Goldthorpe, 1997). While compensatory advantage theory and relative risk aversion theory provide a theoretical foundation to make predictions on the incentives and behaviours of individual households, they do not formally consider behaviours under different external constraints, for example expansions of educational opportunities.

The maximally maintained inequality thesis maintains that expansions in educational opportunities reduce socio-economic differentials in educational attainment if and only if participation among the most socio-economically advantaged was already at its highest prior to educational expansions (Raftery & Hout 1993). By contrast, the effectively maintained inequality thesis states that even if expansions of educational opportunities were to primarily benefit socio-economically disadvantaged individuals, they would not necessarily be effective in reducing inequalities in life outcomes (Lucas, 2001). Qualitative differences in the opportunities enjoyed by different socio-economic groups would in fact most likely emerge as a way for the socio-economically privileged to maintain their advantage (Altbach, Reisberg & Rumbley, 2009).

Despite these concerns and evidence that educational expansions may not necessarily promote social mobility, many governments continue to invest in educational expansions as a way to reduce inequality by providing individuals from disadvantaged backgrounds with skills to succeed in the labour market and life in general (OECD, 2018a). With this belief, many governments have put in place strategies to widen participation in higher education (HE) among the groups of individuals who are traditionally underrepresented in HE, such as individuals whose parents did not participate in HE, those living in poverty, those living in rural areas or those with an immigrant or minority background.

Given the policy relevance of understanding inequalities in HE and the relative paucity of comparable data, the aim of this paper is to propose a set of key indicators that can be used to map inequalities in HE across OECD countries and monitor its evolution over time. The goal is to examine the impact educational expansions can have on social mobility and identify to what extent predictions based on the theoretical frameworks detailed are supported by the data.

The paper answers the following research questions:
1. Was the expansion of HE that occurred in the past decades in many countries associated with a reduction of inequality in HE participation?
2. Was the expansion of HE that occurred in the past decades in many countries associated with a reduction of skills inequality?
3. Are individuals from a disadvantaged socio-economic background less likely to access HE and to graduate with more advanced higher education degrees?
4. Are socio-economically disadvantaged secondary school students less likely to expect to enrol and complete HE, even when their academic achievement is on a par with their more advantaged peers?

Answering the first two questions allows us to test predictions based on the maximally maintained inequality thesis and the effectively maintained inequality thesis. If the maximally maintained inequality thesis were correct, educational expansions would be associated with reductions in inequality only in countries with historically high levels of participation. If the effectively maintained inequality thesis were correct, educational expansions would not be associated with reductions in skill disparities.

The third and fourth research questions imply testing predictions based on compensatory advantage theory and relative risk aversion theory. According to these theories, we would expect lower participation in HE among socio-economically disadvantaged groups, disparities in expectations to participate in HE and a stronger association between educational expectations and academic achievement among socio-economically disadvantaged youngsters. Students who hold ambitious expectations about their educational prospects are
more likely to put effort into their learning and take an advantage of the education opportunities available to them to achieve their goals (Beal and Crockett, 2010; OECD, 2012; OECD, 2017a; Perna, 2000). Crucially, this can be an explanation for our findings related to the first and second research questions. If people from socio-economically disadvantaged groups are less able to take advantage of the opportunities offered by differentiated higher education systems, expanding access to higher education may not reduce learning outcome inequality (Marginson, 2016a, 2016b; Crawford et al., 2016, Shavit et al., 2007).

2 Data and Methods

2.1 Data

In this paper, we exploit a variety of datasets steered by the OECD in order to answer the research questions outlined in Section 1 as comprehensively as possible.

2.1.1 The OECD Survey of Adult Skills (also called Programme for the International Assessment of Adult Competencies – PIAAC)

PIAAC is a low-stakes assessment that was administered in 2012 (although additional administration rounds were organised in 2015 and 2017). The PIAAC target population includes all non-institutionalised adults between the ages of 16 and 65 (inclusive) whose usual place of residence is in the country at the time of data collection. Key assessment domains in PIAAC are literacy, numeracy and problem solving in technology rich environments. PIAAC is a household-based study. The PIAAC instruments were designed to be comparable with the International Adult Literacy Survey (IALS) and the Adult Literacy and Lifeskills Survey (ALL). Trained interviewers first administered the background questionnaire which was conducted using Computer Assisted Personal Interviewing (CAPI). Respondents were then encouraged to start the direct skill assessment. The questionnaire took around 40 minutes to complete on average and the assessment took slightly less than an hour. The questionnaire was designed to identify detailed information on respondents’ educational attainment, employment and personal characteristics, such as the educational attainment of the parents of respondents. Detailed information on PIAAC can be found in OECD (2016a).

2.1.2 The OECD Indicators of Education System Network (INES) Pilot Survey on Equity in Tertiary Education

The INES Pilot Survey on Equity in Tertiary Education is a data collection initiated by the OECD Indicators of Education Systems (INES) and carried out by national statistical offices in OECD member countries. National statistical offices have provided ex-post harmonised data on the number of new entrants in HE, HE graduates and on the overall number of individuals in the population by age, gender, HE education level, parental education, immigrant status, rural origin. These data are assembled using information collected through national censuses, administrative sources or representative surveys and they enable researchers to calculate rates of access to and graduation from HE by socio-economic background. All data comply with the same definitions of socio-economic background indicators agreed upon by the OECD by and member countries for the purpose of this data collection. More details on the methodology and data sources can be found in OECD (2017b) and in the Appendix (Tables B1, B2 and B3). The data presented in this paper on HE inequalities by parental education and immigrant status have been published in OECD (2017c), OECD (2018b) and OECD (2019); the data on rural origin presented in this paper are hitherto unpublished in country-by-country form (aggregates of countries had been published in OECD, 2019).

2.1.3 The Programme for International Student Assessment (PISA)

PISA is a triennial large-scale low-stakes standardised assessment conducted since 2000. The number of participating countries has increased from 32 in 2000 to over 70 in 2015. Each PISA cycle assesses three core domains (reading, mathematics and science), one of which constitutes the major domain in a given cycle (reading in 2000 and 2009; mathematics in 2003 and 2012 and science in 2006 and 2015). The assessment is complemented by a background questionnaire designed to gather information on students’ background, attitudes towards learning and behaviours. Since the target sample of the study is 15-year-olds who were in school at the time of the assessment, individuals who had already left formal education by that age are not represented in the study. Because school dropout is associated with socio-economic and demographic status, results represent a lower bound of potential disparities in educational expectations.
2.2 Analytical methods

2.2.1 Estimating the association between educational expansions and inequalities in HE participation and skills

In order to answer the first and second research questions laid out in Section 1 we examine if increased participation in HE is accompanied by an increase in equity in learning outcomes among individuals from different socio-economic groups by assessing if, other things being equal, skill disparities are wider or smaller among age cohorts and countries experiencing different rates of participation in HE. We do so using data from the OECD Survey of Adult Skills.

We estimate the relationship between the higher education access rate and several measures of skills and participation inequality across age cohorts and countries. In brief, these estimates allow us to determine if, other things being equal, skill disparities are wider or smaller among age cohorts experiencing different rates of participation in HE. Our main explanatory variable is the proportion of individuals in different cohorts who report to have entered HE (access rate). To calculate this proportion, we considered as having accessed HE all individuals who reported having ever enrolled in a HE programme, independently of completion.

We estimate the association between this variable and five different measures of skill and participation inequality in the population:

1. Mean levels of literacy proficiency in the overall population in the country. The relationship between this variable and the access rate shows whether HE participation is associated with higher skills at all in the sample – a precondition for its potential to reduce skill inequality.
2. The relative access rate, operationalised as the ratio between the proportion of people accessing HE among those without higher educated parents and among those with at least one parent with HE. This is a measure of equity of access to HE: the higher the ratio, the closer is the probability to access HE between people with different levels of parental education.
3. The percentage-point difference between the proportion of people accessing HE among those without higher educated parents and among those with at least one parent with HE (percentage-point gap). This is an alternative measure of equity of access to HE: the higher the percentage-point gap, the closer the probability to access HE between people with different levels of parental education.
4. The standard deviation of literacy proficiency. The standard deviation in literacy proficiency is an indicator of skill inequality in the population. The higher the standard deviation, the larger is skill inequality – the differences in literacy proficiency observed across individuals.
5. The difference between the mean levels of literacy proficiency among those without higher educated parents and among those with at least one parent with HE (literacy proficiency gap). This is an alternative measure of skill inequality: the higher (i.e., closer to 0) the literacy proficiency gap, the closer the levels of skills across people with different levels of parental education.

For a number of different inequality indicators, we calculated the difference across successive age cohorts within countries participating to the survey. The following equation was estimated by OLS:

\[ \Delta y_{ic} = \beta_1 \cdot \Delta \text{access}_{ic} + \beta_2 \cdot \Delta \text{secondary}_{ic} + \beta_3 \cdot \Delta \text{basicskills}_{ic} + \epsilon_{ic} + \Delta f_c \]

Where \( \beta_1, \beta_2, \) and \( \beta_3 \) are the coefficients to be estimated; the subscript \( i \) denotes a country or economy for which data are available, \( c \) denotes a cohort, the operator \( \Delta \) represents the difference for a certain variable between the age cohort \( c \) and the younger age cohort in the same country or economy; \( f_c \) denotes cohort fixed effects; and \( \epsilon_{ic} \)

1 The percentage-point gap lends itself to a more demanding test of reduction of inequality, as compared to the relative access rate. When the percentage-point gap narrows, the relative access rate always improves; the contrary is not true.
2 Compared to the standard deviation of literacy proficiency, the literacy proficiency gap provides a more direct test of the hypothesis that HE is able to reduce the skill gap across socio-economic groups. Supposing that participation in the disadvantaged socio-economic group increases faster than in the advantaged group (as it does in our sample) and individuals from both socio-economic groups benefit equally from HE, then increased access to higher education should always improve the literacy proficiency gap in the population. In contrast, even under the two conditions outlined above, it could be that expanding access to HE increases the standard deviation of literacy proficiency across the population (i.e. measured). Take the illustrative, fictitious example of a society with perfect skill equality and 0% enrolment to HE. In that case, expanding access would lead some individuals to acquire more skills than others, therefore increasing the standard deviation of literacy proficiency.
represents a stochastic error term. In the model estimation, country fixed effects are accounted for by the differencing, which ensures that only within-country variation is used in the model. The estimates of the standard errors for the coefficients are robust to intra-country correlation of the error term (clustered standard errors).

The model includes two control variables. The first control variable (secondary) represents upper secondary education attainment, i.e. the proportion of individuals in each country and cohort who completed upper secondary education. This variable is needed to control for the fact that an expansion in access to HE is usually correlated with a general expansion of education attainment, and particularly of upper secondary education attainment (which in many countries offer the credentials needed to access HE). The general expansion in education attainment is, in other words, a factor potentially affecting both access to HE and the dependent variables (i.e., potentially introducing endogeneity into the model). Therefore, it is necessary to control for upper secondary attainment when estimating the association of changes in participation to HE with other variables.

The second control variable (basicskills) represents the mean literacy proficiency score across individuals who did not access HE in a given country and cohort. This variable has been included to take into account generic differences in the level of skills across countries and cohorts, which could affect the relationship between HE access and the skills variables in a number of ways. For example, one could speculate that it is more difficult for education to increase the level of skills when the population already reached a certain skill level. In addition, in the model with the population skill level as the dependent variable, there could be reverse causality from the skill level to HE access. Including the level of skills among those that did not access HE takes this potential problem into account.

The age cohorts are 15-24, 25-34, 35-44, 45-54 and 55-64, and data are available for 33 countries and economies participating in the Survey of Adult Skills in 2012 or 2015. This leads to 132 country-cohort observations. The target sample size of the Survey of Adult Skills is 5,000 adults aged 15-64 (OECD, 2016b) (with some variation in the final sample size across countries), so the typical number of individuals for each cohort within a country is around 1,000 individuals. All estimates consider the stratified nature of PIAAC data and the fact that achievement is represented in the data through ten plausible values for each achievement domain and were obtained following PIAAC data analysis procedures and recommendations (OECD, 2016a).

### 2.2.2 Disparities in access to and completion of different HE degrees

In order to examine potential reasons for the persistence of skills disparities in the face of expanded access, data from the INES Pilot Survey on Equity in Tertiary Education (OECD, 2017b) are used to identify inequality in access and completion at two different levels of HE among different socio-economic and demographic groups. Our analysis compares the share of individuals from these groups among new entrants3 and first-time graduates4 to their representation in the population.

The INES Survey covers two entry-level educational programmes in HE: 1) short-cycle tertiary education programmes; and 2) bachelor’s and long first degrees or equivalent programmes. Short-cycle programmes are relatively short (up to two years) and are typically more occupationally-specific and practice-based than other HE programmes (for example, tertiary vocational education, or fagskoleutdanning, in Norway). However, they can also have a more general character and prepare students for access into HE programmes at other levels (for example, some associate degree programmes in the United States). Usually, short-cycle programmes are not offered by universities, but by other HE institutions.5 The bachelor’s level is in the large majority of countries the most common level through which individuals access HE. Bachelor’s programmes tend to last three or four years. They can be practically-based programmes oriented towards the labour market as well as theoretically-oriented, research-based programmes preparing for more advanced qualifications. Long first degrees are classified at the master’s or equivalent level. However, they are generally accessible with an upper secondary or post-secondary, non-tertiary qualification. In this respect, they are more similar to bachelor’s and short-cycle programmes than to other master’s programmes. A typical example on long first degrees are medical programmes (UNESCO Institute for Statistics, 2012; OECD/Eurostat/UNESCO Institute for Statistics, 2015).

3 New entrants are individuals who enter a HE programme for the first time in their life.
4 First-time graduates are individuals who graduate from a HE programme for the first time in their life.
5 Short-cycle programmes are less theoretically-oriented than bachelor’s programmes and are considered as a lower ISCED level (UNESCO Institute for Statistics, 2012; OECD/Eurostat/UNESCO Institute for Statistics, 2015). Across OECD countries, earnings of individuals with this level of educational attainment tend to be higher than among individuals with upper secondary education, but lower than for individuals with higher levels of HE (OECD, 2018).
We complement analyses of socio-economic disparities with disparities across individuals living in urban vs. rural communities. Geographic factors can also play a role in HE participation decisions. For example, existing studies have shown that distance of the family home from HE institutions plays an important role in participation decisions in large countries such as Canada (Frenette, 2006) and the United States (Hillman and Weichman, 2016). However, its role seems less important in smaller countries such as Denmark (Sørensen and Høst, 2015) and Ireland (Cullinan et al., 2013). In addition, at least in certain countries, rural communities are characterised by different values, traditions and customs compared to urban communities (Smalley and Warren, 2013), which could affect education enrolment decisions.

Internationally comparable data on entrants to HE from rural communities are difficult to gather. The INES Survey allows us to compare the share of entrants with the share of the overall population living in regions (at Territorial Level 3) that are considered predominantly rural or intermediate (or equivalently, not urban) according to the OECD (2011) Regional Typology. According to the OECD’s Regional Typology definition regions are classified as predominantly rural or intermediate, rather than urban, if at least one of the following three conditions holds:

1. Their population density is below 150 inhabitants per square kilometre (500 inhabitants for Japan and Korea)
2. The share of population living in rural local units (local units with a population density below 150 inhabitants per square kilometre) is above 15%
3. They lack the presence of an urban centre of more than 500 000 inhabitants (1 000 000 for Japan and Korea) representing at least 25% of the regional population

This definition has the advantage of being standardised and agreed upon internationally, but it has the important limitation of being based on the characteristics of residency at the meso-level (region) rather than micro-level residency (community). Therefore, people living in small towns located in rural or intermediate regions are not considered “urban” according to this definition. In a similar way, people living in rural communities in a region that includes a large metropolitan area are classified as living in an urban region. The distinction between urban and rural/intermediate in the OECD (2011) definition reflects, in many cases, the distinction between the regions surrounding large cities and capitals from other regions. For example, in Austria only Vienna and its surroundings (Wiener Umland/Nordteil, Wiener Umland/ Südtteil, and Vienna), and the regions of Innsbruck and Rheintal-Bodenseegebiet are considered urban, whereas the rest of the country is rural or intermediate. In some other countries, the distinction reflects other geographical factors: for example, Portugal has a number of urban territorial units, mostly located on the coastal area, and a larger number of rural or intermediate units mostly located in the inner part of the country.

### 2.2.3 Estimating inequalities in educational expectations

In order to estimate inequalities in educational expectations a dichotomous dependent variable was created. In 2015 and 2003, the PISA survey waves used in this paper, participating students were asked to report the highest level of education they expected to complete. Students who indicated that they expected to complete a degree at the 5A, 5B or 6 level according to the 1997 International Standard Classification of Education were considered as expecting to complete a higher education degree (UNESCO, 2006). The analysis examines the degree to which the expectation that students will complete a HE degree differs depending on key indicators of socio-economic condition and if they changed between 2003 and 2015.

The first indicator we use to identify disadvantage is a composite socio-economic status (SES) index, which aggregates information on parental education, occupation and availability of cultural resources (Pokropek, Borgonovi and Jakubowski, 2015). The indicator is standardised to have a mean of 0 and a SD of 1 across OECD countries. In our analysis, “high SES” students are those that were assigned a value on the PISA SES indicator in the top quarter of the national distribution of SES; and “low SES” students are those with values on the indicator in the bottom quarter. Students were considered to have an immigrant background if they reported having at least one foreign-born parent or reported being foreign born themselves. Finally to identify disparities depending on place of residence, we compare students depending on whether they live in a city (more than 100 000 people), those living in a town (between 3 000 and 100 000 people) and those living in a village or rural area (less than 3 000 people).

We first develop a series of country specific descriptive statistics to compare average levels of HE expectations...
among different groups of students, and how these evolved between 2003 and 2015. These results are presented in Tables C1, C2 and C3 in the Appendix. Next, we fitted a series of country specific logistic regression models to estimate the odds that students will report expecting to complete HE depending on personal characteristics. All results control for students' academic performance in the PISA standardised test (through an indicator of whether the student achieved at least the PISA proficiency level 3 in reading, mathematics or science). We include all countries with available data in our analyses, implying that the country coverage extends well beyond OECD countries.

3 Results

3.1 Are expansions in access to HE associated with lower socio-economic disparities in participation?

In order to answer the first research question we use data from the OECD Survey of Adult Skills. The access rate in HE of 25-44 year-olds whose parents did not obtain a HE degree was more strongly correlated with the overall access rate in that age group than the access rate in HE of 25-44 year-olds with at least one parent who obtained a HE degree ($r=0.86$ among the former group and $r=0.50$ among the latter group – see Figure 1). These results are in line with predictions: as participation in HE rises in a country, increases will be especially concentrated among those who do not have parents with HE degrees. A one-percentage point increase in the overall rate of participation to HE in a cohort is associated with a reduction of one fifth of a percentage point in the participation gap between people having no parent with HE and individuals with higher educated parents.

3.2 Are expansions in access to HE associated with lower disparities in skills?

Increased participation in HE could fail to provide greater social inclusiveness if it is accompanied by social stratification within the HE sector. If the children of higher educated parents and those of non-higher educated parents attend institutions of different quality and prestige, the expansion of HE opportunities could lead to wider inequalities in labour market opportunities and wages (Marginson, 2016a, 2016b; Crawford et al., 2016, Shavit et al., 2007). Persisting inequality in skill outcomes and expanding access to HE may also reflect other factors, such as differences in a study experience, graduation

Figure 1: Intergenerational educational mobility (2012 and 2015). Proportion of 25-44 year-olds who have entered HE at least once in their life (independent of completion) by parental education attainment.

*Note:* Countries are ranked in descending order of the share of the HE access rate of 25-44 year-olds without parents with HE attainment.

*Source:* Authors' calculations based on the Survey of Adult Skills (PIAAC) (2012, 2015).
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probability and grades, and career opportunities after graduation for people from different socio-economic backgrounds (Crawford et al., 2016).

Our results show that, across different cohorts, a wider access to HE is related to higher overall literacy proficiency and to improved odds of participation in HE among individuals with no parent with a HE qualification. However, wider access is not related to a reduction in skill inequality across the population (Table 1).

A one-percentage point increase in the overall rate of participation in HE in a cohort of individuals is associated with a significant improvement in literacy proficiency by 0.47 score points (Model 1). To put this result in perspective, an increase of 20 percentage points in the share of individuals entering HE within a cohort (as observed between the 25-34 and the 35-44 age cohorts in Korea, Lithuania and Poland - at the upper edge of the distribution of the variation in access rates) is associated with an increase of about 10 points in the literacy proficiency score (which correspond to around one fifth of a standard deviation in skills). This result accounts for country and cohort fixed effects, the change in upper secondary attainment and the change in “basic skills” (the mean literacy proficiency of those without HE).

A one-percentage-point increase in HE access is also significantly associated with an improvement in the relative probability to access HE for people without higher educated parents (Model 2); and by 0.22 percentage points in the access rate gap between people with and without at least one parent with HE (Model 3).

However, expanding access in HE is not associated with a reduction in skill inequality. Neither the standard deviation of the literacy proficiency score, nor the literacy proficiency gap between the two socio-economic groups are associated with wider access to HE (the coefficients are close to 0 and not significant – Model 4 and Model 5).

In summary, these results indicate that, across different cohorts, a wider access to HE is related to higher overall literacy proficiency and to improved odds of participation in HE among individuals with no parent with a HE qualification. However, wider access is not related to a reduction in skill inequality across the population. In other words, expanding access to HE reduces the HE access gap between people from higher and lower socio-economic background, but not the skill gap. These results are consistent with the widely held view that the expansion of access of HE has led to better skills across different cohorts, and better opportunities for people from lower socio-economic backgrounds to access HE (Ritzen, 2010; Altbach, Reisberg, & Rumbley, 2009). However, they also suggest that the expansion of HE does not necessarily reduce skills inequality in the population, possibly because of social stratification in HE opportunities.

### Table 1: Relationship between the variation in literacy proficiency and HE participation

|                               | Model (1) | Model (2) | Model (3) | Model (4) | Model (5) |
|-------------------------------|-----------|-----------|-----------|-----------|-----------|
| **Δ mean literacy proficiency score** | 0.47** (0.06) | 0.56** (0.15) | 0.22* (0.11) | -0.01 (0.04) | 0.09 (0.09) |
| **Δ relative access rate for people without higher educated parents** | -0.06 (0.04) | 0.02 (0.13) | -0.14 (0.10) | 0.03 (0.06) | 0.02 (0.06) |
| **Δ percentage-point gap in the access rate for people without higher educated parents** | 0.74** (0.033) | 0.03 (0.14) | 0.38** (0.10) | -0.14* (0.06) | -0.33** (0.10) |
| Cohort fixed effects          | Yes       | Yes       | Yes       | Yes       | Yes       |
| Observations                  | 132       | 132       | 132       | 132       | 132       |

Coefficients from the first-difference regressions of the column variables on the row variables, conditional on cohort fixed effects (cluster-robust standard errors in brackets). Δ represents change in one variable across two different cohorts within the same country or economy.

**Significant at the 1% level; *Significant at the 5% level

Note: The changes refer to the difference in the variable values between two subsequent 10-year cohorts of individuals. The cohorts are 15-24, 25-34, 35-44, 45-54 and 55-64.

Source: OECD Survey of Adult Skills (PIAAC).
3.3 Cross-country evidence on disparities in HE access and completion

Disparities in the skills associated with participation in HE across individuals from different socio-economic and demographic groups could be due, among other things, to differences in participation to programmes of different quality. Prior research has highlighted, for example, how individuals from disadvantaged groups are especially less likely to attend Russell group universities in the United Kingdom, which comprises the most well regarded universities for academic achievement (Belfield et al., 2018). Although international comparable data on academic quality are not available, it is possible to identify the extent to which entrants in short-cycle programmes, Bachelor programmes, long first degree programmes from different socio-economic and demographic backgrounds are over or under-represented compared to the share of such group in the general population. Furthermore, by comparing differences between access and completion to different programmes, it is possible to identify the barriers socio-economic disadvantage poses not at entry, but within the HE sector.

Across countries with available data, the share of individuals whose parents did not complete HE is between 15 and 35 percentage points lower among new entrants to bachelor’s and long first degree programmes, than in the total population (Figure 2). Furthermore, the proportion of students whose parents do not have a HE qualification is consistently higher among new entrants in short-cycle tertiary education programmes than among new entrants to bachelor’s and long first degree programmes. In some countries, such as Chile and Slovenia, the proportion of students whose parents do not have a HE qualification is also slightly higher among new entrants in short-cycle tertiary education programmes than in the overall population.

The share of young people without higher educated parents tends to be similar among new entrants and among first-time graduates (between 40% and 50%, on average across countries with available data). This could suggest that there is no systematic relationship between socio-economic backgrounds and HE completion. However, data from the OECD Survey of Adult Skills suggests that non-completion across OECD countries is related to socio-economic backgrounds. Therefore, caution is needed when drawing conclusions on the completion rate of individuals from different demographic groups.

Large disparities by parental educational attainment are confirmed by PIAAC data (Table 2). Across OECD countries around 27% of individuals in the 20-40 year-old population have parents without upper secondary education. However, the figure is 16% among those who started HE but did not complete (dropouts), and is even lower among current HE students (11%), graduates (14%), and graduates from doctoral programmes (7%). Similarly, while in the population, the proportion of 20-40 year-olds with at least one parent with a HE qualification is one third, this figure increases to 43% among HE dropouts.
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Individuals with an immigrant background are also under-represented among new entrants and first-time graduates, relative to their share in the population. This is the case for all countries with available data, and both for the short-cycle and the bachelor’s and long first degree programmes (with the exception of first-time graduates at the bachelor’s and long first degree programmes in the Netherlands). On average across countries with available data, the proportion of young people with immigrant background is 10 percentage points lower among first-time graduates in bachelor’s and long first degree programmes than in the population.

An immigrant background is considered among the most relevant equity dimensions for HE among OECD governments (OECD, 2016c; Marconi, 2017). The inclusion of immigrants in HE depends on a variety of factors, including their command of the language of instruction, their wider socio-economic backgrounds (parental education, income, etc.), and their legal status (Camilleri et al., 2012). These can vary widely across countries (Camilleri et al., 2012), leading to variability across countries in the representation of immigrants among entrants and graduates as illustrated (Figure 3).

The association of immigrant backgrounds with various forms of participation in HE is less evident (Table 2). Across OECD countries, between 10% and 12% of the population was foreign-born. This figure was similar among HE students, graduates and drop-outs. Foreign-born individuals were over-represented among doctoral graduates, presumably due the high level of internationalisation of higher education, particularly at the doctoral level (OECD, 2019). Individuals with foreign-born parents represent a relatively small fraction of the 20-40 year-old population across OECD countries and they account for a similar share of individuals among HE graduates and dropouts. However, their proportion is about twice as large among doctoral graduates.

The share of young people from rural and intermediate regions tends to be lower among new entrants in bachelor’s and long first degree programmes than in the overall population across countries (though with some exceptions). In Chile and Poland (two emerging economies covering relatively wide areas), the share of young people from rural and intermediate regions is around (or over) 10 percentage points lower among new entrants than among the overall population (Figure 4). In other six countries, this difference is more moderate (between 1 and 3 percentage points). However, considering the overall good quality of these data, often of an administrative nature and covering the whole population (OECD, 2017b), even relatively small differences can be of policy relevance.

Table 2: Share of individuals by socio-economic backgrounds in selected categories relevant to HE (2012 or 2015), pooled data across OECD countries.

| Group                              | Doctoral graduates | HE graduates | HE dropouts | HE students | Overall population |
|------------------------------------|--------------------|--------------|-------------|-------------|--------------------|
| First-generation immigrant          | Percentage         | 29.2         | 9.5         | 12.0        | 11.2               | 11.7               |
|                                    | Standard error     | 5.6          | 0.6         | 1.5         | 1.1                | 0.3                |
|                                    | Sample size        | 421          | 26069       | 2715        | 10168              | 75837              |
| Second-generation immigrant         | Percentage         | 9.8          | 4.1         | 5.1         | 7.4                | 4.2                |
|                                    | Standard error     | 4.3          | 0.3         | 1.5         | 1.2                | 0.2                |
|                                    | Sample size        | 421          | 26069       | 2715        | 10168              | 75837              |
| Parents without upper secondary education | Percentage | 7.2          | 13.9        | 15.7        | 10.8               | 26.9               |
|                                    | Standard error     | 2.2          | 0.4         | 1.3         | 0.8                | 0.3                |
|                                    | Sample size        | 445          | 27081       | 2813        | 10628              | 76385              |
| At least one parent with HE        | Percentage         | 70.5         | 50.0        | 43.8        | 55.0               | 33.4               |
|                                    | Standard error     | 5.0          | 0.7         | 2.8         | 1.2                | 0.4                |
|                                    | Sample size        | 445          | 27081       | 2813        | 10628              | 76385              |

Source: OECD Survey of Adult Skills (PIAAC).

50% among HE students and graduates and is around 70% among doctoral graduates.

Table 2: Share of individuals by socio-economic backgrounds in selected categories relevant to HE (2012 or 2015), pooled data across OECD countries.

7 In Estonia, Greece and Ireland (three relatively small countries), 18-24 year-olds from rural and intermediate regions are over-represented among new entrants at the bachelor’s and long first degree level.
Finally, the share of people from rural or intermediate regions is higher among new entrants in short-cycle tertiary education than in bachelor’s or long first degree programmes in the large majority of countries with available data.

This evidence is consistent with what was observed for other dimensions of socio-economic and demographic characteristics reported in Figures 2 and 3 and suggests that short-cycle tertiary programmes can play a role in providing opportunities to access HE for people who may otherwise find it difficult to do so. However, it is important to note that short-cycle degrees do not generally confer the same opportunities to progress at higher levels of HE (OECD, 2019). Therefore, expansion of access to short-cycle degrees among people from disadvantaged socio-demographic groups could be one of the reasons why the overall expansion of access to HE does not necessarily result in a reduction in skill inequality.

### 3.4 Emerging disparities: the educational aspirations of secondary school students

The Appendix illustrates socio-economic disparities in the percentage of 15-year-old students who expected to earn a HE degree in 2003 and 2015 across countries with available data; as well as disparities related to place or residence and immigrant background. Results reveal large gaps between high and low SES students in the expectations to attend HE: on average across OECD countries, students with higher SES were around 40% more likely to expect to complete HE than those with lower SES and such gaps narrowed significantly between 2003 and 2015 in several countries, in line with the general expansion of access to higher education.

Brazil and Korea are the only countries where the gap in HE expectations increased in the past decade. In Brazil, this may partly be explained by the fact that the percentages of students with HE expectations decreased dramatically in the same period, particularly among students with low SES (from 64% in 2003 to 39% in 2015). In most countries, 15-year-olds who live in villages or rural areas are significantly less likely to expect to attend and graduate from HE institutions, and disparities between urban and rural areas are a fairly stable phenomenon across the countries examined and within countries over the past decade. On average across countries with available data, students in village/rural areas were 20% less likely to have HE aspirations than their peers in cities. Disparities are substantial in countries such as Hungary, Italy, the Slovak Republic, Portugal and Turkey where in 2015 the difference in the percentage of students living in villages or rural areas and those living in cities who expected to complete HE was 35% points or larger. In Hungary as little as 3% of students living in a village in 2015 expected to complete HE, while 50% of those living in a city did so.

Despite the fact that students with an immigrant background tend to have a disadvantaged socio-economic condition and to have low levels of competencies when
compared to students without an immigrant background, they are more likely to expect to obtain a HE degree, than their naive peers. In particular, the group of students who holds the most ambitious educational expectations is precisely the group of students who is most disadvantaged in terms of SES status and levels of academic proficiency: foreign-born students.

Results presented in Table 3 confirm the descriptive results presented in the Appendix and indicate that, in general, disparities are little affected by the inclusion of controls for academic achievement: among students of equal academic achievement at age 15, socio-economically advantaged individuals are generally more likely to expect to pursue HE than their socio-economically disadvantaged peers. The exception are students with an immigrant background, who appear to consistently express greater educational expectations than their peers without an immigrant background. In fact, differences between the two groups are magnified when achievement is accounted for in Table 3.

3.5 Limitations

Our study suffers from a number of limitations that could be addressed by future research. First, while our reliance on different sources of data lets us investigate our research questions more comprehensively, it also implies that our indicators of socio-economic condition differ across the different analyses undertaken. Second, the focus of our analyses is on disparities (inequalities) across socio-demographic groups, rather than on equity. Equity depends on differences in cultural and political institutions, making it more difficult to capture this concept through a quantitative analysis like the one we undertake. For example, a society may consider a certain degree of inequality in the distribution of opportunities equitable. Third, studying inequality requires high-quality data that are often more available in richer countries. Although we were able to assemble comparable data for the vast majority of OECD countries, our analyses tend to reflect the situation of a group of high and middle high income countries. Finally, in the absence of longitudinal evidence, some of the analyses we conducted rely on retrospective data on participation in higher education among different birth cohorts.

4 Conclusion

The evidence discussed in this paper showed that in OECD countries, large disparities still exist in participation in HE. Across cohorts, expanding access to HE is associated with a reduction in the HE participation gap between socio-demographic groups, but not with a reduction in the skill gap between the same groups.

Expanding access to higher education is associated with a general increase in the population skill level, and with increasing odds of accessing higher education for people from disadvantaged socio-demographic groups (compared to advantaged groups). However, we find that expanding access to higher education is not associated
Table 3: Disparities in Educational Expectations.

| Country         | High ESCS compared to low ESCS | Students with an immigrant background compared to native students | Foreign-born students with an immigrant background compared to native students | Native-born students with an immigrant background compared to native students | Students in cities compared to villages | Students in towns compared to villages | Students in cities compared to towns |
|-----------------|--------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------|--------------------------------------|--------------------------------------|
| Australia       | 4.35                           | 1.96                                                          | 2.96                                                                          | 1.65                                                                          | 2.04                                  | 1.27                                  | 1.56                                  |
| Austria         | 5.08                           | 1.13                                                          | 0.86                                                                          | 1.24                                                                          | 1.04                                  | 0.92                                  | 1.16                                  |
| Belgium         | 5.58                           | 1.63                                                          | 2.04                                                                          | 1.61                                                                          | 0.81                                  | 0.86                                  | 1.2                                  |
| Canada          | 4.85                           | 1.83                                                          | 2.34                                                                          | 1.61                                                                          | 2.12                                  | 1.51                                  | 1.33                                  |
| Chile           | 2.34                           | 0.76                                                          | 0.82                                                                          | 0.71                                                                          | 2.46                                  | 2.29                                  | 1.07                                  |
| Czech Republic  | 7.99                           | 1.19                                                          | 1.57                                                                          | 1.1                                                                          | 1.9                                   | 1.5                                   | 1.24                                  |
| Denmark         | 3.61                           | 1.48                                                          | 1.36                                                                          | 1.52                                                                          | 1.24                                  | 0.83                                  | 1.54                                  |
| Estonia         | 6.23                           | 0.7                                                           | 0.7                                                                           | 0.7                                                                           | 0.95                                  | 1.02                                  | 0.97                                  |
| Finland         | 7.38                           | 1.46                                                          | 1.58                                                                          | 1.42                                                                          | 1.62                                  | 1.19                                  | 1.38                                  |
| France          | 3.68                           | 1.36                                                          | 1.79                                                                          | 1.29                                                                          | 1.22                                  | 0.9                                   | 1.35                                  |
| Germany         | 6.12                           | 1.49                                                          | 1.26                                                                          | 1.56                                                                          | 2.21                                  | 1.83                                  | 1.21                                  |
| Greece          | 4.19                           | 0.8                                                           | 0.68                                                                          | 0.87                                                                          | 1.18                                  | 0.86                                  | 1.31                                  |
| Hungary         | 8.03                           | 1.39                                                          | 1.42                                                                          | 1.38                                                                          | 4.83                                  | 4.49                                  | 1.18                                  |
| Iceland         | 3.74                           | 1.18                                                          | 1.29                                                                          | 1.09                                                                          | 1.54                                  | 1.66                                  | 0.95                                  |
| Ireland         | 3.14                           | 0.97                                                          | 1.01                                                                          | 0.93                                                                          | 0.89                                  | 0.94                                  | 0.97                                  |
| Israel          | 2.84                           | 0.95                                                          | 0.92                                                                          | 0.96                                                                          | 1.05                                  | 1.29                                  | 0.81                                  |
| Italy           | 7.16                           | 0.91                                                          | 0.81                                                                          | 0.99                                                                          | 3.7                                   | 4.7                                   | 0.79                                  |
| Japan           | 5.02                           | 1.18                                                          | 0.84                                                                          | 1.32                                                                          | c                                     | c                                     | 1.54                                  |
| Korea           | 5.54                           | 1.09                                                          | c                                                                              | 0.94                                                                          | c                                     | c                                     | 1.59                                  |
| Latvia          | 5.74                           | 0.9                                                           | 1.48                                                                          | 0.87                                                                          | 0.87                                  | 1.01                                  | 0.91                                  |
| Luxembourg      | 4.32                           | 1.33                                                          | 1.73                                                                          | 1.2                                                                           | m                                     | m                                     | 1.31                                  |
| Mexico          | 2.98                           | 0.67                                                          | 0.82                                                                          | 0.51                                                                          | 1.99                                  | 2.05                                  | 0.96                                  |
| Netherlands     | 3.06                           | 2.07                                                          | 2.03                                                                          | 2.14                                                                          | c                                     | c                                     | 1.57                                  |
| New Zealand     | 5.18                           | 1.71                                                          | 1.88                                                                          | 1.6                                                                           | 1.36                                  | 0.85                                  | 1.57                                  |
| Norway          | 4.22                           | 2.01                                                          | 2.03                                                                          | 2.06                                                                          | 2.08                                  | 1.52                                  | 1.33                                  |
| Poland          | 10.76                          | 0.85                                                          | 0.76                                                                          | 0.93                                                                          | 1.42                                  | 1.16                                  | 1.23                                  |
| Portugal        | 10.72                          | 0.93                                                          | 1.16                                                                          | 0.85                                                                          | 1.31                                  | 1.22                                  | 1.15                                  |
| Slovak Republic | 7.61                           | 0.97                                                          | 0.83                                                                          | 1                                                                              | 1.94                                  | 1.69                                  | 1.14                                  |
| Slovenia        | 5.25                           | 1.46                                                          | 1.75                                                                          | 1.39                                                                          | 1.3                                   | 1.19                                  | 1.07                                  |
| Spain           | 4.78                           | 0.95                                                          | 1.04                                                                          | 0.85                                                                          | 0.86                                  | 0.87                                  | 1.01                                  |
| Sweden          | 4.76                           | 2.33                                                          | 3.25                                                                          | 2.13                                                                          | 2.56                                  | 1.71                                  | 1.44                                  |
Table 3: Disparities in Educational Expectations.

| Country                  | High ESCS compared to low ESCS | Students with an immigrant background compared to native students | Foreign-born students with an immigrant background compared to native students | Native-born students with an immigrant background compared to native students | Students in cities compared to villages | Students in towns compared to villages | Students in cities compared to towns |
|-------------------------|--------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------|---------------------------------------|--------------------------------------|
| Switzerland             | 4.1                            | 1.33                                                          | 1.62                                                                      | 1.25                                                                      | 2.13                                   | 1.75                                  | 1.23                                 |
| Turkey                  | 2.11                           | 0.91                                                          | 0.52                                                                      | 1.17                                                                      | 5.49                                   | 5.88                                  | 0.89                                 |
| United Kingdom          | 4.28                           | 2.5                                                           | 2.92                                                                      | 2.33                                                                      | 1.61                                   | 1.07                                  | 1.7                                  |
| United States           | 4.78                           | 1.6                                                           | 1.57                                                                      | 1.69                                                                      | 1.38                                   | 1.54                                  | 0.91                                 |
| OECD average            | 5.19                           | 1.31                                                          | 1.46                                                                      | 1.28                                                                      | 1.84                                   | 1.66                                  | 1.22                                 |
| Brazil                  | 3.02                           | 0.7                                                           | 0.46                                                                      | 0.8                                                                       | 1.44                                   | 1.47                                  | 1.05                                 |
| B-S-J-G China           | 7.04                           | 0.58                                                          | 0.13                                                                      | 1.15                                                                      | 1.81                                   | 1.41                                  | 1.47                                 |
| Bulgaria                | 5.14                           | 0.72                                                          | 0.61                                                                      | 0.76                                                                      | 2.62                                   | 2.73                                  | 0.96                                 |
| Colombia                | 1.92                           | 0.53                                                          | 0.35                                                                      | 0.64                                                                      | 1.44                                   | 1.31                                  | 1.14                                 |
| Costa Rica              | 2.29                           | 0.85                                                          | 0.75                                                                      | 0.88                                                                      | 1.13                                   | 1.04                                  | 1.08                                 |
| Croatia                 | 4.75                           | 1.14                                                          | 1.17                                                                      | 1.14                                                                      | c                                      | c                                     | 1.11                                 |
| Cyprus                  | 4.55                           | 0.66                                                          | 0.45                                                                      | 0.88                                                                      | 1.31                                   | 1.45                                  | 0.89                                 |
| Dominican Republic      | 1.09                           | 1.03                                                          | 1.44                                                                      | 0.89                                                                      | 1.06                                   | 0.94                                  | 1.01                                 |
| Hong Kong (China)       | 4.37                           | 1.21                                                          | 1.19                                                                      | 1.27                                                                      | m                                      | m                                     | m                                    |
| Lithuania               | 6.85                           | 0.76                                                          | 0.95                                                                      | 0.74                                                                      | 1.53                                   | 1.59                                  | 0.93                                 |
| Macao (China)           | 2.84                           | 1.57                                                          | 1.73                                                                      | 1.5                                                                       | c                                      | c                                     | c                                    |
| Montenegro              | 3.96                           | 0.88                                                          | 0.85                                                                      | 0.88                                                                      | c                                      | c                                     | 0.72                                 |
| Peru                    | 1.76                           | 0.65                                                          | 0.78                                                                      | 0.58                                                                      | 0.74                                   | 0.96                                  | 0.79                                 |
| Qatar                   | 2.99                           | 1.15                                                          | 1.03                                                                      | 1.3                                                                       | 0.75                                   | 0.69                                  | 1.14                                 |
| Russia                  | 4.57                           | 1.05                                                          | 1.04                                                                      | 1.05                                                                      | 1.65                                   | 1.29                                  | 1.33                                 |
| Singapore               | 1.86                           | 0.94                                                          | 0.82                                                                      | 1.02                                                                      | m                                      | m                                     | m                                    |
| Chinese Taipei          | 6.42                           | 1.23                                                          | 1.07                                                                      | 1.25                                                                      | c                                      | c                                     | 1.51                                 |
| Thailand                | 4                              | 0.55                                                          | c                                                                         | 0.57                                                                      | 2.62                                   | 1.83                                  | 1.36                                 |
| Tunisia                 | 2.44                           | 0.74                                                          | 0.88                                                                      | 0.65                                                                      | 1.21                                   | 1.11                                  | 1.17                                 |
| United Arab Emirates    | 2.04                           | 1.2                                                           | 1.14                                                                      | 1.26                                                                      | 1.08                                   | 1.08                                  | 0.98                                 |
| Uruguay                 | 3.36                           | 1.15                                                          | 1.45                                                                      | 1.07                                                                      | 0.66                                   | 0.78                                  | 0.85                                 |

Source: PISA 2015 data. Numbers denoted in bold imply that a difference is statistically significant at the 5% level. The letter c denotes that there are not enough observations to identify meaningful estimates. Results are based on country specific logistic regressions that control for students’ academic performance in the PISA standardised test (through an indicator of whether the student achieved at least the PISA proficiency level 3 in reading, mathematics or science) and socio-economic status, operationalised through the PISA Index of Economic, Social and Cultural Status.
with a reduction in measures of skill inequality. Across OECD countries, inequality tends to increase at higher levels of education. This suggests that varying levels of inequality within higher education pathways could be an explanation for the previous result. Disparities in HE participation and attainment do not depend only on skills, but they are rooted in disparities in the ambitions and expectations individuals hold long before they have to make a decision to apply and enrol in HE. These underlying differences in educational aspirations across socio-demographic groups are worrying, because they may play a role not only in the decision to access HE, but also to access different programmes within the HE system.

The high level of inequality in access to and completion of HE is problematic because participation in HE is generally associated with better labour market and well-being outcomes. Returns to participation in HE are substantial, although the earnings advantage associated with participation in HE is typically lower in countries with higher education attainment among the older population (OECD, 2018b). Moreover, technological progress and globalisation is likely to lead to even more polarised employment patterns featuring high-skill/high-paying jobs on the one hand and low-skill/low-paying jobs on the other. When jobs are classified into different skills categories, OECD countries have seen an average increase of about 5 percentage points in jobs with high skill requirements and an increase of about 2 percentage points in jobs with low skill requirements. Employment in medium skilled jobs decreased by 7 percentage points between 1995 and 2015 (OECD, 2017d).

It appears that, in most countries, disparities in HE participation and attainment are rooted in disparities in the ambitions and expectations individuals hold long before they have to make a decision to apply and enrol in HE, and are not a result of their potential and ability to succeed in HE. For example, at the age of 15, socio-economically disadvantaged students are less likely to expect to complete HE than their more advantaged peers of equal ability. Similarly, students who live in rural areas are less likely than students who live in large cities of similar ability and socio-economic status to expect to complete HE. Disparities by immigration backgrounds in the ambitions harboured by 15-year-old students are more complex: many foreign-born students and the children of foreign-born have ambitious educational plans, but education systems typically fail to equip them with the skills that are needed to succeed in HE (OECD, 2018c).

The findings suggest that short-cycle HE programmes may play a role in reducing inequality in HE access and attainment. These programmes are shorter, and typically more occupationally-specific and practically-based than other HE programmes. More students at this level of education study part-time than at the bachelor’s level, on average across OECD countries (OECD, 2016d). This may be appealing to students with different backgrounds, and may help individuals who would be the first in their families to attend HE or who have few role models of HE participation among their acquaintances to integrate into the HE learning environment. However, inequality in HE is not only about access and attainment, but also about what programmes people enrol in, and what value these programmes bring to them. Some evidence indicates that HE graduates from socio-economically advantaged household typically display higher skills than HE graduates from more disadvantaged households, an indication of potentially increased polarisation in the quality of institutions attended. Widening participation by encouraging attendance in short-cycle HE programmes may run the risk of further contributing to disparities in outcomes among HE graduates.

The differences in the underlying educational ambitions and in the type of HE programmes attended by people in different socio-economic groups could be an explanation for the findings we presented at the beginning of Section 3. These findings indicate that expanding HE can create more opportunities for individuals from different backgrounds to develop skills that will be required in the labour market and in society. However, we find that HE expansions in and of themselves may not be enough to reduce skill inequalities across the economy and, in fact, may exacerbate these, as argued by proponents of compensatory advantage theories, and theories of maximally and effectively maintained inequality. In order to improve effectively the equality of opportunities among different individuals, it may be necessary to broaden access not only to HE in general, but also to all type of programmes [in particular, to the most prestigious ones – e.g. Brennan and Naidoo (2008)]. Furthermore, work needs to be done with socio-economically disadvantaged youths and their families, to ensure that they are equipped to benefit from HE, that they have adequate information on the labour market returns associated with participation and they are supported to build adequate paths that lead to participation of a comparable quality with that enjoyed by the socio-economically advantaged. More evidence is needed to understand how skill inequalities across individuals from different socio-economic and demographic backgrounds can be reduced, and the role HE can play. Our work facilitates this by providing comparable indicators that can be used in further empirical research.
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# Appendix

Table A1: Data for Figure 2 Percentage of 18-24 year-olds with parents without HE (2015) in the total population and among HE entrants and graduates.

| Country | Entrants, short-cycle | Entrants, bachelor's and long first degrees | Graduates, short-cycle | Graduates, bachelor's and long first degrees | Population |
|---------|-----------------------|--------------------------------------------|------------------------|----------------------------------------------|-------------|
| ITA     | a                     | 70.64                                      |                        | 69.24                                         | 82.17       |
| CHL     | 84.19                 | 67.35                                      | m                      | m                                             | 79.33       |
| GRC     | a                     | 59.54                                      | a                      | m                                             | 74.68       |
| LTU     | a                     | 37.26                                      | a                      | m                                             | 71.51       |
| NLD     | m                     | 54.24                                      | m                      | 50.54                                         | 69.09       |
| AUS     | m                     | 46.18                                      | m                      | 41.53                                         | 68.09       |
| SVN     | 70.9                  | 52.52                                      | 74.63                  | 50.71                                         | 64.94       |
| CHE     | a                     | 43                                         | a                      | 37.56                                         | 64.57       |
| FRA     | 63.24                 | 46.78                                      | 63.55                  | 43                                            | 63.49       |
| Average | 65.03                 | 48.12                                      | ~                      | 44.59                                         | 63.29       |
| SWE     | 60.66                 | 42.52                                      | 58.39                  | 45.08                                         | 61.32       |
| NOR     | 61.02                 | 42.75                                      | 61.37                  | 44.02                                         | 58.11       |
| DEU     | m                     | m                                          | m                      | 47.76                                         | 56.6        |
| ISR     | m                     | 38.53                                      | m                      | 40.4                                          | 56          |
| USA     | 50.77                 | x                                          | m                      | 36.11                                         | 50.72       |
| EST     | a                     | 30.97                                      | a                      | m                                             | 46.25       |
| FIN     | a                     | 28.15                                      | a                      | 29.09                                         | 45.8        |
| PRT     | 64.43                 | 61.34                                      | m                      | m                                             | m           |

Notes: a: level of education is not applicable; m: missing; x: data are included in the other level of education; ~: insufficient number of observations to calculate a meaningful average. See Table B1 for more information on definitions and data sources.
Table A2: Data for Figure 3 Percentage of 18-24 year-olds with immigrant background (2015) in the total population and among HE entrants and graduates.

| Country | Entrants, short-cycle | Entrants, bachelor’s and long first degrees | Graduates, short-cycle | Graduates, bachelor’s and long first degrees | Population |
|---------|-----------------------|---------------------------------------------|------------------------|---------------------------------------------|-------------|
| USA     | x                     | 19.67                                       | m                      | 13.12                                       | 34.9        |
| CHE     | a                     | 17.68                                       | a                      | 15.85                                       | 31.4        |
| SWE     | 15.3                  | 16.89                                       | 14                     | 15.81                                       | 22.4        |
| ISR     | m                     | 20.05                                       | m                      | 18.73                                       | 22.22       |
| GRC     | a                     | 9.46                                        | a                      | m                                           | 19.34       |
| DEU     | m                     | m                                           | m                      | 6.66                                        | 18.17       |
| Average | ~                     | 10.75                                       | ~                      | 10.07                                       | 17.8        |
| NOR     | 4.85                  | 9.69                                        | 4.01                   | 6.59                                        | 15.27       |
| EST     | a                     | 4.77                                        | a                      | m                                           | 9.28        |
| NLD     | m                     | 8.7                                         | m                      | 4.95                                        | 9.2         |
| SVN     | 4.87                  | 4.7                                         | 5.5                    | 4.4                                         | 7.09        |
| FIN     | a                     | 4.79                                        | a                      | 4.53                                        | 6.58        |

Notes: a: level of education is not applicable; m: missing; x: data are included in the other level of education; ~: insufficient number of observations to calculate a meaningful average. See Table B2 for more information on definitions and data sources.

Table A3: Data for Figure 4 Percentage of 18-24 year-olds coming from rural areas (2015) in the total population and among HE entrants.

| Country | Entrants, short-cycle | Entrants, bachelor’s and long first degrees | Population |
|---------|-----------------------|---------------------------------------------|-------------|
| SVK     | 77.21                 | m                                           | 91.37       |
| HUN     | 90.49                 | 82.67                                       | 83.89       |
| SWE     | 86.67                 | 75.13                                       | 78.7        |
| NOR     | 85.36                 | 75.77                                       | 77.49       |
| IRL     | 34.41                 | 77                                           | 71.66       |
| AUT     | 66.96                 | 60.16                                       | 63.14       |
| CHL     | 54.47                 | 49.17                                       | 58.17       |
| EST     | a                     | 63.83                                       | 57.15       |
| DEU     | m                     | 54.29                                       | 56.78       |
| GRC     | a                     | 68                                           | 52.86       |
| Average | 69.1                  | 52.17                                       | 52.59       |
| POL     | m                     | 33.67                                       | 45.87       |
| PRT     | 76.29                 | 44.7                                        | 45.25       |
| AUS     | m                     | 21.05                                       | 25.77       |
| CHE     | a                     | 13.48                                       | 16.48       |
| USA     | 35.38                 | x                                           | 14.1        |
| ISR     | m                     | 8.41                                        | 8.36        |

Notes: a: level of education is not applicable; m: missing; x: data are included in the other level of education; ~: insufficient number of observations to calculate a meaningful average. See Table B3 for more information on definitions and data sources.
Table B1: Metadata for Figure 2 Percentage of 18-24 year-olds with parents without HE (2015) in the total population and among HE entrants and graduates.

| Country | Category | Reference year | Definition: operational and conceptual differences | Coverage differences | International students inclusion | Data source |
|---------|----------|----------------|--------------------------------------------------|----------------------|---------------------------------|-------------|
| AUS     | Entrants/graduates, ISCED 6 | . | . | . | Survey of institutions (Higher Education Student Data Collection) |
|         | Population | 2014 | . | . | Survey (ABS General Social Survey) |
| CHE     | Entrants ISCED 6 | 2013 | Includes all entrants (not only new entrants) | . | Survey on the social and economic condition of students’ life |
|         | Graduates ISCED 6 | . | Includes all graduates (not only first-time graduates) | . | Graduate survey |
|         | Population | 2011 | Includes international students | . | Swiss Adult Education Survey 2011 |
| DEU     | Graduates ISCED 6 | 2013 | Only includes academic programmes | Includes international students (3%) | Graduate Panel 2013, German Centre for Higher Education Research and Science Studies (DZHW) |
|         | Population | 2012 | . | . | OECD Survey of Adult Skills |
| EST     | Entrants ISCED 6 | 2013 | First-year students instead of new entrants | . | EUROSTUDENT |
|         | Population | 2012 | . | . | OECD Survey of Adult Skills (PIAAC) |
| FIN     | Entrants ISCED 6 | 2016 | Includes all entrants (not only new entrants) | Includes international students (6%) | Statistics Finland’s student and degree data registers. |
|         | Graduates ISCED 6 | . | Includes all graduates (not only first-time graduates) | Includes international students | Statistics Finland’s student and degree data registers |
|         | Population | . | Includes international students | . | Statistics Finland’s population data. |
Table B1: Metadata for Figure 2 Percentage of 18-24 year-olds with parents without HE (2015) in the total population and among HE entrants and graduates.

| Country | Category | Reference year | Definition: operational and conceptual differences | Coverage differences | International students inclusion | Data source |
|---------|----------|----------------|-----------------------------------------------------|----------------------|--------------------------------|-------------|
| FRA     | Entrants ISCED 5/6 | .              | .                                                   | .                    | .                              | Cohort of new entrants into Tertiary Education (“bacheliers” 2014). |
|         | Graduates ISCED 5/6 | .              | .                                                   | .                    | .                              | The cohort of new entrants into Tertiary Education (“bacheliers” 2008), followed within the Tertiary Education from September 2008 up to September 2014. |
|         | Population | 2012           | .                                                   | .                    | .                              | OECD Survey of Adult Skills (PIAAC) |
| GRC     | Population | 2011           | .                                                   | .                    | .                              | Population census survey 2011 |
|         | Entrants | .              | .                                                   | .                    | .                              | Annual entrant survey |
| ISR     | Entrants/graduates, ISCED 6 | .              | For most students, parental educational attainment has been inferred on the basis of their mothers’ number of years in education. | .                    | .                              | Administrative files and population registry and educational attainments registry (different sources are used). |
|         | Population | .              | .                                                   | .                    | .                              | Population registry and educational attainments registry |
| LTU     | Entrants ISCED 6 | 2016           | .                                                   | First-year students instead of new entrants | .                              | Survey (EUROSTUDENT) |
|         | Population | 2011           | .                                                   | .                    | .                              | Census (Population and Housing Census 2011) |
| NLD     | Entrants/graduates, ISCED 6 | .              | .                                                   | .                    | .                              | Administrative (register data) |
|         | Population | .              | .                                                   | Includes international students | .                              | Administrative (municipal registration data) |
| NOR     | Entrants/graduates, ISCED 5/6 | .              | Parental education when the student was 16 years old | .                    | .                              | Administrative registers |
|         | Population | .              | .                                                   | .                    | .                              | Administrative registers |
| PRT     | Entrants ISCED 5/6 | .              | .                                                   | Includes international students (1%) | .                              | Annual Survey filled in by all higher education institutions |
Table B1: Metadata for Figure 2 Percentage of 18-24 year-olds with parents without HE (2015) in the total population and among HE entrants and graduates.

| Country | Category | Reference year | Definition: operational and conceptual differences | Coverage differences | International students inclusion | Data source |
|---------|----------|----------------|----------------------------------------------------|----------------------|---------------------------------|-------------|
| SVN     | Entrants and graduates, ISCED 5/6 | 2012 | Includes all entrants (not only first time enrolment) | . | Includes international students | Central administrative database of students enrolled (the Ministry of education), Central population register, Census |
| SWE     | Entrants/graduates, ISCED 5/6 | 2012 | Includes all entrants (not necessarily first time enrolment) | . | Includes international students | Student registers |
| USA     | Entrants, ISCED 5/6 | 2012 | Includes all entrants (not necessarily first time enrolment) | . | Includes international students | Beginning Post Secondary Students |
|         | Graduates, ISCED 6 | 2008 | Includes all entrants (not necessarily first time enrolment) | . | Includes international students | 2008 Baccalaureate and Beyond Longitudinal Study (B&B) |
|         | Population | 2012 | Includes all entrants (not necessarily first time enrolment) | . | Includes international students | OECD Survey of Adult Skills (PIAAC) |

Table B2: Metadata for Figure 3 Percentage of 18-24 year-olds with immigrant background (2015) in the total population and among HE entrants and graduates.

| Country | Category | Reference year | Definition: operational and conceptual differences | Coverage differences | International students inclusion | Data source |
|---------|----------|----------------|----------------------------------------------------|----------------------|---------------------------------|-------------|
| CHE     | Entrants ISCED 6 | 2013 | Includes all entrants (not only first time enrolment) | . | Includes international students | Survey on the social and economic condition of students’ life |
|         | Graduates ISCED 6 | 2009 | Only includes academic programmes | . | Includes international students (3%) | Graduate Panel 2009, German Centre for Higher Education Research and Science Studies (DZHW) |
|         | Population | 2009 | Only includes academic programmes | . | Includes international students | Federal Statistical Office: Microcensus 2009 |
| DEU     | Graduates ISCED 6 | 2013 | First-year students instead of new entrants | . | Includes international students | EUROSTUDENT |
Continued Table B2: Metadata for Figure 3 Percentage of 18-24 year-olds with immigrant background (2015) in the total population and among HE entrants and graduates.

| Country | Category | Reference year | Definition differences | Coverage differences | International students inclusion | Data source |
|---------|----------|----------------|------------------------|----------------------|--------------------------------|-------------|
| FIN     | Entrants ISCED 6 | 2016 | . | Includes all entrants (not only first time entrants) | Includes international students (6%) | Statistics Finland’s student and degree data registers. |
|         | Graduates ISCED 6 | . | . | Includes all graduates (not necessarily first-time graduates) | Includes international students (6%) | Statistics Finland’s student and degree data registers |
|         | Population | . | . | . | Includes international students | Statistics Finland’s population data. |
| GRC     | Population | 2011 | . | . | . | Population census survey 2011 |
|         | Entrants | . | . | . | . | Annual entrant survey |
| ISR     | Entrants ISCED 6 | . | . | . | . | Administrative files |
|         | Graduates ISCED 6 | . | . | . | . | Administrative files |
|         | Population | . | . | . | . | Population registry |
| NLD     | Entrants/graduates ISCED 6 | . | . | . | . | Administrative (register data) |
|         | Population | . | . | . | Includes international students | Administrative (municipal registration data) |
| NOR     | Entrants, graduates, population | . | . | . | . | Administrative registers |
| SVN     | Entrants/graduates ISCED 5/6 | . | . | . | . | Central administrative database of students enrolled (the Ministry of education) |
|         | Population | . | . | . | Includes international students | Central population register, Census |
| SWE     | Entrants and graduates ISCED 5/6 | . | . | . | . | Student registers |
|         | Population | . | . | . | . | Population registers |
| USA     | Entrants, ISCED 5/6 | 2012 | . | Includes ISCED 6 | . | Beginning Post Secondary Students |
|         | Graduates, ISCED 6 | 2008 | . | . | . | 2008 Baccalaurate and Beyond Longitudinal Study (B&B) |
|         | Population | 2012 | . | . | Includes international students | Current Population Survey 2012 |
Table B3: Metadata for Figure 4 Percentage of 18-24 year-olds coming from rural areas (2015) in the total population and among HE entrants.

| Country | Category | Reference year | Definition differences | Coverage differences | International students inclusion | Data source |
|---------|----------|----------------|------------------------|---------------------|-------------------------------|-------------|
| AUS     | Entrants/graduates, ISCED 6 | . | . | . | . | Survey of institutions (Higher Education Student Data Collection) |
|         | Population | . | . | . | . | Survey (ABS General Social Survey) |
| AUT     | Entrants | . | . | . | . | Statistics Austria, university statistics |
|         | Population | . | . | . | Includes international students | Statistics Austria, population statistics |
| CHE     | Population | . | Residence recorded at the time of obtaining the higher education entrance qualification. | All entrants (not necessarily new entrants) in Bachelor or old 'Diploma' programmes | . | Swiss Higher Education Information System (SIUS) 2015 |
|         | Entrants | . | National definition of rural areas | . | Includes international students (32%) | Population and Household Statistics (STATPOP) |
| DEU     | Entrants | . | . | Data include only academic programmes (ISCED-Lv. 645, 647, 746) because data on urban/rural areas are only collected in university statistics. | . | Federal Statistical Office (2015), University statistics |
|         | Population | . | . | . | Includes international students | Federal Statistical Office (2015), Population statistics |
| EST     | Entrants | 2013 | . | First-year students instead of new entrants | . | EUROSTUDENT |
|         | Population | 2013 | . | . | . | Statistics Estonia |
| GRC     | Population | 2011 | . | . | . | Census 2011 |
|         | Entrants | . | . | . | . | Annual entrant survey |
| HUN     | Entrants | . | . | . | . | FIR OSAP |
|         | Population | . | . | . | . | KSH |
| IRL     | Entrants | . | . | . | . | Student Record System (Database operated by the Higher Education Authority) |
|         | Population | . | . | . | Includes international students | Estimates based on 2011 Census data from the Central Statistics Office |
| ISR     | Entrants | . | National definition of rural areas | . | . | Administrative files |
|         | Population | . | National definition of rural areas | . | . | Administrative files and the population registry |
| Country    | Category          | Reference year | Definition differences | Coverage differences | International students inclusion | Data source                                                                 |
|------------|-------------------|----------------|------------------------|----------------------|---------------------------------|----------------------------------------------------------------------------|
| NOR        | Entrants          |                |                        |                      |                                 | Administrative registers                                                   |
|            | Population        |                |                        |                      |                                 | Administrative registers                                                   |
| POL        | Population        |                | National definition of rural areas |                      |                                 | Estimated data                                                             |
|            | Entrants          |                | National definition of rural areas |                      | Includes international students | Estimates based on 2011 Census Results.                                    |
| PRT        | Population        |                |                        |                      | Includes international students | Annual Survey to all higher education institutions                          |
|            | Entrants          |                |                        |                      | Includes international students | Annual Survey filled in by all higher education institutions              |
| SVK        | Entrants          |                |                        |                      |                                 | Databases of processing statistical reports of schools in Slovak Republic |
|            | Population        |                |                        |                      |                                 | Databases of the Statistical Office of the Slovak Republic                |
| SWE        | Entrants          |                |                        |                      |                                 | Student registers                                                          |
|            | Population        |                |                        |                      |                                 | Population registers                                                       |
| USA        | Population        | 2012           | National definition of rural areas |                      |                                 | Beginning Post Secondary Students                                         |
|            | Entrants          | 2012           | National definition of rural areas |                      | Includes international students | Current Population Survey 2012                                             |

Table C1: Percentage of secondary school students expecting to complete HE - by country of residency, year and socio-economic status.

| Country         | PISA 2015 Low SES | PISA 2015 High SES | Difference (high-low) | PISA 2003 Low SES | PISA 2003 High SES | Difference (high-low) | PISA 2015 - PISA 2003 Low SES | PISA 2015 - PISA 2003 High SES | Difference (high-low) |
|-----------------|-------------------|--------------------|-----------------------|-------------------|--------------------|-----------------------|-------------------------------|-------------------------------|-----------------------|
| Australia       | 38                | 78                 | 41                    | 50                | 89                 | 39                    | -13                           | -11                           | 2                     |
| Austria         | 17                | 57                 | 41                    | 24                | 62                 | 38                    | -7                            | -5                            | 2                     |
| Belgium         | 36                | 83                 | 47                    | 31                | 83                 | 52                    | 5                             | 0                             | 5                     |
| Canada          | 64                | 91                 | 27                    | 71                | 96                 | 25                    | -7                            | -5                            | 2                     |
| Czech Republic  | 37                | 88                 | 52                    | 20                | 77                 | 57                    | 16                            | 11                            | -5                    |
| Denmark         | 26                | 60                 | 35                    | 23                | 69                 | 46                    | 2                             | -9                            | -11                   |
| Finland         | 10                | 49                 | 39                    | 35                | 72                 | 37                    | -25                           | -23                           | 2                     |
| France          | 24                | 66                 | 42                    | 32                | 72                 | 40                    | -8                            | -6                            | 1                     |
Table C1: Percentage of secondary school students expecting to complete HE - by country of residency, year and socio-economic status.

| Country           | PISA 2015 |          |          | PISA 2003 |          |          | PISA 2015 - PISA 2003 |          |          |
|-------------------|-----------|----------|----------|-----------|----------|----------|------------------------|----------|----------|
|                   | Low SES   | High SES | Difference (high-low) | Low SES | High SES | Difference (high-low) | Low SES | High SES | Difference (high-low) | Low SES | High SES | Difference (high-low) |
| Germany           | 7         | 39       | 32       | 6         | 47       | 41       | 1                      | -8       | -9       |                   |
| Greece            | 60        | 92       | 31       | 68        | 97       | 29       | -7                     | -5       | 2        |                   |
| Hungary           | 16        | 73       | 57       | 27        | 93       | 66       | -11                    | -20      | -8       |                   |
| Iceland           | 37        | 73       | 35       | 31        | 75       | 44       | 7                      | -2       | -9       |                   |
| Ireland           | 48        | 80       | 32       | 45        | 88       | 43       | 3                      | -8       | -11      |                   |
| Italy             | 35        | 84       | 49       | 32        | 84       | 52       | 3                      | 0        | -3       |                   |
| Japan             | 58        | 90       | 32       | 49        | 89       | 40       | 9                      | 0        | -8       |                   |
| Korea             | 78        | 97       | 18       | 88        | 99       | 12       | -10                    | -3       | 7        |                   |
| Latvia            | 39        | 83       | 44       | 41        | 84       | 43       | -2                     | -1       | 1        |                   |
| Luxembourg        | 33        | 78       | 45       | 28        | 83       | 55       | 5                      | -5       | -10      |                   |
| Mexico            | 62        | 87       | 25       | 38        | 86       | 47       | 23                     | 1        | -22      |                   |
| Netherlands       | 29        | 62       | 33       | 20        | 66       | 46       | 9                      | -4       | -13      |                   |
| New Zealand       | 32        | 77       | 45       | 33        | 77       | 45       | -1                     | 0        | 0        |                   |
| Norway            | 43        | 79       | 36       | 31        | 81       | 50       | 12                     | -1       | -14      |                   |
| Poland            | 24        | 81       | 58       | 15        | 78       | 63       | 9                      | 4        | -5       |                   |
| Portugal          | 35        | 90       | 55       | 27        | 78       | 51       | 8                      | 13       | 4        |                   |
| Slovak Republic   | 24        | 78       | 54       | 18        | 77       | 59       | 6                      | 1        | -5       |                   |
| Spain             | 43        | 85       | 41       | 37        | 84       | 48       | 7                      | 0        | -6       |                   |
| Sweden            | 40        | 81       | 41       | 35        | 82       | 47       | 5                      | -1       | -6       |                   |
| Switzerland       | 21        | 60       | 39       | 8         | 47       | 39       | 12                     | 13       | 1        |                   |
| Turkey            | 68        | 87       | 19       | 78        | 97       | 19       | -9                     | -10      | 0        |                   |
| United Kingdom    | 35        | 74       | 39       | 19        | 66       | 47       | 16                     | 8        | -8       |                   |
| United States     | 71        | 94       | 23       | 55        | 94       | 39       | 16                     | 1        | -16      |                   |
| OECD average      | 38        | 77       | 39       | 36        | 80       | 44       | 2                      | -2       | -5       |                   |
| Brazil            | 39        | 74       | 35       | 64        | 91       | 28       | -24                    | -17      | 7        |                   |
| Hong Kong (China) | 55        | 86       | 31       | 46        | 83       | 37       | 9                      | 3        | -6       |                   |
| Macao (China)     | 53        | 78       | 25       | 55        | 79       | 24       | -2                     | -1       | 0        |                   |
| Russia            | 30        | 70       | 40       | 37        | 86       | 49       | -7                     | -16      | -10      |                   |
| Thailand          | 56        | 87       | 31       | 37        | 84       | 47       | 19                     | 3        | -15      |                   |
| Tunisia           | 45        | 72       | 27       | 54        | 78       | 23       | -9                     | -5       | 4        |                   |
| Uruguay           | 30        | 71       | 41       | 46        | 86       | 40       | -16                    | -15      | 1        |                   |

Source: PISA 2003 and 2015 Database.

Notes: High SES students are students in the top quartile of the national distribution of a composite indicator of socio-economic status, the PISA Index of Economic, Social and Cultural Status, which summarises information on the educational attainment and occupational status of the parents of participating students as well as resources available in the household. Low SES students are students in the bottom quartile of the national distribution.

Numbers denoted in bold imply that a difference is statistically significant at the 5% level.

* Students are considered to expect to complete HE if they reported that they expect to obtain a degree at level 5A, 5B or 6 according to the International Standard of Educational Classifications (ISCED).
Table C2: Percentage of secondary school students expecting to complete HE - by country of residency, year and geographical residency.

| Country     | Village/rural area | Town (between 3,000 and 100,000) | City (>100,000) | Percentage of students expecting to complete higher education* | Difference in the percentage of students expecting to complete higher education* | Percentage of students expecting to complete higher education* | Difference in the percentage of students expecting to complete higher education* |
|-------------|--------------------|----------------------------------|-----------------|---------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------|
|             | City - village     | Town - village                   | City - town     | PISA 2015                                                     | PISA 2003                                                                        | PISA 2015 - PISA 2003                                         | PISA 2015 - PISA 2003                                                      |
| Australia   | 38                 | 47                               | 63              | 26 10 16 48                                                   | 63 76                                                                           | 28 15 -11 -16 -13                                             | -3 -6 3                                                                     |
| Austria     | 30                 | 33                               | 38              | 8 3 4 35                                                     | 41 42                                                                           | 7 6 -5 -7 -4                                                  | 1 -2 3                                                                     |
| Belgium     | 74                 | 62                               | 57              | -17 -13 -5 47                                                | 57 63                                                                           | 16 10 6 27 5                                                 | -33 -22 -11                                                                |
| Canada      | 64                 | 78                               | 84              | 20 14 6 79                                                   | 82 90                                                                           | 11 3 8 -15 -4                                                | 9 11 -2                                                                    |
| Czech       | 46                 | 62                               | 75              | 29 16 13 36                                                 | 46 57                                                                           | 20 10 11 10 16                                               | 9 6 3                                                                      |
| Denmark     | 40                 | 39                               | 50              | 10 -1 11 34                                                 | 44 49                                                                           | 15 10 5 6 -6                                                | 1 -11 6                                                                    |
| Finland     | 19                 | 24                               | 36              | 17 5 12 44                                                 | 50 58                                                                           | 15 7 8 -25 -26                                               | 3 -1 4                                                                     |
| Germany     | 12                 | 19                               | 25              | 13 7 6 11                                                  | 19 27                                                                           | 16 8 0 0 -2                                                 | -3 0 -2                                                                    |
| Greece      | 69                 | 74                               | 84              | 15 5 10 67                                                 | 83 87                                                                           | 21 16 4 2 -9                                                | 6 -11 5                                                                    |
| Hungary     | 3                  | 37                               | 50              | 47 34 14 5                                                 | 55 73                                                                           | 69 50 19 -2 -18                                              | -21 -16 -5                                                                 |
| Iceland     | 41                 | 59                               | 59              | 18 18 0 38                                                 | 54 61                                                                           | 23 16 7 3 5                                                 | -5 2 -7                                                                    |
| Ireland     | 65                 | 64                               | 67              | 2 0 3 63                                                   | 68 69                                                                           | 5 4 1 1 -3                                                 | -3 -4 1                                                                    |
| Italy       | 25                 | 61                               | 64              | 38 36 2 71                                                 | 53 63                                                                           | -9 -18 9 -46                                                | 47 54 -7                                                                   |
| Japan       | c                  | 70                               | 80              | c  c 11 m                                                  | 67 75                                                                           | m m 8 m 2                                                   | m m 3                                                                      |
| Korea       | c                  | 85                               | 90              | c  c 5 c                                                   | 92 96                                                                           | c  c 4 m -7                                                 | m m 2                                                                      |
| Latvia      | 50                 | 62                               | 68              | 18 13 5 54                                                 | 67 69                                                                           | 15 13 2 -4 -4                                               | 3 0 3                                                                      |
| Luxembourg  | m                  | 46                               | 62              | m  m 17 m                                                  | 54 6 m                                                                          | m m m -8 m                                                  | m m m                                                                      |
| Mexico      | 54                 | 77                               | 81              | 27 23 4 40                                                 | 62 74                                                                           | 34 22 12 14 15                                               | 7 -1 8                                                                     |
| Netherlands | c                  | 40                               | 54              | c  c 13 c                                                  | 36 48                                                                           | c  c 11 m 4                                                   | m m m                                                                      |
| New Zealand | 44                 | 47                               | 62              | 17 3 14 37                                                 | 48 58                                                                           | 21 10 10 7                                                  | -3 -7 4                                                                    |

*Percentage of students expecting to complete higher education includes students who expect to go to academic university or to vocational or technical training institution.
Inequality in Higher Education: Why Did Expanding Access Not Reduce Skill Inequality?

Table C2: Percentage of secondary school students expecting to complete HE - by country of residency, year and geographical residency.

|                | PISA 2015 | PISA 2003 | PISA 2015 - PISA 2003 |
|----------------|-----------|-----------|-----------------------|
|                | Percentage of students expecting to complete higher education* | Difference in the percentage of students expecting to complete higher education* | Percentage of students expecting to complete higher education* | Difference in the percentage of students expecting to complete higher education* | Percentage of students expecting to complete higher education* | Difference in the percentage of students expecting to complete higher education* |
|                | Village/rural area (<3,000) | City (>100,000) | Town (between 3,000 and 100,000) | Village/rural area (<3,000) | City (>100,000) | Town (between 3,000 and 100,000) | Village/rural area (<3,000) | City (>100,000) | Town (between 3,000 and 100,000) | Village/rural area (<3,000) | City (>100,000) | Town (between 3,000 and 100,000) |
|                | % | % | % point diff. | % | % point diff. | % | % point diff. | % | % point diff. | % | % point diff. | % | % point diff. |
| Norway         | 49 | 63 | 70 | 21 | 14 | 7 | 49 | 58 | 60 | 11 | 10 | 2 | 0 | 5 | 10 | 9 | 4 | 5 |
| Poland         | 37 | 50 | 63 | 25 | 13 | 12 | 32 | 46 | 59 | 27 | 14 | 13 | 5 | 4 | 4 | -2 | -1 | -1 |
| Portugal       | 38 | 59 | 74 | 36 | 21 | 15 | 34 | 49 | 64 | 30 | 15 | 15 | 3 | 10 | 10 | 7 | 7 | 0 |
| Slovak Republic| 27 | 53 | 65 | 38 | 26 | 12 | 29 | 47 | 68 | 39 | 18 | 21 | 7 | 2 | 7 | -1 | 8 | -9 |
| Spain          | 65 | 62 | 68 | 2 | -4 | 6 | 57 | 58 | 62 | 6 | 1 | 4 | 9 | 4 | 5 | -3 | -5 | 1 |
| Sweden         | 39 | 57 | 69 | 30 | 17 | 12 | 50 | 57 | 65 | 15 | 7 | 9 | -11 | 0 | 4 | 14 | 11 | 4 |
| Switzerland    | 27 | 36 | 45 | 17 | 9 | 9 | 16 | 22 | 47 | 31 | 6 | 25 | 11 | 14 | -2 | -13 | 3 | -16 |
| Turkey         | 25 | 76 | 77 | 52 | 51 | 0 | c | 82 | 89 | c | c | 7 | m | -6 | -13 | m | m | -7 |
| United Kingdom | 54 | 51 | 58 | 3 | -4 | 7 | 42 | 37 | 42 | 0 | -5 | 5 | 13 | 13 | 16 | 3 | 1 | 3 |
| United States  | 80 | 85 | 81 | 1 | 5 | -4 | 68 | 79 | 75 | 7 | 1 | -4 | 12 | 6 | 7 | -5 | -6 | 0 |
| OECD average   | 43 | 56 | 64 | 20 | 12 | 8 | 44 | 56 | 64 | 19 | 10 | 8 | 0 | 0 | 0 | 0 | 1 | -1 |
| Brazil         | 36 | 52 | 61 | 25 | 16 | 9 | 65 | 76 | 83 | 18 | 11 | 7 | -29 | -24 | -22 | 7 | 5 | 2 |
| Russia         | 33 | 46 | 60 | 27 | 13 | 14 | 42 | 59 | 74 | 32 | 17 | 15 | -9 | -13 | -14 | -5 | -4 | -1 |
| Thailand       | 50 | 71 | 83 | 33 | 21 | 12 | 41 | 57 | 77 | 35 | 16 | 19 | 9 | 14 | 6 | -3 | 5 | -7 |
| Tunisia        | 44 | 53 | 64 | 20 | 9 | 11 | 52 | 62 | 70 | 18 | 9 | 9 | -8 | -8 | -6 | 2 | 0 | 2 |
| Uruguay        | 43 | 45 | 50 | 7 | 2 | 5 | 53 | 63 | 72 | 19 | 10 | 9 | -10 | -18 | -22 | -12 | -8 | -5 |

Source: PISA 2003 and 2015 Database. Numbers denoted in bold imply that a difference is statistically significant the 5% level.

* Students are considered to expect to complete HE if they reported that they expect to obtain a degree at level 5A, 5B or 6 according to the International Standard of Educational Classifications (ISCED).
Table C3: Percentage of secondary school students expecting to complete HE - by country of residency, year and migration background.

| Students with an immigrant background | Students with an immigrant background | Students with an immigrant background |
|---------------------------------------|---------------------------------------|---------------------------------------|
| **Native students**                   | **Foreign-born**                      | **Total**                              |
| **Between native-born students**      | **Between foreign-born students and native students** | **Between foreign-born students and native students** |
| **Native students with an immigrant background** | **Foreign-born students with an immigrant background** | **Total**                              |
| **Mean** | **Mean diff.** | **Mean** | **Mean diff.** | **Mean** | **Mean diff.** | **Mean** | **Mean diff.** | **Mean** | **Mean diff.** | **Mean** | **Mean diff.** | **Mean** | **Mean diff.** |
| Australia | 51 | 66 | 63 | 72 | 15 | 12 | 21 | 66 | 77 | 75 | 82 | 11 | 9 | 16 | -15 | -11 | -12 | -10 | 4 | 3 | 5 |
| Austria | 36 | 30 | 33 | 25 | -6 | -3 | -12 | 42 | 35 | 41 | 31 | -7 | -1 | -11 | -6 | -5 | -8 | -6 | 1 | -2 | 0 |
| Belgium | 62 | 58 | 59 | 58 | -4 | -3 | -4 | 60 | 49 | 51 | 46 | -11 | -9 | -15 | 2 | 9 | 8 | 12 | 7 | 6 | 11 |
| Canada | 76 | 86 | 84 | 89 | 10 | 8 | 13 | 82 | 92 | 90 | 94 | 9 | 7 | 12 | -6 | -6 | -6 | -6 | 0 | 0 | 1 |
| Czech Republic | 63 | 65 | 63 | 70 | 2 | 0 | 7 | 49 | 40 | 38 | 53 | -8 | -11 | 5 | 14 | 24 | 26 | 17 | 10 | 11 | 2 |
| Denmark | 40 | 43 | 43 | 43 | 3 | 3 | 3 | 43 | 45 | 42 | 50 | 2 | -1 | 7 | -3 | -2 | 1 | -7 | 1 | 4 | -4 |
| Finland | 27 | 30 | 31 | 30 | 4 | 4 | 4 | 5 | 59 | 59 | 56 | 61 | 8 | 5 | 10 | -24 | -28 | -25 | -31 | -4 | -1 | -6 |
| France | 44 | 43 | 44 | 41 | -1 | 0 | -3 | 51 | 54 | 55 | 50 | 3 | 4 | -1 | -6 | -11 | -11 | -9 | -4 | -5 | -2 |
| Germany | 20 | 18 | 19 | 16 | -2 | -1 | -4 | 22 | 17 | 18 | 16 | -5 | -4 | -5 | -2 | 1 | 1 | 0 | 3 | 3 | 2 |
| Greece | 79 | 70 | 74 | 61 | -9 | -5 | -19 | 85 | 75 | 86 | 68 | -10 | 1 | -17 | -6 | -4 | -12 | -7 | 1 | -6 | -1 |
| Hungary | 41 | 54 | 54 | 51 | 13 | 14 | 10 | 62 | 68 | 68 | 68 | 7 | 6 | 7 | -21 | -14 | -14 | -17 | 6 | 7 | 4 |
| Iceland | 55 | 57 | 54 | 60 | 2 | -1 | 5 | 51 | 59 | 53 | 64 | 8 | 2 | 13 | 4 | -2 | 1 | -4 | -6 | -3 | -8 |
| Ireland | 65 | 66 | 66 | 67 | 1 | 1 | 2 | 66 | 70 | 70 | 70 | 4 | 4 | 4 | -1 | -4 | -4 | -3 | -3 | -3 | -2 |
| Italy | 60 | 53 | 58 | 46 | -7 | -2 | -14 | 57 | 58 | 62 | 51 | 1 | 5 | -5 | 4 | -4 | -3 | -6 | -8 | -7 | -9 |
### Inequality in Higher Education: Why Did Expanding Access Not Reduce Skill Inequality?

Table C3: Percentage of secondary school students expecting to complete HE - by country of residency, year and migration background.

| Country         | Native-born Total | Foreign-born | Native-born Total | Foreign-born | Native-born Total | Foreign-born | Native-born Total | Foreign-born | Mean Index | Mean Index | Mean Index | Mean Index | Mean diff. | Mean diff. | Mean diff. | Mean diff. | Mean diff. | Mean diff. | Mean diff. | Mean diff. | Mean diff. | Mean diff. | Mean diff. | Mean diff. | Mean diff. | Mean diff. | Mean diff. |
|-----------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Japan           | 77                | 76           | 77                | 71           | -2                | 0            | -6                | 73           | 78         | c          | c          | c          | c          | 5          | c          | c          | 5          | -2         | m          | m          | -7         | m          | m          |
| Korea           | 90                | 88           | 84                | c            | -2                | -6           | c                 | 95           | c          | c          | c          | c          | c          | c          | c          | c          | -5         | m          | m          | m          | m          | m          |
| Latvia          | 62                | 60           | 59                | 74           | -1                | -3           | 12                | 64           | 63         | 62         | 67         | -1         | -2         | 3           | -2         | -3         | -3         | 7          | 0          | -1         | 10         |
| Luxembourg      | 58                | 51           | 49                | 54           | -8                | -9           | -4                | 57           | 51         | 52         | 50         | -6         | -5         | -7          | 1           | 0          | -3         | 5          | -2         | -4         | 3          |
| Mexico          | 75                | 67           | 64                | 69           | -9                | -12          | -6                | 64           | 50         | 67         | 40         | -14        | 3          | -24         | 12          | 17         | -3         | 29         | 6          | -14        | 17         |
| Netherlands     | 43                | 51           | 52                | 49           | 8                 | 9            | 6                 | 40           | 42         | 43         | 41         | 2          | 2          | 1           | 3           | 9          | 9          | 8          | 6          | 6          | 5          |
| New Zealand     | 48                | 62           | 59                | 65           | 14                | 11           | 17                | 47           | 60         | 56         | 66         | 13         | 9          | 18          | 1           | 2          | 3          | 0          | 1          | 2          | -1         |
| Norway          | 60                | 67           | 70                | 63           | 7                 | 10           | 3                 | 55           | 59         | 62         | 54         | 4          | 7          | -1          | 5           | 8          | 8          | 9          | 3          | 3          | 4          |
| Poland          | 49                | 54           | 56                | 53           | 5                 | 7            | 4                 | 44           | c          | c          | c          | c          | c          | c          | 5           | m          | m          | m          | m          | m          |
| Portugal        | 61                | 65           | 68                | 59           | 5                 | 7            | 2                 | 51           | 50         | 59         | 39         | -1         | 8          | -12         | 9           | 15         | 8          | 20         | 6          | -1         | 10         |
| Slovak Republic | 51                | 48           | 47                | 48           | -3                | -4           | -2                | 48           | 50         | 49         | 58         | 2          | 0          | 10          | 3           | -3         | -1         | -10        | -5         | -4         | -12        |
| Spain           | 66                | 59           | 63                | 56           | -6                | -2           | -9                | 60           | 59         | 57         | 62         | -1         | -3         | 2           | 6           | 0          | 6          | -5         | -6         | 1          | -11        |
| Country          | Mean Index | Mean Index | Mean Index | Mean Index | Mean diff. | Mean diff. | Mean diff. | Mean Index | Mean Index | Mean Index | Mean Index | Mean Index | Mean diff. | Mean diff. | Mean diff. | Mean Index | Mean Index | Mean Index | Mean Index | Mean diff. | Mean diff. | Mean diff. |
|------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Native students  | 57         | 65         | 64         | 66         | 8          | 8          | 9          | 55         | 63         | 63         | 64         | 8          | 7          | 8          | 1          | 2          | 1          | 2          | 2          | 1          | 0          | 1          |
| Total            | 39         | 37         | 36         | 40         | -2         | -3         | 1          | 24         | 26         | 27         | 24         | 2          | 3          | 0          | 15         | 11         | 9          | 16         | -4         | -6         | 1          |
| Foreign-born     | 76         | 82         | 86         | 70         | 6          | 9          | -7         | 86         | 83         | 89         | 76         | -3         | 2          | -11        | -10        | -2         | -3         | -6         | 9          | 7          | 4          |
| Native students  | 47         | 66         | 65         | 67         | 18         | 18         | 19         | 36         | 53         | 54         | 50         | 17         | 18         | 14         | 12         | 13         | 11         | 17         | 1          | 0          | 5          |
| Total            | 84         | 83         | 84         | 79         | -1         | 0          | -5         | 77         | 76         | 78         | 72         | -1         | 1          | -5         | 7          | 7          | 6          | 7          | 0          | -1         | 0          |
| United States    | 57         | 59         | 59         | 57         | 2          | 2          | 1          | 57         | 57         | 58         | 56         | 1          | 3          | 1          | 0          | 1          | 0          | 1          | 1          | 0          | 1          |
| OECD average     | 56         | 49         | 52         | 40         | -7         | -4         | -16        | 79         | 80         | 81         | 81         | c          | 1          | 2          | c          | -23        | -31        | -29        | m          | -8         | -6         | m          |
| Brazil           | 75         | 69         | 71         | 66         | -6         | -4         | -9         | 65         | 63         | 66         | 58         | -3         | 1          | -7         | 9          | 6          | 5          | 8          | -3         | -5         | -2          |
| Hong Kong (China)| 59         | 67         | 66         | 68         | 8          | 7          | 9          | 63         | 66         | 68         | 61         | 2          | 4          | -3         | 5          | 1          | -1         | 7          | 6          | 3          | 12         |
| Macao (China)    | 51         | 53         | 53         | 51         | 2          | 2          | 0          | 64         | 64         | 67         | 59         | 0          | 4          | -5         | -12        | -11        | -14        | -8         | 1          | -1         | 5          |

Table C3: Percentage of secondary school students expecting to complete HE - by country of residency, year and migration background.
### Table C3: Percentage of secondary school students expecting to complete HE - by country of residency, year and migration background.

| Country      | Mean Index | Mean Index | Mean Index | Mean Index | Mean diff. Mean diff. | Mean Index | Mean Index | Mean Index | Mean diff. Mean diff. | Mean Index | Mean Index | Mean Index | Mean diff. Mean diff. |
|--------------|------------|------------|------------|------------|-----------------------|------------|------------|------------|-----------------------|------------|------------|------------|-----------------------|
| Students with an immigrant background |            |            |            |            |                       |            |            |            |                       |            |            |            |                       |
| Native students | 70         | 55         | 56         | c         | -15                   | -13        | c         | 58         | 77         | 73         | c         | 19         | 15         | c         | 12         | -22 | -17 | -34 | -29 | m |
| Total         | 58         | 55         | 52         | 60        | -3                    | -6         | 2         | 63         | 63         | 66         | 61        | 1          | 3          | -1        | -5         | -8 | -14 | -1 | -3 | 3 |
| Foreign-born   | 47         | 51         | 48         | 59        | 4                     | 1          | 12        | 66         | 69         | 72         | 67        | 3          | 6          | 1         | -19        | -19 | -23 | -8 | 0 | 4 |

Source: PISA 2003 and 2015 Databases. Numbers denoted in bold imply that a difference is statistically significant at the 5% level.

* Students are considered to expect to complete HE if they reported that they expect to obtain a degree at level 5A, 5B or 6 according to the International Standard of Educational Classifications (ISCED).