



# Danish universities under transformation: Developments in staff categories as indicator of organizational change

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## Abstract

Claims of fundamental changes of the organizational model of universities have been widespread during the latest decades. To empirically assess the character and extent of organizational change is however not straightforward. This article contributes with partial, but also very tangible evidence of long-term organizational changes at Danish universities by analyzing detailed data on staff composition and salary distributions. The article shows that Danish universities indeed have undergone significant transformations, but that the full extent of these changes only becomes visible when a fine-grained analytical approach is employed. On the academic side of the organizations, relatively low-wage temporary positions have boomed at the expense of more expensive permanent ones. On the administrative side, specialized and highly educated administrative staff has surged substantially, while less expensive positions such as clerks, technicians, and service staff conversely have diminished in relative terms. Hence, while the analysis supports the overall claims in the literature, it also adds important nuances to the dominant narratives of organizational change.

**Keywords** Staff composition · Salary distribution · Universities as organizations · Non-academic professionals · Organizational change · University administration

## Introduction

Both the functions and the organizational structures of the traditional university model have been under increasing attack from stakeholders and policy-makers since the 1980s. Changes have in particular been demanded in order to transform the predominantly collegial institutions into more professionalized and hierarchically managed organizations

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(Whitley and Gläser 2014). In the literature, this process has been described as a general organizational turn towards more complete entities (Bleiklie and Kogan 2007; Brunsson and Sahlin-Andersson 2000; De Boer et al. 2007; Krücken and Meier 2006). But while it is generally acknowledged that substantial changes have taken place in this period, it is not entirely clear what the development covers, how fast and how far reaching it has been, and to what degree the developments are uniform in both content and timing across institutional and national contexts. Although studies appear to document some general cross-country patterns (Baltaru and Soysal 2017; Bleiklie et al. 2017a; Kehm 2015) and although there are more detailed accounts of a few national cases, the available evidence is in general still limited and patchy (Rhoades 2017; Seeber et al. 2015).

As most other European systems, also the Danish higher education system has been significantly reformed over the past decades: From the initial radical democratization reforms of the 1970s to the comprehensive “New Public Management”-inspired reforms of the new millennium. These reforms have in turn spurred a number of discussions on the actual content and extent of organizational changes at Danish universities. But a particular challenge both in a Danish and in a broader international context concerns the fact that national discourses as well as some scholarly debates tend to perceive “administrative cost” as anything that is not academic in a traditional sense (Rhoades 2017, for Danish examples see McKinsey & Co. 2009; Boden and Wright 2010; PriceWaterhouseCoopers 2011; Paldam 2015). This simplistic binary view of the universities is insufficient to the task of understanding the changing organizational models and the changing landscape of professional employment in higher education. Instead, as Rhoades argues, we need to map and tap into data that more accurately tracks the new structures of professional employment (Rhoades 2017, p. 215).

Hence, data on changes in staff compositions over longer time spans can be seen as a partial, but very tangible indicator of organizational changes (Gornitzka and Larsen 2004; Krücken et al. 2013). Based on unique and newly created Danish time series on job titles, education, and salary for all eight current Danish universities from 1999 to 2017, this analysis moves beyond crude staff categorizations and provides a coherent image with a sufficient resolution to capture changes both within and between the academic and administrative staff. Hereby, the analysis contributes to the emerging mapping of long-term changes in staff composition at universities across countries (e.g., Baltaru 2018 (UK); Desrochers and Kirshstein 2014 (USA); Gornitzka et al. 1998, 2009 (Norway); Karlsson and Rytberg 2016 (Sweden); Krücken et al. 2009, 2013 (Germany)). This is not least interesting as the time period covered by the present study allows us to follow the development throughout a period characterized by extensive policy change. From this outset, we examine at different levels of detail how the staff composition has developed at Danish universities over time. Most emphasis will here be given to the administrative side as developments within this broad category often is treated as a black box and as these developments are crucial to understand the extent to which the organizational model of the Danish universities has been undergoing transformation.

## Universities under transformation

The central managerial and administrative level has historically played an almost negligible role at universities in continental European countries, which often have been characterized as pluralistic and bottom-heavy institutions with low potency for collective action (Clark 1983). Traditionally,

this level mainly consisted of secretaries, auxiliary staff, and local academics elected as temporary managers by their colleagues. Rather than managers and administrators, the actors influencing the practices at the universities were the state and the academics. The state decided on most financial and administrative matters top-down, while academic guilds, dominated by individual professors, decided on the academic activities bottom-up (Clark 1983). The organizational level was squeezed in the middle with limited legitimate space. In recent years, however, scholars have highlighted how the administrative and managerial level has been extensively empowered at universities in many European countries (Amaral et al. 2003; Bleiklie et al. 2017a; Kehm 2015; Rhoades and Sporn 2002; Thoenig and Paradeise 2016). It is argued that this reflects a “corporatization process,” aiming to enable universities to act more as “corporate actor” (De Boer et al. 2007), “organizational actor” (Krücken and Meier 2006), or “strategic actor” (Whitley 2008).

Hierarchy and capacity for rational action are perceived as key ingredients for such organization building (Brunsson and Sahlin-Andersson 2000, p. 726). The construction of hierarchy takes place through state-devolution and local centralization of duties and responsibilities and through the strengthening of managerial roles (Bonaccorsi and Daraio 2007). This has been described as rationalization aiming to improve the organization’s capabilities to set goals, gather information, formulate plans, delegate responsibilities, and evaluate progress (Ramirez 2013). In terms of staff composition, these processes require managers to decide on goals and actions and specialized personnel to gather information and execute organizational plans. Hence, centrally placed staff takes on a variety of new “tasks, which previously were not regarded as part of the organization’s responsibility” (Krücken and Meier 2006, p. 250). Prominent examples of such tasks include the evaluation of academic results, knowledge transfer, professional development, internationalization, student support, communication, and the safeguarding of meritocratic norms. According to the literature, these tasks have in turn led to a proliferation of new management functions and a widening set of responsibilities incorporated into the formal organizational structure (Borggräfe 2018; Gornitzka and Larsen 2004; Krücken et al. 2013; Logue 2014). The result is an increasingly fine-grained set of offices expected to handle specialized tasks on behalf of sub-units, the organization as a whole, and the state. To match the scope of these new tasks, universities in many countries have witnessed an influx of whole new categories of highly qualified administrative and managerial professionals (Schneijderberg and Merkator 2013).

While there seems to be general agreement in the literature concerning the main trends in these developments across most countries, there are still important empirical gaps in terms of the content, timing, and extent of the changes. The existing empirical evidence about these long-term organizational transformations uses mostly cross-sectional methods and deduces change retrospectively. However, the nature of the claimed transformations calls for robust longitudinal studies. Analyses of staff changes offer one such perspective. It is a perspective that many university stakeholders intuitively take when considering organizational change and it often implies a quantitative notion of proportionality over time. However, the available empirical evidence is often torn between thick qualitative studies of sub-units on the one side and overly aggregated records of official categories on the other.

Both types of studies yield important insights; however, the epistemic distance between the two seems at times too large, leaving room for rather contradictive interpretations (e.g., administrative bloat versus administrative savings). Thus, our understanding of staff changes, and how it may reflect organizational change, can be sharpened by employing an empirical middle position: One that maintains the quantitative overview of proportionality and temporality and incorporates the

qualitative realization that staff categories have unclear content and boundaries. Our approach represents such a middle position by providing an alternative to formal staff categorizations: A tiered categorization constructed abductively from formal job titles and collective agreements, where the content of high-level categories can be transparently analyzed as aggregations of lower-level categories.

The main questions in the empirical part of this article are to what extent the described organizational transformation also can be observed in a Danish context through the lenses of changes in staff composition and salary distributions. To what extent and at what pace has the composition of the administrative staff at the Danish universities changed during the period 1999–2017? Which sub-groups have grown and diminished in relative terms and how do these developments relate to changes on the academic side of the universities? Do the detailed data in fact support the general claim of an organizational turn?

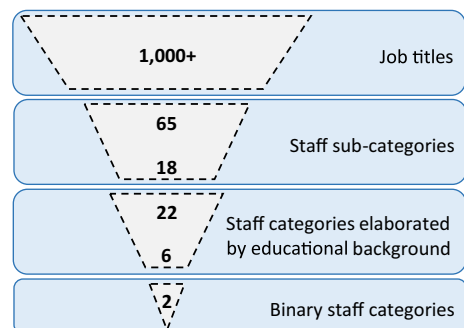
## Data and methods

The present study draws on rich data from a Danish public payroll database (ISOLA) that keeps track of staff and salary trends. Altogether, it contains information across 64 variables such as job title, staff categories, workplace, salary, working hours, employment conditions, age, and gender. For this project, the ministry granted us temporary access to all Danish universities' payroll data from 1999 to 2017. In total, the data covers 256,320 individuals, who, at least once, received a salary payment from a Danish university. Hence, the ISOLA data provide a very fine-grained and consistent picture of the staff composition and salary distribution over time.

As a starting point, we assume that differences in salary and job titles represent differences in tasks and responsibilities. The reality is obviously not that clear cut as many job titles overlap. Nonetheless, employers do not assign salaries or job titles to employees randomly. Job titles serve a range of organizational purposes and tie jobs to formal systems and social conventions. Assigning job titles is a key mechanism to manage employees and construct divisions of labor (Burton et al. 2016). Dividing labor between different role categories is at the heart of the very idea of an “organization” (Brunsson and Sahlin-Andersson 2000). Job titles are therefore a suitable starting point for developing a staff categorization system.

We constructed the categorization bottom-up as a fully transparent thesaurus of job titles and sub-categories (Fig. 1). The thesaurus enables the break-down of each category to sub-categories and their individual job titles (see Appendix 1).

**Fig. 1** Thesaurus of job titles and sub-categories. The move from 18 to 22 reflects an elaboration of four categories by a binary education indicator



**Table 1** The six staff–category level

Academic staff	Faculty	Permanent academic staff: Professors, associate professors, and similar positions such as senior researchers
	Other academic staff	Mainly temporary academic staff: Assistant professors, postdocs, PhDs, and academic assistants, but also teaching positions usually not requiring a PhD degree, where few are permanent
Non-academic staff	Degree-holding professionals	Administrative staff with a university degree: Mainly managers, officers, coordinators, and consultants
	Clerks	Administrative staff usually with a vocational education: Mainly secretaries, clerical officers, and section managers
	Service, craftsmen, and technicians	A wide range of positions usually not performed at an office desk, e.g., janitors, laboratory technologists, and engineers
	Employed students and apprentices	Mainly employed students and paid apprentices from vocational educations

As a first step, related job titles were bundled into 65 sub-categories by their area of competence, work, and employment conditions. Classic academic and civil servant job titles neatly form their own categories (e.g., professor or officers), while we categorized more specialized job titles under thematic headings (e.g., IT staff, managers, craftsmen). These 65 sub-categories give a structured view of more than 1000 job titles, and they formed the foundation for creating the next 18 more general mid-level categories. At this mid-level, the mutual exclusivity of most categories improved significantly. However, four administrative and managerial categories remained too diverse. To improve those four categories, we split each into two by separating employees with a university master degree from those without<sup>1</sup>: degree-holding professionals versus clerks. This elaboration added four categories to the original 18. We thereby end with 22 distinct mid-level categories making it relatively easy to move forward to form the six end-result categories shown in Table 1.

These six macro categories resemble those used in analyses in other countries (Gornitzka et al. 2009; Krücken et al. 2013; Rhoades and Sporn 2002) and function as our main level of analysis. But as we will show in the following section, the possibility to open these categories further up enables us to highlight important developments which otherwise would be hidden under the surface.

## Changes in staff composition at Danish universities

This section first presents a brief account of the Danish policy background, before we in detail examine staff developments at different levels of aggregation. The empirical part starts at the most aggregated level and then proceed by gradually opening up relevant categories. Subsequently, we provide figures of salary distributions, which further highlight the hierarchy of the categories and the magnitude of the observed changes.

<sup>1</sup> In Denmark, collective agreements regulating individual positions form a good indicator for educational background. They rigidly separate those with a master-level degree from those without. The latter group usually holds a vocational education and gives on-the-job training higher priority.

## Danish policy background

The Danish higher education system consists of eight research universities and a number of non-research-based organizations such as university colleges and academies of professional higher education. While the Danish higher education system as a whole has undergone profound changes since the turn of the millennium, this article focuses on changes of the research universities only.

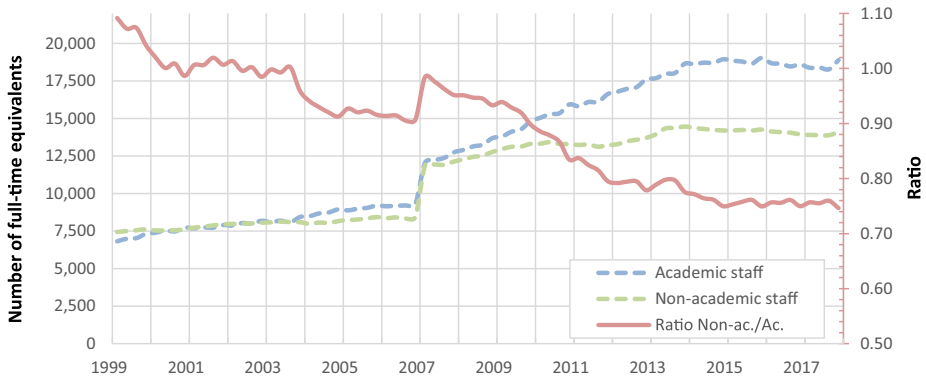
Up until the early 1990s, Danish universities were bottom-heavy, self-organizing entities with a weak organizational level closely resembling the traditional models described in the “Universities under transformation” section. The universities were formally governed by the minister of education, but the internal management was first and foremost guided by collegially agreed rules and procedures without much external interference. In 1993, a reform strengthened the department head and dean functions, but more fundamental changes were not seen before the turn of the millennium (Degn and Sørensen 2015; Pedersen 1982).

After a change of government in 2001, a sweeping reform process started with the intention to transform Danish universities into key players in the global knowledge economy (Aagaard and Mejlgaard 2012). Increased competition for funding and students, higher demands for accountability, more comprehensive evaluation activity, and stronger focus on social responsibility were seen by the government as some of the essential means to transform the universities. Four elements in this wave of reforms can be seen as central in the change processes affecting the university sector. Firstly, a new University Act from 2003 introduced governing boards with a majority of external members and abolished the “*primus inter pares*” model by requiring appointed university leaders at all levels instead of elected. The stated objectives were to accentuate the universities’ profiles, to professionalize and empower managerial structures, and to increase collaboration between research and innovation activities (Aagaard and Mejlgaard 2012; Degn and Sørensen 2015). Secondly, the research funding system became more competitive with the establishment of a number of new research funding councils (Aagaard 2017). Thirdly, while some changes in the funding systems were initiated in 2003, they were all considerably strengthened as a result of the comprehensive Danish Globalisation Strategy, presented in 2006 to make Denmark a leading knowledge and entrepreneurial society (The Danish Government 2006). A part of this strategy targeted PhD education with the aim of doubling the uptake. Fourthly, in 2007, the government launched a far-reaching merger process, which reduced the number of universities from twelve to eight and transferred twelve out of fifteen Government Research Institutes (GRIs) to the eight remaining universities (Aagaard et al. 2016). However, the extent to which the organizational structures of the universities actually have changed during this reform-intensive period remains a contested issue.

## Macro trends in the staff composition at Danish universities

The total number of full-time equivalents (FTEs) employed at the eight current universities grew from 14,266 to 32,980 from 1999 to 2017. The doubling of the sheer size has however not been a simple upscaling of 1999 practices. Instead, the staff composition has been restructured thoroughly.

At the highest category level, Fig. 2 shows the conventional distinction between non-academic and academic staff. Here, it is interesting to notice that there has in fact been a steady trend towards a higher relative share of academics. While the two groups were of almost equal size up until 2004, the academic group started to grow at a faster pace from here onwards. The

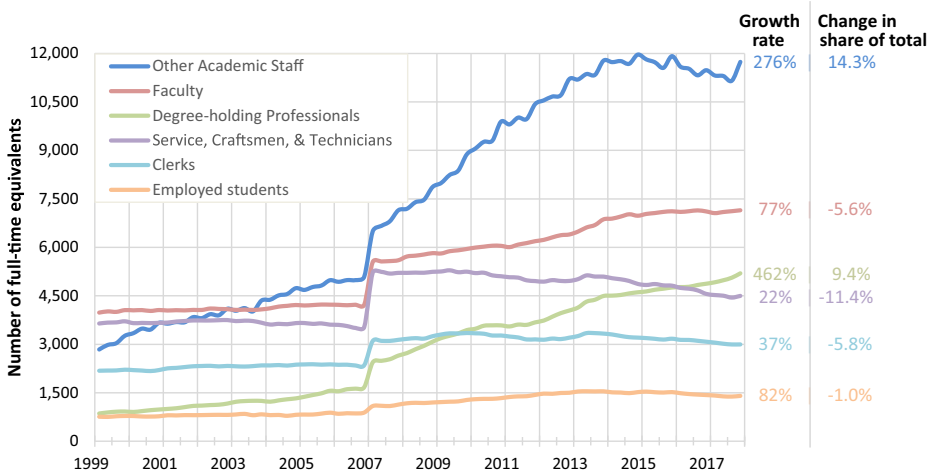


**Fig. 2** Binary staff composition across all current universities, 1999–2017. Left y-axis for the green and blue lines, and right y-axis for the red line. The ratio is non-academic staff divided by academic staff

sudden jumps seen in 2007 reflect the large-scale merger process, leading to an increase in the numbers of both academics and non-academics. Notice, however, that the share of non-academics was higher at the GRIs than at the universities. Hence, the mergers affected not only the total number of staff, but also the ratio between the two groups—at least in the short run.

Although crude, this figure shows a picture that stands somewhat in contrast to a popular narrative of an ever-growing administration at the expense of the academic heartland. This simple categorization may however also lead to misleading conclusions as it hides noticeable underlying shifts. Hence, to gain a better understanding of the developments, a more fine-grained categorization is needed. Figure 3 shows the same development at the six-category level.

Although all six categories shown in Fig. 3 have increased in absolute numbers from 1999 to 2017, variation in growth rates has led to substantial relative shifts. Particular two categories (one from either side of the conventional binary distinction) stand out:



**Fig. 3** Staff composition across all current Danish universities, 1999–2017. Growth rate is in percentage and change in share of total is in percentage points, calculated from 1999 to 2017

on the academic side, the category “other academic staff,” mainly consisting of academics in temporary positions; and on the non-academic side, the category “degree-holding professional.” Both categories have had rapid growth rates of respectively 276% and 462%.

As the figure shows, the aforementioned academic upswing represents in fact an intensified use of temporary academics in the “other academic staff” category. Where the permanent “faculty” outnumbered “other academic staff” by 1000 FTEs in 1999, this situation has changed significantly during the period—in particular from 2007 to 2014. If “faculty” had maintained their 1999 relative size, there would have been over 2000 additional full-time faculty in 2017. However, by further opening up these academic categories (see Appendix 2 for details), it can be seen that the number of “full professors” has almost tripled since 1999, increasing their relative size among all employees by one percentage point. Meanwhile, “associate professors” has only grown with one-third of the rate of professors, leading to a drop in their relative size by 6.6 percentage points. Also, the three sub-categories of “PhD student,” “postdocs,” and “academic assistants” have all had growth rates from 279 to 404%, which have dramatically increased their respective shares of total employees. Thus, the academic staff composition has become more polarized around the top academic positions and the temporary bottom positions. The tenured in-between position of associate professors has on the other hand experienced a substantial relative decrease.

An equally comprehensive change can be observed on the administrative side. By the turn of the century, the main bulk (88%) of non-academic staff was found in the categories “service, craftsmen, technicians,” “employed students,” and “clerks.” However, in the subsequent decade, these categories grew much slower than the other administrative category. They even have sloping curves in the last 5 years, exposing decreasing absolute numbers. In stark contrast to the falling shares of clerks and technicians, a steady growth of “degree-holding professionals” started to take off around 2003. This trend further accelerated significantly around 2007. By 2017, this category made up 16% of the total number of university FTEs, compared with only 6% in 1999. If the “degree-holding professionals” had kept their 1999 relative size, they would account for approximately 3200 fewer FTEs in 2017.

## Comparison between universities

In order to investigate whether the observed sector trends may be the result of a more heterogenic underlying picture, we have selected three rather different universities for comparison: Copenhagen Business School (CBS), a relatively small, teaching intensive, predominantly social science-oriented university; University of Copenhagen (KU), a large, comprehensive, and research intensive university; and finally, the Technical University of Denmark (DTU), a large, research intensive technical/natural science university.

As Fig. 4 shows, the staff categories’ direction of change, whether increasing or decreasing, is uniform across the three universities. Naturally, CBS with its predominantly social science-oriented profile employs fewer craftsmen and technicians for experiments than the Technical University of Denmark. But still, relatively speaking, the two universities display the same trend: Both of them as well as KU have halved their share of “service, craftsmen, and technicians” during the period. Likewise, although with different initial volumes all three universities have more than doubled their proportion of “degree-holding professional” and almost halved their proportion of “clerks.” On the academic side, the direction of change is also uniform, but with greater variation when it comes to “other academic staff.” KU and DTU have increased their share of “other academic staff” at a faster pace than CBS. The share of faculty has dropped quite



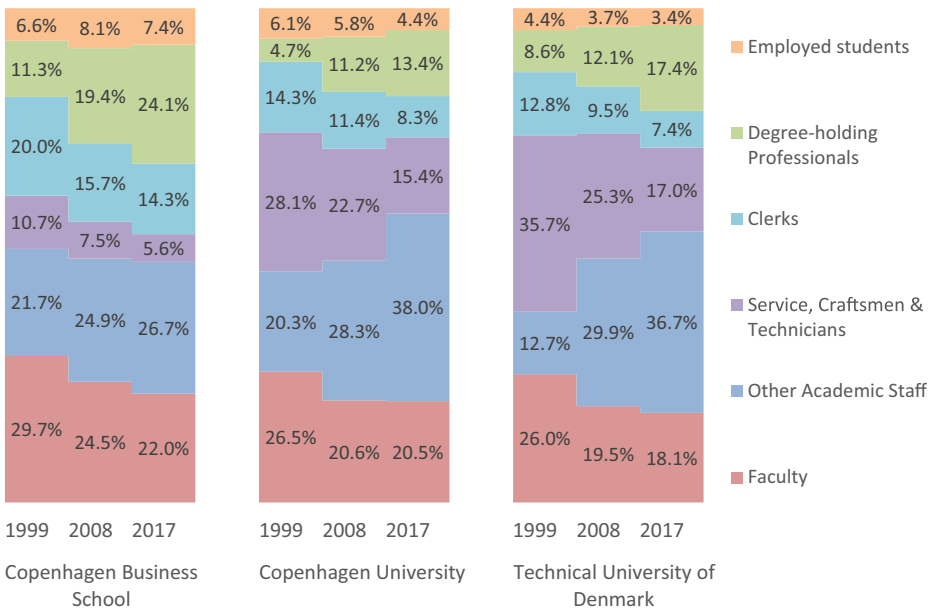


Fig. 4 Changing staff composition at three selected universities, 1999–2017

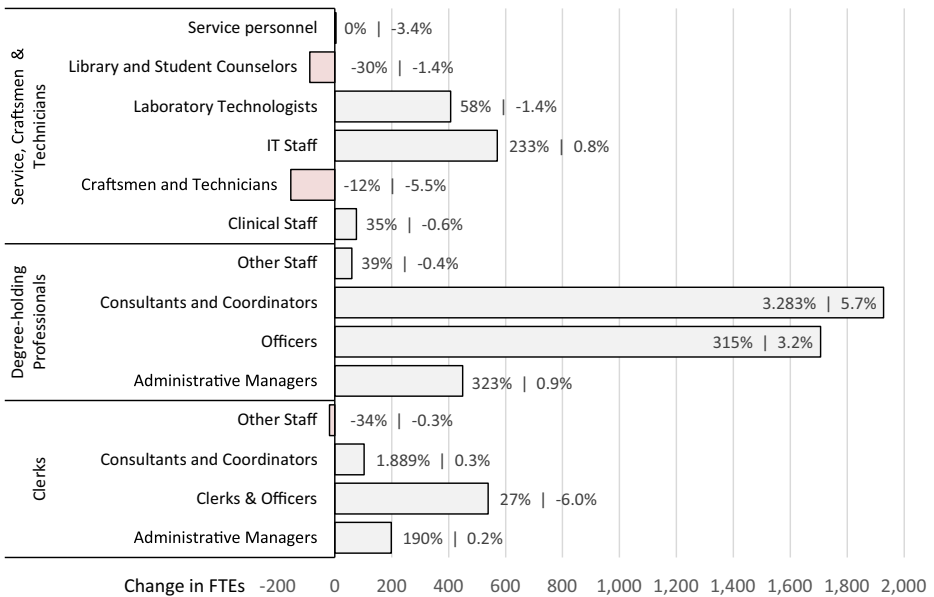
uniformly by 6–8 percentage points across all three universities. Hence, the observed trends at the sector level appear to be mirrored fairly accurately at the level of individual institutions, even across universities of very different size and with very different profiles.

### Opening up the administrative categories

As shown in the “Macro trends in the staff composition at Danish universities” section, substantial changes have taken place between different sub-categories during the period under examination. Hence, the six-category level reveals significant restructuring within both the non-academic and the academic categories. But while the changes on the academic side in general are well-known, there is a need to open up the administrative categories further. A key question is what this restructuring entails on the administrative side in more detail. To do so, we draw in additional details from the lowest category level. By further differentiating the non-academic staff categories, additional restructuring comes to the fore as shown in Fig. 5.

The category of “degree-holding professionals” is the key in order to understand the element of organizational change at Danish universities. The category not only grew the most, but also has been internally changed in composition. In 1999, “degree-holding professionals” were mainly found in jobs categorized as either “administrative officers” or as “managers/head of units.” The number of FTEs in both of these two sub-categories quadrupled from 1999 to 2017. But parallel to these large expansions in the two traditional sub-categories, a new sub-category of “degree-holding consultants and coordinators” surged. It covers job titles almost not used at all prior to 2003. In 2017, one out of every 16 university employees belonged to this emerging sub-category. In addition, the number of obscure job titles placed in the category “other staff” grew among degree-holding professionals.

In the other large administrative category, “clerks,” we observe a different picture. The traditionally very large sub-category of “clerks and officers,” which comprised 14% of all



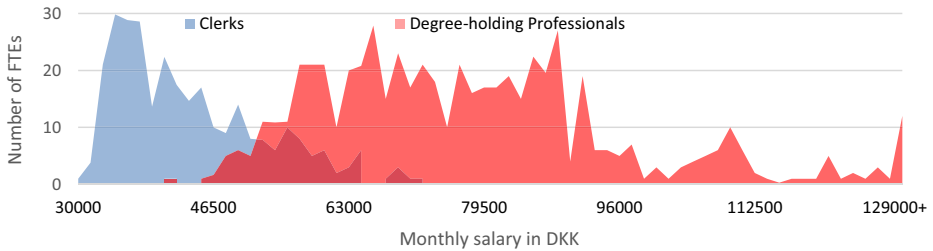
**Fig. 5** Change in number of FTEs between 1999 and 2017 in sub-categories. The bars' length shows changes in FTEs in absolute numbers. The numbers next to the bars show growth rates in percentages and changes in share of total in percentage points

employees in 1999, grew with merely 27%. That is very low compared with the overall growth rate of 122% needed to breakeven. Its relative size has therefore been reduced by 6.0 percentage points from 1999 to 2017. Upcoming job titles, here categorized as “consultants and coordinators,” have only rarely been assigned to clerks ( $n = 109$  in 2017). However, in contrast to the other clerical sub-categories' low growth rates, “managers and heads of units” almost tripled in numbers.

In the same vein, the diverse category of “service, craftsmen, and technical staff” has also been reduced substantially in relative terms. The only technical sub-category actually gaining in relative size is the “IT staff” (0.8 percentage point), and even here, the increase is surprisingly low given the massive growth in the use of IT technologies during the period under examination. In all other areas, the share of technical and practical positions has been decreasing. The employees inhabiting these positions usually have educational backgrounds and competences quite different from “clerks” and “degree-holding professionals.” Thus, today there is a relatively much smaller group of technical and practical positions among the non-academic staff to do maintenance, campus services, and technical research support than at the beginning of the period. Notice however that it varies widely whether technical staff has direct research support functions. In particular, the laboratory technologists and a subset of the technicians and librarians have to varying degrees technical research support tasks. However, they all belong to proportionally diminishing sub-categories.

### Frequently used job titles

As mentioned in the “Opening up the administrative categories” section, there are unclear boundaries between job titles in administrative and managerial staff categories at the lowest



**Fig. 6** Monthly salary distribution between clerical and degree-holding managers in 2017. See definition of salary in Table 2's note. 1000 DKK = 134 €

level of analysis. But by breaking down the same-named sub-categories of “clerks” and “degree-holding professionals” to frequently used job titles<sup>2</sup> and comparing them side-by-side, important details of how they differ beyond education become visible (see Appendix 3 for exact tables).

This is in particular the case when examining the “manager” job titles, where important differences between “clerks” and “degree-holding professionals” can be seen. Both categories have managerial job titles for smaller office units, but the “degree-holding professionals” exclusively hold the senior management positions. This division is also manifest in the distribution of salary, which shows a minimal overlap between the two groups (see Fig. 6).

Close to all clerical managers hold the uniform title of “section manager,” while the degree-holding managers hold a set of more differentiated and descriptive job titles. This set, on the one hand, covers the classic university management titles such as rector, dean, and head of department, whose status was formally converted to strictly “non-academic” in Denmark by the University Act in 2003. But on the other hand, “degree-holding managers” also covers a broad range of “director” or “manager” titles, which state the rank or the area of responsibility such as deputy, vice, university, office, communication, economy, or human resources.

Also, the broad “officer” category shows interesting differences. In this category, we find all the traditional administrative positions for both “clerks” and “degree-holding professional.” In 1999, almost all “clerks” held job titles such as “senior assistant,” “clerical officer,” and various versions of “secretary.” Similarly, the majority of the “degree-holding professionals” outside of the managerial hierarchy, held either an “officer” or “correspondent” title in 1999. The widely used job titles, “clerical officer” and “officer,” differ by a formal university-degree requirement. These traditional administrative positions have over the years been used less and less, in particular for the “degree-holding professionals.”

At the same time, new types of job titles, which were hardly present in 1999 at all, have steadily become the new normal. Compared with the traditional administrative titles, these new titles signal expertise in specific subjects. While few “clerks” have been assigned new job titles such as specialist and consultant, the big changes are found among the “degree-holding professionals.” The job titles “special consultant” and “senior consultant,” which public agencies commonly use to rank their civil servants by expertise, have rapidly gained ground in Danish university administration as well (respectively, 1140 and 560 in 2017, compared with 16 and 8 in 1999). Also, “coordinator” and “consultant” titles have proliferated (remarkably often with a hyphenated specialization such as

<sup>2</sup> Top 10 most used job titles with no less than 400 FTEs from 1999 to 2017

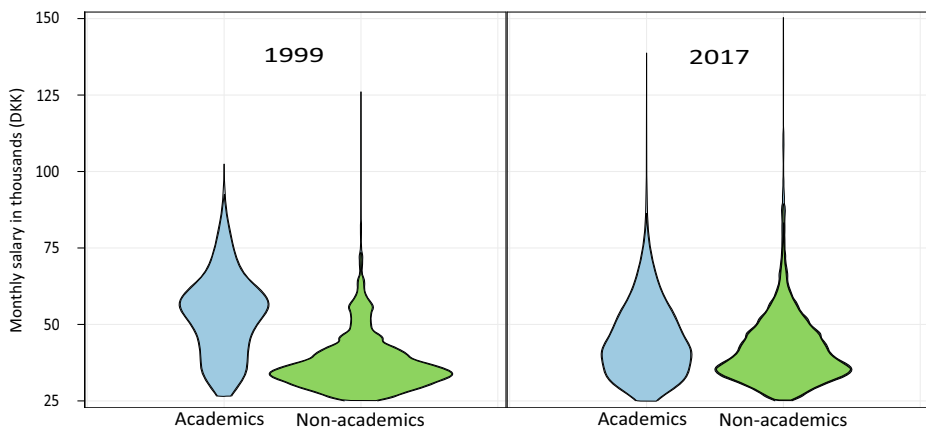
development, project, HR, economy, communication, administration, research, or education). However, decreasing numbers of “coordinators” in recent years indicate that such positions have been incorporated in the ever-growing corps of various in-house consultants.

Summing up, “clerks” hold low-level managerial positions, and they continue to be employed mainly under traditional administrative job titles. “Degree-holding professionals,” on the other hand, hold senior management positions, and their traditional administrative job titles have been extensively complemented by a new set of job titles signaling expertise and new functions.

## Salary profiles

To supplement the FTE analysis, we here examine the boundaries between the categories with data on salary levels. The salary profiles of different categories provide further insights into their relative standings, while at the same time providing another type of longitudinal overview of the development. As the violin plot in Fig. 7 shows, the distribution of salary has changed substantially for both the academic and the non-academic categories from 1999 to 2017 (see Appendix 4 for details). In 1999, the salary distribution of the academics was mid/top-heavy, while the distribution of the “non-academics” was very bottom-heavy. In 2017, the salary distribution of the “academics” has become noticeably more bottom-heavy as a consequence of the strong growth in the temporary staff. Interestingly, the opposite is the case for the “non-academics,” where the 1999 bottom-heaviness has become less pronounced and the middle and top layers have expanded. Thus, the two contrasting staff categories display by 2017 a newfound similarity, both converging towards a drop-shaped composition of low- and high-wage employees.

As Table 2 shows, salaries vary considerable between staff categories (see Appendix 5 for the 22-category level). Thus, changes in staff composition have significant consequences for universities’ overall salary expenditures. The permanent “faculty” is obviously more expensive than the “PhDs” and the “postdocs,” and similarly do “degree-holding professionals” on average earn significantly more than the “clerks” and “service, craftsmen, and technicians.”



**Fig. 7** Academics and non-academics’ relative salary distribution in 1999 and 2017. The 1999 salaries are adjusted to 2017 level by Statistic Denmark’s wage index for public institutions

**Table 2** Average salary in thousands (DKK) across staff categories in 2017

Staff categories	Average monthly salary of:			Standard deviation	Pay rise 1999–2017 (%)
	All	Top 10%	Bottom 10%		
Clerks	36	51	27	7	90
Degree-holding professionals	51	84	34	14	89
Service, craftsmen, and technicians	38	53	26	7	78
Faculty	57	80	45	11	67
Other academic staff	37	47	29	6	69

Salary is defined in accordance with Moderniseringsstyrelsen’s recommendation (2016) and covers employee’s basic salary, pension contributions, regular supplemental payments for the fourth quarter’s middle month (i.e., November), and 1/12 of their total irregular supplemental payments for the past 12 months, except paid overtime, compensated leftover vacation, and severance payment. The table shows the salary of full-time positions. 1000 DKK = 134 €

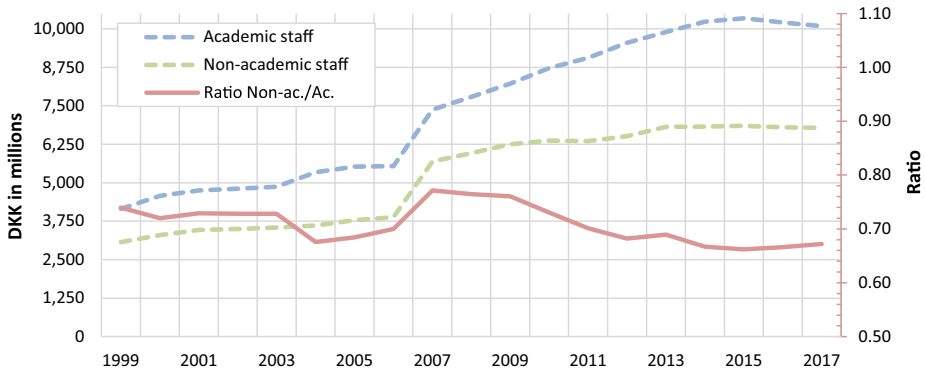
On both sides, there is on average a 40–50% salary gap between the high-wage and the relatively low-wage staff categories.

The salary ranges of “clerks” and “degree-holding professionals” have a minimal overlap (see Table 2). The top 10% of “clerks,” presumably the most experienced and skilled of these, receive the same salary as the average “degree-holding professional.” Thus, the overlap is restricted to top-clerks and bottom-degree-holding professionals. Compared with “clerks” as well as “service, craftsmen, and technicians,” the bulk of “degree-holding professionals” is virtually in a league of their own in terms of salary. The top 10% of “degree-holding professionals” ( $n = 463$  in 2017) earns even more than the top 10% of “faculty.” The actual distribution of job titles within this administrative and managerial elite is shown in Table 3.

Regarding these titles, it should be noticed that while recruitment to the classic management titles happens from the ranks of faculty, the other “top 10% positions” are recruited more broadly (e.g., business firms or other public institutions). The large number of hyphenations of the “director” and “manager” titles reflects an elaborated management hierarchy. In addition, the many senior consultant positions, which are also among those with an average monthly salary of 84,544 DKK, underline the

**Table 3** The top 10% highest paid “degree-holding professionals” by job title in 2017

Job titles. Parenthesis show the number of FTEs	Full-time equivalents
Classic management titles	
Head of department (120), dean (25), pro-dean (24), rector (8), and pro-rector (7)	184
Director titles	
Not hyphenated (16)	82
Hyphenated with department (23), vice (23), faculty (8), university (7), library (1), campus (1), corporate (1), education (1), and economy (1)	
Manager titles	
Hyphenated with office (26), section (20), administration (10), secretariat (13), function (7), economy (6), human resources (5), communication (5), study (5), and others (24)	121
Consultants	
Senior consultant (65), special consultant (5), department administrator (3), and top advisor (2)	75
Total	462



**Fig. 8** Yearly salary expenses at the binary category level across all current Danish universities, 1999–2017. Left y-axis for the green and blue lines, and right y-axis for the red line. The ratio is non-academic staff divided by academic staff. Salary expenses are adjusted to 2017 level by Statistic Denmark’s wage index for public institutions. See definition of salary expenses in Table 2’s note

significant buildup of high-profiled competence also outside the official line-management.

Figure 8 shows how the overall salary expenses for academics and non-academics have evolved over time. In 1999, the non-academic group accounted for 42.5% of all salary expenses, decreasing to 40.2% in 2017. However, this decrease amounts only to a minor drop in the salary expense ratio by 0.05 (Fig. 8), although the FTE ratio between non-academics and academics decreased by 0.32 (Fig. 2). In other words, the non-academic group’s share of FTEs has decreased much less than their share of salary expenses. This disproportionality reflects the above documented occupational restructuring that has occurred within each of the two crude staff categories. From 1999 to 2017, the average salary expenses increased by 19.3% per non-academic employee and decreased by –7.4% per academic employee.

## Discussion and concluding remarks

Based on the results presented in the “Changes in staff composition at Danish universities” section, we now return to the key questions raised in the “Introduction” and “Universities under transformation” sections. To what extent has the organizational model of Danish universities changed viewed through data on staff composition and salary distribution over an extended time period? The discussion will touch upon several elements that can only be answered partly because of the approach chosen in this study. Hence, in our concluding remarks, we point at issues that deserve further attention in the ongoing discussions of university transformations.

## Main findings

The period under examination has been characterized by massive overall growth in personnel at all eight current universities, but this growth has by no means been even for all staff categories. By gradually opening up different levels of staff categories, we have shown that a very fine-grained examination is indeed necessary to grasp the full extent of the organizational changes.

At the most aggregated level, we observe a trend towards a strengthening of the academic side of the university. This observation is somewhat in contrast to a popular Danish narrative of an administration outgrowing the academic part of the universities. Nevertheless, this binary view only shows a superficial part of the larger picture. As soon as we open up the aggregated categories, important nuances surface. These nuances have clear implications for understanding universities as organizations. Most notably, the growth on the academic side is to a very large extent the result of massive growth in the use of temporary positions for junior academics. Hence, the balance between permanent and temporary academic staff has tilted dramatically during the period under examination. As shown in other countries, also the Danish academic labor market has become markedly more precarious over time (Rhoades 2017). On the administrative side, we also see a very significant change of balance between different categories, but here, the direction is almost the opposite: The strongest growth has taken place among the categories placed high in the internal hierarchy, while almost all other categories have decreased in relative terms. Noticeable, these trends appear to be uniform across very different university types. Hence, on the academic side, we observe a weakening of the middle and a strengthening of the bottom layers of the career hierarchy, while the strengthening at the administrative side is found at the middle and top layers. In terms of salaries, these trends can be translated into a growth of the relatively low-wage positions at the academic side and a growth of the more expensive positions on the administrative side. Further, a detailed examination of job titles at the administrative side shows indications of a proliferation of new, specialized functions that are added on top of the (now shrinking) traditional administrative support functions.

### **Changed staff composition = changed organizations?**

Overall, we accordingly observe clear indications of an “organizational turn” within Danish universities. Despite a notorious reputation for being reluctant to change, this analysis has shown that the organizational model in fact has undergone considerable changes from 1999 to 2017. However, as Gornitzka and Larsen (2004, p. 463) have highlighted, bystanders might interpret the increased share of “degree-holding professionals” as nothing more than renamed job titles as a result of more and more people holding higher education credentials. This view would imply the work of renamed jobs had remained largely the same. While this might partly be the case, our analysis shows that it is by no means the whole story. Not only does the sizeable salary gap between old and new non-academic categories indicate that the latter group engages with new and more demanding types of work, so does the job titles. Here, the new tasks of the administration become very visible and likewise we see the contours of a new and more elaborated hierarchy. These observations are also in line with qualitative studies of managers and highly qualified administrators finding that these groups indeed differ notably from “clerks” in terms of work tasks, attitudes, skill sets, levels of discretion, internal and external networks, sense-making processes, and employment conditions (Rhoades et al. 2008; Rytberg and Geschwind 2017; Schneijderberg and Merkator 2013; Whitchurch 2013). In other words, the observed staff changes support the claims of qualitative studies of a large-scale influx of employees working on new tasks, which previously were not regarded as part of the administrative and managerial responsibilities.

Judging from the job titles, Danish universities today display an increasingly professionalized and rationalized administration and management. The increasing use of specialist and hyphenated manager and administrator titles shows how responsibilities are increasingly separated into designated offices and organizational subdivisions that complement each other in a fine-grained and rationalized system. In this process, certain types of non-academic employees have gained priority at the expense of others. Employees with specialized job titles, high qualifications, and high salaries have increased, while employees with job titles that directly refer to practical, technical, and clerical work have declined. The latter includes direct research support, where cadres of temporary junior research staff seem to take over. Instead, the payroll data show a hiring boom in administrative employees with better prerequisites for handling work that is more ambiguous and that takes higher levels of professional interpretation (i.e., symbolic, analytic, advisory, coordination, communication, and decision-making).

Our analysis might underestimate practical and technical positions, because we cannot detect outsourcing. However, the same is true for knowledge-heavy administrative positions. Outsourcing to prominent consultancy firms is widespread despite the boom in advanced in-house capabilities. No full picture of such outsourcing exists, but Aarhus University is an illustrative case. In the reform intensive years from 2007 to 2011, they outsourced “development tasks” to consultancy firms for 200 million DKK (Aarhus University 2018), which equals 330 average degree-holding professionals (FTEs).

The documented staff changes also point at potential changes in the relationship between the academic and the administrative workforce: Where the majority of the non-academic staff previously carried out tasks clearly subordinated those of academic staff, this is less and less the case. As Aberbach and Christensen (2017, p. 9) writes, “the administrative hierarchy now seems to be not only relatively more influential, in its own right, but also more closely connected to the academic.” The group of staff explicitly titled as practical and clerical workers is shrinking, while the growing parts of the administration and management are positions signaling additions or upgrades of tasks and functions. While these new tasks and functions still in many respects can be seen as support of core activities, they are of a distinctively different character. Technology transfer, strategic planning, internationalization, communication, external relations, and grant writing support are just some of these new tasks, which due to their specialized (or para-academic) and proactive nature are not as clearly subordinated the academic activities.

Abbott highlights that increases in professional tasks do usually not equal decreases in clerical and practical tasks. Rather, the claim is, most people are overly optimistic about how professionalization and technology reduce the need for clerical and practical manpower. Therefore, in organizations with growing shares of professionals, Abbott notices an internal diffusion of clerical and practical tasks (Abbott 2016, p. 251). The extensive staff changes documented here beg the question of how the work task distribution and portfolio of different positions has evolved. For instance, studies find that professors increasingly need to master and do a widening set of skills and tasks beyond the traditional academic ones, for example, fundraising, project and personnel management, and networking (e.g., Latour and Woolgar



2013). However, our data only provide an initial and rough indicator of the multiple changes in tasks beneath the observed changes in personnel structure.

## Future work

The analysis presented in this study raises a number of further questions. At least two of these will be central in our coming work: Firstly, in this article we have not touched much upon the drivers behind the observed changes. How and to what extent are the observed organizational changes driven by factors such as international blueprints, national and transnational policies, job market trends, societal expectations, and evolved academic practices? As indicated in this article, the pace of the changes suggests that national university policies have played a significant role in the Danish case. As shown in the “[Changes in staff composition at Danish universities](#)” section, the observed changes have developed continuously since 1999, but they clearly accelerated shortly after the 2003 reform and again after the mergers in 2007. Similarly, the restructuring of the academic workforce appears to have stabilized around 2014, shortly after the funding from the Danish Globalisation Strategy ran out. At the same time, the non-academic workforce has nonetheless kept changing steadily in the same direction without signs of stabilization.

However, the Danish pattern of change is at the same time similar to patterns observed in other countries (Baltaru and Soysal 2017; Gornitzka et al. 2009; Karlsson and Rytberg 2016; Rhoades and Sporn 2002). For instance, the trend in Germany matches the one we observe in Denmark: A relative bigger academic side, with ever more junior positions, and a shrinking but heavily restructured non-academic side (Krücken et al. 2013). Hence, these observations indicate that there clearly also are transnational drivers involved in the transformation processes. More systematic work is therefore necessary to try to disentangle the relative importance of different drivers.

Secondly, a key question is also to what extent the observed organizational changes, and in particular the strengthening of the administrative mid- and top-level, in fact affect the organizational culture and core academic activities? Is it possible that the Danish universities, which increasingly resemble complete organizations in terms of administrative and managerial capacities, still on the “factory-floor” function more or less as they did 30 years ago as loosely coupled systems of self-reliant academics? As Drori et al. note “It is an open question whether universities only ritually adopt new and globally diffusing concepts and models stressing their actorhood, whether they are making fundamental changes in their institutional identities and actual organizational practices” (Drori et al. 2006, p. 21). Hence, the new organizational model do not necessarily dismantle academia’s other vibrant features completely. Different models and logics may coexist and mix in different combinations (Bleiklie et al. 2017b; Hüther and Krücken 2018; Kleimann 2018). The actual mix at particular universities may be dependent on their local traditions and pathways (Ramirez and Christensen 2013; Thoenig and Paradeise 2016; Whitley 2012). For understanding the full extent of actual change in the inner workings of universities as organizations, the approach chosen in this study needs to be complemented by other types of data and methodologies.

## Appendix 1. Staff thesaurus

A fully expandable thesaurus over the multi-level staff categories can be provided by request to the corresponding author.

This thesaurus extends down to separate job titles accounting for at least five full-time equivalents during the period under examination ( $n = 895$ ). To indicate the relative weight of (sub-)categories and job titles, the number of full-time equivalents (FTEs) for the full period is displayed next to the name:

Category/title name | number of FTEs

Figure 9 is an explanatory snapshot of the thesaurus with the various levels colored.

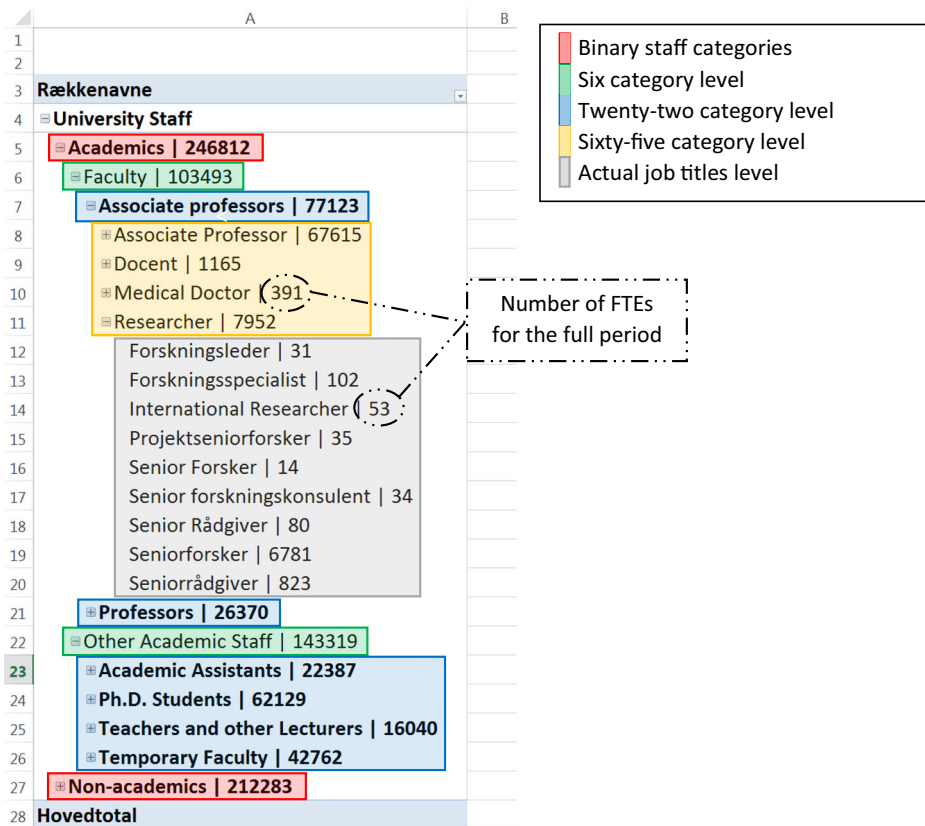
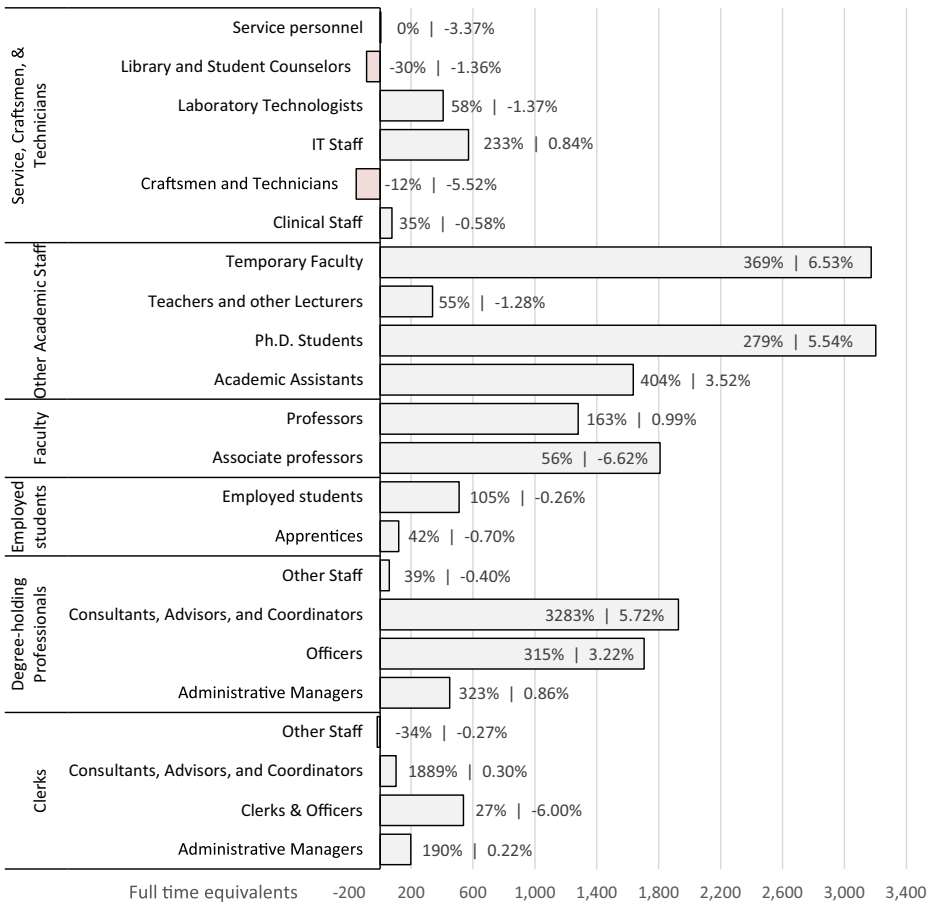


Fig. 9 Explanatory snapshot of thesaurus

## Appendix 2. Full 22-category level

The full 22-category level includes academic and student sub-categories. We draw upon these developments in the “Macro trends in the staff composition at Danish universities” section.



**Fig. 10** Change in number of full-time equivalents (FTEs) between 1999 and 2017 by sub-categories. The length of the bars shows change in full-time equivalents in absolute numbers. The numbers next to the bars show growth rate in percentages and change in share of total in percentage points

### Appendix 3. Frequently used job titles

Tables 4, 5, and 6 show a side-by-side comparison of the most frequently used job titles within the same-named sub-categories of “clerks” and “degree-holding professionals.” These sub-categories are “administrative managers and head of units,” “administrative officers,” and “consultants and coordinators.”

In Table 4, the number of full-time equivalents for each job title during the full period from 1999 to 2017 is displayed in brackets. We delimit the most frequently job titles to the top 10 most used job titles with no less than 400 FTEs in total during the 19 years. Below the top 10 list, we briefly summarize the residual job titles.

**Table 4** Managers and head of units

Degree-holding professionals	Clerks
Head of secretariat (2649)	Section manager (13,853)
Head of unit/section (2399)	Operation manager (729)
Office manager (2023)	Team manager (562)
Director (1019)	Economy manager (406)
Administration manager (830)	Head of secretariat (400)
Vice director (792)	
Deputy manager (732)	
Communication manager (602)	
University director (470)	
Economy manager (681)	
Hyphenated manager and director titles ( $\approx 2900$ ) such as campus, deputy, development, team, HR, faculty, economic, museum, operation, and administration	Hyphenated manager titles ( $\approx 800$ ) such as administration, office, and HR

**Table 5** Administrative officers

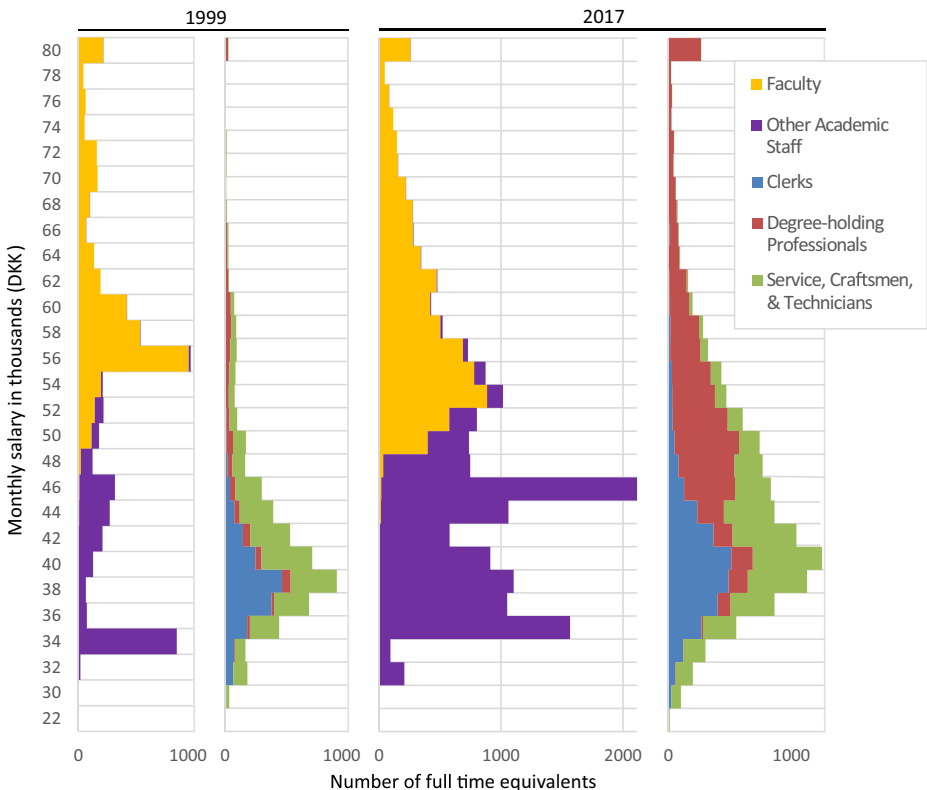
Degree-holding professionals	Clerks
Officer (68,582)	Senior assistant (51,205)
Correspondent (7094)	Clerical officer (50,020)
AC staff (4164)	Office staff (22,039)
AC officer (3070)	Assistant (11,447)
Project staff (2208)	Helper (4883)
Journalist (1962)	Economic officer (4765)
Communication staff (1275)	Secretary (4173)
Academic (Faglig) secretary (950)	Office assistant (3828)
Secretary (1101)	Principal administrator (2200)
Information staff (808)	Study secretary (1946)
	Senior secretary (1131)
Hyphenated secretary titles ( $\approx 1000$ ) such as center, department, institute, or management	Hyphenated secretary titles ( $\approx 3200$ ) such as HR, research (–group), education, department, doctors', management, or project.
Various job titles related to office staff, administrators, and economic officers ( $\approx 4300$ )	Various job titles related to office staff, exams, projects, administrators, receptionist, and economic officers ( $\approx 3900$ )

**Table 6** Consultants and coordinators

Degree-holding professionals	Clerks
Special consultant (27,020)	Specialist (649)
Senior consultant (15,502)	Consultant (537)
Project manager (1695)	Coordinator (459)
Consultant (1200)	Economic coordinator (400)
Research consultant/specialist (756)	Project manager (400)
Research officer (808)	
Program coordinator (782)	
Project coordinator (778)	
Coordinator (488)	
Hyphenated consultant and coordinator titles (≈ 4000) such as development, process, HR, economy, management, logistics, marketing, information, communication, administration, research, academic (faglig), or education/didactic	Hyphenated consultant and coordinator titles (≈ 2200) such as administrative, project, work environment, housing, exam, study, didactic, HR, and salary

### Appendix 4. Salary distributions across staff categories

While the violin plot (Fig. 7) shows the relative change in composition, it does not convey changes in absolute numbers. The Fig. 11 below shows the absolute salary distributions and the variation between the six staff categories. In terms of salary, the figure lays out the hierarchy both within and between the staff categories.



**Fig. 11** Salary distribution across staff categories

## Appendix 5. Salary across sub-categories

**Table 7** Salary in thousands (DKK) across staff sub-categories

Staff sub-categories		Average monthly salary in 2017			Standard deviation	Pay rise 1999–2017 (%)
		All	Top 10%	Bottom 10%		
Clerks	Managers/head of units	45	65	33	10	71
	Clerks and officer	35	44	27	5	88
	Consultants and coordinators	43	58	29	8	–
	Other staff	29	40	23	6	–
Degree-holding professionals	Managers/head of units	77	118	53	19	105
	Administrative officers	42	51	33	5	75
	Consultants and coordinators	53	67	44	7	69
	Other staff	42	60	31	10	68
Faculty	Associate professors	53	65	45	6	62
	Professors	69	93	58	11	66
Other academic staff	Academic assistants	38	50	29	6	72
	PhD students	32	39	29	3	67
	Teachers and other lecturers	45	55	36	6	89
	Temporary faculty	41	48	35	3	64
Service, craftsmen, and technicians	Clinical staff	39	55	28	8	59
	Craftsmen and technicians	40	54	30	7	75
	IT staff	43	57	32	7	83
	Laboratory technologists	35	43	28	4	89
	Library and student counselor	42	52	33	5	70
	Service personnel	33	51	24	8	73

Following Moderniseringsstyrelsen's recommendation (2016), salary covers employee's basic salary, pension contributions, and regular supplemental payments for the fourth quarter's middle month (i.e., November) and 8.33% (1/12) of their total irregular supplemental payments for the past 12 months, except paid overtime, compensated leftover vacation, and severance payment. Based on full-time positions' salary. 1000 DKK = 134 € or 166 \$

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