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La presente Collana intende portare un contributo di studio e di ricerca ai temi relativi all'educazione e alla formazione per tutta la vita, in differenti contesti ed in maniera profonda (*Lifelong, Lifewide, Lifedeeep Learning*). Data la ricchezza, complessità e problematicità di tali ambiti, la Collana si avvale dei contributi teorico-metodologici di differenti prospettive disciplinari. Particolare attenzione viene rivolta ai campi di studio e di ricerca della comunicazione e formazione, pedagogia dei gruppi e di comunità, orientamento e pratiche valutative.

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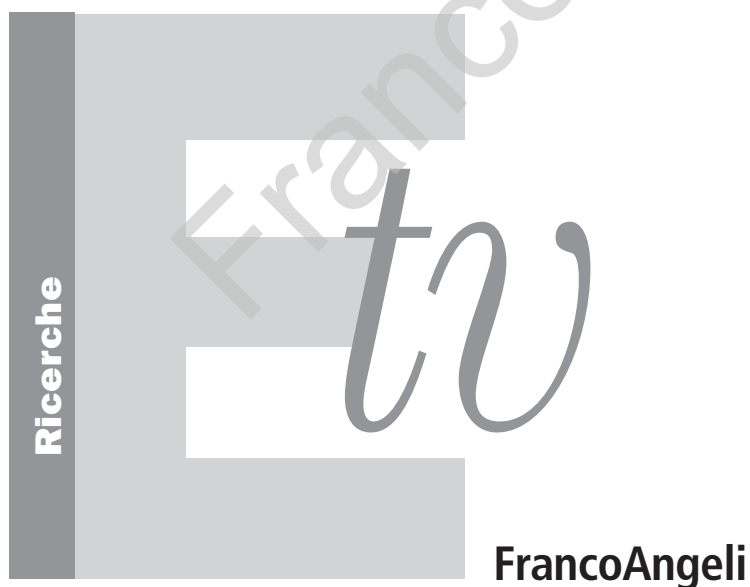
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L'educazione permanente a partire dalle prime età della vita

a cura di Liliana Dozza
e Simonetta Ulivieri

con la collaborazione di Monica Parricchi



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***The determinants of Participation
in Adult Education and Training:
a Cross-National Comparisons Using PIAAC Data***

di Andrea Cegolon – Università degli Studi di Macerata

Abstract: Lifelong learning over the life course is becoming important in order to compete in a knowledge-based global economy. Adult education and Training (AET) are a possible strategy of adjusting the skills of the adult population to the needs of either the changing occupational structure and aging societies. Nevertheless, despite the importance of AET, empirical evidence on the topic is still scarce, particularly as regards the cross-national comparative research. In this sense, this paper aims to contribute to this field of studies by analyzing the determinants of participation in AET programmes. In view of this, I use data from Programme for the International Assessment of Adult Competencies (PIAAC) to investigate four different countries - Italy, France, UK and Sweden - the influence of individual characteristics on participation in formal and non-formal AET.

Keywords: Adult Education and Training, Skills, Cross-National Comparisons, PIAAC

1. Introduction

Background

Recent challenges, such as the transition of modern economies to knowledge-based economies under globalisation, besides the demographic aging of societies, have pushed many countries and organizations to seek new ways to maintain competitive advantage. Enhancing the levels of skills in the population required for the jobs for now and for the future, is a strategic concern in the economic growth and social development of countries all over the world.

On the one hand, globalisation is speeding up technology and innovation: new occupations are emerging while replacing others; within each occupation, required skills and competencies are evolving, as the knowledge content of production processes and services is rising (ILO, 2011). At the same time, demographic processes related to increasing life expectancy and lower fertility rates are causing, on one side, problems for welfare state budgets; on the other, they increase labor shortage, due to the shrinking proportion of young workers (ILO, 2013).

In addition to these trends, there is strong evidence that poor cognitive skills, such as literacy and numeracy, have a negative impact on the quality of life of individuals, in particular on their earnings and employment prospects. A variety of surveys have shown that people with good skills, measured by standardised test scores, tend to have higher wages and better chances of being in work than people with low level of skills

(Dearden et al. 2001, Vignoles et. al. 2010, Murnane et al., 2000, Hanushek and Zhang, 2008).

In this context the prevailing point is that the success of a country largely depends on the possibility to rely upon a labour force with higher levels of individual competences. As a result, many governments aim at investing resources in order to increase the skill level of their citizens. Adult education and Training (AET) are a possible strategy of adjusting the skills of the adult population to the needs of either the changing occupational structure and ageing societies (Cummins et al., 2015). AET also have important implications for social inequality. On the one hand, this objective has the potential to reduce inequalities emerged also in early life. Moreover, the mentioned macro-trends of globalisation and demographic changes are likely to have a strong impact on the need both for older and lower qualified people to take part in lifelong learning activities in order to update their skills to match labor market demands (Organisation for Economic Co-operation and Development, 2013). On the other hand, AET may actually increase existing inequalities if well-educated people are the primary group taking advantage of these opportunities (Kilpi-Jakonen et al., 2014).

Cross-National Comparisons

Despite the importance of AET, empirical evidence on the topic is still scarce, particularly as regards the cross-national comparative research. In this sense, the aim of this paper is to contribute to this field of studies by analyzing the factors driving the participation in adult education and training programmes. In view of this, I use data from Programme for the International Assessment of Adult Competencies (PIAAC) to investigate in four different countries – Italy, France, UK (namely England and Northern Ireland) and Sweden – the influence of individual characteristics on participation in different types of adult education and training.

This paper, in particular, examines the outcomes for the four countries aforementioned – included in the PIAAC survey – regarding individuals who participated in formal and non-formal AET. In addition, comparisons of country levels are made between Italy, Sweden, the UK, and France. The choice of these countries is based on the considerable differences among them with respect to the characteristics of their educational, training, and occupational system; their labour market regulations; the nature of their employment-sustaining policies; the level of the decommodification offered by their national welfare systems. My hypothesis, indeed, is that the national institutional setting plays an important role in influencing trajectories of continued learning participation. In particular, following the well known welfare state typology (Esping-Andersen, 1990; Arts and Gellinsen 2002; Fenger, 2007), combined with participation rates in adult education and training (Dännrich et al. 2014), it is possible to attribute each of these countries to a particular macro-group, presenting so broad common features, namely Social-Democratic/Nordic countries (Sweden); the Central Conservative countries (France); Southern European countries (Italy) and the Anglo-Saxon, liberal countries (the UK).

Research Question

Does participation in AET vary by age, gender and initial educational level between countries?

2. Literature Review

The belief among policy-makers, employers and individuals is that continual skill formation plays an important role in the accumulation process of human capital (Jenkins et al., 2002). Nevertheless, despite the increasing emphasis placed in the last two decades on the positive role of lifelong learning, most of the research attention has been on the acquisition of human capital by young people through formal education. This paper focuses on two different kinds of lifelong activities – *the formal and non-formal AET* – and it intends to investigate, for four countries (Italy, UK, Sweden and France), the factors influencing the participation of individuals in these different programmes. In this paragraph, I examine the literature concerning the determinants of the participation in AET and I derive some hypotheses. I focus on three factors shaping participation: age, gender, prior level of education.

Regarding age, the general pattern is that the likelihood of participation in AET decreases in time, which is primarily due to the lower perceived benefits of participation and possible incompatibility of learning with adult-life courses role (Hostetler et al., 2006; Elman and O'Rand, 2007). In line with these findings, my expectation with regard to age profiles is that the participation in all types of AET is concentrated among young adults, especially in Italy and France, where the age discrimination in the labour market is usually higher than Nordic and Liberal countries (Dämmrich et al., 2014).

Turning to prior education, there is a wide ranging evidence that individuals with higher educational attainments are more likely to participate in non-formal AET, regardless of the country taken into account (Bassanini et al., 2007; Dieckhoff and Steiber, 2011; Albert et al., 2010). One possible explanation is that higher educated people tend to work in more demanding and knowledge-intensive jobs, which requires more training (OECD, 2013). In literature this is also known as “a cumulative advantage” (DiPrete and Eirich, 2006). According to Blundell et al. (1999), a strong complementarity exists indeed between the three main components of human capital – innate ability; qualifications and knowledge acquired through formal education; skills, competencies and expertise gained through workplace training. These findings, moreover, consistent with the cumulative and multiplier effects of learning, find further support in Heckman's research for whom ‘skills beget skills’ (Cunha and Heckman, 2007). In other words, this literature “*suggest that there should be strong investments in early childhood, both because the sensitive periods for acquiring several capabilities occurs early in life, but also because successful early in life is the foundation for successful later in life*” (Carneiro et al. 2010, p. 256). As a result, I expect that individuals with higher initial education and those in better occupational positions be more likely to participate in non-formal AET.

On the other hand, formal AET should have a different pattern. In particular, the general expansion of tertiary education in the last years has also attracted more mature students (Schuetze and Slowey, 2002). Some studies, indeed, show that individuals with no

diploma or degree but rich in earlier experience are more likely to return to education as adults (Elman and O'Rand 2004, Hällsten, 2011). At the same time, we can expect that those already owning a high qualification have less incentives to return to formal education, especially for the high opportunity costs of this investment: acquiring a formal qualification typically last for one or more years, therefore it can be a big deterrent, in terms of time commitment. On the contrary, those with low levels of education may face dispositional barriers to re-entering a formal education system due to the lack of necessary entry qualifications (Kilpi-Jakonen et. al, 2014). Moreover, although the opportunity cost could be lower for lower educated, the absolute costs of formal qualification can be a barrier to entry. Thus we expect that individuals with medium level of education would be more likely to participate in formal AET. Though, since both Nordic and liberal countries have a less stratified educational system (OECD, 2007), the barriers to participate in AET in the form of previous diplomas play a minor role. Instead, central and southern European countries have a high stratified educational system, which probably makes it more difficult to take part in AET. Then, I expect that differences between lower and higher educated individuals in the likelihood to participate in formal AET should be smaller in Sweden and the UK and higher in Italy and France.

The third factor here taken into account is gender. Evidence from previous research shows a higher probability for women to participate in formal AET (Fouarge and Schils, 2009; Kilpi-Jakonen et al., 2012). A possible explanation is that women may feel more need to update their skills after family-related employment interruptions (childbearing), in order to remain competitive in the labor market (Stenberg et al., 2011). Dieckhoff and Steiber (2011) have shown that men have a higher probability of participating in non-formal AET. Under this view it is sensible for employers to invest in men, because males do not tend to interrupt their career for family reasons (Ibidem). Thus, I expect that women should be more likely than men to participate in formal AET, while men should have higher probability to participate in non-formal AET. From a country point of view, I expect that in Sweden, where the welfare state emphasizes gender equality, the gender difference should be less marked. Even in the UK the gender difference should be not so high, because it is a liberal country, characterized, on one hand, by a high level of competition in the labour market and, on the other, by low state support. Thus, for women it is difficult to get a long interruption and employers should be less reluctant to invest for their training. Conversely, I expect Italy and France be more inclined to invest in men, because in these countries women interrupt their careers for childbearing more often and for a longer time (Dämmrich et al., 2014).

3. Data and Empirical Strategy

Data

I use data from the Programme for the International Assessment of Adult Competencies (PIAAC), a large-scale comparative survey conducted under the auspices of OECD. The survey directly assesses the skills of about 5,000 individuals per each country, aged 16-65 and representing the countries working age population. In this paper, I use data of the first round, carried out in 24 industrialised countries between 2011-2012. I analyse

the public-use files as available on the OECD's PIAAC webpage. PIAAC builds on knowledge and experiences gained from previous international adult assessments - the International Adult Literacy Survey (IALS), conducted between 1994 and 1998, and the Adult Literacy and Lifeskills Survey (ALL), conducted between 2003 and 2008.

The current analysis includes only 4 of the 24 countries: Italy, Sweden, UK, and France. In order to capture lifelong learning activities taking place after the completion of initial education, I leave individuals aged 16-24 out of the analysis. Then, I focus on individuals aged 25-65, the normal age range to enter in the labour market. Overall, the final sample covers four countries and includes 21,157 individuals.

Methods

Since individual observations in the dataset are not independent because clustered within countries, multilevel regressions models, which combine individual and contextual factors, should be an appropriate technique, because they can account for the nested structure of the data. However, the application of multilevel models for an international survey-data-set, like PIAAC, is a bit troubling. Firstly, in these surveys the country selection is not a random sample, but a convenient sample of those countries where researchers are willing and have the financial means to participate in the study. Secondly, the analysis of this paper is restricted only to a sub-sample of four countries (and, in any case, the total number of countries included in PIAAC sample are less than 25), consequently the application of multilevel model would have a low number of degrees of freedom on the country level¹. Then, as pointed out by Möhring (2012, p. 3), *“the advantages of multilevel models, as the introduction of random slopes and cross-level interaction effects, cannot be fully applied due to statistical reasons. If models are correctly specified paying regard to the small number country level, only low number of macro level indicators can be controlled for”*.

Given the above, to address research question I carry out separate logistic regressions for each country and each learning activity. The dependent variable is a dichotomous variable indicating whether a person participated AET in the 12 months prior the survey. As mentioned earlier, I distinguished between 2 types of AET, formal and non-formal. The “Logit” model is specified as the log odds of equation:

$$\text{Ln} [p_i / (1-p_i)] = \alpha + \beta_1 \text{Age}_i + \beta_2 \text{Female}_i + \beta_3 \text{Educ}_i + \beta_k x_i \quad (1)$$

As independent variables, I consider three factors: age (in year bands), gender (a dummy variable which has value 1 for females, and 0 for males) and education level (from primary to tertiary level). In addition to these variables, I include a set of covariates (x_i), related to individual characteristics: subjective working condition (employed or self-employed, retired, unemployed, etc.), working sector (private sector, public sector), social classes (unskilled workers, skilled manuals, professionals, etc.), the number

¹ Mass and Hox (2005), conclude that only samples with more than 50 macro units produce unbiased estimators.

of individuals in the households, the number of children, the health condition, the language mastery (whether the respondent is a native speaker), the highest qualification of parents and the number of books at home at age 16.

This approach uses a method called 'Maximum Likelihood', which allows to find the value of the parameters β which maximises the likelihood of observing what I have actually observed in the data. So, if the model leads to a large improvement in the likelihood, compared to the null model, then it has some explanatory power and is better than the null model.

4. Empirical Results

In the following paragraph, the results of the logistic regressions regarding the influence of individual characteristics on participation in both formal and non-formal AET are set out (Tables 1 and 2). In particular, in order to address the research question I focus on discussing the effect of age, education and gender on participation in different types of lifelong learning activity.

Table 1 – The determinants of participation in formal AET, Logit estimates

	France		Italy		Sweden		UK		Pooled	
	OR	S.E.	OR	S.E.	OR	S.E.	OR	S.E.	OR	S.E.
<i>Female</i>	0.782***	0.17	0.967***	0.224	1.422***	0.173	1.172***	0.172	1.043***	0.102
<i>Age Bands</i> (reference: 25-35)										
36-45	0.681***	0.152	0.490***	0.139	0.604***	0.103	0.812***	0.119	0.738***	0.079
46-55	0.295***	0.077	0.187***	0.073	0.412***	0.078	0.686***	0.107	0.555***	0.067
56-65	0.070	0.045	0.050	0.045	0.139***	0.041	0.246***	0.073	0.219***	0.053
<i>Education levels</i> (reference: Primary or less)										
Lower secondary	0.798***	0.253	2.468	2.517	3.922	2.904	1.285**	0.665	1.47**	0.623
Upper secondary and post secondary	0.503***	0.113	3.306	3.000	4.409	3.252	2.866**	1.228	2.384**	0.961
Tertiary	-	-	-	-	12.852	9.405	2.873**	1.228	3.387**	1.380
<i>Constant</i>	0.042**	0.024	.003	0.009	0.011	0.017	0.117*	0.063	0.020**	0.009
<i>LL_0</i>	-2,862,746		-2,972,890		-1,149,170		-6,417,471		-1,44E+07	
<i>LL_1</i>	-2,463,786		-2,345,294		-917,131,800		-5,955,877		-1,28E+07	
<i>Chi2</i>	131.237***		128.131***		297.658***		103.195***		376.082***	
<i>N</i>	2,583		1,845		2,369		3,547		10,498	

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controlling for: current work situation, type of contract, sector, social class, health, household, number of book at age 16, parental education and native speaker condition.

Table 2 – The determinants of participation in non-formal AET, Logit estimates

	France		Italy		Sweden		UK		Pooled	
	OR	S.E.	OR	S.E.	OR	S.E.	OR	S.E.	OR	S.E.
<i>Female</i>	0.947***	0.071	0.883***	0.124	0.968***	0.133	0.938***	0.124	0.924***	0.055
<i>Age Bands</i> (reference: 25-35)										
36-45	1.141***	0.122	1.164***	0.209	0.839***	0.138	1.281***	0.213	1.207***	0.083
46-55	1.232***	0.126	1.105***	0.215	0.799***	0.132	1.323***	0.226	1.338***	0.105
56-65	0.738***	0.110	0.892***	0.271	0.520***	0.100	1.143***	0.232	1.116***	0.128
<i>Education levels</i> (reference: Primary or less)										
Lower secondary	1.718***	0.443	0.836*	0.481	2.422**	1.099	1.559***	0.453	1.089***	0.188
Upper secondary and post secondary	2.668***	0.620	1.154*	0.637	3.237**	1.398	1.830***	0.470	1.587***	0.248
Tertiary	4.183***	0.919	1.750*	1.028	3.032**	1.388	2.165***	0.582	2.321***	0.381
<i>Constant</i>	0.233***	0.074	0.302*	0.176	1.731	1.109	0.755***	0.303	0.353***	0.075
<i>LL_0</i>	-10,400,000		-8,858,951		-1,829,766		-8,502,565		-31,700,000	
<i>LL_1</i>	-9,292,254		-7,835,782		-1,622,649		-7,331,267		-27,600,000	
<i>Chi2</i>	308.575***		204.537***		246.087***		272.754***		889.647***	
<i>N</i>	2,718		1,864		2,382		3,556		10,528	

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controlling for: current work situation, type of contract, sector, social class, health, household, number of book at age 16, parental education and native speaker condition.

Age

As evident in Table 2, there is a significant relationship between all age bands and participation in non-formal AET in all countries selected. Contrary to my expectations, in Sweden the rate of decrease in the odds of AET participation for older groups of individuals is higher. Here, individuals aged 36-45 have an expected decrease in odds of participating in non-formal AET of 0.839 ($p < 0.01$), with respect to the reference group (individuals aged 25-35). Afterwards, the odds tend to decrease with the age, till the older groups (56-65). Conversely, in the other three countries, the pattern is a bit different. The 36-45 age group experiences the highest odds of entering in non-formal AET, compared to the reference group (25-35). For example, in Italy individuals aged 36-45 have an odds of 1.164 ($p < 0.01$) of being in non-formal AET. Afterwards the relative odds decrease with age. Instead, in the UK and in France, the odds of participating in non-formal AET increases until age 46-55 and then it drops.

Results for formal AET (Table 1) indicate that overall the relationship between the outcome and age is statistically significant, except for the oldest individuals (56-65) in Italy and France. In all countries, the odds of taking part in formal AET diminish with the age at a rate steeper than the one observed for non-formal AET. This trend is particularly evident in Italy where being a person aged 36-45 lowers the odds of taking part in formal AET in the prior 12 months of about 0.490 ($p < 0.01$), compared to the reference group (25-35). Then with age the odds drop to 0.187 ($p < 0.05$) for people 46-55 and to 0.050 ($p > 0.10$) for the oldest group. This trend is a bit less marked in the UK, where the odds decrease from 0.812 ($p < 0.01$) for people aged 36-45, to 0.686 ($p < 0.01$) for individuals aged 46-55, and 0.246 ($p < 0.01$) for people closer to retirement.

Summary: as age increases the odds of the individual to participate in any type of AET increases. This result is in concordance with my expectation and with the human

capital theory (Becker, 1964), which states that younger individuals have higher probability of participating in adult learning activities due to higher net returns over the remaining life (see also Ben-Porath, 1967; Li et al., 2000; Fourage and Schils, 2009).

Education

The results for non-formal AET (Table 2) in Italy indicate that compared to people who have just finished primary school, those who with a post-secondary qualification or a university degree (or more) have the higher odds to enter formal AET (OR = 1.750, $p < 0.10$); followed by those holding an upper secondary diploma (OR = 1.154, $p < 0.10$) and those who got a lower secondary qualification (OR = 0.836, $p < 0.10$). There are a barely detectable statistically significant difference between all categories. In France and Sweden the association between education level and the odds of entering non formal AET is stronger; Italy depicts the weaker relationship.

With regard to formal AET, the overall results suggest an association of increasing strength between the education level and the odds of entering formal AET. Nevertheless, as I hypothesised in the literature review section, the differences between lower and higher educated individuals in the odds to participate in formal AET is found to be smaller in countries with less stratified school system, such as the UK and Sweden, compared to Central and Conservative countries, like Italy and France. In Italy, with respect to people holding only a primary diploma, those who reached a lower secondary level have an higher odds of being in formal AET (OR = 2.468, $p > 0.10$), this is even higher (OR = 3.306, $p > 0.10$) in those in upper secondary level. In the UK the differences between levels are less marked. The odds of entering formal AET there is 1.285 ($p < 0.10$), 2.866 ($p < 0.05$) and 2.873 ($p < 0.05$), for individuals in lower secondary, upper secondary, and tertiary levels, respectively.

Summary: the results in Table 1 and 2 strongly support my expectation for which better educated persons participate more often in non-formal adult learning courses than their lower counterparts. However, the same educational effect, with the exception of France, is also found for formal AET. In most countries education seems one of the most important influencing predictor for participation in both types of AET. This could be due to the already mentioned complementary relationships between initial and AET and/or because of higher skill requirements and higher learning capacity of better educated persons (Brunello, 2001; Albert et. al. 2010).

Gender

In France women have lower odds to enter in formal AET (OR = 0.782, $p < 0.01$). The association between both learning activities and gender turns out to be highly significant in all countries. Furthermore, my expectation about a less market gender difference in Sweden and in the UK, compared to Italy and France, is partially confirmed, since it is found only for non-formal AET, but not for formal AET. Indeed in Italy women have almost the same odds of men to enter in formal AET (OR = 0.967, $p < 0.10$), while in Sweden is 1.422 ($p < 0.01$).

Summary: The results of the multivariate logistic model show that, in line with my expectations, men are more likely to participate in non-formal AET. While women are

more likely to enter in formal AET only in the UK and in Sweden, but not in France and in Italy.

5. Conclusion

The combination of two factors - the demographic aging of societies and a shift in the age distribution of labour force - results in the need for policies to encourage people to upgrade skills in order to remain at work. Policies providing opportunities for adult individuals to participate in AET programmes are necessary to ensure economic security in retirement, a competitive labour force and economic growth. The implementation of policies focusing on lower income groups and especially unemployed are crucial, as they are the most in need of skills upgrading and most at risk for economic insecurity.

This study investigated the factors influencing the participation of individuals aged 24-65 in formal and non-formal AET for four countries: Italy, UK, Sweden, and France. The following analysis especially focused on three variables: age, prior education and gender.

First, as hypothesised, the general pattern with regard to age profiles is for participation in all types of AET to be concentrated among young adults with the probability of enrolment to decrease with age. The exact functional form differs a bit among countries and learning activities. In some cases, the decrease over the age is monotonic, whereas in others the rate at which participation decreases change over the life course. More specifically, participation in formal AET tends to decrease in a linear way: whereas participation in non-formal learning activities tends to be enough stable among middle ages groups (36-45 and 46-55), afterwards reducing dramatically for the oldest individuals.

Secondly, as expected in the literature review section, the more-highly educated individuals are more likely to participate in non-formal learning activities in all countries. Regarding formal activities, I expected that medium-educated individuals would be more likely to participate in formal AET. Instead, with the exception of France, I found the same educational effect observed for non-formal AET. However, as hypothesised, the differences between lower and higher educated individuals in the odds to participate in formal AET is found to be smaller in countries with less stratified school systems, such as the UK and Sweden, compared to Central-Conservative and Southern Europeans countries, like Italy and France. Overall the results suggest an association of increasing strength between the education level and the odds of entering both types of AET.

Lastly, as the outset, I expected that men would be more likely to participate in non-formal AET. The results from the logistic regressions, confirm this hypothesis, though I also expected that women to be more likely to enter in formal AET. This hypothesis found evidence only in the UK and in Sweden, but not in France and in Italy. Furthermore, my expectation about a less market gender difference in Sweden and in the UK, compared to Italy and France, is partially confirmed, since it is found only for non-formal AET but not for formal AET.

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