

# Is the decrease of fertility a consequence of the postponement of the Entrance in the labour market?

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## Abstract

As the postponement in the age of entrance into the labour market and the fertility decline in Portugal are a primary concern in Society it is important to understand the patterns associated with this issue.

Data from the Portuguese Labour Force Survey (LFS) - data source: National Statistical Institute - from 1998 to 2004 was utilised in order to study the evolution of the entrance age into the labour market and the relationships between entrance age, sex and education level.

The multinomial logit model evidenced that being a woman, being younger or having a higher qualification implied a later entrance age into the labour market, while being a man, being older or having lower qualifications were involved in an earlier entrance into the labour market.

**Keywords:** age of entrance, labour market, fertility, multinomial logit

## Introduction

In this study, it was first analysed the relationship between entrance age into the labour market and sex, age and educational level. Next, it was described the relationship between the late entrance and the fertility decline in Portugal. To estimate the age of entrance in the labour market it was utilised data from the Portuguese Labour Force Survey (National Statistical Institute) from 1998 to 2004 and a multinomial logit model.

### 1. Evolution of the age of entrance into the labour market

The recent literature concerning the entry of young people into the labour market focuses empirically mainly on the differences between sex and educational level and few studies consider the variations of the age of entrance into the labour market according to the different groups of ages. In Portugal, studies on the relationship between educational levels and rates of participation in the labour market showed that higher qualification implied more chances of participation (Dias and Mata, 1997) although the entrance into the labour market happens mainly when people are aged from 20 to 29 years (Santos and Mendes, 2007). The rate of participation of the female was quite lower than the rate of participation of the male and the female entrance into the labour market happened at older ages (Dias and Mata, *op. cit.*).

#### 1.1. Descriptive statistics

Table 1 provides the descriptive statistics concerning the age of entrance into the labour market.

**Table 1 – Mean age, median age and modal age of entrance into the labour market (years)**

|                                  | Mean  | Median | Mode |
|----------------------------------|-------|--------|------|
| 1998 (4 <sup>th</sup> trimester) | 17,03 | 16     | 14   |
| 2000 (4 <sup>th</sup> trimester) | 17,23 | 16     | 14   |
| 2002 (4 <sup>th</sup> trimester) | 17,09 | 16     | 14   |
| 2004 (4 <sup>th</sup> trimester) | 17,54 | 17     | 14   |

Source: INE, data from LFS 1998, 2000, 2002, 2004

In 1998, the median age of the entrance in the labour market was 16 years and the median 17, 03 years. In 2004, the median age was 17 years and the average age 17, 54 years. This analysis showed that the age of entrance slightly increased every year. There was a substantial decrease of the percentage of active population in the group aged from 15 to 19 years, and a lower decrease of that percentage in the group aged from 20 to 24 years, which illustrate a delayed entry of young people into the labour market (table 2).

**Table 2 – Active population (%) by group of ages (years)**

|  | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|

|                              |      |      |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|------|------|
| 1998 (4 <sup>th</sup> trim.) | 23,3 | 60,2 | 75,3 | 72,6 | 67,2 | 64,7 | 60,2 | 49,9 | 36,3 | 20,5 |
| 2000 (4 <sup>th</sup> trim.) | 23,4 | 59,9 | 76,4 | 74,0 | 71,4 | 64,9 | 59,5 | 50,8 | 36,9 | 22,1 |
| 2002 (4 <sup>th</sup> trim.) | 22,4 | 63,0 | 79,0 | 75,5 | 71,0 | 68,1 | 63,3 | 53,3 | 39,4 | 22,3 |
| 2004(4 <sup>th</sup> trim.)  | 17,8 | 59,2 | 79,1 | 79,7 | 73,9 | 70,7 | 65,4 | 57,4 | 42,3 | 21,8 |

Source: INE, data from LFS 1998, 2000, 2002, 2004

In all the other groups there was an increase in the percentage of active population. The higher increase was observed in the groups aged from 50 to 54 and from 30 to 34 years. In Table 3 are expressed the percentages of students in each age group. There is evident a substantial increase in that percentages in the groups aged from 15-19 (68,4% to 75,4%) and from 20-24 years (25,5 to 33,6). The increment was quite lower (5,1% to 6,6%) in the group aged 25-29 years. This means that the youngest continued their studies until older ages.

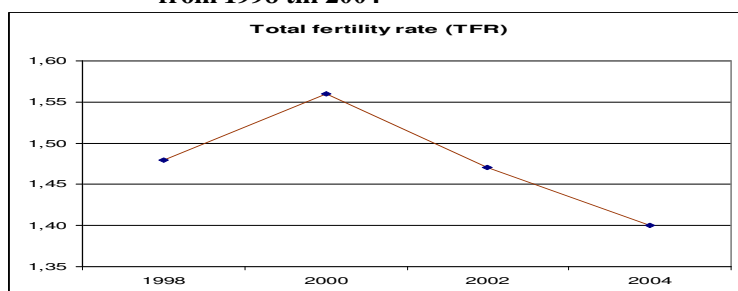
**Table 3 - Percentages of students in the different age groups**

|                              | 15-19 | 20-24 | 25-29 | 30-34 |
|------------------------------|-------|-------|-------|-------|
| 1998 (4 <sup>th</sup> trim.) | 68,4  | 25,5  | 5,1   | 0,5   |
| 2000 (4 <sup>th</sup> trim.) | 67,6  | 29,0  | 6,0   | 0,5   |
| 2002 (4 <sup>th</sup> trim.) | 69,6  | 27,1  | 5,3   | 0,7   |
| 2004 (4 <sup>th</sup> trim.) | 75,4  | 33,6  | 6,6   | 0,5   |

Source: INE, data from LFS 1998, 2000, 2002, 2004

Comparing data from Tables 1 and 2 and Graphic 1 we verified that in the years where the mean age of entrance increased - resulting in a less significant level of participation in the labour market - there was a decrease in the total fertility rate (with exception for the case of 2000). This year has been very atypical in the Portuguese fertility context. The increment in the TFR observed in 2000 could be related with the attraction experienced by parents relatively to the number 2000 (and the beginning of the new century) when they decided the timing of childbearing.

**Graphic 1 – Evolution of the total fertility rate (TFR) in Portugal from 1998 till 2004**



Source: INE

## 1.2. Multinomial logit

In order to study the relationships between the evolution of the age of entrance into the labour market and the age groups, sex and educational level, we utilised a logit multinomial analysis. In Table 4 are presented the variables utilised.

**Table 4 – Means of the selected variables used in Multinomial logit**

| variables | Description                                | Categories                                                                                                                         |
|-----------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| leq3      | Sex                                        | 1. Male<br>2. Female                                                                                                               |
| Grupinser | Age Group of Entrance in the Labour Market | 1. inst up to 14<br>2. inst 15-19<br>3. inst 20-24<br>4. inst 25-29<br>5. inst 30 to 34<br>6. inst 35 to 39<br>7. inst 40 and over |

|                       |                       |                                                                                                                                                   |
|-----------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Grupoetario           | Age Group             | 1. 15-19 years old<br>2. 20 - 24<br>3. 25 - 29<br>4. 30 - 34<br>5. 35 - 39<br>6. 40 - 44<br>7. 45 - 49<br>8. 50 - 54<br>9. 55 - 59<br>10. 60 - 64 |
| Instrnivel            | Level of Education    | 1. less than elementary<br>2. elementary education<br>3. secondary education<br>4. tertiary education                                             |
| dependent variable    | <b>Description</b>    | <b>Categories</b>                                                                                                                                 |
| Grupinser             | Age Group of entrance | 7 categories                                                                                                                                      |
| independent variables | <b>Description</b>    | <b>Categories</b>                                                                                                                                 |
| Female                | Female                | Female=1 if ieq=2, female=0 others                                                                                                                |
| Male                  | Male                  | Male =1 if ieq3=1, male =0 others                                                                                                                 |
| age15-19              | 15-19 years old       | Age 15 to19 =1 if grupoetario =1, age 15 to 19 = 0 others                                                                                         |
| age20-24              | 20-24 years old       | Age 20 to 24 =1 if grupoetario =2, age 20 to 24 = 0 others                                                                                        |
| age25-29              | 25-29 years old       | Age 25 to 29 =1 if grupoetario =3, age 25 to 29 = 0 others                                                                                        |
| age30-34              | 30-34 years old       | Age 30 to 34 =1 se grupoetario =4, age 30 to 34 = 0 others                                                                                        |
| age35-39              | 35-39 years old       | Age 35 to 39 =1 se grupoetario =5, age 35 to 39 = 0 others                                                                                        |
| age40-44              | 40-44 years old       | Age 40 to 44 =1 se grupoetario =6, age 40 to 44 = 0 others                                                                                        |
| age45-49              | 45-49 years old       | Age 45 to 49 =1 se grupoetario =7, age 45 to 49 = 0 others                                                                                        |
| age50-54              | 50-54 years old       | Age 50 to 54 =1 se grupoetario =8, age 50 to 54 = 0 others                                                                                        |
| age55-59              | 55-59 years old       | Age 55 to 59 =1 se grupoetario =9, age 55 to 59 = 0 others                                                                                        |
| age60-64              | 60-64 years old       | Age 60 to 64 =1 se grupoetario =10, age 60 to 64 = 0 others                                                                                       |
| Seminstr              | Less than elementary  | seminstr=1 if instrnivel=1 seminstr=0 others                                                                                                      |
| Instrbas              | Elementary            | instrbas=1 se instrnivel=2, instrbas=0 others                                                                                                     |
| Instrsec              | Secondary             | instrsec=1 se instrnivel=3, instrsec =0 others                                                                                                    |
| Instrsup              | Tertiary              | instrsup=1 se instrnivel=4, instrsup=0 others                                                                                                     |

The categories used as base outcomes were: concerning the dependent variable, the category 1 (up to the age of 14). In the case of the independent variables: in what concerns the variable “age group”, the category 10 (the 60-64 years old); and the category 4 (persons without any educational level) for “educational level” and the category male for “sex”. The models showed significance (Table 5), presenting not significant values only in the cases of the variables that were excluded in Table 6.

**Table 5 – Estimated Results (1998-2004)**

|                      | 1998          | 2000         | 2002         | 2004          |
|----------------------|---------------|--------------|--------------|---------------|
| observations         | 31477         | 18901        | 18566        | 21269         |
| Log Likelihood ratio | -29492,234    | -21250.642   | -20216,802   | -23702,755    |
| LR chi2              | (78) 13031,91 | (78) 9678,64 | (78) 9548,27 | (78) 11088,11 |
| Prob > chi2          | 0,0000        | 0,0000       | 0,0000       | 0,0000        |
| Pseudo R2            | 0,1810        | 0,1855       | 0,1910       | 0,1896        |

Source: INE, data from LFS 1998, 2000, 2002, 2004; Note: All variables are dummies, except “Grupinser”

The results can be summarized as follows: the age of entrance was, in general, later for females; persons with secondary and higher education levels entered, mainly, when aged from 25-35 years. The entrances more early occurred especially in male’s case that, in the moment of the inquiry, had between 35 and 49 years old.

**Table 6 – Logit - Age of entrance into the labour market, by age group, sex and educational level**

| Grupinser (Age Group of Entrance) | Independent variables | RRR1998  | RRR2000  | RRR2002  | RRR2004  |
|-----------------------------------|-----------------------|----------|----------|----------|----------|
| 2 (15-19)                         | age15-19              | 11.20404 | 24.56862 | 31.27961 | 35.58731 |
| 2 (15-19)                         | age20-24              | 1.884252 | 10.32792 | 14.45849 | 22.42344 |
| 2 (15-19)                         | age30-34              | .6932585 | 3.894915 | 4.089633 | 5.021401 |
| 2 (15-19)                         | age35-39              | .6488141 | 3.454199 | 3.500308 | 3.495164 |
| 2 (15-19)                         | age40-44              | .4396577 | 2.179998 | 2.858849 | 3.342867 |
| 2 (15-19)                         | age45-49              | .4335054 | 1.946375 | 1.824333 | 1.879027 |
| 2 (15-19)                         | age50-54              | .5110925 | 1.37777  | 1.768742 | 1.600284 |

|           |                      |          |          |          |          |
|-----------|----------------------|----------|----------|----------|----------|
| 2 (15-19) | age55-59             | .6943375 | 1.447779 | 1.233261 | 1.288531 |
| 2 (15-19) | Female               | 2.450243 | 1.220336 | 1.163481 | 1.194644 |
| 2 (15-19) | tertiary education   | 6.63244  | 19.49405 | 15.37659 | 16.11067 |
| 2 (15-19) | secondary education  | 10.4339  | 15.75912 | 10.90878 | 12.2597  |
| 3 (20-24) | age20-24             | 8.320729 | 13.42397 | 20.54334 | 23.7503  |
| 3 (20-24) | age25-29             | 5.909937 | 6.058392 | 8.262119 | 8.64275  |
| 3 (20-24) | age30-34             | 5.357311 | 4.094558 | 3.70186  | 3.874705 |
| 3 (20-24) | age35-39             | 4.475555 | 3.118894 | 3.764042 | 3.368265 |
| 3 (20-24) | age40-44             | 2.941589 | 2.399196 | 3.377368 | 3.187563 |
| 3 (20-24) | age45-49             | 3.171572 | 1.993571 | 2.372549 | 2.132731 |
| 3 (20-24) | age50-54             | 2.443857 | 2.018817 | 2.287049 | 1.868291 |
| 3 (20-24) | age55-59             | 1.907461 | 1.959879 | 2.023049 | 1.483726 |
| 3 (20-24) | Female               | 2.288624 | 2.048803 | 1.876107 | 1.71808  |
| 3 (20-24) | tertiary education   | 260.0046 | 290.5693 | 274.0443 | 148.4128 |
| 3 (20-24) | secondary education  | 114.2221 | 74.72818 | 67.6913  | 33.84669 |
| 3 (20-24) | elementary education | 3.948603 | 3.350007 | 2.948226 | 1.679475 |
| 4 (25-29) | age25-29             | 3.361504 | 3.523101 | 3.25679  | 3.901113 |
| 4 (25-29) | age30-34             | 3.016863 | 2.926989 | 2.162893 | 2.640775 |
| 4 (25-29) | age35-39             | 2.801518 | 2.619103 | 1.862497 | 1.77352  |
| 4 (25-29) | age40-44             | 1.489127 | 1.494082 | 1.608889 | 2.114201 |
| 4 (25-29) | Female               | 2.576331 | 2.25102  | 2.436635 | 1.800653 |
| 4 (25-29) | tertiary education   | 364.4852 | 534.3868 | 448.094  | 212.9646 |
| 4 (25-29) | secondary education  | 83.26218 | 58.97752 | 46.09533 | 18.15018 |
| 5 (30-34) | Female               | 7.059765 | 6.726109 | 6.407277 | 4.322743 |
| 5 (30-34) | tertiary education   | 83.00601 | 216.6682 | 114.8431 | 91.7766  |
| 5 (30-34) | secondary education  | 33.92508 | 37.88794 | 22.66319 | 13.84554 |
| 5 (30-34) | elementary education | 3.228649 | 5.354673 | 2.517049 | 2.418828 |
| 6 (35-39) | Female               | 24.28451 | 11.67763 | 16.67852 | 9.74077  |
| 6 (35-39) | tertiary education   | 41.3503  | 34.15193 | 16.13819 | 14.58973 |
| 6 (35-39) | secondary education  | 17.51219 | 7.114673 | 20.26054 | 4.331104 |
| 7 (40+)   | age40-44             | .2051166 | .0815604 | .3400376 | .4699622 |
| 7 (40+)   | Female               | 51.91474 | 86.99355 | 41.72085 | 73.7059  |
| 7 (40+)   | elementary education | 3.0648   | 2.887524 | 2.045342 | 2.323472 |

Source: INE, data from LFS 1998, 2000, 2002, 2004

The logit model showed that being a woman, being younger or having a higher qualification implied a later entrance into the labour market. On the other hand, being a man, being older or having lower education implied an earlier entrance into the labour market.

## Conclusions

The results revealed the postponement of the age of entry in the labour market due to the enlargement of the lifetime period of education and probably, to the difficulty of getting a job. However there is no scientific information to support the later statement. The decrease of the total fertility rate that has been simultaneously verified, placing in risk the future replacement of the generations, can be associated to the referred postponement. This research is still in progress, so we expect to have soon some consistent findings that can tell us more about that association, specifically between the postponement of motherhood and first job participation.

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