

# Going for gold: How do doctoral candidates perceive the market value of a doctorate for the non-academic labor market?

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## A DOCTORATE AS ADDED VALUE? WHAT EMPLOYERS AND DOCTORATE HOLDERS SAY

Innovation is a priority for the [European Commission](#) and, according to the OECD (2010), doctorate holders are crucial to that end. Addressing this, the number of doctorate holders has increased in the OECD countries over the past years (OECD, 2019). As a result, more and more doctorate holders enter the non-academic labor market. However, little is known about non-academic employers' perceptions of a doctorate holder. In addition, there is little knowledge about the experiences of doctorate holders: do they experience their doctorate as an added value for their job and career?

The scarce research in Europe and Flanders that investigates the perceptions of non-academic employers about the added value of a doctorate reveals several opinions. Many employers see an added value in the research skills of doctorate holders, their capacity to process information, their innovativeness, their communication skills and their ability to organize work (Stassen et al., 2016; ECOOM-Brief 32). However, those employers also report that doctorate holders are not in touch with the non-academic world, are not or insufficiently skilled for managerial or commercial settings and cannot adapt quickly (Stassen et al., 2016; ECOOM-Brief 32).

Looking at doctorate holders, a study involving nine European universities (Boman et al., 2021) shows that 93% of the surveyed doctorate holders would do their doctorate all over again. Also, 72% of the doctorate holders employed in the private sector report a relationship between what they do in their current job and the research field of their doctorate. In line with this finding, Belgian doctorate holders who obtained their doctorate in Belgium (Boosten et al., 2014) also report a (close) relationship between their doctorate and the content of their current job. The amount of doctorate holders that perceived their doctorate as relevant for their job does however decrease when they have obtained their doctorate a longer time ago.

Moreover, approximately seven out of ten doctorate holders that have a non-academic job agree that their doctorate offers added value for their employer. Research conducted in Flanders (see <https://www.phdcareersflanders.com/en/>) suggests that two thirds of the doctorate holders who obtained their doctorate at a Flemish university and are currently active on the non-academic labor market, experienced a doctorate as an added value in the transition to a job outside academia. Furthermore, three out of four would choose to do a doctorate if they could do it all over again. The numbers from these three studies must be interpreted with caution because the samples weren't entirely representative for the population of doctorate holders in Europe, Belgium and Flanders.

## THE ADDED VALUE OF A DOCTORATE IN THE EYES OF DOCTORAL CANDIDATES

Because a clear perspective of doctorate holders' jobs once they left academia is lacking, doctoral candidates cannot make an evidence-based assessment of the return on investment of pursuing a doctorate for their future career (ECOOM-Brief 31). The lack of a clear image of possible job opportunities for doctorate holders and the potential value of a doctorate for one's future career can have an impact on the motivational processes that doctoral candidates experience. For example, doctoral candidates who perceive a doctorate in their discipline as an added value for future employers outside academia, think less frequently about quitting their doctorate, have a lower risk of developing mental health issues, are more satisfied with their job and experience more vitality (see ECOOM-Briefs 18, 19, 21, 22).

In this brief we investigate how junior researchers in Flanders look at the (added) value of a doctorate for the non-academic labor market. More specifically we pose the following questions:

1. *To what extent do junior researchers perceive a doctorate in their field as an added value for future employers outside university?*
2. *Does the perceived value for doctoral candidates differ according to gender, nationality, science cluster, doctoral phase and interest in different employment sectors?*
3. *Does the perceived value for doctoral candidates differ in each phase of the doctoral trajectory according to gender, nationality, science cluster and interest in different employment sectors?*

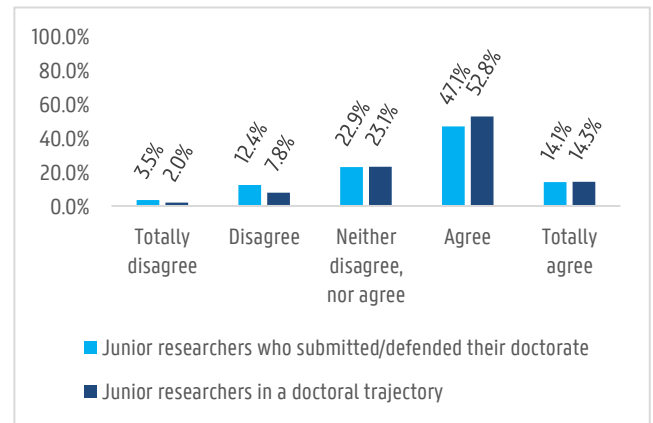
We answer these research questions using data from the Survey of Junior Researchers (SJR) 2018 (see ECOOM-Brief 17). This survey was organized by ECOOM-Ghent University and sent to all junior researchers at the five Flemish universities. For the current analyses, we limit ourselves to those junior researchers in a doctoral trajectory ( $N=3359$ ) and those who have recently submitted/defended their doctorate ( $N=199$ ). An important observation is that not every junior researcher answered the question regarding the added value of a doctorate in their field for future employers outside university ( $N_{\text{junior researchers who are in a doctoral trajectory and did not answer the question}} = 373$ ;  $N_{\text{junior researchers who submitted/defended their doctorate and did not answer the question}} = 29$ ). First, we notice selective drop-out by nationality for both junior researchers who are in a doctoral trajectory and junior researchers who recently submitted or defended their doctorate. Among junior researchers with a nationality outside the European Union, the question on the added value of a doctorate in their field for future employers outside academia was not answered by 1 out of 5 in the group of junior researchers in a doctoral trajectory and by 3 out of 10 in the group that has recently submitted/defended their doctorate. Looking at the junior researchers with the Belgian nationality, respectively 1 out of 5 and 1 out of 10 did not answer the question. Second, we also see selective drop-out by science cluster for the junior researchers who were in a doctoral trajectory. As a result, the sample size in the exact sciences and humanities has become relatively small. Finally, there is selective drop-out by gender for junior researchers who have just submitted/defended their doctorate: 1 out of 5 men and 1 out of 10 women did not answer the question about the added value of a doctorate in their field for future employers outside the university. This means that we must be careful when interpreting the findings for nationality, exact sciences, humanities and gender in the respective groups of junior researchers.

### TO WHAT EXTENT DO JUNIOR RESEARCHERS PERCEIVE A DOCTORATE IN THEIR FIELD AS AN ADDED VALUE FOR FUTURE EMPLOYERS OUTSIDE UNIVERSITY?

In 2018 we presented junior researchers the following statement: “A doctorate in my field can provide an added value for future employers outside university”. The possible answers for this question ranged from totally disagree (1) to totally agree (5). Only a minority of the doctoral candidates didn’t see any value in a doctorate in their current field for non-academic employers. In contrast, almost two out of three doctoral candidates is convinced of the added value of a doctorate in their field.

However, there is also a large group of doctoral candidates (nearly 1 out of 4) that does not know whether a doctorate offers added value for the non-academic labor market. Among the junior researchers who recently submitted/defended their doctorate we find a similar pattern. Thus, also a quarter of this group does not know what the value of a doctorate in their field is for the labor market outside academia.

Figure 1. Junior researchers' perceived value of a doctorate in their field for future employers outside university, Flanders 2018 ( $N_{\text{junior researchers in a doctoral trajectory}} = 2986$ ;  $N_{\text{junior researchers who submitted/defended their doctorate}} = 170$ )



### DOES THE PERCEIVED VALUE FOR DOCTORAL CANDIDATES DIFFER ACCORDING TO GENDER, NATIONALITY, SCIENCE CLUSTER, DOCTORAL PHASE AND INTEREST IN DIFFERENT EMPLOYMENT SECTORS?

To answer the following two research questions, we consider junior researchers as junior researchers who perceive a doctorate in their field as an added value for employers outside university when they answered “agree” or “totally agree” for that statement. We compare this group with the group that did not agree or did not know the value of a doctorate in their field. We zoom in on the group of junior researchers in a doctoral trajectory. We leave out the group of junior researchers that has already submitted/defended their doctorate. The small number of junior researchers within the latter group does not allow us to make comparisons within that group.

In Table 1 we break the perceived value down by gender, nationality, science cluster, doctoral phase and interest in future employment sectors. When we look at **gender**, we see that the amount of male doctoral candidates (70.9%) that perceive the doctorate as an added value is significantly higher than the amount of female doctoral candidates with the same positive perception (64.0%).

We note no significant differences across **nationalities**: approximately 65% à 68% of doctoral candidates from Belgium, the EU-28 and non-EU-28 countries agree that a doctorate in their field has an added value for non-academic jobs.

We also observe significant differences across **science clusters**. In the applied sciences, 75.5% of doctoral candidates perceive an added value, followed by doctoral candidates in the biomedical sciences (69.9%) and

the exact sciences (69.5%). Among the doctoral students in the social sciences, there is 61.6% that perceive an added value. Doctoral candidates in the humanities close this list with approximately 1 out of 2 doctoral candidates that perceive a doctorate in their field as an added value for non-academic employers. Post-hoc comparisons with a stricter significance level ( $p < 0.01$ ) show that the share of doctoral candidates in the humanities and social sciences that perceive value in a doctorate in their field is smaller than that share in the exact, biomedical and applied sciences. The difference in shares between the humanities and the social sciences is also significant.

Finally, non-significant differences exist between the **doctoral phases** (initiating phase: 70.2%, executing phase: 67.2%, finishing phase: 64.1%) and the **sectors of future employment where doctoral candidates are very interested in** (only academic: 67.0%, only non-academic: 68.9%, both academic and non-academic: 66.9%).

Table 1. Share of doctoral candidates that perceive a doctorate in their own field as an added value for future employers outside university according to gender, nationality, science cluster, doctoral phase and interest in sector for future employment, Flanders 2018 ( $N=2986$ )

	Added value %	Sign (S)
<b>Gender</b>		***
Male	70.9	
Female	64.0	
<b>Nationality</b>		n.s.
Belgian	67.9	
EU28	64.3	
Non-EU28	66.4	
<b>Science cluster</b>		***
Exact sciences	69.5	
Biomedical sciences	69.9	
Applied sciences	75.5	
Humanities	49.8	
Social sciences	61.6	
<b>Doctoral phase</b>		n.s.
Initiating	70.2	
Executing	67.2	
Finishing	64.1	
<b>Very interested in sector for future employment</b>		n.s.
Only academic	67.0%	
Only non-academic	68.9%	
Both academic and non-academic	66.9%	

(S) significance based on the Chi<sup>2</sup>-test

n.s.=not significant \*= $p < 0.05$  \*\*= $p < 0.01$  \*\*\*= $p < 0.001$

Note:  $N=2962$  for nationality.

## DOES THE PERCEIVED VALUE FOR DOCTORAL CANDIDATES DIFFER IN EACH DOCTORATE PHASE ACCORDING TO GENDER, NATIONALITY, SCIENCE CLUSTER AND INTEREST IN DIFFERENT EMPLOYMENT SECTORS?

In this section we are investigating whether there are differences according to gender, nationality, science cluster and interest in sector for future employment for each step in the doctoral trajectory (initiating, executing and finishing). There are two important reasons to look into every step in the doctoral trajectory independently. First, we notice a trend towards differences in perceived value when comparing the different steps in the doctoral trajectory. Secondly, each step in the doctoral trajectory has its own specific characteristics. Doctoral candidates that experience more costs than benefits or perceive an insufficient return-on-investment do not advance to the executing or finishing phase. As a result, the group of doctoral candidates in the initiating phase is more heterogenous than the group of doctoral candidates in the executing or finishing phase. This is a possible explanation for the absence of a significant relationship between doctoral phase and added value in Table 1. Furthermore, there are also career related differences between doctoral candidates in the different steps of the doctoral trajectory. Perhaps doctoral candidates in the finishing phase reflect more on their future career and what the value of a doctorate can be for their career than doctoral candidates in the other two phases. In addition, there are also differences concerning the interests for future employment sectors (ECOOM-Brief 36). Doctoral candidates that are only interested in an academic career possibly reflect less on the value of a doctorate for the non-academic labor market than doctoral candidates who want to pursue a non-academic career after their doctorate.

In Table 2 we observe no significant differences according to the **nationality** of doctoral candidates and according to the **sector of future employment where doctoral candidates are very interested in**.

When we look at **gender**, we only observe a higher share of male doctoral candidates that perceive an added value of a doctorate in their field compared to female doctoral candidates that perceive an added value in the executing phase. It is also remarkable that the share of men who perceive a doctorate as an added value is stable across the different steps of the doctoral trajectory, while the share of women who perceive a doctorate in their field as an added value is smaller in the executing and finishing phase compared to the initiating phase.

Finally, looking at **science cluster**, we notice in the initiating phase that the share of doctoral candidates that perceive an added value in a doctorate in their own field is significantly smaller in the humanities than in the biomedical and applied sciences. In the executing phase, the share of doctoral candidates in the humanities and the social sciences who perceive a doctorate as an added value for non-academic employers is smaller than that share in the exact, biomedical and applied sciences. Furthermore, the share of doctoral candidates in the humanities that perceive a doctorate in their field as an added value is smaller than that amount in the social sciences. Also, the share of doctoral candidates in the biomedical sciences that perceive a doctorate in their field as an added value for future employers outside university is smaller than that share in the applied sciences. Lastly, there are no significant differences across science clusters in the finishing phase.

Table 2. Share of doctoral candidates in each doctoral phase that perceives a doctorate in their own field offers as an added value for future employers outside university according to gender, nationality, science cluster and interest in sector for future employment, Flanders 2018 ( $N_{\text{initiating phase}}= 499$ ,  $N_{\text{executing phase}}= 1503$ ,  $N_{\text{finishing phase}}= 608$ )

	Initiating phase	Executing phase	Finishing phase
<b>Gender</b>	n.s.	***	n.s.
Male	68.0%	73.4%	67.5%
Female	72.0%	62.4%	61.0%
<b>Nationality</b>	n.s.	n.s.	n.s.
Belgian	70.6%	68.0%	65.5%
EU28	65.7%	65.6%	58.6%
Non-EU28	71.3%	65.5%	62.6%
<b>Science cluster</b>	**	***	n.s.
Exact sciences	70.3%	71.2%	63.9%
Biomedical sciences	79.9%	68.7%	63.0%
Applied sciences	72.0%	78.1%	73.3%
Humanities	52.9%	45.5%	60.4%
Social sciences	67.6%	60.8%	58.1%
<b>Very interested in sector for future employment</b>	n.s.	n.s.	n.s.
Only academic	61.2%	68.2%	69.8%
Only non-academic	69.6%	70.4%	64.7%
Both academic and non-academic	73.5%	65.3%	64.6%

(§) significance based on the Chi<sup>2</sup>-test

n.s.=not significant \* $p < 0.05$  \*\* $p < 0.01$  \*\*\* $p < 0.001$

## DISCUSSION

Our findings show that two out of three doctoral candidates and six out of ten junior researchers who already submitted/defended their doctorate, perceive a doctorate in their field as an added value for future employers outside academia. However, it is remarkable that one out of four doctoral candidates and one out of four junior researchers who already submitted/defended their doctorate, have no idea whether a doctorate in their field offers an added value for the non-academic labor market. Further inspection of the answers of doctoral candidates show that the share that has no idea about the value of a doctorate remains stable across the doctoral phases (initiating phase: 21.5%, executing phase: 23.6%, finishing phase: 23.5%; analyses not presented in this brief). Together these findings possibly indicate that doctoral candidates and freshly graduated doctorate holders cannot form an accurate image of the non-academic career opportunities and have no or limited knowledge on the value of a doctorate in their field for those opportunities.

Looking specifically at the group of doctoral candidates, the share that perceived a doctorate in their field as an added value is not associated with (1) their interest in a specific career path (academia, outside of academia or both) and (2) their nationality. Because there was selective drop-out by nationality when answering the question regarding perceived value of a doctorate for a non-academic job, we should be careful when making conclusions based on this observation.

The share of female doctoral candidates that perceives an added value in a doctorate for future employers is lower than that share of male

doctoral candidates. A possible explanation are differences between men and women in terms of the non-academic sectors they are interested in and the specific non-academic sectors they are employed in. More female than male doctoral candidates want to work in (higher) education outside university, the non-profit sector and hospitals (ECCOOM-Brief 36). Furthermore, the public sector employs a larger share of women (Labour Force Survey of Statbel, 2020). Perhaps it is more difficult to initially see the added value of a doctorate in these sectors. Another possible explanation is that female doctoral candidates expect that a doctorate does not result in an increase in salary. The PhD Career Survey shows that the share of satisfied female doctorate holders with their salary in the non-academic labor market is lower compared to the share of satisfied male doctorate holders when they held a postdoctoral position before their non-academic job (ECCOOM-Brief 27). On a more speculative note, it is also possible that female doctoral candidates are less informed about the career opportunities and the value of a doctorate in their field for these opportunities (see also ECCOOM-Brief 31).

Moving onto science cluster, the share of doctoral candidates in the humanities that perceive an added value in a doctorate for non-academic employers is smaller than that amount in the social sciences. Furthermore, the share of doctoral candidates in the humanities and social sciences that perceive value in a doctorate is smaller than the share of doctoral candidates in the exact, biomedical and applied sciences who perceive added value. However, we must be careful when interpreting the findings for doctoral candidates in the exact sciences and the humanities since these groups are relatively small due to selective drop-out. An explanation for these differences might be differences in the interest in specific non-academic sectors for future employment. Doctoral candidates in the exact, biomedical and applied sciences are mainly interested in the private sector, while the most popular non-academic sector for doctoral candidates in the humanities is higher education outside university and for doctoral candidates in the social sciences the government (ECCOOM-Brief 36). For the higher education sector and the government sector, the added value of a doctorate is possibly less clear for doctoral candidates. Additionally, how quickly doctorate holders make the transition to the non-academic labor market could also influence the beliefs regarding the perceived value of a doctorate in their own field for non-academic employers. The PhD Career Survey shows that a larger share of doctorate holders in the exact, biomedical and applied sciences are immediately employed in a non-academic sector, while a larger share of doctorate holders in the humanities and social sciences remain employed at a university (ECCOOM-Brief 25).

Looking at the results in each step of the doctoral trajectory, we notice that there is only a relationship between gender and perceived value in the executing phase and between science cluster and perceived value in the initiating and executing phase. The various findings in the different steps in the doctoral trajectory can be due to cohort effects: the specific characteristics of the doctoral candidates might cause these differences. Another possible explanation are differences in the extent to which doctoral candidates think about the (added) value of a

doctorate in their field for employers outside university in each step of the doctoral trajectory. In the initiating phase doctoral candidates probably don't think about this, while this issue becomes more pressing in the executing phase. The reason why we do not see any differences according to gender, nationality, science cluster, and interest in sector for future employment in the finishing phase might be explained by the investments made by doctoral candidates: in the finishing phase doctoral candidates have already invested so much in their doctorate, that it is hard to believe that a doctorate has no value for future employers outside university.

Finally, we note that the share of female doctoral candidates that perceive a doctorate as an added value is smaller in the executing and finishing phase compared to the share of female doctoral candidates in the initiating phase. We can only speculate why we observe this pattern. More female doctoral candidates are interested in sectors for which the value of a doctorate is possibly less clear at first sight (see above). Perhaps these interests become clearer for female doctoral candidates as the doctoral trajectory progresses.

The Flemish universities are already taking actions to inform doctoral candidates on the broad spectrum of career opportunities and to install contacts between doctoral candidates and the non-academic labor market. For instance, Ghent University and Hasselt University organize [From PhD to SME](#) in collaboration with VOKA to build bridges between academia and small and medium-sized enterprises. During the [Career Talks](#) of KU Leuven, academia and non-academic sectors meet and go in dialogue with each other. Doctoral candidates reflect in the workshop [Inside a company](#) of the University of Antwerp on how a business works and what the value of a doctorate can be for non-academic careers. The Vrije Universiteit Brussel (VUB) offers a webinar series called [Your Doctorate: what's next?](#). In these webinars VUB alumni talk about their career and give advice to doctoral candidates who aspire a similar career. Finally, there are also interuniversity initiatives, such as the [PhD Talent Pool](#) and the [KBC winter school](#). The findings in this brief show that the initiatives of informing doctoral candidates and bringing together the non-academic labor market and academia should be strengthened, in each step of the doctoral trajectory. After all, there is a large share in each step of the doctoral trajectory that does not know whether a doctorate in their own field offers an added value for the non-academic labor market. This is especially important given that doctoral candidates think about quitting their doctorate when they feel their doctoral research contributes little to society and they have doubts about the added value of a doctoral title for their further career (ECOOM-Brief 20). On the one hand doctoral candidates can be informed on the possible career opportunities and sectors of employment based on the PhD Career Survey. On the other hand, the future Survey of Employers of ECOOM-Ghent University can contribute to more accurate insights in the perceptions that non-academic employers have about doctorate holders.

In addition to informing and connecting the academic and non-academic world, it also seems important to stimulate the development of skills that are deemed necessary for the non-academic labor market. Examples are teamwork and project management skills (Bebiroglu et

al., 2022; De Grande et al., 2014). By investing in the development of these skills, possible discrepancies between the extent to which these skills are acquired by doctoral candidates and the extent to which these skills are necessary in non-academic jobs can be diminished (Bebiroglu et al., 2022; De Grande et al., 2014). The [Stakeholder Engagement Panel](#) concerning the competencies of doctorate holders and the extent to which they meet the requirements of the non-academic workplace organized by the VLIR on the 24<sup>th</sup> of November 2022 already addresses this. Moreover, focusing on the development of transferable skills can result in an increased perception that the doctoral education better prepares doctoral candidates for the non-academic labor market. This in turn might contribute to the perceived added value of a doctorate for the non-academic labor market.

Various initiatives present a clearer image of the plethora of career opportunities after obtaining a doctorate, how a doctorate can offer an added value for each of these career opportunities and how doctoral candidates can prepare themselves (even) better for a non-academic job. As a result, this will lead to a smoother transition to the non-academic labor market, which is one of the action points of the Flemish coalition agreement 2019-2024.

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