





Deciding the method of using the migration background data in OECD PISA has been one of the challenges during the study. Although the data on country of birth of the students and their both parents are collected in all the countries, the level of the detail for these variables in the officially published data sets differs across countries. Moreover, although more detailed data are available in some countries, the country of birth information is provided in broader country groupings rather than the single countries. In particular, for the countries analysed in this study, the detailed data are published for Belgium, Germany and the Netherlands, whereas they are not available in France, Sweden and the UK data sets. In this respect, the migration background of the students for the rest of the analyses has been obtained by the combination of the country of birth variables for the students, their mothers and fathers with the broadest categories (i.e. born in the country and foreign-born), which are available in all of these six countries. The preliminary analysis results, which is not presented in this conference, shows that there are negligible differences between the foreign-born and native-born students, whose both parents are native-born. Moreover, the number of observations in the former group of students is too small to provide statistically reliable findings. Therefore, these two groups are merged under the “both parents native-born” category. The other four migration background categories used in the analyses are one parent native/student native-born; both parents migrants/student native-born; one parent native-born/student migrant; and both parents migrants/student migrant (All migrants) respectively.

### Descriptive Findings

#### Socio-demographic and school-related characteristics

As the findings point out, the proportion of the students with two native-born parents decreased over time in Belgium, Sweden, the UK and Germany (with the exception of 2012 in the latter country), while there is no significant change in the share of this group in France and the Netherlands. Besides, native-born students with one native-born parent and native-born students with two migrant parents are two groups with the second or third highest shares in all study countries.

As mentioned above, Belgium, Germany and the Netherlands are the only selected countries with detailed country of birth categories. The descriptive results indicate that they have different migrant groups with various weights in relation with their histories and migration policies. In this respect, it can be argued that the changes in the number, size and composition of the migrant groups bring different socio-economic and education-related challenges in each country.

The data also show that the majority of the families of the foreign-born students with two migrant parents were speaking languages other than the language at school. It is

also the case for native-born students, whose both parents were migrants, all throughout 2006-15 period in Sweden, and some years in Belgium and Germany. Moreover, it is observed that a significant increase in the share of students speaking other languages over time in Germany and Sweden, while a decrease in the proportion of this group of students was observed in Belgium.

When the information on the school of the student is examined, it is found that the students with at least one foreign-born parent were less likely to attend ISCED 3A/B programs in Belgium, Germany and France in all years analysed, and in the UK until 2009. On the other hand, the descendants of the migrants in Sweden all over the period and in the UK after 2012 were more likely to attend such schools. The findings suggest that the students with two foreign-born parents are the most disadvantageous groups in attending schools with higher ISCED level.

There are also prominent differences in the education level of the parents between the descendants of the migrants and the native-born population. Students with at least one foreign-born parent were more likely to have parents with low education attainment level (ISCED 0-2) in all countries. This proportion was the highest among the students with two foreign-born parents.

For comparative analysis, the highest parental occupation index (HISEI), which is published in the raw OECD PISA data sets, have been divided in three equal groups according to the students' ranking in this index. Findings show that more than half of the native-born students with two migrant parents were in the lowest 33% HISEI group in all the years in Belgium, Germany, France and the Netherlands, and during the last two years of the period in Sweden. Foreign-born students, whose both parents were also foreign-born, had the similar trend in these countries. On the other hand, the figures indicate that the proportions are similar across students if at least one parent is native-born regardless of the student's country of birth. It is also found that there was less differentiation across migration background categories in the UK relative to other countries.

Home possessions (HOMEPOS) index is a pre-calculated summary index of all household and possession items (OECD, 2014). In the analysis, the percentile groups for this indicator based on the ranking of the actual index scores have been used. The descriptive analysis results show that more than one third of the foreign-born students with two migrant parents were in the lowest percentile of the HOMEPOS index in all years in Belgium, Germany, France, the Netherlands, Sweden, and the first two years of the period in the UK. This proportion exceeded half of the students in this category in the Netherlands and Sweden in some years. It is also found that the native-born students, whose both parents were foreign-born, was the second least advantageous group in terms of home possessions in all selected countries.

The PISA index of economic, social and cultural status (ESCS) is a comprehensive indicator determining the overall socio-economic level of the student's household. The composite score of this index is calculated by the indicators for the highest parental education level, the International Socio-Economic Index of Occupational Status (ISEI), the PISA index of family wealth; the PISA index of home educational resources; and the PISA index of possessions related to "classical" culture in the family home (OECD Glossary). Similar to the analyses of HISEI and HOMEPOS indices, the ESCS scores have been divided in equal deciles for comparative purposes. In the descriptive analysis of this study, the average decile groups for each migration background category are presented. The results highlight that both foreign-born and the native-born students with two migrant parents had much lower positions in the ranking of the ESCS Index relative to the other groups. However, the students with two native-born parents were not always the most advantageous category; the ones with one native-born parent and one migrant parent had higher index values in France, the Netherlands and the UK in the years examined in this study.

#### Plausible values in reading, mathematics and science

The initial findings demonstrate that having at least one migrant parent significantly reduces the plausible values in all three domains. The ratio relative to the students with two native-born parents was 85% or less for the migrant students, whose both parents were born abroad, in Belgium, Germany, France and Sweden. The ratios of the native-born students with two migrant parents relative to the descendants of the native-born parents were around 90% or less in all the countries but the UK. The ones with one native-born parent had higher averages than the former group of students in all domains. However, their results were still much lower than the students with two native-born parents. In the UK, in all the years, the average plausible values of students with only one native-born parent were equal to the average of the ones in the reference group; otherwise they were significantly higher, in all three domains. On the other hand, the findings indicate that the ratios for the students with two foreign born parents relative to the students, whose both parents were native born, were much lower than 100% in the other study countries.

#### Multivariate analysis findings

The dependent variables used in the multiple regression models are the natural logarithm of plausible values for reading, mathematics and science. Converting the actual values of the dependent variable into logarithmic values enables the proportional comparison of other categories with the reference category within the independent variables.

Independent variables included in the model are gender; language spoken at home; highest parental education level; 33% HISEI groups; home possessions (HOMEPOS) index percentiles; ISCED 97 program of the school (see UNESCO-UIS, 2006); and the migration background of the student.

According to the  $R^2$  values of the multiple regression models, it can be asserted that the explanatory power of the models for three separate sets of plausible values are similar in each country. Highest  $R^2$  values are for the Netherlands and France, and the lowest are found for Sweden and the UK.

The model coefficients indicate that the girls have much higher plausible values in reading relative to the boys in all countries and in all years. However, this pattern is just the reverse in mathematics and science domains in Belgium, France, the Netherlands and the UK, and to a smaller extent in Germany. On the other hand, there is no statistically significant differentiation between girls and boys in these two domains in Sweden.

Language spoken at home is more influential on the plausible values of the students in Germany and Belgium compared to other four countries. The effect of language at home is observed in particular years in the other countries. Interestingly, the ones speaking other languages at home were more successful in Belgium in 2006. The effect of highest parental educational level is not significant in Belgium while having parents with low educational attainment notably reduces the plausible values in Germany, Sweden and the UK. Likewise, the lower the HISEI index group, the lower the plausible values in all domains. The effect of HISEI is not significant for the medium 33% HISEI group in the Netherlands. The students in the lower ranks of the HOMEPOS index are likely to have lower plausible values. The negative impact was bigger for the ones, who were in the first two lowest 20% groups, though the third and fourth percentiles had lower plausible values to a smaller extend and statistical significance. Being in a lower ISCED level on the one hand and attending a labour market-oriented program on the other hand, result in having lower plausible values. The ratios relative to the ISCED 3A/B is as low as 48% in ISCED 2C schools in the Netherlands and it is below 70% in general in ISCED2A programs in Belgium, France and the UK.

When the coefficients for the migration background categories are examined, it is observed that, most of the gap is eliminated, otherwise reduced after controlling all other socio-economic, parental and school-related differences. Belgium is the only country, where the differences between all migrant groups and the descendants of the native-born parents remain to a big extent, although the disparities found in the actual plausible values between other categories and the reference group significantly reduce in the multiple regression models.

The differences in plausible values in mathematics also remain between the reference category and the native-born students with two migrant parents in France, the Netherlands and Sweden. In science domain, foreign-born students with two migrant parents also have relative disadvantage. The disparities between the descendants of two native-born parents and these two categories are also observed in Germany. Moreover, all other groups had lower mean plausible values in science relative to the reference category in 2015 in this country. The negative impact of having two migrant parents on plausible values in reading is evident in particular years in Germany, France, the Netherlands and Sweden. In the UK, there is no differentiation in plausible values between the descendants of the migrants and the native-born population. On the contrary, native-born students with one native-born parent were likely to have higher plausible values than the reference group in all domains in 2012.

### **Conclusion**

Both descriptive analyses and multiple regression models point out the educational and socio-economic inequalities across the students with different individual and parental migration experiences. The level of success of the students in the secondary school is influenced by the socio-economic and cultural levels of the students' households. The ISCED level and program of the school are among the main determinants. The findings also indicate that there is a relationship between the language at home and success in the school; but not present in all countries and in all years. The proportions of the low skilled jobholders and the less educated individuals among the parents of the students with two migrant parents are much higher than the ones in other migration status categories. These differences have a multiplier effect on the disparities in school success.

According to both descriptive and multivariate analysis results, it can be argued that the students with at least one migrant parent are the least advantageous ones in Belgium. Less inequality in the plausible values is observed across groups in the UK relative to other five countries. These patterns are evident in all years and all plausible value domains. Furthermore, students, whose both parents are migrants, is the most affected group in all the countries. Besides, it can be concluded as the differences across migration background categories are likely to reflect the cumulative effect of the disadvantages in the earlier stages of education. According to the findings of the OECD-PISA data analysis, welfare regimes seem not to be influential to reduce the disparities in educational outcomes. It is also found that the differences between migration background categories are more remarkable in mathematics and science compared to reading. The results do not indicate a significant change in the patterns over time both for the differences between migration background and socio-economic groups.

Based on the analysis results, some future research with more detailed migration background categories can be suggested. This may be fruitful to examine the disparities in the educational outcomes between groups. For this, the availability of comparable and detailed country of origin variables in all countries is the prerequisite in the OECD PISA analysis. Moreover, the analysis for the language proficiency and/or efficiency for the ones speaking the test language at home may provide more consistent results for the effect of language spoken at home. Nevertheless, currently, this information is not available in the OECD-PISA, either. Finally, better sampling designs capturing all ISCED levels/programs and migrant groups in the host countries may enable the researchers to obtain data of the rare groups in the countries.

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