

LONG-TERM EFFECTS OF EARLY LIFE OUTCOMES[‡]

Who Gets Their First Job at a Large Firm? The Distinct Roles of Education and Skills[†]

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Young workers' early experiences in the labor market are key for their long-term prospects. A large literature reviewed in von Wachter (2020) documents long-lasting earnings losses associated with entering the labor market in bad macro-economic times. Using data on workers' cognitive skills from the Programme for the International Assessment of Adult Competencies (PIAAC) Survey of Adult Skills, in Arellano-Bover (forthcoming), I show that at least part of these earnings losses are underpinned by bad entry conditions having negative effects on workers' long-term human capital accumulation. These findings imply that early experiences inherently shape workers' capabilities, and they lend support to the idea of the early labor market years as a formative period of time.

When thinking about early work experiences as a formative period, a key question is what environments are more conducive to on-the-job skill acquisition. The characteristics of young workers' employers are an evident dimension to consider. However, it is hard to systematically measure all firm attributes that could plausibly impact young employees' skill development (e.g., productivity, use of new technologies, management practices, coworkers' quality). As a result, existing literature uses firm size as a summary measure of firm "quality" that is

positively correlated with the aforementioned hard-to-measure attributes.¹ Oreopoulos, von Wachter, and Heisz (2008) show that among young people in Canada who graduate during a recession, those who start out at large firms suffer fewer negative consequences than those who start out at small firms. Using an instrumental variables approach to address selection into large firms, in Arellano-Bover (2020), I find that in Spain, getting the first job at a larger firm leads to better long-term career outcomes. In Arellano-Bover (forthcoming), I show that, holding constant baseline skills, young employees at the largest German firms experience greater skills growth than those employed at smaller firms.

Who are the young people who get to start out at large employers? In this article, I study the selection into large firms of inexperienced young workers in 31 countries as a function of cognitive skills and formal education.² I exploit the key features of PIAAC: representative samples of adults from multiple countries and the measurement of work-relevant cognitive skills. Studying selection as a function of education and skills sheds light into large firms' hiring practices (i.e., to what degree they attract the more skilled and/or more qualified youth) as well as plausible sources of career-long inequality—whether those more productive to begin with are the most likely to benefit from large-firm employment.

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¹See Arellano-Bover (2020) for related literature on the positive correlation between firm size and productivity, on-the-job training, use of new technologies, management quality, fringe benefits, and wages.

²By studying the distinct roles of education and skills, this article relates to the literature on labor market signaling and employer learning (e.g., Lange 2007).

I. Data

The PIAAC Survey of Adult Skills is managed by the OECD and designed to measure cognitive skills that are useful, general, learnable, and relevant for the workplace.³ I use cross-sectional samples from 31 countries: Austria, Belgium (Flanders only), Canada, Chile, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, South Korea, Lithuania, the Netherlands, New Zealand, Norway, Poland, Russia, Singapore, Slovakia, Slovenia, Spain, Sweden, Turkey, the United Kingdom (England and Northern Ireland only), and the United States.⁴

My sample includes labor force participants not working in the public sector and not self-employed. When studying the young and inexperienced, I further restrict attention to people aged 16–29 who report having zero or one year of paid work during their lifetime and are either employed or unemployed and not enrolled in formal education.

PIAAC measures three skill dimensions, of which I focus on numeracy skills. This is motivated by previous work (Hanushek et al. 2015) and by these skills being the most affected by entry conditions (Arellano-Bover forthcoming). I standardize numeracy skills to have mean zero and standard deviation one within each country.

I categorize as large-firm employees people who report working for an employer with over 250 workers.⁵

³See Arellano-Bover (forthcoming) for details on PIAAC.

⁴Data were collected between 2011–2012 in all countries except Chile, Greece, Israel, Lithuania, New Zealand, Singapore, Slovenia, and Turkey, where it was collected between 2014–2015. The United States collected data during both periods.

⁵The literature typically considers either the firm or the establishment as employer definition. PIAAC asks about employer size by referring to “the place where you work,” and interviewers’ instructions specify that the question refers to the geographic location where the job is carried out. As such, the PIAAC employer definition is closer to an establishment than a firm. Notwithstanding this definition, I follow past literature and use the terms “firm” and “employer” interchangeably.

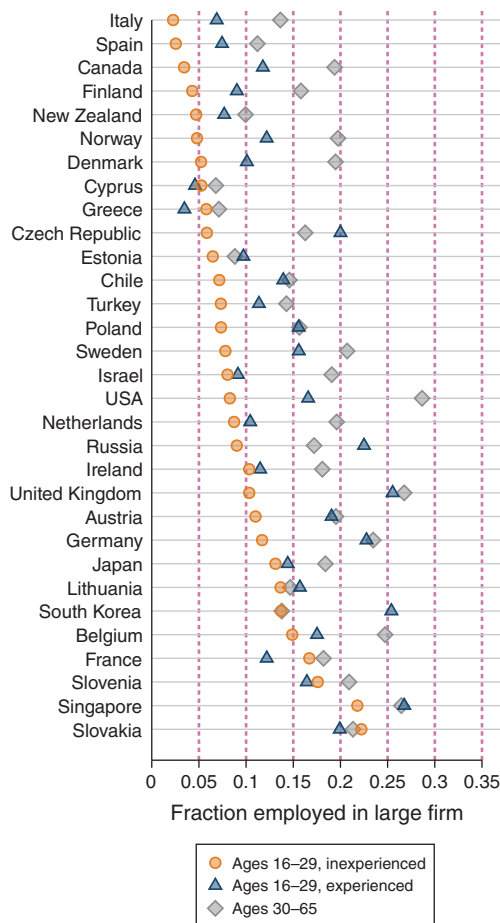


FIGURE 1. LARGE-FIRM EMPLOYMENT BY AGE AND EXPERIENCE, ACROSS COUNTRIES

Notes: Fraction of employed private sector workers in each country who work for an employer with over 250 employees. Separately for (i) ages 16–29 and at most one year of paid work experience during lifetime, (ii) ages 16–29 and over one year of paid work experience during lifetime, and (iii) ages 30–65. Sample sizes for each country range between 1,065 and 11,417.

II. Large-Firm Employment by Age and Experience, across Countries

I begin by documenting patterns of large-firm employment across countries and age-experience groups. For each country, Figure 1 shows the fraction of workers employed at a large firm, separately for three groups: young and inexperienced, young and experienced (with over one year of experience), and older (aged 30–65)

workers. Large-firm employment opportunities vary considerably across countries and across workers within each country. The five countries where young and inexperienced workers are least likely to be employed at a large firm—with the fraction being below 5 percent—are Italy, Spain, Canada, Finland, and New Zealand. The five countries where young and inexperienced workers are most likely to be employed at a large firm—with the fraction ranging between 15 and 22 percent—are Slovakia, Singapore, Slovenia, France, and Belgium. In the United States, Chile, and Japan, 8, 7, and 13 percent of young and inexperienced workers are employed in a large firm, respectively.

Most countries show evidence consistent with a job ladder in terms of firm size, since experienced workers and older workers are more likely to be found at large firms. The differential rate of large-firm employment varies across countries. The United States, the United Kingdom, and Canada show large differential rates, with older and experienced workers much more likely to work at a large firm than the young and inexperienced. In contrast, Cyprus, Greece, Japan, Slovenia, and Slovakia show small differential employment rates at large firms. In the case of Cyprus and Greece, large-firm employment is uniformly low; in the case of Japan, Slovenia, and Slovakia, it is uniformly high.

III. Young and Inexperienced Workers: Selection into Large Firms

Focusing on the young and inexperienced, I study selection into large-firm employment as a function of education and skills. Table 1 shows the correlation matrix between large-firm employment, years of education, and skills. Being employed at a large firm is correlated with both more years of education ($\rho^{LF,Ed} = 0.16$), and greater skills ($\rho^{LF,Sk} = 0.12$).

The correlation between years of education and skills is high ($\rho^{Ed,Sk} = 0.35$) but far from 1. This motivates considering education and skills as two distinct dimensions, possibly impacting the selection into large-firm employment separately. I estimate variants of the linear regression:

$$(1) \quad LF_i = \beta_1 Educ_i + \beta_2 Skills_i + \Gamma_{c(i)} + \varepsilon_i,$$

where LF_i is a dummy variable equal to one if young and inexperienced person i is employed

TABLE 1—CORRELATION MATRIX: LARGE-FIRM
EMPLOYMENT, EDUCATION, AND SKILLS OF INEXPERIENCED
YOUTH

	Large-firm employment	Years of education	Cognitive skills
Large-firm employment	1	0.16	0.12
Years of education	0.16	1	0.35
Cognitive skills	0.12	0.35	1
Observations	6,427		

Notes: Sample of inexperienced youth between ages 16–29 described in the text. Correlation matrix between a dummy variable for being employed at a large firm (employer with over 250 employees), years of education, and numeracy skills. Numeracy skills measured in within-country standard deviations.

at a large firm, $Educ_i$ are i 's years of education, $Skills_i$ is i 's skills score, and $\Gamma_{c(i)}$ are country-of-residence fixed effects.

Table 2 presents estimates of equation (1) pooling the young and inexperienced from all 31 countries. Column 1 shows that when only including education, 1 more year of education is associated with a 0.017 higher probability of large-firm employment (20 percent of the sample mean). Column 2 shows that including country fixed effects leaves the estimate unchanged, a common feature across specifications. Columns 3 and 4 show that when only including skills, 1 standard deviation higher skills are associated with a 0.035 higher probability of large-firm employment (42 percent of the sample mean). Columns 5 and 6 consider education and skills jointly. When keeping the other variable constant, both education and skills positively impact the chances of large-firm employment. An additional year of education, keeping skills constant, is associated with a 0.014 higher probability of employment at a large firm. Skills that are greater by 1 standard deviation, keeping education constant, are associated with a 0.021 higher probability of large-firm employment.

Table 2 reflects that among the young and inexperienced, both formal education and cognitive skills have independent positive impacts on being (one of the few) employed at a large firm. However, given the cross-country differences in large-firm employment presented in Figure 1, could it be that these selection patterns differ across the world? That is, is the

TABLE 2—SELECTION INTO LARGE FIRMS: INEXPERIENCED YOUTH

	=1 if employed at large firm					
	(1)	(2)	(3)	(4)	(5)	(6)
Years of education	0.017 (0.003)	0.017 (0.003)			0.014 (0.003)	0.014 (0.003)
Cognitive skills			0.035 (0.009)	0.035 (0.010)	0.021 (0.008)	0.021 (0.009)
Mean outcome	0.084	0.084	0.084	0.084	0.084	0.084
Country fixed effects	No	Yes	No	Yes	No	Yes
R^2	0.027	0.039	0.014	0.028	0.032	0.043
Observations	6,427	6,427	6,427	6,427	6,427	6,427

Notes: Sample of young and inexperienced youth between ages 16 and 29 described in the text. Regression estimates where outcome is a dummy variable equal to one for those employed at a large firm (employer with over 250 employees), as a function of years of education, numeracy skills, and country fixed effects. Numeracy skills measured in within-country standard deviations. Robust standard errors that take into account that skills are measured through multiple plausible values in parentheses.

TABLE 3—SELECTION INTO LARGE FIRMS: INEXPERIENCED YOUTH IN THREE REGIONS

	=1 if employed at large firm			
	Pooled (1)	Europe (2)	East and Southeast Asia (3)	North America (4)
Years of education	0.016 (0.004)	0.006 (0.003)	0.026 (0.009)	0.029 (0.010)
Cognitive skills	0.024 (0.010)	0.023 (0.010)	0.030 (0.023)	0.028 (0.021)
Mean outcome	0.087	0.083	0.125	0.067
Country fixed effects	Yes	Yes	Yes	Yes
R^2	0.051	0.035	0.050	0.106
Observations	5,493	4,021	575	897

Notes: Sample of young and inexperienced youth between ages 16 and 29 described in the text, restricted to sample countries in Europe, East and Southeast Asia, and North America. Regression estimates where outcome is a dummy variable equal to one for those employed at a large firm (employer with over 250 employees), as a function of years of education, numeracy skills, and country fixed effects. Numeracy skills measured in within-country standard deviations. Robust standard errors that take into account that skills are measured through multiple plausible values in parentheses.

importance of formal education versus skills different in different places? To answer this question, I restrict attention to the world regions for which I observe data from several countries (i.e., Europe, East and Southeast Asia, and North America) and estimate equation (1) separately for each of these regions.⁶ The goal is to compare the relative importance of β_1 and β_2

across regions in order to learn about differential patterns of selection into large firms.

Table 3, column 1 shows regression estimates for the pooled set of countries in Europe, East and Southeast Asia, and North America. These estimates are similar to the ones for the full sample in Table 2: the coefficient on years of education is 0.016, and the coefficient on skills is equal to 0.024. Columns 2 to 4 show separate estimates for the three different regions. Cognitive skills positively impact large-firm employment probabilities across Europe, East and Southeast Asia, and North America, with estimates equal to 0.023, 0.030, and 0.028, respectively (although the estimates for East

⁶Europe: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Lithuania, Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden, and United Kingdom. East and Southeast Asia: Japan, Singapore, and South Korea. North America: Canada and United States.

and Southeast Asia and for North America are imprecisely estimated). In contrast, the impact of education varies substantially across regions: in Europe, the coefficient estimate is equal to 0.006; for East and Southeast Asia and for North America, estimates are 0.026 and 0.029, respectively.

IV. Concluding Remarks

Growing evidence shows that the early years in the labor market are a defining and formative period for young workers. Using data from 31 countries, this article documents the selection of labor market entrants into large firms—an employer attribute that previous work associates with propitious environments for young workers. In the vast majority of countries, the young and inexperienced are underrepresented at large firms compared to more experienced and older workers. The young and inexperienced who do get their first job at large firms are positively selected in terms of both formal education and cognitive skills. While skills are strongly associated with large-firm first jobs throughout, in relative terms, formal education explains less of large-firm employment patterns in Europe compared to East and Southeast Asia and North America. Understanding the source of this geographic differential is beyond the scope of this article, but it could be an interesting question for future research.⁷

This article contributes to our understanding of how initial labor market inequalities persist in the long run. Together with related literature, these findings also point to important normative questions: Should we aim to correct

externalities created by firms' heterogeneous formative environments? Should policy try to have initial work experiences mitigate existing inequalities instead of exacerbating them? From efficiency and fairness perspectives, how should organizations offering attractive employment opportunities weight formal qualifications versus skills?

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⁷Possible explanations include differences in large firms' screening practices, in education systems and the resulting codetermination of qualifications and skills, or in the role of social networks in finding first jobs.