

**ACTIVITY BASED COSTING AS A MEANS TO FULL COSTING –
POSSIBILITIES AND CONSTRAINTS FOR EUROPEAN
UNIVERSITIES***

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This paper presents possibilities and constraints for implementation of the Activity Based Costing (ABC) method, as a full costing method, at European universities. We investigated the current practice and trends in developing the cost allocation method at universities in the European Union. Precisely, we analyzed trends and current movements at universities in the EU countries and the major problems in setting the ABC method at a university. By using this information, we proposed guidelines for the development of a full costing system at the University of Zagreb that is based on the following parameters: categories of costs, main activities, cost objects and cost drivers. Our paper shows that despite public demands for efficient managing within universities, still, a very small percentage of universities has implemented full costing systems. The most important obstacles for that are: resistance to change, non-reliable data in current account systems, lack of management will and legal barriers. Furthermore, our paper explains that one of the challenges involved in implementing full costing systems seems to be the fact that universities are still income oriented than cost oriented. Nevertheless, positive trends in implementing a full costing method, respectively the ABC method, are obvious. We highlighted universities in Portugal and Liverpool as universities that have successfully implemented the ABC method as well as all drivers, barriers and benefits that came out from that implementation.

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1. INTRODUCTION

University of Zagreb is included in the activities of the European University Association (EUA) in relation to the project of settlement on full costs (full cost accounting) and has participated in the work of all recently held workshops and events by the EUA. In the summer of 2010, the University of Zagreb organized a second workshop on the EUA on the theme Settlement according to full costs at universities. At the national level, there is no developed system for the internal settlement cost based on the Activity Based Costing (ABC) method that is applied to the university, and the University of Zagreb is trying to develop a pilot project regarding the ABC method implementation on one of the constituents of the University of Zagreb. Thus, from that, the contribution of this paper in the implementation of the ABC costing method in the case of the University of Zagreb can be seen.

Efficient management demands from management of Croatian universities to apply a wide range of managerial techniques and methods. The improvement of financial management in the public sector leans on the skills of management and its capacity for the usage of accounting and non-accounting information. This especially applies to the usage of managerial and cost accounting, and financial and non-financial indicators. Croatian universities should answer some very important questions: are the provided services aimed towards the users, are the resources used in the best manner to give the best value for money and is their management successful and headed towards the above-stated. The answers to these questions are a complex story about performance measurements in the public sector.

The ABC system was designed in order to correct the deficiencies of traditional costing systems. The initial purpose of the ABC system is to provide a fair and accurate cost allocation and therefore product, or in this case services, profitability evaluation also. Accordingly, the ABC system focuses its attention on indirect costs. The aim is to define the most appropriate way for indirect costs allocation to cost objects. Since at universities all costs are indirect, that is the reason for trying to implement the model of the ABC method. Considering processes in the public sector, recommendation for cost allocation could be the Activity-Based method. Granof, Platt & Vaysman (2000) discussed ABC implementation in the public sector, by using the example of an university department. They have demonstrated the validity of ABC method application in accordance with university processes.

Institutions of higher education (HE) in Croatia are still not familiar with the ABC method. One of the most important reasons for that is a very high percentage of such institutions in Croatia, being almost fully financed out of state or local budgets. With the ABC method, they could charge prices of provided services, based on actual costs and the government could use accurate data for the cost allocation. By implementing the accrual principle and cost control into the governmental units, the performance measurements and program efficiency evaluation are made on actual relevant data, as well as the decision-making process. Implementation of the basic accrual principle into the public sector should solve all those problems.

However, all governmental units can choose different methods for cost planning, cost allocation and cost control. Using different modern methods for managing costs, information about costs are significantly different. Therefore, the process of decision-making in the public sector and decisions made on costs can vary, which makes it is very important to implement the right cost allocation method.

The main purpose of this paper is to analyze the possibility for implementation of the ABC method in an academic environment and to identify its potential benefits. We identify the main drivers for the implementation of full costing at several universities. In this paper, authors wanted to emphasize contributions and benefits of the ABC method. Those can be identified in the fundamentals of an internally oriented accounting system, which could provide all the necessary information for the decision-making process.

2. LITERATURE REVIEW

The first studies reporting on the development of the ABC system in the public sector, especially at universities, were developed during the 1990s in the UK, with the assumption that the more accurate identification of costs makes them more manageable. Further in the paper, some of these studies and their results will be mentioned.

Berry (1994) introduced a new model for overhead allocation in universities. This was the beginning of the development of the ABC system in higher education institutions, although this study did not develop a methodology for ABC implementation. Also, Goddard & Ooi (1998) discussed the ABC methodology, as implemented in library services at the University of Southampton. The result showed substantial differences in the allocation of the central overheads cost as between institutions of HE using the ABC model and

the existing system. These authors argue that, although the ABC approach may overcome some of the problems of overhead allocation and improve the economic efficiency of organizations, there are significant problems with its practical application. In this study, it has been concluded that the ABC model provides more equitable overhead allocation than traditional systems, as it ensures that the faculty is charged for its actual consumption of central resources. It also enables allocated costs to be both verified and refuted. However, this case study showed that, in practice, the ABC model is less efficient than in theory. Also, it is very expensive to develop and maintain such a system. Another weakness of this case study is the fact that it is mainly concerned with developing a methodology to improve efficiency, instead of testing the applicability of the system to institutions of HE across the board.

Another relevant study has been authored by Tatikonda & Tatikonda (2001). They have discussed the implementation of Activity-Based Costing in higher education institutions and concluded that implementation of the ABC system can help universities achieve tighter financial management and better resource allocation. In their paper, authors have shown simple example stages of the Activity-Based Costing application in higher education. Several problems occurred with their simple ABC model. First, costs were allocated on a single volume basis, with no distinction between fixed and variable costs. In addition, the methods failed to account for students who take courses outside their college. The model also assumed that all courses consume the same activities in the same proportion, when, in fact, some programs may be subsidizing others. At the end of their paper, the authors have concluded that the ABC system may provide benefits to academic institutions, such as: better cost information, better identification of resource needs, better distribution of scarce resources, better course and program mix, better cost control and better public relations tool.

Cropper & Cook (2000) describe the current costing within the higher education sector, reviewing recent published literature and analyzing the progress made by institutions in implementing the Activity-Based Costing system. They concluded that ABC has come to be regarded as the most significant costing innovation in higher education, but the findings of their survey suggest that institutions have made little progress to date in moving towards ABC.

3. ACTIVITY-BASED COSTING FRAMEWORK

The Activity-Based Costing system was designed in order to correct the deficiencies of traditional costing systems. The initial purpose of the ABC

system was to provide a fair and accurate cost allocation, as well as the product profitability evaluation. Accordingly, the ABC system focuses on indirect costs. Its aim is to define the most appropriate way for indirect cost allocation to cost objects. The main assumption of the ABC system is: products consume activities and activities consume resources (Hongren, Datar & Foster, 2003). The more activities are set up, the more complex the ABC system is. An activity is defined as any event, action, transaction or work sequence that incurs cost, when producing a product or providing a service (Weygandt, Kieso & Kimmel, 2005). In the ABC system, direct costs are also directly traced to products or services, so the main attention is paid to indirect costs which are allocated to activities, instead of to departments (like in traditional systems).

Basically, the application of the ABC system is going through two main stages. In the first stage, indirect costs are allocated to activity cost pools. It is important to determine the correlation between a particular indirect cost and an identified activity. Each indirect cost must be assigned to a proper activity, which causes its occurrence. The second stage in ABC application is assigning indirect costs from activity cost pools to products, by using defined cost drivers. A cost driver is any factor or activity that has a direct cause – effect relationship with the resources consumed (Weygandt, Kieso & Kimmel, 2005). The ABC system uses multiple cost allocation bases to assign indirect costs to cost objects. The usage of multiple allocation bases can provide a more accurate and objective profitability evaluation. Cost drivers should correctly show the relationship between a certain activity and cost objects. Otherwise, even this costing system can lead to cost distortion and unreliable profitability evaluation. The ABC system is very complex and takes much more effort and resources to implement than traditional systems. Its application is justified only if the benefits from the ABC system exceed the costs of its implementation.

Therefore, when management decides to implement the ABC system, it must be sure that the system will provide more useful cost information for business decision-making than traditional systems. The highlighted value of the ABC method application at universities is based on the determination and allocation of costs, which provide an objective estimation of costs for provided services. It is achieved mainly through the way in which indirect costs are allocated to services, i.e. by using cost drivers, considered to cause their occurrence. Each scale of activities and type of costs represent different problems and effects in ABC method application at universities.

There are many problems and questions, which are unique for institutions of HE and are both related to a significant amount of costs, and demand the

individual approach. Some of these problems, specific for academic institutions, include the issues of faculty, who can simultaneously serve as employees and use the services of the same institution, issue of how to account for scholarship and research grants from external funders, etc. Considering that the faculty (teaching staff) do not have traditional working hours, it is difficult to determine the number of working hours spent on lectures, research or providing professional services. Often, these activities are interconnected. For example, to conduct research, a lecturer could guide and educate postgraduate and doctoral students. During their work on scientific papers for academic publications, lecturers perceive what will influence their lectures and further research. At institutions of HE, quite often, users of services can simultaneously serve as employees – services providers. For instance, doctoral students could work as teaching assistants and, in that case, they are users of services, but also employees.

The advantages of the ABC method at institutions of HE are (Granof, Platt & Vaysman, 2000):

- *Flexibility is a key factor for the successful implementation and appliance of the ABC method at the faculty.* Regarding the decentralized system of academic governance, it would be impossible to impose rigid rules for cost allocation.
- *ABC method should be used for providing information in a decision-making process and not only for cost measurement.* This is especially important in decision related to programs, resource management and activities, which should be supported.
- *The basic principle of the ABC method appliance is in cost allocation by the most appropriate cost drivers which are causing cost to occur.*

4. TOWARDS FULL COSTING METHOD IN EUROPEAN UNIVERSITIES

Terminology of the full costing method usually stands for the ability to identify, calculate and allocate all direct and indirect costs of all the university activities, including projects. In this context, implementation of the ABC method should not be necessary. The majority of European universities have decided to implement the ABC method, which is being accepted as a full costing method. The full costing method in higher education has been influenced and demanded by various concepts. It has been mostly influenced by the European Commission Research Framework Programmes FP6 and FP7, which demand a complete separation of direct and indirect costs occurring in financed projects. To become commonly used in the high education sector

throughout Europe, the ABC method has to accommodate diversities among countries. National legislative is different across European countries and it differently affects accounting and cost practice and terminology. There are different accounting bases (through cash to accrual basis), recognition of depreciation, terms and purposes in financial reports, etc.

In 2008, the European University Association (EUA) has prepared the study "*Financially Sustainable Universities – Towards Full Costing in European Universities*"² in which they have numbered different factors which are influencing the development of the full costing method at European universities. Those factors are: legal status, size, profile, ownership of property, governance, funding structure and the level of autonomy.

The study has shown that some countries have fully developed a full costing system (such as the UK and the Netherlands) and that some, like Estonia, Slovenia and Croatia, do not have any method for tracing and allocating costs. The reasons for that could be found in available databases for implementation, especially accounting and costing data, but also in the institutional framework for universities.

National formal requirements, positive attitude and governmental support are playing a crucial role for full costing development at universities. If the national government provides its support for full costing implementation, then it would have benefits on the national and European level. The higher cost recovery of project costs and financial sustainability of universities can be achieved through the benefits on the national level, which include: a more comprehensive approach to costing, more efficient internal resource allocation, improved decision-making - based on a better understanding of investment decisions, benchmarking possibilities within the sector and price activities (EUA, 2008).

On the European level, full costing is ensuring accountability. It helps in building trust between governments, funding agencies and universities. On the other hand, the existence of internal and external obstacles for full costing implementation is unquestionable. The most common external obstacles are (ibid.): "*lack of autonomy, legal barriers, government not having the will power for changes, not interested in knowing the occurred costs and the price of*

² The objectives of this study were to provide information and empirical data to be used in the debate on financial sustainability of European universities, analyse the development of full costing and relationship between full costing and university financing.

services and because of that they are reluctant to provide financial support but also technical and human resources for implementation of full costing". As a result of those obstacles, it is important to raise awareness about the ABC method benefits and to try to communicate those benefits effectively and extensively among government and key academic and administrative staff.

Table 1. European Universities through stages of the ABC method implementation

Groups	Phases of ABC method implementation	Universities
Group A	Full costing is developed and applied to all or the majority of structural units of the university in order to identify the full costs of the core activities (teaching, research, other) both at the university level as well as at the level of its main structural units.	<ul style="list-style-type: none"> • University of Liverpool (UK) • University of Birmingham (UK) • Trinity College Dublin (Ireland) • University of Twente (Netherlands) • University of Coimbra (Portugal)
Group B	Full costing is at the stage of development (in most cases with already specific time-lines attached).	<ul style="list-style-type: none"> • Uppsala University (Sweden) • NUI Galway (Ireland) • Friedrich-Alexander University Erlangen- Nuremberg (Germany), UEN • Graz University of Technology (Austria) • University Carlos III of Madrid (Spain) • Catholic University of Leuven
Group C	Methodology and databases for allocating indirect costs to activities are at the stage of development but no decision or time schedule is in place for implementing full costing.	<ul style="list-style-type: none"> • University of Tartu (Estonia) • Tomas Bata University in Zlín (Czech Republic) • ISIK University (Turkey) • University of Warsaw (Poland) • University of Ljubljana • University of Zagreb

Source: Financially Sustainable Universities – Towards Full Costing in European Universities, EU report, EUA Publications 2008, available at: www.eua.be

In order to analyze costing and funding from an institutional perspective, it was necessary to consider a broad range of issues rather than confining the focus to financial data alone. The analysis conducted by the EUA covered legal

status, size, profile, ownership of property, governance, funding and costing structure and level of autonomy and the influence of these factors on the development of full costing. Such an analysis allowed, according to EUA, despite the great diversity among European universities, to recognize certain similarities in set-up, approach and structure. This, in turn, allows universities in the process of introducing full costing to identify others with similar structures for possible cooperation or for benchmarking purposes (EUA, 2008, pp. 20-21).

In terms of legal status, they have divided universities into four broad categories: government agencies, public sector institutions operating autonomously, independent legal entities operating under public law and non-profit legal entities operating under private law. According to these categories, the level of the government involvement in university control can be determined. Results have demonstrated that universities, operated by public law, as opposed to those operated by private law, receive a higher proportion of public funding (ibid). In addition, complex legal background required the same complexity of the full costing system. In addition, universities of different size (estimated by a different number of enrolled students) do not necessarily require a different full costing methodology. However, size affects the process of planning and implementation and must be, thus, taken into account.

A university's profile, according to the EUA, is obviously linked to the costing system prerequisites. Profile of the university could be seen as teaching oriented, research oriented, or the combination of both. There is an impact of some factors to full costing, including: a range of subjects offered, the student profile and the extent of research activities. Research intensive universities which gain a higher percentage of their income from research funding schemes will implement a different full costing system from universities which primarily focus on teaching (ibid.), due to the different structure of costs.

According to the EUA, ownership and management of property also has an impact on the design of a full costing system and costs involved. For the participating universities, there seem to be just two possibilities – either the university, or the state owns the vast majority of the buildings. In developing a costing system for activities of an institution, it is vital to understand who covers the costs of buildings and facilities and where they are reflected. If the state owns the buildings, this does not exclude that all costs (maintenance, etc.) are borne by the university. A university's ability to insure property is also of importance, with some countries, such as Portugal, not allowing universities to insure their property. This has an impact on the costs of property, in particular,

where historical buildings with high maintenance and high historical value are concerned (EUA, 2008, p. 21).

Funding sources differ to a large extent and have an impact as well on the costing structure. Universities receive funding from many different sources. These sources can be divided into broad categories of: national public funding, national private funds, international funds (EUA, 2008, p. 23). A university structure, in terms of its different units, such as faculties, institutions, departments, centers, etc. can also play a role in the way full costing is implemented. Size usually has an impact on how a university is structured, but not exclusively (EUA, 2008, p. 25).

One of the challenges involved in implementing full costing seems to be the fact that most systems in universities are still more income-oriented than cost-oriented and the cost structures of most universities are based on cost items (*ibid.*). This makes it difficult to measure costs for a “product” such as a programme, a graduate or a research project. There is not always a clear connection between funds received for teaching and the actual costs of teaching which occur within the university (*ibid.*).

According to the EUA study, the impact of the status of autonomy on the development of full costing is two-fold. A lack of autonomy may not only reduce the motivation to introduce full costing but also limit a university’s ability to make changes in order to be able to implement full costing. The groups of universities, participating in the EUA study, have different degrees of autonomy and there seems to be a positive correlation between autonomy and the development of full costing. Here, financial autonomy is especially important regarding the complexity of ABC method implementation (EUA, 2008, p. 26.).

4.1. Experiences of EU universities with the application of full costing

In order to reveal the importance of the full costing application at Croatian universities, it is necessary to analyze the development of full costing in countries and universities that have already implemented and use this costing method. Experiences of other countries are a useful source of information for possible future implementation. In this paper, we analyze drivers of full costing application at several EU universities, as well as the barriers and benefits that appear in this process.

The University of Coimbra (Portugal) started with the implementation of the full costing method in 2000. The main drivers which drove the institution to begin the implementation of a costing system that would identify the full costs of activities and projects are shown in Table 2. It is obvious that there are multiple drivers for the application of full costing, but emphasis is put on the need for a strategic management tool and efficient resource allocation. On the other side, there are barriers, and one of the biggest is the absence of financial and other support for the implementation of full costing.

Table 2. Implementation of full costing at the University of Coimbra

UNIVERSITY OF COIMBRA - Portugal	
DRIVERS	<ul style="list-style-type: none"> • Need for strategic management tool to support efficient resource allocation • To handle better increasing complexity of activities • To establish indicators to monitor activities and to ascertain the deviation between the real costs and %estimates
BARRIERS	<ul style="list-style-type: none"> • No external financial support for the implementation of full costing • Technical and legal barriers • Cultural barriers
BENEFITS	<ul style="list-style-type: none"> • Internal institutional benefits: better and efficient resource allocation that is based on sound data, improved strategic decision-making, higher recovery of indirect costs, make data internally more comprehensible • External institutional benefits: more objective decision-making basis for budget allocation, European funding schemes (FP7) and their conditions of cost recovery

Source: *Financially Sustainable Universities – Towards Full Costing in European Universities, EU report, EUA Publications 2008, available at: www.eua.be*

The University of Liverpool started with the process of implementing the full costing system in April 2004. A timetable had been agreed between UK universities and the national bodies that the University of Liverpool had to complete the first phase of implementation until March 2005. In that period, a team in the Finance Department was established to develop data requirements, collect and record the time allocation information and develop a software model that attributed costs using agreed cost drivers. Initially a team of three, there are now four full-time staff members working full-time on costing. The main

drivers, benefits and barriers of full costing implementation at the University of Liverpool are summarized in Table 3.

Table 3. Implementation of full costing at the University of Liverpool

UNIVERSITY OF LIVERPOOL – United Kingdom	
DRIVERS	<ul style="list-style-type: none">• Using full costing for strategic decision-making• Trend towards an increase in external competitive funding• The ability to recover more indirect costs
BARRIERS	<ul style="list-style-type: none">• Technical and legal barriers• Cultural barriers
BENEFITS	<ul style="list-style-type: none">• Widespread recognition of the full costs of activities across the university• Better process is being achieved for externally funded activities• Return on investments is substantial, both financially and in managerial terms

Source: *Financially Sustainable Universities – Towards Full Costing in European Universities, EU report, EUA Publications 2008, available at: www.eua.be*

Unlike the described universities, Graz University of Technology has not developed motivation for a full costing system. In that sense, Austrian national external competitive funding schemes do not cover the full costs of research activities and the projects of universities. In that way universities are forced to fall short of real costs due to a limited indirect cost rate for universities, for example 20% of personnel costs (EUA, 2008). One of drivers, such as the comprehensive financial software program and EU projects, has resulted in the advancement in calculating indirect costs and establishing a sustainable costing system by itself.

In the Tomas Bata University in Zlin (Czech Republic), the major driver is the management's commitment to adopt a full costing methodology motivated by the solid understanding of its advantages. Although there is currently no exact schedule of the implementation of a system or any project structure, the management of this university would like it to be implemented as soon as possible to allow for decisions based on knowledge on real costs. Major barriers to the introduction of the full costing system is the lack of decision on cost allocation, and also the Tomas Bata University has no experience with full costing and no external financial support.

From the experience of described universities, which have implemented the full costing method or are going in that direction, it is obvious that there is no uniform costing system for Europe's universities. This does not mean that the costing model does not operate according to certain common principles. Thus, it is very useful to know the experiences of other countries that have already implemented full costing. The analysis of its drivers on the one side, and its barriers and benefits, on the other side are a starting point for the development of full costing at universities.

The EUA study report identifies a huge diversity in the different national systems and, therefore, it is not possible to provide guidelines that would apply in each country. It resulted with the indicative roadmap that should be considered in the implementation of full costing. This roadmap can be summarized as follows (EUA, 2008, p. 27):

- **Define the objectives for the university** (reasons for implementing full costing and how to maximize benefits from the system);
- **Status analysis** (identify existing costing and accounting procedures, check availability of data and consider the profile of the university);
- **Scan the environment** (scan other universities with a similar profile and objectives that have already started the implementation process of full costing, research if there is room for partnership and joint initiatives);
- **Setting up the project management** (gain commitment of university leadership, ensure communication on the progress and purpose of the project throughout the implementation process, set realistic estimates of time scale);
- **Define settings of cost methodology** (identify activities, choose cost objectives, define activity cost drivers, design of allocation method, define the cost basis);
- **Manage the data** (define the data necessary before starting, define the modalities of data collection, ensure the quality of data).

5. EXPECTED RESULTS AND SIGNIFICANCE OF THE ABC IMPLEMENTATION AT A CROATIAN UNIVERSITY

The higher education system in view of the usage of modern and traditional methods for governing costs includes their tracking and allocation. One can say that the education process is in fact a 'production' of study programs, as well as students. Different trends, terms and assumptions in the Republic of Croatia require the usage and application of different tools, which will enable the public

HE institutions to compete with private (business) schools. As competitive subjects, they should provide a high quality of studies and highly educated students. Increase of the number of students and the quality of studying require more financial resources. Financial resources from all kinds of sources, such as donations, state budget, but also from scholarships, are available to the public HE institutions in Europe.

In Croatia, the main source for financing higher education is the state budget, which only partially provides sources for wages, material costs and some level of research costs. Accordingly, it is necessary to determine, on the national level, the criteria for distributing financial resources and develop a model of state financing with a satisfying distribution formula. Due to the restrictions and inadequate budget amount available, it is necessary to obtain funds from different sources and, eventually, charge tuition fees to all students (now being charged only to some students).

In the last century, a new financial surrounding has emerged, mainly because of decreasing resources from the state budget. Lack of funds encourages institutions to undertake more of commercial activities, i.e. commercial research projects, financed by business subjects, foundations, international organizations, etc. Higher education costs are increasing with a higher rate than the state can support by financial resources from the budget, which requires independent provision of different sources of financing. This also requires competences in strategic governance of financial and other assets. This especially applies to human resources, since faculty members are the key to maintain the studies and programs in the future. All this information could be collected more easily, which would also make the decision-making process easier on the level of an individual institution. Nevertheless, management of the entire university also requires development and usage of cost allocation methods.

The accounting systems of individual institutions are based on a budgetary accounting concept or on a modified accrual accounting principle. The goal of that existing system is primarily in satisfying legal terms in the form of external reporting, but not in providing quality information to the internal users for effective management. Accounting systems of individual institutions of HE, or the university in general, can not provide basic information about the costs of special programs or international projects. This is very important, since it may justify a certain program or international project, or enable an institution to recover the highest amount of indirect costs occurring in international projects.

As a result, it is expected that the ABC method would achieve efficient evaluation of economic viability, not only for an entire institution, but also for special programs or projects, as well as for international projects. Through the establishment of the ABC model, demands of national and European financing schemes are met, since they require the full costing method approach, as to obtain the right for a refund of indirect projects costs. In addition, University of Zagreb would have added benefits from the model of internal cost settlement on the international level, but also on the level of constituents of the university.

The University of Zagreb has 44 constituents (institutions of HE) which are all legal persons with all formal rights regarding mission, strategy and policy decision-making. At the moment, University of Zagreb is under reform, as it is trying to integrate its constituents and achieve an integrated accounting information system. Each constituent is a different place of costs, with different programs or activities and management is responsible for efficiency and effectiveness, especially for the costs.

The full costing model could be provided as a separate tool in the accounting information system, which should allow tracking and recording of all costs (e.g. depreciation) important for the internal usage and decision-making process – both for management of the institution, as well as for the entire university. Since public demands for enhanced responsibility become more and more intense, this would enable the university to demonstrate that the benefits from their programs and activities which they attempt are appropriate to the costs.

The current national accounting-information system is based on the modified accrual basis, and universities, as budgetary users, are obligated to prepare their reports under the mentioned basis. In relation to the application of the full accrual basis, this accounting model is marked with the following adjustments (Vašiček et al., 2009):

- **Revenues of public sector entities are recognized when the cash is received:** therefore, revenues are based on a cash basis.
- **Expenses of current non-financial assets** are recognized at the time of purchase and not at the time of actual consumption.
- **The costs of procuring a fixed asset with small value are not capitalized,** because they are entirely presented as an expense at the time of purchase.
- **The costs of procuring a fixed asset are not capitalized** and they are not systematically apportioned on a time or functional basis as expenses

during the period of useful life. Therefore, the annual amounts of depreciation are not calculated and the cost of the asset becomes an expense of reporting period when the asset is purchased. This principle applies also to advances that have been given in the process of procurement as well as investments in progress regardless if the process of procurement is not completed, or that asset is not ready for use.

- **Increase in assets during the procurement fixed non-financial assets** without the costs (capital received donations) are not recognized as revenue but directly increased the sources of ownership (public capital).
- **Spending fixed non-financial assets during the administration estimated life is expressed as the expense of the sources of ownership** (public capital) using the proportional method of value adjustment.
- **Residual value of the fixed non-financial asset that is sold or decommissioned is not reported as an expense** that arises from the fact that the total expense was recognized at the time of purchase.
- **The changes in value and volume of assets and liabilities** are not reflected in the financial result, but they directly reflect on the value of sources of ownership (public capital).

This accounting model demonstrates that the current accounting focuses on the financial assets and liabilities, while non-financial assets are included in the balance sheet only to complete information on all available resources of institutions. The existing model is based on the assumption that revenues from subjects of the general government sector are mostly non-reciprocal, or that they do not require any delivery as the basis for their acquirement (Vašiček et al, 2010).

The presented national accounting system has to be upgraded for internal reporting purposes by introducing elements of full accrual and only in that way it would be possible to develop cost and managerial accounting in the public sector. According to that, accounting systems which objectively estimate and report about costs are necessary. Thus, the following objectives of the full costing method implementation support the long-term goals and development strategy of the University of Zagreb:

1. Define a scheme of internal costs reporting;
2. Create a procedure and rules of activity analysis related to creation of costs;
3. Create a mechanism for the analysis of the place of costs and the basic structural units;

4. Ensure project initiatives from cost aspects;
5. Ensure comparison (benchmarking) of the University of Zagreb with competitors and external benchmarks;
6. Ensure timely reporting to government authorities and their agencies;
7. Create a database of structured data for:
 - (a) the establishment of mechanisms for the transparent allocation of common costs;
 - (b) the adoption of structural and investment decisions;
 - (c) calculations, preparing offers and negotiating with public and private financiers;
 - (d) establish mechanisms for transparent funding of joint development and other needs;
 - (e) decision-making procedure, aimed toward improvement of the system.

Monitoring costs by the ABC method provides transparent data for determination of the total costs, but also the cost of individual activities at institutions of HE and the university. This particularly applies to the costs of individual educational programs and studies, which is important to ensure transparent financing. The importance of ABC implementation is reflected in the fact that the results of this project will contribute to successful competition within international programs to which Republic of Croatia provides financial participation (FP7, ESF, EMBO, HERA, COST, etc.). It will contribute to compensate for all incurred costs (direct and indirect) related to the project on each constituent of the university.

However, in order to accomplish the aforementioned, it is necessary to develop a model of internal cost settlement for monitoring and registering all costs related to all activities of an university. To meet these requirements, it is necessary to define the basic types of costs and set up a system of their identification, collection, monitoring, registering, classifying and analyzing, which is an integral part of accounting and the overall information system, supported by computer technology. The results of ABC implementation, achieved through its objectives, could be manifested in:

- improving the quality and reliability of financial statements, and significant data from which the efficiency indicators are calculated and counted;
- effective control of resources, but also monitoring the qualitative and quantitative information;
- improving financial management and the decision-making process by monitoring the administration of constituents and the university through

a reliable accounting information, both of financial and non-financial nature;

- an attempt to apply a system of internal controls, and significant support for the introduction of external control and audit.

Development and implementation of the ABC method at the university fits into the priority directions of development and strategy at the University of Zagreb. The development strategy in the area of a financial system is based on the principles of autonomy, with a responsible and transparent financial management. Sources of funds from the state budget, as a stable source of funding, will be provided through the program agreement, based on operations, tasks and performance indicators of the university. The university will manage budgetary resources and ensure other sources of financing, necessary for the stability and development.

This is to be achieved by a system of competences and responsibilities of the governing bodies, as well as by performance contracts between the rector and deans of individual institutions/constituents. One of the very important assumptions for the implementation of the program funding is an accounting reporting system, which provides enough information for the performance evaluation of an individual program. It should also make it possible to present program results, as to make sure that it deserves increased funding from the state budget. Likewise, active participation in European research projects requires tracking of project costs by the full costing method, with the ABC as a preferred method, if all the projects costs are to be recovered.

5.1. Activities and cost drivers for the University of Zagreb and its constituents

The basic purpose of the cost allocation process is to determine the cost of a service. Besides this fundamental purpose, cost allocation performs should also provide information for economic and non-economic decisions, motivate managers and employees, justify costs or compute reimbursement and measure performance for reporting to external parties (in this case, the university or ministry of education) (Hongren, Datar & Foster, 2003). The first purpose is the most important, because the cost allocation process is mostly implemented for enabling economic decisions, such as pricing, capacity, forming the service mix, implementation of new services, meeting student needs, etc. Cost allocation can contribute to motivate faculty management and employees to design new services (study programs). Also, cost allocation can be used to justify costs or compute reimbursement when certain costs are not included in

the cost of a study. Finally, cost allocation is necessary for the performance measurement for external reporting (Hongren, Datar & Foster, 2003).

Since cost allocation is a difficult and complicated process, which is also hard to enforce, certain activities are needed to be provided in order to make the cost allocation process possible. These activities include: a) cost determination; b) cost classification; c) the choice of accounting method for cost allocation. The cost accounting system has to be designed in such a manner, which makes it easy to determine and classify costs. While cost determination is a process which is also required for the purpose of external reporting, cost classification is extremely important for internal management reporting. In addition, without this process, there is no enforcement of the cost allocation process. This would make it impossible to determine the cost of a particular product and evaluate product profitability.

Cost classifications directly enable cost allocation. For the cost allocation purpose, costs need to be classified according to the following criteria: time period, management function, accounting treatment, traceability to studies, cost behavior, decision significance, and managerial control (Cherington, Hubbard & Luthy, 1985). It is important to emphasize that the same cost can be included in several or in all cost classifications. However, all the cost classifications mentioned above do not have the same significance for particular accounting purposes.

For the purpose of cost allocation, the relevant cost classifications are: a) traceability to studies; b) management function and c) accounting treatment. These cost classifications are needed to be provided by the accounting system of a faculty in order to enable the cost allocation process. The most important cost classification for the cost allocation process and evaluation is classification related to accounting treatment. In order to provide the cost allocation process, all costs of a particular accounting period are associated to study programs. Generally, costs of study programs are determined as all costs enabling the institution to function, i.e. directly or indirectly related to the programs. At an individual institution of HE, they include salaries and all other indirect costs.

Direct costs are can be attributed to particular cost objects, i.e. study programs. Indirect costs, or overheads, are those costs which cannot be traced to particular programs. Therefore, these costs need to be allocated to the individual study programs by using appropriate accounting methods. The costs occurring become expenses in the same period in which they are incurred and are matched to revenues of the particular accounting period. In that way, costs have an

immediate impact to the financial result in the period of their appearance, which includes all administrative costs. The complete accounting cost treatment is shown by Figure 1.



Figure 1. Accounting cost treatment at an institution of HE

There are three main programs at the University of Zagreb and its constituents, where the ABC method could be used:

1. program for basic activities;
2. program for additional activities;
3. program for support activities.

Based on those main and sub activities that are shown in Figure 2, we can recognize cost objects or particular services of the University of Zagreb. The main cost objects are: undergraduate, graduate, and postgraduate studies, scientific and research projects or commercial projects.

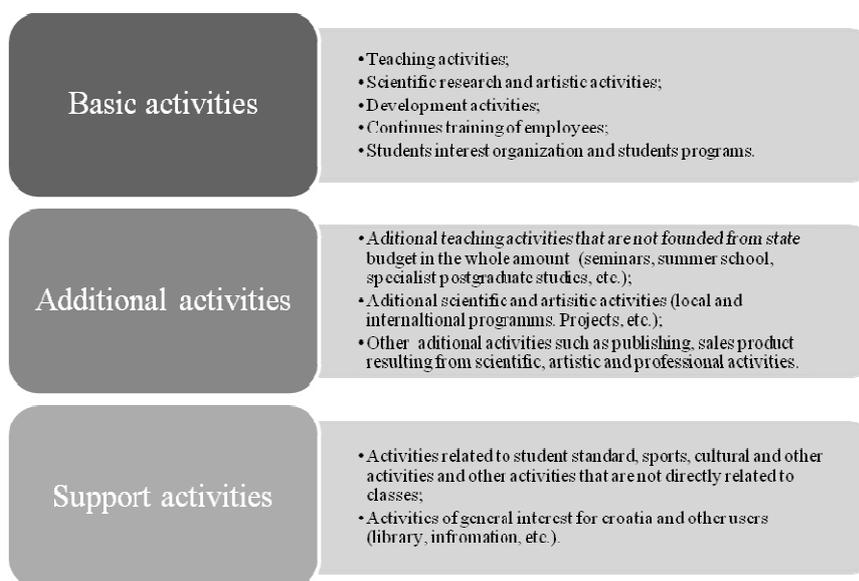


Figure 2. Activities at the University of Zagreb

Table 4. Cost categories and cost drivers for the University of Zagreb

Cost categories	Cost drivers
1. Gross wages and other expenses for employees (bonuses, awards, severance pay and fees) and payroll;	Hours or some other relevant coefficient
2. Compensation of employees (i.e. teaching at undergraduate studies, working at some commercial projects);	Hours or some other relevant coefficient
3. Intellectual services;	Service fee per hour
4. Material and energy costs (materials, energy, small inventory);	m ² /m ³ /lit. or spent resources
5. Costs of services (telecommunications, transport services, rent);	m ² /m ³ /lit. or spent resources
6. Current and investment maintenance;	Spent units or number of maintenance
7. Financial costs (interest, insurance, etc.);	Depends on the nature of financial costs: maintenance, new programs, lifelong learning...
8. Furthermore, other expenses if they are specifically mentioned in the contract concluded between the universities and relevant ministries.	None

Source: Authors

From the previous table, it can be seen that there is no depreciation as cost category. The reason for that is the usage of the modified accrual basis, instead of the full accrual. The costs of procurement of fixed assets are not capitalized and they are not systematically apportioned on a time or functional basis as expenses during the period of useful life. Therefore, the annual amount of depreciation is not calculated - the cost of assets rather becomes an expense of the reporting period, in which the asset is purchased. This principle applies to downpayments in the process of procurement, as well as investments in progress, regardless whether the process of procurement is not completed, or that asset is not ready for use.

Regarding the potential to provide information by each system, we believe that the combination of different methods for cost tracking and cost allocation would be most appropriate. The ABC method could provide cost allocation through activities, but cost tracking could be done through cost places which are more convenient for a traditional allocation system.

4. CONCLUSION

As costs of higher education are constantly increasing, which is followed by growing demands on universities - both in education and research, it is very important to track and control costs in an appropriate way. The first step in responding to these claims is to identify the real costs of university activities, which requires the implementation of the full costing method. The full costing method usually stands for the ability to identify, calculate and allocate all direct and indirect costs of all the university's activities, including projects. In this context, the ABC method should not be necessary. However, the majority of European universities do not use any cost allocation method and that reflects on their systems of funding.

The EU study report has shown that the main results of ABC implementation at EU universities could be manifested in: improving the quality and reliability of financial statements and significant data from which the efficiency indicators are calculated; effective control of resources and monitoring of qualitative and quantitative information; improvement of financial management and decision-making process by monitoring the administration through reliable accounting information. The ABC method would achieve an efficient evaluation of economic performance - not only of individual institutions, but also of special programs and projects, as well as international projects, conducted by an institution. Therefore, the possible implementation of the ABC method on Croatian universities is a very important topic.

Through the establishment of the ABC model, demands of a national and European scheme of financing are also fulfilled, which is followed by additional benefits for University of Zagreb – at the level of individual constituents (institutions), as well as on the university level. For those reasons, it is very important to analyze experiences of EU universities that have successfully implemented full costing. In this context, this paper identifies major drivers, benefits and barriers for potential implementation of ABC at Croatian universities.

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ABC METODA KAO METODA OBRAČUNA POTPUNIH TROŠKOVA – MOGUĆNOSTI I OGRANIČENJA EUROPSKIH SVEUČILIŠTA

Sažetak

U ovom se radu raspravlja o mogućnostima i ograničenjima za implementaciju metode računovodstva troškova zasnovane na aktivnostima, kao metode obračuna punih troškova europskih sveučilišta. Analizirali smo tekuću praksu i trendove u razvoju metoda alokacija troškova na sveučilištima u EU. Preciznije, analizirali smo trendove i tekuću situaciju na sveučilištima u zemljama EU, kao i ključne probleme provedbe ABC metode u akademskom okruženju. Na temelju dobivenih rezultata, predlažemo smjernice za razvoj sustava obračuna punih troškova na Sveučilištu u Zagrebu, i to na temelju sljedećih parametara: kategorija troškova, troškovnih objekata i čimbenika koji kreiraju troškove. U ovom se radu pokazuje da, unatoč javnim zahtjevima za učinkovitim upravljanjem u akademskom okruženju, tek vrlo mali postotak sveučilišta prihvaća sustave obračuna punih troškova. Kao najvažnija ograničenja identificirali smo: otpor promjenama, nepouzdanost podatke u postojećim računovodstvenim sustavima, nedostatak predanosti menadžmenta i pravne zapreke. Štoviše, smatramo da bi jedan od izazova u implementaciji sustava zasnovanog na punim troškovima mogla

biti činjenica da su sveučilišta i dalje orijentirana prema ostvarivanju prihoda, a ne i prema kontroli troškova. Međutim, pozitivni trendovi u provedbi metode obračuna zasnovane na punim troškovima su očiti. Pritom posebno naglašavamo primjere sveučilišta u Portugalu te Liverpoolu, koja su uspješno implementirala metodu ABC ali i razmatramo pokretače, ograničenja i prednosti koji iz nje proizlaze.

