

TRAINING OF PERSONNEL: DETERMINANTS AND CROSS-COUNTRY DIFFERENCES

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Abstract

The study is aimed at identifying cross-country differences in personnel training.

According to the human capital theory, probability of personnel training is positively related to expected return on training. According to available data, most employees in different countries are trained with the employer's financial support. In this context, young workers and workers in high-tech industries as well as workers with a higher level of education in positions of managers and specialists should be trained more often.

The study tested hypotheses about the impact of characteristics of country, company and employees' individual characteristics on the probability of training.

The main source of information is 8th round of studies of the European Social Survey (2016) in 18 countries. Research methods are descriptive and regression analysis.

The probability of on-the-job training has a significant cross. The results show that workers are more likely to be educated in countries with better conditions for doing business. Training of employees is positively influenced by gender, age, organization size, its membership in public sector, employment in education, health care and some other areas of activity. The work reveals differences in training between countries of Northern and Western Europe, Eastern Europe and Russia.

Key words: human capital, on-the-job training, cross-country differences

JEL Code: J24, M53

Introduction

Modern knowledge-based economy places high demands on human capital, the formation of which is traditionally seen not only at the level of specialized institutions, but also at the level of firms (Becker, 1964). The latter circumstance has several explanations:

1. Obsolescence of human capital obtained in the process of learning in universities and colleges in conditions of fast changing technologies and requirements.

2. Presence of specific skills demanded only at the level of individual firms, the receipt of which is impossible outside of these firms.
3. Employer receives rents after an employee's training due to asymmetry of information in the labor market and salary compression (Acemoglu, Pischke, 1998; Booth, Bryan, 2005; Conti, 2005; Almeida-Santos, Mumford, 2005).

A rational employer invests in the training of staff if he receives a return on investments. There are several studies supporting this conclusion (Conti, 2005; Ballot et al., 2006; Travkin, Sharunina, 2016). That is why the analysis of the training provided by employers has become particularly relevant in recent times, due to the attempt to understand which countries invest the most in the human capital of their employees and have the potential to improve the competitiveness of their national economies.

The researchers use different approaches, which differ both in the content of the evaluated indicators and sources of information when comparing information on training of personnel.

It should be noted that for cross-country comparisons, the data of state statistics collected by a certain number of organizations are of little use, since it do not cover all employees and use indicators of formal education, which may be several times lower than the prevalence of real (formal and informal) education and may have different criteria from country to country and even in one country at different time periods.

In this regard, the survey methods provide more valuable information. Employer surveys provide estimates of the number of firms providing training to their employees over time (usually the last year). The use of this indicator allows estimating how many employers are providing their workers with training, but at the same time it gives no information about how many employees are trained. However, studies show that employees and employers under the same conditions may assess the level of education differently (Barron et al., 1997).

Another indicator is the coverage of employees with training for a certain period of time (usually the last year). While providing more accurate estimates of the prevalence of on-the-job training, it does not always show the extent of training in firms with different qualitative characteristics.

Analysis of the available studies reveals various factors that affect the probability of employee training. The probability of training for women (especially the young) is lower in comparison with men. A higher level of education and the position of manager or specialist have a positive impact on the probability of personnel training. Employers in large

organizations and in organizations in the private sector train their employees more often. Work experience in the company affects not so much the probability of training as the probability to continue working in the company. The influence of age on the probability of training is ambiguous. Thus, in European countries, young workers are being trained more often, and the likelihood of training begins to fall with increasing age. Russian researchers note no statistically significant influence of age on the probability of training in the private sector, but at the same time they record a positive influence of it in the budget sector of the economy (Leuven, Oosterbeek, 1999; Bassanini et al, 2005; Gimpelson et al, 2011). In addition, there is reason to believe that workers in high-tech sectors of the economy should be trained more often than others, since knowledge in their workplaces becomes obsolete faster (Developing Skills, 2013).

These results were obtained for individual countries and at different periods of time on the basis of different data, without taking into account the impact of countries' characteristics.

1 Methods of research

This study uses microdata from the 8th round of the European Social Survey (ESS, 2016) in 18 countries (Austria, Belgium, Czech Republic, Estonia, Finland, France, Germany, Ireland, Israel, Iceland, Netherlands, Norway, Poland, Russian Federation, Slovenia, Sweden, Switzerland, UK). The total sample size was 30,765 people.

Using this data, as well as data from the World Bank, we were able to assess the impact of not only the characteristics of individuals and firms, but also the characteristics of countries on the on-the-job training.

The main research methods are descriptive analysis and regression analysis (logit regression). There were used both the general equation for the sample and the equations for groups of countries.

By using logistic regression models, the authors estimated the probability of employees' training.

The model has the following form:

$$f(z) = \frac{1}{1 + e^{-z}} \quad (1)$$

$$z = b_0 + \sum_{i=1}^n b_i x_i + u \quad (2)$$

where z - dependent variable, e - base of natural logarithm, b_i - estimated regression parameters, x_i - regressors, n - number of regressors, and u - random error. The function $f(z)$ in this model takes values in the interval from 0 to 1, what allows its use to assess the likelihood of various states of employment.

Dependent variable is the fact that an employee has completed courses or trainings during the last year to improve the knowledge or skills needed for the job.

The model includes factors that influence personnel training:

1. Characteristics of the firms in which respondents work (economic activity, size, legal form of organization, type of settlement);

2. Characteristics of employees (gender, age and the square of age, number of years of education, type of occupation, availability of employment contract, full employment, position occupied in organization);

3. Characteristics of the countries (GDP per capita, belonging to different groups of countries). There were used several indicators to characterize countries:

- logarithm of gross domestic product per capita on purchasing power parity, reflecting the level of economic development of the country and correlating with the quality of the workforce;

- index of the country in terms of doing business. We used this variable as a proxy that characterizes the quality of institutions that create conditions for doing business and legal protection of employers. The basis for including this variable in the analysis is the conclusions about the relationship between the quality of institutions and economic growth (Easterly, Levine, 2003; Acemoglu et al., 2002).

The models under consideration were constructed both for the whole sample and for groups of countries: European countries, as well as Russia and Israel. European countries are further divided into groups of Western (Austria, Belgium, Germany, France, Switzerland), Northern (Great Britain, Ireland, Iceland, Netherlands, Norway, Finland, Sweden), Eastern Europe (Poland, Slovenia, Czech Republic, Estonia). Each of these groups has distinct cultural and historical features that can affect both the business and decision-making on the training of personnel.

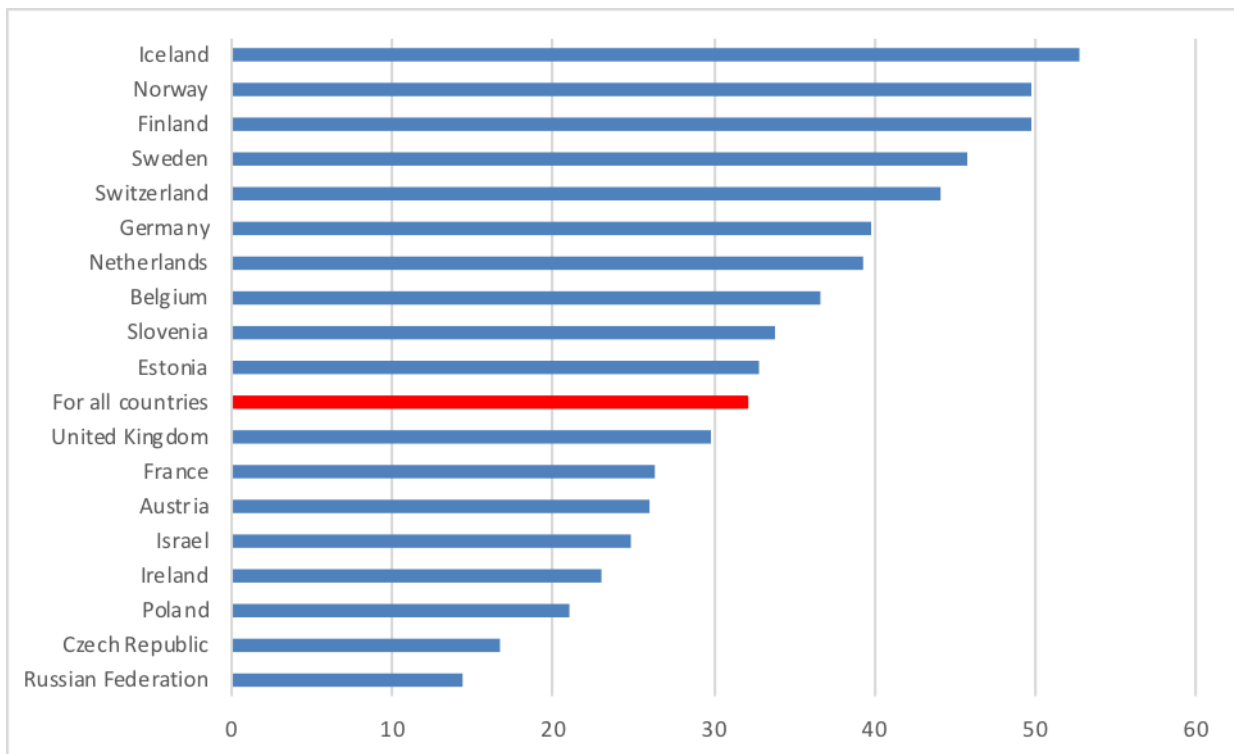
2 Results of research

The coverage of employees with training in different countries is presented in Figure 1.

We see a significant differentiation in the coverage of employees with training in different countries. The gap between the highest (52.8%) and lowest (14.3%) factor reaches 3.7 times with a standard deviation of 11.4. Analysis of the geographical distribution of European countries shows a moderate intra-group variance of probability of education. The North European countries show the highest rates of employee training: on average, 42.5% of employees in these countries are trained during the year. Indicators of the group of Western countries are slightly lower – 34.6. Eastern European countries show even lower enrolment – 26.1.

The grouping of countries by gross domestic product (GDP) by purchasing power parity based on data from the World Bank and the International Monetary Fund shows similar results with average binding strength by Pearson correlation coefficient ($r = 0.52, p < 0.05$), grouping by Ease of doing business ranking - $r = 0.45, p < 0.1$.

Fig. 1: The coverage of employees with training in different countries, %



Source: European Social Survey, 2016

The constructed model of the probability of learning on a full sample correctly predicted 75.2% of cases (Nagelkerke R Square - 0,345). The direction of influence of the factors included in the model, reflecting the individual characteristics of workers, is

predictable. The probability of employee training is positively related to male gender and the number of years of formal education ($p < 0.01$). The likelihood of learning from age varies according to parabolic dependence, gradually increasing at a young age and decreasing in the future.

In general, the direction of influence of jobs characteristics on the probability of training was expected. Access to training is increased if the employee is officially registered, holds the position of a manager or a specialist of the highest qualification. Probability of training the specialists of middle qualification level is higher than probability of training the employees occupying the lower positions (in all cases $p < 0.01$). Most often, compared with workers in the manufacturing industry (reference group) are trained employees in the fields of education, health, public administration and defense, financial activities ($p < 0.01$), transport, communications and energy ($p < 0.05$). Workers in the construction ($p < 0.1$), and hospitality sectors ($p < 0.01$) are less likely to be trained. Public sector workers are more likely to be trained than the private sector workers ($p < 0.05$). The probability of on-the-job training increases with the size of the organization. Employees of companies with more than 25 employees are being trained more often than employees of companies with less number of personnel. Employees of companies with 500 people or more are trained most often. Larger firms may have internal career ladders that require specific human capital, so a broader coverage of the training of employees of such firms is appropriate.

The differences in probability of workers to be trained according to their place of residence were unexpected. Under other equal conditions, employees residing in cities, towns, villages have equal chances of learning. Probably, this fact may have several explanations: on the one hand, higher inter-firm mobility of workers in large settlements, limiting investment in training, and on the other hand - greater opportunities for informal learning and online training.

On the contrary, differences in the country-specific indicators of the ease of doing business index have had a significant impact on enrolment of personnel in training ($p < 0.01$).

The extent of learning is influenced by the cultural characteristics of groups of countries. Thus, all other things being equal, the largest enrolment is recorded in the countries of Northern and Western Europe, and the smallest is in the Russian Federation.

Models built separately for Western and Northern Europe (model 1), Eastern Europe (model 2), Eastern Europe and Russia (model 3), showed significant differences. Unlike model 1, model 2 and model 3 do not capture the gender gap. The differences between

training of men and women are not statistically significant. In other words, education in Eastern European countries and Russia is more evenly distributed by sex.

Model 1 and model 2 show a more even distribution of the probability of training in the context of settlement types. There are no statistically significant differences between education in large cities, suburbs, small towns and villages. Model 3 captures less educational opportunities for villagers.

Model 2 and model 3 have no difference between the public and private sectors, but the results of model 1 show that employees of public sector are trained more often.

Under other equal conditions, the effect of the logarithm of GDP is statistically significant in model 3 (positive influence).

In model 3, unlike model 1 and model 2, the logarithm of gross domestic product ($p < 0.01$) was statistically significant (positive influence), while the ease of doing business index had a lower statistical significance ($p < 0.05$ and $p < 0.01$ in other models).

Conclusion

The study showed that the probability of on-the-job training has a significant cross – country differentiation, which, on the one hand, is due to the different scale of training in countries, and on the other hand – is due to different factors determining the possibility of employees training.

In Northern and Western Europe, employees are trained more often than in other countries (Eastern Europe, Russia and Israel). This conclusion is confirmed not only by the data of descriptive statistics, but also by the results of regression analysis in the control of the characteristics of employees and jobs.

At the same time, the impact of country characteristics on the probability of personnel training is mixed. First of all, we should note the statistical significance of the positive dependence of personnel training on ease of doing business index both for the model built on the whole sample and for the models calculated by groups of countries.

The statistical significance of coefficients for groups of countries shows that the extent of training is determined not only by economic indicators and the structure of workers and jobs, but also by other cultural factors.

In the countries of Eastern Europe and Russia, characterized by a lower extent of training, there is a greater equality of chances for training between men and women, between the public and private sectors.

References

- Almedia-Santos, F. & Mumford, K. (2005). Employee training and wage compression in Britain. *The Manchester School*, 73(3), 321-342.
- Acemoglu, D., Johnson, S. & Robinson, J. (2002). Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution. *The Quarterly Journal of Economics*, 1231-1294.
- Acemoglu, D. & Pischke, J. S. (1998). Why do firms train? Theory and evidence. *The Quarterly Journal of Economics*, 113(1), 79-119.
- Ballot, G., Fakhfakh, F., & Taymaz, E. (2006). Who benefits from training and R&D, the firm or the workers? *British Journal of Industrial Relations*, 44(3), 473-495.
- Barron, J., Berger, M. & Black, D. (1997) How Well Do We Measure Training? *Journal of Labor Economics*, 15(3), 507-528.
- Becker, G.S., (1964). *Human Capital: A Theoretical and Empirical Analysis*. N.Y.: Columbia University Press.
- Booth, A. & Bryan, M. (2005). Testing Some Predictions of Human Capital Theory: New Training Evidence from Britain. *Forthcoming Review of Economics and Statistics*, 87 (2), 391-394.
- Conti, G. (2005). Training, productivity and wages in Italy. *Labour economics*, 12(4), 557-576.
- Developing Skills for Innovative Growth in the Russian Federation (2013). Retrieved from <https://openknowledge.worldbank.org/bitstream/handle/10986/16100/ACS1549.pdf?sequence=1>
- Easterly, W. & Levine, R. (2003). Tropic, Germs and Crops: How Endowments Influence Economic Development. *Journal of Monetary Economics*, 50, 3–39
- Gimpelson, V. E. & Kapelyushnikov, R.I. (2011). *Russian worker: education, profession, qualification*. Moscow: HSE Publisher.
- Leuven, E. & Oosterbeek, H. (1999). Demand and supply of work related training: Evidence from four countries. *Research in Labor Economics*, 18, p. 303-330.
- Travkin, P. & Sharunina, A. (2016). The return to training in Russia: a difference-in-differences analysis. *International Journal of Training & Development*. Vol. 20. No. 4, 262-279.
- Workplace Training in Europe / Bassanini A., Booth A., Brunello G., et al. IZA Discussion paper series. 2005. No. 1640.

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