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# Universities' internal budget models

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**Six European case studies**

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Six European case studies

technopolis <sub>group</sub> June 2016

Göran Melin, Peter Kolarz, Elisabeth Zaparucha, Dirk Johann

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## Sammanfattning på svenska

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Uppdraget har bestått i att genomföra fallstudier vid några europeiska universitet, av deras respektive interna budgetmodell. Vi har valt två universitet i Sverige, två i Storbritannien, ett i Frankrike och ett i Tyskland. Vi har försökt att finna universitet som i rimlig grad påminner om NTNU genom sin storlek och profil. Uppgiften har också varit att diskutera modellerna, inte minst med avseende på balansen mellan prestationsbaserad medelstilleddning och andra resurskanaler. Studien omfattar inte externa medel; vi talar här om det direkta statliga anslaget till universiteten.

De sex universiteten uppvisar en bredd vad gäller den interna budgetmodell som de tillämpar. Ett universitet, Paris-Sud, får sitt statliga anslag grundat på femåriga kontrakt med ministeriet. Den absoluta lejonparten av detta distribueras ner i organisationen till fakulteter och institutioner utan andra kriterier än de reella kostnaderna på respektive enhet. En mindre del kan användas fritt, till strategiska satsningar eller andra satsningar som ligger utöver de fasta kostnaderna. Även om systemet skänker en viss stabilitet så gör det också lärosätet starkt beroende av kontraktet med ministeriet, och det kan inte i särskilt hög grad påverka om ministeriet skulle vilja skära i budgeten. Paris-Sud har därmed begränsad förmåga att själv styra över sina resurser.

De båda brittiska universiteten är tämligen resultatorienterade. De skiljer sig dock samtidigt åt. Det ena, i Bristol, har en klart resultatbaserad medelstilleddning internt, där institutioners och andra enheters intäkter belönas med ytterligare resurser. Förvisso aggregeras intäkterna till fakultetsnivå, för att undvika risken för stora svängningar år för år. Det är i norsk eller skandinavisk jämförelse ett mycket starkt resultatfokuserat system, där de som lyckas dra in medel av olika slag belönas med mer resurser.

Det andra brittiska universitetet, i Loughborough, fördelar sina medel internt på ett annat sätt. En enda person (provost), har makten att fördela resurserna som han eller hon anser bäst. En mindre stab av ekonomiadministratörer står till dennes förfogande. Det finns också tillgång till olika slags statistik och andra data som grund för hur fördelningen kan göras, men denna person behöver inte begagna sig av dem. Det kan tyckas som ett märkligt system, men det fungerar bra och vi har inte fångat upp några signaler om särskilt missnöje med hur fördelningen fallit ut. Naturligtvis blir det dock ytterst personberoende.

KTH tillämpar en budgetmodell bestående av en fast del som utgör drygt hälften av resurserna, en prestationsbaserad del som utgör en fjärdedel, och en del för strategiska eller riktade satsningar som utgör knappt en fjärdedel. På detta sätt fördelas medlen från central nivå till KTHs tio skolor, vilka sedan distribuerar medlen vidare till institutioner och avdelningar enligt ungefär samma principer. Vissa avvikelser finns dock.

På Chalmers har man nyligen utvecklat en ny modell, som ska införas steg för steg under de kommande sex åren. Grundtanken i modellen är att en kombination av fasta resurser och prestationsbaserade resurser, samt strategiska medel, ska täcka 75% av varje medarbetares kostnader, åtminstone på institutionsnivå. Resterade medel måste erhållas från externa finansiärer. Det nya systemet är ett ambitiöst försök att skapa en modell som är både prestationsinriktad och samtidigt skänker långsiktighet och säker kostnadstäckning ner på individnivå.

Det tyska exemplet, TU Berlin, har en modell som fördelar en blandning av strategiska medel och prestationsbaserade medel framför allt från fakultetsnivån till institutionsnivån. Universitetets professorer – professorsstolarna – finansieras från central nivå, och denna del utgör en huvuddel av de icke-externa resurserna för forskning och resurserna för undervisning. Fakulteternas fördelning av prestationsbaserade och strategiska resurser går exempelvis till satsningar på unga forskare och ökad jämställdhet.

Några olika kategorier av budgetmodeller kan extraheras ur de ovanstående exemplen. En första variant utgörs av långsiktiga kontrakt mellan lärosätet och ministeriet, som i sig innehåller olika

prestations- eller resultatbaserade komponenter. Lärosätet kan upprätta motsvarande kontrakt mellan fakulteter och den centrala nivån.

En andra variant är att låta en mycket stor del av de statliga fasta resurserna fördelas efter prestation. En mindre del kan behållas av den centrala nivån för särskilda strategiska satsningar. Ett sådant system kräver i princip väl utvecklade indikatorer för forskning och undervisning, som är transparenta och erkända, och som skänker rimlig stabilitet och planeringshorisont på institutionsnivå, samtidigt som de premierar enskilda individers prestationer. Det är då viktigt att indikatorerna verkligen täcker in all verksamhet vid lärosätet; forskning, utbildning och samverkan, med alla sina aspekter.

En tredje variant är en avvägd kombination av fasta medel från central nivå och ner i organisationen, prestationsbaserade medel (både forskning och undervisning), och strategiska satsningar. Frågan blir då vilken balans mellan dessa tre huvudsakliga delar som ska råda, och vilka de prestationsbaserade indikatorerna ska vara. En ganska lång rad indikatorer kan tänkas. Finns fler än två nivåer inom lärosätets organisation, som på KTH, så kopieras eller upprepas huvudprinciperna för fördelning också ner på nästa nivå (normalt från fakultets- till institutionsnivå).

Vi tror att denna tredje variant är den mest tillämpbara för NTNU, som då har att ta ställning till vilken balans som gäller för de olika finansieringsströmmarna, samt vilka prestationsbaserade indikatorer som ska användas. När det kommer till det senare föreslås att NTNU låter sig inspireras av Chalmers, där man till skillnad mot på KTH har nyttiggörande som en av indikatorerna. Det är antagligen viktigt att alla delar av det nya NTNU har möjlighet att få en prestationsbaserad resurstilldelning, oavsett om man presenterar väl inom forskning, utbildning eller samverkan med omgivande näringsliv och samhälle. NTNU måste också göra överväganden om hur modellen ska implementeras på organisationens olika nivåer, samt vilken tidsperiod som ska ligga till grund för mätningen av prestationer.

# 1 Introduction

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On 1 January 2016, The Norwegian University of Science and Technology (NTNU) merged with the University Colleges of Ålesund, Gjøvik and Sør-Trøndelag. Subsequent to this major organisational change, various internal organisational reforms or other types of restructuring are needed. For instance, the scientific organisational chart on faculty level has been remade, and the organisation of the administration is being revised as well. Furthermore, on national level, a new funding system of higher education institutions have been put in place, not fundamentally different from the previous one but with more emphasis on external funding and quality. All these changes have resulted in a need for NTNU to consider a new internal funding model.

As one part of formulating a new internal funding model, NTNU has assigned a study, including a mapping and brief analysis of the internal funding model at a selection of other relevant Nordic and European universities, to Technopolis Group. According to the Terms of reference, a new internal funding model should

- help realise NTNU's vision and long term goals as stated in the merger platform and NTNU's strategy Knowledge for a better world (*Kunnskap for en bedre verden*)
- ensure that NTNU has sufficient room for manoeuvre to make overarching strategic priorities and restructuring
- ensure a unified and balanced resource allocation in accordance with the Board's priorities and NTNU's future organisation
- provide opportunities for clear strategic governance and long-term planning at various levels
- stimulate collaboration across academic and other organisational units
- be simple, transparent and predictable

Furthermore, a new funding model should include both a base funding and a performance-based component (incentives) that provide faculties and other organisational units the opportunity to deliver high quality over time, and provide competitive working conditions for staff and students. It should also support long-term planning and ability to make strategic priorities.

The purpose of the mapping is

- to identify relevant models and principles used for internal budget allocation at some foreign institutions
- to elaborate on possible budget allocation models through illuminating ideal type models
- to undertake a discussion of the principle advantages and disadvantages of the different ideal types given the set of bullet points above

The following universities have been selected for the mapping:

- The Royal Institute of Technology, Sweden
- Chalmers University of Technology, Sweden
- University of Bristol, UK
- Loughborough University, UK
- Paris-Sud, France
- Technische Universität Berlin, Germany

In this report, the mapping including a brief analysis is presented. Each university is presented as case studies, with description of its internal budget distribution model, and a discussion of its characteristics. Each case study has been undertaken through investigation of available information and data from the respective university, and through interviews with one or two representatives from each university.

Göran Melin has functioned as project manager and has conducted the Swedish cases. Peter Kolarz has conducted the British cases, Elisabeth Zaparucha the French case, and Dirk Johann the German case. The mapping and analyses were made during May and June 2016. The team from Technopolis Group wishes to extend our thanks to the participating universities which have kindly made material available to us and shared information and insights during the interviews.



# The Royal Institute of Technology, KTH

## 2 Internal budget distribution model at KTH

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### 2.1 The university

Founded in 1827, The Royal Institute of Technology (KTH) is Sweden's largest technical university. KTH is working with industry and society in the pursuit of sustainable solutions to challenges such as climate change, future energy supply, urbanisation and quality of life for the rapidly-growing elderly population. KTH is active in research and education in natural sciences and all branches of engineering, as well as in architecture, industrial management, urban planning, history and philosophy. Almost two-thirds of the turnover relates to research.

Basic and applied research is performed side-by-side at KTH and interdisciplinary research is conducted in parallel with work in specific fields. KTH embraces academia and the public and private sectors working together. The university is active in international research collaborations and participates in a large number of educational exchanges or joint programmes with universities and colleges around the world.

KTH's activities are separated into ten different Schools. Each of these is heading a number of Departments, Units, Centres of excellence and undergraduate study programmes.

### 2.2 The budget allocation model

First, it should be explained that in Sweden, the governmental direct appropriations to higher education institutions come in two different streams, one for research and PhD training, and one for education on first and second level (undergraduate education). The national distribution models for the two streams are different; there is one distribution model for research and PhD training, and another one for education. The funds distributed within both streams arrive at the institution as such (in practice to the rector), which then freely distributes the funds within the institution itself. When doing so, it is very common that again, different models are used internally for research and PhD training, and for education.

At KTH, the total turnover in 2015 was SEK 4.8 billion (SEK10~NOK10~€1). Of this amount, the two streams of governmental grants (the direct appropriations) added up to approximately SEK 1.1 billion each for education at first and second level (undergraduate) and for research and doctoral studies. The rest, approximately SEK 2.6 billion, came as external funding.

#### 2.2.1 Research and PhD training

For 2016, the rector at KTH distributed SEK 1,144m to the schools. SEK 944m of these funds were distributed through a model introduced in 2010, consisting of three parts, where the benchmark is that approximately 55 percent of funds will go to the schools as base funding, approximately 25 percent as performance-based allocation, and about 20 percent as strategic initiatives (*riktade medel*). The balance between these parts can vary between schools depending on history and other reasons. It has been observed that the strategic initiatives that continue over a long period have been reclassified to base funding.

The strategic initiatives are partly thematically allocated in accordance with the strategies stated by the KTH management. During 2016 priority is given to research infrastructure, faculty development and interdisciplinary initiatives, preferably cross schools. Efforts should be linked to schools' development plans. KTH has also invested in establishing the tenure track system that was introduced in 2010,

which focuses on the positions lecturer and assistant lecturer (*lektor* and *biträdande lektor*). These positions are often financed with strategic funding.

For 2016, the total base funding accounts for SEK 517m; the total performance-based funding accounts for SEK 221m, and the strategic initiatives accounts for SEK 206m.

The SEK 1,144m to the schools also contains earmarked funds under the government's strategic research areas amounting to SEK 118m, the government's investment in the Science for Life Laboratory with SEK 66m and SEK 15m to platforms to promote interdisciplinarity.

The performance-based part consists of number of PhD exams, the size of the external funding, and publications<sup>1</sup>. For 2016, 70 percent was allocated based on the number of PhD exams, 20 percent based on external funding and 10 percent on publications.

Besides the funds allocated directly to the schools, the rector keeps about SEK 40-50m to be used for co-financing of EU projects, and about SEK 20m for commitments and other upcoming needs during the year.

#### 2.2.1.1 Bibliometric component of the model

The KTH model for funding allocation is intended to give incentive to the researchers of KTH to publish in highly cited journals. On behalf of the rector, the Unit for Publication Infrastructure (PI) at the ECE School<sup>2</sup> has developed a journal indicator for allocation of research funds. The indicator rewards publication in journals, which are highly cited relative to the subject fields the journals belong to. It is combined with a volume measure: the number of faculty full time equivalents. This combination constitutes the KTH bibliometric indicator for funding allocation called BIFA<sub>KTH</sub>. Values of BIFA<sub>KTH</sub> are calculated per department. Values of the journal indicator are generated by PI, whereas values of the volume measure are generated by the Human Resources Department. The Finance Office then calculates the values of the combined indicator, i.e. of BIFA<sub>KTH</sub>. In 2015, the amount that was allocated by the model was SEK 21.6m. Allocation of funds occurs the year after the year of analysis.<sup>3</sup>

It should be noted that the bibliometric component of the model does not include citations, but only publications.

Examples from two schools at KTH are given below.

#### *Example from School A<sup>4</sup>*

The allocation for research and PhD education to School A was, according to the contract between the school and the rector, SEK 137.4m in 2016. Of these, SEK 31.5m came as special funding to so called Strategic Research Areas, something that the Swedish government has decided upon. The funds also includes strategic initiatives of about SEK 19m. The remaining SEK 87m was distributed to the school's departments as follows:

1. SEK 800,000 per professor and SEK 500,000 per lecturer, about 48% of the total
2. 10% directly on external funds, about 24%
3. The school's own citation bonus, about 1%
4. KTH's publication bonus, about 3.5%
5. SEK 600,000 per PhD exam spread over 3 years, about 23.5%

The change from previous year must not be greater or less than 10% of points 1 and 2.

<sup>1</sup> The indicator rewards publication in journals, which are highly cited relative to the subject fields the journals belong to. It is combined with a volume measure: the number of faculty full time equivalents (FTEs).

<sup>2</sup> The School of Education and Communication in Engineering Science.

<sup>3</sup> A substantially more detailed description, including calculation examples, is given here: <https://www.kth.se/en/kthb/publicering/vagledning/bibliometric-funding-allocation-at-kth-1.630080>

<sup>4</sup> The examples are real, but the names of the schools in the examples have been anonymised.

### *Example from School B*

The allocation to School B for research and postgraduate education in 2016, according to the contract between the rector and the school, amounted to SEK 61m. Of these, about SEK 39m comes as basic funding to be distributed to the departments. SEK 21m will be distributed after decision by the school's dean. In addition, the school receives funding according to the three different types of performance, nearly SEK 25m for PhD exams, SEK 6m for external funding, and SEK 3m for publications.

The school also receives targeted funds from the rector, SEK 18.4m, related to specific projects such as support for research centres, co-financing, relocation support and support to lecturer positions or professorships.

Finally, the school receives certain funding for the governmental Strategic Research Areas. In 2016, the school got nearly SEK 24m for these purposes. Some of these funds are however transferred to other partners within KTH.

#### *2.2.2 Education at undergraduate level*

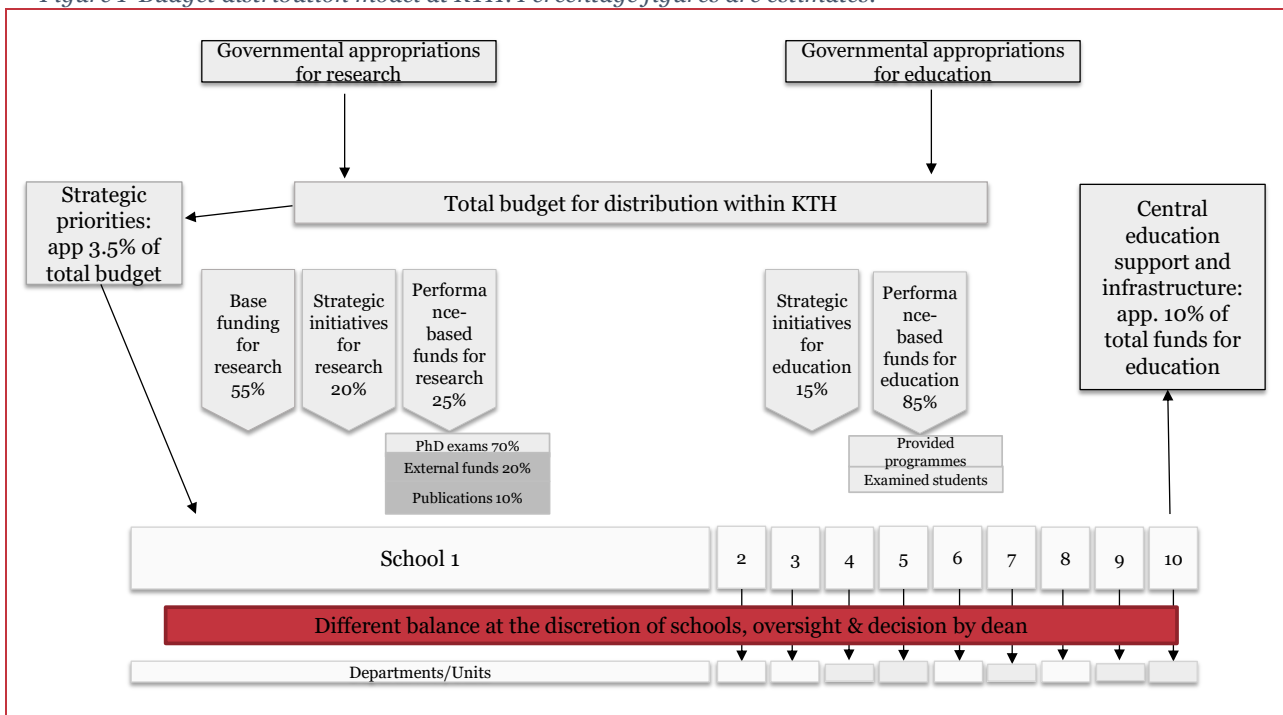
A new model at KTH for allocation of resources to education at undergraduate level was introduced in 2015. The principle of the model is that the entire education grant from the government is distributed to the schools. The amount allocated to the schools also includes the estimated tuition fee income for students from third countries.

The model is linked to the way in which funds are allocated by the government to higher education institutions, where the funds are generated on the basis of producing full-time students and annual performance. The funding KTH receives for full-time students is distributed according to a performance-based principle, where responsibility for providing a programme and for examining students are measured according to a certain formula. In addition, there are some funds for targeted initiatives, approximately 15 percent of the total funding for education. Part of the distributed funds is set aside (in fact returned to the central management) from each school for central functions and infrastructure for education, approximately 10 percent. One concrete example from a school is given below.

### *Example from School C*

For 2016, the rector allocates, according to the principal contract with School C, a total of SEK 45.4m in education funds. SEK 4.6m is instantly paid back as a contribution to the central support and infrastructure for education. Of the total amount, SEK 2.1m refers to targeted funding. The targeted funding goes for instance to developing pedagogy, coordination of candidate theses, education at KTH's campus in the Stockholm suburb Haninge, and a certain responsibility for relations with India. The remaining amount, about SEK 39m, is allocated according to the performance-based formula. The funding is paid monthly to the school's departments according to the outcome. An adjustment can be made at the end of the year depending on the final results.

Figure 1 Budget distribution model at KTH. Percentage figures are estimates.



### 3 Comments

The distribution model that KTH applies corresponds in part to the features of the government’s distribution of the direct appropriations to the higher education institutions. The performance-based components for undergraduate education are relatively similar to those that the government applies on national level. For research, a relatively large share comes as base funding, in order to provide stability, and is complemented with a performance-based share and funding for strategic initiatives. The performance-based component builds on three clear parts, which mostly corresponds with what the government uses on national level. One difference is that KTH does not use citations. The performance-based component is however substantially larger than what the government has so far used. The share of strategic funding is relatively large for both education and research.

The model signals great importance for performance-based allocation. All academic staff at KTH need to show results in order to get funding, regardless of their duties. A certain proportion is kept at central level for strategic initiatives, not a large proportion but still substantial amounts of money. Of course these funds are also distributed further into the organisation, and arrive at departments, units and individuals. There is reason to believe that they mostly arrive at high performing corners of the university, so this is likely to primarily function as yet a performance driver. Co-funding for EU-projects is for instance found within this part.

A particular detail may however work in the other direction. When calculating the bibliometric indicator, the publication volume is multiplied with the number of staff in order to get what is called  $BIFA_{KTH}$ . This means that a high number of staff is in fact rewarded, something that has not passed unnoticed at school and department level. As one of our interviewees notes: “And at this place, people can count”. This interviewee thinks that this indicator functions as a driver for establishing positions as assistant lecturer.

It can be noted that despite the fact that KTH is underlining and indeed has a history of cooperation with industry, there is no performance indicator that targets actual utilisation or cooperation with industry or society. Perhaps this is not needed due to the working climate and history at KTH? Many large (and smaller) companies in Sweden have since long time collaboration with researchers at KTH, and they are active in the planning of curricula at the engineering programmes as well. A comparison can be made with another technical university in Sweden, Chalmers. While KTH uses three performance-based parameters, Chalmers uses five, of which one is utilisation.

The model also builds on performance contracts between the schools and the rector. These contacts are negotiated and agreed upon annually. This means that the performance parameters are reported year by year. If there are significant differences on department and school level from one year to another, this will have certain impact on the budget allocation. For instance, if there are relatively many PhD examinations one year, but relatively few the next year, the budget allocation to a given department may swing back and forth to quite some degree. For distribution within a school, longer time periods can be used, as shown in the example of School A.

Much is happening at lower levels in the organisation. Some schools receive more, or less, of each part in the model, and this may have relatively large impact on a given school and its departments and units. The share of base funding from central level to the schools is a counterweight to this. Substantial monitoring responsibility and power is given to the deans of the schools, who can and should distribute the base funding to create stable conditions and long term planning within the school. The base funding is also meant to provide for certain freedom at school level to act as they find fit.

Adjustments have been made of balances or other parts of the model, whenever this has been called for. To that extent, there is flexibility to the model as such. While it is perceived to be reasonably transparent as a whole, the education stream is less transparent. The description here is somewhat simplified – there are certain characteristics and features in it that are difficult to explain unless one is fully aware of the national Swedish funding system for undergraduate education – for the staff members who need to take all details into account, it is in part complicated.

# Chalmers University of Technology

## 4 Internal budget distribution model at Chalmers

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### 4.1 The university

Chalmers University of Technology was founded in 1829. It is a technological university, the second in size in Sweden. The university is named after the major benefactor, William Chalmers, one of the directors of the Swedish East India Company in Göteborg. Chalmers is organised around eight focus areas, and in eighteen departments. In contrast to almost all other universities in Sweden, Chalmers is legally a private university. In this respect, it is not bound by the same organisational legislation as other universities, which legally are governmental authorities. When it comes to governmental funding of its research and education, this circumstance has less impact; the government distributes the same two streams of funding to Chalmers as was described in the chapter about KTH.

### 4.2 The budget allocation model

The total turnover in 2015 was SEK 3.6 billion. Of this amount, education at first and second level (undergraduate) accounted for just over SEK 1 billion, of which the governmental direct appropriations to undergraduate education accounted for SEK 0.9 billion. Of the total turnover, research and PhD training accounted for the rest, approximately SEK 2.6 billion, of which the governmental direct appropriations accounted for around one third, SEK 841m. The remaining sum consists of various other incomes to research, typically external funds.

From 2016, Chalmers is introducing a new distribution model for the governmental direct appropriations.<sup>5</sup> It will be implemented step by step during six years, and thus be in place with full effect in 2021.

The model is called Base Funding Model and it uses an individual-based component, and a performance-based component – for both the funding stream to research and PhD training, and the stream to education on undergraduate level. The respective components have certain features in each of the two streams.

The following conditions apply to the individual-based portion of the distribution model:

- The department receives 50% of the salary costs for its staff (plus overhead)
- Only staff up to 67 years of age can be included
- Staff on leave longer than 1 year (minimum 20%) and partial pensions are deducted
- No deductions are made for short leaves of absence, illness, parental leave, etc.
- Management assignments outside the department gives no deduction
- Transfer of services between departments is subject to special agreements
- The salary costs are recalculated with a standard coefficient for the next (annual) salary review
- If the department has more or fewer FTEs than the prescribed number (for example, double affiliations and temporary vacancies) the average salary costs (plus overhead) is used as a basis for the calculation

The positions that form the basis for the individual-based component have been divided into two categories:

- **Category 1**, research positions which contain teaching: Professor, Assistant Professor, Associate Professor, Senior Lecturer (*professor, biträdande professor, docent* and *universitetslektor*)

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<sup>5</sup> This section builds on descriptions of the model called “Beskrivning av basfinansieringsmodellen 2016”, Chalmers, 1 Sep 2015

- **Category 2**, full-time teaching staff: Technical Lecturer, Lecturer and teachers of arts (*tekniklektor, universitetsadjunkt and konstnärliga lärare*)

For the individual-based component, in Category 1, a mix of funding from the stream for research and the stream for education is combined to reach the 50% target for coverage of the department’s salary costs (first bullet point above). For Category 2, the full portion of 50% comes from the education stream, as staff in this category only do teaching. See Table 1.

Table 1 The Base Funding Model at Chalmers; Performance-based and Individual-based components

| To departments           | Undergraduate education            | Research   | Portion |
|--------------------------|------------------------------------|--|---------|
| <b>Individual-based</b>  | Category 1: 15%<br>Category 2: 50% | Category 1: 35%<br>Category 2: –   | 50%     |
| <b>Performance-based</b> | Provided courses and programmes    | <ul style="list-style-type: none"> <li>• Bibliometrics</li> <li>• Utilisation</li> <li>• External funding</li> <li>• PhD exams</li> <li>• Externally recruited postdocs</li> </ul> | 50%     |

The remaining 50% of performance-based funding for education is dependent on provided courses and programmes. The remaining 50% of performance-based funding for research is calculated through a combination of five different performance parameters (Table 2):

Table 2 Performance parameters from research

| Parameter  | Weight |
|--|--------|
| Bibliometrics                                    | 40%    |
| Utilisation                                      | 10%    |
| External funding                                 | 25%    |
| Number of PhD exams                              | 20%    |
| Number of externally recruited postdoc positions | 5%     |

Details regarding the performance parameters:

- Bibliometrics – the following five dimensions together constitute the parameter. For each dimension, the department’s share of all departments’ total is measured. Weight 40%
  - Average field-normalised citation level for publication channels (Jf) \* the number of publications the last four years (Web of Science). Weight 11%
  - Publication volume in international, peer-reviewed and verifiable publishing channels the last four years (Scopus). Weight 4%
  - The top 20%. Number of publications published in publishing channels rated among the 20% most cited in the field area, during the last four years (Web of Science). Weight 7%

- Average field-normalised citation level of publications (Cf) \* the number of publications, the last four years (Web of Science). Weight 11%
- Top 10%. Number of publications in the top 10% most cited in the field area, the last four years (Web of Science). Weight 7%
- Utilisation – for 2016, this parameter is constituted by five parts (Weight 10%):
  - Co-publication with external organisations
  - Collaboration with external organisations
  - Number of researchers and industrial PhD candidates with double affiliation between Chalmers and industry
  - Participation in Vocational education and training
  - Impact stories. Self-assessment and reporting from the departments
- External funding – the department's accumulated external funding during the last three completed financial years in relation to all departments' total external funding. Weight 25%
- Number of PhD exams – the department's number of awarded PhD and licentiate degrees the last five academic years, in relation to all departments' total examinations. Weight 20%
- Number of externally recruited postdocs positions – the department's number of externally recruited postdocs during the last three years in relation to all departments' total number. The average of two measurement periods per year is used. "Externally recruited" means that the recruited individuals must not have had any previous employment at Chalmers. Weight 5%

The details described above result in a 50% coverage of the departments' salary costs, distributed as a type of base funding. The portions in Table 1 thus sum up to 50% of the costs that a given department has for its staff. In addition to this, there are other (non-external) funding channels that go to the departments, especially for research, and for other initiatives of various kinds. They make up for an additional 25% of the internal distribution to departments. Hence, the departments receive altogether 75% of their total costs for their staff as internal base funding, calculated as the above-mentioned model describes. 25% remains to be granted from external sources.

Figure 2 depicts a more complete illustration of the total budget distribution in 2016 at Chalmers. It is still a simplification; several smaller components and streams have been included in the larger ones. A parallel reading of Figure 2 and Table 1 is probably necessary in order to grasp the distribution model fully. Deviations from figures in Table 1 occur; this is explained by the fact that the new model is not fully implemented until 2021.



Figure 2 Illustration of Chalmers' budget distribution 2016. Percentage figures are approximations. To be read from left to right.



## 5 Comments

The new budget model at Chalmers has been introduced quite recently, and its effects are still to be investigated, evaluated and discussed. Also, the model is being introduced step by step during six years' time, with one sixth per year, and it will be fully implemented in 2021.

Five overarching impact goals<sup>6</sup> are set by Chalmers, and the model is created in order to support the achievement of these goals. They are:

- Increased international and national attractiveness for researchers and teachers
- Create a sense of unity – one Chalmers

<sup>6</sup> Effektmål

- Increase risk taking and long term planning in research
- Provide all researchers/teachers with the opportunity and incentive to contribute within teaching, research and utilisation over time
- Provide opportunities to organise Chalmers' faculty from a strategic perspective

The new model is a serious attempt to create an internal funding model that on the one hand seeks stable conditions for the academic staff, providing 75% funding of positions and salaries on individual level, thus leaving 25% to attract from external sources, and on the other hand create a set of performance-based parameters both in teaching and research. It should be noted that the model does not intend that each and every one of the staff members should have his or her salary covered up to 75% – differences between individuals is inevitable – but it is a benchmark and within a department, the staff members should altogether have their salaries covered at this level.

Chalmers is paying close attention to the model's flexibility. The rector has expressed that if there is any need for changed balances or reformation of the model, in order to improve its functionality and its ultimate capacity as an instrument to reach the impact goals, such changes must be made.

An additional ambition with the model is that it should be sufficiently simple, transparent and predictable. Before its introduction it was much debated and many members of staff submitted comments about it; of course, some were critical and others were positive. The process seems to have been very open. Many details still need to be figured out along the way, and our interviewee is certain that various clarifying principal decisions will be necessary as the model is implemented step by step, year by year.

# University of Bristol

## 6 Internal budget distribution model at University of Bristol

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### 6.1 The university

The University of Bristol is part of the UK's prestigious Russell Group of research-intensive universities, receiving its Royal Charter (formalising university status) in 1909. In 2014/15 Bristol had 17,117 undergraduate students, and 5,061 postgraduate students (3,069 taught, 2,092 research). The university is organised into six faculties (which in turn each contain several 'schools'), each led by a Dean, which are all of roughly comparable size: Arts; Biomedical Sciences; Engineering; Health Sciences; Science; and Social Sciences and Law.

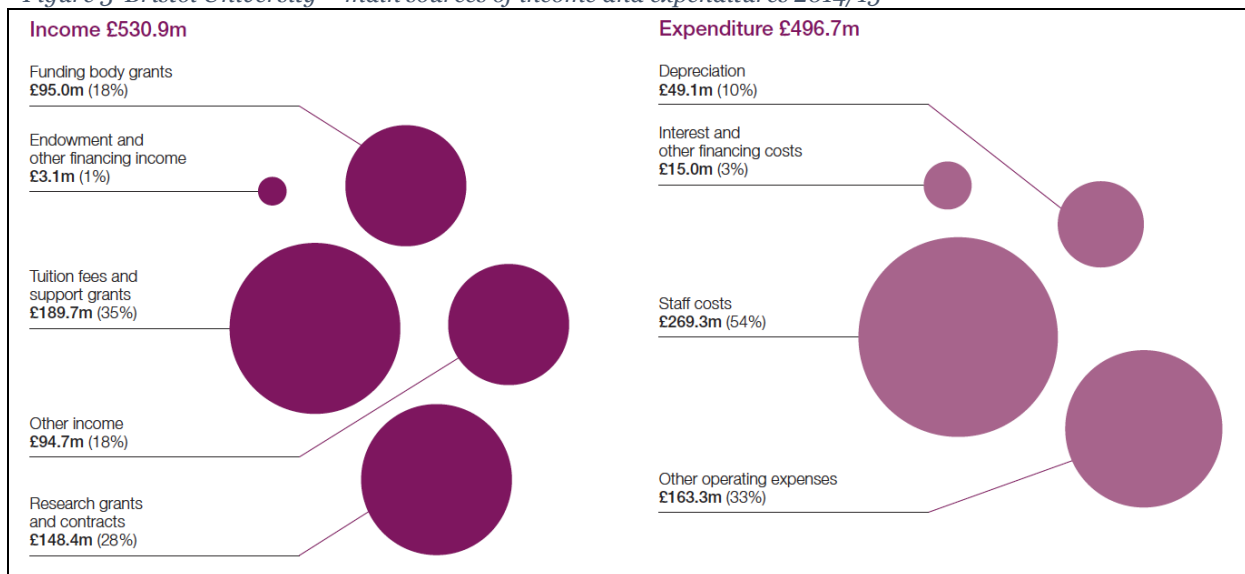
Bristol has a broad and high quality research profile, scoring among the top UK institutions overall in the research assessment exercise REF2014. Though research is conducted across a very broad range of fields, the university points in particular to its strengths in: geography; public health; health services and primary care; earth sciences; chemistry; mathematical sciences; and sport and exercise sciences.

### 6.2 The budget allocation model

The University of Bristol has a relatively (but not completely) devolved model for budget allocation, strongly centred around the six faculties, who occupy a central role between individual schools on one hand and management on the other. Moreover, its system attempts to combine a formulaic approach with 'human', strategic decision-making. Critical for the allocation system is each school's performance in terms of money brought in. However, schools' incomes are aggregated to the level of faculty, and it is this aggregation that sets the basis for budget allocation from the university, though there is scope for strategic decisions to deviate from formulaic allocation based on faculties' overall income-performance.

Bristol's main sources of income (excluding grant funding) are tuition fees, a teaching block grant from the Higher Education Funding Council of England (HEFCE) for particular subjects, institutional research funding from HEFCE (allocated to institutions through the REF), other institutional funding (eg from charities/industry), as well as various 'other' income sources (consultancy, income from conferences, special courses, knowledge exchange / technology transfer, etc). Some elements of research grants are also set aside to contribute to schools' overhead costs. To give a sense of scale, Figure 3 summarises the main consolidated sources of income and expenditure for the previous financial year.

Figure 3 Bristol University – main sources of income and expenditures 2014/15



Source: University of Bristol Annual Reports and Financial Statements 2014/15

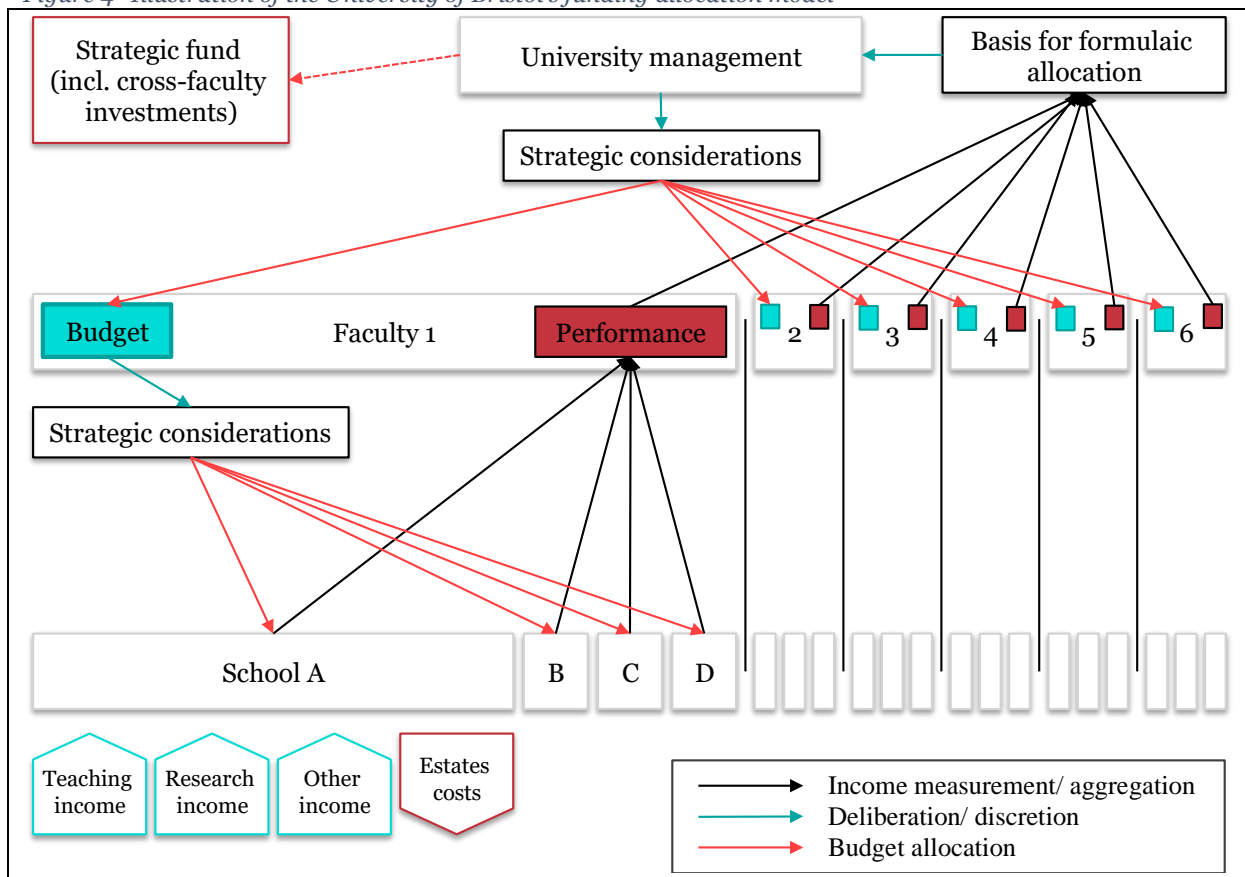
For all of these sources, the university monitors contribution at the level of schools. This includes factors such as number of students taught, PhDs supervised, each school’s performance in the REF, etc. Per school, estates expenditure is also monitored (including adjustment factors owing, for instance, to the fact that teaching space for Chemistry is more costly than for English literature).

These income levels are then aggregated to the level of faculties, and these aggregated figures then provide a benchmark for the budget allocations from the university management level back to the faculties. This is done first by considering the school level: expected students numbers per school are taken into account here, but the overall budget goes to the faculty.

However, the university management has discretion over the extent to which the budget allocation to faculties directly reflects the aggregated income of each faculty. In other words, this is where the university’s strategy can come into effect. Management may decide to augment either research or teaching activity in certain areas, or to provide seedcorn funding for cross-faculty research or teaching endeavours (the latter are in part facilitated through a strategic fund at university level derived from overall surplus). A modified reflection of each faculty’s income is thus distributed back to each faculty. Our interviewee described this system as starting everything mathematically, but then overlaying a judgement.

The university’s direct control of budget allocation formally ends at the faculty level. Faculties then distribute the budget to schools, where the faculty level once again has discretion over how exactly the budget is allocated: it is possible at this level also to have strategic investment, such as seedcorn funding for particular research or teaching endeavours. In effect, faculties are at liberty to distribute the budget as they wish, though they are accountable to the university in terms of delivering on strategic objectives for both teaching and research.

Figure 4 Illustration of the University of Bristol's funding allocation model



### 6.3 Research and teaching

Whilst the benchmark for budget allocation – income per school, aggregated to the faculties – is very clearly divided into various research-specific and teaching-specific elements, the intended uses of the budget, once allocated, are not formally divided into these two categories. Our interviewee explained that the main costs of the university is staff – the vast majority of whom have both teaching and research as part of their remit. However, at the same time staff are expected for the most part to fund their research activities by obtaining grants (as mentioned, small amounts of institutional funding for pump priming are available). At university, faculty and school levels, strategic decisions may be taken to invest in certain projects that relate specifically to research or to teaching. However, whilst strategic objectives for teaching and research exist at all levels, there is no formal separation in the budget, and thereby also no relation between the proportions of research and teaching income initially generated and consequent budget spend on each respective area.

### 6.4 History and judgement

This system of budget allocation was introduced at Bristol within the last ten years. Prior to that, there was direct allocation to the schools, so the critical site of allocation has in fact been elevated from school to faculty level. This has meant that the role of Deans of each faculty has expanded significantly, and, some time after the elevation, the human resources at faculty level were augmented: each of the faculties now has a faculty manager, who is appointed, rather than the Dean who changes every few years. Each faculty now also has a faculty team that reports to the finance division at university level, but is responsible for the faculty and based within the faculty.

The move was in part instigated in order to increase efficiency by drawing areas together (ie to aggregate schools into faculties), and simultaneously to create greater flexibility between schools.

However, an additional reason was to combat excessive siloing between schools and increasing the structural prospects for collaborations to take place. However, whilst the present system at Bristol appears to counteract dangers of siloing at the level of schools, it does little to overcome (and potentially even creates more) silo-effects between faculties, who are placed in direct competition. We discuss this and other effects in the next section.

## 7 Comments

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### 7.1 A compromise between data and strategy

Bristol's model creates an interesting juxtaposition between transparency and contestation: our interviewee noted that the use of income data as a benchmark sends clear signals that those faculties that 'earn' the money are accordingly rewarded for it. This is a clear system that is understood down to the level of schools and individuals, and in itself avoids conflict. However, by itself this system would self-evidently be too rigid and would leave little space for strategic considerations – at any level. Additionally, data-driven approaches were noted as resulting in over-analysis and perhaps excessive constant focus on monitoring data by all involved.

The diametric opposite approach would of course be a purely strategy-based, top-down approach, which would be in danger of causing conflict and consternation, with no evident relationship between performance and reward. Opting for this 'compromise', where income-driven performance-based allocation to faculties acts as an initial benchmark, and then considering strategic deviations from the resulting allocation data enables to some extent both incentivisation of faculties to perform, as well as space for strategy.

But any deviation from the data-based allocation benchmark is of course subject to contestation – there might well be winners and losers, faculties ending up with either more or less than what they 'earned'. This is a potentially problematic process, and one that needs to be carefully managed and negotiated. Our interviewee stressed the importance of what may be termed the human component of this process. Heads of faculty (Deans) play an important part here: consultation with the faculties when considering strategic deviation from allocation based on income data is critical here. More broadly, it was noted that whichever allocation model a university may choose, it always needs to involve a level of effective communication, and the process needs to be kept stable over long periods, firstly in order to manage and minimise adversarialism, and secondly to ensure faculties, schools and individuals can 'learn' the system and understand how to work in it and achieve optimal outcomes.

Nevertheless, a residual adversarialism of course remains in Bristol's system. A clear advantage of the system is that silo-effects are minimised at the level of schools: by aggregating budgets at faculty level, collaboration between schools in the same faculty is clearly incentivised. However, siloing plainly does occur at the level of faculties, who are effectively placed in direct competition. In very practical terms this means that, for instance, moderately inter-disciplinary activities (eg between sociology and anthropology, who are based in the same faculty) is made easier, whilst more radical cross-collaborations (eg sociology and neuroscience) is not. At this point, the university's strategy fund assumes its importance: this is often used precisely to stimulate cross-faculty activities from the level of university management, which is a critical tool in the absence of other budgetary incentives to collaborate.

### 7.2 Long-term planning: aggregation as insulation

In terms of long-term planning, Bristol's system once again has advantages and disadvantages. Overall, planning at Bristol tends to occur on a three-year cycle. Though this may appear to be relatively short-term, it needs to be noted that several parts of the UK HE system have been in considerable flux for some time: the allocation formula of the national research assessment system (REF, which distributes almost 100% of institutional funding) is subject to modifications; rates of tuition fees (the highest in Europe) have changed several times and continue to do so, including different rates for home/EU and overseas students; there have been continuous debates and changes

to the rules around visas for overseas students, affecting the attractiveness of the UK to overseas students overall. Individual schools and faculties at Bristol are of course proactive in terms of recruitment and research planning. However, by basing budget allocations on income streams that depend partially on external factors, individual schools are of course heavily exposed to the repercussions of these factors: reforms to UK laws around student visas will disproportionately affect those subjects that traditionally have a high intake of overseas students.

On the other hand, the aggregation to the faculty level mitigates against this exposure, at least in cases where external factors have an effect only on individual schools or disciplines: because budgets are allocated at the faculty level, disciplines with a low intake of overseas students might 'carry' others if visa-regulations are tightened; subjects affected negatively by changes to the REF's funding formula may be carried by beneficiaries of such changes. The exposure to uncertainty triggered by the income-based approach is thus partially mitigated by aggregation to the level of faculty.

### 7.3 Flexibility and incentives

More broadly, there seems to be a lot of scope for flexibility within faculties and within departments. As long as the allocation system is understood, schools are able to mix and match between the various income streams and collaborate as appropriate in order to optimise their income. It should be noted that individual schools' incomes also take into account factors such as inter-school teaching, where a student may be based in one school, but be taught courses in another.

But an additional point noting, however, is that the system can also dis-incentivise over-performance at the level of schools: if one school within a faculty out-performs, but all others do less well, the school in question is unlikely to gain much, as the overall faculty budget will not reflect that particular school's over-achievement. However, our interviewee noted that in exceptional cases, where over-performance is especially evident, the university may step in and take strategy-driven steps to ensure due rewards – likewise, the faculty level may also do so, but such steps are not inherent in the allocation system as such.

### 7.4 Summary

Bristol's system thus strikes several important balances: between transparent, formulaic and contested, strategic approaches; between siloing and aggregation; between exposure to, and insulation from outside influences. On all these dimensions, there are pros and cons, though ultimately Bristol's continuing status as a high-performing university speaks for itself. However, it is not an immediately 'simple' or transparent system, which adds weight to the need to keep it constant over time and communicate it clearly.

# Loughborough University

## 8 Internal budget distribution model at Loughborough University

### 8.1 The university

Loughborough University is located in the East Midlands of the UK. It received its Royal Charter in 1966 as the Loughborough University of Technology and was renamed Loughborough University in 1996. The university has 12,148 undergraduate and 3,458 postgraduate students, of which 2,406 are taught and 1,052 are research students (2014/15 figures). The university is organised into ten schools of varying sizes: some have several departments; others do not (Table 3).

Table 3 Schools and student numbers of Loughborough University (2014/15)

| Academic school  | Student population | %   |
|--|--------------------|-----|
| Aeronautical, Automotive, Chemical and Materials Engineering | 1,349              | 9%  |
| Business and Economics                                       | 2,341              | 17% |
| Civil and Building Engineering                               | 1,024              | 7%  |
| Design School  | 740                | 5%  |
| Electronic, Electrical and Systems Engineering               | 596                | 4%  |
| Mechanical and Manufacturing Engineering                     | 1,216              | 9%  |
| Science  | 1,851              | 13% |
| Social, Political and Geographical Sciences                  | 1,738              | 13% |
| Sport, Exercise and Health Sciences                          | 1,597              | 12% |
| Arts, English and Drama                                      | 1,280              | 9%  |

Loughborough conducts research across the spectrum of subject areas. However, it is particularly well known for its strengths in Business/Economics and Engineering. Sport Science is an additional area of particular strength.

In recent years, Loughborough has been something of a ‘rising star’ among UK universities, consistently performing well in research assessments, student satisfaction, as well as in the more composite league tables (eg Times Higher Education, Complete University Guide, etc). The university has undergone some expansion, notably and most recently through opening a new campus in London, on the main site of the 2012 Olympics.

### 8.2 The budget allocation model

Loughborough has a strongly top-down model for its budget allocation, which makes minimal use of metrics, but where the role, engagement and extent of oversight of the Provost are critical. Furthermore, there is a continuous measure to achieving efficiency savings, which are partially used to bolster a strategic fund for schools to bid in. Figure 5 summarises the main income and expenditure streams for the year 2013/14.



Figure 5 Main income and expenditure streams

| <i>Income</i>                       | <i>£M</i>     | <i>%</i>   |
|-------------------------------------|---------------|------------|
| Funding council grants              | 45.7          | 18         |
| Academic fees                       | 112.0         | 43         |
| Research grants and contracts       | 38.6          | 15         |
| Other Income                        | 64.2          | 25         |
| <b>Total</b>                        | <b>260.5</b>  | <b>100</b> |
| <i>(2012-13 Total</i>               | <i>244.9)</i> |            |
|                                     |               |            |
| <i>Expenditure</i>                  | <i>£M</i>     | <i>%</i>   |
| Academic departments and services   | 109.1         | 45         |
| Research grants and contracts       | 31.1          | 13         |
| Maintenance of premises             | 29.0          | 12         |
| Administration and central services | 28.2          | 12         |
| Other                               | 47.6          | 19         |
| <b>Total</b>                        | <b>245.0</b>  | <b>100</b> |
| <i>(2012-13 Total</i>               | <i>236.8)</i> |            |

Like other UK universities, the principal income streams of Loughborough – other than research grants – are tuition fees, a block grant from the Higher Education Funding Council of England (HEFCE) for teaching, quality-related research funding from HEFCE distributed by the research assessment system REF, as well as various other income sources (technology transfer / knowledge exchange, endowments, other quality-related funding eg from industry or charities, income from conferences and other activities). These income sources are all conflated into a single total income figure. Whilst income therefore comes through distinct research and teaching streams, this separation disappears completely at the level of allocation. The main cost across the university is staff salaries, which take up over half of the budget spend.

The money is allocated from university management to the ten schools. The benchmark is each school's budget from the previous year. However, each year between 1.5% and 2% is deducted, so each school is continuously forced to implement small efficiency savings, often around staff replacements, but they can come from other school costs as well. This is seen to manage inevitable needs for 'slimming down' and cutting out unproductive elements over time, avoiding sudden and widespread cuts.

Part of these efficiency savings, and part of the overall income, are set aside into a strategic fund, into which schools can then bid for strategic projects (these can range from hiring an extra person to

starting a large – eg several £100k or more – initiative.<sup>7</sup> The extent of the overall efficiency savings, and the amount that can be set aside for the strategic fund varies depending on the overall health of a year's performance: it may be very little, but it might also be up to the order of £4-5m.

Each school submits a budgeting plan for the year, detailing how its fixed costs will be met on the previous year's budget, minus the efficiency savings. However, the Provost examines these plans, and further scrutinises whether they are feasible, and whether there is any waste, any space for further savings, or indeed space for budget expansion in each school. Allocations are based on the Provost's judgement.

Additionally, schools formulate a short strategy every year, detailing not only how to manage efficiency savings, but also proposing strategic investments. These effectively are bids towards the strategic fund. Success of bids depends to a large extent on whether they relate to the university's overall strategic priorities. As with fixed costs, the Provost reviews the proposed strategic investment and grants or rejects these. For strategic investments, there is the capacity for several schools to cooperate, proposing eg facilities that several schools might make use of.

In reaching his judgements, the Provost has access to various metrics around student numbers, research income per school, and so on, and may draw on these to reach judgements, but there is no obligation to do this. The Provost has additional capability for oversight through quarterly reviews with each school, where progress and ability to meet budgetary demands are discussed. Furthermore, strategic investments can be proposed throughout the year, and decisions to grant them are made by the provost on a weekly basis.

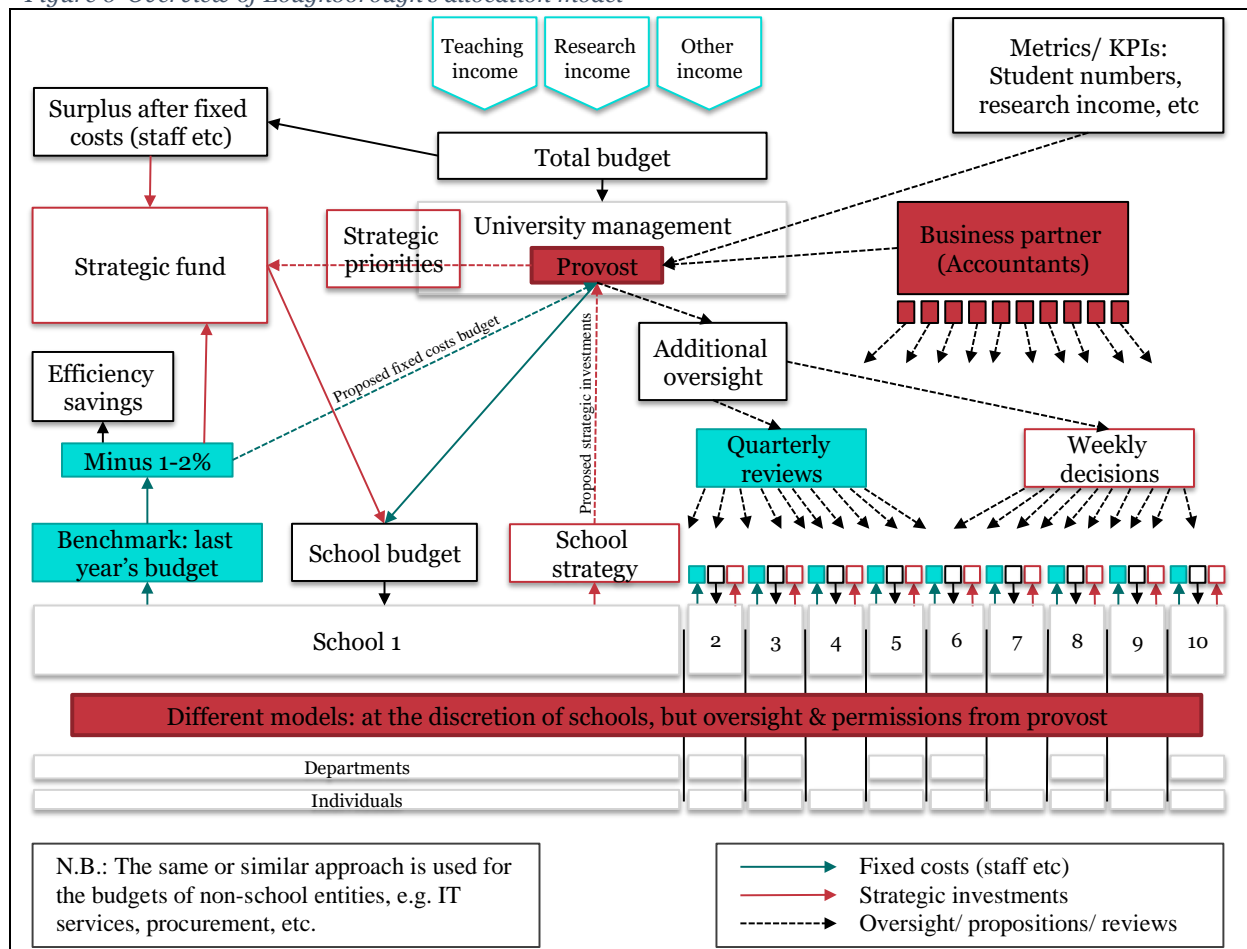
Our interviewees noted that a critical part to making this system work are the business partners: a team of accountants located at the university management level, but who also have dedicated members for each school. These help and advise each school how to manage and plan their budgets, but also advise and collaborate with the Provost.

At the lower level, each school has some discretion over how the budget is further distributed downwards. Our interviewees noted that there is considerable variation at this level; not least because the schools are of different sizes and organisational structures – some are comprised of several departments, others are not. However, even at the sub-school level, the role of the Provost has direct influence, as any new investments, and even replacements need to be authorised from above. This means that, for instance, if a member of staff at a particular school leaves (eg retires), the school cannot automatically fill that position like-for-like, but needs to seek approval first from the Provost.

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<sup>7</sup> The new London campus was financed through this mechanism.

Figure 6 Overview of Loughborough's allocation model



### 8.3 History and judgement

Loughborough's model has only existed for a relatively short period of time: it has been in place since around 2012, when the university was re-organised into the current structure of ten schools. Prior to this, it comprised of three colleges: Science, Engineering, and Social Sciences and Humanities. Our interviewees had not been at the institution long enough to be able to comment on why this change was undertaken, or how different the allocation model was before that time. However, they were fairly confident that the change was not directly tied to budget allocation models, and likely reflected wider strategic needs for re-organisation. A point worth making here is that in a top-down model of the kind used by Loughborough, the number of units (schools/colleges) to which budgets are allocated does have some significance; if there are too many, the multiples of organisational work can become too burdensome and proper oversight lost. However, with too few, and especially larger entities, schools may become able in their own right to take independent strategic directions, and control is lost.

## 9 Comments

Overall, Loughborough's model needs to be viewed in the context of the fact that the university has been doing extremely well in recent years. Whilst direct causal attribution to this model is not immediately possible, the strong performances have certainly occurred in an institution strongly structured by it. Nevertheless, there are several important discussion points, advantages and dangers that need to be considered.

### 9.1 The role of the Provost: too much power, too much responsibility?

Self-evidently, Loughborough's system relies to a very large extent on the Provost. A single person is given significant responsibility and power of judgement. This has a number of implications. Firstly, it means that whoever occupies the position of Provost needs to have many important qualities: openness to debate and reason are critical, so as not to appear autocratic and antagonising schools and individuals; secondly, oversight and a thorough understanding of university strategy is essential, as well as the ability to relate a range of different plans in a range of different schools to a range of different strategic priorities, and to each other. Additionally, the Provost's workload as such appears to be formidable: the allocation process itself, plus quarterly reviews for each school as well as weekly decision-making on further strategic matters appears likely to stretch capacity.

Our interviewees noted the critical importance of the support unit of accountants (the 'business partner') in this context, and that without these, many elements of the allocation system at Loughborough would become extremely difficult. At the top level, it is evident that these individuals provide extensive and important accounting work to assist the provost in taking decisions and coordinating what is effectively the entirety of the university's financial affairs. In this sense, the responsibility of the Provost is currently sufficiently supported to ensure a functioning system.

There was a general sense that the current Provost fulfils the kinds of criteria noted above. As mentioned, Loughborough's success in recent years also speaks for itself. However, the system has only been in place for four years (the extent of difference before that is unclear) and, given the power, responsibility and centrality of this single individual, there appears to be a question around whether the system would continue to remain as functional as it is now, if a different individual were to occupy this post in the future. Put simply: much of Loughborough's system relies on the personal characteristics of one specific individual in a key role. Inevitably, this presents a potential risk.

### 9.2 Incentives: a business approach

The absence of direct use of performance indicators, or any kind of immediate performance reward means that there is no immediately obvious system of incentives built into Loughborough's budget allocation approach. For individuals, our interviewees noted that there are things like merit awards, but these are not part of the budget allocation system. At this level, certain incentives therefore exist, though only in relatively exceptional circumstances. But at department or school level, or indeed at individual levels for the most part, good performance in itself will not necessarily guarantee rewards. However, emphasising again the critical role of the Provost, there is a general perception that the Provost's judgement will likely identify areas of high performance and promise, and is likely to allocate budget to these accordingly.

Direct incentive management appears to be based on the fact that failure to present a clear and transparent budget, to work in accordance with that budget and implement the required efficiency saving is likely to result in adverse career consequences. At the same time, it is understood that if strategic ideas reflect the university strategy, there is a stronger likelihood of success in securing extra funds.

Our interviewees noted that this is effectively a system of incentives, but does not so much reflect a metrics-driven incentives system characteristic of many universities, but more of a business-model of incentives, where failure to perform adequately results in sanction, while contribution to strategic aims may result in reward.

### 9.3 Ability to plan and grow

A key strength in Loughborough's system clearly lies in the capacity for long-term planning and overall efficiency and financial health. The strategic fund in itself is perhaps a relatively common occurrence, but the constant onus on schools to achieve efficiency savings, and tying these where possible to growing the strategic funds available to all, makes significant amounts available for strategic investment. The extent of the Provost's discretion additionally means that investments can certainly be made with a long-term perspective in mind: it is telling in this sense that the new London campus was

financed through these means. The Provost's discretion also means that smaller, mid-year suggestions can be turned around quickly: the system of weekly decisions means that if a school suggests a small investment, decisions do not take long and particularly where the situation is such that a quick decision is important, Loughborough's system is well-suited to provide the required speed.

In addition to this, there appears to be a relatively non-adversarial relationship between schools: it is possible for schools to bid for joint initiatives (however large or small), and where several schools can see a self-interest, such joint bidding does occur. Though school's self-interest is the driver of proposed projects, the barriers between schools are not absolute.

Meanwhile, the constant emphasis on efficiency savings may present a challenge to schools, but has prevented costs from spiralling, and also managed necessary cuts over time rather than inducing shocks to the system. This process is seen to have put the university on overall secure and positive financial footing, which is necessary to be able to make long-term strategic investments. Once again, the presence and availability of qualified accountants (one per school as well as a central team) is important here to ensure that schools are able to carry out this task of budget planning and making efficiency savings with the least possible amount of sacrifice.

# Paris-Sud University

## 10 Internal budget distribution model at Paris-Sud University

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### 10.1 The university

Paris-Sud University was created in the beginning of the 1970's. Paris-Sud is a research intensive multi-disciplinary university with a strong focus on science (the Science faculty accounts for about 45% of all university resources, staff, students, etc.). Paris-Sud offers BA, Masters and PhDs as well technological training & life-long learning. The university is organised in nine components of which five are faculties<sup>8</sup>, one an engineering school (Polytech Paris-Sud), and three are technology institutes. Paris-Sud trains more than 30,000 students a year of which 2,600 are PhD candidates. It has 2,800 teachers and researchers (2014–2015). The university has 78 research units; most of them are a mix of research units and public research organisations such as CNRS, INSERM, or CEA. Paris-Sud is renowned for the quality of research, especially in physics (two Nobel prizes) and mathematics (Medal Fields). A special characteristic of Paris-Sud is that it is located around eight campuses in the south of Paris.

Since 2014, Paris-Sud is a founding member of the Paris-Saclay University<sup>9</sup>, a large project with the objective to account for 20% of French research by 2020.

### 10.2 Budget allocation model

The budget allocation model is rather incremental due to the historical preeminent governance of the Ministry for Higher Education and Research in the university management and specifically in the management of human resources. There are attempts to develop performance-based budgeting but the university's room for manoeuvre is still limited.

#### 10.2.1 Budget breakdown

Legally the university has three budgets: the principal budget (95%), the technology transfer office budget and the University Foundation budget (5% altogether). The funding coming from public sources is found in the principal budget.

The overall university income is approximately €400m (2016): the public funding streams are coming from the state endowment for public service provision<sup>10</sup>, the State Region Plan Contract (CPER, pluriennial contract), The Investment for the Future Programme (PIA), the Campus Operation<sup>11</sup>, and the National Agency for Research (ANR) for research grants. The income is split into two categories (see Figure 7):

- The global budget (77% of the total income) which is a common pot, out of which 68% comes from the general state endowment for public service provision and 9% from the university's own resources (private sources by definition: tuition fees, revenues from life-long learning, the training tax<sup>12</sup>, private research contracts and revenues from valorisation).

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<sup>8</sup> Jean Monnet Faculty (Law, Economics and Management), Medicine Faculty, Pharmacy Faculty, Orsay Science Faculty, Sports Faculty.

<sup>9</sup> Paris-Saclay University gathers 18 members; two universities, 11 schools, 6 PROs and one competitiveness cluster.

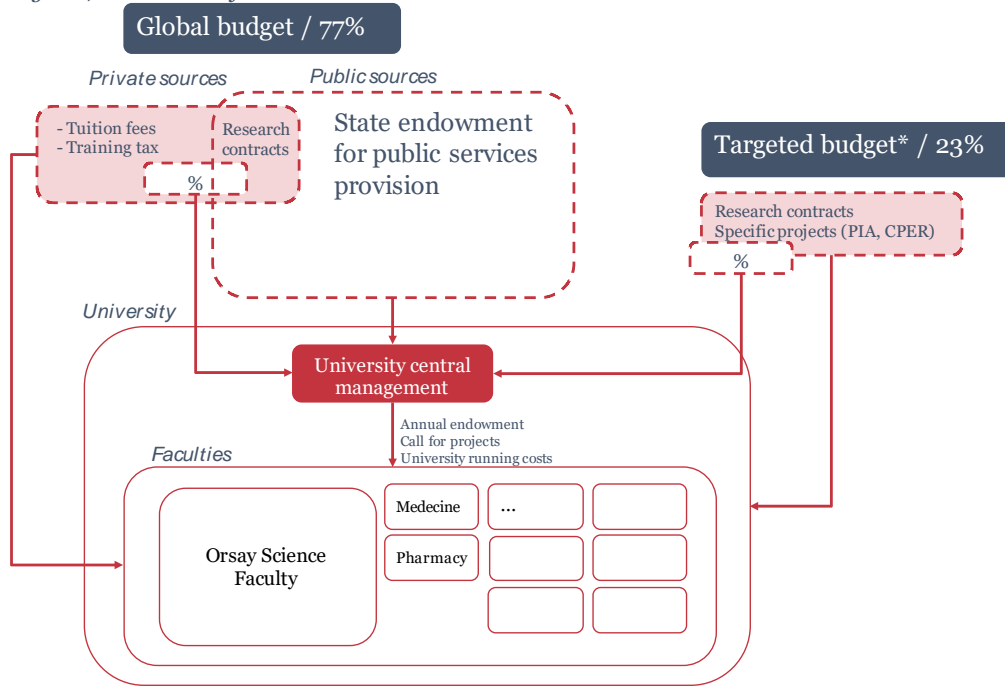
<sup>10</sup> 'Donation globale pour charge de service public'

<sup>11</sup> Starting in 2008. The Campus Operation is an investment in selected universities of excellence aimed at strengthening the attractiveness and visibility of French universities.

<sup>12</sup> French firms have to pay a training tax, the objective of which is to develop vocational and technological training.

- The targeted budget<sup>13</sup> (23% of the total income): all income streams targeted at a specific activity (mostly investment in buildings, or public research contracts with the National Research Agency, etc.). The university has no room for manoeuvre regarding this funding stream as it already targets pre-defined activities.

Figure 7 Overview of Paris-Sud's allocation model



\* The financing institution decides on the allocation of funds

### 10.2.2 The management of the human resources budget

The overall university room for manoeuvre in terms of decision making with regard to the global budget has dramatically changed since 2010.<sup>14</sup> Since this year, the Ministry for Higher Education and Research does no longer directly fund the universities' staff (teachers, researchers and administrative staff with the status of civil servants). The consequence is that the universities are now in much more control of managing their human resources. The university president and board define the staff missions, the payroll policy, and the creation of or reshuffling of positions within the university. The university has however a maximum number of 'positions' permitted and cannot hire more than the authorised maximum. In parallel to this maximum number of positions, the university receives an annual 'financial envelop' to pay for these positions (included in the state endowment for public service provision).

For most universities, it has been (and still is) a challenge to develop strategic management of their staff including a correct numbering of staff and a precise forecasting on costs according to career trajectories (and costs incurred). This is also a critical issue at Paris-Sud where 89% of the state endowment for public service provision (68% of the total budget) is devoted to the payment of permanent staff (teacher-researchers and administrative personnel with the civil servant status).<sup>15</sup>

<sup>13</sup> 'Budget fléché'

<sup>14</sup> 2007 Law on Freedom and accountability of universities, *Responsabilités et Compétences Elargies* (RCE)

<sup>15</sup> This percentage is equivalent at other French universities. The university can also recruit people on fixed term positions.

The university develops step by step a thinking in terms of total payroll rather than in terms of numbers of positions, as it used to do it when the ministry was managing the payroll. Paris-Sud has for instance taken action in terms of staff reshuffling (5 positions were reallocated between faculties within an overall movement of 40 reorganised positions) based on various criteria such as the overall weight of faculties but also with relative student/staff ratio according to disciplines. The objective is to be more and more strategic and to allow for the creation of new positions based on scientific projects and not according to an automatic continuation of the positions, as it used to be.

After 2010, the university has also sought to reorganise its human resources structure in order to decrease the proportion of less qualified administrative staff.<sup>16</sup> The room for manoeuvre is still much larger regarding fixed term contract staff than permanent staff.

### 10.2.3 Internal allocation of public funds

The impact of the university's central strategic decisions is limited by the overall volume of funds that the university can directly and freely handle. Once the permanent staff is paid for (88% of total state endowment), about €35m remains for the university's running costs and specific actions. The €35m is coming i) from the state endowment for public services provision, ii) from a 'tax' that the university is collecting from all public research contracts (14% of which half is directed to the university TTO activities and the other half is at the university management's disposal and is not targeted).

The €35m is split into two approximately equal parts:

- Mandatory expenses corresponding to all expenses allowing for hosting students and researchers such as fluids, surveillance, catering etc. All running costs on campuses and outside buildings are centrally managed by a central direction at university level (used to be managed at faculty level).
- Other expenses split between research / training and steering and horizontal actions
- Research (about 40%):
  - The university is allocating recurring funding to its laboratories, every year, with the objective to provide the same amount over the whole duration of the state-university pluriennial contract (4 to 5 years). This recurring amount is defined mainly based on the number of staff
  - The university is funding patent protection and patent maintaining costs (€300k/year)
  - Projects labelled 'mutualised research', to cover means (€700k every two years) and other research equipment (€400k every year)
- Training (about 50%):
  - The university is not managing the global budget for training. It however provides a limited amount of financing for overtime (*heures complémentaires*)
  - The university manages a pedagogic call for project (€500k for pedagogic equipment)
- Steering and horizontal actions (about 10%) such as:
  - Digital resources
  - Steering and reorganisation
  - Library, documentation (periodic/journals)

### 10.2.4 Internal allocation mechanism between the universities and Faculties / components

The allocation mechanism is rather incremental with a 'budgetary conference' at the beginning of September with the university president team and each of the nine university components. The bulk endowment based on the previous year (*budget socle*) is discussed according to a process called 'management dialogue' (*dialogue de gestion*). This management dialogue is quite new to the

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<sup>16</sup> Administrative staff is ranked in categories A, B, and C.



university. Before 2009, the university director of services (administrative counterpart to the university president) used to allocate the funding directly.

#### *10.2.5 At the faculty level*

Each of the nine components at the university has its own internal budget allocation model which is more or less centralised. Historically, faculties enjoy a great deal of autonomy. For instance, each faculty collects and spends the tuition fees (€7m as a whole in 2016) according to its own priorities. The other revenues that faculties have, such as revenues from life-long learning and the training tax, are also at the faculty's disposal. However, the university charges overhead on these revenues (from 5% on the training tax to 6% on the tuition fees) in order to finance the university's running costs.

## 11 Comments

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The overall budgetary context has been evolving rapidly and strongly the last years. Still, even if the university has some strategic capacities, they are relatively limited.

The relatively limited freedom that the university has regarding its internal budget allocation is in part an effect of the limited resources it has for strategic allocations (today 6-7% of the budget). One challenge is to increase the university's own 'non-earmarked' resources in order to be able to act more strategic. At the same time, Paris-Sud is engaged in a large joint project (IDEX Paris-Saclay) where the philosophy is to share more and more financial means to develop shared activities (there are already common doctoral schools at the Paris-Saclay level). This ties up much available resources.

The current model provides a medium term planning horizon with respect to the five year contract established with the state. The model's limitation is the human resources management constraint. Moreover, the Paris-Sud staff is quite young (on average about 40 years old) which is considered a demographic time bomb. With increasing wages and stable endowment from the state in terms of payroll, there is a strong risk in seeing the human resources budget representing a larger share of the overall budget. This could damage the university's ambition of increasing the strategic share of the budget.

Collaboration across academic and other organisational units is sought in particular with the call for projects MRM and ERM (even though it can be intra-disciplinary).

An important issue is the allocation of recurring funds to laboratories. The allocation of these funds used to take into account the evaluation results of laboratories performed by the National Evaluation of Research and Higher Education Agency (AERES). The evaluation reports used to provide a type of grading (A, B, C, D) on various aspects of the laboratories activities. Paris-Sud used these evaluations as a basis for the allocation of funds, which was at the time more geared towards performance-based funding. With the substitution of the High Council for the Evaluation of Research and Higher Education (HCERES) to the AERES in 2013, the evaluation is today only qualitative and is difficult for the university to use as a performance-based tool. As a result, the allocation of recurring funds is now only based on the weight of the laboratories. The university favoured the previous solution but has no resources for developing an internal evaluation system to replace the national one. This circumstance leads even further away from a flexible and strategically dynamic allocation system.

To conclude, while the university (but also other French universities) is working on developing monitoring and steering tools and seek more relevant information systems in order to increase its overall strategic capacities, its possibilities for acting freely and strategically is limited.

# Technische Universität Berlin

## 12 Internal budget distribution model at TU Berlin

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### 12.1 The university

Technische Universität Berlin, known as TU Berlin or Technical University of Berlin, was founded in 1879. As one of the most prestigious research and education institutions in Germany, it has the highest proportion of foreign students out of all universities in Germany, with 18.1% of 32,752 students in the winter semester 2014/15. TU Berlin is organised in seven faculties (Humanities; Mathematics and Natural Sciences; Process Sciences and Engineering; Electrical Engineering and Computer Science; Mechanical Engineering and Transport Systems; Planning – Building – Environment; Economics and Management), and a satellite campus (El Gouna) in Egypt that is operated as a scientific and academic field office.

The establishment of large research groups (*Forschungsverbände*) by the Excellence Initiative, the German Research Foundation, and the European Institute of Innovation and Technology, in conjunction with a steady increase in external funding for research projects exemplify the dynamic development of TU Berlin's high quality research profile. Furthermore, TU Berlin's high score in national and European rankings is underpinned by numerous prestigious prizes and awards. These include Alexander von Humboldt Professorships, Einstein Professorships, the Gottfried Wilhelm Leibniz Prize, and numerous Grants of the European Research Council.

### 12.2 The budget allocation model

The governance regime of the German university system has changed from a "self-management model" to a "management model". As part of this development, it was expected that the performance of universities be improved, both in research and in teaching. An effective allocation of funds must take into account the range of topics as well as the specifics of the different subjects with regard to the provision of services and financing needs. The model of the performance-based allocation of funds can be based on two possible approaches. Firstly, the allocation of funds can be linked to performative success, whereby a high degree of quantitative comparability is possible. On the other hand, target arrangements can be made.

The TU Berlin has developed an internal model for the allocation of funds that is operated at the level of the faculties. The model is based on a set of differently weighted indicators (Figure 8). While the basic funding for professorships is allocated centrally by the President's office, the direct control over the performance-related allocation of funding is devolved to the faculties. Each of the seven faculties has the discretion as to which extent specific areas will receive performance-related funding. While the funding of chairs, which constitute the back-bone of the TU Berlin in all areas of research, is allocated on a needs basis, the specific area research is to a high extent financed through external funding.

Overall, the model rests on the devolution of control over decisions down to the level of the faculties. In the case of the TU Berlin, this is not conducive to an atmosphere of adversarialism between the faculties or individual research groups. In effect, the amount to be allocated on the basis of performance-related criteria is split between the three categories teaching, research / young researchers development, and equality. However, the performance-related share in the allocated budget is relatively small.

Figure 8: TU Berlin – Weighted criteria of the performance-oriented model of budget allocation

| Coverage Part     | Criteria  | Weighting |
|-------------------|---|-----------|
|                   | Degree of Capacity Utilisation  | 30%       |
|                   | Acchievment: Number of alumni   | 30%       |
| Teaching (50%)    | Regular study time: Number of graduates within the regular study time +2 / total number of alumni   | 30%       |
|                   | Internationality: Number of foreign students / total number of students   | 10%       |
|                   | Third-party funds: Third-party funds per scientific employee  | 10%       |
|                   | Publications: Number of published books, articles in research papers, monographies and lectures per scientific employee   | 33%       |
| Research (45%)    | Internationality: Number of the Alex-Humboldt-Scholarship Holders and Awardees, number of stays of researchers of the TU Berlin in foreign Universities, numbers of foreign researchers staying at the TU Berlin per scientific employee. | 16%       |
|                   | Scientific Work: Number of Ph.D. graduates, architecture competitions, postdoctoral research qualifications (Habilitation) and number of tributes/appraisals per scientific employee  | 16,30%    |
|                   | Scientific Organisation: Number of organised conferences, consultant activities, publisher activities and scientific advanced training per scientific employee  | 16,30%    |
| Equalization (5%) | Share of women in the number of alumni  | 20,00%    |
|                   | Share of women in Ph.D.   | 20%       |
|                   | Share of women in Professorships  | 20%       |
|                   | Share of women in appointments for new professorships   | 40%       |

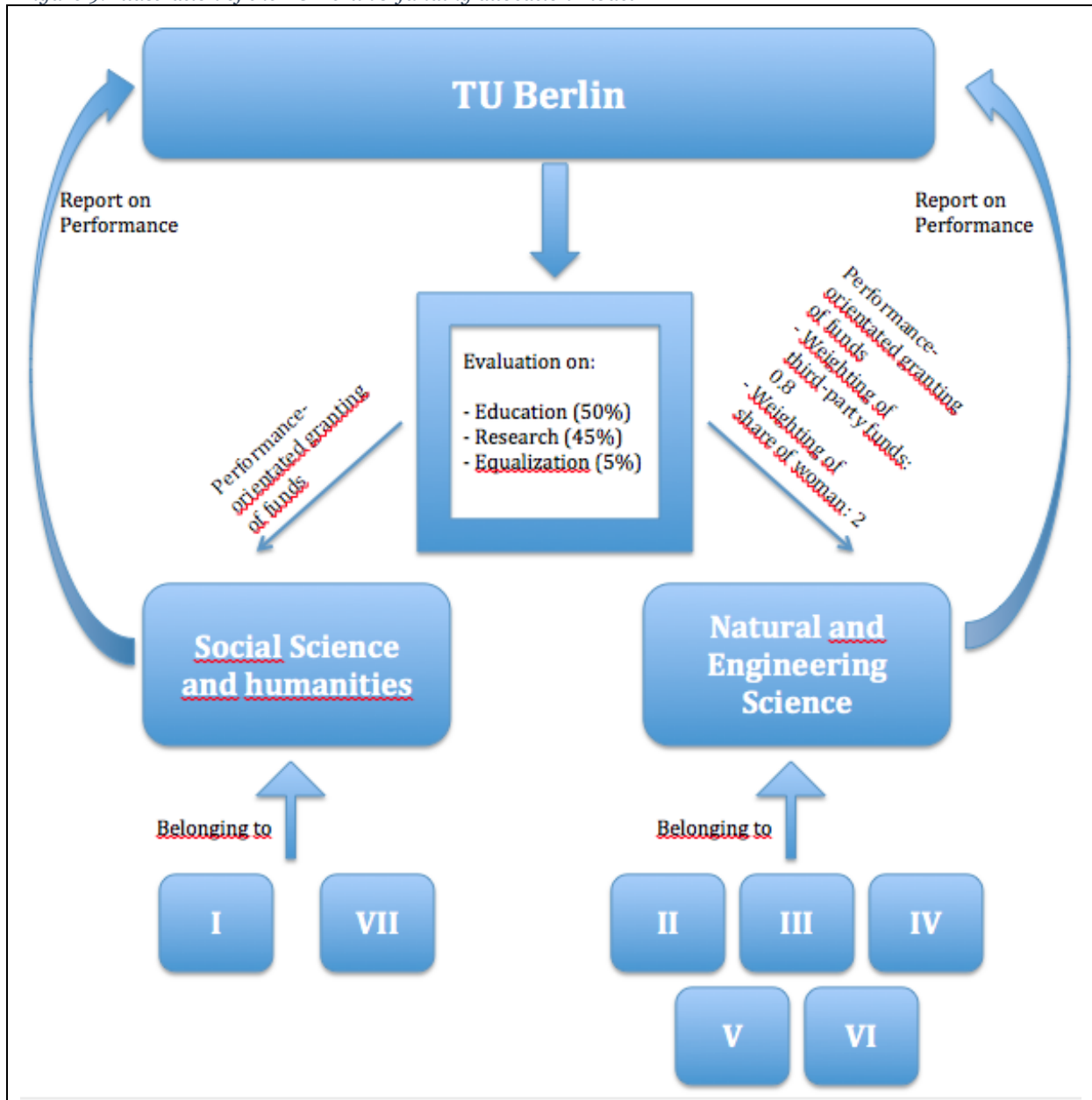
Source: Evaluation der leistungsbezogenen Mittelvergabe an den Berliner Hochschulen (2009)

### 12.3 Research and teaching

An important prerequisite for the budget allocation is the definition and measurement of various indicators. A distinction is made between performance-oriented indicators and indicators that are independent from performance. The performance-independent indicators are fixed values, such as personnel (scientific and non-scientific), the general basic equipment (infrastructure, equipment, etc.) and individual parameters of the university. Performance-based indicators relate to the areas of teaching, research and policy or internal university objectives. In the area of teaching, this is captured by statistical data on the number of students, the number of graduates and passed final examinations done in relation to the enrolled students. In the field of research, the common indicators are the amount of third-party funds, the number of doctorates and the number of publications. TU Berlin's

internal objectives of resource allocation are, for example, issues of equality and internationalisation. Among the three areas (research, teaching, equality), teaching is weighted most heavily. Figure 9 shows the funding model.

Figure 9: Illustration of the TU Berlin's funding allocation model



### 13 Comments

Performance-related criteria and indicators are generally used to achieve or enhance certain control effects (e.g. the promotion of gender equality), provide an incentive scheme, or generate a performance assessment mechanism. Until 10 years ago, TU Berlin still had target agreements, which were meant to fulfil this threefold strategic purpose. However, since the formulation of target agreements was based on negotiations between the faculties and the President's Office, it strongly followed a bottom-up

principle. Since the target agreements provided no significant strategic tool for strategic performance planning, they have been considered as overhauled and were abolished some years ago.

An important feature of the model of internal budget allocation in place at TU Berlin is that it does not provoke any debates about issues of distributive justice across the disciplinary boundaries. This is partly due to the fact that the incentives provided through the model reward only outstanding achievements by applying the same parameters to all disciplines.

TU Berlin's model provides a good example of how a performance-oriented scheme of budget allocation is not necessarily conducive to polarising different disciplines. The interviewee confirmed that it is safe to assume that this is in part due to the strong position of the central administration and the strong position of the faculties.

On the whole, the model fits well in the relatively consensus-based governance of TU Berlin, which is not following a pure top-down approach in applying performance-oriented criteria through the budget allocation.

## 14 Concluding reflections

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It has been more difficult to persuade universities to participate in the study than anticipated, not so much in Sweden, but in the other countries. A couple of other universities than the ones initially approached have been included in the study. A few other universities felt certain reluctance to participate but in the end agreed to do so. In one case, NTNU had to assist us which was most helpful and crucial in order to get in touch with one university. The information we got from that case was still limited. These circumstances have had an impact on our ability to describe and analyse the respective funding models.

NTNU has asked how an ideal type of budget model would look like. Which kind of model that is the preferred one – the ideal one – at a given institution, depends on many complex and intertwined circumstances. Just to mention the obvious ones: the size of the institution, its history, its internal organisation, the national budget model for higher education institutions, national academic culture, internal academic culture...

The six case studies show a range of alternative internal budget distribution models. Some of them, and some features in them, may be of more relevance to NTNU than others. The cases point towards a few fundamental types of budget models. One is based on performance contracts between the university and the ministry. Such contracts can contain set targets regarding results and performance both for research and education, and for other operations at the university as well. Another type is a clear results or performance oriented model, where a very large proportion of the funding is distributed according to performance-based criteria. In such a model, it is important that the indicators that are used to assess the performance cover all kinds of operations that occur at a university; research, education, collaboration, utilisation, etc. They need to be transparent, and recognised and accepted by the staff. A third type of model is a combination of base funding, performance-based funding, and strategic funding. The relation between these three components and other details can differ, but all components need to be reasonably large.

Discussions regarding a new model at NTNU ought to be, not only about the ideal type, but also about balances and organisational levels. Essentially all models in our case studies (in part with the exception of Paris-Sud) contain a combination of base funding, performance-based funding, and what we call strategic funding, that can be allocated beside the two other streams. It seems reasonable that NTNU applies a model that contains these parts, and further investigates what balances are optimal for the university. Given the fact that the governmental appropriations are relatively large, it seems important for a university with the ambitions that NTNU has, to arrange for a sufficiently large component of performance-based distribution within the institution. Good results should be rewarded, through the organisation.

The ten schools at KTH, with departments and units within the schools, show similarities with the organisation at NTNU. KTH applies a relatively clear distribution of base funding, performance-based funding (based on performance in both research and education), and a substantial proportion of strategic funding. This creates both stability and predictability for schools and departments, and a climate where good achievements – performance – are indeed awarded. The strategic funding provides the schools and in part the departments with freedom to choose independently where to put extra resources.

Chalmers' new model should also be of high relevance. To begin with, the idea to implement it step by step during six years' time could perhaps be interesting for NTNU to look into. There may be voices at NTNU, at the different campuses, who would like organisational changes to come slowly (six years will probably be too long though). We interpret Chalmers' model as an attempt to create substantial predictable and almost guaranteed funding at individual level of around 75% of the costs, while at the same time create a strong performance-based system. A difference between KTH and Chalmers is that Chalmers applies utilisation as one part of the performance-based indicators for research. This may be of particular interest and importance to those parts of NTNU that used to be colleges before the merger. Their strength lies not least in well-established links with the local business sector. Another

reason for including a utilisation indicator is that the ministry in Norway has decided to include a utilisation component in the national funding model. It will thus be important for the university to perform well in this respect. Chalmers' model is possibly more complex than KTH's, but there are features in it that ought to be of strong interest for NTNU to further explore.

An alternative performance-based system is found at the University of Bristol. The university has the same three levels as NTNU and primarily distributes funding based on performance, but in Bristol's case, the performance is measured as the level of income on the lowest level of the organisation (called schools at Bristol). It is thus really an economic results-based funding system, where those who create income are rewarded for it. However, the income is aggregated to the next level (faculties). The performance of individual schools is thus not directly measured as a base for the future funding of the schools. The central management distributes funding to the faculties, depending on the aggregated income level of the respective faculty. The faculty in turn distributes the funding onwards to schools, but at their own discretion.

Loughborough also allocates funding from the central level depending on income on lower levels. There are two peculiar features of Loughborough's model: First, there is no obligation to make use of any metrics when deciding on the allocation. The Provost who is ultimately responsible for the allocation may use various available metrics, but is not obliged to do so. Secondly, the benchmark for funding is each school's budget from the previous year, but each year between 1.5% and 2% is deducted, so each school is continuously forced to implement small efficiency savings. The savings are put into a strategic fund, from which the schools can bid for extra allocations for special investments of various kinds.

The French case is (still) highly centralised and less flexible, and with limited room for manoeuvre for the university, both on top management level and at lower levels in the organisation. There is some strategic funding, but it is of limited proportion and also comes with limited possibility to use as the institution itself wishes. The system allows for both transparency and reasonable planning horizon, but as it relies on contracts with the ministry, which could change for the next contract period, it does not allow for long term stability.

The two British cases appear as highly results-oriented, perhaps more so than what seems reasonable and applicable in a Norwegian or Scandinavian context. Nor are we convinced that automatic annual deductions of the budget on department level would be possible to implement at NTNU. The arrangement at Loughborough, with a single individual (the Provost) who has ultimate power over the allocation of funding to all schools at the university, is perhaps also something that the collegial community at NTNU would find hard to swallow. Possibly different management cultures matter here; the British style may be more managerial and at least in part more authoritative than the Norwegian one. At the same time, the solution at Loughborough seems highly efficient and the Provost is supported by administrators with accountant skills. There can very well be features and details in Loughborough's model that are interesting to NTNU.

The six cases in this study provide ground for suggesting that there are a few choices that need to be made regarding a new budget distribution model. It is to us quite clear that a distribution model primarily consists of 1) a stream of base funding, which builds on size one way or the other, like FTEs, number of students, or similar; and 2) a stream of performance-based funding; and 3) a stream of strategic funding for particular purposes and prioritised investments. The first choice is which proportions these three main streams should have. As already said, NTNU is encouraged to implement a reasonably large performance-based component, as a balance to the otherwise relatively large block grant resulting from the performance contract with the ministry.

Another choice is how the performance-based indicators should be selected and compiled. Here, NTNU would probably benefit from including utilisation as one indicator. In addition, one or two bibliometric indicators is more or less taken for granted, not least given the excellent bibliometric data and analytic capacity that are available to Norwegian institutions.

Yet another choice is whether the distribution model should be copied also from faculty to department level, or if it should only apply from central level to faculties. TU Berlin provides an interesting mirror

in this respect, as its model in practice only distributes funding from the faculties to lower levels at the university, and mostly funding to specific areas of research. The professorial chairs are funded through base funding on a needs basis from central level, and the funding of the teaching is included in this stream. The actual re-distribution of funding and the strategic distribution, is thus devolved to faculty level.

NTNU's organisation has three levels; the central level, the faculty level, and the department level. In order to in fact create a model with impact on the performance on individual level, performance-based distribution of funding should not only be made from central level to the faculties, but also further down in the organisation, to departments, and eventually to research groups and individuals. However, this does not necessarily mean that exactly the same distribution model ought to be applied through the whole organisation.

On a broad level, the time periods for assessing performance should be set. We have seen how annual periods may result in unintended large changes from year to year, with potential negative impact. Chalmers for instance uses different periods of a few years (3-5), depending on which type of performance indicator and internal distribution stream we speak of.

Last, in the points referred to in the introduction, NTNU's room for manoeuvre and collaboration cross the units at the university is emphasised. These ambitions, which a new budget distribution model should support, most likely call for a relatively large proportion of strategic funding, to be distributed to the faculties, for further distribution to selected prioritised activities and areas. A certain amount should also to be kept at central level for specific investments and special allocation at the discretion of the top management.





Faugert & Co Utvärdering AB  
Skeppargatan 27, 1 tr.  
114 52 Stockholm Sweden  
T +46 8 55 11 81 00  
E [info@faugert.se](mailto:info@faugert.se)  
[www.faugert.se](http://www.faugert.se)  
[www.technopolis-group.com](http://www.technopolis-group.com)