Age, skills and labour market outcomes in Finland

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ABSTRACT/RÉSUMÉ

Macro-simulations benchmarking employment in Finland to the Nordic average show that closing the large gaps in labour participation *vis-à-vis* the other Nordics across genders and age groups would boost employment significantly. Regressions on micro-data from the OECD Survey of Adult Skills (PIAAC) show how skills, education and other socio-economic background variables explain some of the observed differences in labour market outcomes across age and gender. Low employment in the oldest Finnish cohorts is partly a result of a large skills gap *vis-à-vis* younger generations.

This Working Paper relates to the 2016 OECD Economic Survey of Finland
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Key words: Finland, Employment, Earnings, Mismatch, Labour market, Adult skills.

Les macro-simulations comparant l'emploi entre la Finlande et la moyenne scandinave montrent que réduire l'écart de taux de participation au marché du travail vis-à-vis des autres pays Nordiques pour chaque sexe et groupe d'âge stimulerait significativement l'emploi. Les régressions sur les micro-données de l'Évaluation des compétences des adultes de l'OCDE (PIAAC) montrent comment les compétences, l'éducation et d'autres facteurs sociaux-économiques expliquent en partie les différences observées sur les résultats du marché de l'emploi pour chaque sexe et catégorie d'âge. Le faible emploi des cohortes les plus âgées en Finlande est en partie dû au large écart de compétences vis-à-vis des plus jeunes générations.

Ce Document de travail se rapporte à l'Étude économique de l'OCDE de la Finlande 2016
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JEL: J11, J21, J24, J31.

Mots-clés : Finlande, Emploi, Salaires, Inadéquation, Marché du travail, Compétences des adultes.

TABLE OF CONTENTS

AGE, SKILLS AND LABOUR MARKET OUTCOMES IN FINLAND

By Jon Kristian Pareliussen[1]

Summary

1.   This paper provides two complementary perspectives on labour market outcomes in Finland. Macro-simulations show that closing the large gaps in labour participation *vis-à-vis* the other Nordics across genders and age groups would boost employment significantly. Regressions on micro-data from the OECD Survey of Adult Skills (PIAAC) show how skills, education and other socio-economic background variables explain some of the observed differences in labour market outcomes across age and gender.

Main findings

2.   Macro-simulations benchmarking employment in Finland to the Nordic average show that:

- The large gap in employment rates *vis-à-vis* the Nordic average represents sizeable untapped potential.

- Increases in labour participation have been small in the past for both genders and for all except the youngest and oldest age groups.

3.   Labour market outcomes are shaped by the interplay between socio-economic background (which can be captured with PIAAC micro-data) and labour market institutions such as work incentives, regulations and pension age limits (which cannot). Socio-economic background affects employment in the following ways:

- Education improves labour market outcomes directly by raising employment and earnings, but also indirectly by raising foundation skills. General education is more effective than vocational in building foundation skills.

- Lower skills relative to younger generations plays a role in explaining low employment in the oldest cohorts. Older cohorts are also less educated than the young.

- Women with children below three have low odds of employment. A substantial gender pay gap may contribute, together with cultural norms and family policies, to low employment of women in childbearing age.

4.   This paper is structured as follows: The next section gives a brief introduction to skills and employment in Finland. The third section contains simulations of labour participation, benchmarking employment in Finland to the Nordic average across age and gender. Determinants of skills, employment, earnings, qualification- and skills mismatches are explored in the fourth section.

Background

5. In the latest PISA survey, Finland ranked sixth among OECD countries in mathematics, fifth in problem solving, third in reading and second in science (OECD, 2014a). Adult skills are also high. Both literacy and numeracy average proficiency are second highest in the OECD behind Japan, and Finland is second only to Sweden in problem solving in technology-rich environments, as measured in the PIAAC survey (OECD, 2013). Furthermore, Finland has one of the highest levels of educational attainment in the OECD, with 84% of the 25-64 year-old having at least completed upper secondary education and 39% holding a tertiary degree, against OECD averages of 75% and 32%, respectively. But the skills gap between the young and the old is high, as the latter have not benefitted from the rise to excellence of Finnish compulsory school and rising educational attainment (OECD, 2016).

6. Despite high skills, Finland's employment rate is the lowest in the Nordics (Figure 1). Part of the difference in employment reflects legacies from the 1990s crisis, lower prevalence of part-time work and low demand for labour due to the sluggish recovery from the Great Recession. Even so, policy settings such as slow tapering of unemployment insurance and low pension age limits also hold back labour supply. The biggest difference is found among older workers. With an employment rate of 59% in the 55 to 64 age group, Finland fares much worse than neighbouring Sweden (74%), Norway (72%) and Denmark (63%), despite steadily increasing employment in this age group since the turn of the century (OECD, 2016).

Figure 1. Employment is low compared to other Nordics

Employment to population rate by age and gender, 2014[1]

1. The shaded area shows the range of employment rates over all OECD countries.

Source: OECD Labour Market Statistics Database.

7. Men are less likely to be employed than in other Nordics in almost all age groups, but especially so in older cohorts. Middle-aged women do relatively well, with employment rates approaching those of Sweden. In contrast, women in childbearing age are much less likely to be employed than in Sweden and Norway. Family policies and the gender wage gap incentivise women to stay home and care for children, cementing traditional family structures (OECD, 2012). The employment rate of young adults is lower in Finland than in Norway and Denmark, even though more students continue into tertiary education in those countries (OECD, 2016). Individuals with a vocational education enter the Finnish labour market fairly smoothly at a young age. They are, however, less likely to be employed at an older age compared to those with general education (Hanushek et al., 2011).

Benchmarking labour market participation in Finland to the Nordic average

8. This section explores paths to reduce the gap in employment between Finland and the Nordics by simulating increasing labour market participation in Finland. The simulations set out two alternative convergence paths towards Nordic average participation rates by gender and age cohort, as well as a third scenario based on past participation growth.

Baseline

9. The simulations are based on OECD long-term scenarios with end-point in 2060 (Johansson et al., 2013). Labour market participation is driven by two factors, the size of cohorts and changing rates of participation within each cohort. The size of cohorts in this paper is based on population projections from Eurostat. Demographics drive labour force participation as the relative size of cohorts changes over time. For example, as large cohorts of baby boomers reach older ages, overall participation declines, since older individuals are less likely to be in the labour force. This transition is more advanced in Finland than the OECD average, and large cohorts entering retirement will hold down employment rates in Finland in the years to come (Figure 2).The size of cohorts is fairly well known in the medium term. Even though changing migration patterns, birth rates and longevity can alter trajectories, such changes tend to be minor except in the very long term. Only 5% of the population were foreign-born and gross inflows were 0.3% in 2013, of which half was work immigration, almost exclusively from other EU countries (OECD, 2014b). The number of asylum seekers – notably from Iraq, Somalia and Afghanistan – surged in 2015, but is still too low to substantially change demographic projections, as the inflows are quite small compared to the size of the cohorts they enter.

10. Participation within each age cohort also changes over time, as a result of a range of factors. The baseline participation rates in this paper are based on a long-term convergence scenario, where the baseline already includes significant advances, notably in the area of educational attainment. Higher attainment will postpone labour market entry of the young, but individuals with higher skills and education are also likely to stay longer in work. Other important factors that reduce labour market exit rates are the legal retirement age, the implicit tax on continued work and old age health status. In the baseline scenario up to 2030, legislated pension reforms[2] that involve a gradual increase in the normal retirement age are assumed to be implemented as planned and they lower the exit rates for older age group in the countries concerned. For the period after 2030, to characterise the long-term effect of structural policies aimed at sustaining labour force participation in the face of ageing, effective old-age retirement evolves over time in line with life expectancy so as to maintain the average share of lifetime spent in activity unchanged (Johansson et al., 2013). Work incentives created by the wage structure, taxes, benefits, family polices and active labour market policies are important factors driving employment across age groups (OECD, 2016), but these factors are not explicitly modelled.

Scenarios

11. Three scenarios are simulated. The first two convergence scenarios are constructed to close the gap in labour market participation between Finland and the Nordic average at a constant pace within each gender and age cohort. Gaps are constructed by calculating the simple average participation rate within each gender and age cohort for Norway, Denmark, Sweden and Iceland and subtracting the Finnish baseline participation rate. Annual convergence is constructed by multiplying the gap for each year, gender and cohort with a fixed percentage and adding this cumulatively to the baseline. Finally, participation rates are

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[2] The Finnish pension reform that involves gradually raising the lower pension age limit from 63 to 65 years and linking it to longevity thereafter was legislated too recently (November 2015) to be taken into account in the baseline scenario.

weighted together by population shares to arrive at the participation rate. Two scenarios are presented in this paper, with 2% and 5% annual convergence, respectively.

12. The third scenario is constructed by identifying the highest historical five-year moving average participation growth since 1963 within each cohort and gender. This growth is then linearly extrapolated from 2013 to 2060. Linear growth is chosen over applying growth rates, as growth rates would imply exponential growth. Exponential growth is unlikely, since the most able are likely to enter the work force at a higher rate than the less able. The concentration of harder-to-employ individuals in the inactive part of the population will therefore grow when the labour force reaches a higher level. Even linear growth may thus be an overly optimistic assumption. As in the convergence scenarios, participation rates are then weighted together by population shares to arrive at the overall participation rate.

Figure 2. The large cohorts of baby boomers reach older ages

% of population within each age cohort
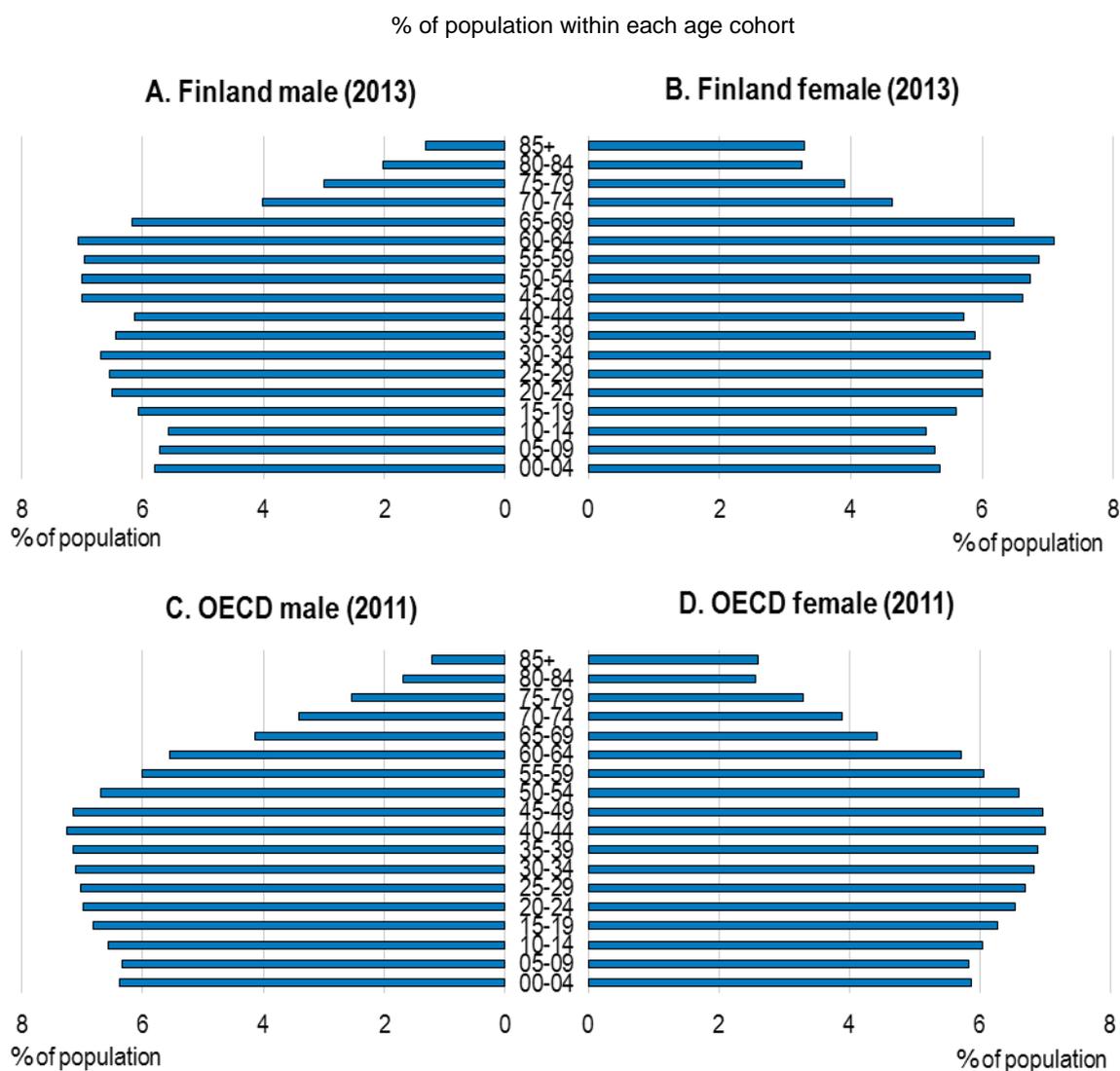
Source: OECD Population Statistics database.

13. Employment rates are derived from the simulations by subtracting the non-accelerating inflation rate of unemployment (NAIRU) from OECD long-term participation scenarios (Johansson et al., 2013). Hence, the scope to increase employment by lowering the NAIRU is overlooked.

Results

14. Participation only converges fully to the Nordic average in the 5% convergence scenario. Demographic headwinds lead to a flat participation rate for the ten coming years in the baseline. The scenario based on past labour force participation shows that growth needed to converge to the Nordic average for the working age population, defined as aged 15-64, is without precedence in recent Finnish history, implying that comprehensive policy reforms are needed to tap into the considerable potential illustrated by the convergence scenarios (Figure 3, Panel A). Strong past growth in older cohorts places the scenario based on past growth rates between the two convergence scenarios for ages 15-74, and even higher at the end of the simulation period (Panel B).

Figure 3. Labour force scenarios
Employment to population rates
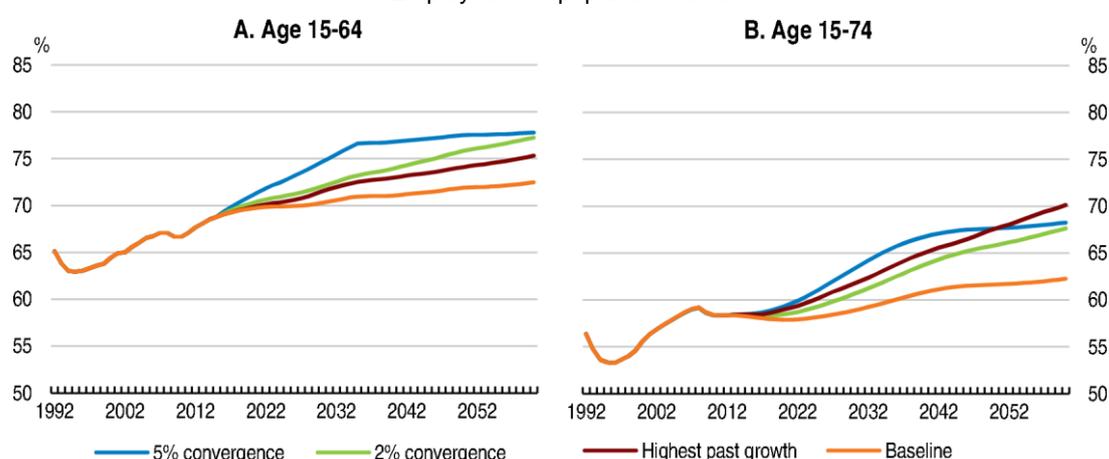
Source: OECD calculations based on Johansson et al. (2013).

15. The highest past growth scenario reflects which groups have increased participation in the past, while the convergence scenarios show in which groups the largest untapped potential can be found. The potential to increase participation of women in the ages 25 to 44 appears clearly in the convergence scenarios, but the scenario based on highest past growth implies close to zero growth in that group. The same is the case for men aged 35 to 54. The simulations reflect that past growth in the age group 55 to 74 has been considerable but the potential to catch up to the participation rates of the other Nordics is nonetheless substantial (Table 1).

Table 1. Percentage points increase in participation rates from 2014 to 2030

| Age	Men				Women			
	Baseline	2% scenario	5% scenario	Highest past growth scenario	Baseline	2% scenario	5% scenario	Highest past growth scenario
15-19	-2.7	1.4	7.5	7.9	-2.7	2.0	9.0	5.3
20-24	-1.0	-0.2	1.0	3.2	-0.8	0.9	3.5	2.5
25-29	1.3	1.6	1.9	2.6	2.5	3.4	4.7	0.0
30-34	1.5	2.2	3.3	3.3	4.4	5.9	8.3	0.3
35-39	1.6	2.4	3.5	0.4	3.8	4.8	6.2	0.0
40-44	1.4	2.7	4.5	0.1	2.3	2.7	3.3	0.3
45-49	0.9	2.4	4.6	0.5	0.8	0.8	0.8	0.3
50-54	2.4	4.2	7.0	-0.1	2.0	2.0	2.0	0.1
55-59	2.7	6.7	12.6	3.6	2.7	3.0	3.5	2.6
60-64	3.7	9.9	19.2	7.9	3.9	7.2	12.3	5.9
65-69	4.3	8.7	15.2	17.8	3.4	6.7	11.6	10.3
70-74	5.2	5.3	5.6	37.1	2.9	3.1	3.4	20.4
75-99	0.4	0.4	0.4	0.0	0.1	0.2	0.2	0.0

Source: OECD calculations based on Johansson et al. (2013).

Micro-level determinants of skills and labour market outcomes

16. Microdata from the OECD Survey of Adult Skills (PIAAC) are used in this section to analyse determinants of skills, employment, earnings and labour market mismatches. To give a complete micro-founded explanation to the findings from the labour market participation simulations would require a much richer dataset than PIAAC, notably taking into account work incentives. However, PIAAC can give useful information about other factors that drive differences in labour market outcomes between sub-groups of the population.

17. Skills and education are important determinants of employment in all countries covered by the PIAAC data, but in particular for the Nordics and other countries with a compressed wage distribution. In Finland as in the other Nordics, the wage structure is relatively flat due to high coordination of wage bargaining (OECD, 2015). This compressed wage structure makes it attractive to hire high-skilled workers, whose productivity does not fully translate into higher wages. The low-skilled are relatively well paid if they find employment, but high minimum wages make employers reluctant to hire them, and their probability of employment is therefore drastically lower. The 11% of the adult population at level 1 or below on literacy in the OECD Survey of Adult Skills (PIAAC) and the 27% at level 2, have higher wages, but lower employment rates than the PIAAC average, and also lower than Sweden and the Nordics (Figure 4).

Figure 4. High wages hold back employment of the low-skilled[1]
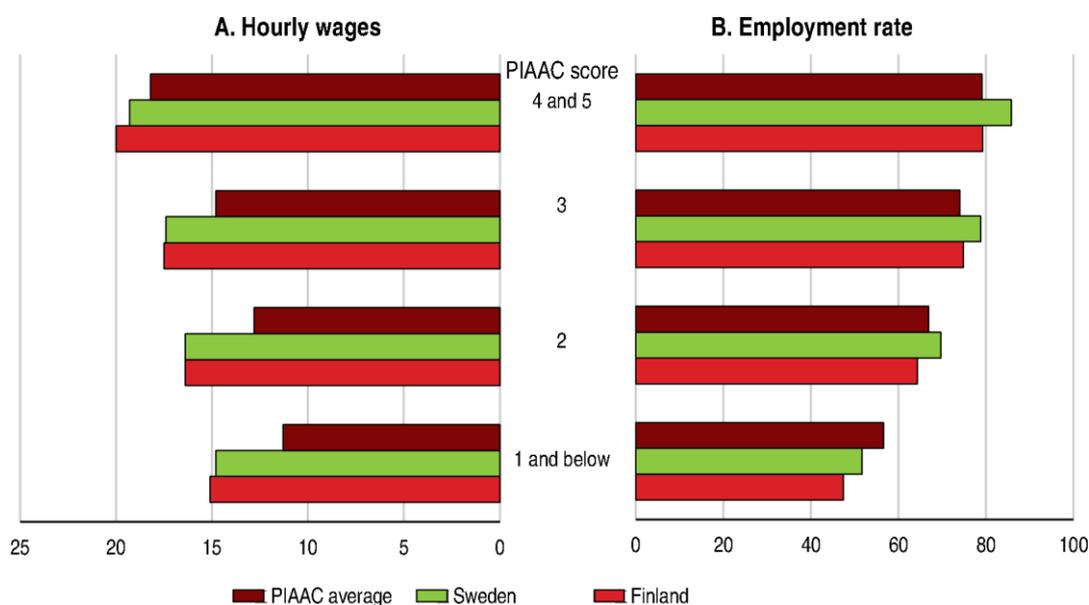
1. Hourly wages among employed individuals, PPP adjusted USD, 2012.
Source: OECD (2013b).

18. The PIAAC measure of literacy proficiency captures skills that are important in a workplace, such as language and processing skills, but does not capture job-specific skills and formal requirements that may be better captured by the education level. Together, these two measures give a more complete picture of work-relevant skills, complemented by socio-economic background variables recorded in the PIAAC dataset. The data allow to examine which groups are likely to be relatively low-skilled and therefore have lower employment, to which extent lower employment in certain groups also reflects other factors than skills and education, whether or not earnings are well explained by skills and education and whether or not workers tend to be well-matched, so that their skills and education come to good use.

Empirical strategy

19. Literacy skills depend on individuals' backgrounds. Important variables are education, parents' education and immigrant status. These variables are also correlated with employment and earnings prospects, but to an extent only indirectly via skills. To explore this link we start by estimating determinants for literacy proficiency in an OLS regression, where X is a vector of socio-economic background variables, including dummies for gender, age groups, educational level, parents' education and immigrant status[3] (1).

$$(1) \ \text{Lit} = \alpha_L + \beta_L(X) + \varepsilon_L$$

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[3]   The reference group in all regressions presented in this paper is a man with upper secondary education aged between 35 and 44. He is native-born, living in a couple and at least one of his parents has attained upper secondary education. Students in full-time education are excluded from the sample (any age).

20. We then estimate a Logit regression of the odds of being employed based on the same variables plus PIAAC scores on literacy, variables describing household type[4] and some additional controls (public/private sector, firm size, part time worker and type of work contract) (2).

$$(2)\ \text{Emp} = \alpha_E + \beta_E(X) + \varepsilon_E$$

21. A similar exercise is repeated to investigate earnings differentials. After excluding individuals who are not in employment from the dataset, we run an OLS regression on log earnings[5] and the same variables as above (3).

$$(3)\ \log(\text{Earn}) = \alpha_\Pi + \beta_\Pi(X) + \varepsilon_\Pi$$

22. Finally we explore labour market mismatches and estimate the following Logit regressions, where X is the same vector of socio-economic background variables as above. We estimate four types of mismatch (See Box 1), Overskilled (4), Underskilled (5), Overqualified (6) and Underqualified (7):

$$(4)\ \text{Over}_{\text{lit}} = \alpha_{\text{lit}} + \beta_{\text{lit}}(X) + \varepsilon_{\text{lit}}$$

$$(5)\ \text{Under}_{\text{lit}} = \alpha_{\text{lit}} + \beta_{\text{lit}}(X) + \varepsilon_{\text{lit}}$$

$$(6)\ \text{Over}_q = \alpha_q + \beta_q(X) + \varepsilon_q$$

$$(7)\ \text{Under}_q = \alpha_q + \beta_q(X) + \varepsilon_q$$

Box 1. Mismatch definitions

The indicator of qualification mismatch is defined as follows: a benchmark of "appropriate" qualifications required to get the job is created, based on the following question: "If applying today, what would be the usual qualifications, if any, that someone would need to get this type of job?". If the person has a qualification (measured by the International Standard Classification of Education (ISCED) level corresponding to their highest qualification) above (below) this benchmark, they are classified as over-qualified (under-qualified).

The measure of skill mismatch involves three steps: First, the (literacy) proficiency scores of workers who report themselves as well-matched – i.e. those who neither feel they have the skills to perform a more demanding job nor feel the need for further training in order to be able to perform their current job satisfactorily – are used to create a quantitative scale of the skills required to perform the job for each occupation (based on 1-digit ISCO codes). Second, using this scale of proficiency scores of well-matched workers, minimum and maximum threshold values based on the 5th and 95th percentile are identified as the bounds of being a well-matched worker. Third, respondents whose scores are lower (higher) than this minimum (maximum) threshold in their occupation and country, are classified as under-(over-) skilled. By contrast, respondents scoring within these bounds are not counted as mismatched, regardless of whether they self-report themselves as well-matched or mismatched.

Source : Adalet McGowan and Andrews (2015).

[4] To the extent a correlation between family situation and literacy exists, literacy is assumed to affect the likelihood of finding a mate and childbearing, not the other way around. Household type variables are therefore not included in regression (1), contrary to the regressions on labour market outcomes, where family situation is an important explanatory variable.

[5] Monthly earnings including bonuses in PPP adjusted USD.

Immigrants in the PIAAC sample

23. Immigrants to Finland in the PIAAC sample come exclusively from Sweden, Estonia and Russia. Russians and Estonians are pooled together in the analyses presented in this paper, and robustness checks where the two are split do not yield significantly different results on either of the regressions. Estonians, Swedes and Russians are the three largest foreign-born groups in Finland, but the findings for these groups are sensitive to the small number of immigrants in the sample.[6] Furthermore, the results are not automatically representative of other groups of immigrants to Finland, such as Somalis and Iraqis, who are the fourth and fifth most populous immigrant groups and Indians, Poles and Afghans, who are increasing rapidly in numbers (Figure 5). These clear weaknesses of the sample reduce the robustness of the conclusions drawn regarding immigrants. However, immigrant status is important in explaining literacy scores in Finland and labour market outcomes in many countries. Excluding immigrants from the sample would therefore most likely lead to biased and inconsistent estimates.

Figure 5. Stock and net inflow of immigrants[1]
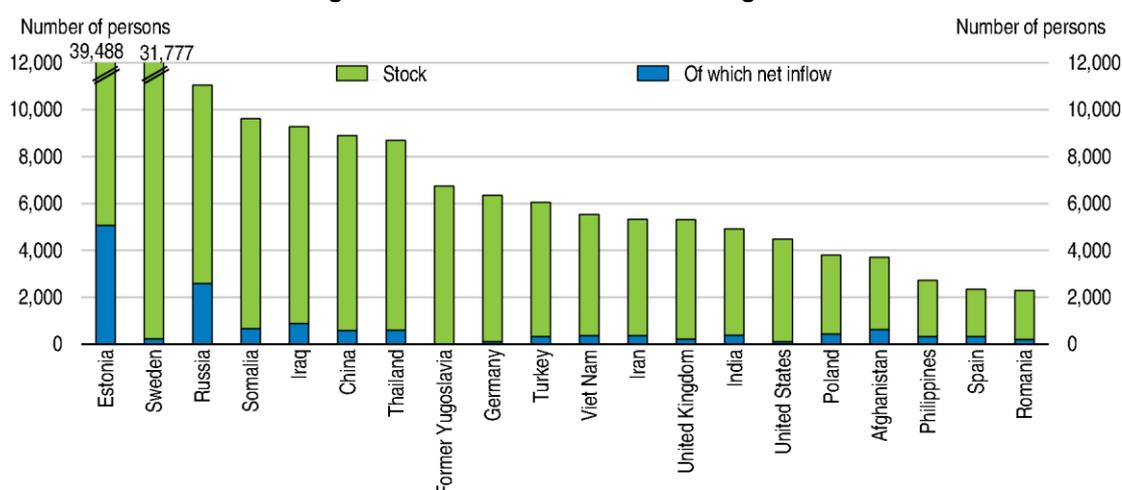
1. Immigrants to Finland from top 20 countries of birth, in 2013.

Source: OECD International Migration Database.

Results

24. Skills formation (Table 2, first column)*:* Education is a strong driver of literacy skills, and general education is associated with higher skills than vocational both for secondary and tertiary graduates. Furthermore, skills increase with the education level of parents. There is no significant difference between the average literacy score of women and men when controlling for education and the other background variables. However, looking at the unadjusted sample shows that men are more likely than women to score low on literacy (Figure 6, Panel A). Swedish is an official language in Finland; Swedish immigrants, who have had the option to take the survey in their native language, show the same skill levels as natives. Estonian and Russian immigrants on the other hand score much lower compared to natives, and robustness checks show that the skills shortfall compared to natives is approximately the same for both nationalities. It is not possible to disentangle language skills from information processing skills in the PIAAC dataset, but it is reasonable to assume that the negative coefficient found for these immigrants to some extent reflects both these factors. On the one hand, background variables that should generally explain processing skills better than language skills are controlled for, which speaks in favour of language difficulties being the

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[6] The number of immigrants in the sample is 116 (28 Estonians, 42 Russians and 46 Swedes).

most important factor explaining the skills shortfall. On the other hand, the Estonian language is fairly closely related to Finnish, and a significant portion of Russians in Finland are repatriated Ingrian Finns,[7] of which some still speak Finnish or Estonian, which would suggest that language barriers are modest on average also for these immigrants.

25. *Employment* (Table 2, second column)*:* Both skills and education are important to succeed in the Finnish labour market. Those without an upper secondary education have lower odds of being employed. The difference in employment prospects of upper secondary vocational and general graduates is not significant when accounting for the higher skills of the latter. Tertiary education increases employment prospects handsomely for both academic and vocational graduates. Men in couples are the most likely to work, followed by women in couples, single women and single men. A dummy for women with one or more children aged three or below is added to take into account the combined effect of parental leave and a generous homecare allowance (OECD, 2016). Women with children aged three or below have particularly low odds of being employed.[8] These findings contribute to explain the wide gender differences within some age groups (Figure 6, Panel B). Employment for low-skilled women in childbearing age is particularly low compared to low-skilled men in the same age group. There is a sharp age profile with employment falling considerably after the age of 55 also when controlling for skills, education and the other background variables. Labour market outcomes of immigrants are not significantly different from natives when accounting for skills and the other factors. Robustness checks indicate that Estonians are more likely to be employed than Russians, but neither of the coefficients are significant. These (lack of) results may be affected by the small sample of immigrants.

Figure 6. Low-skilled young women are unlikely to be employed[1]
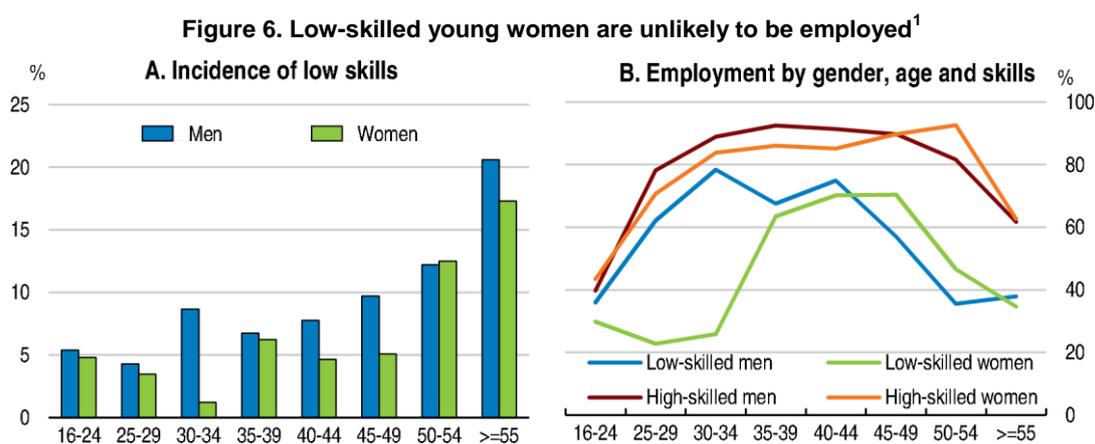
1. Low skills are defined as PIAAC level 2 or lower in literacy. Data were collected in 2012.
Source: OECD Survey of Adult Skills, 2012.

26. *Earnings* (Table 2, third column)*:* Earnings are strongly affected by skills. The gender wage gap, which is more than 20% compared to men in couples and approximately 15% compared to single men, seems to be fairly similar for single women and women in couples regardless of whether or not they are mothers of young children. Wages increase with age until age 45-54. Upper secondary graduates obtain higher earnings than those without an upper secondary degree, regardless of going the vocational or general track. Tertiary graduates, on the other hand, earn significantly more if they have gone the general track than if

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[7] The Finnish population of Ingria (now the central part of Leningrad Oblast in Russia), descending from Lutheran Finnish immigrants introduced into the area in the 17th century, when Finland and Ingria were both parts of the Swedish Empire.

[8] A similar dummy for fathers included in an alternative specification as a robustness check is as expected not significant.

they have a vocational degree, even when accounting for their higher literacy skills. Russian and Estonian immigrants earn significantly less compared to natives. Parents' educational backgrounds seem to be relevant to employment and earnings only indirectly, through skills formation. Further controls[9] show earnings penalties for public sector workers, workers on fixed-term contracts and part-time workers. Wages rise with firm size.

27. Labour market mismatch (Table 3)*:* There is some evidence of qualification mismatches, where the oldest tend to be under-qualified, and the youngest tend to be over-qualified. Evidence of mismatch is even clearer for skills mismatches, where workers in the age group 55 to 64 have more than six times higher odds of being under-skilled and six times lower odds of being over-skilled than the 35-44 year old reference group. Workers in the age group 45-54 have 2.4 times higher odds of being underskilled and less than half the odds of being overskilled compared to 35-44 year-olds.

28. Single men are more likely to be overqualified and less likely to be underqualified than the other family types, but their skill levels seem to be as well-matched as the other groups. Upper secondary general education graduates are more likely to be both underqualified and overskilled than upper secondary VET graduates (the reference group), and also less likely to be underskilled. Tertiary graduates are more likely to be overskilled than the reference group, and tertiary VET graduates are in addition likely to be overqualified. Parents' educational backgrounds have no significant effect on mismatches. Variables on sector, firm size, marital status, part time work, and contract type have some bearing on qualification mismatches. Public sector employees are less likely to be overqualified. Those working in larger companies are less likely to be overqualified but also more likely to be underqualified. Part-time workers and those on temporary contracts are more likely to be overqualified. However, none of those variables are significant in explaining skills mismatches.[10]

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[9] For space considerations these controls are not included in the table, but are available upon request.

[10] These variables are not presented in the table because of space considerations, but are available upon request.

Table 2. Skills formation, employment and earnings[1]

	Skills (1)	Employment[2](2)	Earnings(3)
Literacy		2.62	0.11
		[0.12]**	[0.02]**
Female	-1.95		
	[1.58]		
Female in couple		0.71	-0.24
		[0.1]**	[0.02]**
Female, single		0.61	-0.26
		[0.12]**	[0.03]**
Male, single		0.37	-0.08
		[0.12]**	[0.03]**
Mother, child 3 or younger		0.29	0.00
		[0.21]**	[0.04]
Less than 24	1.70	0.55	-0.48
	[3.17]	[0.19]**	[0.04]**
25-34	4.17	0.88	-0.16
	[2.23]	[0.17]	[0.02]**
45-54	-10.72	0.80	0.10
	[2.58]**	[0.18]	[0.02]**
More than 55	-28.04	0.20	0.08
	[2.32]**	[0.15]**	[0.02]**
Max lower secondary	-13.65	0.71	-0.15
	[2.78]**	[0.12]**	[0.04]**
Upper secondary general	24.67	1.21	-0.01
	[2.7]**	[0.16]	[0.03]
Post secondary non-tertiary	5.74	1.35	0.07
	[3.43]	[0.23]	[0.03]*
Tertiary vocational	22.29	1.61	0.04
	[2.01]**	[0.12]**	[0.03]
Tertiary academic	39.91	1.85	0.23
	[1.92]**	[0.14]**	[0.02]**
Foreign born, Sweden	6.28	1.57	0.01
	[6.42]	[0.59]	[0.05]
Foreign born, Estonia and Russia	-54.91	1.75	-0.13
	[8.95]**	[0.44]	[0.06]*
No parent attained upper secondary education	-6.18	0.92	-0.01
	[1.76]**	[0.1]	[0.02]
At least one parent attained tertiary education	9.13	1.01	0.01
	[2.09]**	[0.14]	[0.02]
N	4,713	4,713	3,201
R2	0.354	0.185	0.618

1. Standard errors of the coefficients are in brackets, with * and ** indicating significance at the 90 and 95% level respectively. The reference category is a man with upper secondary education aged between 35 and 44. He is native-born, living in a couple (regressions 2 and 3) and at least one of his parents has attained upper secondary education. Students in full-time education are excluded from the regression.

2. How to read this column: Coefficients are odds ratios. Coefficients with a value below 1 indicate that there is less chance of an event occurring for a particular group compared to the reference group, and coefficients greater than 1 represent greater chances. The literacy score variable is scaled by100.

Source: OECD calculations based on Survey of Adult Skills, 2012.

Table 3. Labour market mismatch[1]

	Overskilled (4)	Underskilled (5)	Overqualified (6)	Underqualified(7)
Female in couple	1.07	1.28	1.08	0.74
	[0.18]	[0.29]	[0.14]	[0.17]
Female, single	0.75	1.36	1.29	0.63
	[0.26]	[0.31]	[0.16]	[0.24]
Male, single	1.04	1.24	1.86	0.63
	[0.24]	[0.48]	[0.17]**	[0.22]*
Mother, child 3 or younger	0.8		0.94	0.73
	[0.34]		[0.34]	[0.62]
Less than 24	1.38	0.69	0.98	0.51
	[0.32]	[1.11]	[0.22]	[0.31]*
25-34	1.53	0.47	1.25	0.72
	[0.21]*	[0.9]	[0.18]	[0.28]
45-54	0.46	2.26	0.66	1.36
	[0.28]**	[0.4]*	[0.17]*	[0.22]
More than 55	0.16	6.06	0.6	1.82
	[0.47]**	[0.43]**	[0.18]**	[0.21]**
Max lower secondary	0.64	1.01		10.3
	[0.43]	[0.39]		[0.17]**
Upper secondary general	3.14	0.13	1.43	2.74
	[0.26]**	[0.8]*	[0.19]	[0.16]**
Post secondary non-tertiary	1.04	0.82	5.52	2.58
	[0.59]	[0.54]	[0.2]**	[0.23]**
Tertiary vocational	1.92	0.66	2.8	
	[0.26]*	[0.29]	[0.17]**	
Tertiary academic	2.56	0.53	0.8	
	[0.25]**	[0.28]*	[0.16]	
Foreign born developed	1.25		1.77	1.72
	[0.77]		[0.42]	[0.62]
Foreign born emerging		4.5	2.27	0.84
		[0.68]*	[0.47]	[0.56]
No parent attained upper secondary education	0.88	1.12	1.09	0.9
	[0.22]	[0.27]	[0.1]	[0.18]
At least one parent attained tertiary education	1.43	1.13	0.92	1.1
	[0.19]	[0.47]	[0.16]	[0.19]
N	2,745	1,522	2,954	2,839
Pseudo R2	0.11	0.17	0.12	0.14

1. Standard errors of the coefficients are in brackets, with * and ** indicating significance at the 90 and 95% level respectively. The reference category is a man aged between 35 and 44 with upper secondary education. He is native-born, living in a couple and at least one of his parents has attained upper secondary education. Students in full-time education are excluded from the regression. How to read this table: Coefficients are odds ratios. Coefficients with a value below 1 indicate that there is less chance of an event occurring for a particular group compared to the reference group, and coefficients greater than 1 represent greater chances. The literacy score variable is scaled by 100.

Source: OECD calculations based on Survey of Adult Skills, 2012.

Cross-country comparisons

29. Re-running the regressions described above[11] on a sample of OECD countries and regions[12] shows that the pattern of decreasing skills and increasing skills mismatches with age is common to most countries and

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[11] Due to differences in national education systems it is necessary to collapse education background into the three broader categories to compare. Full results from these regressions are available upon request.

[12] Regressions are run on the panel as well as on individual countries. Full results from these regressions are available upon request. The countries (regions) in question are: Austria, Belgium (Flanders), Canada, the Czech Republic,

regions, as experience gained in work-specific skills over time partly compensates for lower formal qualifications and processing skills. But the PIAAC score point difference between the reference group (35-44) and the oldest age group (55+) is higher in Finland than in any of the other countries, and the odds of being over(under)-skilled for the oldest age group is among the lowest(highest) (Figure 7, Panels A and B). Furthermore, comparing the odds of employment in two alternative specifications, one including and one excluding the PIAAC literacy score as a determinant, Finland and Denmark are the only two countries where the employment prospects of the oldest age group are significantly different in the two specifications (Figure 7, Panel C). This suggests that low employment in the oldest Finnish cohorts is partly a result of a large skills gap *vis-à-vis* younger generations, reflecting the quick transition to a world-class school system.

Figure 7. The gap in literacy skills between young and old is high
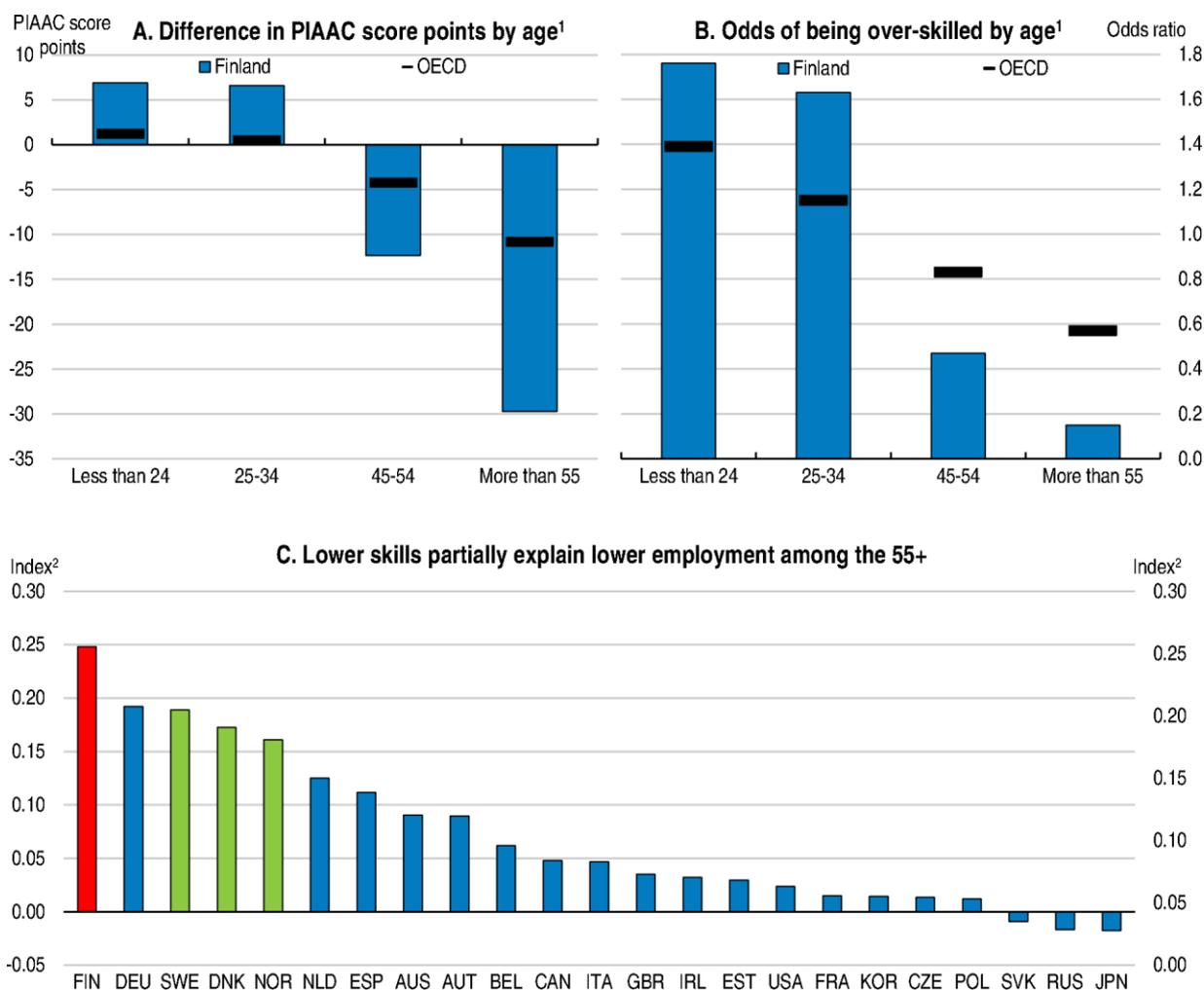
1. Compared to the age group 35-44. Coefficients are adjusted by control variables as described in this paper.
2. The difference of the logit coefficient of a dummy variable for the age group 55+ in two specifications exploring the odds of employment. The specifications were identical except that one included and one excluded PIAAC score as a determinant.

Source: OECD calculations based on the OECD Survey of Adult Skills, 2012.

Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Japan, Korea, the Netherlands, Norway, the Slovak Republic, Spain, Sweden, Russia, the United Kingdom (England and Northern Ireland), and the United States.

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