

PhD holders and job contracts: is one better off in the non-academic sector?

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JOB CONTRACT IN FLANDERS

In 2019 the share of employees in Flanders with a temporary job contract was 8.4%. Gender differences are prevalent: 7.6% of male employees are at work on a temporary job contract, compared to 9.2% of female employees (Statistiek Vlaanderen, 2020). Statistics assessing type of employment contract signed by highly educated employees show that only 6.0% of them have a temporary job contract (Statistiek Vlaanderen, 2020).

PHD HOLDERS' JOB CONTRACT TO INSPECT THE PRECARIOUSNESS OF RESEARCH CAREERS

Increasingly more PhD holders receive a permanent job contract instead of a temporary contract. This trend is not a recent one (Mangematin, 2000; Vitae, 2010; European Science Foundation, 2017; for Wallonia-Brussels see: Bebiroglu, Dethier, & Ameryckx, 2019). However, PhD holders in the academic sector are less likely to receive a permanent contract in comparison to PhD holders in non-academic sectors (Waaier et al., 2017).

Within academic and non-academic contexts, different aspects influence the likelihood of receiving a specific type of contract. In the academic context, one's job position strongly determines the type of job contract one receives: postdoctoral researchers most commonly receive a temporary job contract (Herschberg, Benschop, & van den Brink, 2018), whereas Principal Investigators receive a permanent job contract. In the non-academic context, the sector of employment plays a role in the likelihood of receiving a permanent job contract: working in the industry, the service and business sector shows the highest likelihood of being employed with a permanent job contract (Bebiroglu et al., 2019; European Science Foundation, 2017). It is, however, unknown whether the contracts of PhD holders in the non-academic labor market differentiate depending on their involvement in research.

The literature indicates towards differences between male and female PhD holders in the received type of job contract: the share of women

receiving a temporary contract is larger compared to men (Auriol, Misu, & Freeman, 2013; Bebiroglu et al., 2019).

Research in Flanders on PhD holders' job contract is currently non-existent. Therefore, this ECOOM brief will focus on PhD holders' type of job contract according to career type (academic/non-academic and research/non-research) and gender. We will focus on the following research questions:

1. *Does the type of job contract differ between PhD holders' career paths?*
2. *Are there differences between men and women?*

ANSWERS BASED ON THE PHD CAREER SURVEY

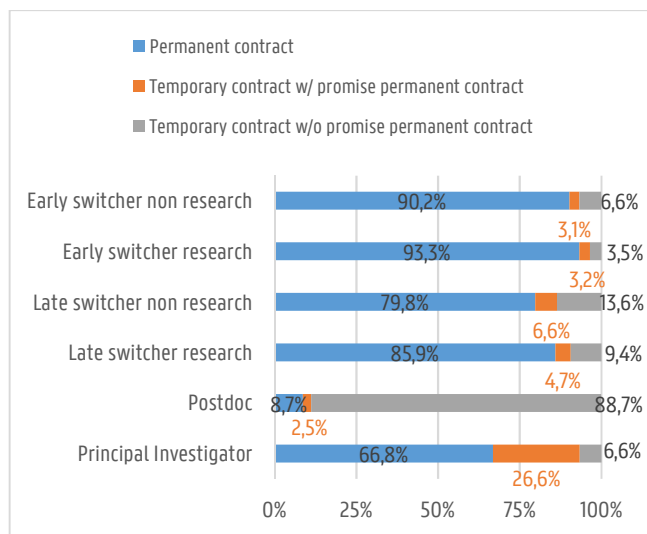
We answer the above questions based on the PhD Career Survey conducted by ECOOM-UGent in 2017. For a detailed discussion we refer to ECOOM-brief 23. For a visual overview we refer to the website <https://www.phdcareersflanders.com/en/>. In short: the PhD Career Survey maps the career paths of PhD holders who obtained their PhD at one of the Flemish universities. In what follows we analyze the answers of 2982 PhD holders. If the PhD holder was still currently employed, the question concerning job contract was asked as follows: "which type of contract do you have in your current job?". If the PhD holder was no longer employed, the question concerning job contract was asked as follows: "which type of contract did you have in your last job?" The possible answers were "permanent job contract", "temporary job contract with the promise of a permanent job contract (e.g. tenure track)", and "temporary job contract without the promise of a permanent job contract". The answers of both questions were combined to have an overview of the job contract in the current or last job.

Based on the PhD Career Survey, we distinguished four career paths, namely (1) "*early switcher*": PhD holders in a non-academic job who left academia immediately after their PhD (33%); (2) "*late switcher*": PhD holders in a non-academic job who did have an academic appointment after their PhD (29%); (3) "*postdoc*": postdoctoral researchers (16%); (4) "*principal investigator*" (Tenured Academic Personnel): PhD holders

who currently hold a position as professor at a university (22%). For more details on these career paths we refer again to ECOOM brief 23. Whether PhD holders had a research career was determined in two ways. Firstly, PhDs who were in the career path "postdoc" or "principal investigator" were seen as having a career in which research forms a fundamental aspect. Secondly, in the survey we also asked whether the PhD holders who were in a non-academic job, were still involved in research. Here, we distinguished between basic research, applied research and experimental development. PhD holders were classified as still active in research if they were still involved in one or more of these types of research. This information combined with the four major career paths resulted in six specific career paths: (1) "early switcher and not involved in research"; (2) "early switcher and involved in research"; (3) "late switcher and not involved in research"; (4) "late switcher and involved in research"; (5) "postdoc" and (6) "principal investigator" or professor. Those six career paths will be taken into account in the comparison of the different job contracts to inspect the precariousness of research careers.

We also differentiate by gender in our analyses. We used Chi square test and Cramer's V to inspect for significant differences between the career paths and between men and women. Both tests check whether the numbers differ significantly from each other. Cramer's V is less dependent on the sample size than Chi square. Results are considered significant at $p < .05$.

DOES THE TYPE OF JOB CONTRACT DIFFER BETWEEN CAREER PATHS?



To answer this question, we inspect Figure 1. The figure shows a significant association between the type of job contract and career paths ($\chi^2(10) = 1827.10, p < .001$; Cramer's $V = .58; N = 2755$). We discuss the figure for each type of job contract below.

In terms of a permanent job contract, we see the highest share of PhD holders with a permanent job contract in the group of "early switchers who are still in research" (93.3%). This differs significantly from the share of "late switchers", whether they are still involved in research (85.9%) or not (79.8%). When we look at the groups of "early switchers" and "late switchers" without research activities, we see significantly more permanent job contracts reported by those PhD holders who left university immediately after their PhD defense. The share of PhD

holders with a permanent contract in the academic context stands out: both shares of PhD holders with a permanent contract in either the "postdoc" career path (8.7%) and the "principal investigator" career path (66.8%) are significantly lower compared to all other career paths. What about temporary contracts with a promise of becoming permanently employed? Looking at the academic sector, again both "postdocs" and "principal investigator" stand out. Permanent job contracts with the promise of becoming permanently employed is only reported by 2.5% of the "postdocs", while a significantly larger share of 26.6% of the "principal investigators" report being temporary employed but with the promise of becoming permanently employed.

Lastly, we inspect the differences between the career paths in terms of temporary contract without any promise of a permanent job contract. The career path "early switcher research" has the smallest share of PhD holders with this type of contract (3.5%). This differs significantly from the "late switcher non research" (13.6%), "late switcher research" (9.4%) and "postdoc" (88.7%) career paths. Looking at the share among "principal investigators", we can see that it (6.6%) is significantly lower compared to the career paths "late switcher non research" (13.6%) and the "postdoc" (88.7%). Finally, the largest share of PhD holders with a temporary contract without the promise of a permanent contract is seen for "postdocs" (88.7%), which differs significantly from all other career paths.

ARE THERE DIFFERENCES BETWEEN MEN AND WOMEN?

To answer this question, we look at Table 1 which shows the share for every type of contract, broken down for career path and gender. Taking into account the stricter $p < .01$ significance level for posthoc testing, we see that the share of PhD holders in a certain type of contract significantly differs between men and women for "early switcher research" ($\chi^2(2) = 9.81, p < .01$; Cramer's $V = .12; N = 659$). In this career path, the share of male PhD holders having a permanent job contract is larger compared to the share of female PhD holders with this type of job contract. The share of male PhD holders having a temporary contract with the promise of a permanent contract is smaller compared to the share of female PhD holders with this type of job contract.

If we would use the $p < .05$ criterion in Table 1, we would find that there are also significant gender differences in the "late switcher non research", "late switcher research" and "postdoc", but not in the other career paths.

DISCUSSION

Compared to the non-academic sector, PhD holders in the academic sector are less likely to have signed a permanent job contract. In the career path of principal investigator, one in four contracts are for temporary employment, but include a promise of a permanent contract (e.g. tenure track). PhD holders in a postdoc position have the most precarious careers: nine in ten are employed on a temporary contract without promise of a permanent contract. In the non-academic labor market, no less than eight in ten PhD holders are employed on a permanent job contract.

Our finding that careers of postdocs are precarious when it comes to job contracts comes as no surprise and is not idiosyncratic to the Flemish

context. The pattern of employment of postdoctoral researchers based on temporary contracts without any longer-term institutional engagement is seen throughout Europe and beyond (Oliver, 2012). Research shows that compared to elsewhere in Europe, Belgium has the largest share of short-term postdoctoral researchers with a median duration of three years (IDEA, 2018). This time frame is perceived as too short in terms of career development and learning-on-the-job (IDEA, 2018). The consequences of short term contracts for postdoc are well-known: while postdoctoral researchers play a crucial role in science and in the successful completion of research projects, a long-term institutional vision on the role of postdoctoral researchers and their career development is often lacking or underdeveloped (Herschberg et al., 2018), rendering postdoc's careers largely or entirely dependent on the applied policy and available budgets of the principal investigator (Lam & de Campos, 2015).

To overcome this precarious job situation of postdocs, several policy changes were implemented. For instance, Ghent University has established a framework for less precarious work conditions and to stimulate the career prospects of their research staff (Ghent University, 2019). For the KU Leuven, the Group Humanities (Groep Humane Wetenschappen) has engaged itself for sustainable academic careers (KULeuven, 2020). There is abundant research showing that job insecurity as a result of temporary contracts, affects job satisfaction negatively (Waaijer et al., 2016). In many countries, such as the Netherlands, the United Kingdom, France, and Germany, labor laws limit consecutive temporary job contracts. For Belgium, the law allows up to four consecutive temporary contracts (Belgium.be). This practice might not result in the job security that many postdocs wish for, but on the contrary increase the precariousness of their labor market position: if institutions are not willing or able to offer a permanent job contract, then postdocs who have been employed formerly on a temporary contract are necessarily pushed out of their academic position and work context (Herschberg et al., 2018; Powell, 2015; Shmatko, Katchanov, & Volkova, 2020).

When we look at job contracts signed in the non-academic sectors, our findings show that PhD holders who leave academia immediately after their PhD defense (i.e. "*early switchers*"), are more likely to receive a permanent contract in comparison to those who left academia after a postdoc position (i.e. "*late switchers*"). The causal patterns behind this observation still needs to be unraveled and might be linked to the scientific field in which the PhD was successfully defended. As ECOOM brief 25 shows, PhD holders in applied sciences turn to the non-academic labor market much sooner than PhD holders in humanities and social sciences. The causal pattern might also be linked to the sector of employment: a large percentage of PhD holders in applied sciences are employed in the private sector with R&D, whereas this percentage is only limited for PhD holders in the humanities and social sciences (<https://www.phdcareersflanders.com/en/currentjob.php#sector>).

Further research might also look into the effect of having held a postdoc position when applying for a job outside of academia. Do employers consider the postdoc phase in the applicant's career track as an added value or as a handicap? Research on the value of a PhD and postdoc position for a job outside of academia still remains scarce. In Stassen, Levecque & Anseel (2016) the question of added value of a PhD was central to 30 interviews with key stakeholders on the Flemish labor market. Findings from our current research based on the PhD Career

Survey show that the timing of transitioning from academia to the non-academic sector plays a significant role when the PhD holder's aim is a permanent job contract. Within each of the career paths of "*early switcher*" and "*late switcher*" there are only minor non-significant differences in type of contract according to whether or not the job entails research activities. Future research might refine these observations by looking into the scope and nature of the research activities involved (e.g. fundamental vs experimental vs applied research) or the specific role that the PhD holder is taking up in the research activities that are part of his/her job (e.g. managing role or not).

Table 1. Job contract broken down by career path and gender (N=2755)

	Early switcher Non research		Early switcher Research		Late switcher Non research		Late switcher Research		Postdoc		Principal Investigator		Totaal	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Contract	92.0%	88.5%	95.9%	90.0%	85.6%	76.2%	89.1%	81.0%	12.5%	5.3%	70.3%	61.4%	75.4%	65.8%
Permanent contract														
Temporary contract with the promise of a permanent contract	3.2%	3.1%	1.6%	5.2%	1.9%	9.5%	2.9%	7.5%	1.4%	3.5%	24.2%	30.3%	7.7%	10.4%
Temporary contract without promise of a permanent contract	4.8%	8.4%	2.4%	4.8%	12.5%	14.3%	8.0%	11.5%	86.1%	91.2%	5.5%	8.3%	16.9%	23.8%

REFERENCES

- Auriol, L., Misu, M., & Freeman, R.A. (2013). Careers of Doctorate Holders: Analysis of Labour Market and Mobility Indicators. OECD Science, Technology and Industry Working Papers 2013/04. <https://dx.doi.org/10.1787/5k43nxgs289w-en>
- Bebiroglu, N., Dethier, B., & Ameryckx, C. (May, 2019). Employment status of PhD holders in the Federation Wallonia-Brussels. ORCS Thematic Report Series #1, Observatory of Research and Scientific Careers, Brussels, Belgium.
- Belgium.be (2020). Arbeidsovereenkomst voor bepaalde tijd. Retrieved from https://www.belgium.be/nl/werk/arbeidscontract/soorten_contract_en/duur_van_het_contract/bepaalde_duur
- ECOOM brief 25 - Mortier, A., Levecque, K., & Debacker, N. (2020). You have a PhD! What's next? The career paths of PhD holders ECOOM UGent.
- European Science Foundation (2017). 2017 Career Tracking Survey of Doctorate Holders. Project report.
- Ghent University (2019). WP policy. Retrieved from www.ugent.be/wpcareer on November 27, 2020.
- Herschberg, C., Benschop, Y., & van den Brink, M. (2018). Precarious postdocs: A comparative study on recruitment and selection of early-career researchers. *Scandinavian Journal of Management*, 34, 303-310. <https://doi.org/10.1016/j.scaman.2018.10.001>
- IDEA (2018). Systeemevaluatie van de financiering van (fundamenteel) onderzoek. Retrieved from https://ewi-vlaanderen.be/sites/default/files/systeemevaluatie_onderzoeksfinanciering_2018.pdf on November 27, 2020.
- Jobat (2020). Nieuwe werkvormen niet langer taboe. Retrieved from <https://www.jobat.be/nl/art/nieuwe-werkvormen-niet-langer-taboe> on November 27, 2020
- Mangematin, V; (2010). PhD job market: professional career trajectories and incentives during the PhD. *Research Policy*, 29, 741-756.
- Oliver, E. A. (2012). Living flexibly? How Europe's science researchers manage mobility, fixed-term employment and life outside work. *The International Journal of Human Resource Management*, 23(18), 3856-3871.
- Powell, K. (2015). The future of the postdoc. *Nature*, 520, 144-147.
- KU Leuven (2020). Postdoctoral researchers' policy and career development. Retrieved from https://ghum.kuleuven.be/phd/postdoc_policy on November 27, 2020.
- Shmatko, N., Katchanov, Y., & Volkova, G. (2020). The value of PhD in the changing world of work: traditional and alternative research careers. *Technological Forecasting & Social Change*, 152, 119907 <https://doi.org/10.1016/j.techfore.2019.119907>
- Statistiek Vlaanderen. (2020). Type arbeidscontract. Consulted from <https://www.statistiekvlaanderen.be/nl/type-arbeidscontract#tijdelijkcontract> on November 19, 2020.
- Vitae (2010). Doctoral graduate destinations and impact three years on. Published by The Careers Research and Advisory Centre (CRAC) limited.
- Waaijer, C.J.F., Belder, R., Sonneveld, H., van Bockhove, C., & van der Weijden, I.C.M. (2017). Temporary contracts: effect on job satisfaction and personal lives of recent PhD graduates. *Higher Education*, 74, 321-339. [10.1007/s10734-016-0050-8](https://doi.org/10.1007/s10734-016-0050-8)

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