

## Tilburg University

### Science under pressure

de Vries-Stotijn, Anne

*Published in:*  
Science under pressure

*Publication date:*  
2019

*Document Version*  
Publisher's PDF, also known as Version of record

[Link to publication in Tilburg University Research Portal](#)

*Citation for published version (APA):*  
de Vries-Stotijn, A. (2019). Science under pressure: The PhD premium - Quantity over quality. In *Science under pressure: Essays on research integrity* (pp. 35-43). Tilburg University.

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# Anne de Vries

PhD candidate at Tilburg Law School,  
Tilburg University

Science under pressure:  
the PhD premium – quantity over quality<sup>1</sup>



This essay reflects the personal opinion of the author and is meant to stimulate further debate on the topic.

PhD dissertations are an important part of the research output of Dutch universities. However, in this essay I will argue that the quality of our PhD system is under pressure due to the PhD premium (in Dutch: *de promotiepremie*). This premium is a financial incentive the Ministry of Education, Culture and Science provides to the Dutch universities for each completed PhD dissertation. The premium steers towards maximizing the *number* of PhD dissertations instead of focusing on maximizing the *quality* of the PhD research. The PhD premium can make supervising PhD candidates a lucrative business. This may even lead to questionable research practices being tolerated or even institutionalized if these practices increase the number of PhD dissertations. Therefore, I will propose an alternative to the current PhD premium that could eliminate this potentially perverse incentive.

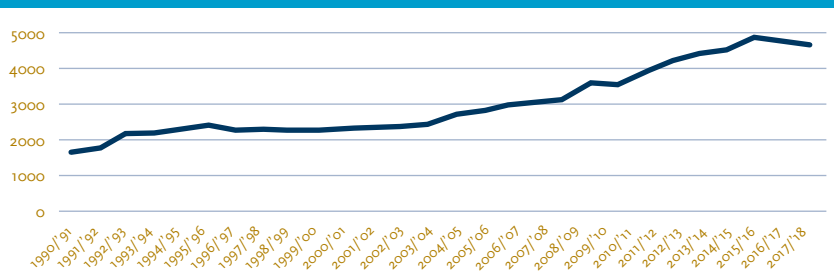
### A brief history: some facts and figures

In 1993, the Ministry introduced the PhD premium. Until 2009, the premium was considerably higher for PhD dissertations in the exact, technical and medical sciences than in the other research areas. In 2009, the PhD premium was set at € 95,000 for all disciplines.<sup>2</sup>

Since the early 1990s, the annual number of completed PhD dissertations at the 14 Dutch universities has almost doubled from 2,478 dissertations in 1999/2000 to 4,781 in 2017/2018. The graph shows a particular sharp increase since 2002/2003, and a small decrease in 2017/2018:

PhD dissertations per year 1990/91-2017/18

Source: <https://opendata.cbs.nl/statline/>, data set 'Wetenschappelijk onderwijs; gepromoveerden aan universiteiten 1990/'91-2015/'16' and 'Wetenschappelijk onderwijs; promoties, studierichting'



<sup>2</sup> H. Vossensteyn, H. De Boer & B. J loed, *Chronologisch overzicht van ontwikkelingen in de bekostigingssystematiek voor het Nederlandse hoger onderwijs*, CHEPS: Deventer 2017.

Already in 1994, Frans W. Saris, a Dutch professor in physics and later the dean of his School, predicted that the PhD premium would lead to a rise in PhD dissertations.<sup>3</sup>

The strong increase of the number of PhD dissertations had a disruptive effect on the public funding of academic research. It meant that a larger part of the structural funding for academic research went to PhD premiums. According to the Minister of Education, Culture and Science this caused an unwanted steering effect.<sup>4</sup> Therefore, in 2016 the total budget available for PhD premiums was maximized to 20% of the total (structural) government funding of academic research. As a result, the PhD premium has dropped to € 80,329 per dissertation in 2019.

### The PhD premium: a profitable model?

The Association of Dutch Universities (VSNU) claims that the PhD premium does not promote quantity at the expense of quality, because the costs for supervising PhD candidates are higher than the PhD premium.<sup>5</sup> This would mean that the strong increase of the number of PhD dissertations in the last two decades only increased costs for universities. However, this argument does not distinguish between the various types of PhD candidates.

Indeed, the costs for employing a PhD candidate, which are approximately € 200,000, are much higher than the PhD premium, but VSNU figures show that the number of employed PhD candidates has stayed almost the same since 2008, while the number of PhD dissertations increased by almost 50% from 3,214 in 2007/2008 to 4,781 in 2017/2018.<sup>6</sup> Most likely, the strong increase of the number of PhD dissertations comes from non-employed PhD candidates, who do not receive a salary and thus are much 'cheaper' for universities than employed PhD candidates.

Common types of non-employed PhD candidates are international scholarship PhD candidates and external PhD candidates. The first category receives a scholarship from a foreign organization. This means that a university's costs are limited to providing supervision, office and research facilities, graduate courses and sometimes a research budget for traveling and attending conferences. In addition, some universities, such as the universities of Delft and Groningen, provide

<sup>3</sup> F.W. Sairs, 'Universitair leven Frans W. Saris De promotiepremie', *De Gids* 1994-197.

<sup>4</sup> *Wetenschapsvisie 2025*, p. 22.

<sup>5</sup> *Factsheet gepromoveerden. Gepromoveerden van belang voor Nederland*, VSNU: Den Haag 2014

<sup>6</sup> See the second graphic on [https://www.vsnunl/f\\_c\\_promovendi.html](https://www.vsnunl/f_c_promovendi.html)

scholarship PhD candidates with a monthly financial top-up to their (often low) scholarship. To my knowledge, there is no reliable information available about the average costs for universities facilitating international scholarship PhD candidates. Presumably, since universities do not need to pay for salary, pension or other social benefits, the costs for these PhD candidates are much lower than for regular PhD employees.

Even less costly are external PhD candidates. External PhD candidates conduct their research in their own time and/or in their employer's time. For example, an academically educated financial specialist employed at a bank may have the ambition to obtain a doctoral degree in financial law next to his job at the bank. The costs for the university are limited to supervision and in the future, based on a plan launched by the VSNU in 2019, some basic facilities (e.g., e-mail, access to the library). Access to additional facilities, such as access to graduate courses, is at the discretion of the universities.<sup>7</sup> Again, solid information about the costs of supervising external PhD candidates is lacking, but it is likely that external PhD candidates can indeed be profitable. In particular, in 2017 and 2018, radio show Argos branded our university a “promotion factory” because of the large numbers of external PhD candidates some professors supervised. According to Argos some of the supervisors received a financial reward for each completed PhD dissertation, which suggests a direct financial interest in the completion of dissertations. I consider these incidents a symptom of a structural problem in the current funding system. During my term as the President of the national PhD council (PNN), at different universities I noticed practices seemingly aimed at increasing the number of PhD dissertations. In particular, when external PhD candidates pay an annual fee for their supervision (sometimes as high as € 12.000) that covers part (if not all) of the costs, external PhD candidates can become even more lucrative.

Is profit making still an option, now that the PhD premium is maximized at 20% of the structural research budget of universities? This is a valid question, since the PhD premium per dissertation will be lower when the number of PhD dissertations in the Netherlands increases. A lower PhD premium will also lead to a weaker perverse incentive. However, the incentive on quantity rather than quality persists, because the maximum of 20% of the total annual budget applies to all Dutch universities *combined*. This means that universities may still compete for the biggest piece of the pie, even though that pie has a maximum size. Prof. van Gestel, member of the Tilburg Scientific Integrity Committee, noticed that this leads to privatizing of profits

and communizing of costs.<sup>8</sup> This means that the potential gain (i.e., more PhD premiums) of increasing the number of PhD dissertations a particular university realizes is accompanied by the potential loss (i.e., a lower PhD premium) that is spread over all universities. I think that this system does not promote responsible behavior unless universities start to cooperate for the greater good rather than compete. So far, I have seen very little evidence of such cooperation when it comes to putting a stop on the universities' growth ambitions.<sup>9</sup>

### System focused on quantity

These concerns are not new. During my term as the president of PNN, I voiced similar concerns.<sup>10</sup> I was not the first,<sup>11</sup> and not the last.<sup>12</sup> Some parties are more positive about the current system than I am though.<sup>13</sup> In 2012, the Inspection for Education noted that there are generally enough warranties to counter the effect of the PhD premium. On the other hand, the Inspection warned that universities should pay more attention to eliminating potential perverse incentives in their internal financial allocation models.<sup>14</sup> To my surprise, a year earlier (before I was president), PNN argued that the PhD premium should be transferred directly to research groups and supervisors, as – according to PNN – already happens in some cases. The idea was that, to increase the chances of successfully finishing a PhD trajectory, all deans should follow this example by giving the promotor such a direct financial incentive.<sup>15</sup> In 2018, a Dutch university suggested transferring PhD premiums to research groups and providing the PhD candidate with a financial reward if they finish their PhD dissertation within four years.<sup>16</sup> I think that other incentives that promote quantity, such as a minimum number of PhD dissertations per professor per annum, are equally undesirable. Such incentives are especially risky in alpha and gamma sciences, where research grants are generally harder to

<sup>8</sup> R. van Gestel, 'Buiten promovendi gerekend', *Ars Aequi* 2019, p. 242-247.

<sup>9</sup> A similar observation could be made in respect of the annually growing number of students at Dutch universities.

<sup>10</sup> A. de Vries & K. Hoyer, 'Ontneem hoogleraar promotierecht bij ondermaatse begeleiding De promotiefabriek: wachten op een volgend schandaal', *ScienceGuide*, 14 September 2018.

<sup>11</sup> See a.o.: 'De perverse promotiepremie mag wel worden afgeschaft', *NRC Handelsblad* 21 April 2011; B. Sprecher, 'Het promovendi-overschot', *Mare* 15 October 2015.

<sup>12</sup> K. Marée, J. Been & B. Hekkema, 'Voor elke promotie krijgt de universiteit geld. En de promovendus betaalt de prijs', *De Correspondent*, 9 May 2019; Prof. Paola Gori Giorgi cited in: J. Chaudron, 'De promovendus die tegen het zere been van de hoogleraar schopt, vliegt eruit', *Trouw* 11 May 2019

<sup>13</sup> For example, Lawson argues that the PhD premium is not a perverse incentive, because it is outweighed by the costs of PhD research (R.A. Lawson, 'Promoties onder het vergrootglas', *Ars Aequi* 2017(11), p. 886-892). However, he does not distinguish between external and internal PhD candidates.

<sup>14</sup> *Verkenning naar de kwaliteitsborging van promotietrajecten en promoties*, Inspectie OCV, October 2012.

<sup>15</sup> M.M. Meijer, Behoud Talent! Een rapportage over de verschillende aspecten die een rol spelen bij de begeleiding van promovendi, PNN 2011, p. 16, p. 42.

<sup>16</sup> C. Boomsma, FSE wants bonus for fast PhD students, UKrant 9 April 2018.

<sup>7</sup> *Een gezonde praktijk in het Nederlandse promotiestelsel*, VSNU: Den Haag 2019.

obtain and where the number of annual PhD dissertations on average is considerably lower than in the beta and medical domain.<sup>17</sup> In particular in case of limited financial resources, quantity incentives may unintendedly promote recruiting “low cost” external PhD candidates whereas the focus should be with the PhD project’s content and relevance to the School’s research program, the supervisor’s expertise and the candidate’s qualities. In sum, all steering mechanisms that are meant to increase the PhD output are inherently risky in a system that is already heavily focused on quantity.

### More is less?

One may argue that an incentive that steers towards quantity does not necessarily steer away from quality. However, there is a clear tension between the two goals. If an external PhD has paid thousands of euro’s for receiving PhD supervision, doesn’t this put pressure on the supervisors to accept the manuscript at some point, even if it is below standard? If a professor supervises dozens of PhD candidates simultaneously, can he or she still properly supervise the quality of the research being done? If a research group or an individual has a direct financial interest in the completion of a PhD project, does this not interfere with quality requirements that ask for patience rather than pressure? If a School or a research group becomes dependent on external PhD candidates for generating income, will it remain critical with respect to the quality of the research?

I do not believe that there is one answer to each of these questions. Many academics are able to maintain their scientific integrity, also when under pressure to produce more PhD dissertations, but some may not and this may be true in particular in a system that rewards quantity of output. This is the essence of this issue: the PhD premium may amplify a rather persistent quantity-driven culture at universities. As such, the PhD premium may contribute to an unhealthy environment where science becomes profit-driven. This steers away from what academic research should be about an independent quest for knowledge.

### Solutions

Some argue that the current system provides sufficient checks and balances to safeguard the quality of PhD dissertations. For example, for each dissertation the PhD committee carries out a final quality check. However, because the PhD supervisors have a strong say in the selection of the members of the PhD committee, the PhD committee’s judgment should not be the only quality check.

<sup>17</sup> Likewise: R.A. Lawson, ‘Promoties onder het vergrootglas’, *Ars Aequi* 2017(11), p. 887.

The VSNU seems to support this view to some extent. In 2019, the VSNU presented several recommendations for safeguarding the quality of PhD trajectories, also for external PhD candidates. For example, PhD candidates should be registered with a Graduate School at least two years before the defence of the thesis, PhD committees should always consist of at least one, and preferably two, members from another university, and each PhD candidate should have at least two supervisors.<sup>18</sup> Another option, not proposed by the VSNU, would be to regulate the distribution of the PhD premiums within universities in a way that perverse incentives are abolished. For example, a university could pay a lump sum for PhD projects to research groups and departments rather than passing on the PhD premium if a dissertation is completed.

The VSNU recommendations are necessary, but are less suited to fix a financial system that favors quantity over quality. It is like prescribing medicine to a patient for an unhealthy diet, rather than changing the diet. In a system that heavily promotes quantity, the proposed checks and balances require extensive supervision and control to make sure that they do not become a paper tiger. Therefore, I believe that the root causes of the problem should be eliminated. One of the root causes lies with the PhD premium that rewards quantity rather than quality and allows universities to make a profit from uncritically increasing the numbers of certain “low-cost” PhD candidates.

If we accept that making a profit should not be a reason for conducting independent academic research, the solution is simple: change the system in a way that no profit can be made on PhD dissertations. A logical solution has already been proposed in 2018 by the national PhD Council (PNN)<sup>19</sup> and in 2019 (tentatively) by the Committee van Rijn when it advised restructuring the funding of universities.<sup>20</sup> The proposal is to align the PhD premium with the actual (average) costs that a university makes in relation to the different types of PhD candidates. This means assigning a higher premium for PhD employees and a lower premium for external PhD candidates. A third category could be introduced for international scholarship PhD candidates. If a PhD candidate has already covered the costs for his own supervision by paying a fee, a PhD premium should not be awarded at all. In October of 2019, the Ministry of Education, Culture and Science suggested that it would investigate the real costs of the different types of PhD candidates

<sup>18</sup> Een gezonde praktijk in het Nederlandse promotiestelsel, VSNU: Den Haag 2019.

<sup>19</sup> Actieplan: Naar een Gezond Promotiesysteem, PNN, 16 October 2018 (I was the president of PNN around that time).

<sup>20</sup> Adviesrapport bekostiging hoger onderwijs ‘Wissels om’, Adviescommissie Bekostiging Hoger Onderwijs en Onderzoek, 19 July 2019

and how the funding of universities can be better aligned to those costs.<sup>21</sup> A differentiated PhD premium is not entirely new, and two Dutch universities already use a differentiated PhD premium for low versus high-cost PhD projects, the latter leading to a 60-70% higher 'internal PhD premium'.<sup>22</sup>

I expect that the proposed change in the PhD premium stimulates a more balanced investment in young researchers and softens the high investments that universities make to employ a PhD candidate. Simultaneously, the change prevents profit-driven practices in relation to external and scholarship PhD candidates. This allows universities to focus on what really matters, selecting promising young researchers to conduct sound and independent PhD research.



*Anne de Vries is a PhD researcher in private law at Tilburg Law School and a member of the Tilburg Environmental Law Team. In her research she focuses on contract and liability law and environmental law, and regularly speaks, advises and publishes in these fields. As a member of the Tilburg PhD platform (TiPP) and the University Council, she represented the interests of the PhD community at Tilburg University. In 2018-2019 she was the president of the National PhD Network (PNN). In that capacity she raised awareness in the national media and politics about problems faced by PhD candidates. Among other things, she strongly criticized the PhD premium because for its strong emphasis on quantity of research. Anne writes columns on academic life and culture for *Univers*, the independent magazine of Tilburg University and was elected as one of ten top opinion makers of the academic year 2018-19 by news platform *ScienceGuide*.*

<sup>21</sup> *Opdrachtbeschrijving onderzoek toereikendheid en doelmatigheid macrobudget en kosten(-toerekening) middelbaar beroepsonderwijs, hoger onderwijs en (wetenschappelijk en praktijkgericht) onderzoek*, Ministry of OCW, 18 October 2019.

<sup>22</sup> B. Jongbloed et. al., *Bekostiging van het Nederlandse hoger onderwijs: kostendeterminanten en varianten*, CHEPS: Deventer 2018 p. 50. For PDEngs, which only take two years, university also receive a lower premium.