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ORIGINAL ARTICLE

The Relevance of the German Excellence Initiative for Inequality in University Funding

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Abstract

The *Excellence Initiative* was the largest competitive funding procedure to create German world-class universities and overcome the traditional Humboldtian homogenization of German higher education. This paper examines whether the Excellence Initiative has spurred financial inequality in the national higher education sector. For a period of 15 years, we analyze the third-party funding success of 78 universities that were either winning or losing in the competition. We find that the Excellence Initiative augmented pre-existing differences in third-party funding across institutions. However, this is a one-off level effect that does not initiate a further self-reinforcing divergence process as would be suggested by Matthew effects.

Keywords University funding · Financial inequality · Excellence Initiative · Matthew effect

Introduction

Over the last two decades, policymakers worldwide have started to invest public funds for the creation of so-called *world-class universities*. This trend of establishing elite institutions originated in 1998 in China and has been adopted in South Korea, Japan, Germany, and many other countries (Deem et al., 2008; Luo, 2013). While there were only 11 such initiatives worldwide in the period from 1989 to 2004, this figure climbed to 29 for the period 2005–2012 (Salmi, 2016). A major reason for this trend is the belief that cutting-edge research by universities leads to greater competitiveness and economic growth. Moreover, competition in the higher

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education sector has considerably intensified in recent decades due to the publication of international university rankings and facilitated information access with the emergence of the internet (Guri-Rosenblit et al., 2007; Ordorika and Lloyd, 2015).

In this paper, we examine the financial inequality in the higher education sector that accompanies programs intending to develop world-class universities. Programs to boost the international competitiveness of chosen institutions necessarily require a highly selective allocation of funding. Consequently, non-elite universities may be falling behind their competitors domestically and internationally in this process. Such a selective funding program could lead to a level change in institutional financial inequality. However, an initial differentiation may also set off Matthew effects as described by Merton (1968). This implies that financial inequalities could be exacerbated in a self-reinforcing dynamic since better funding positions allow institutions to reap further advantages. Such inequalities among institutions may spill over to differences between geographical regions with access to world-class universities and those without or between subject groups.

We investigate these issues based on the "Excellence Initiative" ("Exzellenzinitiative," henceforth EI), Germany's most prestigious and competitive funding program for universities, which was initiated by the government in 2006. The EI is a particularly illustrative case for two reasons. First, Germany historically exhibits a very egalitarian higher education system, such that policy decisions that increase inequality should have particularly evident effects. Germany's university system still subscribes to the ideal of Humboldtian homogenization (Liefner et al., 2004; Gaehtgens, 2015), where the idea of establishing a few outstanding research institutions by concentrating financial resources represents a relatively stark contrast (Jungblut and Jungblut, 2016; Huber, 2010). Second, the German EI distributed substantial amounts of money which should make any effects more visible. Between 2007 and 2017, the federal and state governments awarded 4.6 billion euros in additional funding to selected universities. This funding implied that the total funding available to all German universities for research suddenly increased by 4%. It is thus unsurprising that creating an uneven playing field among institutions, regions, and subject groups as a result of the EI has been a major concern in the public debate.

To examine the development of financial inequality among German universities following the introduction of the EI, we conduct a descriptive analysis of universities' third-party funding that employs data from the German Research Foundation (henceforth DFG) and the German Federal Statistical Office (henceforth Destatis). Third-party funding is an important target variable as it is typically awarded in competitive procedures, unlike universities' core funding that governments award proportionally to all universities. In 2015, about 48% of universities' total budgets stemmed from third-party sources[1] (Dohmen and Wrobel, 2018). For the analysis, we construct a panel of 78 German universities over a period of 15 years. As a guiding theme, we compare groups of universities

[1] This number refers to the share of university funding which is not part of the core-funding from the federal state budgets. The remainder of this paper considers third-party funding in a slightly narrower sense, that is, third-party-funding contributing to universities' research activities.

receiving additional funding with those that do not. That is, we compare successful excellence universities which benefit from all funding lines, partial excellence universities that only receive additional funding from single EI subprograms, and non-excellence universities obtaining no additional resources at all. Furthermore, we analyze financial development against the background of the number of professors. We also consider whether there has been a geographical divergence of successful universities, especially between Eastern and Western Germany. This distinction is particularly salient due to the different histories under communism and capitalism (Becker et al., 2020). Last, we also consider whether the increases in funding have predominantly benefited only narrow subject groups. More broadly, this project examines the implications of national policies to develop world-class universities on the differentiation of the higher education sector.

We find that there are substantial differences between excellence and non-excellence universities in terms of third-party funding, university size, and geographical location. Focusing on the funding levels relative to the number of professors, we find an initial upward shift in third-party funding upon the launch of the EI for universities successful in the competition. In subsequent years, there is no further increase in the gap among different groups of universities. Thus, our findings suggest that the EI set off a mere level effect, rather than a spiral of divergence in university funding.

We contribute to the existing literature by examining financial inequality at the inter-university level that accompanies the establishment of world-class universities. Financial divergence in the higher education sector through selective funding procedures has received little attention so far. Existing studies typically examine the effects of university funding on publication performance (Auranen and Nieminen, 2010; Zhao et al., 2018). Other papers ask whether different types of university funding are substitutes or complements to each other in the scientific production process (Connolly, 1997; Muscio et al., 2013; Czarnitzki and Lopes-Bento, 2014). Existing studies of the German EI range from analyses on the effects on the university choice of high-ability students, bibliometric analyses on research output and the effects on institutional efficiency (Horstschräer, 2012; Fischer and Kampkötter, 2017; Möller et al., 2016). Most closely related to our paper, Buenstorf and Koenig (2020) study interrelations in third-party funding sources of German universities, finding that German non-excellence universities receive more third-party funding provided by governmental research grants. While Buenstorf and Koenig (2020) focus on the short-run substitutability among different funding types, our emphasis is on the dynamics of inequality in third-party funding introduced by the EI in the longer term.

This paper proceeds as follows. The following section provides details on the EI and describes the organization and selection procedure. Next, we describe the data and our methodology. The subsequent section presents our main results and summarizes additional analyses concerning heterogeneity in the development of university funding across different groups. A short summary and discussion of our findings concludes the article.

The German Excellence Initiative

Traditionally, there has been no substantial vertical stratification in the German university system, which meant that all universities were considered of similar quality (Kehm, 2013). Since the early 1990s, however, there has been a growing debate as to whether this homogeneous system should be developed in favor of establishing a few outstanding research institutions that could compete with elite universities of other countries. This was followed in 1999 by the standardization of higher education systems and degrees through the Bologna reform in Europe, which led to better comparability between universities and consequently an increase in competition (Fischer and Kampkötter, 2017).

As a result, several political initiatives were launched to strengthen the autonomy of universities and to promote further differentiation among German universities (Jungblut and Jungblut, 2016). The best-known and most far-reaching of these initiatives is the Excellence Initiative (Bleiklie and Lange, 2010). It was a funding program initiated by the federal and state governments in Germany that lasted from 2006[2] to 2017. Its aim was to promote cutting-edge research and improve the overall quality of universities to make Germany internationally competitive in research. The initiative is subdivided into two funding periods, with the first period beginning in 2006 and the second in 2012. Since 2019, the EI has continued as an "Excellence Strategy" ("Exzellenzstrategie"), which implements a number of changes, but we will not further consider these in this paper.

The EI consists of three funding lines: First, the "graduate schools" ("Graduiertenschulen") funding line is designed to improve doctoral training. Second, there are "clusters of excellence" ("Exzellenzcluster") in which a knowledge cluster on a socially relevant subject area is established through personnel acquisition and interdisciplinary cooperation. Third, "institutional strategies" ("Zukunftskonzepte") describe overall university strategy concepts for the general improvement of research. An institutional strategy, however, can only be approved if a university has also successfully applied for the other two funding lines. Once a university has been granted funding for all three lines, it bears the title of a "university of excellence," even though it is colloquially referred to as an "elite university" (Bruckmeier et al., 2017).

In principle, all universities were eligible to apply for funding from the EI. The selection procedure for successful applications was a two-stage process. In the first stage, universities could submit proposals for graduate schools and clusters of excellence, as well as a draft proposal for one institutional strategy. Graduate schools and clusters of excellence were then reviewed and evaluated by a "commission of experts" and the institutional strategies by a "strategy commission." For the second stage, submitting a detailed application was only possible after a favorable assessment of the first-round submissions. The evaluation of the outlines and proposals as well as their selection was based on scientific criteria. At the end of the first phase

[2] The first funding round started in 2006; however, the list of successful universities was only completed in 2007.

of the competition in 2012, all universities had to reapply for the new round of the competition.

With a total funding amount of 4.6 billion euros, the initiative is one of the most expensive funding programs in German higher education. However, there are large differences in the importance of the three funding lines. Graduate schools were each funded with 1 to 2.5 million euros per year. The clusters of excellence were funded with 6.5 million euros per year in the first phase of the competition and 3 to 8 million euros per year in the second phase. Most importantly, the institutional strategies were funded with an average of 12.5 million euros per year in the first phase and 9.6 to 13.4 million euros in the second phase. The varying significance of the funding lines is also reflected in the unequal distribution of successful universities across funding lines. The first phase provided funding for 39 graduate schools, 37 clusters of excellence, and 9 institutional strategies, and the second phase funded 45 graduate schools, 43 clusters of excellence, and 11 institutional strategies (Sondermann et al., 2008).

Data and Empirical Approach

We use administrative data from the DFG and Destatis to construct a panel of German universities. The DFG data are extracted from the DFG funding rankings starting with DFG (2003). It provides information on third-party funding amounts at the university level for the period 1999–2016 in 3-year intervals. Years given within the results section therefore refer to the midpoint of these intervals. For instance, the datapoint 2006 then represents the years from 2005 to 2007. Hence, the datapoint 2006 already comprises EI funding for all universities which were successful in the first round. Variables included are the total third-party funding per institution which may be further distinguished by funding source. The main source of third-party revenues for universities is the DFG itself. The data distinguish between DFG-funding, which excludes EI revenues, and all other forms of third-party funds. Moreover, the data readily provide the number of professors per institution. Finally, the data also include the total third-party funding received by four broad subject groups. The Destatis dataset comprises the total number students per institution and academic year[3], which we combine with the funding data.

The DFG dataset contains 141 institutions of higher education whose DFG and third-party funding is broken down by subject, number of professors, and the funding channels of the EI. We restrict these institutions to universities and exclude polytechnics because they were ineligible to participate in the excellence competition. Our dataset is then reduced to 90 universities. In the next step, we exclude all universities for which some information regarding DFG and third-party funding are

[3] Data are available from table number 21311-0002 in the GENESIS database offered by Destatis.

missing. Typically, these are smaller institutions covering only a narrow set of academic subjects. The final dataset then comprises 78 universities.[4]

We propose a descriptive analysis to examine the effects as our interest is not in the fate of individual universities but in the university sector overall. To analyze the differential financial affectedness of universities due to the EI, we classify them into three groups according to their success in the competition. In particular, we distinguish between excellence universities, partial-excellence universities and non-excellence universities. We define excellence universities as universities that have achieved the excellence status at least in one of the two funding waves. We do not differentiate further between universities that have gained or lost their excellence status between the two rounds of the competition. Partial-excellence universities have been the main applicants for a cluster of excellence in at least one funding wave but did not become excellence universities. The group of non-excellence universities is thus the remainder of our universe. These universities did not achieve excellence status in any of the funding periods, nor were they the main applicant for a cluster of excellence. We do not consider the graduate school program in our classification as it is financially the most negligible EI funding line. Our final sample then consists of 14 excellence universities, 19 partial-excellence universities, and 45 non-excellence universities. Table 1 lists the universities included in each group. The composition of the successful universities can be illustrated based on their membership in German university networks established between 2006 and 2013: Eight out of nine universities that are part of the *TU9*, which comprises leading technical universities, were fully or partial-excellence universities. Furthermore, 12 out of 15 universities in the *German U15*, which comprises 15 research-intensive universities offering a full spectrum of subjects including medicine, were fully or partial-excellence universities. Conversely, only one of the 18 mid-sized universities from the *MGU* network was successful in acquiring EI funding.

Table 2 presents the summary statistics of our sample for all years after the beginning of the competition. Compared to the other groups of universities, excellence universities exhibit larger amounts of third-party funding in general but are also larger in terms of the number of professors, domestic students, and international students. The same relationship holds true for partial-excellence universities relative to non-excellence universities.

Results

This section presents the main results of our descriptive analysis and is structured as follows: First, we examine the development over time of DFG and third-party funding for excellence universities, partial-excellence universities, and non-excellence

[4] One of these universities, the University of Karlsruhe, merged with the Karlsruhe Research Center in 2009 to create the Karlsruhe Institute of Technology. However, this does not bias our results as our data only reflect the finances of the university part.

universities. We consider both the absolute funding amounts and funding standardized by the number of professors. Second, we analyze the funding situation over time using Gini coefficients. We do so both at the inter-university level and at the intra-university level. Third, we show the results for alternative classifications of success in the EI. Fourth, we look at differential affectedness based on the geographical distinction between Eastern and Western Germany as well as based on the universities' history. Last, we analyze heterogeneity in DFG funding across subject groups.

Third-Party Funding of Universities by Their Success in the EI

Figure 1 depicts the development of the average DFG and total third-party funding of universities over time, while Figure 2 shows the same development on a per-professor basis. In addition, each figure distinguishes between different groups of universities and funding amounts are given with and without funding from the EI. Figure 1 indicates that until 2006, there were only small differences in funding between the excellence universities, partial-excellence universities, and non-excellence universities. With the exception of the initial level differences, no further drifting apart occurs in DFG funding up to this point. Similarly, in the case of third-party funding, an even spread can be observed, which does not further increase the initial level differences. With the launch of the EI in 2006, however, we see a considerable leap forward in DFG funding for the excellence universities, a smaller increase for the partial-excellence universities, and a near-zero increase for the non-excellence universities. Furthermore, in addition to an increase in the general gap, a tendency for a stronger divergence can be observed. Also interesting to note is that the greatest increase is taking place in 2006. This is exactly what was expected from the implementation of the EI. A similar trend can be seen in third-party funding more generally, although the overall increase seems to be more gradual from 2006 onwards. In general, we observe that without the additional funds of the EI, the DFG funding would have remained in the same proportions to each other for the most part and the divergence in third-party funding would have been smaller.

Looking at Figure 2 for the funding per professor, both the differences in DFG and third-party funding are smaller from the outset and increase to a lesser extent after the start of the EI. We conclude that although the absolute funding amounts indicate a further divergence between the different types of universities, the analysis of funding per professor points to a mere level effect. Increases in third-party funding of excellence universities thus go hand-in-hand with increases in the number of professors.

Figure 3 shows the development of the Gini coefficient over time across all universities. Figure 3 thus illustrates the inequality in the German higher education system with regard to DFG funding. At an initial level of approximately 0.47, inequality is already relatively high, and as shown, it increases even further with the introduction of the EI. As this trend could simply occur from further differentiation within the group

of excellence universities, Figure 4 gives a corresponding breakdown by university group according to their EI success. It is apparent that the EI largely does not influence inequality within the respective groups. However, the levels of the Gini coefficients by the different university groups vary remarkably, with non-excellence universities standing out with particularly high inequality. From this figure, it can also be seen that the groups we formed are more homogeneous regarding their DFG funding and that the increasing inequality seen in the previous graph is due to differences between the groups and not within them. Similar trends occur when repeating the same analysis for total third-party funding (Online Appendix Figures B1 and B2[5]). Overall, the Gini coefficients at the inter-university level also indicate no steady financial divergence but rather a level effect.

Using Alternative Classifications of EI Success

As mentioned in the data section, our main analysis does not distinguish between universities which were unsuccessful in both rounds of the EI and those which were only successful in the graduate school funding line. Figure B3 shows the results (on a per-professor basis) if we include an additional category of universities which received funds through the graduate school funding line but through neither of the other two lines. This is motivated by the consideration that whilst being relatively insignificant in terms of funding amounts, the graduate school program allowed universities to position and distinguish themselves within the German academic landscape. This could possibly have led to improved funding opportunities. Figure B3 shows that while there is a slight divergence between solely graduate school line universities and non-excellence universities, for DFG funding this divergence already exists before the start of the EI program. For total third-party funding, the picture is somewhat mixed: There seems to be some divergence in 2006, followed by a partial re-convergence until 2012 and another divergence until 2015. This tentatively suggests that the graduate school program may have improved funding opportunities more generally. However, our conjecture that the increase should have been smaller than for fully or partial-excellence universities is confirmed.

Further, our main analysis defines full excellence universities as having achieved excellence status in at least one of the two EI rounds. Figure B4 shows DFG and total third-party funding per professor for the 14 full excellence universities divided into three categories: Six stayers, which were granted excellence status in both rounds, three T1 universities, which only succeeded in the first round, and five T2 universities, which only succeeded in the second round. Gaps in both DFG and total third-party funding between the three groups are generally small and do not increase substantially over time. Interestingly, Figure B4 provides some tentative evidence that any improvement in funding opportunities caused by EI success was relatively unstable: The increasing trend in both DFG and total third-party funding, excluding EI funds, of T1 universities slowed down or even reversed after 2012 when these universities lost their excellence status.

[5] The online appendix is available from the journal website and contains supplementary figures labeled with *B*.

Differences in Third-Party Funding by Location and History

A major criticism of the EI program was the uneven distribution of successful universities across Western and Eastern Germany, with the majority being Western German. Therefore, we analyze the potential heterogeneity in financial inequality between Eastern and Western German universities. Figure 5 depicts the development of average DFG and third-party funding by universities over time. We find that it is important whether we add Berlin to the East when comparing Eastern and Western German universities. Looking at Figure 5, universities in the West receive higher amounts of DFG funding, on average, than their counterparts in the East. However, this difference is considerably greater if Berlin is excluded from the group of Eastern universities. The fact that only a few Berlin universities can change the pattern shows how strongly the successful institutions in the East are concentrated in Berlin. Apart from two Berlin universities, there is only one other university of excellence in the East, TU Dresden. Another reason is that there are generally fewer universities in the East, so the weight of the Berlin universities is very large. When overall third-party funding is considered, the magnitude of this effect becomes particularly obvious.

Figure 6 presents DFG and third-party funding standardized by the number of professors. Compared to the non-standardized figure above, we find that the East-West gap diminishes once university size differences are taken into account. In recent years, we can even document that universities from the East are ahead of those from the West with respect to overall third-party funding per professor. This can be interpreted insofar as both the Berlin universities and the universities in the West are larger than those in the East, on average. Hence, the overall results do not point to a further divergence between the universities in the East and West. If Berlin is included as part of the East, there even seems to be alignment.[6]

Furthermore, we analyze differences in the development of third-party funding between traditional universities and universities founded after 1945. The results on a per-professor basis can be seen in Figure B6. Traditional universities received more EI funds than new universities, on average, as the gaps between the solid and dashed lines show. In terms of DFG funding, there is no clear divergence following the introduction of EI in 2006, but total third-party funding seems to have diverged substantially between the two groups. This divergence seems to be largely due to an acceleration of funding for traditional universities after 2006. However, considering that in our main findings we find little evidence for divergence between the professor-standardized funding of universities that were successful and unsuccessful in the excellence competition, it is questionable whether the divergence between traditional and new universities can be attributed to the EI.

[6] As an alternative, we conduct this analysis with a different specification where Humboldt University is included in the group of Eastern universities and the two other Berlin universities are included in the group of Western universities. This follows their historical location within the divided Berlin. The results are similar and can be seen in Figure B5.

Third-Party Funding Differences by Subject

A separate concern about the EI program was that its ostensible focus on STEM subjects may have negative spillover effects on further funding opportunities for the humanities. Figure 7 illustrates the different distribution of DFG funding with regard to the subject groups Humanities, Life Sciences, Natural Sciences, and Engineering as well as university groups. Results show that the funding levels for the respective subject groups and university types develop relatively evenly. What is striking, however, is the uneven distribution with regard to, on the one hand, the different subject groups and, on the other hand, the different university types. The relationship between the life sciences and the other subject groups is particularly unbalanced for the excellence universities. A second interesting aspect is that the humanities and social sciences are particularly outperformed among the partial-excellence universities. Overall, the EI seems to have shifted the financial situation more in favor of the life sciences. To further investigate this issue, Figure B7 shows the development of DFG and total third-party funding for universities with and without a medical center. It shows slight divergence in DFG funding after 2006 and quite substantial divergence in total third-party funding, tentatively supporting the previous finding that the EI may have disproportionately improved funding opportunities for the life sciences. However, the divergence disappears when standardizing by the number of professors (Figure B8), suggesting that any financial improvements were mostly absorbed by the creation of new professorial positions.

Conclusion

This paper investigates the financial divergence in the German higher education sector due to the implementation of the Excellence Initiative. Distinguishing between successful and non-successful institutions in the excellence competition, we present a descriptive analysis of third-party funding for 78 German universities over a fifteen-year period.

Our main research question asks whether the higher education sector experiences an acceleration of financial divergence after the implementation of the EI. Our results point to an increasing divergence in the total third-party funding amounts for the institutions that were awarded the university of excellence status. However, when standardizing funding levels by the number of professors, we no longer observe further divergence after an initial level effect with the launch of the EI.

This result indicates that the funding from the EI received by a university does not act as a complement in attracting further funding sources. A potential explanation is that professors do not have the capacities to prepare time-consuming applications for other third-party funding at the same time or that researchers face decreasing returns to additional funding. This implies that the one-off funding boost due to the launch of the EI results in a higher level of financial inequality but does not further

reinforce itself. Another possible explanation for the absence of further divergence is the historical egalitarianism of the German university system, which may inhibit stratification even when promoted by differential funding programs. Overall, our results do not suggest the presence of Matthew effects, which is consistent with the findings by Buenstorf and Koenig (2020).

Furthermore, we would like to address the question of a geographical concentration of successful universities. It seems that there are no significant differences between East and West in terms of funding, at least from the perspective of the number of professors. Our results also show that excellence universities receive particularly large amounts of funding for life sciences, disproportionately more than the other two types of universities.

These results are highly policy relevant. They indicate that the targeted promotion of exceptionally research-intensive universities does not necessarily set off a self-reinforcing process leading to increasing financial inequality among universities as suggested by the Matthew effects. Instead, from the case of Germany, we may rather expect a modest one-off higher degree of stratification.

Table 1 List of universities by excellence status

(1)	(2)	(3)		
Excellence universities	Partial-excellence universities	Non-excellence universities		
RWTH Aachen	TU Berlin	Augsburg	Hohenheim	Siegen
FU Berlin	Bielefeld	Bayreuth	TU Illmenau	Trier
HU Berlin	Bonn	Bamberg	Jena	Ulm
Bremen	Bochum	TU Braunschweig	TU Kaiserslautern	Weimar
Cologne	TU Chemnitz	TU Clausthal	Kassel	Witten/Herdecke
TU Dresden	TU Darmstadt	TU Cottbus	Koblenz-Landau	Würzburg
Freiburg	Düsseldorf	Dortmund	Leipzig	Wuppertal
Göttingen	Erlangen-Nuremberg	Duisburg-Essen	Lübeck	
Heidelberg	Frankfurt (Main)	Eichstätt-Ingolstadt	Lüneburg	
Karlsruhe	Gießen	Erfurt	Magdeburg	
Konstanz	Hamburg	Frankfurt (Oder)	Mannheim	
LMU Munich	Hannover	TU Freiberg	Marburg	
TU Munich	Hann. Medical School	Greifswald	UdBW Munich	
Tübingen	Kiel	Hagen	Osnabrück	
	Mainz	HSU Hamburg	Paderborn	
	Münster	TU Hamburg	Passau	
	Oldenburg	UVM Hannover	Potsdam	
	Saarland	Halle-Wittenberg	Regensburg	
	Stuttgart	Hildesheim	Rostock	

Source: Own classification scheme based on DFG data

Table 2 Descriptive statistics

	(1) Full sample	(2) Excellence universities	(3) Partial-excellence universities	(4) Non-excellence universities
Total TPF-Funding	58.71	133.11	76.90	27.89
	(56.85)	(69.46)	(41.80)	(23.81)
TPF-Funding per Prof.	0.20	0.30	0.23	0.15
	(0.137)	(0.136)	(0.137)	(0.113)
DFG-Funding	22.22	54.30	30.08	8.92
	(22.58)	(24.69)	(14.74)	(8.980)
DFG-Funding per Prof.	0.07	0.13	0.09	0.04
	(0.0523)	(0.0554)	(0.0422)	(0.0345)
No. of Professors	276.36	446.13	361.26	187.70
	(164.8)	(138.7)	(151.3)	(107.9)
No. of Students	18373.73	28557.69	24901.65	12449.15
	(12635.4)	(11374.1)	(10734.6)	(10157.3)
No. of Int. Students	2278.13	4133.04	3211.26	1307.05
	(1853.2)	(1685.3)	(1720.9)	(1204.9)
Observations	78	14	19	45

Notes: Table presents variable means. Standard deviations are given in parentheses

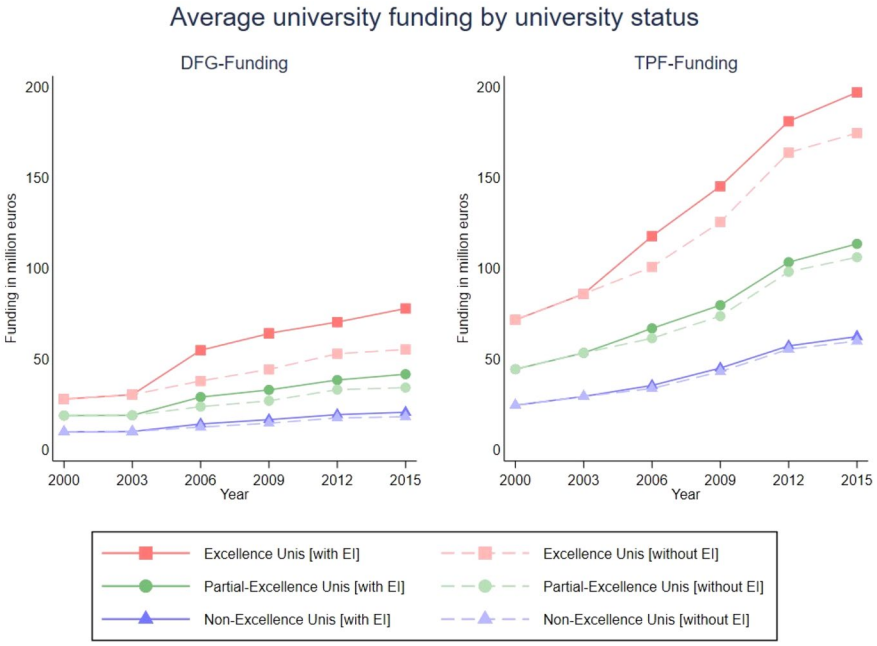

Fig. 1 Average university funding by university status and funding source as a total sum. *Notes*. The figure shows the development of average DFG and third-party funding received by universities over time. A distinction is made between different types of universities, and the funding amounts are indicated with and without funding from the EI. *Source*: DFG data. Sample period 2000–2015

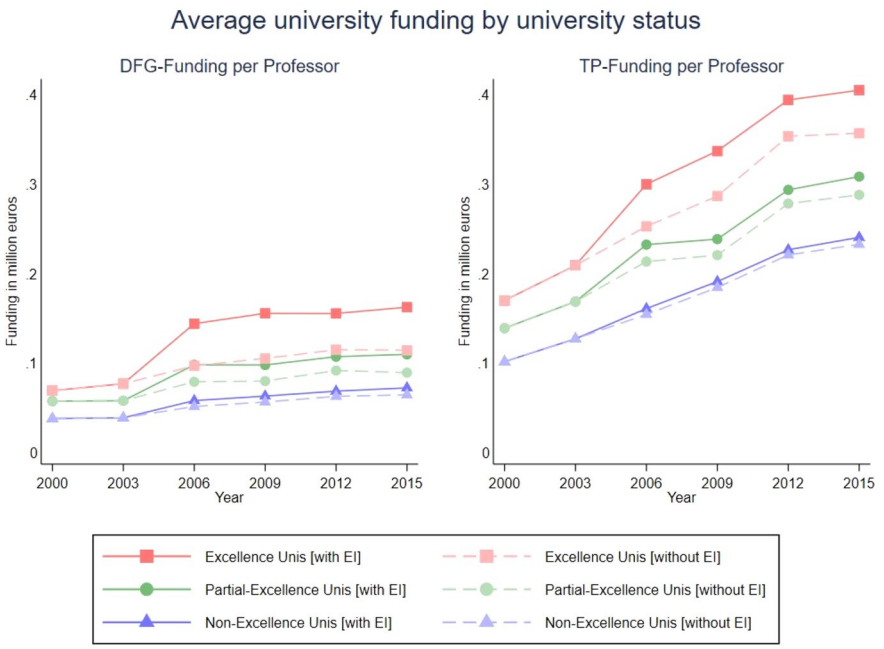

Fig. 2 Average university funding by university status and funding source on a per-professor basis. *Notes*. The figure shows the development of average DFG and third-party funding received by universities over time on a per-professor basis. A distinction is made between different types of universities, and the funding amounts are indicated with and without funding from the EI. *Source*. DFG data. Sample period 2000–2015

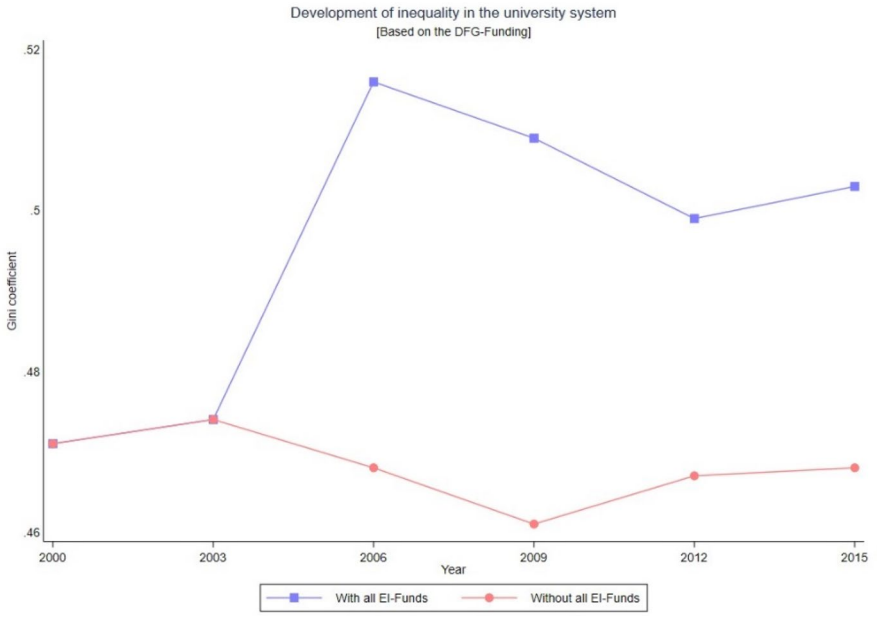

Fig. 3 Development of the Gini coefficient over all universities with and without EI funds. *Notes*. The figure shows the development of the Gini coefficient over time across all universities. One version is presented with the funds of the EI and one without. *Source*. DFG data. Sample period 2000–2015

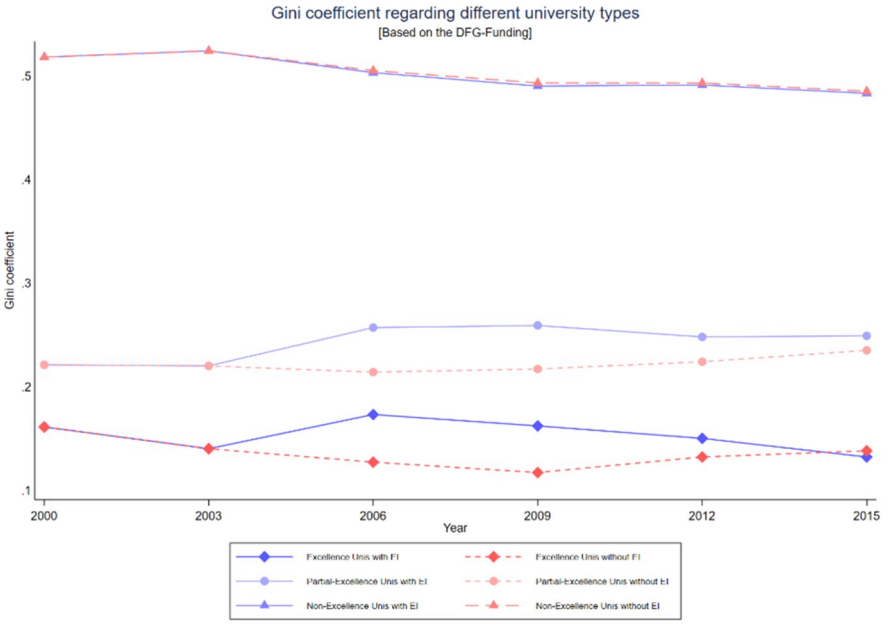

Fig. 4 Development of the Gini coefficient between the different university types with and without EI funds. *Notes*. The figure shows the development of the Gini coefficient over time across three different university types. In each case, one version is presented with the funds of the EI and one without. *Source*. DFG data. Sample period 2000–2015

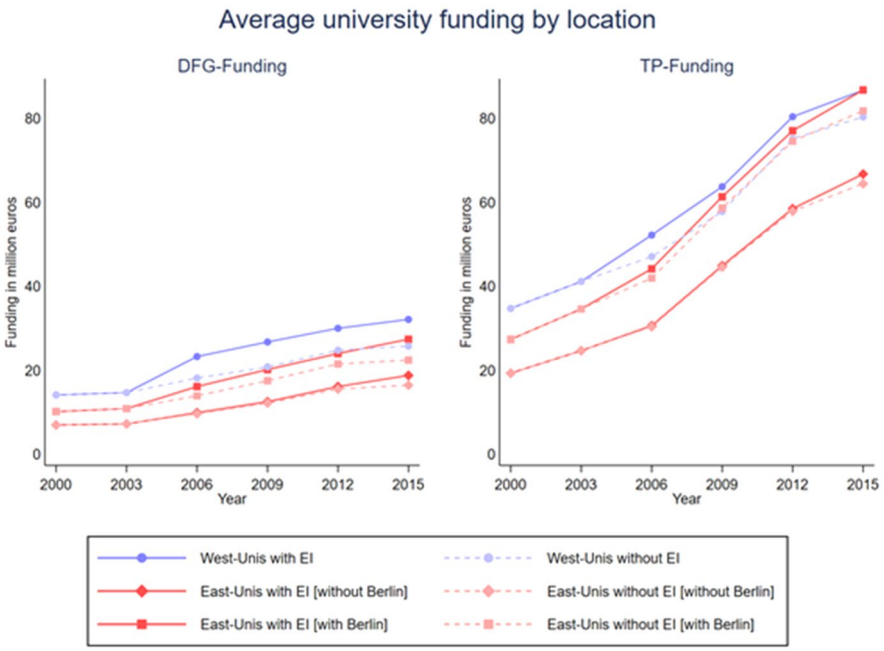

Fig. 5 Average university funding by location and funding source as a total sum. *Notes*. The figure depicts the development of average DFG and third-party funding received by universities over time. A distinction is made here regarding the location, and universities are divided into Eastern and Western Germany. The funding amounts are indicated with and without funding from the EI. *Source*. DFG data. Sample period 2000–2015

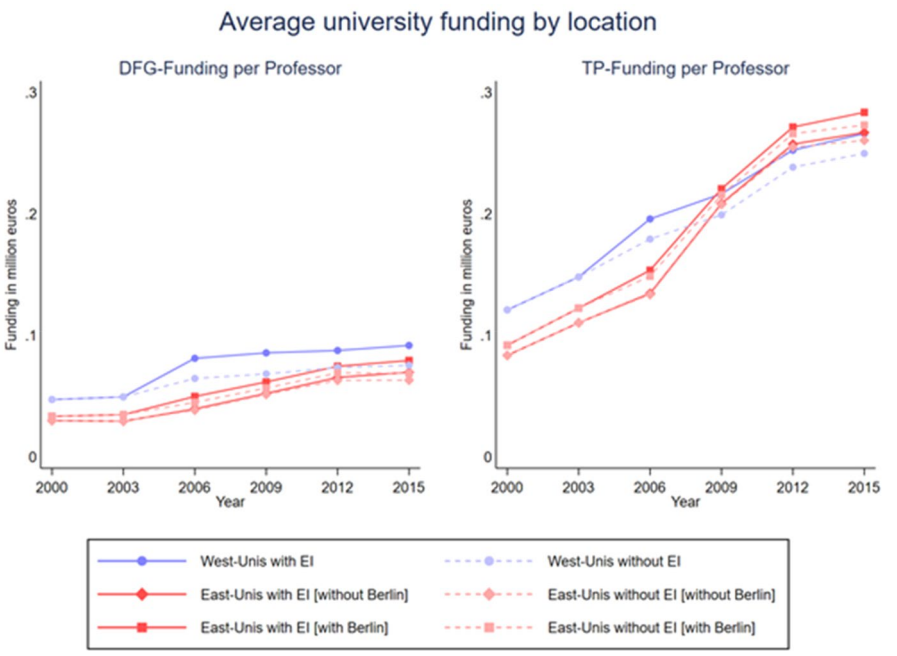

Fig. 6 Average university funding by location and funding source on a per-professor basis. *Notes*. The figure depicts the development of average DFG and third-party funding received by universities over time on a per-professor basis. A distinction is made here regarding the location, and universities are divided into East and West. The funding amounts are indicated with and without funding from the EI. *Source*. DFG data. Sample period 2000–2015

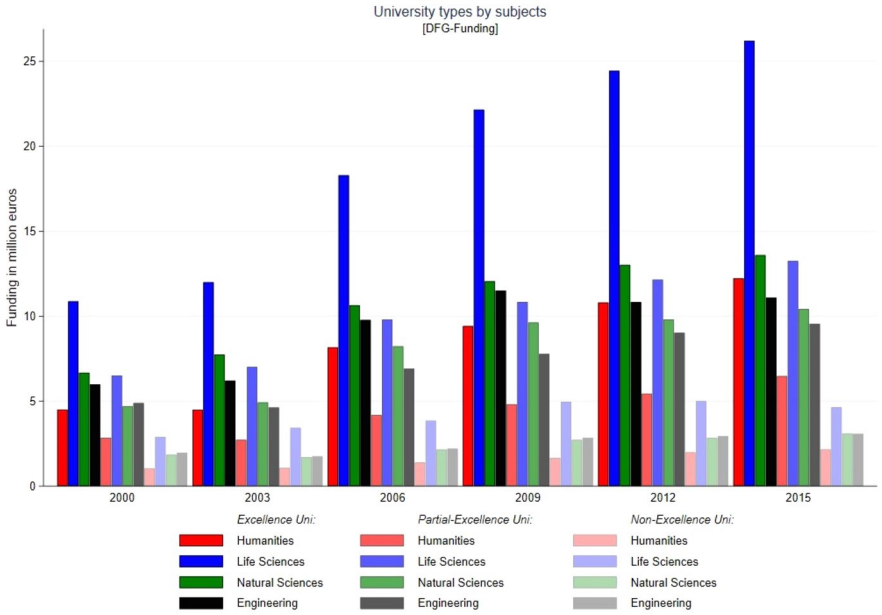

Fig. 7 Average university funding by subject group and university status. *Notes*. The figure illustrates the different distribution of DFG funding with regard to the subject groups and university types. *Source*. DFG data. Sample period 2000–2015

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Declaration

Conflict of interest Both authors declare that they have no relevant or material financial interests that relate to the research described in this paper.

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