

Financially Sustainable Universities

Full Costing: Progress and Practice

Thomas Estermann and Anna-Lena Claeys-Kulik

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Foreword



Following its first study on the topic ‘Financially Sustainable Universities – Towards full costing in European universities’, this report is another milestone in EUA’s work on financial sustainability, in particular, the development of full costing. EUA has since then carried out a variety of studies and held many events which also contributed to a better understanding of the current funding challenges for universities.

Following a growing awareness that full costing is an important tool to address these funding challenges and an increased demand for relevant expertise and assistance, EUA began to coordinate the EUIMA cooperation initiative (‘European Universities Implementing their Modernisation Agenda’).

One part of this project aimed to support the exchange of experience and expertise in the implementation of full costing across Europe, and to foster the coordinated development of full costing at institutional and system level. The high number of participants, about 1000 in 11 events in 10 countries across Europe, reflects the high level of interest in this topic.

The evidence from the EUIMA project has brought further substantial insight into the work EUA has developed on financial sustainability. This report, bringing together data from the EUIMA project and previous EUA work reveals the considerable progress that has been made in the implementation of full costing in European universities in recent years. It nevertheless shows that further activities and support are crucial to continue the progress already made.

It is hoped that the experiences and good practice documented in the present report can inspire more European universities to start or continue the development of full costing in their institutions.

The analysis also confirms again the importance of support from funders and governments. The country profiles show that funding rules are an important driver to foster the implementation of full costing. National and European public funders should for that reason accept cost claims and reimbursement based on full costing methodologies.

EUA, for its part, will continue its work on the topic of financial sustainability and further analyse current and future developments to illustrate good practice. The next project will take a look at strategies for efficient funding of higher education in Europe and analyse specifically performance-based funding mechanisms, excellence schemes, mergers and concentration measures.

Finally, I would like to thank all contributors to this report for their expertise and commitment.

A handwritten signature in blue ink that reads 'Maria Helena Nazaré'. The signature is fluid and cursive, with a horizontal line underlining the name.

Maria Helena Nazaré
President
European University Association

Acknowledgements

This report is bringing together evidence from a variety of different projects and activities. The EUIMA project yielded a wealth of information on the current state of the implementation of full costing and good practice examples from universities across Europe. Previous work on full costing and related topics, undertaken in the context of EUA's first study on full costing (2008), the EUDIS project (2011) and the continuous monitoring of the impact of the financial crisis on higher education has also fed into the analysis. This report mainly aims to assist university practitioners and EUA members in implementing full costing but will also be of value for policy makers and funding bodies to receive relevant and up-to-date information on the topic of full costing.

EUA is deeply grateful to the many contributors (see list in the annex) who provided essential information for the report either through specific case studies or information on the development of full costing in their respective countries. Their knowledge and experience has brought essential information for this report, in particular on the more technical issues of full costing.

The two senior advisers to the EUIMA project, Pierre Espinasse and Camilla Österberg-Dobson, provided expertise throughout the EUIMA project and also contributed to the writing of this report.

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Finally, thanks are due to Lesley Wilson and John Smith who provided critical feedback on the report.

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Thomas Estermann

Head of Unit, EUA

Definitions

Activity-based costing (ABC):	A special costing methodology that identifies activities in an organisation and uses multiple cost drivers to assign indirect costs to these activities.
Cameralistic accounting:	Single-entry bookkeeping, traditionally used accounting method in public administration in Germany and still obligatory for universities in some German states today.
Co-funding:	Funding for which the main funder requires the beneficiary institution to raise a proportional amount of the full cost of the activity or project being funded, from its own budget or another public or private source.
Cost:	The monetary value of resources used or liabilities incurred to perform an activity or service.
Cost driver:	Any factor that causes a change in the cost of an activity resulting in the activity consuming fewer or greater amounts of resources.
Cost object:	A fixed-cost component of total costs (e.g. labour or material).
Direct cost:	A cost directly attributable to an activity.
Full costing:	The ability to identify and calculate all the direct and indirect costs per activity and/or project that need to be considered to accomplish these activities.
Funding on a full cost basis:	A funder pays the costs of an activity or project based on the full costs of an activity (both direct and indirect costs). This does not mean that 100% of these costs are funded.
Funding full costs:	A funder accepts cost claims based on a full costing methodology and funds 100% of the full costs (both direct and indirect) of an activity.
Full economic costing (FEC):	A full costing methodology based on activity-based costing developed by universities in the United Kingdom.
Indirect costs:	Costs that have been incurred for activities, but which cannot be identified and charged directly to each individual activity. (Sometimes the term “overhead” is used to describe indirect costs. This report uses the term indirect cost.)
Matched funding scheme:	Initiative by public authorities whereby public money is provided to match money raised from the private sector by the university (on a 1 to 1 or a lower ratio, not necessarily in the framework of a project).
Philanthropic funding:	Funding obtained from foundations, corporate donors, or individuals acting independently from government and for the public benefit, by supporting the university’s activities through grants or non-financial means (donation of land, buildings, etc.), or by operating their own programmes.
Project-based funding:	Universities apply for funds through proposing a specific project and the application is estimated on the basis of meeting the set of criteria and/or on the basis of competition between other institutions.
Time allocation:	The allocation of time to different tasks and activities (e.g. research, teaching, etc.). There are many different models to allocate time, such as staff surveys, interviews, sampling or profiling, which are intended to allocate time to certain activities, often as a proportion of overall work time rather than by measuring the exact hours worked on an activity.
Time recording:	Method of measuring the time spent on a specific activity, for instance through time sheets.
Transparent Approach to Costing (TRAC):	An activity-based costing methodology to identify the cost of research and teaching developed by universities in the United Kingdom.

Key messages on the implementation of full costing

Why?

- **To enhance financial sustainability:** it gives universities a tool to identify the full costs of their activities and thus enhances the understanding of costs and the adequate level of funding needed to support the financial sustainability of universities.
- **To increase transparency:** it enables universities to show in a transparent way how they spend money and what the real costs of their activities are. It supports thus universities' accountability in relation to funders.
- **To strengthen the position of universities:** it can inform pricing decisions of different activities. Thus it helps to move away from a 'low-cost culture' and has the potential to strengthen the position of universities in relations with contract partners.
- **To support strategic management:** it is an essential strategic management tool for universities that provides information for evidence-based decision-making at the strategic level of the university. It has to be used strategically in accordance with the mission and vision of each individual university.

How?

- **Leadership commitment:** the commitment of the institutional leadership and management is key to the successful implementation of full costing.
- **A coordinated approach:** a coordinated approach including all relevant stakeholders at institutional level as well as cooperation between universities, public authorities and funding bodies at system level can facilitate the implementation process and increase efficiency.
- **Common principles – different models:** there is not just one way to implement full costing in universities. Each university has to decide on a methodology that suits its needs depending on its institutional profile and structure.
- **Funding rules:** funding rules can be an important driver to foster full costing implementation and therefore national and European public funders should accept cost claims and reimbursement based on full costing methodologies.

1 Introduction

Growing expectations placed on teaching and research, along with squeezed public budgets are increasingly endangering the financial sustainability of Europe's universities. EUA's monitoring of the impact of the financial crises on university funding has shown that public investment in higher education in many European countries has stagnated or decreased in real terms, while the costs of university activities have increased sharply (EUA 2010a; EUA 2010b; EUA 2011a; EUA 2011b; EUA 2012).

In this situation it is even more important for universities to know the full costs of all their activities. Full costing methodologies become an essential tool of modern university management. EUA has carried out a variety of activities on full costing in recent years. Its study 'Financially Sustainable Universities. Towards full costing in European universities' (EUA 2008) showed that numerous factors, including a lack of leadership support and staff expertise as well as uncertainty about the choice of method and implementation modalities, still impede the development of full costing at European universities. These difficulties are often compounded by a lack of interest and knowledge at the level of funding bodies.

Since its first study EUA has noted a growing awareness of full costing and an increased demand for relevant expertise and assistance. In 2010 EUA began to coordinate the EUIMA cooperation initiative ('European Universities Implementing their Modernisation Agenda'). One part of this project aimed to contribute to the development of full costing in European universities by helping them to better identify the costs of all their activities and projects.

Based on the exchange of experiences and capacity-building activities, the EUIMA-Full Costing project yielded a wealth of information on the current state of full costing implementation and good practice examples from universities across Europe. Through the present publication EUA wishes to make this information available to the higher education community. Previous work on full costing and related topics, undertaken in the context of EUA's first study on full costing (2008), the EUDIS project (2011) and the Public Funding Observatory (ongoing), has likewise fed into the analysis.

How to read this report

Firstly this report aims to assist university practitioners in implementing full costing and provide good practice examples from universities across Europe. Furthermore, it provides important information for policy makers and funding bodies with up-to-date information on the state of play of full costing.

Chapter 2 provides essential background information. It presents the major current challenges to universities' financial sustainability, such as shrinking public budgets, highly diversified income structures and growing co-funding requirements, and explains how full costing may contribute to overcoming these.

Chapter 3 looks at the implementation of full costing at system level. It examines its impact on the relationship between universities and different types of funders, including national public and European funders, business and industry and foundations, and provides an up-to-date picture of the current state of full costing implementation in 14 European higher education systems.

Drawing on experiences and good practice examples from numerous European universities, Chapter 4 deals with the operational aspects of full costing implementation at the institutional level. It points out a number of principles to consider during the planning and implementation stages, and offers practical advice on some of the most important aspects of full costing methodologies, including time allocation mechanisms.

Finally, Chapter 5 explains how the data collected in the process may be used to inform financial management and institutional strategies.

2 Full costing and the financial sustainability of universities

Financial sustainability is one of the key challenges for Europe's universities and constitutes a strong focus of the work of EUA. This work is structured around the following three pillars:

- Universities must be able to identify and better understand the costs of all their activities and projects.
- Universities must develop and maintain a reasonably diversified income structure to mitigate risks and enhance autonomy.
- Universities need sufficient and sustainable public funding.

Europe's universities are currently faced with a number of funding challenges which they need to overcome if they are to continue to provide high quality teaching and conduct excellent research. The following chapter will outline these challenges, and illustrate how full costing can help to address them.

2.1 Challenges to the financial sustainability of universities

Almost 75% of European universities' income comes directly from public sources (EUA 2011c: 50). As governments struggle to balance their budget deficits with austerity measures, many have reduced their investment in universities.

EUA's Public Funding Observatory has revealed cuts in many European countries (EUA 2012). It has shown that, while systems have been affected very differently across Europe, no national higher education system has remained completely untouched. Even those HE systems which have seen no or very minor public funding cuts are facing a range of other pressures and challenges, such as increased student numbers, increased use of co-funding by public authorities and difficulties to attract additional income sources. A number of countries mainly in the south and east of Europe, some of which already have lower overall public investment levels (as a % of GDP) in higher education, have made major or substantial cuts to higher education budgets since 2008.

The high level of public funding in budgets of most European universities means that any reduction is bound to have a major impact on their financial sustainability.

Modes of public funding are subject to change

Public funding for universities is undergoing changes in terms of the way in which universities receive these funds. While block grants are still the most important form of basic funding in many countries, more and more competitive elements are being introduced into the allocation of funding. This is done through output-oriented criteria or performance-based elements in funding formula. A number of countries also use excellence schemes to allocate parts of public funding. The success in attracting funding from additional, mostly competitive, sources is often among the allocation indicators. These allocation mechanisms have an impact on strategic decisions as well as on the amount of resources used to attract funding.

Co-funding requirements are widening the funding gap

Probably the most underestimated challenge to universities' financial sustainability is the increasing trend to resort to co-funding requirements. Co-funding requires a university to raise a proportional amount of the full cost of the activity or project being funded, either from its own budget or from another public or private source. A majority of universities deals with co-funding requirements on a daily basis, whether for most or part of their public funding. Both European and national public funders increasingly use co-funding requirements by funding either just a certain percentage of the direct costs or just a part of the indirect costs of an activity (this is particularly the case in competitive funding schemes).

Managing multiple funding streams remains a complex task

Some universities have well over 100 different income sources, which in many cases have very diverse accountability regimes. With the pressure to explore new funding sources, this is a growing concern. To secure new funds universities need to invest a lot of time and resources, especially as application, contractual, reporting and reimbursement procedures often differ widely. In reality, small income sources can often generate a disproportionate amount of paperwork and administration, which in turn raises the operational costs for universities. Modern financial management is instrumental in dealing with this complexity.

To respond to these challenges and improve their financial sustainability, universities need to develop the right tools to identify the full costs of all their activities and projects. Full costing therefore becomes an essential strategic and operational tool for managing an institution.

2.2 Benefits of full costing

Full costing provides benefits for universities, national governments and on a European level. Among the benefits for universities are: a more systematic approach to activity analysis and costing; a more efficient internal resource allocation; improved strategic decision-making based on better understanding of investment decisions; benchmarking possibilities within the sector and an enhanced ability to negotiate and price activities, which leads to higher cost recovery of project costs and thus contributes to financial sustainability.

On the national and European level full costing is vital to ensure accountability. It builds trust between governments, funding agencies and universities, and smoothes over the transition towards institutional autonomy. It facilitates national government budget allocation, as universities can reliably and verifiably prove what they need. Full costing enables universities to act more efficiently and base their decisions on sound data, which in turn reassures governments that the funding provided is used appropriately. Robust costing systems can also help governments to benchmark their own achievement of objectives more effectively.

2.3 Obstacles to full costing

Despite the numerous benefits of full costing methodologies, many institutions remain unable to fully identify their costs. The situation ranges from countries such as the United Kingdom and Ireland, where uniform but flexible systems have been introduced in more or less all universities, to countries where universities still struggle to develop full costing systems.

The EUIMA project has confirmed that there are both internal (institutional) and external obstacles. Some of these do not hinder the process of implementing full costing as such, but rather delay and weaken the quality of implementation. Among the most common institutional obstacles are resistance to change and specifically to the introduction of a more managerial approach in universities, concerns over time accounting and a

lack of management and leadership commitment. To overcome these internal barriers, raising awareness of the benefits of full costing among the leadership and key academic and administrative staff is crucial, as is communicating effectively and extensively throughout the institution during the implementation stage.

The most common external obstacles are a lack of autonomy, legal barriers and a lack of trust between stakeholders, in particular between funders and universities. Universities also face a lack of external financial support for the implementation of full costing, which is a costly process and a strain on financial, technical and human resources. As demonstrated by the EUIMA project, public authorities therefore have an important role to play in granting greater autonomy to universities and providing financial and other types of support. Assigning more importance to the development of full costing should also help to move from a 'low-cost culture' towards the correct pricing for projects undertaken by universities.

3 System level: the process of full costing implementation

Although full costing brings a number of internal benefits to universities, external drivers such as European and national funding schemes have also played a major role in its development in universities across Europe. Both EUA's first study (EUA 2008) and the EUIMA-Full Costing project (EUA 2009-2012) have confirmed this. Furthermore, the implementation of full costing has a direct impact on the relationship between universities and different types of funders. A coordinated approach between all relevant actors – universities, funders and public authorities – is therefore crucial for the successful implementation and the subsequent use for multiple purposes.

3.1 The relationship between universities and funders

Full costing has a major impact on universities' relations with funders. Two aspects must be distinguished though: first, the acceptance by funders to declare costs incurred by universities based on a full costing methodology that identifies all direct and indirect costs related to an activity; and, secondly, the question to what extent funders then cover these costs, meaning whether they fund the full costs or only a certain percentage of the total costs incurred.¹ These two aspects are often confused in the debate across Europe. Universities have to deal with a variety of public funders and differing rules for receiving these funds. Public authorities and policy makers designing such funding schemes are therefore among the key actors universities must cooperate with when developing full costing methodologies.

National public funders

At the national level the main drivers for the implementation of full costing in universities have been cuts to public investment in higher education and research on the one hand (EUA 2008: 36), and increasing costs of universities' activities (e.g. due to rising student numbers and increasing research activity) on the other hand.

This has led public authorities in several systems to establish legal obligations to change institutional accounting systems. While the financial autonomy of universities in many systems has increased, accountability mechanisms have been strengthened in return. Full costing methodologies are used to provide the necessary transparency to meet these accountability requirements.

Example: The United Kingdom

In the United Kingdom the abovementioned considerations together with concerns about the financial sustainability of the sector led to the development of full costing as early as the 1990s and with major support from the government. The transparent approach to costing (TRAC) was developed on the basis of an activity-based costing methodology. Since 2000 all UK universities have had to adopt TRAC, under which they have to report their income and expenditure under teaching, research, and other activities. In reaction to this the seven British research councils also changed their funding modalities and based their system on TRAC. Since 2005 all research organisations in the UK, including universities, have been required to cost research projects submitted to the research councils on a full cost basis. This meant that new categories of costs, such as indirect costs and estates costs, featured on grant applications for the first time. Since these indirect costs became eligible for funding, the control procedures had to be changed in order to ensure that these costs are calculated appropriately. The research councils therefore developed a new assurance methodology together with the universities. This also changed the relationship between the research councils as funders and universities as beneficiaries towards a more trust-based cooperation.

¹ See explanation of the terms 'funding on a full cost basis' and 'funding full costs' in the definitions section at the beginning of this report.

European Funders

According to EUA's EUDIS study, international public funding, which consists largely of European funding, accounts on average for about 4% of a university's income, although this strongly varies between institutions, with some receiving up to 20% of their overall budget from EU funds (EUA 2011c: 25ff).² 74% of respondents also indicated that they expect EU funding for their institutions to increase slightly or considerably in the future (ibid).

In addition to internal strategic considerations, the EU's 7th Framework Programme for Research and Innovation has been a major driver for the implementation of full costing in universities (EUA 2008: 9-10). The possibility to receive a higher reimbursement of costs on the basis of a certified full costing methodology than through a flat rate has been a very strong incentive for institutions to start developing costing methodologies.

It sent a strong signal to national funders, and in some countries fostered a move towards the acceptance of full costing methodologies in funding programmes. The data from participating countries in the EUIMA project also demonstrated the strong impact these funding conditions had on the development of full costing in European universities. In 10 out of 14 systems the funding rules of FP7 are seen as a major driver for the development of full costing. Many institutions also felt the need for using a full costing methodology as a modern management tool.

The data from the EUIMA project further shows that, while there are other drivers, European funding has been particularly important in enabling institutions to internally convince the university community of the necessity to have a full costing methodology in place. It was often used as an argument to overcome internal resistance to its implementation.

Example: Finland

Finland is a good example of how national and European developments coincided. Discussions between the Finnish universities and national funding bodies about indirect costs for research have been ongoing since the 1990s. The universities claimed that the indirect cost allowance of 12% provided by the Academy of Finland was not enough to cover indirect costs for administration and facilities. Some funding bodies did not accept that they should fund any indirect costs.

An important driver of the debate on full costing in Finland was the European Commission's announcement to provide a possibility to recover a higher amount of indirect costs based on a full costing methodology in FP7. In their annual negotiations with the Ministry of Education one of the two major Finnish research funding bodies, the Academy of Finland, agreed as a result to accept full costing methodologies starting from the first application round in 2009 for research projects from January 2010 onwards. The decision was partly based on a report published by the Ministry of Finance in 2007. Another reason for the decision was based on the regulations in the Community Framework for State Aid for Research and Development and Innovation (European Commission 2006). The other major Finnish research funding body, Tekes, had already decided to accept full costing methodologies from the beginning of 2009 for the same reasons. These developments helped to convince university staff of the necessity to implement full costing in order to be eligible for external funding. The unions also eventually agreed on a model that satisfied all parties.

Business & industry

According to EUA's study on the diversification of income streams, funds from private partners constitute the largest additional source³ of funding for universities, representing on average 7% of their income. Figures vary considerably among universities with some reporting less than 1% and some up to 25% (EUA 2011c: 32).⁴ Besides costing and cost reimbursement for specific activities, pricing also comes into play here, especially with regard to collaborative research activities.

² The terms 'European funding' and 'EU funding' are used synonymously throughout the publication.

³ Additional sources are those that are not main public funding and tuition fees.

⁴ The study collected data from over 100 universities in 27 European countries.

When universities do not know the full costs of their activities, it is very difficult to adequately price research activities for business partners. Before the establishment of full costing, universities in the UK, for instance, priced research projects on the basis of additional marginal costs plus a notional indirect cost rate. This often led to under-pricing and as a result university research was considered very good value for money.

This can be changed with the implementation of full costing methodologies, which provide a clear basis for universities to negotiate with their business partners and calculate a suitable benefit. As a consequence, the price of academic research for business and industry increases, and changes the relationship between universities and their contractors. On the one hand, it may strengthen the bargaining position of universities, on the other hand, as prices rise, expectations may also increase on the business side. This happened in the UK after the transition to full costing. In order to develop and manage these changing relationships with business partners, universities need specialised human resources. University staff dealing with this must be able to conduct professional negotiations, manage contracts and communicate effectively with the business sector.

Example: The United Kingdom (II)

The 2009 Research Councils UK and Universities UK (RCUK/UUK) review of the impact of the introduction of full costing noted that many British universities used full costing to determine the cost of projects, but were then keen to discuss the value, rather than the cost of their work, with their industry partners (RCUK/UUK 2009). Indeed, the review showed that there was often too much emphasis on cost in university-industry collaborations, and that there was a need to shift the focus towards outputs, with deliverables adjusted to budgets rather than vice-versa. Contractual negotiations with industry became more robust in such issues as intellectual property and publication rights, as it became clearer that price was just one element of the contract. There was also a growing recognition of the value of in-kind contributions from industry in the form of access to data, materials or facilities. Academic culture thus had to adapt to a more professional approach to performance and deliverables.

There is no evidence that the introduction of full costing and the consequent increase in the price of university research has led to any reduction in collaboration with industry. Indeed, the Confederation of British Industry (CBI) noted that its members continued to recognise links with universities as a key component of the UK's innovation ecosystem, which provides the economy with a major competitive edge. The lesson learnt from the example of the UK is that the introduction of full costing in universities will have an impact on their relationship with industry but, for those universities who establish clear support mechanisms and policies on handling such funding, it offers opportunities to put that relationship on a more equitable footing.

Philanthropic funding, charities and foundations

Philanthropic funding accounts on average for 4% of the total income of most European universities. Institutions in the UK, Sweden, Italy and France are the most successful in attracting such funds, with figures sometimes above this average (EUA 2011c: 32). As a matter of policy, charities generally only meet the direct costs of the research they support. They may bear other costs, including infrastructure, buildings and equipment costs, but only where these meet their wider goals.

Example: The United Kingdom (III)

When full costing was introduced at project level for UK universities in 2005, charities made it clear that, while they recognised the importance of sustainability for universities, they believed that responsibility for sustaining general university infrastructure lay with the government and that they should not therefore be expected to provide for such costs. Government recognised the validity of this argument, and accepted the fact that public funds might be needed to help support the general infrastructure costs required for charity-funded research. As a result, the 'Charity Support Grant' (CSG) was introduced in 2005 which provides matched funding to universities, based on quality assessments, to complement research funding obtained through peer review and in open competition from charities and foundations. In 2010 the CSG for English universities was some £194 million. Although charities continue to focus their funding on the additional,

direct costs of the research they support, the introduction of full costing has allowed universities to identify the full cost of each resource and facility used in a project. This has in many cases led to better cost recovery from charities, since the latter have been more willing to cover infrastructure costs directly attributable to those facilities, costs which in the past could not be differentiated from general indirect costs.

3.2 The importance of a coordinated approach

An inclusive and coordinated approach involving all relevant stakeholders at institutional level and cooperation between universities, public authorities and funding bodies facilitate the process of developing and implementing full costing methodologies, and are instrumental to their success (EUA 2008, EUA 2009-2012).

Support by public authorities and funders for the implementation of full costing is essential if significant progress is to be made in the coming years. This support can be provided in several ways: either directly through additional funding for the modernisation of university management and accountancy systems, or indirectly through funding schemes that allow for cost reimbursement based on full costing methodologies and thus incentivise their development. When reforming legal frameworks and designing new funding schemes, policy makers and funders should work together with universities to define appropriate measures and take into account institutions' needs, depending on their specific profile and their management and accounting practices.

Universities themselves can speed up the development of full costing by working together. This increases the efficiency of the implementation process, and improves cost efficiency, transparency and accountability. Wherever the government or funding agencies are in some way included in the process, additional benefits may be reaped, such as improved mutual trust and simplified funding rules and procedures.

Sweden, Ireland and the United Kingdom are examples of countries where a coordinated approach has led to a successful implementation of full costing, albeit in different ways.

Example: Sweden

The introduction of full costing in Sweden was coordinated at national level. Full costing had been an issue for many years and there were continuous discussions between universities and research funding organisations. In 2005 the Association of Swedish Higher Education (SUHF), which represents Swedish higher education institutions, set up a group to handle questions regarding the financing of indirect costs. In the beginning the group consisted of representatives from universities, but it was soon extended to include representatives from important funding organisations.

Another group (HfR Redovisningsråd) had already been established in the mid-nineties by university administrators to develop generally accepted accounting principles for Swedish universities. This group started to discuss full costing as an alternative when the Swedish National Audit Office criticised several universities for incorrect income accounting in autumn 2005.

Both groups started working together in 2006. HfR Redovisningsråd developed the Swedish model and important issues were discussed and agreed on in the SUHF-group. In March 2007 the SUHF-group delivered a report describing the fundamental bases of the model and afterwards a manual was produced. In November 2007 SUHF recommended the adoption of the model to all its members.

The implementation of the costing model was coordinated by SUHF and almost all universities implemented the model between 2008 and 2009. There were general principles based on traditional cost accounting theory that all institutions followed, while adjusting the details to their specific needs, such as different accounting systems or charts of accounts. Common definitions and common terms were developed. National workshops were organised to support the implementation teams in each institution. Every university had an implementation team consisting usually of the finance and/or planning departments. The problems that arose were solved jointly and solutions were made available to everybody. All universities participated voluntarily in these coordinated activities, and benefited from the exchange of experience and expertise.

Although no additional public funds were made available for implementation, the government supported the process politically. In December 2009 it was stated in the Public Service Agreements⁵ for government research funding bodies that full costing methodologies should be applied, and that research grants should finance direct and indirect costs in equal proportions.

Example: Ireland

The development of full costing in Ireland was initiated collectively by the seven Irish universities in 2006. Irish universities were going through a significant reform process, and the Irish government initiated a Strategic Innovation Fund (SIF) to support reform and innovation in the Irish higher education system, through the Higher Education Authority (HEA), the state higher education funding agency.

The full costing project started in early 2007. The Irish universities believed that there would be significant benefit in developing a consistent model across the sector and this was also an important consideration for national funding agencies. Through the Irish Universities Association (IUA), the representative body for Irish universities, the universities submitted a successful proposal under the SIF programme to develop a full costing framework for the sector. Total funding of approximately 2 million Euro was provided for the development of Full Economic Costing. This support was a key enabler in the development of full costing in Ireland.

The initial step involved the appointment of external consultants to produce a conceptual framework which formed the basis of the full economic costing model. This conceptual framework was agreed to and signed off by the seven universities and two groups were formed:

- *A national steering group was established with overall responsibility for all aspects of the project concerning oversight and decision-making. It comprises the chairs of the local steering groups and a number of technical representatives (e.g. finance, IT, HR, research and the IUA). Additionally, a number of pre-existing groups had an advisory role in the process, such as the university chief finance officers group.*
- *A working group was established under the leadership of the Irish Universities Association project manager comprising the seven full economic costing project managers from each university. The individual project managers were responsible for the delivery of the model within their own institution, with coordination at a national level provided by the IUA project manager.*

There were two distinct project phases. Phase I involved the development of a conceptual framework for full costing and Phase II involved the detailed design and implementation of full costing in universities.

Implementation of a consistent full costing model was completed by 2012 in all seven universities in Ireland. Further refinements are however being made to the models and these are being co-ordinated centrally to ensure that the consistency of the models and comparability of the outputs is retained and protected. The coordinated approach to full costing in Ireland has been very successful. The strong project governance structures have been essential in addressing the challenges associated with a national coordinated approach.

Example: The United Kingdom (IV)

The success of the development of full costing in the UK can be attributed to the close collaboration between government, funders and universities. Although its initial introduction was a government requirement, it arose out of earlier work undertaken by the universities themselves.

Full costing was developed under the aegis of the Joint Costing and Pricing Steering Group (JCPSG) running for eight years from 1997 until 2005, a representative group bringing together members from eight universities and the UK funding councils, supported by government funding. While the JCPSG came to

an end in late 2005, full costing in the UK and its ongoing development continues to be overseen by a National Financial Sustainability Strategy Group working closely with the Transparent Approach to Costing (TRAC) Development Group, both of which have university and funding council representation.

The first stage of TRAC, a high level activity-based costing methodology to identify the cost of research and teaching, was developed by a pilot group of nine universities in 2001, with 30 other universities adopting the methodology later that year, and all remaining UK universities in 2002.

The second stage (full economic costing at project level) was again developed by a pilot group of nine universities working closely with the UK research councils. The methodology was adopted by all UK universities in September 2005, and accepted by the research councils in the costing and pricing of research projects.

This coordinated approach brought a number of advantages. Firstly, it ensured that the methodology adopted was sufficiently flexible to allow for the broad diversity of universities and their missions. Secondly, although all universities incurred implementation costs, these were significantly lower than they might have been without the coordinated approach.

Thirdly, it ensured that the methodology was recognised by funders as being robust and, since they had been involved in its development, meant that they had to accept the costs as being realistic. Finally it also enabled universities to reassure the government that they were able to account for their use of public funds, and that they had the capacity to manage their resources more efficiently.

3.3 The state of implementation of full costing in Europe

As the country profiles in the annex show, the state of implementation of full costing in Europe is highly diverse. Even within the 14 higher education systems for which data was collected during the EUIMA and previous projects the level of development often differs between institutions.

Mature and advanced systems are those where universities are more or less at the same level of implementation, but differ regarding the strategic use of full costing. The United Kingdom, Ireland, Finland and Sweden, who were first to initiate the process, are the most advanced systems in terms of development and implementation of full costing methodologies. Although in these countries full costing was implemented system-wide, it was done in different ways: Ireland, Sweden and the UK developed a sector-wide model through a coordinated approach based on cooperation between universities. By contrast, in Finland, individual universities developed full costing methodologies on their own in response to requirements by the ministry and the national research funding councils. In systems where full-costing methodologies are at a mature stage, several universities are using full costing data for strategic management and decision-making, as the examples of British and Irish universities in chapter 5 illustrate.

Many universities in the Netherlands are also quite advanced in the implementation and strategic use of full costing, but there were no system-wide coordinated process or state requirements. Main drivers were a higher cost recovery for contract research, or the need for reliable financial information to support internal decision-making. Today most Dutch universities are using full costing methodologies.

Austria, Belgium (Flemish-speaking community and French-speaking community), France and Germany are in the process of implementing full costing methodologies, although differences remain between these systems. The level of development also differs strongly between universities, despite the fact that discussions on full costing have been ongoing for several years.

In Austria the establishment of a commercial accounting system became a legal requirement in 2002. However, after the first move towards a common approach for a full costing methodology driven by FP7 requirements failed in 2007, individual universities are now developing their own models.

A similar development can be observed in Germany, where universities had formulated common principles in the so-called 'Greifswald resolution' in 1999, but failed to obtain the approval of the state ministers of finance. Furthermore, in some states, universities still have to use cameralistic accounting, which makes the introduction of a full costing system very difficult. The situation in Germany is therefore very diverse, with some institutions being more advanced than others.

In Belgium and France a number of universities started to develop full costing methodologies several years ago. Despite the fact that there is no formally coordinated approach at system level, universities actively exchange their experiences with the support of their respective university association/national rectors' conference. Some institutions have recently made considerable progress in terms of implementation, or have already instituted a working system.

This also applies to some Portuguese universities, although in Portugal there is little support from the public authorities and funders and less cooperation between institutions.

In Poland only three universities have started the implementation process, but awareness of the importance of financial sustainability has grown among universities during the last years.

In Croatia and Turkey discussions on full costing in universities were initiated with the EUIMA-Full Costing project. In these systems, universities have undergone the planning phase and some have started the implementation phase over the last couple of years. In Croatia and Turkey, universities have joined forces to develop common projects, led by the Council of Higher Education CoHE (YÖK) in the case of Turkey. The EUIMA-Full Costing project has thus had a considerable impact in participating countries and systems.

3.4 Lessons learned

The analysis shows that considerable progress has been made in the implementation of full costing in European universities in recent years. EUA was able to contribute to this through its continuous work on the topic since the first EUA publication in 2008 (EUA 2008). The country workshops and study visits in the framework of the EUIMA project further promoted the development of full costing across European universities and provided a platform for practitioners for mutual learning through the exchange of experience and good practice. But despite these positive developments, there are still too many institutions that remain unable to fully identify their costs or use full costing appropriately and strategically. Further activities and support for the development are therefore crucial to continue the progress already made.

To ensure the further development of full costing in European universities a number of requirements must be fulfilled. At system level, the process needs to be supported in two ways: directly through reforms of legal frameworks to enhance the financial autonomy of universities where needed, through financial support for the development and implementation of a full costing methodology, and through educational support in the form of staff training. Indirectly, public funders should incentivise the development of full costing methodologies through funding rules that allow for the reimbursement of real costs. As FP7 and several national funding programmes have shown, this can be a powerful driver for this important change process.

The examples from different countries demonstrate that there are several ways to organise the implementation process and the involvement of different actors. Notably the role of public authorities and policy makers in the process can take different forms. In the UK the so-called buffer bodies have strongly supported the process from the beginning. In Ireland the process was led by the universities, but supported by public funding. While in Sweden there was no additional financial support by the government, political support was provided through the acceptance of full costing methodologies by public research funding bodies.

These examples showcase further that a coordinated approach for full costing implementation can increase the efficiency of the process, also in terms of costs, as well as foster transparency and accountability resulting in enhanced trust between funders and universities. Furthermore a coordinated approach offers the opportunity to simplify funding rules and procedures, and creates the potential to develop a coherent approach among funders and to improve the funding system as a whole.

4 Institutional level: good practice in full costing implementation

How full costing is implemented at institutional level varies from one university to another, and depends on a variety of external and internal factors. While common principles can be useful, it is important to respect institutional diversity and to adjust the process and model to the specific needs of each institution. The indicative roadmap developed by EUA helps to structure the implementation process (EUA 2008: 73-77).

Once the objectives have been defined at the strategic level, a status analysis should be carried out in order to evaluate the different aspects of the institutional profile (in terms of cost structure, degree of autonomy, funding sources etc.). It is necessary to complement this exercise with an outward-looking analysis. This should include scanning the environment for partnership and funding opportunities as well as good practices in the field and exploring opportunities for coordination and cooperation with other universities, funding bodies and public authorities. On this basis the leadership needs to initiate the process by setting up the project management and allocating financial and human resources. Further steps include the decision whether and for what aspects external help and advice might be needed.

4.1 Common success factors

The need for leadership commitment and effective communication

The commitment of the university leadership is one of the key conditions for the successful development of full costing. Clear objectives for the implementation have to be set at the strategic level. The leadership team therefore needs to articulate a clear vision (on what it wishes to achieve). It further needs to analyse potential obstacles to full costing, and proactively and systematically address them throughout the whole institution. It is the role of the leadership to promote a coordinated approach by engaging the entire university community and by communicating with the various administrative units involved in the implementation. The leadership also has a mission to communicate externally and should engage with other universities, funders and public authorities to support this complex change process with the necessary legislative and political reforms.

Example: The University of Coimbra

The University of Coimbra is an example of an institution where leadership commitment was the key to the successful implementation of full costing. In 2000 the university started to develop an activity-based costing methodology. There was no external support (neither financial or other), during the process, so this development was only made possible because of the financial capacity of the university and the strong commitment of its leadership. The top management felt the need to acquire a strategic management tool in order to support efficient resource allocation, understand the institutional cost drivers, and apply a coherent approach to planning, monitoring and evaluating institutional performance. From the very beginning the institutional leadership also sought the commitment of the leadership at faculty level. This was important as the faculties were responsible for the data and for decisions regarding their specific system for time accounting and time distribution, framing rules (actual number of teaching hours) and allocation. Furthermore, the project development team was sponsored by the leadership and based in the university administration. This was a small team of proactive and strongly committed people with specialised competences. Clear, continuous and efficient communication among the different groups and organisational levels was accorded particular importance from the beginning, which contributed to the successful implementation.

Development of human resources

In the last decade, many factors, such as new demands and activities, the evolution of universities' missions and an increasingly competitive environment have led to the transformation of the higher education sector. This change has also had an impact on the role of university leadership and the human resources and necessary skills associated with it (EUA 2011c: 54). The same applies to the financial management of universities, and more specifically to the implementation and the use of full costing methodologies.

Both the implementation of full costing and the running and use of the system require professionally trained and experienced staff. In EUA's previous work on the implementation of full costing, knowledge-sharing between universities was highlighted as being a particularly efficient mechanism (EUA 2008: 55), and best suited to the sector's specific needs. During the study visits and country workshops organised in the framework of the EUIMA project, 'sector to sector' consultancy has again proved appropriate. The specificities of the education and research environment require an in-depth understanding to implement and apply full costing in a suitable way. In some cases they might need external support and consultancy, particularly in the initial implementation phase.

It is particularly important that full costing is used sensibly and in a way that does not undermine the main aims of universities' activities. Data has to be interpreted correctly so that the right conclusions are drawn. Administrative staff therefore must be able to link financial results with long-term strategic implications and individual project decisions. This requires special knowledge and a broad range of skills, which administrative staff must have in order to apply results and communicate effectively with academic staff.

In the long term universities have to design strategies that may attract highly qualified personnel for the financial and strategic management of higher education institutions. The financial function should evolve from being a 'compliance function' to a fully-fledged 'enabler function' involved in the strategic development of the institution (EUA 2011c: 70).

Common principles – different models

Although common basic principles for full costing can be identified, different models exist as regards structure and implementation. A 'one-size-fits-all' approach is not appropriate. The diversity of full costing systems should reflect the diversity of institutional profiles and missions. Time allocation methodologies are a good example of the variety of possible instruments. The use of time can be identified through time sheets, staff surveys, staff interviews, staff profile creation and other instruments. The actual data used can come from different sources and be collected at different intervals. Each university has to determine the most appropriate instrument, depending on the context in which it operates. Full costing is hence a flexible tool that must be adapted to an institution's profile.

4.2 Setting up a costing methodology

The design of the costing methodology should start by identifying the different activities that need to be costed. It also requires the selection of cost objects and the definition of cost drivers on the basis of which an allocation method can be developed. The project needs to ensure appropriate and robust data collection. This may require a substantial amount of time, depending on the availability and quality of the data. Appropriate quality assurance mechanisms need to be put in place (in relation to the overall project cycle) to ensure that data outputs measure costs in a comprehensive and robust way. Once the model is in place, further refinements and adjustments may be necessary, depending on how and for which purpose the data will be used.

This section contains examples of universities from across Europe that have already implemented full costing. It describes how these institutions set up their costing methodologies, the challenges they experienced and how they managed to overcome them. These examples provide those institutions that are planning to develop a full costing methodology with practical information and illustrate the most important aspects to consider during implementation.

University of Amsterdam (NL)

Founded in 1632 · approximately 33,000 students · more than 5 000 staff · comprehensive university

The implementation of a full costing methodology at the University of Amsterdam was driven by the strong desire of the board to rationalise financial decision-making within the university, based on proper information on the real cost of activities. It was also part of a broader range of measures, which aimed to set up new governance and budgeting structures within the university.

In parallel to the implementation of full costing, a comprehensive reorganisation of all support units took place: the majority of support staff members were grouped into a limited number of central shared service units. These units were set up to provide added value for internal use, but also to act as cost drivers. Since 2006 the shared service units have to recover their full costs by charging their services to all internal customers, according to the number of delivered units of service at benchmarked rates. These rates are set annually by the board.

Simultaneously the internal funding model has been revised. In the new model more than 90% of the block grant received from the government and the income collected from tuition fees is distributed to the faculties. The distribution is mainly based on output or performance parameters, which are roughly in line with the national funding parameters. Internal policies, goals and targets for research and teaching further help to fine-tune this allocation.

All faculties now see in their financial reports that variations in the use of facilities and services have a direct impact on their costs and hence on the available budget for teaching and research.

The implementation of an appropriate full costing methodology has been a key element in giving the university's different faculties and decentralised units full responsibility for their budget. The table below shows some of the most important elements of the current financial system:

Table 1. Important elements of the financial system at the University of Amsterdam

Cost settling		Budget allocation	
Cost centre	Cost driver	Activity	Budget parameter
Student facilities, admissions, college rooms	# Students	Teaching	# EC by students
Personnel records office	# headcount personnel		# MA degrees
Finance records office	# invoices processed		# freshmen
ICT-department	# work stations	Research	# PhD thesis
University library	# fte academic staff		% on contract income
Real estate, space-related facilities	# sqm		# Ma degrees

The following principles have been used in the design and further development of the full costing model in the university's financial system:

- All costs in the university have to be justified on the basis of whether they provide, directly or indirectly, added value for teaching or research. To implement this principle in its budgeting procedure the University of Amsterdam uses cost allocation sheets in a strict format, which show how all individual cost elements and cost centres relate to teaching and research.
- Budget allocation and contract income are exclusively concentrated within the teaching and research institutes at the faculties: they are the profit centres, all other units and departments are functional cost centres.
- Time spent by academic staff is the primary cost driver in cost allocation to teaching and research. The full cost rates are expressed in Euros per hour (Euro/h) and consist of personnel costs and an indirect cost component. The latter is also expressed in Euro/h (not in % of direct personnel costs) as this better indicates the relation with these costs than the position or the seniority of the employee.

- d) Differences in full cost rates are justified by significant differences in costs. Therefore the University of Amsterdam applies different rates (rate components) depending on the salary level, the indirect cost structure of the different academic departments, and specific teaching- or research-related indirect costs.
- e) The system aims to inform decision-making on all organisational levels. Therefore all the principles of budget allocation and cost-setting have been integrated in the financial system. Internal financial reports are updated monthly and all deans, directors and managers have access to an electronic management information system and have to account for the figures presented there.

An analysis, six years after the introduction of full costing as part of a modernised governance model, shows that the benefits have helped to overcome the initial concerns of most members of the university community. A new way of thinking and acting has been established.

Some of the positive changes are:

- a) Cost awareness has increased and raised creativity at all organisational levels in saving costs and in becoming more efficient.
- b) Decision-making is inherently better oriented towards teaching and research: less energy is lost in internal negotiations, since budget allocation and cost-setting are focused on added value for the core activities.
- c) The university's contributions to activities that are not contracted or subsidised on a full cost basis are visible and transparent: formerly implicit or hidden subsidies to contract activities are made explicit. Because of this the negotiation position vis-à-vis external partners (including the ministry of education) has become stronger.
- d) Since financial procedures have been normalised and integrated into the financial system, the University of Amsterdam has been able to considerably reduce the financial support staff. Moreover a total reduction of about 20% on support costs has been realised over the last six years.

University of Helsinki (FI)

Founded in 1640 in Turku, transferred to Helsinki in 1828 · 37,000 students · 8 600 staff · comprehensive university

With the EU's 7th Framework Programme a possibility was provided for declaring indirect costs based on the actual costs incurred, which enabled universities to receive a higher reimbursement rate based on a certified methodology. This was followed by similar decisions by the Academy of Finland and TEKES, the two major research funding bodies in Finland. The University of Helsinki therefore had to take steps to introduce a methodology in order to be able to identify the total costs of research. The total cost of a research project includes all direct costs and indirect costs for staff, administration, support services, facilities and equipment. The approach chosen for identifying and allocating total costs for research is based on an activity-based costing methodology.

Preconditions

The University of Helsinki has been developing a data warehouse since the late 1990s. Ten years later information from the main central IT systems, such as accounting (SAP), human resources (including salaries) and student information, can now be transferred daily to this data warehouse. In addition to this, a work time allocation system (SoleTM) was introduced, and has been used by most university units since the beginning of 2009. The information from SoleTM is also transferred to the data warehouse. Having access to all vital information in the same system was important for designing a full costing methodology. It is easier to design reports using information from several systems when the data is accessible from a single database.

Activity areas and cost drivers

One of the initial tasks was to define the activity areas and choose the cost drivers for full costing calculations. The Ministry of Education and Culture had defined the core performance areas for the Finnish universities:

- teaching
- research
- societal interaction
- artistic activities (not at the University of Helsinki)

Other activities are administration and support services and the costs of these have to be allocated to the core activities using cost drivers. The chosen cost drivers were:

- effective work time
- person-years
- number of students
- number of research projects

The number of square meters of space was considered as a cost driver for rents and other costs for facilities. However, it was decided to use effective work time, because the result was more or less the same; there was no advantage in making the model more complex by increasing the number of cost drivers.

Salaries and salary add-on costs

The salaries were allocated to activity areas using the information in the work time allocation system. The recorded work time for each person was matched to his/her salary in the data warehouse and the salary costs were allocated to the activity areas using the same proportions as in the time recordings. The recorded work time is the effective work time, and does not include paid absences such as annual leave and sick leave. These additional personnel costs are included in a salary add-on cost rate, which also includes compulsory salary-related costs, such as provisions for social security and pensions in accordance with national legislation and collective agreements. The information about paid absences is available in the human resources system and the information about compulsory provision is recorded in SAP. At the initial stage of allocating unit-specific personnel costs to the core activities, unit-specific salary add-on costs were used. Later an average salary add-on rate of 53.3% was established, based on unit-specific rates. This average rate is the same throughout the university and is used when applying for and reporting on project funding based on full costing. The rate is recalculated every year once the accounts for the previous year are closed and all other necessary information is available. The changes during 2009 and 2010 were insignificant and the salary add-on rate was adjusted to 55% from the 1 January 2012.

Central administration costs

The costs of central administration first had to be allocated to the academic units. Some of the costs could be allocated both to an academic unit and a core activity, such as costs for student and research support. The costs of student support were allocated to the academic units with teaching using the number of students as a cost driver. The driver for research support costs was the number of research projects. The rest of the costs of central administration were allocated to the academic units using person-years as cost driver.

Support activities

In addition to the cost of administration, costs of support activities, including the language centre and the libraries, were identified. The costs of the language centre were allocated to the academic units using the number of students as the cost driver. The library costs were allocated using person-years as the cost driver. There are some other service-providing units, such as the laboratory animal centre, but they invoice for their services internally, and were therefore already included in the academic unit costs.

Academic units

The total costs of the academic units were allocated to the core activities either directly or indirectly, using effective work time allocation as the cost driver. Costs of student and research support, costs of the language centre as well as some other costs for teaching and research were allocated directly to the activity areas. The costs for facilities were allocated to the units by charging internal rents. Some of the costs for teaching halls and research laboratories could be allocated directly to the activities. The remaining costs for the facilities

and the costs for general administration (central and local as well as other costs that could not be allocated directly) were allocated to the activity areas using effective work time as the cost driver.

Defining general indirect costs rates

When the total costs were allocated to academic units, and within the units to activity areas, the outcome was analysed in order to establish a general indirect cost rate for research, which was to be added to the total salary costs. As described above, the total salary costs consist of the cost for effective work time and the salary add-on rate including paid absences and compulsory provisions. The University of Helsinki covers all fields of study except engineering and business administration. It was obvious that the general indirect cost rates would vary between academic units. Establishing one indirect cost rate for the whole university would have been too simplistic. The university is located on four campuses in Helsinki and academic units with similar cost structures are located on the same campus. Therefore it was possible to establish indirect cost rates for research for each campus except for one: the variation in cost structure between the faculties on the Viikki Campus was such that two rates had to be established.

The indirect cost rates for research at the University of Helsinki were, based on financial data from 2008, between 84% and 112% depending on the campus and the subject area. The calculations based on financial data from 2008 have been updated annually. The variations were minor in 2009 and 2010 and the indirect cost rates remained the same. However, the calculations based on financial data from 2011 showed that the rates had to be adjusted from 1 January 2012. The changes are mostly due to salary increases and higher costs for facilities. The indirect cost rates vary between 93% and 128%. At the same time, indirect cost rates for teaching were calculated and they turned out to be much higher than the rates for research and vary between 114% and 150%. The final analyses of the rates are not completed, but among the reasons for the higher rates are the costs for the lecture halls. The rates include the costs for a whole year but the lecture halls are more or less not used at all for four months of the year.

Trinity College Dublin (IE)

Founded in 1592 · 16,747 students in 2010/11 · 2 860 full time staff · comprehensive university

The approach at Trinity College Dublin (TCD)

Trinity College Dublin is part of the group of seven Irish universities that developed a common full economic costing (FEC) methodology. Following the establishment of the national steering group two local groups were also formed within TCD:

- A local steering group, chaired by the project sponsor (a senior academic within the university), and comprised of the FEC project manager, an academic representative from each faculty plus a number of technical representatives (e.g. finance, IT, HR, research).
- A working group established under the leadership of the FEC project manager and comprising the representatives of each area responsible for providing information and data for the FEC project.

On the basis of the conceptual framework and the decisions taken by the national and local groups, a small team within the finance office, supported by the local steering and working groups, then took up responsibility for the operation and delivery of the outcomes of the FEC model.

The Irish FEC Model

The FEC model is consistent across the seven Irish universities, and allocates all costs to the primary activities of the university, i.e. teaching, research and other activities. It can be divided into a six-stage process:

Stage 1: costs/resources are identified from the financial statements and then two FEC-specific agreed cost adjustments are made as well as a number of other adjustments (e.g. pensions) in order to enable the comparability of outcomes. The specific FEC adjustments are:

- I. Financing & investment – to cover the costs of borrowing (interest), the opportunity cost of institutional cash used for financing and a surplus for the rationalisation and development of the institution's business capability and capacity.

II. Infrastructure – to reflect the full long-term costs of maintaining the infrastructure in a safe, productive state to a norm that is required to be competitive in the sector.

Stage 2: FEC costs are allocated to the academic units (e.g. faculties, schools and disciplines in the case of TCD) using agreed common cost drivers. For example under the Irish model we allocate:

- IT via three pools – (i) costs specific to an academic unit going directly to that unit; (ii) infrastructure costs based on square meters; and (iii) all other costs allocated on the basis of staff and student full time equivalents (FTEs).
- Premises/estates by weighted square meters with the weighting determined by the type of space occupied i.e. highly-serviced laboratory, laboratory, classroom/office space, storage/shed space.
- Central administration – in the 2009/10 FEC outcomes central administration was divided into two cost pools: research and all other costs. It has been agreed that for 2010/11 and future years there will be five central administration cost pools. These are student-related costs; staff-related costs; international student-related costs; research related costs and all other costs with a different cost driver for each pool.

Stage 3: FEC costs per academic unit are allocated across three categories (teaching, research and other), which are further sub-divided into nine academic activity cost pools. This allocation is driven primarily by the Academic Activity Profiles (AAP), which are compiled by academic staff and are one of the key drivers used in the FEC process. Other drivers are AAP staff costs (this driver being based on the staff costs within an academic unit, which are generally based on the AAP-percentage, as mentioned above), student FTEs, head of area estimates, etc.

Stage 4: AAP 9: administration and management costs are allocated over all other eight academic activity cost pools driven by AAP staff costs.

Stage 5: AAP 5 & 6: research (no external sponsor with output and other research & scholarly activity) costs are allocated to the three teaching academic activity cost pools, driven by student FTEs.

Stage 6: full economic cost outcomes are produced giving:

- Cost per student FTE as per HEA (Higher Education Authority) subject category (AAP 1, 2 and 3)
- Research indirect cost rate (AAP 4)
- Total university cost of other income generating activities (AAP 7)
- Total university cost of clinical services (AAP 8)

FEC Outcomes

TCD and the other six universities produced the first FEC outcomes in June 2011 for the academic and financial year 2009/10. However, as there were significant concerns regarding data inputs and Academic Activity Profile (AAP) data in particular, these outputs are regarded as a preliminary dataset only.

TU Dresden (DE)

Founded in 1828 as the Royal Saxon Technical School · before German re-unification in 1990: committed to science and engineering · Today: comprehensive university · 36,000 students · more than 8 500 staff

Driving forces for full costing

As a response to the changing national and international environment marked by increased competition, the university leadership identified the need for reforming institutional management approaches. The university's internal need for information and controlling, new university management approaches in Saxony, the requirements of various funding organisations (such as the EU), the application of EU state aid rules to universities and the German tax law were the forces driving the development and implementation of a full costing methodology.

Development of a costing methodology

At the beginning, TU Dresden (TUD) analysed several existing costing methodologies at universities in Germany and other European countries. This investigation led to the conviction that it would be best to develop a costing model taking into account the specific needs of TUD, rather than simply implementing a model from another institution. TUD's long experience with cost accounting formed a solid starting point, which was further adapted in order to develop a full costing methodology fit for current requirements and conditions.

Between 1996 and 1998 the costing model was developed following five major steps:

1. Allocation of centrally managed operating expenses
2. Allocation of the costs of administration, central and other units of TUD on the basis of the number of employees, major usable floor space and students as cost drivers to research or teaching
3. Allocation of the costs of institutes and deans' offices to research or teaching
4. Allocation of costs of state-financed staff using time allocation mechanisms
5. Allocation of teaching costs to different study programmes

Since 2000 TUD has worked with this model and the software that was developed in parallel. In order to improve the allocation of costs of state-financed staff, the implementation of a new time allocation mechanism is planned for 2013.

Further development

Since 2010 the further development of the model has been driven by EU state aid rules and German tax law. In this context it became necessary to operate an 'audit-proof' distinction between economic activities, i.e. in which TUD scientists compete in an open market, and non-economic activities.

The first aim was to better identify the costs for economic activities with external funders, which account for around 10% of TUD's external funds, but affect more than 60% of professors. However, the classification of external activities proved to be challenging.

A two-step testing scheme was therefore developed together with a working group of heads of administration of German universities and academic and administrative staff of TUD. This scheme allows for the categorisation of externally funded projects and activities into ten groups: public third-party funding, teaching, research cooperation, contract research, research services, donations, sponsoring, licences and patents, rental of infrastructure and other activities. Clear and distinct definitions enable all university staff to group externally funded activities into these categories. In a second step the testing scheme enables the classification of these activities into economic and non-economic activities with due regard to fiscal aspects. Another scheme was developed to allow scientists of TUD to calculate and budget their economic activities. Both schemes have been fully in application since 2012.

4.3 Time allocation mechanisms

One of the fundamental aspects underpinning the development of full costing relates to the identification and measurement of the cost drivers. For universities, the most relevant driver is people's time. Capturing that time and allocating it to the various activities, be they teaching or research, is often the most controversial part of full costing.

While there is often an assumption that time recording through daily or weekly timesheets is required for accurate time allocation, in reality there are many different methods, such as staff surveys, interviews, sampling or profiling, all of which can provide sufficiently robust data for activity-based costing models. Whatever the method chosen, there are three fundamental principles that must be borne in mind:

First, it is the 'activity' that is being measured, not the 'object' (for example, time spent preparing a lecture, not time spent on a specific Masters course, since the former is a single activity while the latter may involve a number of activities; or time spent undertaking publicly funded research, not time spent on a specific research project).

Secondly, the chosen model should be robust and applied consistently over time.

Thirdly, the methodology and the objectives of the exercise should be clearly communicated to the community involved.

It is important that each institution selects the method which works best in its respective environment. On the basis of an analysis of more advanced institutions, the following general recommendations can be given:

- The method should not be too complex: an automatic generation of timesheets out of planning data can be helpful in this regard;
- Flexibility and adaptability for different purposes is needed, such as the possibility to have more detailed information for staff working on project funding;
- Acceptance by the academic community is important, since it helps to increase participation, which is important to obtain statistically robust data;
- It needs to be acknowledged that not everything can be measured precisely.

University of Amsterdam (NL)

Founded in 1632 · approximately 33,000 students · more than 5 000 staff · comprehensive university

Personnel costs are by far the biggest cost element. Since salaries are paid monthly, these costs are by nature time-driven. Most of the non-personnel costs related to facilities used by personnel are proportional to time as well (e.g. rent, energy, cleaning, depreciation, interest, etc.). So measuring the time spent on activities by (academic) staff was believed to be the most suitable key in any allocation of (the majority of) costs in the university.

However, since universities in the Netherlands do not have the obligation to state the (full) costs of teaching and research separately in their annual report, until recently there was little pressure to implement a system of time allocation. Universities reported on cost elements (personnel costs, material costs, etc.) and cost centres (faculties, support units, etc.). There was no need to report on the final cost objects (teaching, research and other activities).

When the proportion of contract research reached a considerable level of universities' activities, the situation changed. The need for a system to separate the costs of the different activities became more urgent, because most contract conditions required a detailed report of costs incurred during contract research projects. At that point most universities in the Netherlands started to develop a more or less detailed system of time distribution.

The University of Amsterdam started in the 1990s with a simple procedure, which it applied to the output of the payroll system: a proportion of the salary costs of a project employee (involved in a contract project with specific cost reporting conditions) was separated and charged to a separate project account, in order to represent the proportion of time spent on the project according to the contract agreement.

In the course of time two disadvantages of this approach were discovered: a) it did not reflect the real (actual) time spent; and b) it charged only direct personnel costs (gross salaries) to the projects.

Most contract partners do not accept pre-calculations or assumptions: they are only willing to recover costs based on actual data, which reflects the costs of actual time spent. Some contract partners accept cost charging based on full costing. The inability of the initial simple system to accommodate these two principles led the University of Amsterdam to completely redesign its costing system.

In this redesign process it was recognised that it was useful for all activities (not only for contract research) to know the full costs, based on time allocation of all staff. Therefore a costing system was set up in which time spent by staff is the central cost indicator. In this system, contract researchers can record their actual time spent on projects at the required level of detail according to the contract conditions. This system is presented to them in the form of an employee self-service web-based portal. At the same time, time sheets of all other academic and support staff are generated, based on the collected data on the time apportioned to their different activities, as agreed in their appointments and work schedules. As a result information is provided

on time spent by all staff, whether it derives from actual entry by the individual employee, or from automatic generation by the system in the background based on planning data.

This dualistic time recording system is directly integrated in the HR system, the project system and the financial system. This enables the University of Amsterdam to charge full cost rates, according to the appropriate salary level of each individual, complemented with the relevant full cost rate components, to the accounts of each individual project or activity (teaching, research), regardless of the nature of the funder. The full costs of each activity can thus be compared with the budgets available, whether it is a contract or a regular activity.

As a result information on cost objects can also be included in the annual financial report of the university, even though this is not mandatory in the Netherlands. The information gained through the full costing system helps the University of Amsterdam to play a leading role in discussions with its partners (Ministry of Education, National Research Council, other contract parties) about cost recovery and ways to implement policy decisions with financial implications. The time recording system is an essential part of the full costing methodology of the University of Amsterdam that has been certified by the European Commission for use in FP7.

University of Birmingham (UK)

Founded in 1900 · 26,800 students · 6 000 staff · comprehensive university

The process to collect data on the use of time at the University of Birmingham was originally developed around the year 2000 and has gone through a number of refinements since then. The university was one of the original nine pilot universities working on the project to develop the Transparent Approach to Costing (TRAC) methodology across universities in the UK, and has been directly involved in every major development since then. Consequently the time allocation process evolved in tandem with the rollout of TRAC across the sector.

At the outset a number of key decisions were required:

- Who should be asked to participate (which staff types)?
- What are they required to do?
- How often should the data be collected?
- How can it be ensured that the process produces statistically accurate results?
- How should the information be collected?

In the first round of time allocation surveys heads of school were provided with a spreadsheet file containing a list of all their academic staff, and were asked to allocate the proportion of time spent over the whole of the previous academic year to a number of defined activities.

A full detailed schedule explaining the precise definition of these activities was also provided. These definitions were developed in close cooperation with other universities in the UK and in accordance with TRAC. They covered 'direct' time on income-generating activities (i.e. teaching, research, other) as well as 'support' time (e.g. preparing lectures, writing research bids, etc.). Some heads of school did this themselves, some asked staff to complete them individually and then quality checked them. Once completed, the time data was averaged for each school (but weighted by pay grade) to produce an overall time basis for the allocation of academic staff costs. Heads of school were asked to sign off the summary level view as being representative of the balance of activities. All data was collected via spreadsheet completion.

Before that, the use of timesheets had also been discussed, because some academics actually wanted to report their hours worked, rather than a rough proportion of time spent on different activities. However, it was felt that this level of detailed time recording was not needed for the purpose of full economic costing, and would cause more work, rather than benefits, for all involved.

Further refinements

A number of refinements have been made to the process since the inception with the following key developments:

- Continuous information of staff about the purpose of collecting this data as well as a number of assurances helped to convince employees of the usefulness of the procedure. It was stated clearly that the data would never be used at the level of individual staff (e.g. to monitor performance), and that it would only be used as aggregated data for costing purposes. This helped to overcome the scepticism of unions and staff representatives.
- Annual retrospective surveys were replaced by tri-annual retrospective surveys, because it was found that the distribution of time between the activities was considerably different in semester 1, semester 2 and the summer period.
- An online password-controlled system of submission was developed via a website, which also contained background and supporting information to assist staff in carrying out the exercise. That way the data collection was facilitated.
- It was decided to collect time data from individual academic staff rather than from heads of school. It was felt that the data would be more accurate this way, as heads of school tend to indicate time distribution as it is foreseen in staff profiles or HR plans, rather than how it is actually used by individual staff. However, since it was more difficult to chase individual staff, this at first led to a negative impact on response rates, which went down to about 65%. To be statically valid it should be at least around 70%. Nevertheless, the University of Birmingham considered this change as necessary in the long run to strengthen the ownership of the process by all academics.
- Furthermore, chasing up of non-respondents was devolved to local management at departmental level, an approach which made an enormous difference to response rates, and helped to push them up to around 90%.

University of Derby (UK)

Founded in 1992 following several college mergers, historical roots back to 1851 when the Diocesan Institution for the Training of School Mistresses was created · 21,000 students · 1 600 staff · teaching-focused university

Background

The University of Derby had two drivers for the move to Academic Workload Planning (AWP) as a replacement for the previously used Time Allocation System (TAS). First the university had moved towards a standardised Academic Contract, as part of standardising the employment conditions across all areas of the university. This project had been led by the human resources department, and had succeeded in defining a range of standard allowances that were to apply to its academic staff. This led the leadership to extend the project to define and build a standard Academic Workload Planning tool that would replace the diverse local systems.

At the same time the existing retrospective Time Allocation System was coming under increasing pressure, as academics viewed it as a task with no added value whose benefits were difficult to justify, particularly at local subject area level. The process of TAS was also seen as a finance driven system that lacked accuracy and, as the data was collected in percentage terms, lacked meaning to the individuals completing the forms. Derby is also a teaching-intensive university; many of the issues concerning research and its broader scope were therefore not major factors for most academics.

The 'old' TAS system

For the old TAS system data had been collected retrospectively from all academics (except sessional staff) three times a year through an online system. The online forms had to be completed by the individual academic and approved by the line manager within two months of the end of each period.

However, a couple of difficulties occurred with this system. The categories of activity were broad, it was not possible to identify a research sponsor, the data was collected in percentages rather than hours and it was not possible to use the information for any other purpose. It was perceived as a financial form with little credibility among academics, because its purpose was not clear to them.

Implementation of the new AWP system

The University of Derby therefore decided to introduce a new system of Academic Workload Planning, which allowed for a coherent approach to workload planning across all faculties based on standard allowances. The AWP system was built into the university student system, which made it possible to directly connect it to standard data, such as taught module codes, and to link across other systems. Furthermore it enabled more accurate staff coding in the accounting system.

In order to successfully implement the new system, the process had to be supported at senior management level and the project led by an academic. Furthermore the staff unions needed to be involved in order to create a system that was acceptable to academic staff. In this way ownership of the new system by academics and their faculties was ensured and the new system was not perceived as yet another obligation from the finance department. The finance department was involved to ensure the compliance with the UK-wide used TRAC system. Challenges encountered during the implementation process were the need to ensure that the system covers all activities and all different requirements of faculties and subject areas, to clearly define the outputs and the use for faculty management from the beginning, and to avoid overcomplicating the system. The system is not yet perfect and further refinements are required to ensure that the system provides a more complete process for the academic managers, but significant progress has been achieved.

University of Helsinki (FI)

Founded in 1640 in Turku, transferred to Helsinki in 1828 · 37,000 students · 8 600 staff · comprehensive university

The University of Helsinki introduced an online time recording system called SoleTM in 2007. By the end of 2009 most units within the university were using the system. SoleTM is integrated with the data warehouse, and is one of the major systems providing information for full costing.

The main principle is that each member of staff allocates their work time, but accuracy and methods vary. Because the system provides options for detailed time recording, there is a temptation to collect as much information as possible. At the university level, work time is allocated to teaching, research, societal interaction and administration. For internal use each unit can establish an indefinite number of sub-tasks within each main activity. Service-providing and administrative units particularly wanted to use this feature. The staff found time recording to be time-consuming and complicated. Resistance was also based on the fact that for most staff the purpose of time allocation and recording was difficult to understand in the first place. During 2010 and 2011, the recording was simplified without endangering the value of the information collected. Several options for simplification provided by SoleTM, such as creating profiles, were used. The last changes were made in 2011 and today, only staff members who are involved in externally funded research projects record their work time on a daily basis. For the other staff, work time is allocated mainly by using work plans and profiles.

Academic staff

The target for the University of Helsinki is to simplify and streamline the process to minimise the administrative burden for researchers. In accordance with the collective agreement between university employers and employees (2010-2012), academic staff members have an annual work load of 1 600 hours. As stated in the collective agreement, academic staff draw up a plan for how their work time will be allocated between teaching, research, societal interaction and administration. The plan has to be approved by the supervisor once a year and the authorised plan is recorded in SoleTM. The time spent on externally funded research is recorded daily, but for the rest of the work time no additional recording is required. The plans can be revised during the year if there are major changes in proportions between teaching and research. This happens for instance when a course is cancelled and the time planned to be used for teaching is used for research instead. The proportions of work time spent on the main activities of teaching, research, societal interaction and administration are used in the cost calculations for the indirect cost rates.

Externally funded projects

Academic staff members working on externally funded projects have to record the time spent on these projects daily. The allocated hours for each person are subsequently matched with his/her salary in the data warehouse, and the salary costs allocated to the projects accordingly. The SoleTM system provides options for pre-recording and profiling, if the time used on certain projects remains the same over a longer period. The system provides the time sheets that must be supplied to funding agencies.

Administrative and support service providing staff

When work time allocation was first introduced, administrative and support service-providing staff used to allocate their work time on a monthly basis. The administrative tasks were divided into sub-tasks (student support, finance, human resources, etc.) and most departments within the central administration had the sub-tasks divided even further. However, over time it became clear that variations for each person recording their work time were limited, which also led to opposition to time recording in general. In 2011 the recording process for administrative and support service-providing staff was changed, so that the system generates the work time allocation automatically for each staff member to the same profit centre that his or her salary is paid from without any other specification. Active time recording on a weekly or monthly basis is therefore not compulsory anymore. However, it is an option for units that need the information for internal reasons. The libraries and IT centre still require time recording from their staff members. Staff allocate their work time to the tasks they perform and this enables internal cost allocation to the tasks. The information is mainly used when pricing the services provided.

The time allocation system in place provides several options to enable this and some of them have already been introduced. Today, only work time spent on externally funded projects is recorded, while the time allocation for academic, administrative and support staff is generated automatically using profiles and other tools available in the time allocation system.

The University of Oxford (UK)

Founded in the 11th century · 21,000 students · 9 553 staff · comprehensive university

The Oxford academic activity survey (AAS) gathers data on the different activities undertaken by the university's 1 700 academics. Each week around 35 academics are selected at random and are asked to fill in a sheet, which details how many hours they have spent on teaching, research and other activities. Every academic is asked to fill in the survey once per academic year (during the 52 weeks between October and September).

The resulting data updates a rolling four-year database, which is used to apportion the university's costs between activities, in order to complete various returns required as part of the TRAC process. One output from this process is the calculation of the university's Full Economic Cost (FEC) research rates, another is the completion of the subject facts for teaching return (TRAC(T)).

The AAS covers only academic staff whose posts are not directly funded externally. It would be impossible to cost the activities of the university accurately without first understanding the allocation of academic time. The various tasks undertaken by Oxford academics are key drivers of the activities of the university, and their salaries are a key element of the costs.

Academics are asked to complete a return for one week of the academic year (Monday to Sunday), in which they indicate the number of hours spent on a range of activities (such as contact hours for lectures or hours spent on publicly-funded research). Every week of the year is sampled, regardless of public and other holidays, due to Oxford academics having largely self-determined working practices. There is no expectation that every week/person sampled will result in a return of hours; absence due to holiday, for example, would be an equally valid response. There are no links to any other individual records on other university databases.

The response rate averages over 80% and shows no bias in terms of seniority of academic or area of specialty. It is important to maintain a high response rate in order to satisfy external bodies, such as the Research Councils (RCUK) who carry out periodic audits of the Oxford methodology and data.

The data obtained from the survey updates a rolling database, which attributes total non-activity specific costs of the university to five major activities and around 30 detailed sub-activities. The data also helps to inform planning models.

The original objective of the survey was to produce statistically robust academic activity-based cost drivers whilst ensuring anonymity for the individual academic. These objectives have been and continue to be

achieved. Expansion of the use of the data obtained will always have regard for the original objectives of the scheme and these two primary objectives will always have precedence over other uses of the information. An individual's return is never shared with anyone else unless the university has express permission to do so.

4.4 Course costing

Many universities have started to implement full costing in relation to their research activities. Costing models therefore often have a stronger focus on the identification of costs of externally funded research projects, although exceptions exist of course. However, the capacity to understand the costs for an institution's teaching activities is equally important to make effective decisions, manage resources and achieve financial sustainability. Course costing is essential for prioritising resources efficiently, and making effective pricing decisions.

However, as with decisions for research activities, the cost information for teaching activities does not provide all the answers to management questions. It simply reveals how much a course costs. It is one valuable piece of information, which needs to be used and interpreted alongside other information sources.

Course costing is an instrumental part of a full costing methodology aimed at identifying all costs of a university's activities. The following example from the University of Leicester illustrates this.

University of Leicester (UK)

Founded in 1921 · 23,000 students · 3 100 staff · comprehensive university

In 2011 the UK higher education sector considered how the UK standard approach to activity based costing could be actively leveraged to inform management decisions. The course costing project was jointly led by the University of Bath and the University of Leicester, and involved over 30 institutions.⁶

In considering course costing it was important to be clear from the outset about what the project wanted to achieve. Clarity of objective at the start of design and implementation was critical. Costing a whole study level or large course presents very different challenges to costing an individual module where far greater granularity of detail is required.

Most institutions involved in the project opted for a full costing model, including allocation of central indirect costs and space costs. This is an essential approach to ensure financial sustainability and inform pricing decisions. However, marginal costing can be helpful in a limited range of circumstances, such as assessing the cost of running an additional residential element or increasing the student numbers on a course.

In determining the cost of courses, academic and support staff costs needed to be allocated as well as other course-related costs, such as equipment and consumables. Furthermore, overheads needed to be attributed, such as indirect and estates costs, to determine the full cost of individual courses.

The largest direct cost for any course is normally academic staff time, and it is therefore important to develop a methodology to consistently allocate this cost in a robust and pragmatic way. TRAC, the UK activity-based costing approach, was helpful as at the university level the total cost of staff time is split between teaching, research and other. Using the basic premise that the teaching cost must be the sum of all courses, it was possible to generate assumptions to split the total cost of teaching over the courses. TRAC in itself does not allocate teaching across the modes of study or courses, but institutions may have further records which assist this, such as workload planning models and student full time equivalent (FTE) records. Alternatively a standard hourly cost of teaching can be used and developed with varying degrees of granularity. However, it is important to strike a balance between complexity and accuracy, versus convenience and pragmatism.

Other costs may be specifically identified in the institutions' finance system as attributable to a course, or may be allocated using a range of cost drivers. The emphasis is to keep the methodology simple and consistent across the institution. Income should also be matched to courses, including tuition fees, specific funding and an allocation of general teaching grants. Course income minus cost provides the net profit of a course.

Institutions should start by identifying what information they already have, and what the key sources of data are. It is important to not overcomplicate the process, and use standard costs and assumptions where appropriate. The focus should be on the audience that will use the information and the outputs they need. Proactive engagement and communication are key to implementing course costing successfully.

There are five things which the project recommended to do first:

1. Decide why you want to do course costing, and what you hope to get out of it.
2. Get senior management buy-in and support.
3. Find out what data you already have and how you could use it.
4. Work with colleagues across the institution to develop a costing approach and template.
5. Decide what you are going to do first and get on with it.

The University of Leicester developed its own approach, which is being used in full by one college and being developed for the remaining three colleges of the university. It has been a deliberate approach to encourage ownership by allowing the Colleges to develop the methodology themselves. The information has been very useful and sometimes surprising. Most importantly, the provision of some facts and data, albeit supported by many assumptions, has enabled better conversations and decisions around course structures and course futures.

4.5 IT infrastructure

The development of a costing methodology first needs to address conceptual questions regarding the overall design, but it cannot be separated from the issue of data collection and the use of information technology to support the implementation and running of a costing system. Depending on the existing IT environment and the needs and resources of each university, different systems can be considered. The following examples point out a common challenge to the technical implementation. Data is often collected and sourced in different independent systems which cannot be connected. Furthermore appropriate reporting tools are often missing. A major restructuring is frequently required, whose implications go beyond changing an IT system.

The cases from the Technische Universität Dresden, Germany, and the University of Helsinki, Finland, illustrate the long and complex processes involved in developing integrated systems which serve multiple purposes and provide appropriate management information. Both cases also highlight that external factors, such as funders' requirements or broader higher education system reforms, play an essential role in kicking off the change processes. The integration into a broader context requires time, expertise and human and financial resources.

Technische Universität Dresden (DE)

Founded in 1828 as the Royal Saxon Technical School · before German re-unification in 1990: committed to science and engineering · today: comprehensive university · 36,000 students · more than 8 500 staff

Although full costing has been discussed at TU Dresden for years, there was no appropriate IT support to practically implement the preferred full costing model. The university had a heterogeneous IT landscape with different systems, which lacked appropriate connections among them. There was no central system for data, and just a few systems supported a regular adjustment of data. Similarly there was no possibility of modelling a full costing system in the current IT landscape. The university therefore decided to renew the IT

infrastructure and to establish a more homogeneous system. The aim was to have just one central system and one database, which would also support full costing and allow for better reporting.

To reach these objectives the university leadership established the TUDo project ('TU Dresden optimised'), which represented a major change process with far-reaching consequences. It was clear that the implementation of a new integrated ERP system to support full costing would not only be expensive, but also required an appropriate project approach and the full engagement of the university community. The participation in the German excellence initiative⁷ gave the project a further focus and reinforced the need for appropriate IT support.

The first phase of the project started with an analysis of institutional processes, which involved 160 employees. In a second step the identified processes were analysed in relation to their weaknesses. This was followed by prioritisation and process optimisation. In parallel all existing IT systems dealing with resource planning both at central and decentralised levels and units were listed. In a second phase, the university launched a call for tenders, including specifications of services based on the established target processes. The implementation phase started in 2012, and is being rolled out over the next years. Some of the success factors were the support of the management team that had a clear vision, the set-up of a steering committee, including institutional and faculty leadership, and an experienced project manager.

University of Helsinki (FI)

Founded in 1640 in Turku, transferred to Helsinki in 1828 · 37,000 students · 8 600 staff · comprehensive university

Until 2009 the University of Helsinki had an accounting system in place that was designed for state accounting but did not meet the financial reporting requirements of the faculties and central administration of a university. Financial data was therefore transferred to a data warehouse, and since 2001 financial reports were designed using more appropriate tools. Today data from more than 10 systems is transferred to the data warehouse, some on a daily, and some on a monthly basis. The University of Helsinki replaced the old accounting system with a SAP system at the beginning of 2010. Although SAP provides tools that satisfy financial reporting needs, the data is transferred into the data warehouse on a daily basis to be used in more comprehensive activity reporting. Some of the reports for external research funding agencies that require full costing cannot be produced in SAP.

The data warehouse provides the basis for the new management information system, which the university implemented in 2009. The system includes tools for strategic planning and budgeting. The university reform in Finland that took effect on 1 January 2010 enabled the introduction of new processes, new systems and internal structural reforms. The number of departments was reduced radically and the new larger departments' status as financially accountable units was enhanced. The university abandoned its internal funding allocation formula, and introduced a new budgeting system as part of the management information. Previously the strategic plan and the unit-specific action plans were in one IT system and funding allocation calculations were made using Microsoft Excel. Today plans and budgets are integrated into a single system that provides information from the data warehouse. All plans follow the same structure which enables both summaries and comprehensive reporting. The defined key performance indicators can be monitored through the year because the information needed is in the data warehouse, even though the data is produced in different systems.

The next step will be to extend the system with a module for project management. It will be possible to manage a research project from the application phase until completion. Information about unsuccessful applications will also be stored in the system, providing useful information for research support. The heads of department will also have access to information about pending applications, which could be valuable when setting annual budgets. The implementation of the project management tool will happen in phases. At first only research projects that have already been approved for funding will be recorded. At a later stage the option to use the system at application stage will be introduced. It will provide principal investigators with a tool to assist them in resource planning for their research projects. Information on each staff member's salary and engagements with other projects will be available and the total workload for each person will thus be easy to estimate. Information on salaries will also be useful when designing project budgets.

⁷ The excellence initiative is a competitive funding scheme of the German Federal Ministry of Education and Research and the German Research Foundation, which aims to promote cutting-edge research.

5 The application of full costing and how to use it

Once full costing is implemented it can provide useful data on the financial performance of the university as a whole and of its individual faculties, schools, departments, and so forth, depending on how far the analysis is broken down. It may become apparent that an activity of a university costs more money than it brings back to the institution. But this as such does not mean that it cannot be useful for the institution in other respects, such as reputation, societal interaction or academic attractiveness. Full costing allows the university leadership and management to make informed and conscious decisions about interdisciplinary cross-subsidising based on the institutional strategy. In order to be able to use full costing data strategically, it has to be processed in an adequate way, which is why the development of appropriate reporting tools is essential. When developing such reporting tools it is crucial to consider the users of the data and their needs from the beginning. The following examples from the National University of Galway (NUI Galway), the University of Birmingham and Edge Hill University demonstrate how full costing can be used in different ways.

NUI Galway (IE)

Founded 1845 · 17,500 students · 1 600 staff (FTE) · Comprehensive university

The university is organised into 35 ‘divisions’, including five colleges, 14 schools, two academic units, eight major research centres and six major support service units (estates, finance, staff, IT, library and student services).

The purpose of divisional reporting

Activity-based costing systems, in use in the Irish university sector since the early 1990s, have been successful in identifying costs per student per course group, and enabling product pricing, profitability exercises, funding advocacy and cost benchmarking. The systems in place were less valuable for detailed strategic planning and review at individual institution or decentralised academic unit level (colleges, schools, research centres, etc). This is due to the complexities of interdisciplinary academic activity within the university and the centralised nature of most of the university’s support services.

In order to address these issues ‘divisional reporting’ was developed and adopted as policy in the early 2000s. The system was implemented at NUI Galway initially in the mid 2000s and currently requires further development to reflect the involvement of core faculty staff in contract research activity.

Divisional reporting structure and methodologies

The reporting framework at NUI Galway reflects the organisational structure. Essentially all relevant income and expenditure is assigned to each unit or ‘division’, and is reported on a budget versus actual basis each month. In relation to student fees and grants, income is apportioned to each division on the basis of an agreed formula, which reflects each division’s contribution to various course groupings.

All direct costs are coded directly to each division in real time. All indirect costs are allocated to divisions on a monthly basis using agreed cost drivers. The cost drivers used are the same as those used for the annual activity-based costing exercise. Support service net costs are then allocated to academic divisions (e.g. schools, research units). The resulting income & expenditure account for each of these divisions provides up-to-date detail of all its income and costs and the resulting net surplus or deficit position of the period under review. Results are also summarised and reported to the five colleges which are the highest-level divisions of the university.

Benefits of combining activity-based costing and divisional reporting

The annual activity-based costing exercise provides a ‘cost per student per course grouping’ as outlined in the following examples:

Table 2. Cost per student per course at the NUI Galway

Cost position	Euro
Arts undergraduate	8 060
Medicine undergraduate	11,451
Engineering postgraduate (taught)	12,530
Science postgraduate (research)	19,157

These costs are then compared against ‘average weighted income per student per course grouping’ to highlight course profitability, benchmark both internally and externally, inform pricing policy and support funding advocacy.

The traditional ‘unit costing’ system was instrumental over the last decade in re-allocating government funding across the sector on the basis of demonstrated relative productivity.

The recently introduced full economic costing system is far more sophisticated than the previous system and identifies costs of research activity as well as costs of teaching and other activity.

Usefulness of divisional reporting for strategic management

The divisional reporting model of NUI Galway assigns both income and costs to individual divisions. These reports provide useful information for the management of these different units. They also encourage a greater sense of ownership of and responsibility for financial outcomes. This in turn empowers and energises strategic management at the different levels within the institution.

The initial model which focused on core activities did not adequately integrate research centre outcomes into school and college reporting. This misrepresented the elements and drivers of income and related costs, presented inaccurate information for decision-making and may have led to poor strategy formulation.

By 2008 the methodology had been improved and research centres were fully integrated into the system. The comparison below of the summary income & expenditure accounts for the College of Science demonstrates the benefit of the current model:

Table 3. Summary of the Income and Expenditure Accounts for the College of Science at the NUI Galway

Cost position	Repartition	2004 Million Euro	2008 Million Euro
Income	Core	29	29
	Research	–	16
	Total	29	45
Expenditure	Core	18	18
	Research	–	16
	Overhead	14	22
	Total	32	56
Surplus / (Deficit)		(3)	(11)

Detailed reports of individual schools and research centres highlight the various elements contributing to the net financial outcome, and assist the management of the different units in developing strategies to address them. The divisional reporting framework also focuses the attention of the senior university management on the strategic issue of sustainability of major areas of activity. In this way the divisional reporting system provides management at all levels with a detailed basis on which to plan and manage activities. Change strategies implemented to date include additional income generation as well as productivity and efficiency programmes, such as realignment of human resources and pay rates.

The strategic benefit of combining activity-based costing and divisional reporting methodologies is derived from the resulting ability to engage both internal and external environments in informing decision-makers at all levels of the financial impact of current arrangements and in prompting change.

The University of Birmingham (UK)

Founded in 1900 to serve the Midlands · 26,800 students · 6 000 staff · comprehensive university

The University of Birmingham has been directly involved in the development of full costing across the UK higher education sector since TRAC was first introduced, and was one of nine pilot universities supporting the project to develop the initial methodology to be rolled out across the sector.

Once the national project had been embedded, the university began to focus on exploiting its full cost information dataset in a strategic way. This coincided with a shift in organisational structure (19 schools to five colleges), a new executive management team, and a new vice-chancellor, all intending to deliver a positive step change in the academic performance of the university.

The system for resource allocation was also reviewed, resulting in a number of recommendations for change. The old system had become overly influenced by internal allocations to manage financial imbalances and therefore lacked clear insight or transparency into the real areas of financial strength or weakness across the university. A new broader system of performance management was introduced, including both non-financial indicators and traditional financial measures. The need to deliver growth in levels of activity, manage base expenditure budgets effectively and create the capacity to invest was recognised as a financial imperative.

Full cost information has been widely shared across the university with the outputs (at least in the first instance) generating significant interest. Pictures (i.e. graphs), numbers (and their presentation) and words (in terms of insightful narrative) have all been part of the communication process and carefully considered before their release. The data has also been used for a variety of purposes, such as school income and expenditure statements, business cases for new investments, costing and pricing new activities and ad hoc exercises considering the relative cost of space across the campus.

The university leadership is a keen advocate of the organisational benefit of this information and its support has been instrumental in generating interest. This has enabled a challenging process to be rolled out across the key management teams of the university, which couples financial sustainability with academic success.

Edge Hill University (UK)

Founded in 1885 as the first non-denominational teacher training college for women in England · 27,953 students · 3 359 staff · teaching-focused university

A key benefit for Edge Hill University is that, by supporting a drive to increased surplus levels, the implementation of TRAC and FEC have protected the institution when facing major cuts in public funding and ensured that it can continue to develop in those areas where it has chosen to set its priorities.

Edge Hill University used TRAC and the accompanying analysis to have an informed and evidence-based debate about the levels of surplus it needed to generate in order to be a sustainable university. The executive team and governing body agreed that it was necessary to generate an institutional surplus of 8% over a four-year period. This was necessary to allow the institution to further develop its portfolio, to strategically develop its estates, to invest when opportunities arise and to deal with changes to the cost base (like staff cost increases) and changes in government policies. It further allows the institution to flexibly support those areas that are unable to maintain elements of their activities in a sustainable way.

Despite incurring substantial losses in its research activities, Edge Hill University has chosen to undertake various levels of work in this area in order to support the institution's brand, reputation and stakeholder perception. Despite sector-wide cuts Edge Hill University continued its investment in teacher training, further strengthening its position as a competitive provider for the future and taking advantage of the demographic development over the coming years. The income generated from various operations has enabled the university to continue to invest in its campus and the infrastructure which it considers to be a major element of its academic offer. The use of TRAC and FEC played a crucial role to inform these strategic choices.

Annex

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Country profiles

The following country profiles have been developed by compiling and analysing information from the EUIMA-Full Costing project, as well as the first EUA study on full costing (EUA 2008) and the EUDIS study on the diversification of universities' income streams (EUA 2011c). They describe the drivers, challenges and obstacles of the implementation of full costing in universities of the respective country as well as the approach which was taken towards the organisation of the process and the current state of play.

Austria

The Universities Act of 2002, which came into effect on 1 January 2004, states that Austrian universities become autonomous legal entities under public law, and that every university shall install a commercial accounting system, including income and expenditure accounting, and a reporting system. Furthermore, the sections concerning externally funded research projects stipulate that these projects shall cover the full costs. Necessary prerequisites for this include the use of a comprehensive financial software programme, double-entry bookkeeping and structural changes. Because of these obligations, universities in Austria started to develop a costing methodology. Another important driver was the 7th Framework Programme with its reimbursement rules. Austrian universities therefore sought a common approach to the implementation of full costing. In 2006 a method was developed to calculate indirect costs, which would reconcile national and international financial rules and the universities' own management and accounting principles.

A task force comprising finance and research staff members from Austrian universities evaluated the method and the Austrian rectors' conference agreed to promote it. The model was also meant to receive certification from the European Commission to be accepted as a simplified method for the calculation of indirect eligible costs under FP7.

However, for various reasons and due to different obstacles, such as changes in management, uncertainty about the certification process of an FP7 methodology, the fear of misunderstandings in the interpretation of regulations and differences among universities regarding research funding sources, the unified approach was abandoned in 2007. Since then individual universities have adopted different approaches to develop an appropriate system for tracking the costs of research, education and other activities, and implement it according to their own abilities, needs and conditions.

The ongoing discussion in Austria about major changes to government funding through the separation of teaching and research funds have once again brought the discussion on full costing to the fore. A working group consisting of representatives of the Ministry of Higher Education and Research and university representatives has been formed in order to define the cornerstones of a new funding system. As far as funding of teaching is concerned, one of the working group's recommendations is to base funding on the number of active students. The working group's calculations are partly based on existing full costing models in Austrian universities.

The EUIMA-Full Costing country workshop, which took place in February 2011 in Vienna, addressed the issue of how full costing methodologies can inform new funding systems, and help to ensure the financial sustainability of the Austrian higher education system. The workshop thus revitalised the debate about full costing implementation in Austrian universities. Through recommendations from EUA, international experts and a series of high-level Austrian stakeholders, including the Minister for Research, the former Minister of Finance and the leadership of Austrian universities, the workshop significantly contributed to current debates on higher education funding in the country. It highlighted how full costing can provide more transparent information to underpin the creation of a new sustainable funding model.

Belgium

In Belgium education and research policies are the remit of the language communities. Universities in Belgium operate in two different and independent legal frameworks, whose funding mechanisms are regulated by the Flemish and the French-speaking communities. Although full costing has been a topic of discussion in both communities, the development process has been different. The profiles of the two existing systems are therefore presented separately.

Flemish-speaking community

The discussions about full costing implementation in Flemish universities started in 2007 with the reimbursement rules of FP7 as an important driver. Institutions also felt the need to be able to show to public funders the real costs of their activities. During the development the institutional strategic benefits of full costing became more apparent, especially in view of budget constraints.

The Flemish Interuniversity Council (VLIR), the representative body of the six Flemish universities, committed itself to support the implementation process between 2011 and 2013. In most universities preparations began in 2010 when the necessary human resources were allocated to the project. Within the universities the process was coordinated by the finance departments, sometimes in collaboration with the research departments. The university management and academics are included in the project steering groups. Today universities are at different stages of development: effective implementation has started in most universities, some are already advanced,⁸ and have put a system in place. In the more advanced institutions full costing is seen as an important step towards a better understanding of their activities. In most universities full costing projects are incorporated into strategic plans and the university board is kept informed through quarterly reports. Although progress is being made, Flemish universities have to deal with common obstacles, such as resistance within the academic community, a major concern being time allocation mechanisms, and limited resources set aside for implementation.

The Flemish Interuniversity Council supports the process, and encourages universities to share experiences and exchange good practices.

French-speaking community

FP7 was also a major driver for the universities of the French-speaking community in starting discussions on the implementation of full costing. The Free University of Brussels (ULB) recently began discussions and the Catholic University of Louvain set up a task force to examine the possibility of developing a full costing methodology in 2008/2009.

However, full costing was in the first place perceived as a way of achieving higher cost coverage in FP7 projects, which led to some hesitation among institutions. Since the certification process to accept a costing methodology as developed by the European Commission proved to be highly complex and uncertain, universities were discouraged and plans for the implementation of full costing stagnated.

The discussion was revitalised at the EUIMA-Full Costing country workshop in Brussels in February 2011, where the benefits of full costing as a strategic management tool were once again emphasised. As a result, the Catholic University of Louvain (UCL) reactivated its task force and developed a project plan, which aims for further implementation steps in 2012. The Free University of Brussels (ULB) originally planned to implement full costing in parallel with a new Enterprise Resource Planning System (ERP). However, this proved to be more difficult than expected and it was therefore decided to fully implement and operationalise the ERP system before developing a new costing methodology. Other institutions, such as the University of Mons, are facing challenges regarding the acceptance of a specific time allocation system. A lack of autonomy in setting up the necessary structures and the lack of financial and other types of external support are also seen as problematic.

Further development in both communities

The EUIMA project workshop on 4 February 2011 gathered representatives and universities from both parts of Belgium to discuss and explore common approaches to the development of full costing in Belgian universities.

⁸ E.g. Catholic University of Leuven and Ghent University.

Although the processes and follow-up activities differ between the communities and across institutions, the workshop gave new momentum for the take-up of further activities.

One of the major achievements was that in both systems the rectors' conferences, as well as some regional and federal funders voiced their support for the development and implementation of full costing methodologies. Both communities have also organised follow-up meetings during which they will discuss concrete steps to take forward the implementation process.

Croatia

The process of full costing implementation started at the University of Zagreb, which hosted the EUIMA country workshop in June 2010, and initiated the debate in Croatia. The workshop gathered more than 60 participants from nearly all Croatian universities, including the senior leadership, administration and academic staff members. One of the central issues addressed during the workshop was the highly decentralised structure and governance of Croatian universities, which present a major challenge to complex reforms, such as the implementation of full costing. The workshop succeeded in bringing together both the leadership and management staff of Croatian universities and therefore represented a unique opportunity to discuss concrete plans. A crucial result of the workshop was securing the commitment of the University of Zagreb, which, as the largest university, often acts as a national driver for change. The university committed to setting up a high-level working group involving all its faculties to foster the implementation of full costing. Other Croatian universities were also invited to join the group, and agreed to work together in the future. The group has held several follow-up meetings, which have paved the way for a coordinated approach at national level. In early 2011 the University of Zagreb began working on a project plan, and agreed to jointly develop a full costing methodology with the Universities of Rijeka and Split.

Croatian universities face a number of challenges, such as the diverse accounting systems used by individual faculties, which are traditionally based on a budgetary accounting concept. The goal of these systems is primarily to comply with the legal requirements of external reporting, rather than providing quality information for effective internal management. Information regarding costs incurred for special programmes or international projects cannot be extracted. The universities therefore plan to develop a costing model that identifies and monitors all costs related to university activities. There is still a lack of government support and funding and, following the recommendations of EUA and international experts, ensuring government support for the implementation process will be one of the project group's primary challenges in the near future.

Finland

In Finland the main drivers for full costing implementation at universities have been national and European funding schemes. Since 1997 Finnish universities have been required to report annually to the Ministry of Education on how their total expenditure (both budget and external funding) is allocated to teaching, research, artistic endeavours and societal activities. To be able to do this adequately, universities should have fully introduced activity-based costing, including a work time allocation system. This was controversial, however: unions claimed that the introduction of such a system would be in breach of a collective agreement for academic staff with teaching responsibilities, which came into force in 1998. According to this agreement, the result of a person's work could not be monitored through their number of work hours. Information on the distribution of hours was only available for projects requiring compulsory reporting, and was collected through surveys with low response rates. The state audit office noted in its annual audit reports that the cost calculations were not reliable because of insufficient work time allocation data. This led a number of institutions to take the first steps towards implementing work time allocation by acquiring an online time allocation system in 2007.

Another important driver for the development of full costing was the European Commission's 7th Framework Programme (FP7), whose specific regulations for cost reimbursement also sent a strong signal to national funders.

In its annual negotiations with the Ministry of Education one of the two major Finnish research funding bodies, the Academy of Finland, had agreed to accept full costing methodologies in its reimbursement regulations from 2009 onwards. The other major research funding body Tekes had made the same decision at the beginning of 2009. This removed one of the major obstacles to implementation, and convinced university staff of the necessity to implement full costing in order to increase reimbursement from external funders. Eventually a model that satisfied all parties, including the unions, was found and agreed on. The time allocation for tenured staff would be based on annual work plans; actual time recording would be required only for externally funded project work.

The tight schedule introduced by the Academy of Finland represented another challenge. From the beginning of 2009 applications for research funding had to be made on the basis of a full costing methodology. The universities only had six months to establish the methodology and calculate the salary add-on rate and the general indirect cost rates. At the same time universities had to adapt to the major changes introduced by the national higher education reform, including several university mergers. The tight schedule combined with the new 2009 Universities Act made cooperation between universities difficult. Instead of working towards a common national model, each university created its own full costing model. Support from the Ministry of Education in facilitating a successful transition to full costing was rather weak. Nonetheless, despite the tight time schedule and lack of coordination, most universities had established the full costing methodology and time allocation system by the end of 2009.

As a result of the lack of cooperation between the universities and funding bodies, Universities Finland (UNIFI; formerly the Finnish Council of University Rectors) in 2010 expressed its concern over certain problems encountered during the application of the full costing methodologies, which mainly related to funding applications, reporting, invoicing and work time allocation. In response to this the Academy of Finland established a working group, comprising members from universities, the Academy of Finland and the Ministry of Education and Culture, to put forward a number of simplifications and clarifications. Their report (Finnish Ministry of Finance 2011), which was published in 2011, makes 20 specific recommendations, which also draw on the EUA report from 2008 (EUA 2008). It has been used as a guideline by Finnish universities to implement full costing.

Today all Finnish universities have put a full costing methodology in place. Even though there was no national coordinated approach, the models used are similar. Work time allocation, which was one of the most difficult aspects of full costing implementation, is slowly establishing itself in universities.

Full costing is used mainly when applying for, invoicing and reporting on external funding provided by the Academy of Finland, Tekes and the European Commission. However, the complexity of the certification process for a methodology for a full cost reimbursement in FP7 has meant that no Finnish university has applied for the certificate. In fact all universities which have been awarded grants within FP7 have used the flat rate. Although full costing is not yet being used to its full potential and as a strategic tool, cost-awareness among staff and especially heads of departments has increased. For instance, decisions on the capacity to take on a project and its implications are now taken more consciously, depending on how it is funded, how much self-financing is required and what added value it represents for the university.

France

The main driver for the implementation of full costing was the common requirement on behalf of funding bodies to put into place appropriate costing methodologies. In some cases the 7th Framework Programme (FP7), with its specific modalities for cost reimbursement, also fostered its development and implementation. More recently the issue has been placed in the context of universities' financial sustainability, institutional management and steering. The Ministry of Higher Education and Research also regards full costing as a tool to provide information for long-term forecasting based on a better understanding of costs.

The development of full costing was initiated in 2005 by AMUE (Agence de Mutualisation des Universités et Établissements), CPU (the conference of French university rectors) and a group of university representatives, including presidents, accountants and financial officers. This was followed by a pilot phase in 2006 and 2007. Although AMUE put forward a methodology, tools, techniques and joint training, each institution

developed its own approach matching its specific context. The projects were usually initiated by the university leadership, implemented by financial officers and managers, and frequently overseen by the vice-president for financial affairs. Although a few universities have reached an advanced implementation stage,⁹ many others are still in the initial planning phase.

One of the major challenges encountered is the reluctance of academics, who see full costing mainly as a controlling tool used by the private sector. Time allocation represents another obstacle. Universities therefore take a cautious approach. Involving the institutional leadership and ensuring ownership of the process by university staff is seen as crucial.

The EUIMA-Full Costing country workshop brought additional momentum to the development of implementation plans. Discussions between over 100 participants from 66 French institutions fostered cooperation among a large number of new stakeholder organisations. The event also reconfirmed the commitment by AMUE and CPU to accompanying the implementation process and regularly discussing related issues in a specialised CPU committee with university presidents. Following the workshop AMUE organised a two-day conference at which French universities presented their ways of cost calculation and the use of this information in institutional steering. Furthermore around 40 university practitioners participated in special accounting training in 2011. Further workshops on specific topics, including contract research and costing of laboratories and degrees, are scheduled for 2012.

Germany

The first attempt to introduce cost accounting in German universities was made by the working group of heads of administration, who formulated a system of cost accounting rules in 1999. These rules were approved by most German universities during a meeting at the University of Greifswald in the same year, resulting in the so-called 'Greifswald resolution'. These principles were subsequently accepted as a basis for good practice in university accounting by the German Institute of Chartered Accountants. The Standing Conference of Ministers of Education and Cultural Affairs also approved the rules. However, the finance ministers of the federal states, who are in charge of accounting systems in their respective state, did not grant their final approval, and the 'Greifswald resolution' was therefore not applied throughout the system. Nevertheless it significantly influenced university accounting in Germany.

The cost accounting framework developed by the Federal Ministry of Finance in cooperation with the 16 State Ministries of Finance also shaped accounting practice in German higher education institutions. Sixteen different systems were developed on the basis of this framework. However, the framework mainly addressed the needs of public administration, rather than those of higher education institutions. To make the situation even more complex, some states were at the time already moving from cameralistic to double-entry bookkeeping.

FP7 and the Community Framework for State Aid for Research, Development and Innovation (RDI Framework) were major drivers in the debate on the implementation of full costing. Furthermore, due to the increasing engagement of many German universities in external cooperation at national level, institutions identified the need for appropriate costing methodologies.

The federal nature of the German system, which results in different legal frameworks and practices in the 16 federal states, makes it difficult to evaluate the current state of play of full costing implementation at German universities. Only in some cases is the development of full costing coordinated by the states through working groups and guidance in the implementation process. Additional resources were generally not made available.

In Germany full costing methodologies are mainly used to prove the full costs of externally funded research and thus to receive higher reimbursement, notably for indirect costs. This also contributes to an enhanced understanding and awareness of costs in German universities and to a more effective use of funds. Two major challenges remain: time allocation, and the fact that not all costs appear in a university's accounting system (due to different rules and regulations concerning the status of ownership of buildings, the costs of building maintenance, depreciation or pensions are not yet included in the system).

⁹ Université d'Aix-Marseille 2 for FP7: merged on 1 January and became Aix-Marseille Université; Université Pierre et Marie Curie (Paris); Université de Savoie (Chambery et Annecy); Université de Nancy 2: merged on 1 January and became Université de Lorraine; Université de Technologie de Troyes; Université d'Angers (for research contracts); Université de Rennes 2 (for continuing education).

Ireland

The development of full costing in Ireland was initiated collectively by the seven Irish universities in 2006. Irish universities were going through a significant reform process and the Irish government, through the Higher Education Authority (HEA), the state higher education funding agency, initiated a Strategic Innovation Fund (SIF) to support reform and innovation in the Irish higher education system.

A major driver to develop and implement full costing were growing pressure on universities' finances, because of increasing participation rates and research activities, advances in technology, increasing pay and pension costs and new societal demands. It became clear that to address concerns regarding underfunding and sustainability the university sector needed to collect clear data to support policy making, and particularly provide evidence to support the case for additional funding. From a funder's perspective full costing was seen as an accountability tool, which would deliver greater transparency and comparability. The development of a full costing system was seen at an institutional level as a key management information tool that would allow universities to identify and understand the cost of their activities and thereby support strategic decision-making.

The full costing project started in early 2007 and was completed in June 2011. The Irish universities believed that there would be significant benefit in developing a consistent model across the sector and this was also an important consideration for national funding agencies. Through the Irish Universities Association, the representative body for Irish universities, the universities submitted a successful proposal under the SIF programme to develop a framework for full costing for the sector. Total funding of approximately 2 million Euro was provided for the development of FEC. This support was a key enabling factor in the development of full costing in Ireland.

There were two distinct phases to the project. Phase I involved the development of a conceptual framework for full costing and during this phase representatives from key national funding agencies participated in the project's national steering group. Phase II involved the detailed design and implementation of full costing in universities. Each of the seven universities was represented in the national steering group and various project working groups, ensuring that all universities had an opportunity to provide input to the design of the model.

A number of challenges were encountered in developing and implementing the full costing model. In particular, data collection on how academic staff spend their time proved problematic. Data was gathered on the proportion of time spent by academics on their various activities and assurances given that the information would not be used for any purpose other than full costing. Despite such assurances, difficulties remained in some institutions and alternative processes were put in place by heads of schools and faculties to gather the necessary data. It also became clear that strong project governance structures are essential in addressing the challenges associated with a national coordinated approach.

Implementation of a consistent full costing model is now complete in all seven universities in Ireland. Further refinements are being made to the models and these are being coordinated centrally to ensure that the consistency of the models and comparability of the outputs is retained and protected. Once appropriate and sufficient trend data is available, next steps will involve the consideration of a number of policy issues for the Irish higher education system arising from full costing outputs.

The external environment has changed significantly since the Irish universities first embarked on this project. The intended benefits that were anticipated to arise from the ability to more accurately measure the real cost of university activities were significantly undermined by the impact of the economic crisis. On the other hand, the financial crisis and resulting pressure on public funding has in many ways reinforced the need for improved management information in respect of the cost of university activities. The long-term benefits to universities and their wider stakeholders thus remain.

Netherlands

Despite a very high degree of financial and organisational autonomy, the Dutch Government has not required universities to implement full costing. Nevertheless most universities in the Netherlands have implemented full costing methodologies. Drivers for implementation were either the terms and conditions of contract

research, which offer a better cost recovery rate to institutions that can identify the full costs of their activities, or the need for reliable financial information for the support of internal decision-making.

In 2007, driven by the 7th Framework Programme (FP7) and its forms of cost reimbursement, all Dutch universities agreed to respect a set of specific principles in developing their full costing methodology. These were approved by the individual universities on the advice of the Association of Universities in the Netherlands (VSNU). The aim was to secure a set of common definitions and to have comparable full cost rates.

Since then, however, each university has worked individually on the design and implementation of a full costing methodology without support or guidelines from national authorities. The result is a very diverse situation. Most universities have a full costing methodology in place, which allows them to identify the costs of the majority of their activities. Nevertheless, in many of these institutions the system is not integrated into their financial system, but run in supplementary systems. Some institutions have implemented a very sophisticated methodology to also use full costing for their strategic decisions.

Universities very actively exchange experiences and good practices in the development of full costing at an informal level. These exchanges address, in particular, principles of time allocation, ways to separate indirect costs related to teaching and those related to research, the relevance of specific cost drivers and the overall model in which to integrate the chosen parameters. However, there is still some reluctance to further develop the system, as this would require more changes in the financial system and a change of the institutional management culture.

In 2012 a coordinated initiative has been undertaken to explore whether the national research council would accept full costing methodologies in its funding scheme. This is considered as another potential driver for the further development of the system at Dutch universities.

Those universities that have implemented full costing throughout the organisation have realised a better cost recovery rate with some contract partners, increased cost awareness at all levels within the organisation, and identified opportunities for cost reduction.

Poland

Discussions about the development of full costing were fostered by FP7 and its forms of cost reimbursement. Universities, other beneficiaries in receipt of FP7 grants and the Polish National Agency for the promotion and support of applicants to the framework programme started debating the implementation of full costing in Polish universities.

In 2007 and 2008 the Polish Ministry of Higher Education announced plans to increase the budget for competitive grants and to reduce institutional core funding. This raised awareness among universities of the need to better identify the costs of their activities. Public discussions on the funding and costs of higher education in 2009 and 2010 further underlined the need for transparent financial management. Despite these pressures only three universities (Silesian Technical University, Technical University Wroclaw, University of Warsaw) have so far started to implement full costing by developing suitable models.

At system level there is neither a coordinated approach nor support from the government in the form of human or financial resources. In addition, new regulations on financial management in higher education, which came into force in 2011, do not sufficiently take into account universities' research activities. This makes the development of a coherent methodology more difficult. Institutions have responded to the new legal provisions for financial management and accounting by prioritising the implementation of changes that are not linked to full costing. The adaptation of universities' IT systems will represent another challenge in the implementation process.

The country workshop in Warsaw was mainly aimed at raising further awareness, particularly among the institutional leadership, to provide new momentum for additional activities. The elections of a new leadership in 2012 in many universities will be another step in the further development of full costing in Poland.

Portugal

In 2007 a new legal framework for higher education set new rules for university governance, which included specific regulations for accounting. Although this theoretically paved the way for cost accounting in universities, national funding schemes for research in Portugal remained unchanged. Portuguese researchers are thus predominantly accustomed to receiving their research funds on an additional cost basis.

Full costing methodologies were considered relevant only with regard to FP7 projects. FP7 reimbursement rules were among the main drivers for starting discussions on the development of full costing. However, there was no coordinated approach at system level or support from government.

Nonetheless, a few universities started to develop a methodology, which, even prior to the impact of European funding, was also seen as a strategic management tool. The University of Coimbra for instance started with a pilot project at one faculty in 2002, and extended this to other faculties in the following years.

At the moment four universities have more advanced full costing methodologies in place. Some of the institutions that have discussed implementation faced big difficulties in the process, due to a highly autonomous faculty structure. This certainly represents an additional challenge. Clear leadership commitment and enforced communication efforts have usually been essential to achieve progress.

Although discussions about full costing have become livelier in recent years, the exchange of experiences between institutions was limited to a few events, at which some aspects of full costing were discussed and limited benchmarking activities between individual institutions undertaken. The EUIMA study visit at the University of Coimbra also gathered a number of Portuguese universities. At the level of the national higher education system, the workshop led to participating universities comparing their different levels of development and engaging in further exchange.

It also helped to define further goals for the implementation of full costing, such as the definition of general rules and a methodology with a view to a regular framework for contractual activity; the increase of the involvement of researchers in European projects; the enhancement of technical skills and knowledge of staff for back office support to researchers; the encouragement of researchers and research teams to work predominantly with funding programmes allowing for full costing as well as an increase in income for the university.

Sweden

Full costing has been discussed in Sweden for many years. While external funding with limited contribution to indirect costs has increased, direct government funding has been relatively stable. On average less than half of research funding is direct government funding and for some universities the share is even lower. In 1990 there was a parliamentary decision that external research funding should contribute to both direct and indirect costs of universities. The level was set at 12% (of direct costs) for indirect costs, excluding costs for premises. The level has then increased over the years. In 2001 there were negotiations between universities and funding organisations, which led to an agreement on 18% for indirect costs and 17% for costs for premises, thus 35% in total.

In the mid-2000s this agreement was questioned by several funding organisations who wanted to pay less. The university leadership also realised that with increasing external funding indirect costs must be shared proportionally between the government and external funders. At the same time the Swedish National Audit Office criticised several universities for incorrect income accounting, especially concerning accounting principles related to the financing of indirect costs. This led to an initiative by chief financial officers at several universities to develop a full costing methodology. The so-called SUHF-model (SUHF = the Association of Swedish Higher Education) was developed in cooperation between the university management, financial officers and representatives from important research funders. The work was conducted through groups representing all universities and university colleges in Sweden, both on a management and an administrative level.

In autumn 2007 SUHF decided to recommend to all its members to adopt the SUHF-model. Starting from 1 January 2011 all Swedish universities and university colleges implemented the model. However, the challenge of calculating the costs for premises that are mostly rented by universities has not been overcome yet. Clarifications, minor changes and follow-up on the model, including solutions for costs of premises, are currently being discussed by a group within the SUHF.

The SUHF-model is based on budgeted, not actual costs. Corrections must be made retrospectively for cost deviations to show the actual costs. Each institution has different time allocation methods, but these are often based on management estimation, rather than on time records.

The most important drivers for change came from inside the institutions. Full costing was needed as a strategic management tool, as well as for decision-making and improved internal control. Furthermore there was a need to improve accounting principles and achieve long-term financial sustainability.

An important external factor was the need to be able to provide accurate and transparent information on indirect costs, and thus regain confidence and understanding from funding organisations. The rules for reimbursement under FP7 also played an important role.

Implementation in Sweden was coordinated, and the general common principles, definitions and language documented by SUHF. Workshops were organised at national level to support the implementation teams in each institution. An information package was developed, frequently asked questions were collected and a help desk for questions was established.

The government supported the work and in December 2009 it was stated in the Public Service Agreements¹⁰ for government research funding bodies that full cost calculation should apply, and that research grants should finance direct and indirect costs in equal proportions. The Wallenberg Foundation, one of the largest private research funding organisations in Sweden, supported the project. The government did not provide any additional financial support.

The use of a full costing methodology has resulted in important changes for most Swedish universities, mainly on a management level. Information on and awareness of indirect costs have improved and led to better financial control. Improved cost analysis has led to greater efficiency, and sometimes even to organisational changes. The information is also being used for benchmarking between universities. However, the method is still lacking in acceptance among researchers. While government research funding bodies have accepted the methods and adopted new principles for financing, other non-governmental research funding organisations have reacted by cutting their grants, which has led to much frustration among both researchers and university management.

Turkey

The country workshop held in Turkey in September 2010 in the context of EUA's EUIMA project provided the impetus for Turkish universities, under the leadership of the Council of Higher Education CoHE (YÖK), to initiate work on full costing. Ankara University, Istanbul Technical University and Kocaeli University, which represent some of the largest and most important universities in the country, joined forces in this project.

One of the workshop's major successes was to achieve the support of all central stakeholder organisations in Turkey, including three relevant ministries and higher education and research funding bodies. Ensuring their involvement represented a key challenge and success factor for the development of full costing. The workshop also brought together a majority of university leaders. Following the workshop a pilot group of universities was established to develop and implement full costing under the leadership of a task force set up by the Council of Higher Education of Turkey. Following the recommendations of EUA and international experts, the main stakeholder organisations concluded that full costing should be placed at the heart of efforts to increase the accountability of Turkish universities, as this would also pave the way for more university autonomy in

the future. This decision coincided with recent efforts by CoHE and the Ministry of Finance to modernise the financial systems of Turkey's higher education institutions.

The original pilot group consisted of three universities¹¹ with considerable research activities supported by diverse funders. In early 2011 another university¹² joined the group. After drawing up a roadmap, institutional and national project groups were established. An important role of the institutional group, which consisted of senior leadership, finance departments, research funding centres and international offices, was to plan and monitor the implementation phase, and to create awareness among the academic community. The national working group was created to share information and experiences on the implementation of full costing at the four institutions, and to work according to a certain methodology, which was based on activity-based costing (ABC).

The plan is to have a methodology implemented in the four pilot universities by the end of 2012. Following the implementation in these pilot universities, the aim is to spread the methodology to other Turkish universities, with pilot institutions sharing their expertise.

The project partners have also provided a draft for a legal provision to CoHE (YÖK), which includes a definition and an explanation of the importance of full costing. The aim is to incorporate the model into national higher education law.

United Kingdom

Research in the UK is primarily focused within universities, and has long been heavily dependent on competitive, grant-based funding. The system in place operates under the principle of 'dual support', whereby universities receive core funding from their national funding council, which is designed to cover the cost of the research infrastructure needed to support competitively funded research projects. However, through the 1980s and 1990s the core funding failed to keep pace with the significant growth in research activity, funded from increasingly diversified sources, which led to significant underinvestment in infrastructure and backlogs in the maintenance of buildings and large-scale facilities.

Following a Transparency Review in 1998, the UK Government, recognising the scale of underinvestment, provided an additional 1.8 billion Euro for university infrastructure on condition that universities became more transparent in the way their funds were spent. Since 2000 all UK universities have had to adopt TRAC (Transparent Approach to Costing) under which they have to report their income and expenditure under teaching, research and other activities.

TRAC is a nationally developed activity-based costing methodology, which uses time allocation surveys of academic staff (not time sheets) as cost drivers to allocate all expenditure to relevant activities. TRAC also includes proxy cost adjustments designed to allow for the fact that the 'real' costs of universities are higher than the historic expenditure set out in their accounts due to a combination of: understatement of current asset values in some institutions; inadequate investment in physical assets (shown by backlogs of maintenance for example) and in services and support for students; and the need to allow a surplus or margin for risk, financing and development.

What TRAC showed was that there was a continuing failure by universities to cover the full costs of their research: the income from competitive research funding plus the core funds under dual support was significantly less (by over 1.2 billion Euro per year) than the real costs of the research undertaken. Universities, encouraged largely by funders and by national quality assessment exercises, had developed a 'low-cost culture' under which volume of research activity and outputs were far more important than cost recovery.

Following a consultation in 2003 on the sustainability of research, the UK Government introduced a requirement that universities should 'recover, in aggregate, the full economic costs of all their activities'. This resulted in the development, in 2005, of a national methodology to establish the full economic costs (FEC) of research

¹¹ Ankara University, Istanbul Technical University and Kocaeli University.

¹² Kadir Has University.

at project level. The initiative was managed by the universities themselves, with the FEC methodology being developed through a pilot group of nine universities with different profiles, working in close collaboration with the national funding councils and with funding from government.

Under FEC, universities use their TRAC data to calculate their premises and indirect costs. They then identify, at project level, all direct and indirect costs of the research, regardless of whether the sponsor of the research will meet all these costs.

Government accepted that funding levels needed to increase if volumes were not to go down, and so allocated additional funds to the research councils so that the latter could cover 80% of the 'full economic cost' of all the research they funded. The intention was to eliminate cross-subsidies from research to teaching, and to ensure appropriate funding of infrastructure. Universities in return were expected to demonstrate that they are operating their research activities on a sustainable basis.

While the focus of FEC was originally on research, a review was undertaken in 2005/2006 by the funding council to extend the use of TRAC to provide cost data to inform the funding of teaching. This led to the introduction in 2007 of a national framework for the costing of teaching based on the principles of the TRAC methodology – TRAC(T) – to provide information on the full economic cost of teaching in different disciplines.

A further review was undertaken in 2010 to assess the state of research funding across universities, to reflect on whether the sector was using funding to ensure sustainability as required, and whether higher education institutions were efficient and economical in their use of public funding. The report confirmed the need for the higher education sector to be transparent and effective in the use of public funds, but found that, when TRAC was extended so as to permit the full economic costing of individual research projects, there had been no explicit consideration given to the need for incentives to drive efficiency of the use of funds for research within universities. Whilst they were now in a position to better identify costs of research, universities were not ensuring that appropriate measures were in place to keep their costs in check. The report made several key recommendations on how universities could reduce their indirect cost rates, through the introduction of efficiency targets, and by encouraging the more intensive use of existing and new assets across the research base.

The process through TRAC and FEC was long, and it used significant resources and necessitated some major cultural changes within universities. The fact that it was coordinated at national level by universities themselves with the full support (both financially and technically) of government helped immensely. The key issue here (and which is still the case) was the tension between the incentives at academic level to win funding to undertake research and publish, and the pressures on universities to cover, in whatever way they can, the real costs of all their activities.

TRAC and FEC can be said to have been a success in that there has been a cultural shift in UK universities with regard to understanding the resource implications of any project. Overall, cost recovery has also improved. While TRAC is primarily concerned with cost analysis, some universities use the data produced to inform their internal resource allocation models. However, as TRAC and FEC have continued to develop since 2005, the process has become more burdensome and the assurance processes more costly and detailed.

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