

## **The influence of performance-based management on teaching and research performance of Finnish senior academics**

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### **Abstract**

Despite the widespread use of performance-based management (PBM) in higher education, empirical research on the actual impacts of PBM has remained scarce, particularly in Europe. With agency theory as framework, our study utilised survey data collected from Finnish universities in order to explore the influence of performance management on perceived teaching and research performance of senior academics. Our findings suggest that although academics hold a quite positive view of performance measurement as such, this attitude does not correlate with perceived high performance in either teaching or research. Moreover, our results suggest that perceived high performance among academics still relates primarily to acknowledgement from the academic community and academic achievement rather than to measurement and financial incentives.

### **Introduction**

Most European countries have reformed their higher education systems during the last decade, placing emphasis on the quality, efficiency, and effectiveness of higher education institutions. Although implementation has varied at national level across countries, these reforms share some common elements, including awarding institutions greater level of institutional autonomy and giving more emphasis on performance measurement and systematic evaluation procedures (Claeys-Kulik & Estermann, 2015; Larsen, Maassen, & Stensaker, 2009; Maassen, Moen, & Stensaker, 2011). Yet, despite the widespread use of performance-based management (PBM) in European higher education and the volume of published research on the topic (and on performance-based funding more generally), surprisingly little is known about its impacts on teaching and research. Indeed, empirical research on the actual impacts of PBM on higher education institutions remains relatively scarce, especially in Europe (Kivistö & Kohtamäki, 2016).

Since the 1990s in Finland, PBM has been the government's main tool for creating university performance incentives. In line with these policies, Finnish universities have reformed their

management structures, adopting internal policies and funding systems that emphasise performance. However, to this date, studies focusing on the actual performance impacts of the Finnish PBM have remained almost non-existent in higher education sector.

To address the lack of knowledge about the impacts of PBM on higher education institutions, the present study analyses survey data collected from Finnish universities in 2015 to answer the following research question: To what extent has the performance management influenced teaching and research performance as perceived by senior academic staff? To guide our analysis, we will utilise the agency theory (also known as principal-agent theory) as an analytical framework. By virtue of its generic nature, agency theory has become increasingly popular as a conceptual tool for modelling the underlying dynamics of accountability and trust relationships in higher education settings (see e.g. Auld, 2010; Borgos, 2013; Enders, de Boer, & Weyer, 2013; Kivistö, 2007; Kivistö & Zalyevska, 2015; Lane, Kinser, & Knox, 2013; Lane & Kivistö, 2008; Liefner, 2003). To date, however, relatively few empirical studies have applied agency theory, especially among those utilising quantitative methods. For that reason, this paper also aims to contribute to the assessment of agency theory's explanatory potential in the context of PBM in higher education sector.

The article is structured as follows: After the introduction, we outline the analytical framework containing discussion on the impacts of PBM and the basic features of agency theory, and then introduce shortly the policy context related to Finnish performance-based management of universities. Then we turn to describe the data, methods and variables which is then followed by descriptive and correlative analyses. In the final section, we offer discussion on the results of the analyses and link this discussion to the analytical framework, at the same time drawing conclusions and discuss the implications of our study.

## **Analytical framework**

In brief, PBM can be defined as the use of resources and information to achieve and demonstrate progress towards an organisation's goals (e.g. Wholey, 1999). It is often seen as a tool for increasing institutional awareness of targeted policy objectives and for ensuring accountability in accomplishing those objectives. Often (if not always), PBM utilises performance-based remuneration at two levels: performance-based funding for institutions and performance-based salaries for individuals. At both levels, the amount of remuneration is linked by a formula to measurable achievement or performance. In a higher education context, most of the performance indicators measure either progress towards or completion of final outputs related to teaching and research such as study credits, number of degrees awarded, publications, competitive research funding awarded, citations, patents, level of competitive/external research funding, or student satisfaction (e.g. Kivistö & Kohtamäki, 2016).

The principal rationale for introducing PBM practices is to improve institutional performance. This is grounded in an implicit belief that performance-based funding will incentivise institutions to improve or maintain their level of performance in exchange for higher revenue (Dougherty & Reddy, 2011). By reformulating incentives so that institutions are rewarded or punished primarily according to actual performance, PBM looks to stimulate a shift in institutional behaviour towards greater

efficiency (Kivistö & Kohtamäki, 2016; Rutherford & Rabovsky, 2014). However, despite the prevalence of PBM, surprisingly little is known about its actual impacts on institutional behaviour and performance. In particular, Kivistö and Kohtamäki's (2016) extensive literature review suggested that very little is known about *how* and *why* PBM affects the behaviour of higher education institutions as organisations and of academics as individuals, and the presumed linear or even causal relationship between performance incentives, organisational behaviour, and performance remains, in many respects, surprisingly unclear. For policy making as well as academic research, then, a better understanding is needed of the logic of PBM. Clarification of how PBM impacts on institutional behaviour, and how this behaviour translates (or does not translate) into shifts in performance, seems crucial for any meaningful evaluation of the effectiveness of PBM practices.

Many important aspects of PBM align with the basic features and general setting of agency theory (Kivistö, 2005; Kivistö & Zalyevska, 2015). Agency theory analyses the relationship between two or more parties, in which one party (designated the *principal*) engages another party (designated the *agent*) to perform some task on their behalf (e.g. Jensen & Meckling, 1976; Moe, 1984; Ross, 1973). The theory assumes that, on delegating authority to agents, principals often have problems controlling them because the agents' goals may differ from their own (goal conflicts), and because agents often have better information about their own capacity and activities (informational asymmetries). Taken together, these goal conflicts and informational asymmetries trigger favourable conditions for the emergence of 'moral hazard', leading to opportunistic, self-serving behaviour on the part of the agent (Kivistö & Zalyevska, 2015).

The principal has two basic contractual options for controlling opportunistic behaviour: 'behaviour-based' contracts and 'outcome-based' contracts. In the case of behaviour-based contracts, the principal invests in monitoring the agent's actions to reduce the level of informational asymmetry and then remunerates the agent on the basis of the observed behaviour. In the case of outcome-based contracts, on the other hand, the principal remunerates the agent on the basis of outcomes produced. Here, the rationale is to reduce goal conflicts by incentivising the agent to pursue outcomes that are compatible with the principal's goals (e.g. Eisenhardt, 1989; Kivistö, 2007).

In higher education settings, agency theory has proved useful as an analytical framework, especially for understanding relationships between government and higher education institutions (e.g. Auld, 2010; Blalark, 2012; Kivistö, 2005, 2007). However, the theory has also been applied in various other settings—for instance, in assessing the relationships between individual academics and university leaders (e.g. Wangenge-Ouma, Lutomiah, & Langa, 2015). It seems likely, then, that the standard principal-agent model outlined above can illuminate the underlying logic of PBM with some accuracy, as the rationale for goal setting and performance measurement embedded in PBM practices can be directly explained by an implicit assumption of existing/potential goal conflicts and informational asymmetries between governments and institutions or, alternatively, between institutional management and subunits or individual academics. In fact, PBM is based on a relatively simple anticipated causal chain, in which restructuring performance incentives (i.e. applying outcome-based contracts) at the level of institutions and individuals would automatically translate into changes in the behaviour of units and individual academics, leading ultimately to improvements in teaching and research performance.

The logics that inform the basic assumptions of agency theory and PBM can be captured in a single essential question: ‘What motivates academics as agents?’ If financial remuneration based on performance is the main incentive attached to standard PBM practices but lacks motivational value for academics, the whole rationale of PBM is thrown into doubt. On that basis, we propose the following hypothesis.

*Hypothesis 1: More than other motivational factors, financial incentives are statistically correlating with academics’ perceived performance. (H1)*

Secondly, motivation can also be affected by other factors that are essential to PBM effectiveness. If the act of performance measurement is interpreted by academics as indicating mistrust rather than as a positive incentive, it is likely to have a negative impact on their performance level. For instance, Jacobsen and Andersen’s (2014) study of academics’ motivation indicated that while payments perceived by their recipients as ‘controlling’ decreased their intrinsic motivation and reduced work effort and performance, payments perceived by their recipients as ‘supportive’ had the opposite effect. Academics (researchers in particular) seem to respond more positively to financial incentives when they find them supportive. In particular, acceptance of the evaluation criteria of performance-related schemes (rather than the size of the financial package) seems to be crucial for their effectiveness (Andersen & Pallesen, 2008). On that basis, we propose the following two hypotheses.

*Hypothesis 2: Attitude to performance measurement as a form of control is statistically correlating with individual perceived performance in teaching and in research. (H2)*

*Hypothesis 3: The assumed impact of measurement on performance is statistically correlating with individual perceived performance in teaching and in research. (H3)*

## **Policy context**

The university sector in Finland is governed by the Ministry of Education and Culture (MoEC), principally through legislation, performance agreements, and performance-based funding. National legislation—in particular, the Universities Act, which was completely reformed in 2009–2010—has a strong regulatory impact on the Finnish university sector. This legislation determines many of the sector’s essential features, including the number of universities, universities’ missions and tasks, governance and administrative structures and bodies, and regulations related to studies and studying and to academic staff.

In relation to performance-based funding, MoEC currently applies one of the most performance-oriented funding models in Europe (see de Boer et al., 2015). The current model is the fruit of a long historical trajectory of continuous development towards a more performance-oriented model. After many years of applying incremental, line-item budgeting procedures in funding universities’ operating costs, MoEC adopted a new policy in the early 1990s, introducing a lump sum allocation model that included minor performance-based incentives. The late 1990s and early 2000s witnessed the introduction of funding model driven more by output and performance. As this change was so

radical, the new performance-based funding model was implemented in phases during the period 1998–2003. The objective of the new model was to ensure accountability by offering incentives for universities to increase their efficiency and effectiveness and the quality of education and research.

During the period 2003–2013, MoEC allocated core funding for universities by means of a performance-based formula, covering approximately 70–90% of total core state funding. The policy of the MoEC has been to upgrade this model every three years, which was the standard duration of these performance agreements in the period 2003–2013. In 2013–2015, the allocation model was restructured to further increase its clarity and transparency while offering stronger but fewer incentives for universities to achieve expected outputs and outcomes. In addition to reducing the number of indicators, the 2013–2015 model also introduced some new ones. In the education component of the model, these new indicators included *number of students who have gained more than 55 study credits (ECTS) within one academic year, study credits for open university and non-degree programmes, number of employed graduates, and Master's degrees awarded to foreign nationals*. In the research component of the model, new indicators included a revised way of calculating scientific publications, which were now tied to the national classification schemes known as the “Publication Forum” for *impact assessment*, along with *international teaching and research personnel and PhD degrees awarded to foreign nationals*.

### **Data, methods and variables**

The data referred to here were collected in 2015 as part of the FINNUT-PERFECT project, funded by the Research Council of Norway, which focused on the impacts of management reforms in four Nordic countries: Denmark, Finland, Norway, and Sweden. The survey included questions on decision-making, performance management, incentives, organisational structures, strategy process, funding, support services, autonomy, control, and working atmosphere. The Finnish sample encompassed all 14 of the country's universities, with responses from all disciplines and educational fields. In total, the data set included the responses of 956 senior academics. The response rate for academic managers' was 44%; for other senior academicians, it was 24%. Here, to increase the precision of our analysis, we include only the responses of senior academics not holding an official management position ( $n = 672$ ). The data were analysed by means of descriptive statistics, cross-tabulations, correlations, and mean analysis. The correlative analysis employed a non-parametrical technique (Spearman's rho). The descriptive statistics are summarised in Table 1.

Table 1. Study sample: descriptive statistics

Focusing only on senior academics (professors and associate professors) can be backed by the following reasons. Firstly, senior academics often enjoy a relatively stable career structures combined with a great level of professional autonomy, which means that they are the ‘core’ or ‘pure’ manifestation of the academic profession in Finnish universities (Pekkola, 2009; Pekkola, 2014; Pekkola, Siekkinen, Kivistö & Lyytinen, 2017). Secondly, the duties of senior academics typically include a more balanced mixture of academic tasks (research, teaching, third mission activities and

administration) compared to their junior colleagues, who often hold fixed-term positions with a more misbalanced set of tasks (e.g. bias towards teaching) (Aarrevaara & Pekkola, 2010; Kuoppala et al., 2015; Pekkola, 2010;). However, senior academics who were at the same time holding a management position (e.g. as deans or department heads) were excluded from our sample as the management role may alter their perceptions on performance (Lind, Pekkola, Stensaker, & Söderlind, 2016; Pekkola, Siekkinen, Kivistö & Lyytinen, 2017) and because some of the survey items utilised in the analysis were not included in the version of questionnaire sent to managers.

### *Perceived high performance*

We analysed both high research performance and high teaching performance in terms of respondents' perceptions. 'Perceived high performance' in research and teaching was measured using a single-item five-point Likert scale variable: 'Compared with colleagues in similar positions in my unit, in the last three years, I have published more' and 'Compared with colleagues in similar positions in my unit, in the last three years, I have had more teaching'. The five-point scale ranged from *strongly disagree* to *strongly agree*. Defining performance in a narrow sense, these variables resonate with definitions of performance in performance management systems. To overcome the apparent differences between disciplines and units, the proposition in the questionnaire was formulated in relative terms (referring to 'colleagues in my own unit'). However, this formulation could not take account of differences in work tasks; for this reason, our analysis deals with perceived performance in relation to the work orientation of academics (as explained next).

### *Work orientation*

In the complete Nordic data set, containing survey data from all four Nordic countries, academics were divided into three equally sized groups (tertiles) according to the content of their work. To define the cutting points, proportional share of teaching and research was subtracted from actual working time. An academic was considered to be teaching-oriented if their teaching time was more than 10 percentage points greater than the share of their time allocated to research. They were considered to be research-oriented if their research time was more than 15 percentage points greater than the share of their time allocated to teaching activities. Academics with a 'balanced' orientation fell between these limits.

### *Motivational factors*

An individual's motivational factors were measured by a single-item variable on a five-point scale, including 'acknowledgements from unit manager', 'acknowledgements from academic staff of [respondent's] own unit', 'acknowledgements from external colleagues', 'acknowledgements from external stakeholders', 'acknowledgements from students', 'media attention', and 'financial incentives'.

### *Attitude to performance measurement*

Negative attitude to performance measurement was measured by a single-item variable: 'In my opinion, performance measurement is a sign of mistrust'. Positive attitude towards performance measurement was measured by the variable 'In my opinion, measurement increases transparency and fairness'.

Positive attitude to the performance impact of performance measurement was measured by a sum variable ( $\alpha = .857$ ) formed from four different variables measuring positive performance impact of performance measurement on research and teaching.

### *Descriptive analysis*

On the research side, perceived performance naturally varies among academics with different orientations; almost a third of research-oriented staff (32%) strongly agree that they have published more than their colleagues in a similar position as compared to 15% of teaching-oriented staff. However, there are no major differences between academics with a more or less balanced working orientation when compared to academics in research-oriented positions (Table 2). In relation to perceived teaching performance, there are also clear differences. Although the difference between research-oriented and teaching oriented academics is wider, a clear difference can also be found between teaching-oriented and balanced academics (Table 3). This may be explained by the few available senior-level teaching positions in Finland, which would not include research activities. Regardless of more or less similar expectations on the research front, teaching loads might differ significantly.

Table 2. ‘Compared with colleagues in similar positions in my unit, I have published more in the last three years’. (Chi sq 46.269; df 8;  $p < .001$ )

Table 3. ‘Compared with colleagues in similar positions in my unit, I have had more teaching in the last three years’. (Chi sq 121.89; df 8;  $p < .001$ )

The survey results indicate that academics do not assign high importance to financial incentives as compared to other motivational factors (Figure 1), echoing similar results from other Nordic countries (Lind et al., 2016). It seems that the implementation of performance-based mechanisms for steering and management have not had a great impact on the traditional motivational structure of academic work, which emphasises intrinsic motivation—that is, performing academic work for its inherent satisfaction and without regard to cost-benefit considerations (Kroner, 2015; Ryan & Deci, 2000). It would be interesting to explore whether experienced importance of financial incentives is linked to perceived performance, as that would imply that performance management systems tend especially to motivate those individuals who appreciate financial incentives.

Figure 1. What motivates you as an academic (%)?

The overall attitude to performance measurement is surprisingly positive; almost 70% of respondents do not dispute the claim that performance measurement increases transparency and fairness, and more than half of the respondents do not consider performance measurement as a sign of mistrust (Figure 2). As to the actual impacts of performance measurement, more than half of the respondents either

agree with (around 20%) or are neutral about (35%) the claim that performance measurement increases performance level.

Figure 2. Attitudes towards performance measurement (%).

### *Correlative analysis*

We now turn to our analysis of the study hypotheses (H1–H3). Based on the cross-tabulations in Table 4, only a few statistically significant correlations can be found between importance of motivational factors and perceived performance. Financial incentives seem to exhibit a positive correlation with research performance among teaching-oriented staff whose perceived research performance is high but not among research-oriented staff whose perceived research performance is high. Additionally, the importance of acknowledgement from external colleagues ( $r = .160$ ) is positively correlated with teachers' publication performance. Based on this finding (and keeping in mind the low correlations), it can be inferred that those teachers for whom financial incentives and acknowledgement from external colleagues is important want to publish more, but this has no impact on their perceived teaching performance. Another interesting (although weak) pair of correlations can be found between opinions on the importance of acknowledgement from students. It seems that this is considered important by respondents with higher perceived teaching performance and lower perceived research performance. This suggests that importance of the content/quality of work as judged by the students has performance implications that might mean lower performance in other tasks. This also indicates that acknowledgement from students particularly motivates teaching-oriented staff with high perceived teaching performance ( $r = -.153$ ) and low perceived research performance ( $r = -.221$ ).

For 'balanced' academics, we found only one statistically significant, low negative correlation ( $r = -.195$ ) between unit manager acknowledgement and perceived research performance. This means that those academics who value their unit manager's acknowledgement perceive themselves as weaker research performers. This may imply that time and effort spent for impressing a unit or unit manager (i.e. to gain their acknowledgement) conflicts with the time and effort to be allocated to research activities, assuming that teaching duties are usually more constant. For research-oriented academics, the only statistically significant correlation ( $r = .218$ ) is between importance of student acknowledgement and perceived teaching performance. This may indicate that those academics who appreciate student acknowledgement have more teaching duties; it seems unconnected with perceived research performance.

Overall, it can be concluded that importance of motivational factors has only a minor connection with perceived high performance in both research and teaching, and that there is no linear connection between opinion about the importance of financial incentives and perceived performance, either in research or in teaching. On that basis, H1 (*More than other motivational factors, financial incentives are linearly connected to academics' perceived performance*) is rejected.

Table 4. Correlations between perceived performance and importance of motivational factors

Our analysis shows (Table 5) that there is no strong linear correlation (in either direction) between the variables ‘attitude towards performance measurement as a control’ and ‘perceived performance’ in either research or teaching. However, some differences in attitude can be observed between teaching- and research-oriented staff. Among teaching-oriented staff, positive attitude towards measurement exhibits a weak but positive statistically significant correlation ( $r = .157$ ) with perceived research performance for teaching-oriented respondents who publish more than their colleagues. In the case of academics with a balanced work orientation and academics with research-orientation, no such correlation exists. A second statistically significant but weak correlation ( $r = .171$ ) exists between negative attitude towards performance measurement and research-oriented staff who are more engaged in teaching. Together, these two findings may indicate that either ability (in the case of teaching-oriented academics who publish more than their colleagues) or opportunity (in the case of research-oriented academics who need to teach more) are to some extent also related to attitudes to performance measurement. While those who are able to publish more *despite their teaching load* feel more positively disposed to performance measurement, those who publish less *because of their teaching load* have negative feelings about performance measurement. Interestingly, the correlation between perceived performance and negative attitude towards performance measurement is statistically significant and negative ( $r = -.242$ ). Those who view performance measurement as a sign of mistrust do not see themselves as high performers; this applies only to those with a balanced work orientation.

Although some individual connections can be found between performance measurement as a form of control and perceived performance, the overall conclusion is that there is no major link between these. On that basis, H2 (*Attitude to performance measurement as a form of control is linearly connected to individual perceived performance in teaching and in research*) is rejected.

Table 5. Correlations between perceived performance and attitude towards performance measurement

As shown by the correlations in Table 6, the impacts of performance measurement on academics’ perceived performance exhibit no statistically significant connections (in either direction). The only exception to this general observation is the statistically significant correlation ( $r = .248$ ) between balanced academics who consider themselves higher performers in teaching and the belief that performance measurement and control increase performance. Despite this deviation, H3 (*The assumed impact of measurement on performance is linearly connected to individual perceived performance in teaching and in research*) is also rejected.

Table 6. Correlations between perceived performance and opinion on the performance impact of performance measurement

Overall, our results demonstrate that there is no linear connection between attitude to performance measurement or its impact on performance and perceived high teaching or research performance (H2 and H3). Contrary to H1, we also found that opinion about the importance of financial incentives does not correlate with perceived high teaching or research performance. However, there are differences between academics with differing work orientations. Among teaching-oriented academics, positive attitude to performance measurement correlates with high publication performance. Among research-oriented staff, negative attitude to performance measurement correlates with high teaching performance. It also seems that financial incentives and acknowledgements from external colleagues (i.e. colleagues working in other units or higher education institutions) particularly motivate those teaching-oriented academics whose perceived research performance is high. Again, those teaching- and research-oriented academics whose perceived teaching performance is high consider acknowledgement from students to be an important motivating factor. The results suggest that the role of incentives in supporting research performance may be important, especially for those academics whose main tasks are not primarily research-related. This also resonates with recent changes in the funding and salary systems of Finnish universities, which emphasise the quantity and quality of scientific publications as performance criteria. Instead, acknowledgement from students can boost the teaching performance of teaching- and research-oriented academics whose perceived teaching performance is high.

Even though focusing on perceived (self-reported) performance has several weaknesses compared to focusing on actual (objectively measured) performance, this approach can be justified on following grounds. Firstly, the lack of actual performance data at the individual level and challenges in connecting this performance data with the variables of the survey made this option impossible within the context of this study. Secondly, even though focusing on perceptions includes a risk that respondents are inaccurate in assessing their own performance, this risk is greatly mitigated in the Finnish context due to the performance appraisals and performance-based salary negotiations which the academic staff and their superiors need to undergo in every two years. These practises increase the possibility that the academic staff are fully aware of their true teaching and research performance. Moreover, one could assume that there are seemingly no rational reasons to exaggerate the level of performance in anonymous survey responses.

## **Discussion and conclusions**

Our results indicate that although senior academics have a quite positive view of performance measurement as such, this attitude does not correlate with perceived high performance in either teaching or research. These findings may have implications for practical aspects of PBM and for theoretical aspects of agency theory. The fact that financial incentives as motivational factors are not directly related to perceived performance conflicts with the basic assumptions of PBM that individual academics place insufficient emphasis on performance or that they are wilfully bypassing opportunities to improve performance unless clearly incentivised to do so (Kivistö & Kohtamäki, 2016). Based on the present findings, it seems that the motivation for high performance among academics still relates primarily to acknowledgement from the academic community and academic

achievement—in other words, from something closer to intrinsic motivation—than from measurement and financial incentives. Even though this finding does not suggest that PBM policies do not have any impact on the behaviour of academics, it nevertheless implies that the estimated impacts of the PBM should not be overestimated due to the motivational factors of individual academics.

From this vantage, our results also do not support the assumption of agency theory that outcome-based contracts represent an efficient means of aligning the interests of principals and agents (e.g. Eisenhardt, 1989; Kivistö, 2005) in an academic context. These findings align with the few existing empirical studies investigating the system-level impacts of performance-based funding (e.g. Hillman, Tandberg, & Fryar, 2015; Rutherford & Rabovsky, 2014; Sanford & Hunter, 2011; Tandberg & Hillman, 2013). None of these studies found any evidence that performance-based funding had increased institutional performance in terms of rates of completion, retention, and graduation.

Moreover, our findings provide no support for the assumption that academics' attitudes to performance measurement might somehow be related to perceived high teaching and research performance. This finding suggests that perceiving performance measurement as either controlling or supportive is not linked to academics' level of performance. Specifically, the assumption that performance-based measurement would 'crowd out' intrinsic motivation if academics perceived it as controlling their work finds no support from our study (cf. Andersen & Pallesen, 2008; Frey & Jegen, 2001). From the perspective of PBM, this implies that performance measurement itself (with or without attached financial incentives) does not increase academics' motivation to perform better (or worse). Furthermore, this finding, although indirectly, provides no support for the agency theory assumption that monitoring (in the form of behaviour-based contracts) would in itself incentivise agents to act in the best interests of the principal.

As a principal limitation of this study, it should be acknowledged that performance level was defined in terms of 'perceived high performance' as determined by individual academics. For that reason, we cannot actually say anything about the correlations between our independent variables and the 'actual' performance of individuals independent of their own perceptions. In addition, the correlations identified in our analysis are weak (although statistically significant). From the correlative analysis, we can conclude that there are no clear linear connections and that there are apparent differences between groups defined according to their work orientation. However, further empirical studies will be needed in order to determine the actual impacts of performance-based management on behaviour and on the performance of individual academics and institutions as a whole. More studies would be also needed in the future for clarifying the level of accuracy between perceived performance measured individual and organisational level performance and to find out whether these are associated with the differences of motivational factors of individuals.

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Table 1.

| <i>Title</i>                | n   | %    |      |
|-----------------------------|---|------|------|
| <i>Employment contract</i>  | Professor (career stage IV)                 | 259  | 38.5 |
|                             | Associate professor (career stage III)      | 413  | 61.5 |
|                             | Permanent position                          | 429  | 63.9 |
|                             | Tenure track                                | 39   | 5.8  |
|                             | Temporary teaching and/or research position | 192  | 28.6 |
|                             | Other                                       | 11   | 1.6  |
| <i>Gender</i>               | Female                                      | 277  | 41.8 |
|                             | Male  | 386  | 58.2 |
| <i>Field of science</i>     | Natural Sciences                            | 183  | 27.2 |
|                             | Engineering and Technology                  | 85   | 12.6 |
|                             | Medical and Health Sciences                 | 81   | 12.1 |
|                             | Agricultural Sciences                       | 15   | 2.2  |
|                             | Social Sciences                             | 165  | 24.6 |
|                             | Humanities                                  | 117  | 17.4 |
|                             | Other, please specify                       | 26   | 3.9  |
| <i>Orientation</i>          | Teaching                                    | 212  | 37.7 |
|                             | Research                                    | 206  | 36.7 |
|                             | Balanced                                    | 144  | 25.6 |
| <i>Weekly Working hours</i> | Mean  | 46.6 |      |
|                             | Standard deviation                          | 9.2  |      |

Table 2.

|                              |   | <b>WORK ORIENTATION</b> |          |          |       |
|------------------------------|---|-------------------------|----------|----------|-------|
|                              |   | Teaching                | Balanced | Research | Total |
| <b>1 (STRONGLY DISAGREE)</b> | % | 13                      | 3        | 3        | 7     |
| <b>2</b>                     | % | 20                      | 9        | 11       | 14    |
| <b>3</b>                     | % | 35                      | 30       | 28       | 31    |
| <b>4</b>                     | % | 17                      | 28       | 28       | 24    |
| <b>5 (STRONGLY AGREE)</b>    | % | 15                      | 31       | 32       | 25    |
| <b>TOTAL</b>                 | n | 184                     | 134      | 181      | 499   |
|                              | % | 100                     | 100      | 100      | 100   |

Table 3.

|                              |   | <b>WORK<br/>ORIENTATION</b> |          |          |       |
|------------------------------|---|-----------------------------|----------|----------|-------|
|                              |   | Teaching                    | Balanced | Research | Total |
| <b>1 (STRONGLY DISAGREE)</b> | % | 1                           | 7        | 19       | 9     |
| <b>2</b>                     | % | 7                           | 20       | 33       | 20    |
| <b>3</b>                     | % | 27                          | 35       | 31       | 30    |
| <b>4</b>                     | % | 30                          | 20       | 11       | 20    |
| <b>5 (STRONGLY AGREE)</b>    | % | 35                          | 20       | 6        | 21    |
| <b>TOTAL</b>                 | n | 189                         | 133      | 177      | 499   |
|                              | % | 100                         | 100      | 100      | 100   |

Table 4.

| Work orientation  |                |   | Unit manager | Acad. staff in my unit | Ext. colleagues | Ext. stakeholders | Students | Financial incentives | Media attention |
|---|----------------|---|--------------|------------------------|-----------------|-------------------|----------|----------------------|-----------------|
| Teaching  | Published more | r | -0.005       | -0.077                 | .160*           | 0.09              | -.221**  | .161*                | 0.042           |
|   |                | p | 0.945        | 0.305                  | 0.03            | 0.248             | 0.003    | 0.031                | 0.576           |
|   |                | N | 177          | 182                    | 183             | 168               | 184      | 178                  | 180             |
|   | Taught more    | r | -0.096       | -0.053                 | -0.042          | 0.113             | .153*    | 0.058                | 0.031           |
|   |                | p | 0.197        | 0.471                  | 0.566           | 0.144             | 0.037    | 0.438                | 0.673           |
|   |                | N | 181          | 186                    | 186             | 169               | 188      | 181                  | 183             |
| Balanced  | Published more | r | -.195*       | -0.069                 | 0.043           | -0.028            | -0.082   | 0.103                | 0.068           |
|   |                | p | 0.026        | 0.43                   | 0.622           | 0.754             | 0.347    | 0.238                | 0.435           |
|   |                | N | 131          | 133                    | 134             | 127               | 132      | 133                  | 133             |
|   | Taught more    | r | -0.066       | 0.048                  | -0.052          | -0.116            | 0.129    | -0.083               | 0.026           |
|   |                | p | 0.456        | 0.583                  | 0.552           | 0.197             | 0.141    | 0.344                | 0.767           |
|   |                | N | 130          | 132                    | 133             | 126               | 131      | 132                  | 132             |
| Research  | Published more | r | 0.046        | 0.08                   | 0.082           | 0.008             | 0.006    | 0.006                | -0.011          |
|   |                | p | 0.551        | 0.29                   | 0.273           | 0.915             | 0.937    | 0.936                | 0.883           |
|   |                | N | 173          | 178                    | 180             | 168               | 179      | 173                  | 179             |
|   | Taught more    | r | 0.051        | -0.017                 | 0.032           | 0.058             | .218**   | 0.077                | 0.097           |
|   |                | p | 0.511        | 0.824                  | 0.676           | 0.466             | 0.004    | 0.323                | 0.202           |
|   |                | N | 169          | 174                    | 176             | 163               | 176      | 169                  | 175             |
| * Correlation is significant at the 0.05 level (2-tailed).  |                |   |              |                        |                 |                   |          |                      |                 |
| ** Correlation is significant at the 0.01 level (2-tailed). |                |   |              |                        |                 |                   |          |                      |                 |

Table 5.

| Work orientation  |                |   | Negative | Positive |
|---|----------------|---|----------|----------|
| Teaching  | Published more | r | -0.074   | .157*    |
|   |                | p | 0.334    | 0.037    |
|   |                | N | 171      | 177      |
|   | Taught more    | r | 0.068    | -0.04    |
|   |                | p | 0.372    | 0.591    |
|   |                | N | 174      | 180      |
| Balanced  | Published more | r | -.242**  | 0.053    |
|   |                | p | 0.006    | 0.55     |
|   |                | N | 129      | 128      |
|   | Taught more    | r | -0.132   | 0.154    |
|   |                | p | 0.138    | 0.083    |
|   |                | N | 128      | 127      |
| research  | Published more | r | -0.103   | 0.007    |
|   |                | p | 0.176    | 0.931    |
|   |                | N | 175      | 176      |
|   | Taught more    | r | .171*    | -0.089   |
|   |                | p | 0.025    | 0.247    |
|   |                | N | 171      | 172      |
| * Correlation is significant at the 0.05 level (2-tailed).  |                |   |          |          |
| ** Correlation is significant at the 0.01 level (2-tailed). |                |   |          |          |

Table 6

| Work orientation |                |   | Performance measurement and control increases performance |
|------------------|----------------|---|---|
| Teaching         | Published more | r | 0.031   |
|                  |                | p | 0.678   |
|                  |                | n | 182   |
|                  | Taught more    | r | -0.045  |
|                  |                | p | 0.544   |
|                  |                | n | 187   |
| Balanced         | Published more | r | 0.137   |
|                  |                | p | 0.115   |
|                  |                | n | 134   |
|                  | Taught more    | r | .248**  |
|                  |                | p | 0.004   |
|                  |                | n | 133   |
| Research         | Published more | r | 0.117   |
|                  |                | p | 0.12  |
|                  |                | n | 179   |
|                  | Taught more    | r | 0.046   |
|                  |                | p | 0.546   |
|                  |                | n | 175   |

\*\* Correlation is significant at the 0.01 level (2-tailed).

Table 7.

| Work orientation |            |          | Published more | Taught more | Negative | Positive |       |       |
|------------------|------------|----------|----------------|-------------|----------|----------|-------|-------|
| Teaching         | Work hours | r        | 0.122          | 0.084       | 0.062    | 0.006    |       |       |
|                  |            | p        | 0.1            | 0.25        | 0.407    | 0.935    |       |       |
|                  |            | n        | 184            | 189         | 180      | 186      |       |       |
|                  |            | n        | 128            | 127         | 131      | 131      |       |       |
|                  |            | Balanced | Work hours     | r           | 0.035    | 0.111    | 0.103 | 0.005 |
|                  |            |          |                | p           | 0.686    | 0.201    | 0.24  | 0.959 |
| n                | 134        |          |                | 133         | 132      | 131      |       |       |
| Research         | Work hours | r        | .164*          | 0.137       | 0.072    | -0.036   |       |       |
|                  |            | p        | 0.028          | 0.071       | 0.337    | 0.628    |       |       |
|                  |            | n        | 180            | 176         | 181      | 182      |       |       |

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

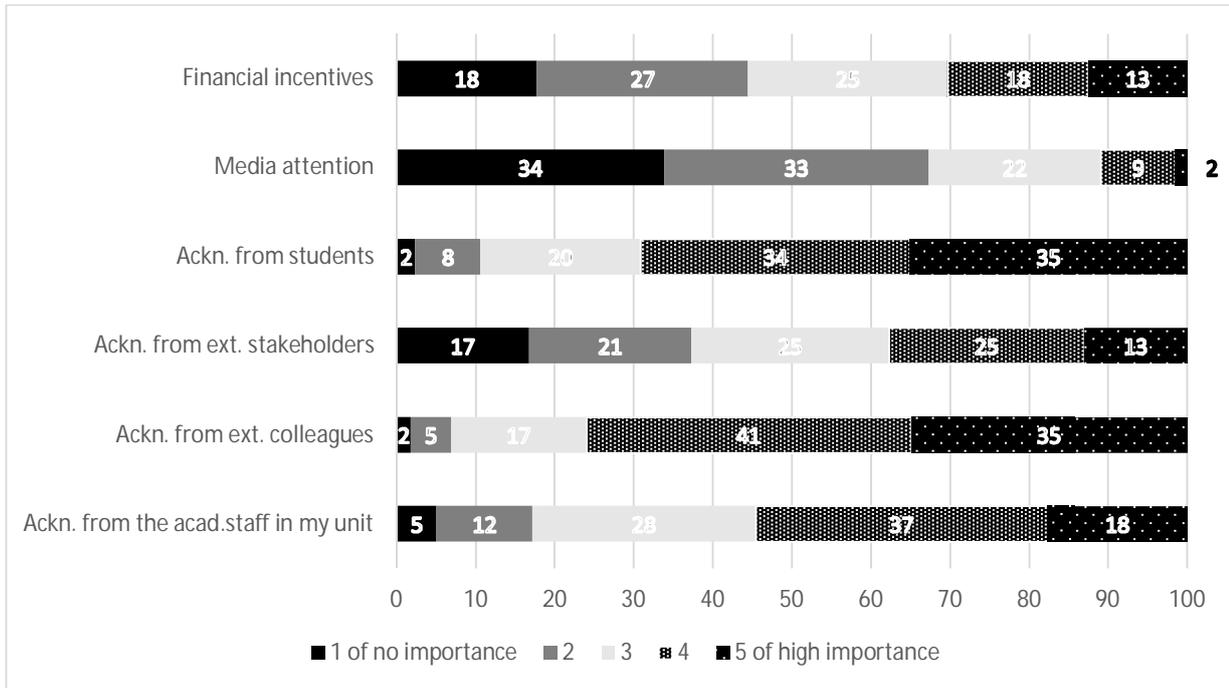


Figure 1

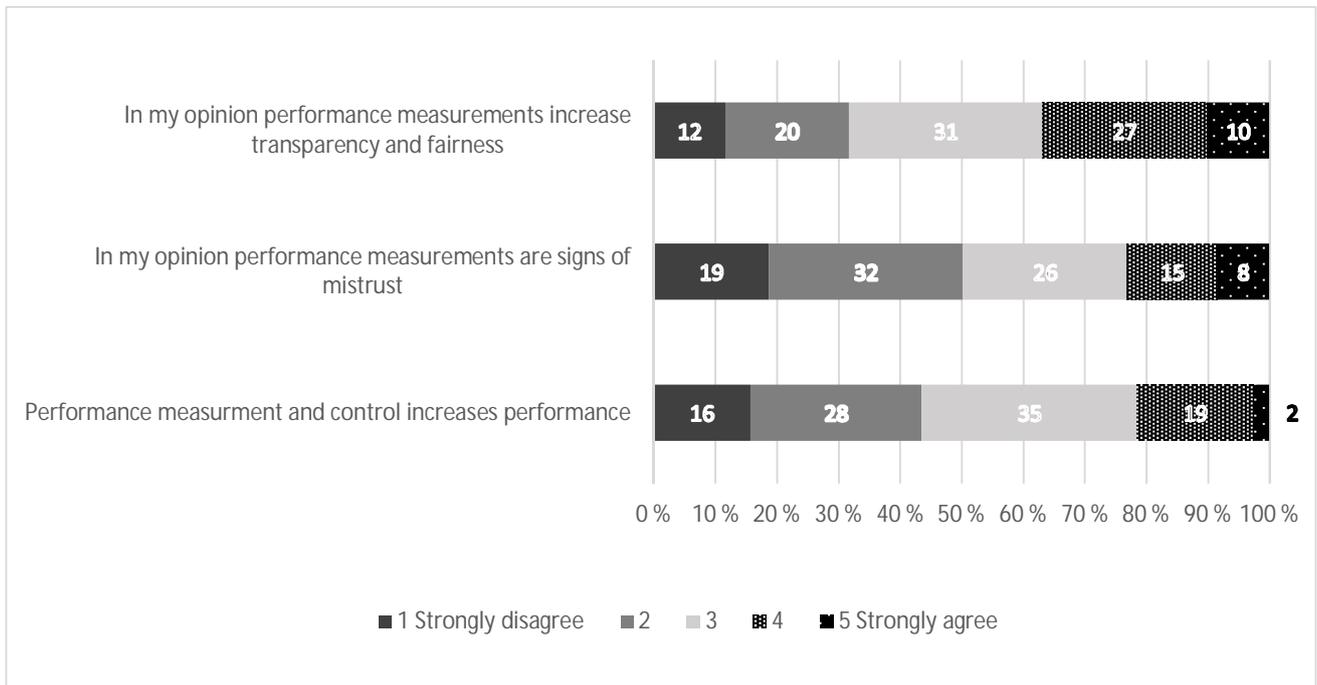


Figure 2