

The Survey of Employers: how do non-academic employers in companies with R&D activity view doctorates?

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In the consolidation and further development of Flanders as an innovative region, PhD holders play an important role (García-Quevedo et al., 2012; Herrera & Nieto, 2015). Therefore, the Flemish government, universities, funding institutions and promoters strongly invested in the education and training of these researchers. In order to maximize the return-on-investment, it is crucial that PhD holders are not only able to build an academic career, but that they can also move on to jobs in the non-academic labor market where they can utilize their full potential. The Flemish coalition agreement 2019-2024 thus focuses on a better preparation of PhD holders for careers outside the university and a smoother intersectoral mobility into non-academic careers. An important step in this is to understand the career paths of PhD holders who leave the university. The PhD Career Survey organized by ECOOM-Ghent University maps this for Flanders (ECOOM Brief 25 and <https://www.phdcareersflanders.com/en/>). This survey shows, for example, that PhD holders who leave the university immediately after their PhD defense, can mainly be found in the private sector with R&D-activities and that approximately half of them are involved in applied research (ECOOM Briefs 42 and 44 - for more insights we also refer the interested reader to ECOOM Briefs 27, 28, 29, 30, 40 and 45). In addition to PhD holders, employers or companies in the labor market outside the university also play a role in the transition from the university to the non-academic labor market (ECOOM brief 32). However, this side of the transition story has received very little attention in Flanders so far. One of the few existing studies on the subject focused on the skills that employers in the industrial sector are looking for in researchers. Specifically, De Grande and colleagues (2014, see also ECOOM Brief 4) found that the top five important skills include technical skills, teamwork, analytical thinking, taking initiative and scientific knowledge. Two other studies focused on how a PhD and PhD holders are perceived. Smit (2010) found that a PhD is perceived as an added value by Research-Development-Innovation managers, but not by HR managers. The interviews by ECOOM-Ghent University with 30 key

stakeholders in Flanders on the value of a PhD in the non-academic labor market pointed to both positive (e.g., innovation capacity) and negative stereotypes (e.g., lack of managerial skills) (Stassen et al., 2016).

Due to the scarcity of research in Flanders from the perspective of non-academic employers, little is known about the role of these employers in the intersectoral mobility of PhD holders (ECOOM Brief 32). Thus, there are many unanswered questions. For example, are the stereotypes that emerge from the interviews of Stassen et al. (2016) widely supported by non-academic employers and companies in Flanders? Which companies employ PhD holders? Which job offers do companies make towards PhD holders? In which initiatives regarding PhD holders are companies in Flanders interested? In 2022, ECOOM-Ghent University organized the *Survey of Employers* to gain insight into how companies with R&D activities in Flanders view PhD holders.

DATA COLLECTION IN TWO PHASES

To gain more insight into how non-academic employers view PhDs and PhD holders, ECOOM-Ghent University organized the *Survey of Employers (SE)*. This is a cross-sectional survey of companies with R&D activity in Flanders. Identifying and contacting these companies was done in two phases.

The first phase involved collaboration with ECOOM-KU Leuven within the framework of their 2022 *Research & Development (R&D) Survey* (reference year 2021) (Department EWI, et al., 2023). The *R&D Survey* is organized biennially and provides the Flemish Government with official statistics on R&D in companies in the business sector in Flanders (headquarters or major R&D site in Flanders) (referred to further in the text as *R&D Survey*). The Brussels region is not included. The surveyed set of companies for the *R&D Survey* includes all companies with known or assumed R&D activities in Flanders for that reference year. The companies eligible for selection are determined on the basis of various sources (among others, answers to past R&D or innovation surveys,

annual accounts data, administrative data to apply for R&D support, membership lists of sector organizations, lists of recent spinoffs,...). The vast majority of this group of companies with known or assumed R&D activities are surveyed by ECOOM-KU Leuven with the comprehensive *R&D survey*. In addition, a random sample of other companies is taken to detect any newcomers in the field of R&D activities (Department EWI, et al., 2023). This detection is done using a shorter *R&D survey*. Companies of which we expect limited, rather occasional R&D also receive the shorter *R&D survey*. In the comprehensive *R&D survey*, companies were asked whether ECOOM-Ghent University could contact them within the context of the *Survey of Employers* and if so, whom we could contact. The comprehensive *R&D survey* reached 4186 companies (of which 3823 actually engaged in R&D activities). 779 of these 4186 companies indicated their willingness to participate in the *Survey of Employers* and provided contact information for individuals who have insight into HR/staff policies.

In the second phase of data collection within the *Survey of Employers*, ECOOM-Ghent University invited all 779 identified contacts to participate in the online survey. The data collection ran between October and December 2022. A total of 245 companies with R&D activity gave their informed consent to participate in the survey and to use their data for research purposes. However, 19 of these companies were found not to answer any or only a limited number of questions from the *Survey of Employers*. They were therefore not retained for further analysis.

REPRESENTATIVENESS

Do these 226 companies with R&D activity who completed the *Survey of Employers* offer a representative picture of all companies with R&D activity in Flanders? In order to answer this question, in Table 1 we compare the characteristics of these 226 companies to the characteristics of the 3823 companies with R&D activity who completed the comprehensive *R&D survey* (here we do not consider companies without R&D activity).

Regarding sector, in Table 1 we adopt NACE codes as applied in the *R&D survey*. Comparing the distribution of participating companies across these sectors, we mostly see parallels. Only the chemical/pharmaceutical industry is over-represented in the *Survey of Employers* compared to the *R&D survey*. Looking at company size, we observe parallels in the representation of medium and large companies, but a difference in the ratio of micro versus small companies. In terms of R&D, the *Survey of Employers* reaches more companies where both internal and external R&D activities take place and where internal R&D activities are done on a permanent basis.

Table 1. Characteristics of companies with R&D activity in the comprehensive *R&D survey* and the *Survey of Employers* - Flanders 2022.

Company characteristics	R&D ^a N=3823	SE ^b N=226
Sector		
Production houses/Telecom/ ICT/ Engineers/Technical testing/ R&D	38%	41%
Other Services	14%	13%
Wholesale and retail trade	10%	8%
Other Industry	6%	6%
Food/beverage	5%	2%
Chemical/Pharmaceutical industry	5%	11%
Metal/Machine repair and installation	5%	4%
Machinery/Vehicles	5%	5%
Refineries/Rubber/Artificial materials/ Non-metallic mineral products	4%	2%
Paper/Wood/Cork/Furniture/ Printing	3%	1%
Informatics/Electronic and optical products/Electronics	3%	6%
Textiles/Clothing/Leather	2%	1%
Company size (# of employees)		
Micro (<10)	34%	27%
Small (10-49)	35%	41%
Medium (50-249)	22%	23%
Large (>=250)	9%	10%
Internal and external R&D activities		
Only internal R&D activities	73%	62%
Internal & External R&D Activities	27%	38%
Nature of internal R&D activities		
Permanent internal R&D activities	75%	85%
Occasional internal R&D activities	25%	16%

Note. ^a refers to the comprehensive *R&D survey*, where percentages were extrapolated to the relevant populations using weights. ^b refers to the unweighted distribution within the set of companies with R&D activities that responded to the *Survey of Employers*.

WHICH TOPICS DOES THE SURVEY OF EMPLOYERS INCLUDE?

The ECOOM *Survey of Employers* includes 6 modules. In Module 1, the focus is on **company characteristics**. Companies are given the opportunity to correct data about their company from the BelFirst database or *R&D survey* (e.g., the date the company was founded, the sector - defined by NACE code - and the number of employees), with the exception of one category of data. These are the data on the R&D activities of the companies, which were obtained from the *R&D survey* and no longer shown to respondents in the *Survey of Employers* for possible correction. The reason behind this is that the respondent of the *R&D survey* is assumed to be the person with knowledge about this, while this is not necessarily the case for the respondent of the *Survey of Employers*. In addition, the survey also asks whether the company is engaged in innovation.

Module 2 asks about aspects related to **employing PhD holders**. For example, it asks whether companies have positions for which a

doctorate is a requirement or plus. It also identifies whether they actively recruit PhD holders and, if they do, how well they succeed in doing so. Questions are asked about collaboration with and employment of PhD candidates and PhD holders. Finally, it gauges the extent to which employing PhD holders fits within the company's strategy, resources and habits and the habits in the sector.

Module 3 compares **companies' offerings to PhD holders to masters** (e.g., with respect to salary and accelerated promotion opportunities). It also gauges the extent to which a higher offer to PhD holders compared to masters fits within the company's strategy, resources and habits and the habits of the sector.

Module 4 focuses on the **perceptions** of companies in Flanders regarding the **added value of PhD holders and their skills, experience and personal characteristics**. In addition, this module also asks about the extent to which companies (1) know how to integrate PhD holders into their company and (2) have positive experiences with PhD holders and PhD candidates.

Module 5 examines whether companies in Flanders are **interested in initiatives related to PhD holders** (e.g., information about the skills of PhD holders and coaching/advice regarding the onboarding of PhD holders) and, if there is interest, whether there is also willingness to pay for it.

The *Survey of Employers* concludes with module 6, which deals with the **respondent him/herself, the representative of the company completing the questionnaire**. More specifically, it asks whether he/she himself/herself has a doctorate and knows (other) PhD holders. If he/she knows (other) PhD holders, he/she is also questioned about how he/she knows them (within or outside a professional work context) and how positive or negative the experience with those PhD holders is. We obtained information about the gender of the company representative from the *R&D survey*.

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