

Returns to Postgraduate Education in Portugal: Holding on to a Higher Ground?

A. Almeida*, H. Figueiredo* †, J. Cerejeira * § ¶, M. Portela * § ¶, C. Sá*§ ¶ and Pedro Teixeira* ‡

* CIPES – Centre for Research in Higher Education Policies; † Department of Economics, Management, Industrial Engineering and Tourism, University of Aveiro; ‡ Faculty of Economics, University of Porto; § School of Economics and Management – University of Minho; ¶ NIPE – Research Unit on Economic Policies

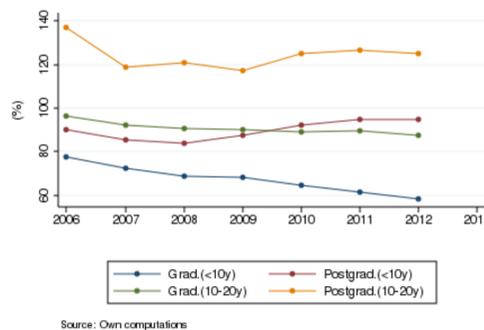
Aim

- **Context:** Massive expansion in the access to Higher Education (HE) in Portugal and HE system reorganization lead to a rapid increase in post-graduate workers in the labour market; evidence of falling premiums and growing inequality among workers with a *diploma*.
- **Framework:** We look at the role of postgraduate education by analysing the differences between graduate and postgraduate wage premium (respectively *GWP* and *PGWP*) in different points of the distribution (among workers with low experience) during the period 2006-2012. We decompose them into their main determinants using several methods and we assess the importance of different mechanisms underneath these trends.

Methodology

- **Data:** “*Quadros de Pessoal*” linked employer-employee database: official, mandatory survey, almost the full Portuguese private sector, detailed information on workers, firms and establishments.
- **Returns:** descriptive measures of relative benefits using cross-sectional approach with few controls; workers with completed high school education as control group.
- **Decompositions:** additional controls introduced; *GWP* and *PGWP* decomposed using DiNardo *et al.* (1996) aggregate decomposition (efficient) and Firpo *et al.* (2009) detailed decomposition (*path independent*); premium of postgraduates over graduates decomposed using Nopo (2008) (relaxes overlapping support assumption)
- **Shift-share analysis:** disentangle *within* and *between* effect in the increasing share of workers with a *diploma*, in general, and postgraduates in particular.

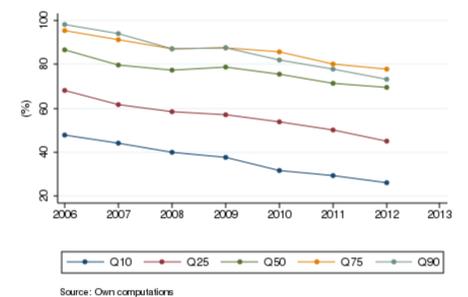
Evolution of GWP and PGWP (2006-2012)



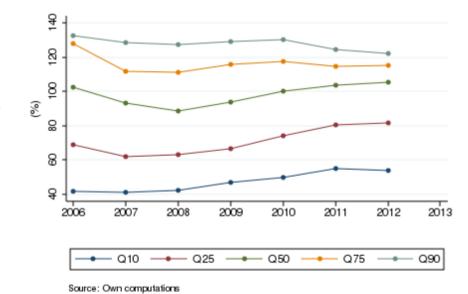
Source: Own computations

Figure 1: Graduates and Postgraduates returns to education by experience cohorts

- *Intergenerational* cleavage in returns; different trends for graduates and postgraduates
- High and increasing returns for postgraduates; falling returns and increasing dispersion for graduates (especially at the bottom); in general returns are still considerable (apart from lower tail of graduate's distribution)



Source: Own computations



Source: Own computations

Figure 2: Graduates (on the top) and Postgraduates (on the bottom) returns to education

DiNardo *et al.* (1996) aggregate decomposition:

	2006			2012		
<i>Non-graduates vs Graduates</i>						
Unadjusted change:	0.6978	0.6072	0.3888	0.5588	0.5505	0.2210
Tool wage-structure effect	0.7232	0.6200	0.3902	0.5425	0.5559	0.2304
<i>Non-graduates vs Post-Graduates</i>						
Unadjusted change:	0.8331	0.6646	0.3001	0.7121	0.6611	0.3975
Tool wage-structure effect	0.8311	0.645	0.2729	0.6423	0.6567	0.4060

Table 1: Graduates (on top) and Postgraduates (on the bottom) *log* real wages total gap and corresponding *wage-structure effect*

Decomposition Results

- Controlling for type of contract, gender, location, firm's dimension, ownership type & industry: same qualitative results
- Non significant compositional effects
- Occupation left out of the analysis due to support issues

Fortin *et al.* (2009) detailed decomposition:

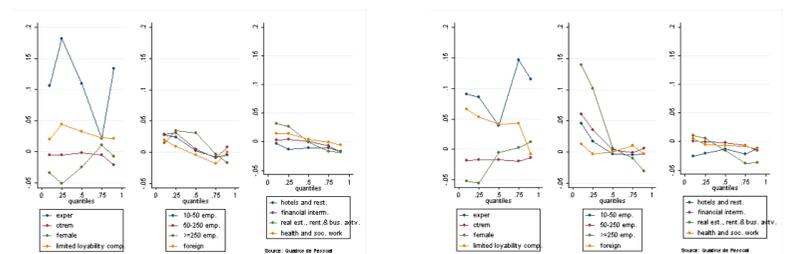


Figure 3: Graduates (on the left) and Postgraduates (on the right) main *wage-structure effects*

- Non significant compositional effects;
- Main *wage-structure effect*: *exper*, firm's size & some industries (especially at the bottom of the distribution).
- Higher gender penalization at the bottom.
- Greater part of the gap left unexplained (importance of occupation)

Nopo (2008) detailed decomposition (between graduate's and postgraduates):

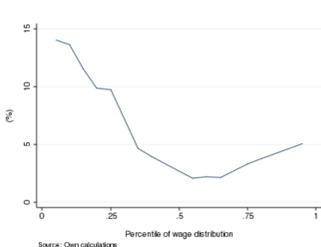


Figure 4: Wage gap between postgraduates and graduates along the wage distribution (left) and top postgrad. jobs out of the common support (right).

Top Postgrad. Occup. (out the common support)	
1.	Spec. in STEM (real estate rent. & bus. act)
2.	IT Spec. (real estate rent. & bus. act)
3.	Spec. in STEM (Manuf. Of metal prod.)
4.	Finance, Acct., Adm., Pub. Rel. & Sales (real estate rent. & bus. act)
5.	Spec. in STEM (wholesale & retail trade)
6.	Spec. in STEM (construction)
7.	IT technicians (real estate rent. & bus. act)
8.	Interm. Techn. in Finance and Bus. (real estate rent. & bus. act)
9.	Prof. (education)
10.	Office workers (real estate rent. & bus. act)

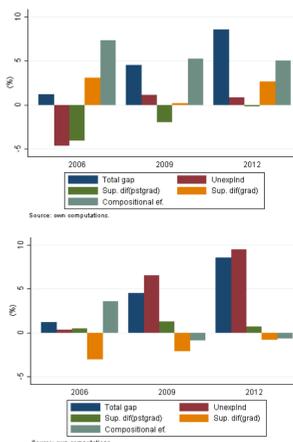


Figure 5: Nopo (2008) with (top) and without (bottom) considering occupation in the matching.

- Only 5% (35%) of the (post) graduates in the common support
- Detailed occupation allows us to explain a great part of the gap
- Differences in graduates within and without the support group.
- Considerable gap between matched, especially at the bottom.

Discussion

- Our results seem to suggest that there are considerable difference in the returns to graduates and post-graduates and that this are mainly due to the different allocation to **occupations**.
- It seems that postgraduate education in Portugal has rapidly become an indispensable instrument to get workers (and young workers in particular) assigned to a relatively low number of higher-paying occupations. In fact, even in those occupations there is an important premium attributed to postgraduates.
- Moreover, it seems that the supply of workers with a *diploma* has been pressuring the graduate's employment and returns during the entire period. However, for postgraduates the pressure was only felt after 2010 (escalation of financial crisis and increase on postgraduate's rate of entry in the labour market? Is this mainly due to a **segmentation** trend in the labour market? Or a manifestation of increasing **displacement** effects? Is it a non-substitution effect based on better worker characteristics or just a **signaling** effect?)

Shift-share analysis

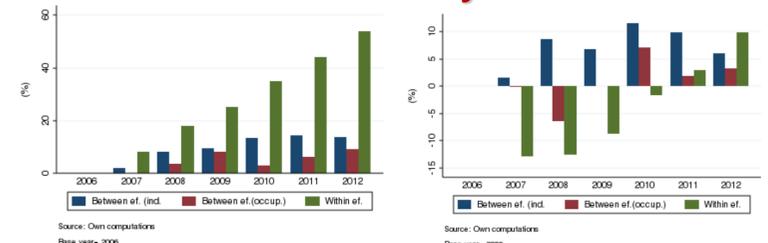


Figure 6: Decomposition of the increase in the share of workers with a *diploma* in the total workforce (on the left) and the share of postgraduates in the total of workers with a *diploma*

- Important displacement effect of graduates (in general) and postgraduates;
- Different dynamics for postgraduates; change in postgraduates trend after 2010