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Time to Complete a Pos-graduation: some evidence of “school effect” upon ISCED 6 trajectories

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Time to complete a Post-graduation: some evidence on “school effect” upon ISCED 6 trajectories¹

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Abstract

Most Portuguese higher education institutions are increasingly compelled to observe rather strict arrangements in what concerns time to achieve post-graduation studies. Actually European equivalence and mobility procedures in the framework of the Bologna process will not allow for considerable heterogeneity in this light. Nevertheless research carried recently on four Portuguese higher education institutions’ MSc. and PhD programmes revealed there is still a large amount of diversity among average time spells required to complete identical degrees. This outcome suggests that under strict time arrangements Bologna 2nd. and 3rd. cycles rate of success will widely vary among higher education institutions. Individual longitudinal data relative to a representative sample of the abovementioned MSc. and PhD. trajectories allows us to adjust a duration model and thereby investigate some of the main features behind those so different time spells, that is to say so heterogeneous success patterns. A quite meaningful “school effect” revealed to be one of the most striking outcomes.

JEL classification: I 23

Keywords: Individual post-graduation trajectories; advanced studies (ISCED 7) organisation; duration models.

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Time to complete a Post-graduation: some evidence on “school effect” upon ISCED 6 trajectories

1. Purpose and General Background

Increasing competitiveness among and for high level skills together with international policies fostering HRSTE equivalence and mobility both reinforce the role played by post-graduation programmes assessment (Eggins 2003).

Most research carried on this issue still relies nevertheless upon cross section methodologies supported by synchronic data most of times. But learning is by itself a rather complex multidimensional and time dependent process. Likewise analyses on school success and failure risk neglecting a great deal of the corresponding major determinants whenever they do not allow for dynamics.

Actually time spells taken by individuals to complete either a Master (MSc.) or a Doctorate (PhD.) are still quite diverse among and sometimes inside higher education institutions as it can be confirmed empirically. Therefore it seems quite advisable that assessment procedures be complemented by specially designed evaluation which should follow a dynamic methodology supported by longitudinal data on individual post-graduation trajectories.

Bologna Reform provides a general institutional framework, actually a prerequisite for further equivalence and mobility. But it will not be powerful enough to foster equal opportunities among individuals who seek for post-graduation certificates; for those who come from countries, as Portugal, in which severe limitations have been appointed to education and training systems chances to become mobile and competitive will inevitably be fewer. So, it seems to be worthwhile to get a further insight on some of the main obstacles Portuguese post-graduate have been encountering along their advanced studies

trajectories³, as it will most probably determine further Bologna second and third cycles rates of success.

Actually, it should be noticed that quite diverse impending restrictions can be at stake by the time one attends a post-graduation: there can be employment and income restrictions, family responsibilities, self motivation and resilience, programmes scheduling and general accessibility, among many other.

OECD Examiners' Report on higher education in Portugal, for instance, stresses that "(...) price is a major determinant of student choice (...)" (OECD 2006: 28), an outcome which doesn't surprise us given the average level tuition fees can attain against public social policy narrowness. Most Portuguese post-graduation students have indeed to depend on a fellowship (or a place in the labour market) as well, according to the Portuguese Science and Technology Foundation's (STF) fellowship database. The above OECD Report states that Graduation students' motivation depends strongly on the institutions location and their availability close to the applicant's residence as well. Will this same kind of reasons affect also decisions to follow post-graduate studies?

Besides learning obstacles intervening at the time in which a given education level attendance is taking place many other determinants occur at earlier stages, the role of which literature and research have been stressing. Among them we must refer to each individual's family school level, own previous schooling patterns and the role played by education institutions successively attended.

Obstacles like the above ones have been emphasized mostly by education sociology when trying to approach multiple interaction effects exerted by the interplay between individual and structural factors along life cycle trajectories. By relying upon dynamic analyses, research of the kind has been enlightening the meaningful role usually played by one's previous school record either upon further studying or ulterior employment and career opportunities. Together with research in economics of education those approaches outcomes have also been shedding light on the influence exerted by origin (father's and/or mother's) and raised family's social and educational background upon studies and

³ By advanced studies we mean post-graduation programmes classified under ISCED 7. For this paper practical purposes seven MSc./PhD. and one MBA programmes are considered.

employment success. Actually they emphasize how these determinants interplay to foster not only educational access and success (or failure) material requirements but also background values, beliefs and motivation which shape life cycle trajectories (Plug 2002; Watson 2003; Devereaux & Salvanes 2004).

Also effects exerted by the education institution upon individual's opportunities and success ("school effect") have been receiving a large concern, mostly in what has to do with basic and secondary education (Hobcraft 2000; Duru-Bellat 2002; UNICEF 2002). More recently, in the eve of Bologna agreement, alike research has been developed which concerns the effects played by higher education institutions (Noyes 2003; Ammermüller 2005).

Research on the Portuguese upper secondary and tertiary patterns has been providing evidence which confirms the influence exerted by most of the above factors (Chagas Lopes et al 2004, 2005 a), 2005 b), 2006). Amâncio (2005) and Perista et al (2004), among other, focus on gender role impact upon graduation and employment opportunities in Portugal.

So, it seemed to be worthwhile to investigate whether a same kind of reasons could have any impact upon post-graduation trajectory patterns, as well.

Economic time, e.g. the state of the economy and the labour market by the time when individuals complete a post-graduation, is also a matter of concern namely when research is considering post-graduate employment opportunities, which is not the case in this paper⁴.

Most of times a compound of the above reasons will be responsible for failure or delay in studies completion, a great deal of the determinants lying outside the scope of economics of education. Likewise research approaches on these issues frequently call for interdisciplinary work, as it is the case with Project Telos II. This should be seen as the obvious counterpart for trying to build a research methodology robust enough to disentangle between individuals' (and their ecosystems) and post-graduation institutions'

⁴ To control for the economic cycle and its effects upon labour market opportunities Project Telos II sample has been stratified into two sub-groups according to the post-graduation completion years: 1995-96 and 2000-01.

responsibility for success and failure, an outcome which Bologna Reform should not look as unworthy, we believe.

Summing up: we intend to assess the joint effect exerted by the abovementioned determinants, or at least most of them, upon post-graduation trajectories. For that purpose we take time required to complete a MSc. or a PhD. as an operative proxy for the dependent variable.

The plan of the paper is as follows: in Section 2 we briefly review literature and leading issues on life cycle trajectories and duration models. Data description and questionnaire main contents are addressed in Section 3. In Section 4 we present and discuss the main outcomes obtained from duration models adjustments, without and with higher education institution as a categorical variable. Finally, we present the main conclusions in Section 5.

2. Life cycle trajectories and duration models

Individual longitudinal trajectories have for long deserved increased attention among research developed in labour economics⁵.

This growing relevance occurs in the framework of human capital theories criticism and inscribes into a broader modern approach for which scope the role played by life cycle theories attracts an increasing concern. The latter main purposes encompass the identification of the major interactions which take place between education/training and work/earnings (and family, sometimes) trajectories along individual life cycles⁶.

Opposite to which happens with those approaches developments in labour market research, their focus on education and training patterns is deserving a still smaller concern

⁵ See, for instance, Ben-Porath (1967), Heckman & Macurdy (1980), Willis (1987), Albrecht et al (1991), among other.

⁶ A relevant research which combines learning and work trajectories along life cycles has been developed by Weiss (1986). It deserves to be mentioned as a seminal approach not only because it sets the combined effect exerted by schooling and work experience upon human capital rate of growth but especially because it allows for employment separations and consequent human capital obsolescence.

despite the increasing role played by research on individual decision making relative to lifelong learning.

Nevertheless, applying life cycle theories to education and training programmes attendance appears to be quite advisable whenever research concerns the effects exerted by learning and schooling obstacles upon time needed to complete those programmes.

As far as post-graduate studies are concerned factors such as students' situation towards employment and occupational status, learning and career opportunities, family structure and responsibilities, family's (father's and mother's but also husband's/wife's) human capital, among other, are expected to meaningfully condition both success or failure outcomes as well as time spells required to complete post-graduation programmes.

Together with the above ones, also individual's personal characteristics, as age and gender, own previous schooling landmarks (namely, graduation's institution, field and starting and completing dates) and "school effect", e.g. the influence exerted by post-graduation institutions upon individual's learning success, deserve to be investigated. For that purpose there is a need to assess features such as curricula contents and syllabuses, course organization and time scheduling, as well as their foreseen adequacy and pertinence towards further work and career expectations.

When trying to identify such a kind of determinants joint influence upon time spells required to complete a MSc. or a PhD. applying duration models seems to be particularly adequate⁷. Cox proportional hazard models are frequently used to adjust duration models mostly because they do not impose any specific probability distribution for time T , actually a major difficulty most of times. Besides, Cox models allow us to work both with censored and not censored data, as well.

Likewise, we would let T represent the duration spell needed to complete a post-graduation programme, being T a random variable with distribution function $F(t) = P(T \leq t)$. Therefore, the survivor function would come $S(t) = P(T \geq t)$ and for the corresponding hazard function we would have $h(t) = f(t)/S(t)$, with $f(t)$ the density

⁷ See, for instance, Heckman & Macurdy (1980), Bollens & Nicaise (1994), Box -Steffensmeier & Zorn (1998), among other, for a review on duration models applications in social sciences.

function for T . Adapting duration models conceptualization to the time length required to complete an advanced studies programme we would say that the hazard function represents the instantaneous probability of completing the post-graduation at time t , given the individual was attending it up to that time moment.

For such a duration model, and using the Weibull specification for the baseline survivor function, we would have (Leão Fernandes, Passos & Chagas Lopes 2004):

$$h(x, t) = pt^{(p-1)} e^{-x\beta}$$

with x representing the characteristic variables, β the corresponding parameters and p staying for time influence.

Nevertheless, for the specific purpose of this paper we did not consider p , e.g. the economic time influence. Actually, we are not concerned here with post-graduates' labour market insertion conditions once MSc. or PhD. having been completed. Besides, the relatively close proximity between the two sub-samples completing dates (5 years) did not allow for meaningful changes in what had to do with most determinants pattern of influence: cultural and social capital transmission effects are lengthy and evolve slowly as well as family patterns and also Government transfer and fellowship policies. Even post-graduation design and organisation arrangements inside institutions were supposed to remain unchanged along this time interval. Actually, interviews with MSc. and PhD. coordinators revealed that intervening organisation changes did not meaningfully affect average duration spells.

Conversely, initial, or previous, conditions, introduced throughout the baseline hazard (h_0) concerned us for the reasons we have been describing and therefore we applied alternatively a continuous time model which proportional hazard rate can be written (see also Lawless 1982; Kachigan 1986):

$$h(t|x) = h_0(t)e^{x\beta},$$

with h_0 the baseline hazard function and x the covariates matrix. The corresponding distribution function being

$$F(t) = \Pr[T \leq t] = \int_0^t f(x)dx$$

and the survivor function, $S(t)$

$$S(t) = \Pr[T \geq t] = \int_t^{\infty} f(x)dx$$

with $S(t)$ continuous, monotonous and decreasing.

Actually, given the methodology applied to the sample design we had not to deal with censored time intervals, as it will be explained later.

Therefore, we set that time spell required to complete a post- graduation – e.g., the likelihood that a MSc. would take more than two years to complete – would depend upon:

- initial (baseline) conditions, h_0 , such as parents' education level, own qualifications, field of study, graduation institution and year, situation towards employment when she/he decided to enrol the post-graduation programme;
- some previously known individual characteristics, like gender, age, place of birth and residence; other intervening determinants as changing employment and career status or expectations, changing family structure or size; and post-graduation institution (x).

3. Data

One of the main purposes of Project Telos II consisted in obtaining data on Portuguese post-graduation patterns in the framework of lifelong learning research studies. The research methodology design considered the systematic depicting of the sample individuals' life cycle trajectories in what had to do with learning and work landmarks.

Besides this kind of time sensitive data it has also been retrieved a considerable amount of information on other pertinent fields throughout interviews with post-graduation directors (UIED 2005), as previously referred.

A survey has been designed and addressed to a representative sample of post-graduates who had completed a MSc. a PhD., or both, in each one of the four adherent Portuguese higher education institutions⁸. This led to address all those who had completed each one of the above degrees in anyone of the four institutions in the school years 1995-96 and 2000-01⁹:

Table 1- Population: Breakdown by Institution, Post-graduation degree and completing year

	MSc.		MSc. TOTAL	PhD.		PhD. TOTAL	MSc. and PhD. TOTAL
	1995-96	2000-01		1995-96	2000-01		
Institution 1	40	33	73	6	14	20	93
Institution 2	48	47	95	6	11	17	112
Institution 3	52	101	153	19	27	46	199
Institution 4	6	16	22	1	13	14	36
TOTAL	146	197	343	32	65	97	440

Source: UIED, 2005.

Legend: *Institution 1 – New University of Lisbon (FCT)*

Institution 2 – Technical University of Lisbon (ISEG)

Institution 3 – University of Aveiro

Institution 4 – University of Lisboa (FPCE)

⁸ Technical University of Lisbon (School of Economics and Management, ISEG), New University of Lisbon (Faculty of Sciences and Technology), University of Aveiro (Department of Education) and University of Lisboa (Faculty of Psychology and Education).

⁹ Actually, only 440 among the 569 possible individuals, due to address change and other “noise” restrictions.

By taking into consideration those two scholar years -1995/96 and 2000/01 – we would be able to identify and control for the main influence exerted by the economic cycle upon individuals' employment opportunities both before and after the post-graduation attendance, a feature which is not concerning us in this paper.

The sample size was about 33% from that universe (145 individuals) and revealed to be gender and age representative, 52,4% being the feminization rate and the age distribution modal class corresponding to the 35-45 years interval. Most respondents (75,2 %) were married/living in a couple with children or other dependents by the time of the survey; a non negligible number (about 4%) was still living with parents nevertheless.

As to parents' school level, about 32% among fathers and some 36% among mothers had not attended school further than the basic education first cycle, actually the most frequent education level among Portuguese elder population. But some 22% and 29 % (for fathers' and mothers', respectively) were described as performing (or having performed) a "scientific or intellectual" occupation. Relatively to the husbands'/wives' school level we could observe the very well known "endogamic" traits, as expected: most MSc. and PhD. graduates' companions have got at least a tertiary level education, about 75,5% among them performing a "scientific or intellectual" occupation as well. Actually, this is what since Becker's approach is usually referred as "assortative mating" (Becker 2005), a concept which strongly bears within that author's neo-classical economics focus. A perspective which has been systematically discussed and set under review by most sociologists of the family and marriage¹⁰.

As an outcome of the survey we obtained data which allowed us to reconstruct 145 post-graduation traectories, being 108 MSc.'s and 37 PhD's¹¹. For each trajectory it became possible to establish therefore a time schedule which metric relied upon post-graduation(s) starting and completing dates (month/year). Likewise we could deal with closed time intervals for each individual and dated situation avoiding therefore the need to correct for interval-censored situations. All features we expected to intervene as main determinants have been dated as well, as we have been describing.

¹⁰ For a literature review on this last approach see, for instance, Torres (2001).

¹¹ For sake of easiness we classify in this paper ISEG MBA trajectories as MSc.'s.

The main questions addressed by the survey may be described as follows:

- those concerning individuals' and their close relatives' personal characteristics, such as age, gender, place of birth and school level, as well as her/his father's /mother's and husband's/wife's school level and occupations;
- questions on each individual's previous school trajectory, as the field of study during upper secondary, graduation area, institution and graduation initial and final year; motivation and reasons to attend post-graduation, as well as the perceived leading obstacles; higher education institution(s) in which MSc. and/or PhD. had been completed, as well as the corresponding beginning and completing dates (month/year);
- questions concerning situation towards employment before, during post-graduation¹² and afterwards, which were classified by occupation, industry, kind of labour agreement and time to get employment in each search situation;
- family structure: living with parents or raising one's family, number of children and/or other relatives before, during and after post-graduation completion;
- respondent's general assessment on post-graduation main features: syllabuses and curricula evaluation and adequacy towards occupational requirements, pedagogical methodologies, contribution to foster skills development, professional attitudes and personal further learning;
- questions on individual's sense of fulfilment and satisfaction with the occupational situation and professional status as a consequence of/after post-graduation completing.

¹² The questionnaire design allowed as well the identification and dating of every change in situation towards employment and/or occupation occurring during post-graduation attendance.

4.Results and Discussion

Our research deals mainly with life cycle transitions, namely in what has to do with school trajectories and patterns. Likewise, before analysing time influence throughout duration models we developed an exploratory analysis in order to further investigate on the transition and dynamic variables main trends.

One of the main questions under research had to do, of course, with studying fields and possible moving among them from graduation to MSc. and/or PhD. The following table provides us a meaningful insight on these features:

Table 2 - Fields of study: Graduation, Master and Doctorate

<u>Field of Study</u>	Graduation	Master	Doctorate
Education Sciences	0,7	12,2	13,5
Foreign Languages	4,9	2,9	0,0
Mother Language	4,2	2,9	0,0
Economics	16,7	12,9	18,9
Business Administration	6,3	8,6	5,4
Biology & Biochemistry	5,6	3,6	2,7
Chemistry	11,1	3,6	10,8
Electronics and Automation	6,9	7,2	8,1

Source: UIED, 2005

According to the table it seems three leading patterns can be depicted: i) some fields, like Education Sciences, appear mostly as destination fields, as almost no individual among the sample graduate in that area; ii) some other, as Foreign and Mother Languages, seem to appear mostly as career starting domains, the corresponding MSc. and PhD. fields lying in different research areas, most probably the Education Sciences one; iii) for the other fields there seems to be a continuous pattern from Graduation to MSc. and even

PhD., an outcome which appears mostly striking in Economics, Chemistry and Electronics.

The above results are expected to affect individual mobility among higher education institutions when trying to advance towards higher degrees. Actually only 10 among the 145 individuals kept in the same institution from Graduation to PhD, 5 among them in one of the institutions providing Graduation, MSc. and PhD in Economics.

Another feature requiring a further insight concerns the need to breakdown between individuals following an academic career and other professionals. Actually, either reasons and motivations, obstacles and constraints, further occupational outcomes and degree of fulfilment... will strongly depend upon that decomposition. Analysing the database we can observe that about one half of the sample individuals (48, 9%) were following an academic career: 45 among MSc's and 26 among PhD's.

To further clarify this latter issue, we applied Contingency Analysis to “time required to complete a MSc.” and “pursuing an academic career” and obtained for the χ^2 significance level a value equal to 0,081, quite close to the 0,05 tolerance level. Proceeding identically for PhD., we obtained no conclusive outcome giving the small number of individuals in this situation. The above results advised us to deal with this feature with most precaution when applying duration models.

Both exploratory analyses and parallel research on this same database have showed that gender effects exert a very strong influence upon individuals' time to complete post-graduate studies (Chagas Lopes 2006). Therefore every adjustment we made has been stratified by sex, although we will not discuss here the corresponding outcomes.

As to location, a feature we must remember OECD Examiners' Report includes among the main obstacles to further studying, we also investigated on its effect. Contingency Analyses did not confirm association between higher education institutions (Graduation, MSc. or PhD) and either origin or present residence location. Notwithstanding time to complete a Graduation proved to be quite well associated with

residence location (χ^2 significance level equal to 0,039), a feature which will not concern us as we are dealing with post-graduation trajectories.

As previously referred we are particularly concerned with the influence exerted by higher education institutions, among other variables, upon time spells individuals need to complete graduation. Despite Contingency Analyses did not unequivocally allow for those variables association, we assume that a great deal of other variables intervening throughout higher education institution may affect those time spells. Therefore, we tried to assess those variables joint influence upon post-graduation duration.

In face of the obvious differences between MSc. and PhD. grades in as much as attendance reasons, potential obstacles and success/failure rates are concerned we decided to analyse separately the corresponding situations. Likewise we considered at a time either the 108 MSc. or the 37 PhD. trajectories.

As previously referred (Section 2) we applied Cox proportional hazard models to adjust for our concerning variables (covariates) joint influence upon time length required to complete a MSc. or a PhD. once started. For the *dependent variable*, e.g. time needed to complete either degree (or conversely, the probability that a MSc./PhD. would take, for instance, longer than two years to complete) we computed it for each observation by subtracting starting from completing dates once normalised.

Covariates were selected from the database according to literature outcomes, our research hypothesis developed in Sections 1. and 2. and the above exploratory results. On account of the outcomes we previously obtained for gender association with other variables we decided to set sex as a stratification categorical variable, thereby allowing for separate baseline hazard functions for women and for men.

Also for each grade (MSc. and PhD.) we alternatively computed adjustments without/with higher education institution as a categorical variable. Likewise, in this latter situation we could disaggregate among different higher education institutions specific influence and consider, or not, it to be influent according to the value for the overall Wald significance test.

4.1.- Adjustment without categorical variable

The adjustment for MSc. trajectories with **no** categorical variable provided an acceptable outcome according to the overall tests and scores¹³(See Appendix 1). Adjustment outcomes displayed by SPSS (version 15.0) provide not only values for the unstandardized regression coefficients β , which cannot be used for prediction, but also some corresponding tests, as the Wald test significance: whenever the latter will be equal or lower than 0,05 the corresponding variable will be considered relevant. Therefore, the following variables and influence have been accepted: Graduation and Master institutions (establ; estabm); several reasons to have completed MSc. (being able to perform the desired occupation – razcurm 7; employer's demanding – razcurm 13; wish to studying further – razcurm 16 and wish to develop own scientific culture – procfm 14); satisfaction with academic work and career (satacadm and peracadm, respectively); lack of support by employer and family (obstfor 2 and obstfor 3, respectively); present occupation status in terms of kind of labour agreement and tenure (relconta; dur2ocup2).

Additionally, in a model like the current one positive values for the coefficients are equivalent to higher values for the hazard function or, conversely, shorter durations (Box – Steffensmeier & Zorn 1998). Thus, negative values for covariates coefficients – whether acceptable – will mean the corresponding variables will affect positively time duration, e.g., will imply longer time spells. This is the case with establ and estabm, razcurm13, satacadm e obstfor3, which means that longer durations are mostly induced by previous and present scholar institutions, employer's behaviour, own degree of satisfaction towards academic career and lack of support by family.

¹³ According to most authors (e.g. Garson 2005) overall tests (*Omnibus tests of model coefficients*) upon which acceptance relied are Qui-square magnitude and significance level (lower or equal to 0,05).

Table 3 - Variables in the Equation (main scores ant tests)

Variables	β	Wald	Exp(β)
Establ	-0,006	0,040	0,994
Estabm	-0,006	0,031	0,994
Razcurm 7	0,077	0,052	1,080
Razcurm 13	-0,054	0,017	0,947
Razcurm 16	0,015	0,002	1,015
Satacadm	-0,015	0,001	0,985
Peracadm	0,118	0,027	1,125
Obstfor 2	0,005	0,000	1,005
Obstfor 3	-0,030	0,001	0,971
Relconta	0,038	0,031	1,038
Dur2ocup2	0,028	0,014	1,029
Profcm 14	0,058	0,011	1,060

Legend: *Establ* – Graduation institution; *Estabm* – Master institution; *Razcurm 7* – Preparing to perform the desired occupation; *Razcurm 13* – Employer’s demanding; *Satacadm* – Satisfaction with academic work; *Peracadm* – Satisfaction with academic career; *Obstfor 2* – Lack of support by employer; *Obstfor 3* – Lack of support by family; *Relconta* – Nature of labour agreement present occupation; *Dur2ocup2* – Present occupation tenure; *Profcm 14* – Wish to develop own scientific culture.

From the above table we can also observe values for $\text{Exp}(\beta)$, or the *Odds ratios*, from which values we can infer the predicted change in the hazard function induced by each variable: the higher the *Odds* (above 1,0) the larger the expected influence. Therefore, degree of satisfaction with academic career (peracadm), becoming able to perform the wished occupation (razcurm 7), wish to develop scientific culture (profcm 14) and, in a smaller way, present occupation (by the time of the enquiry) statutory conditions (relconta and dur2ocup2) all exert an amplifying effect.

Features concerning academic occupations and career appear therefore to be the most meaningful among this adjustment’s outcomes. Actually, both higher education teaching

and research requirements, some of the corresponding occupations and career administrative arrangements, and sense of fulfilment with this kind of occupation, all of them seem to be at stake now. It also deserves to be mentioned that either Graduation and MSc. institutions play a highly meaningful role in as far as time each individual has required to complete a MSc. is concerned. Notwithstanding some matter of concern arises from the apparent contradictory role played by employers: either it seems they set MSc. achievement as a goal or a requirement to be met or they appear among the main obstacles to its completing, together with family. Were there be no further reasons, this single outcome led us to conclude on the probable heterogeneity of the surveyed population. Therefore it appeared to be most advisable to advance throughout a more disaggregated analysis.

4.2.- Adjustment with categorical variable

When we set a given variable as a categorical one the corresponding values will perform the role of *dummies* and compare with the reference (omitted) one. In the present situation each MSc. /PhD. institution has been codified as many times as the number of questioned programmes leading to a different grade, e.g. seven. Results for MSc. Cox regression adjustment setting the institution as **categorical** (indicator) variable are shown in Appendix 2. It is worth to be mentioned that this second outcome provided better results for the overall statistical tests than the previous one (overall Qui-square significance level now equal to 0,002, against a former value equal to 0,007).

Nevertheless the Wald test for the joint MSc. institutions presents now a value which does not unequivocally state for the influence exerted by each one of them, except for “estabm(3)”. Considering covariates significance level (S, see Appendix 2) as an additional test, both “estabm(3)”, “estabm(1)” and to a lesser extent “estabm(2)” appear to exert a meaningful despite symmetrical influence upon time spells required to complete a Master¹⁴. According to β signs, it seems that shorter durations appear to be associated with “estabm(2)” and “estabm(6)”, these same two institutions seeming to exert larger impacts as well in view of the values associated with the corresponding $\text{Exp}(\beta)$.

¹⁴ Quite obviously, observations associated with “estabm(5)” seem to be spurious and have not been taken into consideration.

As to the other covariates effects we must emphasize the following ones: Graduation institution (establ), kind of occupation after MSc. completing (pfcurm), some of the reasons to have attended a Master (being able “to change” or to “perform better” one’s employment – razcurm 3 and razcurm 6, respectively, together with aiming to improve “participation in work organisation” - procfm 10 and, more pragmatically, just the sake for obtaining a MSc. certificate – procfm 7) and first occupation tenure (dur1ocup1). Now, shorter durations seem to be associated with previous Graduation institution (establ), wishing to change from employment (previous or coincident to post-graduation attendance) and first employment tenure (razcurm 3 and dur1ocup1, respectively), wish to participate in work organisation (procfm 10) or simply seeking for a MSc. certificate (procfm 7). Only Master institution, kind of occupation after MSc. completing and wish to perform better her/his own job, appear now as implying longer time spells duration. At the same time, only three variables seem to exert now a meaningful amplifier effect, according to values exhibited by $\text{Exp}(\beta)$: preparing for participating in work organisation (procfm 10), seeking for a MSc. certificate (procfm 7) and preparing to change employment (razcurm 3).

Table 4 displays values behind these conclusion

Table 4 - Variables in the Equation (main scores ant tests)
(estabm as categorical)

Variables	β	Wald	Exp(β)
Establ	0,006	0,019	1,006
Estabm(3)	-0,017	0,000	0,983
Pfcurm	-0,119	0,021	0,888
Razcurm 3	0,038	0,005	1,039
Razcurm 6	-0,060	0,016	0,942
Durlocup1	0,019	0,008	1,019
Procfm 7	0,038	0,007	1,039
Procfm 10	0,066	0,015	1,068

***Legend:** Establ – Graduation institution; Estabm – Master institution; Pfcurm – Occupation after Master completing Razcurm 3 – Preparing to change employment; Razcurm 6 –Preparing to perform better own employment; DuLocup1 – First occupation tenure; Procfm 7 – Seeking for a Master certificate; . Procfm 10 – Preparing for participation in work organisation.*

We should notice as well that two evaluation criteria variables almost reached the significance level tolerance threshold (See Appendix 2): “quality and adequacy of the programme equipment and pedagogical resources” (aval_fm 9) and, in a lesser extent, “curricula adequacy towards own learning purposes” (aval_fm 1), two outcomes which we will keep for further research.

Now other reasons and motivations different from strict academic purposes could appear. Actually, we can now wonder how far investing in a MSc. could have been designed as a professional mobility strategy, a way to improve one’s ability to intervene in work conditions and perhaps also a device to fight against labour precariousness (considering “durlocup1”). Clearly, own previous scholar trajectory could appear again as playing a powerful influence throughout the variable “Graduation establishment”.

*

* *

Applying the same methodology to investigate time required to complete a **PhD**, proved to be unsuccessful and we obtained no convergent adjustment. This result did not surprise us given the few number of doctorate trajectories present in the work sample.

Trying to improve the possible characterization of this latter kind of trajectories we developed some complimentary statistical analyses (using Contingency and Discriminant techniques) and thereby were able to state that two single variables appeared to exert a meaningful influence: “wish to develop own studies and knowledge” and “mother’s school level”. Will this apparent association be in line with most doctorate’s graduation fields, e.g. scientific and cultural occupations and teachers’ training? That’s just a hypothesising question, reliable conclusions on this issue absolutely requiring a more robust database.

5. Conclusion

Despite data limitations we think our main purposes have been fulfilled which may serve as a starting point for further more in depth analyses.

First of all we shed light into adequacy of longitudinal data for research on time dependent processes as it is the case with school and learning degrees. Actually we obtained rather systematic outcomes in which concerns the role played by most determinants and leading issues affecting duration of time spells needed to achieve post-graduation studies.

A first meaningful result concerns mobility among studying fields and, as a consequence, among higher education institutions, mostly between Graduation and MSc’s but also towards PhD’s institutions. Contingency analysis displayed a strong association between Graduation institution and place of residence, an outcome which goes in line with the already mentioned OECD Examiners’ Report. Nevertheless, no geographical

accessibility restrictions appeared to intervene as a major obstacle for post-graduate studies, both for Lisbon institutions' and also Aveiro University's post-graduates.

Duration model adjustment without categorical variable displayed outcomes which we considered quite biased on account of academic trajectories influence, which nevertheless amount to no more than roughly 50% of the whole sample: both duration trends and amplifying effects proved to be quite contingent on academic career variables, as well as on work and family ones.

Readjusting the model by setting MSc. establishment as a categorical variable it became therefore possible to disaggregate among two kinds of MSc. institutions and programmes: those mostly featured to provide academic professionals, and the more transversal ones addressed to broader occupational fields. We could obtain quite diverse outcomes relatively to MSc. institutions and programmes, both in what concerns duration trends and magnitude of effects. Now, also occupational and professional reasons – other than academic ones – proved to be quite meaningful in shortening duration spells: among them we emphasize those associated with previous occupations' statuses, mobility strategies and even a “credential effect”, the latter introduced by a non negligible number of respondents who referred just the sake for obtaining a MSc. certificate among their leading motivations.

Labour market reasons seem to play, indeed, a major role. Either under the form of academic career and corresponding requirements or whenever MSc. intentionally plays the role of job search, horizontal or upward mobility strategies in which concerns other occupation's trajectories. In either situation also the willingness to improve one's knowledge and further learning could be derived as a meaningful outcome, this result requiring a more robust data support in further research.

Family effects are quite obvious as well: they became particularly evident throughout most respondents' answers signalling them among obstacles to complete MSc. within a shorter time spell. Perhaps also mother's school level - the only family's “human capital” among the outcomes - will be affecting most PhD. patterns and determinants but results were not conclusive enough on this feature neither were they relatively to the other PhD. outcomes.

In either model Graduation establishment revealed to exert a relevant influence upon time duration. Heterogeneity among post-graduation institutions relatively to features under review revealed to be quite obvious, as well. Therefore we are now able to disentangle among the ones in where a MSc. takes less time and the other which perform worse under this point of view. And we also obtained meaningful signalling on which institutions (from the respondents' point of view) offer the most interesting curricula and are considered better equipped among the ones which the Project researched.

Actually, the role played by education institutions, both Graduation and Master ones, appeared to be most relevant. This outcome allows us to state that an important “school effect” will go on affecting school trajectories into a further path – post-graduate studies – than the ones with which research is usually concerned, as we had previously set as a research hypothesis.

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APPENDIX 1

Block 1: Method = Enter

Cox Regression

[DataSet1] D:\BASE TELOS.sav

Case Processing Summary

		N	Percent
Cases available in analysis	Event ^a	108	100,0%
	Censored	0	,0%
	Total	108	100,0%
Cases dropped	Cases with missing values	0	,0%
	Cases with negative time	0	,0%
	Censored cases before the earliest event in a stratum	0	,0%
	Total	0	,0%
Total		108	100,0%

a. Dependent Variable: Data Inic/Data Fim Mest Tratada

Stratum Status^a

Stratum	Strata label	Event	Censored	Censored Percent
1	masculino	47	0	,0%
2	feminino	61	0	,0%
Total		108	0	,0%

a. The strata variable is : Género

Block 0: Beginning Block

Omnibus Tests of Model Coefficients

-2 Log Likelihood	719,255
-------------------	---------

Block 1: Method = Enter

Omnibus Tests of Model Coefficients^{a,b}

-2 Log Likelihood	Overall (score)			Change From Previous Step		
	Chi-square	df	Sig.	Chi-square	df	Sig.
614,731	123,544	88	,007	104,523	88	,110

Omnibus Tests of Model Coefficients^{a,b}

Change From Previous Block		
Chi-square	df	Sig.
104,523	88	,110

a. Beginning Block Number 0, initial Log Likelihood function: -2 Log likelihood: 719,255

b. Beginning Block Number 1. Method = Enter

Variables in the Equation^b

	B	SE	Wald	df	Sig.	Exp(B)	95,0% CI for Exp(B)	
							Lower	Upper
datanac1	,281	,377	,556	1	,456	1,325	,633	2,774
concrec	-,002	,001	8,862	1	,003	,998	,997	,999
sitfamil	-,003	,008	,136	1	,712	,997	,981	1,013
nivescp	,816	,237	11,804	1	,001	2,261	1,420	3,600
nivescm	-,574	,247	5,370	1	,020	,564	,347	,915
nivesc	,239	,107	4,973	1	,026	1,270	1,029	1,567
profissp	,002	,001	1,676	1	,196	1,002	,999	1,004
profissm	-,001	,001	2,793	1	,095	,999	,997	1,000
profissc	,001	,003	,205	1	,650	1,001	,996	1,007
areafor1	-,001	,003	,312	1	,576	,999	,993	1,004
areafor2	-,004	,003	1,471	1	,225	,996	,990	1,002
establ	-,006	,031	,040	1	,842	,994	,936	1,055
estabm	-,006	,032	,031	1	,859	,994	,934	1,058
diffic1	-1,008	,335	9,086	1	,003	,365	,189	,703
profcurm	1,094	1,037	1,113	1	,291	2,987	,391	22,810
exigcarm	,346	,460	,564	1	,453	1,413	,573	3,484
pfcurm	-,278	,644	,186	1	,667	,758	,214	2,678
outcursm	1,160	,515	5,075	1	,024	3,191	1,163	8,756
arfcurm	,002	,002	1,354	1	,245	1,002	,999	1,006
razcurm1	-,178	,425	,175	1	,675	,837	,364	1,925
razcurm2	,748	,332	5,064	1	,024	2,112	1,101	4,050
razcurm3	-,480	,483	,990	1	,320	,619	,240	1,594
razcurm4	-,263	,554	,225	1	,635	,769	,259	2,279
razcurm5	,233	,369	,397	1	,529	1,262	,612	2,602
razcurm6	,157	,469	,112	1	,738	1,170	,467	2,932
razcurm7	,077	,337	,052	1	,819	1,080	,577	2,093
razcurm8	,142	,338	,176	1	,675	1,152	,594	2,236
razcurm9	,251	,245	1,056	1	,304	1,286	,796	2,077
razcur10	,948	,545	3,029	1	,082	2,582	,887	7,512
razcur11	-,626	,261	5,753	1	,016	,535	,321	,892
razcur12	-1,036	,557	3,461	1	,063	,355	,119	1,057
razcur13	-,054	,419	,017	1	,897	,947	,417	2,153
razcur14	-,214	,467	,210	1	,647	,807	,323	2,016
razcur15	,318	,350	,826	1	,364	1,375	,692	2,733
razcur16	,015	,317	,002	1	,963	1,015	,545	1,888
razcur17	-,976	,624	2,446	1	,118	,377	,111	1,280
satacadm	-,015	,406	,001	1	,971	,985	,445	2,184
peracad	,118	,718	,027	1	,869	1,125	,275	4,601
obstfor1	-,475	,538	,781	1	,377	,622	,217	1,784
obstfor2	,005	1,430	,000	1	,997	1,005	,061	16,589
obstfor3	-,030	1,262	,001	1	,981	,971	,082	11,505

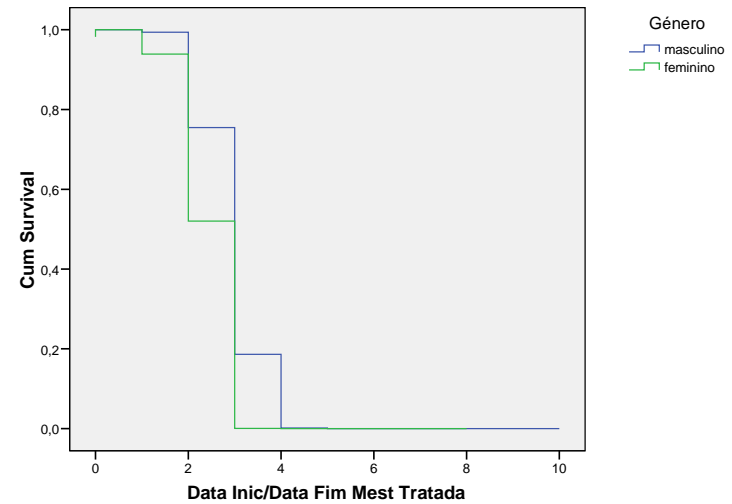
Variables in the Equation^b

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
obstfor4	-.227	,619	,134	1	,714	,797	,237	2,683
obstfor5	.	.	.	0 ^a
obstfor6	.	.	.	0 ^a
obstfor7	-4,564	2,535	3,242	1	,072	,010	,000	1,498
obstfor8	-4,508	2,018	4,992	1	,025	,011	,000	,575
obstfor9	-.895	,743	1,453	1	,228	,409	,095	1,752
obstfor10	,513	,906	,320	1	,572	1,670	,283	9,863
obstfor11	1,922	2,102	,836	1	,361	6,836	,111	420,898
obstfor12	2,388	1,488	2,575	1	,109	10,894	,589	201,357
obstfor13	-1,612	,840	3,684	1	,055	,200	,039	1,035
finobstf	-.550	,386	2,031	1	,154	,577	,271	1,229
propcurs	-.035	,091	,149	1	,700	,965	,807	1,154
profocp	-.004	,003	1,341	1	,247	,996	,990	1,002
prfocupa	,004	,007	,260	1	,610	1,004	,990	1,017
sitprof	,386	,368	1,101	1	,294	1,471	,715	3,027
sitprofa	-.143	,454	,100	1	,752	,866	,356	2,111
relcont	-.133	,203	,431	1	,512	,875	,588	1,303
relconta	,038	,213	,031	1	,860	1,038	,684	1,577
dur1ocp1	,199	,166	1,433	1	,231	1,220	,881	1,691
dur2ocp2	,028	,240	,014	1	,906	1,029	,643	1,647
ocprofac	-.209	,453	,213	1	,644	,811	,334	1,972
nemp	,158	,115	1,894	1	,169	1,171	,935	1,466
traiprof	-.981	,519	3,573	1	,059	,375	,136	1,037
avalfm1	-.438	,731	,359	1	,549	,645	,154	2,702
avalfm2	1,088	,641	2,878	1	,090	2,968	,845	10,429
avalfm3	-1,288	,485	7,052	1	,008	,276	,107	,714
avalfm4	1,277	,624	4,190	1	,041	3,584	1,056	12,170
avalfm5	,584	,437	1,788	1	,181	1,793	,762	4,223
avalfm6	-2,279	,536	18,062	1	,000	,102	,036	,293
avalfm7	-.344	,516	,444	1	,505	,709	,258	1,949
avalfm8	1,272	,642	3,926	1	,048	3,567	1,014	12,548
avalfm9	,315	,415	,578	1	,447	1,371	,608	3,089
procfm1	,561	,438	1,636	1	,201	1,752	,742	4,136
procfm2	,653	,665	,964	1	,326	1,922	,522	7,079
procfm3	1,098	,540	4,134	1	,042	2,998	1,040	8,640
procfm4	-1,373	,460	8,918	1	,003	,253	,103	,624
procfm5	1,851	,534	11,990	1	,001	6,364	2,233	18,143
procfm6	-1,920	,493	15,174	1	,000	,147	,056	,385
procfm7	-.426	,390	1,194	1	,275	,653	,305	1,402
procfm8	1,060	,408	6,752	1	,009	2,887	1,298	6,425
procfm9	,655	,504	1,688	1	,194	1,926	,717	5,177
procfm10	,260	,475	,300	1	,584	1,298	,511	3,294
procfm11	-1,014	,533	3,614	1	,057	,363	,128	1,032
procfm12	-.722	,552	1,712	1	,191	,486	,165	1,433
procfm13	-.113	,326	,121	1	,728	,893	,471	1,691
procfm14	,058	,565	,011	1	,918	1,060	,350	3,207
procfm15	,895	,744	1,446	1	,229	2,447	,569	10,521
procfm16	,933	,550	2,872	1	,090	2,542	,864	7,476
procfm17	6,900	3,052	5,110	1	,024	992,188	2,503	393358,12

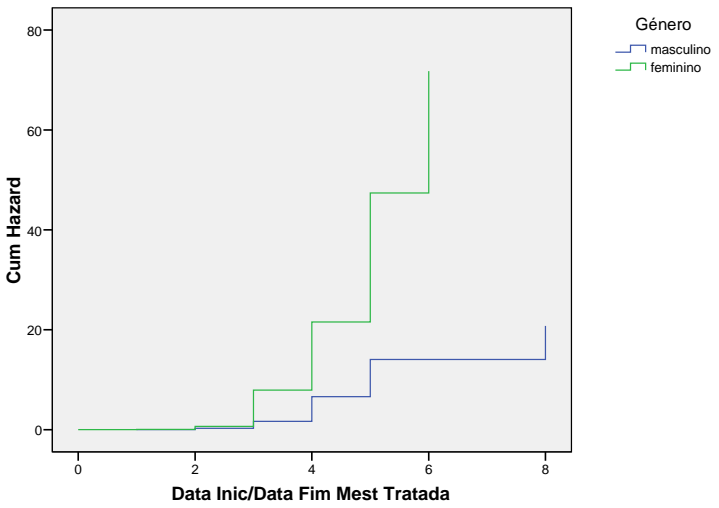
a. Degree of freedom reduced because of constant or linearly dependent covariates

b. Constant or Linearly Dependent Covariates S = Stratum effect. obstfor5 = 0 + S ; obstfor6 = 0 + S ;

Survival Function at mean of covariates



Hazard Function at mean of covariates



APPENDIX 2

Cox Regression

Case Processing Summary

		N	Percent
Cases available in analysis	Event ^a	108	100,0%
	Censored	0	,0%
	Total	108	100,0%
Cases dropped	Cases with missing values	0	,0%
	Cases with negative time	0	,0%
	Censored cases before the earliest event in a stratum	0	,0%
	Total	0	,0%
Total		108	100,0%

a. Dependent Variable: Data Inic/Data Fim Mest Tratada

Stratum Status^a

Stratum	Strata label	Event	Censored	Censored Percent
1	masculino	47	0	,0%
2	feminino	61	0	,0%
Total		108	0	,0%

a. The strata variable is : Género

Categorical Variable Codings^b

	Frequency	(1)	(2)	(3)	(4)	(5)	(6)
estabm ^a 0	1	1	0	0	0	0	0
1	43	0	1	0	0	0	0
8	10	0	0	1	0	0	0
12	1	0	0	0	1	0	0
15	1	0	0	0	0	1	0
26	27	0	0	0	0	0	1
36	25	0	0	0	0	0	0

a. Indicator Parameter Coding

b. Category variable: estabm (Establecimiento mestrado)

Block 0: Beginning Block

Omnibus Tests of Model Coefficients

-2 Log Likelihood
719,255

Block 1: Method = Enter

Omnibus Tests of Model Coefficients^{a,b}

-2 Log Likelihood	Overall (score)			Change From Previous Step		
	Chi-square	df	Sig.	Chi-square	df	Sig.
605,681	138,591	93	,002	113,573	93	,072

Omnibus Tests of Model Coefficients^{a,b}

Change From Previous Block		
Chi-square	df	Sig.
113,573	93	,072

a. Beginning Block Number 0, initial Log Likelihood function: -2 Log likelihood: 719,255

b. Beginning Block Number 1. Method = Enter

Variables in the Equation^b

	B	SE	Wald	df	Sig.	Exp(B)	95,0% CI for Exp(B)	
							Lower	Upper
datanac1	-.251	,442	,324	1	,569	,778	,327	1,848
concrec	-.002	,001	15,588	1	,000	,998	,996	,999
sitfamil	-.009	,009	,824	1	,364	,991	,973	1,010
nivescp	1,029	,276	13,906	1	,000	2,797	1,629	4,804
nivescm	-.644	,285	5,118	1	,024	,525	,300	,918
nivesc	,411	,127	10,493	1	,001	1,508	1,176	1,933
profissp	,004	,002	6,435	1	,011	1,004	1,001	1,007
profissm	-.002	,001	2,139	1	,144	,998	,996	1,001
profissc	-.006	,004	2,070	1	,150	,994	,986	1,002
areafor1	-.002	,003	,434	1	,510	,998	,991	1,004
areafor2	-.004	,004	1,093	1	,296	,996	,987	1,004
establ	,006	,045	,019	1	,890	1,006	,921	1,099
estabm			9,045	6	,171			
estabm(1)	-1,115	2,387	,218	1	,640	,328	,003	35,267
estabm(2)	2,030	1,504	1,822	1	,177	7,618	,399	145,277
estabm(3)	-.017	1,873	,000	1	,993	,983	,025	38,652
estabm(4)	-6,364	3,726	2,918	1	,088	,002	,000	2,554
estabm(5)	10,290	4,785	4,625	1	,032	29441,146	2,490	3,5E+008
estabm(6)	2,602	,971	7,180	1	,007	13,495	2,011	90,541
diffic1	-1,477	,437	11,414	1	,001	,228	,097	,538
profcurm	1,216	1,173	1,074	1	,300	3,373	,338	33,614
exigcarm	,161	,529	,093	1	,761	1,175	,417	3,311
pfcurm	-.119	,821	,021	1	,885	,888	,178	4,435
outcursm	1,539	,602	6,542	1	,011	4,660	1,433	15,157
arfcurm	,006	,003	5,397	1	,020	1,006	1,001	1,011
razcurm1	-.676	,496	1,860	1	,173	,509	,192	1,344
razcurm2	1,288	,505	6,509	1	,011	3,624	1,348	9,744
razcurm3	,038	,523	,005	1	,941	1,039	,373	2,899
razcurm4	-.285	,522	,299	1	,585	,752	,270	2,091
razcurm5	,402	,399	1,015	1	,314	1,495	,684	3,268
razcurm6	-.060	,482	,016	1	,901	,942	,366	2,424

Variables in the Equation^b

	B	SE	Wald	df	Sig.	Exp(B)	95,0% CI for Exp(B)	
							Lower	Upper
razcurm7	-.476	,412	1,339	1	,247	,621	,277	1,391
razcurm8	-.485	,431	1,265	1	,261	,616	,265	1,433
razcurm9	-.497	,276	3,235	1	,072	1,643	,956	2,823
razcur10	2,039	,709	8,269	1	,004	7,685	1,914	30,854
razcur11	-.498	,312	2,549	1	,110	,608	,330	1,120
razcur12	-1,626	,712	5,214	1	,022	,197	,049	,794
razcur13	,423	,610	,482	1	,488	1,527	,462	5,046
razcur14	-1,441	,709	4,127	1	,042	,237	,059	,951
razcur15	,897	,429	4,380	1	,036	2,453	1,059	5,684
razcur16	-.345	,350	,969	1	,325	,708	,357	1,407
razcur17	-.823	,697	1,393	1	,238	,439	,112	1,722
satacadm	-.833	,543	2,351	1	,125	,435	,150	1,261
peracad	1,347	,975	1,908	1	,167	3,844	,569	25,979
obstfor1	-1,384	,649	4,547	1	,033	,251	,070	,894
obstfor2	-.901	1,633	,304	1	,581	,406	,017	9,977
obstfor3	-1,092	1,570	,484	1	,487	,335	,015	7,284
obstfor4	1,467	,873	2,821	1	,093	4,336	,783	24,020
obstfor5				0 ^a				
obstfor6				0 ^a				
obstfor7	-2,879	2,882	,998	1	,318	,056	,000	15,948
obstfor8	-6,340	2,329	7,409	1	,006	,002	,000	,170
obstfor9	-1,064	,890	1,428	1	,232	,345	,060	1,976
obstfor10	,978	1,098	,794	1	,373	2,660	,309	22,861
obstfo11	3,356	2,274	2,179	1	,140	28,685	,333	2472,791
obstfo12	2,056	1,536	1,791	1	,181	7,812	,385	158,501
obstfo13	-4,149	1,353	9,407	1	,002	,016	,001	,224
finobstf	-.342	,447	,583	1	,445	,711	,296	1,708
propcurs	-.103	,084	1,480	1	,224	,902	,765	1,065
profocp	-.007	,003	4,494	1	,034	,993	,987	,999
prfocupa	,007	,008	,734	1	,392	1,007	,991	1,022
sitprof	,261	,380	,471	1	,493	1,298	,616	2,734
sitprofa	-.211	,502	,176	1	,675	,810	,303	2,168
relcont	-.264	,245	1,169	1	,280	,768	,475	1,240
relconta	,080	,283	,080	1	,778	1,083	,622	1,887
dur1ocp1	,019	,213	,008	1	,928	1,019	,671	1,548
dur2ocp2	-.171	,279	,378	1	,539	,843	,488	1,455
ocprofac	-.379	,555	,468	1	,494	,684	,231	2,029
nemp	,165	,131	1,580	1	,209	1,180	,912	1,526
trajprof	-.712	,586	1,476	1	,224	,491	,156	1,547
avalfm1	,258	,897	,083	1	,774	1,294	,223	7,511
avalfm2	,432	,811	,284	1	,594	1,541	,315	7,549
avalm3	-2,194	,666	10,859	1	,001	,111	,030	,411
avalfm4	2,571	,848	9,182	1	,002	13,079	2,480	68,985
avalfm5	1,069	,596	3,211	1	,073	2,912	,905	9,372
avalfm6	-3,156	,700	20,333	1	,000	,043	,011	,168
avalfm7	-.239	,629	,144	1	,704	,787	,229	2,703
avalfm8	,731	,856	,728	1	,393	2,077	,388	11,121
avalfm9	,119	,463	,066	1	,798	1,126	,454	2,791
procfm1	,241	,515	,220	1	,639	1,273	,464	3,493
procfm2	1,277	,856	2,226	1	,136	3,584	,670	19,175
procfm3	,478	,649	,542	1	,461	1,612	,452	5,751

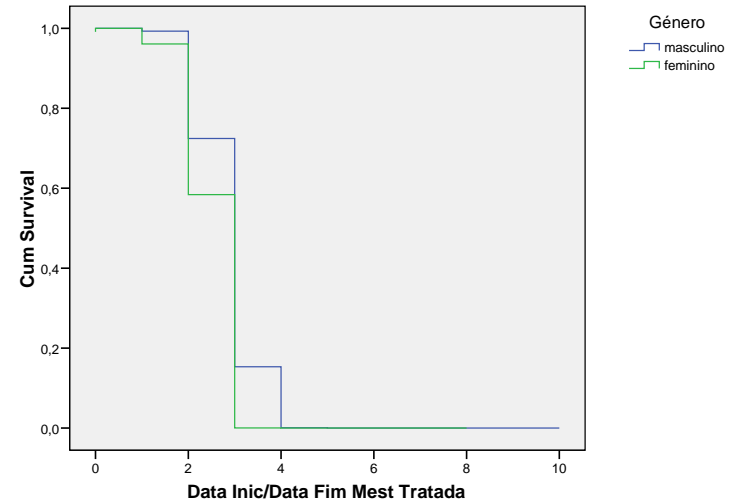
Variables in the Equation^b

	B	SE	Wald	df	Sig.	Exp(B)	95,0% CI for Exp(B)	
							Lower	Upper
procfm4	-1,899	,552	11,836	1	,001	,150	,051	,442
procfm5	2,346	,626	14,044	1	,000	10,447	3,062	35,641
procfm6	-1,829	,552	10,961	1	,001	,161	,054	,474
procfm7	,038	,460	,007	1	,934	1,039	,421	2,560
procfm8	1,217	,439	7,705	1	,006	3,378	1,430	7,979
procfm9	,712	,534	1,782	1	,182	2,039	,716	5,802
procfm10	,066	,542	,015	1	,904	1,068	,369	3,091
procfm11	-1,846	,677	7,435	1	,006	,158	,042	,595
procfm12	,771	,854	,814	1	,367	2,161	,405	11,529
procfm13	-.359	,353	1,031	1	,310	,699	,350	1,396
procfm14	,251	,626	,161	1	,688	1,285	,377	4,381
procfm15	2,053	,868	5,593	1	,018	7,789	1,421	42,687
procfm16	,959	,587	2,665	1	,103	2,608	,825	8,245
procfm17	12,614	3,920	10,354	1	,001	300764,78	138,496	6,5E+008

a. Degree of freedom reduced because of constant or linearly dependent covariates

b. Constant or Linearly Dependent Covariates S = Stratum effect. obstfor5 = 0 + S ; obstfor6 = 0 + S ;

Survival Function at mean of covariates



Hazard Function at mean of covariates

