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Low educational attainment in Portugal – intergenerational transmission of a big problem.

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The lack of formal education and competences of the Portuguese workers is one of the biggest problems of the country. This lack is not shrinking at the wanted speed and the young generations still lag far behind the ones in other OCDE countries. This paper studies the intergenerational transmission of education achievement, in particular higher education completion, trying to see the influence of parents' education and labor market conditions while the child was growing up in their future attainment. We conclude that the education of the parents is very important even if it is only one of them has it. This influence seems not to be independent of the gender of the parent who has it. The fact that the parents face unemployment has a negative effect on the educational achievement of the child. Females perform better than males, but the gap decreases if the father has low education or is facing unemployment problems.

1 Introduction

Portugal is one of the OCDE's countries that shows lower educational attainment even among its younger population, as can be seen in the table I below. In our point of view this is a big problem that Portugal has to solve.

There is a extensive literature relating child's educational achievement to the education or income of their parents (Becker, 1988, Becker & Tomes, 1986, Haveman & Wolfe, 1995, Oosterbeek, 1995, Heineck & Riphahn, 2009, Pascual, 2009, Rumberger, 2009, just to cite a few). The model behind these studies is one where parents decide the allocation of resources to consumption and investment either on assets or human capital of their children. More education implies higher income and therefore a larger choice set allowing the choice of more human capital for their children.

Portugal is a country where returns to education have been very high (see, for instance, Martins & Pereira, 2004) and therefore we would expect that there would be a strong intergenerational transmission of educational achievement and, at the same time, the transmission of the problem of low skills that the country's population faces.

Table I. Population with at least upper secondary education¹ (2007)

Percentage, by age group

| | | Age group | | | | |
|--------------------------|---------------------|--------------|--------------|--------------|--------------|--------------|
| | | 25-64 (1) | 25-34 (2) | 35-44 (3) | 45-54 (4) | 55-64 (5) |
| OECD countries | Australia | 68 | 81 | 70 | 64 | 54 |
| | Austria | 80 | 87 | 84 | 78 | 70 |
| | Belgium | 68 | 82 | 75 | 63 | 50 |
| | Canada | 87 | 91 | 90 | 86 | 78 |
| | Czech Republic | 91 | 94 | 94 | 89 | 85 |
| | Denmark | 75 | 85 | 80 | 71 | 66 |
| | Finland | 81 | 90 | 87 | 81 | 65 |
| | France | 69 | 83 | 74 | 63 | 53 |
| | Germany | 84 | 85 | 86 | 85 | 81 |
| | Greece | 60 | 75 | 67 | 53 | 37 |
| | Hungary | 79 | 85 | 83 | 79 | 68 |
| | Iceland | 65 | 69 | 70 | 62 | 54 |
| | Ireland | 68 | 83 | 72 | 60 | 42 |
| | Italy | 52 | 68 | 56 | 48 | 34 |
| | Korea | 78 | 97 | 92 | 65 | 39 |
| | Luxembourg | 66 | 77 | 67 | 62 | 53 |
| | Mexico | 33 | 39 | 37 | 29 | 18 |
| | Netherlands | 73 | 83 | 77 | 71 | 61 |
| | New Zealand | 72 | 80 | 74 | 70 | 60 |
| | Norway | 79 | 83 | 80 | 77 | 76 |
| | Poland | 86 | 92 | 90 | 86 | 74 |
| | Portugal | 27 | 44 | 27 | 20 | 13 |
| | Slovak Republic | 87 | 94 | 92 | 86 | 71 |
| | Spain | 51 | 65 | 56 | 44 | 28 |
| | Sweden | 85 | 91 | 90 | 83 | 74 |
| | Switzerland | 86 | 90 | 87 | 85 | 81 |
| | Turkey | 29 | 38 | 26 | 22 | 16 |
| | United Kingdom | 68 | 75 | 69 | 66 | 61 |
| United States | 88 | 87 | 88 | 89 | 87 | |
| | OECD average | 70 | 79 | 74 | 67 | 57 |
| | EU19 average | 71 | 81 | 75 | 68 | 57 |
| Partner countries | Brazil | 37 | 47 | 37 | 31 | 22 |
| | Chile | 2 | 50 | 64 | 44 | 32 |
| | Estonia | | 89 | 86 | 94 | 82 |
| | Israel | | 80 | 85 | 83 | 71 |
| | Russian Federation | 3 | 88 | 91 | 94 | 71 |
| | Slovenia | | 82 | 92 | 84 | 78 |

1. Excluding ISCED 3C short programmes.

2. Year of reference 2004.

3. Year of reference 2002.

Source: OECD. (www.oecd.org/edu/eag2009).

The labor market situation of the parents, in particular unemployment, can also decrease the choice set and therefore decrease the investment on the human capital of the children.

The questions we address in this study are the following:

- 1) What is the relationship between parents' education and the individual higher education completion?
- 2) Is this relationship independent of who has the education (mother or father)?
- 3) What is the relationship between parents' labor market situation and the individual higher education completion?
- 4) Do these relationships vary with gender?

2 Methods

We use IEFA¹ (Adult education and training survey – 2007) data. It contains 11289 interviews (5350 males, 5939 females) where the respondents were asked the educational level of the parents and their situation in the labor market while they were growing up (age 12 to 16).

In the dataset there are three educational levels and three labor market situations for the parents:

- BAS – degree corresponding to less or equal to 9 years of education
- SEC – degree corresponding to 11 or 12 years of education
- SUP – Higher education degree
- DES - Unemployed
- EMP - Employed
- INA - Not in the labor market

We only consider cases where we have information about both parents (10436 observations). M stands for mother and F stands for father, so M_BAS/F_BAS is a couple that both partners have BAS education. M_DES/F_EMP is a couple where the mother is unemployed and the father is employed.

In table II below we see distribution of education among parents.

We see that more than 90% of the individuals have both parents with at most a degree corresponding to 9 years of education.

The distribution of the parents' labor market situation appears in table III below.

More than 97% of the individuals had an employed father and for the majority of these the mother was not in the labor market while they were growing up. The cases of unemployment were rare when the individuals were growing up.

¹ This survey was carried out by Statistics Portugal and took place in all European Member States, following methodological guidelines issued by Eurostat.

Table II. Parents' educational achievement

| | N. | % |
|-------------|--------|--------|
| M_BAS/F_BAS | 9,538 | 91.42 |
| M_BAS/F_SEC | 182 | 1.74 |
| M_BAS/F_SUP | 104 | 1.00 |
| M_SEC/F_BAS | 105 | 1.01 |
| M_SEC/F_SEC | 134 | 1.28 |
| M_SEC/F_SUP | 86 | 0.82 |
| M_SUP/F_BAS | 77 | 0.74 |
| M_SUP/F_SEC | 43 | 0.41 |
| M_SUP/F_SUP | 164 | 1.57 |
| | | |
| Total | 10,433 | 100.00 |

Table III – Parents' labor market situation

| | N. | % |
|-------------|--------|--------|
| M_INA/F_INA | 116 | 1.11 |
| M_INA/F_DES | 29 | 0.28 |
| M_INA/F_EMP | 5172 | 49.57 |
| M_DES/F_INA | 3 | 0.03 |
| M_DES/F_DES | 6 | 0.06 |
| M_DES/F_EMP | 29 | 0.28 |
| M_EMP/F_INA | 93 | 0.89 |
| M_EMP/F_DES | 12 | 0.12 |
| M_EMP/F_EMP | 4973 | 47.67 |
| | | |
| Total | 10,433 | 100.00 |

In the dataset the education of the individual (child) appears in 4 categories, one more than those of the parents. The extra category is of individuals who didn't attain any degree. The categories and the distribution of education appear below.

- NONE – no formal degree
- BAS – degree corresponding to less or equal to 9 years of education
- SEC – degree corresponding to 11 or 12 years of education
- SUP – Higher education degree

Table IV – Individual’s education

| | N. | % |
|-------|--------|--------|
| NONE | 514 | 4.93 |
| BAS | 7,098 | 68.03 |
| SEC | 1,675 | 16.05 |
| SUP | 1,146 | 10.98 |
| | | |
| Total | 10,433 | 100.00 |

More than 70% of the individuals have up to a degree corresponding to nine years of education meaning that less than 30% of the individuals have at least an upper secondary degree (as already seen in table I above). Educational attainment is not gender blind as can be seen in table V below.

Table V – Individual’s education by gender

| Individuals Education | Female (FEM) | % | Male | % |
|-----------------------|--------------|--------|-------|--------|
| NONE | 324 | 5.92 | 190 | 3.83 |
| BAS | 3,557 | 64.96 | 3,541 | 71.43 |
| SEC | 884 | 16.14 | 791 | 15.96 |
| SUP | 711 | 12.98 | 435 | 8.78 |
| | | | | |
| Total | 5,476 | 100.00 | 4,957 | 100.00 |

As in other countries females (see, for the US, Goldin, Katz, & Kuziemko, 2006), are more prone to achieve a higher education degree than males.

Finally the dataset gives information about the individual’s age in 5 age groups.

- AGEI – 18 to 24 years old
- AGEII – 25 to 34 years old
- AGEIII – 35 to 44 years old
- AGEIV – 45 to 54 years old
- AGEV – 55 to 64 years old

The educational attainment by age group follows:

Table V – Individual’s education by age group

| Individuals Education | AGEI | % | AGEII | % | AGEIII | % | AGEIV | % | AGEV | % |
|-----------------------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|
| NONE | 13 | 0.95 | 38 | 2.22 | 73 | 3.20 | 129 | 5.04 | 261 | 10.37 |
| BAS | 700 | 51.28 | 916 | 53.54 | 1,622 | 71.11 | 1,931 | 75.46 | 1,929 | 76.64 |
| SEC | 556 | 40.73 | 398 | 23.26 | 316 | 13.85 | 251 | 9.81 | 154 | 6.12 |
| SUP | 96 | 7.03 | 359 | 20.98 | 270 | 11.84 | 248 | 9.69 | 173 | 6.87 |
| | | | | | | | | | | |
| Total | 1,365 | 100 | 1,711 | 100 | 2,281 | 100 | 2,559 | 100 | 2,517 | 100 |

We see that completion of higher education decreases with age except in the first age group. In this youngest group there are still people who didn’t finish their studies.

We perform an ordered probit (4 education levels). We use as explanatory variables parents education, parents labor market situation, age of individual and gender. We allow the influence of the explanatory variables to be different depending on the gender of the individual.

We considered as reference group a young male with both parents with a degree of less or equal none years of education, both not in the labor market.

Due to the small number of individuals whose parents were both unemployed (6 individuals) or whose mother was unemployed and father not in the labor market (3 individuals) we decided to drop them from our sample.

3 Results

The marginal effects on higher education completion appear in table VI.

We see that education of the mother or the father influences educational achievement of the child. The increase is very large, at least almost 30% if the father has a secondary education and more than 40% if it is the mother that has a secondary education degree.

The additional impact achieves almost 60% when the mother has a higher education degree and the father has a secondary or higher education degree.

The effect of a degree depends on the degree of the partner. Having an increase of degree from secondary to higher education of a father has high effect if the mother has a basic education but seems to a negative effect (not significantly different from zero) if the mother has a high education degree.

Table VI – Marginal effects on higher education completion

| variable | dy/dx | Std. | z | P> z |
|---|-----------|--------|--------|-------|
| <i>MBAS_FSEC</i> | .2997595 | .04272 | 7.02 | 0.000 |
| <i>MBAS_FSUP</i> | .4164844 | .06094 | 6.83 | 0.000 |
| <i>MSEC_PBAS</i> | .4031556 | .06458 | 6.24 | 0.000 |
| <i>MSEC_FSEC</i> | .4032619 | .05392 | 7.48 | 0.000 |
| <i>MSEC_FSUP</i> | .4861511 | .06872 | 7.07 | 0.000 |
| <i>MSUP_PBAS</i> | .4122408 | .06973 | 5.91 | 0.000 |
| <i>MSUP_FSEC</i> | .5987253 | .08863 | 6.76 | 0.000 |
| <i>MSUP_FSUP</i> | .5595771 | .05066 | 11.05 | 0.000 |
| <i>M_INA/F_DES</i> | -.0748998 | .00366 | -20.47 | 0.000 |
| M_INA/F_EMP | .0283184 | .02671 | 1.06 | 0.289 |
| M_DES/F_EMP | .2178198 | .13513 | 1.61 | 0.107 |
| M_EMP/F_INA | .0031802 | .04033 | 0.08 | 0.937 |
| <i>M_EMP/F_DES</i> | -.052403 | .02757 | -1.90 | 0.057 |
| M_EMP/F_EMP | .0255261 | .02694 | 0.95 | 0.343 |
| <i>AGEII</i> | .0242619 | .00995 | 2.44 | 0.015 |
| <i>AGEIII</i> | -.0235694 | .00737 | -3.20 | 0.001 |
| <i>AGEIV</i> | -.0296682 | .00712 | -4.17 | 0.000 |
| <i>AGEV</i> | -.040434 | .00674 | -6.00 | 0.000 |
| MBAS_FSEC*FEM | .0231177 | .02928 | 0.79 | 0.430 |
| MBAS_FSUP*FEM | .0014126 | .0323 | 0.04 | 0.965 |
| <i>MSEC_FBAS*FEM</i> | -.0426145 | .01677 | -2.54 | 0.011 |
| MSEC_FSEC*FEM | .0232 | .0349 | 0.66 | 0.506 |
| MSEC_FSUP*FEM | .0257958 | .04591 | 0.56 | 0.574 |
| <i>MSUP_FBAS*FEM</i> | -.0387563 | .02139 | -1.81 | 0.070 |
| MSUP_FSEC*FEM | -.0032356 | .05095 | -0.06 | 0.949 |
| MSUP_FSUP*FEM | .0326183 | .03624 | 0.90 | 0.368 |
| <i>M_INA/F_DES*FEM</i> | -.0678814 | .01254 | -5.41 | 0.000 |
| M_INA/F_EMP*FEM | -.0207577 | .03016 | -0.69 | 0.491 |
| <i>M_DES/F_EMP*FEM</i> | -.0708181 | .00875 | -8.09 | 0.000 |
| <i>M_EMP/F_INA*FEM</i> | -.0447669 | .02508 | -1.78 | 0.074 |
| M_EMP/F_DES*FEM | .0405425 | .14939 | 0.27 | 0.786 |
| <i>M_EMP/F_EMP*FEM</i> | -.0443322 | .02638 | -1.68 | 0.093 |
| AGEII*FEM | .0052481 | .01266 | 0.41 | 0.679 |
| <i>AGEIII*FEM</i> | -.0195432 | .01003 | -1.95 | 0.051 |
| <i>AGEIV*FEM</i> | -.0418633 | .00798 | -5.25 | 0.000 |
| <i>AGEV*FEM</i> | -.0726491 | .00541 | -13.43 | 0.000 |
| <i>FEM</i> | .0927274 | .03446 | 2.69 | 0.007 |
| Predict probability for the reference group (young male with both parents with BAS education and not in the labor market) = .07644406 | | | | |

In the table below we resume the total effects.

Table VII - Total effects on higher education completion (in percentage)

| | F_BAS | | | F_SEC | | | F_HIG | | |
|-------|--------|--------|------------|--------|--------|------------|--------|--------|------------|
| | Female | Male | Difference | Female | Male | Difference | Female | Male | Difference |
| M_BAS | 16,92% | 7,64% | 9,27% | 49,20% | 37,62% | 11,58% | 58,71% | 49,29% | 9,41% |
| M_SEC | 52,97% | 47,96% | 5,01% | 59,56% | 47,97% | 11,59% | 68,11% | 56,26% | 11,85% |
| M_HIG | 54,27% | 48,87% | 5,40% | 76,47% | 67,52% | 8,95% | 76,14% | 63,60% | 12,53% |

We see that being born in a family with both papers having at most nine years of education is a high handicap, as at most one out of five girls are going to achieve a higher education degree and at most one out of ten boys are going to achieve it. Meanwhile, for the children from both parents with a higher education degree, more than seven out of ten girls and more than six out of ten boys are going to achieve it.

If one of the parents has at least secondary education then one out of two children are going to achieve a higher education degree, with the exception of the male children of mothers with basic education and fathers with secondary education where only one out of three is going to achieve higher education.

Father's unemployment seems to affect negatively the achievement of the child.

Younger generations are getting more higher education degrees than older generations.

Looking to the results of females, we see a female effect of almost 10%, meaning that a female has a higher probability of achieving a higher education degree than a male. However this differential decreases if the father has a basic education or one of the parents is unemployed (except if the mother is employed) or if the father is not in the labor market. Similar result appears for the case when both parents are employed. In all these cases the female effect on achievement seems to be positive but lower.

The female effect decreases with age meaning that there seems to be a tendency for this effect to increase.

4 Conclusions

The transmission of education between generations can explain different situations that perpetuate the lag of education of certain groups and the need for policy measures to overcome the unfavorable starting conditions.

In Portugal there is a great influence of parents' education on the child higher education attainment. The probability of achieving a higher education degree is more than eight times higher for a individual whose both parents have a high education degree than for one whose both parents have at most a 9 years of education degree. Therefore low level of education is going to perpetuate from generation to generation and this is the perpetuation of a big problem.

Portuguese data shows that the effect of parents' education is not independent from the gender of the parent that has it and from the education of the partner. Mothers' education seems to have a higher influence than fathers' education and the additional impact seems to decrease the higher is the education of the partner. Due to this result we recommend not to use the highest education level of one of the members of the couple as an indicator of the couple's education.

Unemployment of the father decreases the probability of attaining a higher education degree showing that financial reasons can be the explanation for the low educational attainment.

Female have advantage in terms of educational attainment – a increase of around 10% in the probability of attaining a higher education degree. This advantage reduces if the father has low education level or the parents face unemployment. The female advantage is higher for the younger cohorts than it was for the older cohorts, but it is positive for all cohorts.

Given the results it is very important to intervene in the educational process to see if the children of parents with low levels of education get extra support so they don't leave the studies early. This should also be done with children whose parents are unemployed, in particular the father.

It is important that multidisciplinary studies are done to see what kind of support is missing to the children of parents with low education. The survey used in this study asks young individuals the reason with they left school at the basic level. Wanting to gain their own money or financial problems is point for almost 35% of the individuals whose one of the parents has basic education, so it seems that the support that the support given to the families is not sufficient for them to keep the children studying.

The main reason to leave school is that the individual did not like to study, so it is important to motivate the children and help them to achieve success. The results from the intervention through extra support given by the NGO EPIS (Entrepreneurs for the Social Inclusion) seem to point that the civil society can contribute to help solve what we called a big problem for Portugal.

Female children whose father has low education should also have extra support.

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