

How satisfied are doctoral candidates with their academic career opportunities?

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ACADEMIC CAREERS

The basic indicators provided by the Human Resources in Research Flanders (HRRF) database show that approximately 1 in 10 doctorate holders in Flanders becomes a professor at a Flemish university at some point after obtaining their doctorate (HRRF basic indicators, 2019). The question arises which career paths doctorate holders end up in when not taking up a position as a professor in Flanders? To answer this question, ECOOM UGent organised the PhD Career Survey in 2017. This survey aimed to get an overview of the different academic and non-academic career paths, within Flanders and beyond, of doctorate holders who defended their doctorate at a Flemish university (<https://www.phdcareersflanders.com/en/>). In ECOOM brief 25 and ECOOM briefs 27-30 we elaborate on the specific career aspects of these doctorate holders. In general, it can be said that the career paths are very diverse and that a large share of the doctorate holders in the PhD Career Survey are employed within a university (ECOOM brief 25). These jobs include both academic positions, such as professor or postdoctoral researcher, and various other positions; such as policy advisor, lawyer, marketer, communications manager, or business developer. The research methodology of the PhD Career Survey does not allow us to determine the chances of doctorate holders taking on these positions within the academic sector.

When we combine the previous information provided by the HRRF and the PhD Career Survey regarding academic career opportunities, we find that these career opportunities can only be defined to a limited extent. Consequently, doctoral candidates do not have objective and accurate data to base their career choices on. However, estimating career opportunities is an important factor in the doctoral trajectory: it not only has implications for doctoral candidates' performance and motivation, but also for their well-being (ECOOM brief 21).

In what follows, we look at doctoral candidates' satisfaction with career opportunities in the academic sector. More specifically, we ask ourselves the following questions:

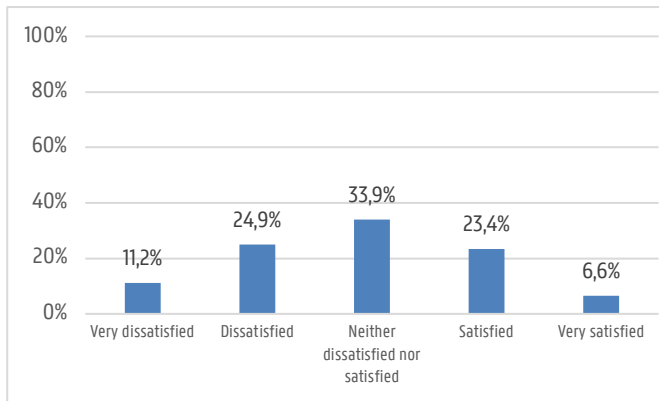
1. *How satisfied are doctoral candidates with their academic career opportunities?*
2. *Does this satisfaction differ according to gender, nationality, science cluster or research phase?*
3. *Does satisfaction differ according to the work and organizational context?*
4. *Is the satisfaction with academic career opportunities among doctoral candidates in Flanders comparable to that of doctoral candidates at foreign universities?*

We answer these research questions using data from the Survey of Junior Researchers 2018 (SJR2018). This survey was organised by ECOOM Ghent University and sent to all junior researchers at the five Flemish universities. For the current analysis, we limit ourselves to the junior researchers in the process of obtaining a doctorate (n=3359). For more information on the survey, we refer to ECOOM brief 17.

HOW SATISFIED ARE DOCTORAL CANDIDATES WITH THEIR ACADEMIC CAREER OPPORTUNITIES?

In the Survey of Junior Researchers 2018, we asked doctoral candidates in Flanders "*To what extent are you satisfied with the career opportunities in the academic sector?*". The response options ranged from 'very dissatisfied' (=1) to 'very satisfied' (=5). Figure 1 shows the percentage distribution of the answers. It shows that 30.0% of the doctoral candidates are (very) satisfied with the academic career opportunities. On the other hand, 36.1% are (very) dissatisfied and 33.9% are neither dissatisfied nor satisfied.

Figure 1. Satisfaction with academic career opportunities among doctoral candidates in Flanders 2018 (N=3359)



DOES THIS SATISFACTION DIFFER ACCORDING TO GENDER, NATIONALITY, SCIENCE CLUSTER OR DOCTORAL TRAJECTORY?

In the following analyses, we consider a doctoral candidate as satisfied if he/she indicated to be satisfied or very satisfied with the academic career opportunities. If the answer was (very) unsatisfied, we will consider this as dissatisfied.

In the analyses, we further differentiated by gender, nationality, science cluster and doctoral trajectory. Nationality is defined as three categories: Belgian, EU28 and non-EU28. We distinguish five different science clusters: exact sciences, biomedical sciences, applied sciences, humanities, and social sciences. Finally, the doctoral trajectory was defined into three phases: initiating phase, executing phase and finishing phase.

We use the Chi-square test for the analyses. Results are considered significant at $p < .05$. This test examines whether the counts differ significantly from each other. For science cluster, nationality and doctoral trajectory post hoc comparisons were made using Chi squared, comparing each category with every other category. Because of an increased chance of a Type 1 error, a stricter significance level was applied for the post hoc comparisons (i.e. $p < .01$). These post hoc comparisons provide insight into which categories differ significantly from each other.

Table 1 presents the share of doctoral candidates who are (very) satisfied with the academic career opportunities according to gender, nationality, science cluster and doctoral trajectory. Are male doctoral candidates more satisfied than their female colleagues with their academic career opportunities? We find no significant differences according to gender: almost 1 out of 3 men and women are (very) satisfied with the career opportunities in the academic sector. However, there are significant differences depending on nationality. Post-hoc comparisons with a stricter significance level ($p < .01$) show that the proportion of satisfied doctoral candidates differs significantly between the three categories: the share of satisfied doctoral candidates is the largest among those from outside the EU (43.6%), followed by

those from within the EU (33.3%) and finally among Belgian doctoral candidates (24.9%).

There are also differences between the science clusters. In the biomedical sciences, the share of satisfied people is the highest (34.4%), followed by applied sciences (34.2%) and the exact sciences (32.4%). The share of satisfied doctoral candidates is 25.1% in the social sciences and 15.9% in the humanities. Post-hoc comparisons ($p < .01$) show that the share of satisfied PhD students is significantly higher in the exact, biomedical and applied sciences compared to shares in the humanities and social sciences. Moreover, the share of satisfied doctoral candidates in the social sciences is significantly higher compared to the shares in the humanities.

Finally, there are significant differences depending on the phase of the doctoral trajectory: whereas in the initiating phase 41.4% of the doctoral candidates reported to be (very) satisfied with the academic career opportunities, the share of satisfied doctoral candidates in the executing phase is only 29.8%. The share of satisfied doctoral candidates in the finishing phase is even lower with 20.5%. Post hoc comparisons ($p < .01$) show that the share of satisfied doctoral candidates differs significantly between all doctoral phases.

Table 1. Satisfaction with academic career opportunities according to gender, nationality, science cluster and doctoral trajectory among doctoral candidates in Flanders, 2018 (N=3359)

	(very) satisfied %	Sign (S)
Gender		n.s.
Male	31.3	
Female	28.9	
Nationality		***
Belgian	24.9	
EU28	33.3	
Non-EU28	43.6	
Science cluster		***
Exact sciences	32.4	
Biomedical sciences	34.4	
Applied sciences	34.2	
Humanities	15.9	
Social sciences	25.1	
Doctoral trajectory		***
Initiating	41.4	
Executing	29.8	
Finishing	20.5	

(S) significance based on the Chi²-test
 n.s.= non significant, *= $p < 0.05$, **= $p < 0.01$, ***= $p < 0.001$

DOES THIS SATISFACTION DIFFER ACCORDING TO THE WORK AND ORGANIZATIONAL CONTEXT?

To answer this question, we use a logistic regression analysis. Table 2 shows how satisfaction with academic career (again: satisfied or very satisfied) is associated with the work context, the organizational context, and sociodemographic variables. The results show that satisfaction with academic career opportunities is higher (OR>1) when (1) the promoter uses an inspiring leadership style, (2) when the doctoral candidate perceives the chances of an academic career as high,

(3) when the doctoral candidate has a positive perception of a career outside the university, (4) when the doctoral candidate is associated with the Vrije Universiteit Brussel (VUB) compared to the KU Leuven (reference category).

Next, we see less satisfaction with career opportunities within the academic sector ($OR < 1$) among doctoral candidates within (1) the humanities and social sciences compared to the exact sciences, (2) during the executing and finishing phase of the doctorate compared to the initiating phase, (3) in case of closed (i.e. non-democratic) team decision-making, and (4) when the doctoral candidate has a partner.

We find no significant differences in satisfaction with academic career opportunities according to job control (i.e. the degree of job variation and job autonomy) and according to job demands (such as work pressure). Furthermore, there are no significant differences according to family-work conflict, work-family conflict, gender, age and whether one has children. There is also no significant difference depending on the interest that doctoral candidates experience in an academic career, nor depending on the type of appointment. Finally, the share of doctoral candidates in exact sciences who are (very) satisfied with their academic career opportunities does not differ from the share in biomedical and applied sciences.

The predictors in Table 2 together show a coefficient of determination (Nagelkerke R^2) of 0.285. In other words: 28.5% of the variance in the degree of satisfaction with academic career opportunities among doctoral candidates in Flanders is explained by the predictors included in the model.

IS THE SATISFACTION WITH ACADEMIC CAREER OPPORTUNITIES AMONG DOCTORAL CANDIDATES IN FLANDERS COMPARABLE TO THAT OF DOCTORAL CANDIDATES AT FOREIGN UNIVERSITIES?

Scientific evidence on satisfaction with academic career opportunities is virtually non-existent, both in Flanders and abroad. Research into the perceived opportunities of having an academic career was carried out at Leiden University. Their survey of 218 PhD students showed that 62% of the doctoral candidates who wanted to work at a university or in research after their doctorate rated their career opportunities as "difficult" or "very difficult" (Waaijer, Heyer, & Kuli, 2016). However, having an interest in a specific career path, the perceived opportunities of doing so and satisfaction with it are different aspects in a person's perception of his/her career opportunities.

What if we no longer focus the benchmark exercise on doctoral candidates abroad, but on the own doctoral candidates in Flanders and their satisfaction with the career opportunities on the non-academic labour market? In ECOOM brief 31 we go deeper into this satisfaction with career opportunities in the non-academic sectors by asking similar questions as in the current ECOOM brief. If desired, the reader can make a detailed comparison of the research results. To conclude the comparison of this ECOOM brief, we limit ourselves to the observation that doctoral candidates at Flemish universities are more satisfied with their career opportunities on the non-academic labour market than within the academic sector.

DISCUSSION

In this ECOOM brief we looked at the satisfaction of doctoral candidates with the academic career opportunities. A striking finding is that a large group of respondents (33.9%) is neither satisfied nor dissatisfied with the career opportunities in the academic labour market. In ECOOM brief 31 we found that 42.5% of doctoral candidates in Flanders indicated that they were neither satisfied nor dissatisfied with their career opportunities outside the academic sector. Possibly, these high percentages of "neither satisfied nor dissatisfied" indicate that doctoral candidates have not yet gained an accurate picture of their future career. Another possibility is that they lack an accurate evidence base to determine such satisfaction.

Regarding gender, we find no significant differences between men and women in terms of satisfaction with academic career opportunities among doctoral candidates at Flemish universities. This is remarkable given the overrepresentation of men in the population of professors at Flemish universities (ECOOM brief 16, VLIR 2020). The more limited gender inequality in the degree of assistant professor in comparison to associated professor, full professor, and senior full professor (ECOOM brief 15) may play a role here: after all, assistant professor is the first step in the career as a professor and the satisfaction with career opportunities may primarily be based on the perceived opportunities of an assistant professorship. It is also possible that the recently re-launched Flemish Gender Action Plan is having a positive effect on the perception of the possibility for women to have an academic career (Young Academy of Belgium (Flanders), 2013).

Next to gender, we also looked at science cluster, doctoral trajectory and nationality. Here we did note differences. Based on Table 1, we recorded more satisfaction in the exact, biomedical and applied sciences compared to doctoral candidates in the social sciences and humanities. These findings parallel the satisfaction with career opportunities outside the university, in the non-academic sectors (ECOOM brief 31). This finding of less satisfaction among doctoral candidates in social sciences and humanities contrasts with the objective high promotion to a professorship in Flanders for these doctoral candidates compared to many doctoral candidates in other science clusters. Statistics from the Human Resources in Research Flanders database regarding the cohort of doctorate holders from 2006-2007 to 2008-2009 show that the share of doctorate holders who become a professor 8 years after obtaining their doctorate is 23.5% in social sciences and 16.9% in human sciences (for comparison: biomedical sciences = 21.7%; applied sciences = 8.7% and exact sciences = 4.7%). Looking at the phases of the doctorate, Table 2 shows us more satisfaction with career opportunities in the academic sector among doctoral candidates in the initial phase of the doctorate, compared to doctoral candidates in a later phase of their doctoral trajectory. Finally, regarding nationality, we recorded a higher degree of satisfaction with academic career opportunities among international doctoral candidates compared to Belgian doctoral candidates. To find out more about the interest of international doctoral candidates in obtaining an academic career at a Flemish university, we refer the reader to ECOOM brief 36.

Table 2. Predictors of satisfaction with academic career opportunities among doctoral candidates in Flanders, 2018 (N=2532: odds ratio (OR), 95% confidence interval (95% BI), significance level (S))

	OR	95% BI	Sign (S)
Constant	0.018		***
Work context			
Job demands	0.993	(0.805-1.225)	n.s.
Job control	1.217	(0.972-1.523)	n.s.
Science cluster			
Exact sciences (ref)	-	-	-
Biomedical sciences	1.210	(0.889-1.645)	n.s.
Applied sciences	0.926	(0.672-1.277)	n.s.
Humanities	0.426	(0.263-0.668)	***
Social sciences	0.642	(0.459-0.897)	**
Type of appointment			
Research staff (ref)	-	-	-
Scholarship	1.161	(0.860-1.567)	n.s.
Research project	1.268	(0.935-1.719)	n.s.
No funding from university	1.530	(0.938-2.498)	n.s.
Other	1.564	(0.943-2.593)	n.s.
Unknown	1.012	(0.531-1.927)	n.s.
Doctoral phase			
Initiating (ref)	-	-	-
Executing	0.683	(0.531-0.877)	**
Finishing	0.492	(0.356-0.680)	***
Leadership style: inspiring	1.388	(1.257-1.533)	***
Much interest in academic career	0.936	(0.750-1.168)	n.s.
Perception of a high chance of an academic career	3.209	(2.582-3.989)	***
Positive perception of a career outside university	1.869	(1.622-2.154)	***
Organizational context			
University			
KU Leuven (ref)	-	-	-
Ghent University	1.063	(0.771-1.464)	n.s.
Antwerp University	0.784	(0.614-1.001)	n.s.
VUB	1.637	(1.049-2.553)	*
Hasselt University	0.989	(0.737-1.328)	n.s.
Closed team decision-making	0.806	(0.718-0.906)	***
Family work conflict	1.097	(0.963-1.250)	n.s.
Work family conflict	0.900	(0.790-1.024)	n.s.
Sociodemographics			
Female	0.998	(0.812-1.227)	n.s.
Age	0.977	(0.952-1.003)	n.s.
Partner	0.734	(0.591-0.911)	**
Children	1.012	(0.721-1.422)	n.s.
Model fit satisfaction with academic career opportunities			
LR = 2493 df = 28 p<0.001 Nagelkerke R ² = 0.285			

Note: OR = odds ratio, 95% BI = 95% confidence interval. Ref. = reference category.

Significances: * = $p < .05$, ** = $p < .01$, *** = $p < .001$, n.s. = not significant

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