

International researchers at Flemish universities (Belgium)

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INTERNATIONAL TALENT IN FLANDERS

In November 2017, the Flemish Advisory Council for Innovation and Enterprise (VARIO) issued an advisory report on attracting and retaining top international talent (1). This advice contained four major recommendations expressed in 20 action points. Several of these action points relate directly or indirectly to the academic track in Flanders, such as the sense of urgency to attract top international talent, the facilitation of the decree rules on language in higher education and of the language requirement for foreign teachers, and an increase in the international attractiveness of Flemish universities and colleges of higher education. The Human Resources in Research Flanders (HRRF) database currently contains data up to and including the academic year 2016-2017, the moment when the VARIO advisory report was published. This point in time is therefore an ideal moment to give a state of affairs with regard to the share of international researchers at Flemish universities. In the future, this can serve as a reference point to monitor the evolution of international researchers at Flemish universities.

SCOPE OF THIS BRIEF

In the present ecom brief, we deal with the following aspects of international researchers in Flanders:

1. How large is their share and what is their nationality, situation in the academic year 2016-2017?
2. How rapidly and at what point in time has their share increased since 1993-1994?
3. In which science cluster are international researchers more and less present?
4. What is the share of men and women among international researchers?
5. Do international researchers move on to a next academic phase in Flanders?

MARKING OUT DATA SOURCE AND DEFINITIONS

The HRRF database contains the appointments of all researchers associated with one of the five Flemish universities since 1990. In addition, it also includes all doctoral enrolments and defences. The database contains information such as gender, nationality, age, in which science cluster the research is carried out and the type of funding. The latest update on which this brief is based, contains the data of the academic year 2016-2017 (https://www.ecoom.be/en/research/research_careers/methods/HRRF).

In this brief, we look at the **new researchers** in Flanders. To determine when someone is new in a certain academic level, we look at 1) the first enrolment date for the doctorate (**new doctoral researcher**); 2) the date of the public doctoral defence (**new doctorate holder**); 3) the date of the first postdoctoral appointment (**new postdoctoral researcher**); 4) the date of the first appointment as a professor (**new professor**). It always concerns a registration, a defence and an appointment **at a Flemish university**.

We focus on **international researchers**, i.e. researchers with a different nationality than the Belgian one. We usually refer to them as **non-Belgians**.

The nationality is displayed according to the different continents (Africa (AF), Asia (AS), North-America (NA), South-America (SA), Oceania (OC) and Europe). Europe is further divided into Belgium (BE), Europe EU without Belgium (EU) and Europe excluding the member states of the European Union (non-EU), taking into account the various dates of accession to or departure from the European Union.

The science cluster of the researchers is determined in a different way depending on the academic level one is in. For new doctoral researchers, it is determined on the basis of the scientific discipline in which they enrolled for their doctorate (see also ecom brief 33). The science cluster of new holders of a doctorate is determined on the basis of the scientific discipline of the doctoral degree. The science cluster of new postdoctoral researchers and new professors is determined on the basis of the organisational unit of employment.

In the presentation of the results, we sometimes abbreviate the notation of the academic year: the academic year "2000-2001" then becomes "'00".

Gender in the HRRF is the gender as known on the identity card.

To look at the preceding trajectory, we restrict ourselves to the researchers born since January 1, 1965. Given that the HRRF contains data starting from the academic year 1990-1991, we can only have an overview of the entire academic trajectory in Flanders for these researchers.

RESULTS

Table 1 shows the share of non-Belgians among 'new' researchers in the academic year 2016-2017 and this for the different academic levels, more specifically new doctoral researchers, new doctorate holders, new postdoctoral researchers and new professors.

Table 1: Share of non-Belgians among new researchers by academic level during the academic year 2016-2017

	Doctoral researchers N=2432	Doctorate holders N=1997	Postdoct. researchers N=1084	Professors N=197
Non-Belgians	50.8%	41.9%	58.9%	26.9%
of which				
EU	39.8%	39.9%	51.8%	67.9%
non-EU	5.6%	5.0%	5.3%	7.5%
AS	34.5%	31.2%	29.0%	11.3%
AF	9.5%	13.3%	2.8%	0.0%
SA	6.2%	6.5%	4.1%	1.9%
NA	3.9%	3.7%	5.6%	9.4%
OC	0.4%	0.5%	1.4%	1.9%

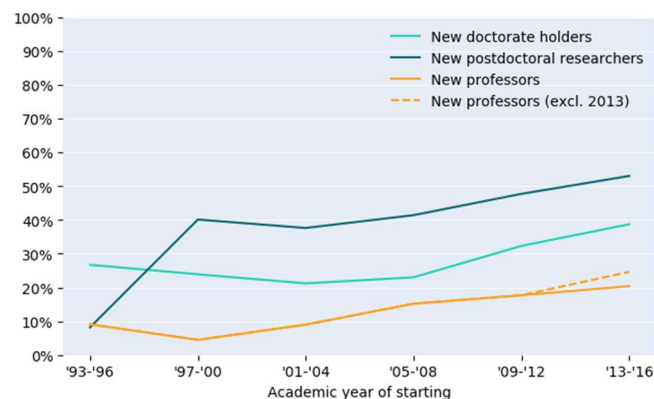
The largest share of non-Belgians is observed at the academic level of new postdoctoral researchers (58.9%). Among the new professors, only slightly more than one in four (26.9%) is non-Belgian. One in two of the new doctoral researchers is non-Belgian; this is smaller among new doctorate holders (41.9%). EU researchers make up the largest share of non-Belgian researchers at all academic levels. Researchers from Asia form the second largest group; up to postdoctoral level, they still make up almost one third of the group of non-Belgians, but as soon as we look at the new professors, we see that their share is considerably smaller in favour of EU researchers. At the doctoral level, the third largest group of non-Belgians are researchers originating from the African continent (almost 10%), but once at the postdoctoral level they are barely present in Flemish universities. With regard to researchers from North-America the figures from Table 1 further suggest that, in particular among professors, they take up a larger share of the non-Belgian researchers. However, because of the small absolute numbers, this should be interpreted with caution; figures from the previous academic years (not in the table) cannot fully confirm this.

With the same caveat on small absolute numbers, we note that among new professors in 2016-2017, Germany, Italy, the Netherlands and North-America are the leaders among non-Belgian researchers (10>=n>=5). Among new postdoctoral researchers, China, Italy, France, Germany and India take the lead (68>=n>=48). Among new holders of a Flemish doctorate, the top countries are the Netherlands, China, Italy,

India and Iran (81>=n>=36). Among new doctorate holders, the leaders are China, the Netherlands, Italy, India and Germany (150>=n>=59).

Figure 1 shows the evolution of the share of non-Belgian researchers among new holders of a Flemish doctorate, new postdoctoral researchers and new professors over time.

Figure 1: Share of non-Belgians among new researchers by academic level - Evolution from 1993-1994 to 2016-2017



The doctoral enrolment date is only sufficiently reliable from 2009-2010 onwards. For this reason, the evolution of non-Belgians among new doctoral researchers is not shown.

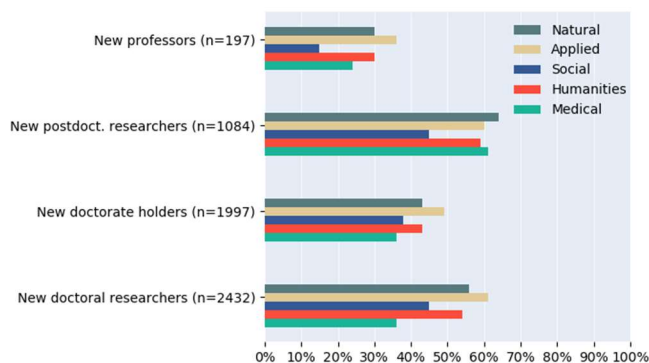
The share of non-Belgian researchers among new holders of a Flemish doctorate started to increase during the period 2009-2012. Detail (not in figure) shows that there was an increase since the academic year 2010-2011 to reach 38% in 2012-2013 which hardly changed until 2015-2016. Among postdoctoral researchers, a larger share of non-Belgian researchers dates back to 1997-2000. A closer look (not in figure) shows that this share then fluctuated between 30% and 40% for several years. It is only from 2006-2007 onwards that the share of non-Belgians among postdoctoral researchers rose steadily again. Amongst professors, the share of non-Belgians started to increase from 2005-2008 onwards. A closer look (not in figure) shows that this increase took place in the academic year 2005-2006. Subsequently, the share of non-Belgians among new professors fluctuated around 15% for several years. Only from 2011-2012 on the share of non-Belgians rose above 20%. An exception is the academic year 2013-2014, but that is explained by the integration into the university of most of the academic programmes that were offered at the colleges of higher education until then (1/10/2013). This has an important impact on the share of non-Belgians among new professors during the period '13-'16; after excluding that academic year, we see that 25% of the new professors instead of 20% are non-Belgian (dashed line in Figure 1).

For new doctoral researchers, we can only report on the evolution from the 2009-2010 academic year onwards. The share of non-Belgian doctoral researchers was 40.2% in '09-'12 and 47.1% in '13-'16. Detail shows that it concerns an annual gradual increase in the share of non-Belgian doctoral researchers.

Figure 2 shows the share of non-Belgians among new researchers by science cluster and academic level. In social sciences, the share of non-Belgian researchers is smaller compared to the overall share at all academic levels (for the overall share, see Table 1). In applied and natural sciences, the share of non-Belgians is larger compared to the overall share. In humanities the share of non-Belgians is larger than the

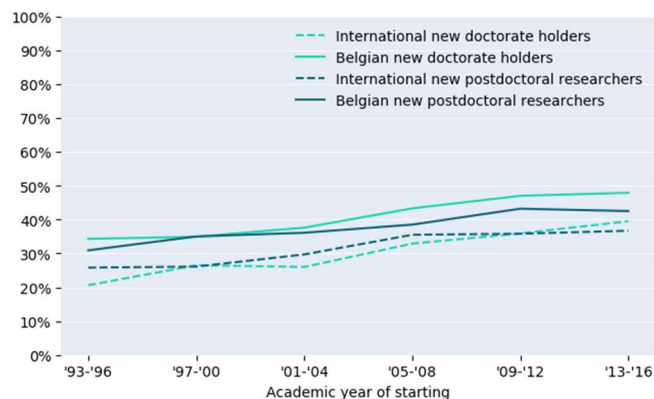
overall share only among new doctoral researchers and new professors. Finally, in medical sciences, the share of non-Belgians among new doctoral researchers and new holders of a Flemish doctorate is smaller than the overall share. For the sake of completeness, Appendix 1 shows the distribution of non-Belgian researchers across the science clusters.

Figure 2: Share of non-Belgians among new researchers in 2016-2017 by academic level and science cluster



In Figure 3 we look at the evolution of the share of women among new doctorate holders and new postdoctoral researchers broken down by nationality (non-Belgians versus Belgians). In both groups, the share of women increased, but the smaller share among non-Belgians does have an effect on the overall gender balance. Also among professors, the share of women among non-Belgians is slightly smaller, but the effect on the overall share is much smaller at this level (due to a small denominator among international professors, this is not shown in the figure).

Figure 3: Evolution of the share of women among new doctorate holders and new postdoctoral researchers for non-Belgians and Belgians separately

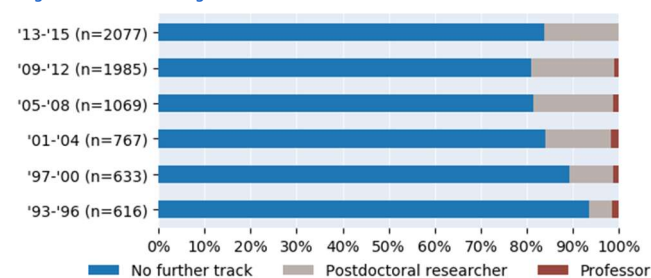


Finally, we examine to what extent non-Belgian researchers remain active in Flanders for a longer period of time. Do they only stay here for one phase of the academic track, or do they add one or more phases to it? We examine on the one hand the preceding academic trajectory of non-Belgian postdoctoral researchers and professors in Flanders and on the other hand the academic follow-up trajectory in Flanders of non-Belgian holders of a Flemish doctorate and non-Belgian postdoctoral researchers. Of the new non-Belgian postdoctoral researchers who started in Flanders during the period '13-'16 (n=2146), almost one in four (23.8%) had previously obtained their doctorate at a Flemish university. This share has slightly increased over time; during the period '01-'08

and '09-'12 it was 14% and 20% respectively. Of the new non-Belgian professors who started in Flanders during the period '13-'16 (n=176), 36.4% had a history at a Flemish university. Just over half of them (54.7%) had only completed the postdoctoral track in Flanders; 37.5% had also obtained a doctorate in Flanders in addition to the postdoctoral track; a minority had only obtained a doctorate in Flanders before starting a position as a professor there (7.8%).

We now look at the reverse, i.e. the continuation (Figure 4), in other words, of all the non-Belgians who obtained a doctorate in Flanders, how many started a postdoctoral track at a Flemish university? We notice an increase over time in the share of non-Belgian researchers who, after obtaining a doctorate in Flanders, move on to a postdoctoral track at a Flemish university (up to 19% of the doctorate holders from '05-'12). In the most recent cohort of doctorate holders ('13 to '15), this is only 16%, but it is possible that some of these researchers only return to a Flemish university later to continue their academic career. The transfer of non-Belgian postdoctoral researchers to a position as professor at a Flemish university is small: 2% to 3% eventually started as professor at a Flemish university (not shown in the figure).

Figure 4: Evolution of the academic continuation in Flanders among non-Belgians after obtaining a doctorate in Flanders



DISCUSSION

The share of non-Belgians among new researchers at all academic levels in Flanders shows a gradual increase in the period under review ('93-'16) and it seems that the ceiling has not yet been reached. At the postdoctoral level, we see the highest share of non-Belgians (almost 60% in 2016-2017, the most recent academic year for which we have data). Among new professors there was an increase in the share of non-Belgians up until 27% in the academic year 2016-2017. However, this increase is reflected only very slowly in the overall staff statistics (VLIR) where we find that in 2020 12.4% of the professors are non-Belgians (2) (in 2015 this was 9.8% and in 2010 7.7% (3),(4)).

The academic continuation at a Flemish university of non-Belgian researchers who obtained their doctorate in Flanders and/or started a postdoctoral research in Flanders is rather small (<20% and <5% respectively). The majority of non-Belgian new postdoctoral researchers and professors have no previous history at a Flemish university (76% and 64% respectively). The origin of the non-Belgian researchers varies according to the level of the academic track. At the doctoral level, there is still an important share of researchers from the African continent (9.5%), but in the subsequent levels they are hardly present; Asian researchers are mainly present at the doctoral and postdoctoral level, but much less so at the professor level. EU

researchers make up the majority of non-Belgian researchers at all levels. The social sciences are characterised by a smaller share of non-Belgian researchers, whereas the natural and applied sciences are characterised by a higher share of non-Belgian researchers (compared to the global share). Finally, the non-Belgian population is slightly more male compared to the Belgian population.

The HRRF database is a perfect tool to closely monitor the characteristics of (new) researchers at Flemish universities and their evolution. It therefore also enables us to map the profile of non-Belgian researchers at Flemish universities. However, when researchers disappear from the database, we know that they have withdrawn from the academic track in Flanders, but the possibility exists that they ended up on the non-academic labour market in Flanders and by extension in Belgium. It is clear that additional data are needed to gain insight into the ambitions of the non-Belgian researchers on the one hand, and to be able to measure the proportion that continues to work on the Flemish/Belgian territory after leaving the Flemish universities on the other hand. The analyses of the interests of non-Belgian doctoral researchers from the Survey of Junior Researchers 2018 already provide a little insight into this (5). The interest among non-Belgian doctoral researchers in working on the labour market outside Flanders (both academic and non-academic) is larger than the interest in staying on the Flemish labour market. Still, almost one in four of EU doctoral researchers and one in three of non-EU doctoral researchers is very interested in a non-academic job in Flanders. Unfortunately, there is no information on the extent to which international researchers are actually employed on the non-academic labour market. The provisional **assumption** is that the majority of these researchers do not end up on the Flemish/Belgian labour market. Still, these international researchers are often to be found in the STEM disciplines (see [APPENDIX 1](#)), the science cluster by definition with a shortage on the Flemish (1) and, by extension, the Belgian labour market (see below). Of course, employers must be prepared to overcome any negative stereotypical perceptions of doctorate holders. Nevertheless, a careful analysis by ECOOM UGent shows that these may be less present in relation to STEM doctorate holders (6). There are, obviously, several other factors that hamper the possibilities of a further career in Flanders, such as language, access to affordable international schools and the many administrative issues one often has to deal with. The Flemish Government recently (March 2021) launched new measures to attract top foreign talent by alleviating some aspects of the administration. This appears to be necessary looking at the international position of Belgium. Indeed the IMD World Talent Ranking 2020 that captures the capacity of an economy to develop as well as attract talent to strengthen its competitiveness, indicates a deteriorating position of Belgium compared to 2015-2017 (7). In terms of attractiveness - the degree to which a country taps into its overseas talent pool - Belgium scores fairly stable with a ranking of 15 to 17. Specifically for brain drain and foreign high-skilled people, Belgium is positioned 21st and 27th respectively in 2020. In terms of the availability of skills and competencies in the talent pool, Belgium has fallen sharply in the ranking (position 18 in 2015 to position 38 in 2020). It seems that the

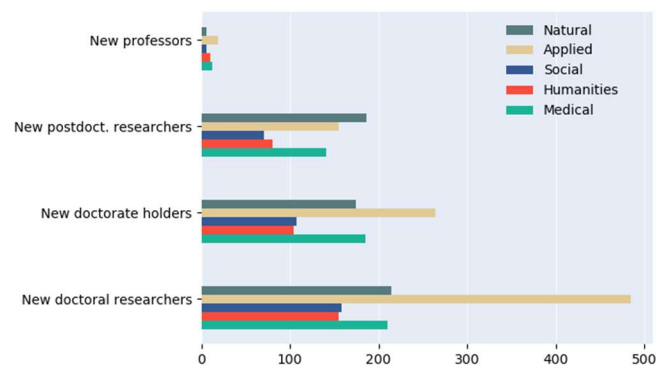
'Graduates in Science' parameter, which was only introduced in 2019 and for which Belgium is ranked 58 in 2020, strongly contributes to this decline. From the results of the 2020 Global Talent Competitiveness Index, which each year ranks countries based on their ability to grow, attract and retain talent, we see a small improvement at the level of attraction and a small decline at the level of retention, but there is much room for improvement at both levels (8).

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APPENDICES

Appendix 1: The number of new non-Belgian researchers by academic level and science cluster in 2016-2017



Disclaimer: This ECOOM-brief reports findings of scientific research conducted by ECOOM Ghent university. Analyses and interpretations are the responsibility of the author(s). They are not formal policy positions of the Flemish Government and Flemish authorities.