

DIANA EERMA

A bookkeeping approach to social
accounting for a university faculty:
the case of the University of Tartu



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2. ‘Measurement Approaches for Evaluation: We Get What We Measure’. *International Evaluation Conference*, Vilnius, Lithuania, 03.–06.07.2013.
3. ‘Social Accounting for a University Faculty – A chart of Accounts’ (with professor P. Friedrich), *9th ICAFT International Conference on Accounting and Finance in Transition, European and World Experience and Public Policy Considerations*, Riga, Latvia, 11.–13.10.2012.
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LIST OF ABBREVIATIONS

BCA	– benefit-cost analysis
BSC	– balanced score card
CBA	– cost-benefit analysis
CO₂	– carbon dioxide
CV	– compensating variation
CS	– consumer surplus
CSD	– corporate social disclosure
CSR	– corporate sustainability report
EEK	– Estonian kroon (the currency of Estonia from 1992 to 2011)
EU	– European Union
EV	– equivalent variation
FMCS	– Faculty of Mathematics and Computer Science
PS	– producer surplus
RT	– research task
SA	– social accounting
SEA	– social and environmental accounting
SEB	– Scandinavian Union Bank
SNB	– social net benefit
SWF	– social welfare function
TBL	– triple bottom line
USA	– United States of America
UT	– University of Tartu
WTA	– willingness to accept
WTP	– willingness to pay
y	– years (in Table 36)

INTRODUCTION

Motivation for the research

All economic units are accountable for their performance to their stakeholders and within society, especially that which concerns their results or outcomes. For example, businesses are primarily accountable for their results (their profit), but also to their shareholders, to their board, and to their customers and staff. Not-for-profit organizations are responsible to account for the key stakeholders as their clients and other beneficiaries as well their community. In demonstrating accountability, organizations, businesses, and other economic entities in the private, public, and so-called third sector, especially not-for-profits, have to not only collect the data, they have to be aware what data is needed and have systems for collecting, measuring, and analyzing it for demonstrating their commercial and social success.

According to Peter Eichhorn (2011: 133) the conventional way of establishing the success of an economic unit has been to look at the outcome figures at the end of the balance sheet; the success of a firm is measured by commercial profit. Therefore, the exchange process demonstrates entrepreneurial market success, but success that does not result from the market, but beyond it, has been ignored, that is, the external¹ effects of a company's or economic entity's activities on individuals, households, society, and nature are not taken into account and are not reflected in profit. This is also true in the case of commercial accounting for not-for-profit economic units.

The term "social success" captures the external effects of an economic unit's activities on individuals, households, society, and nature (Eichhorn 2011). It means a much wider range of success determinants compared to commercial success. The author of this thesis defines social success based on welfare theory through change (improvement) in the welfare in society caused by an economic unit.

Economic units must show their social success for society as a whole and for groups, stakeholders and other economic units. In the case of a university there is a priority to achieve and demonstrate measurable results because of universities' engagement with society. The types of engagement may be presented in three main ways (Watson 2007, 2010). The primary role of universities is to produce graduates, who go to work and play their parts in civil society, where they are likely to contribute more than if they did not attend a university. These graduates also pay their taxes and return a proportion of their higher-than-average incomes as graduates through taxation. Different directions in relation to the first-order engagements of universities with regards to the local

¹ External effect is defined as an effect where money is not exchanged. Therefore, it must take place as a non-market valuation. In business administration, sometimes "external effect" means the environment and activities outside a firm.

community, to the institutions of civil society, to government, to global citizenship (by progressive engagement with political, economic and environmental issues), and to groups of other higher education institutions (locally, regionally, nationally, and internationally) may be seen.

Second-order engagement is connected with universities' task to produce graduates in required disciplines and professional areas. Consequently, universities supply services, research and development, and consultancy.

Third-order engagement is related to commitments between the university and its members. This in general means that both students and staff have responsibilities within society, for example, academic manners, such as listening to and taking account of other people's opinions and views.

These engagements reflect the main characteristics of universities and have developed and keep developing through stages as presented in Table 1. Nowadays, universities are considered to be in transition, from the second to the third generation (Wissema 2009), which also impacts their role in society and influences tasks and activities involved in social success accounting. As described in Table 1, universities develop a global orientation and more interdisciplinary methods. As a result, effects and engagements with society are wider than via commercial accounting, and success can be expressed. Therefore, these tendencies are relevant to consider in their social success and its measurement.

Table 1. Characteristics of the three generations of universities

	Characteristics of the:		
	1st generation university	2nd generation university	3rd generation university
Objective	Education	Education plus research	Education and research plus know-how exploitation
Role	Defending the truth	Discovering nature	Creating value
Method	Scholastic	Modern science, mono-disciplinary	Modern science, interdisciplinary
Creating	Professionals	Professionals plus scientists	Professionals, scientists plus entrepreneurs
Orientation	Universal	National	Global
Language	Latin	National languages	English
Organization	Nations, faculties, colleges	Faculties	University institutes
Management	Chancellor	(Part-time) academics	Professional management

Source: Based on Wissema (2009: 23)

As it is necessary to evaluate how the abovementioned engagements with society are fulfilled, then a need exists for a suitable accounting approach that considers, in addition to internal effects, external effects that are not completed via conventional (financial/commercial) accounting. For that purpose the social accounting approach is useful. In other words, setting a university into a social accounting context allows a determination of its operating costs and the benefits it produces for society. Additionally, more opportunities to account for the mentioned types of engagements with society can be found.

The author of this thesis agrees with the following statement about a university in the corporate world and sees motivation for the research in it: “The reliance on commercial standards to allocate resources jeopardizes the university’s (delicate) balancing of public interest and wealth accumulation priorities. The dilemma occurs because managerialist goals are at odds with the traditional perception of the university as an organic independent center of learning and knowledge creation. Notions of market efficiency are used to obscure the university’s shift towards economic rationalism.”(Saravanamuthu and Tinker 2002: 551)

Social accounting has grown out of a critique of the limitations of conventional accounting (Schaltegger and Burritt 2000:76; Richmond, Mook and Quarter 2003), in particular financial or commercial accounting for giving a narrow image of the interaction between society and organizations. Sometimes social accounting is even characterized as a reaction against conventional accounting principles and practice because then it is better understood (Geddes 1992). Social accounting has undergone development during the last 40 years. The necessity for a broader approach in accounting (Linowes 1968, 1973; Hopwood 1978; Burchell *et al.* 1985; Gray *et al.* 1997) and for a change in context for accounting (Cooper *et al.* 2005; Mook *et al.* 2007; Bebbington *et al.* 2007; Lehman 2007) has been emphasized throughout these four decades.

In general social accounting is considered to be social and environmental accounting (SEA), corporate social responsibility reporting, non-financial reporting or, even more broadly, sustainability accounting (O’Connor and Adams 2007), which means the process of communicating the social and environmental effects of organizations’ economic actions to particular interest groups within society and to society at large (see Gary *et al.* 1997). Social accounting seeks to broaden the scope of accounting overall, especially financial accounting.

The importance and impact of social accounting differs between the sectors. Gray *et al.* (2011) has noted that the “social accounting and auditing project” as a general trend during the past 40 years of experience of social accounting has been concentrated on its contribution to “an energetic discourse in light of the crisis-ridden social and environmental context and the shortcomings of current system of accounting and research on it.” The mentioned authors have noted the problem that social accounting literature and empirical studies have been biased towards private sector activities, where it is most developed. In contrast, both

the public and third sector needs to develop techniques and methods to evaluate their key performance and to capture their principle activities in order to justify their social and environmental existence (Pestoff 2011). The discussion for extending the debate in social accounting in the public sector was raised quite recently (Ball 2003; Marcuccio and Steccolini 2005; Gray *et al.* 2011). Gray and his colleagues (2011) have continued the debate for a newer conception of what social accounting might become.

Existing approaches to social accounting such as human capital accounting, social auditing, etc., applied to public transportation, the chemical industry (Adams and Kuasirikun 2000), the energy industry (Tsimopoulos 1989; Larrinaga-Gonzalez and Bebbington 2001), health services, and even to educational institutions have used methods that are not appropriate for a university because of tasks and activities related to the fulfillment of these tasks. Therefore, the particular issue is under observation in the current thesis.

The main contribution of the abovementioned approaches is the fact that social accounting considers that economic units (companies, educational institutions, and NGOs, etc.) influence the external environment through their actions and therefore should account for these effects as part of their standard accounting practices. It is important to underline that in the framework of social and environmental accounting (SEA) an advanced (Bebbington *et al.* 2007) and integrated approach (Mook, Quarter and Richmond 2007) of social accounting has been sought. This clearly shows a gap in the research domain.

In general, the available approaches of social and environmental accounting are fragmentary, have measurement problems and problems defining the social accounting terms. The author has found support of her statement in Kaya and Yayla (2007).

The research gap in social accounting appears in two main ways: first, in social accounting for a university, and second, in methodology and methods applied.

Based on the literature the author has found that the different approaches of social accounting do not involve one which considers the welfare change in the form of *ex-post*² analysis³ and results in integrated (synthetic) and period-oriented success accounting. Precisely, the research gap is the missing *ex-post*

² *Ex-post* translated from Latin means “after the fact.” *Ex-post* is the opposite of *ex-ante*, which means “before the event.” Definition of *ex-post* is considered term of actual returns. With *ex-ante* and *ex-post* a distinction between the planned and actual values of economic variables are done. The *ex-ante* and *ex-post* reasoning in economics was introduced by Swedish economist Gunnar Myrdal, who suggested that a distinction has to be made between two alternative methods of defining. Quantities defined in terms of measurements made at the end of the period in question are referred to as *ex-post*. According to Rutherford (2007: 84), “*ex-ante* calculus is a question of anticipations, calculations and plans driving the dynamic process forward; *ex-post* is an overall bookkeeping balance.”

³ This is an analysis of the effects, based on information available after performance observed and reported. It is retrospective analysis using equations and identifications.

analysis with a related bookkeeping system that leads to a period-oriented social accounting approach.

There exists at least one additional gap in the research that the current work can fill: the majority of the scientific literature and research on social accounting originates from Western Europe, the USA, and Australia. For example, in Estonia the importance of the social accounting topic is still in the discovery phase.

The topic of this thesis is important because it raises the following questions: what universities offer to society considering operation costs and benefits, and how their contribution in terms of welfare change can be measured. The analyses found in the literature do not tackle the whole bundle of services that a university provides, including teaching, research, consulting and cooperation with other institutions. There exist studies about universities (Leslie and Lewis 2003; Wonnemann 1989) and sustainability reports, but they do not refer to the total success of a university, only to the achievement of special goals. The period-oriented bookkeeping approach for measuring the welfare change caused or in other words measuring social success is suggested in this thesis. As the research object is a university faculty, considering the tasks and activities, the developed approach is applicable with some modifications in the case of other scientific and research organizations as well.

The aim and research tasks

Social accounts give information highlighting the performance of an economic unit and its attitude towards society. A university is the principle producer and distributor of scientific knowledge. Therefore, the social accounting approach is relevant for a university to assess its social success⁴ on the basis of its objectives and justifications for its activities. Universities are not identical in several

⁴ Concerning “social success” as one of the focal terms in the thesis the author has considered discussions about whether to use some other well-known term instead. Since the topic and the aim of the thesis deals with an integrated approach, including welfare economics and bookkeeping (accounting) methods, one considered term to use was “performance.” The latter was discarded because of two main reasons: 1) logic of evaluations based on the willingness-to-pay principle (see subsection 1.3), which considers social accounting from the point of view society and its success. Success itself means certain results (for example, social net benefit); 2) the term “performance” is widely used in management literature. It means realization activities and/or the fulfillment of particular goals. It has more emphasis on the managerial process, which is not in the focus of the current work. To clarify: performance management is considered to be a systematic process that includes planning, monitoring, developing the capacities to perform, recording performance, and recognizing (for example, see Smith 2005). Therefore, using the term “performance” may mislead in the context of the current thesis because the author’s aim is not to find out how the goals have been fulfilled or achieved.

aspects⁵. The first aspect is their organizational structure, but certainly all universities have faculties⁶ and departments, i.e., units that fulfill main tasks and the university's engagements with society. Therefore, the reasonable starting point for social success accounting of a university is at the faculty (or department) level.

The aim of the current dissertation is to develop a period-oriented bookkeeping approach for social accounting, which applies *ex-post* analysis and is based on welfare theory evaluations, to measure the social success of a university faculty. This approach will be developed, operationalized and applied on the faculty data – the Faculty of Mathematics and Computer Science (FMCS) at the University of Tartu (UT), Estonia.

To achieve this aim, the following research tasks are set up:

1. Review social accounting approaches found in the literature and explain reasons to apply social accounting for social success measurement in the case of university.
2. Analyze methods and tools available for social success accounting and evaluate whether these fulfill requirements of a period-oriented *ex-post* analysis.
3. Explain the welfare theory-based bookkeeping approach to social accounting in a university case (formal structure, the chart of additional social accounting, basic evaluations, etc.).
4. Explain the background for the empirical case on a faculty (the FMCS) basis for social accounting.
5. Develop and apply the welfare evaluation-based *ex-post* analysis bookkeeping approach on the FMCS (developing commercial balance, additional operating social success statement and total social balance of the FMCS).
6. Discuss strengths and weaknesses of the welfare theory-based periodical bookkeeping approach in a university social accounting context and make suggestions for the development of social success accounting (improvements for additional social balance).

Different approaches to social accounting are analyzed and methods have been applied in order to assess social success of an economic unit are looked at.

⁵ Universities may be classified as teaching and/or research universities as well specialized in a single subject or multidisciplinary. From the point of view of knowledge creation and location see Andersson and Beckmann (2009).

⁶ In North American (in the USA and Canada) English the use of the word “faculty” means the academic staff of a university. In the European context a faculty is defined as a division within a university in one or a number of subject areas. The author of the thesis refers to the European tradition in the usage of the term “faculty,” which means a faculty that marks a division of subject area within a university, including academic staff. This decision is supported by the fact that the research object officially (also in its name) contains the term “faculty” in this context.

Whether these approaches, general and specific ones, offer a bookkeeping approach to identify the periodical success of an economic unit is also checked.

Originality of the research and its practical value (merit)

University social accounting is a rather rarely touched topic in the social accounting literature, probably because there is a common understanding that it is obvious that universities create positive externalities within society and there is no need to study it more closely.

The context for such a situation was also characterized by a major trend in social accounting in the 1980s and the 1990s with the main focus on environmental aspects (developments of these decades are overviewed by Rob Gray (2001)) because of negative externalities caused in the social accounting topic.

In general, non-market benefits and externalities of education are complicated to identify, but are even more complex to measure. Therefore, education non-market benefits that are measured by a willingness to pay show scant evidence of availability. This aspect has been discussed by Psacharopoulos and Patrinos (2007).

The author of the current thesis has found support for her ideas concerning university social accounting from the works of Lee J. Seidler (1975), Ralph Estes (1976), Ahmed Belkaoui (1984) and Peter Eichhorn (2011).

Many American universities (see Sustainability Reporting of the Top U.S. Universities (2012); Campus Sustainability Report, University of California (2013); Sustainability Yearbook (2012–2013), Appalachian State University; Sustainability Report for Ball State University (2012); Sustainability Progress Report, Brown University (2012); Sustainability Progress Report, University of Michigan (2012)), Canadian universities (Fonseca *et al.* 2011), and Western European universities (Sterling, Maxey and Luna 2013) have introduced sustainability reporting. Starting from the 1990s, university sustainability reports have shown an increasing trend in the USA. Concerning Western Europe, the state of sustainability reporting in universities has been characterized as being in its early stages in terms of numbers of institutions that report as well as the level of reporting (Lozano 2011) even decades later. Nevertheless, these sustainability reports for universities do not concentrate on the main tasks and activities of universities and on the effects caused by these activities in their design of annual sustainability metrics. In the sustainability reports the focus is on the natural environment and indicators describe the situation of sustainability from the point of view of energy consumption and climate change, water consumption, waste produced, transport usage, and how the natural environment is harmed. It means also that these types of sustainability reports follow the trend in social accounting as mentioned above: focus on environmental

aspects. These reports stand apart from conventional accounting and cannot be integrated into the accounting and bookkeeping system because measurement indicators are not given in monetary terms. Different units for measurement have been used, for example, percentages, tons, kWh, etc.

In general, the abovementioned reports and the overview about the developments in universities' sustainability reporting show that the indicators applied are in a non-integrated framework and a variety of approaches have been used in the selection of these indicators.

While sustainability reports demonstrate indicators that describe universities' activities from a broad range of issues they may cause, intellectual capital reporting (Leitner 2004) for universities concentrates on social capital. The starting point here is that the most important output of a university is knowledge. In this context social capital (the term "intellectual capital" is also used⁷) consists of human capital⁸, structural capital⁹, and relational capital¹⁰. In intellectual capital reporting for universities the valuation of intangibles assets takes place via indicators concerning research, education, and knowledge transfer. Similarly to sustainability reports, indicators are used. These reporting indicators are expressed in different measurement units, for example, the number of publications for research, the number of graduates, expert opinions in services, etc. Therefore, comparability issues are raised here as well. The relevance of intellectual capital reporting in the case of universities may be stressed by the fact that in Austrian universities these reports have been obligatory since 2002 (Leitner 2004: 130). Still, in these reports evaluation is limited with knowledge creation and transfer while other tasks as well their effects are not taken into consideration.

The novelty of this thesis stands in the development of the social accounting approach for a university faculty. This approach is based on welfare theory and the evaluation methods of benefit-cost analysis¹¹ and is applied to the bookkeeping system. The approach developed and applied for a faculty is innovative because it is an integrated approach including economics and business administration analysis methods. It overcomes the problems that are

⁷ Intellectual capital could consist of different intangibles and tangible resources interacting to produce an organization's output (Leitner 2004: 131), but also it could be defined as knowledge that can be converted to profit (*Ibid*).

⁸ Concerning knowledge, human capital is defined as the knowledge that employees take with them when they leave the firm (Leitner 2004).

⁹ Concerning knowledge, structural capital is the knowledge that stays within the firm at the end of the working day, meaning routines and procedures, databases, etc. (Leitner 2004).

¹⁰ Resources linked to external partners, as customers and suppliers (*Ibid*).

¹¹ Benefit-cost analysis (BCA) or cost-benefit analysis (CBA) is a methodological framework developed in the 1930s and is used in public policy decision making. The BCA approach also forms the core of a substantial part of a normative foundation of thinking under the wealth maximization issue. Benefit-cost is more closely associated with an economic approach and cost-benefit closer to an engineering approach. (Zerbe and Bellas 2006)

apparent in different sustainability reports, intellectual capital reports, and other types of reporting, which use indicator-based measurement techniques. For introducing the approach in the empirical case the basic decisions on how to identify the social success of the faculty and the requirements of the bookkeeping approach had to be determined. In order to fulfill the task empirically, a proper *ex-post* analysis and an adequate bookkeeping system had to be developed. For the development of social bookkeeping a willingness-to-pay approach from the welfare theory will be applied.

Since the bookkeeping approach development for social accounting of the faculty is based on methods used in economics (welfare economics, *ex-post* analysis) and business administration (accounting, bookkeeping) the relevant terms in both spheres need to be clarified in the context of the current thesis. For this purpose definitions of the key terms are shown in Annex 1.

Delineation and delimitation of the research as follows:

1) Content:

- The concentration is on welfare-oriented social accounting using parts and elements of an *ex-post* analysis, with no further development of micro-and macroeconomics theory, using the welfare theory, but with no further development of the welfare theory.
- The developed approach as an *ex-post* analysis is based on periodical accounting and a bookkeeping system. It does not deal with extended investment accounting or the risk and uncertainty issues of the benefit-cost analysis.
- Welfare change-oriented evaluations with an adaptation of existing evaluation methods are applied to the necessity of the faculty social accounting original data that stem from the willingness to pay expressed by tasks and goal-oriented payments and information available.

2) Methods:

- The existing microeconomic theory and techniques, and bookkeeping rules of business administration and macroeconomic effects according to the effects and transactions to be evaluated are mainly applied.
- No development of economic models of effect measurement on a computerized general equilibrium model or location choice model with equations takes place.
- The current research does not deal with econometrical approaches, but only with simple statistically available information-using methods.

3) The period of empirical study is the year 2006, with respect to the literature assessment up to the end 2013. The year 2006 was chosen for the empirical study because interference into the actual management process is avoided and neutrality in this respect safeguarded.

4) Regional delineation: mainly Estonia and the price system prevailing there is considered, and the welfare change of the inhabitants of Estonia is observed.

At the same time, the limitation of the thesis is that, since the empirical part is exploratory, it does not offer perfect final solutions for general application.

Nevertheless, this kind of social accounting approach is relevant for university social accounting for several reasons. First of all, it offers the possibility to evaluate and measure external effects of the university through its activities in a systematical and integrated way. Secondly, it helps to show the usefulness of these social activities, which are not coordinated through the market. Third, it helps to understand how the university or its faculty fulfills the abovementioned main engagements (described in Motivation for the research) with society. It also gives a scientific base for making the university or its faculty more visible in society.

Research methodology

For the theoretical framework building the author has studied theoretical articles and literature on social accounting, welfare theory and benefit-cost analysis until (including) 2013. This information has been analyzed and discussed from the point of view of the social success accounting and bookkeeping approach of the thesis. The theoretical focus, available measurement methods, logical framework for the empirical case development, and other theoretical aspects are accordingly presented in subsections 1.1–1.3.

For empirical case development, written reports of the faculty (the FMCS) and its institutes, the University Annual Report, and reports and documents from the UT Financial Office of the year 2006 are studied. For the operational social success statement and additional social balance construction interviews in the UT Financial Office and in the Dean's Office of the FMCS were conducted during the time period from March 2011 until August 2012.

The research approach is based on *ex-post* analysis. As the faculty operations concentrate on Estonia, welfare change of inhabitants of Estonia is in the center of the analysis. Therefore, the groups of persons who are impacted and whose willingness to pay has to be determined within Estonia have been taken into account.

Overview about the study concerning the type of data applied, its objective of application, and relation to achieved results are presented in Table 2.

Table 2. Outline of the study

Type of data	Application/objective	Result in subsections
Theoretical articles and materials on social accounting, welfare theory and benefit-cost analysis	To build theoretical framework for the thesis topic	Theoretical focus for social accounting found (1.1 in the thesis), different methods for social success accounting analyzed (1.2 in the thesis) and welfare economics based bookkeeping approach to social accounting explained (1.3 in the thesis)
Written reports (Annual Report of the University of Tartu, Annual reports of faculty's institutes)	For the introduction of research object and to build commercial and additional social balance for the faculty	The object of research described (2.1 in the thesis) and total social success accounting for the faculty developed (2.2 in the thesis)
Chart of accounts (financial/commercial) from the UT Financial Office	To build a faculty-related commercial balance for the faculty	The faculty-related commercial balance with direct and indirect commercial flows and stocks evaluations completed (2.2 in the thesis)
Bookkeeping reports and documents from the UT Financial Office	To make evaluations for commercial bookkeeping transactions.	The faculty-related commercial balance for direct and indirect evaluations completed (2.2 in the thesis)
Answers to a questionnaire on the faculty and its institutes	For additional social balance construction, chart of accounts, transactions	The total social balance developed and corrected (2.2 in the thesis)
Additional information inquiries for the faculty	For additional social balance construction, chart of accounts, transactions concerning additional flows and stocks	The operational social success statement and total social balance developed and corrected (2.2 in the thesis) and alternative evaluation methods analyzed (2.2 and 2.3 in the thesis)

Source: Compiled by the author

The structure of the thesis

This thesis consists of two major chapters. The first one is theoretical, where social accounting approaches found in the literature are reviewed, and social accounting and other types of accounting (commercial, national, and cameral accounting) as the main forms of *ex-post* analysis besides social accounting are compared. For opening the concept of social accounting the author compares different definitions of social accounting and defines social accounting for a university (see subsection 1.1). Next, in the first part (subsection 1.2) different methods for social accounting are presented and compared. Based on the observation of different methods applied in social success measurement the methodological framework for the welfare-based *ex-post* analysis and the bookkeeping social accounting approach is introduced and developed (subsection 1.3). The second chapter contains empirical case development where the method that uses welfare theory and the benefit-cost approach for the evaluation of effects of the faculty activities is applied (subsection 2.1) and the results of the faculty case are presented (subsection 2.2). The *ex-post* analysis and a period-oriented bookkeeping system, which is based on double entry¹² commercial bookkeeping, and additional social success accounting is elaborated. The main challenges are to derive a chart of accounts; make benefit-cost-oriented social evaluations; identify transactions, stocks and flows, and booking and balancing techniques; and interpret results. Under discussion are the necessity of the benefits and challenges of the proposed approach (see subsection 2.3). The overall structure of the thesis is presented in Figure 1 where the links between the theoretical and empirical parts are demonstrated with the support of research tasks (RT in Figure 1).

¹² Double entry bookkeeping is the most commonly used system of bookkeeping and is based on the principle that every financial transaction involves the simultaneous receiving and giving of value, and is therefore recorded twice. This system dates back to the 14th century (see Peragallo 1938).

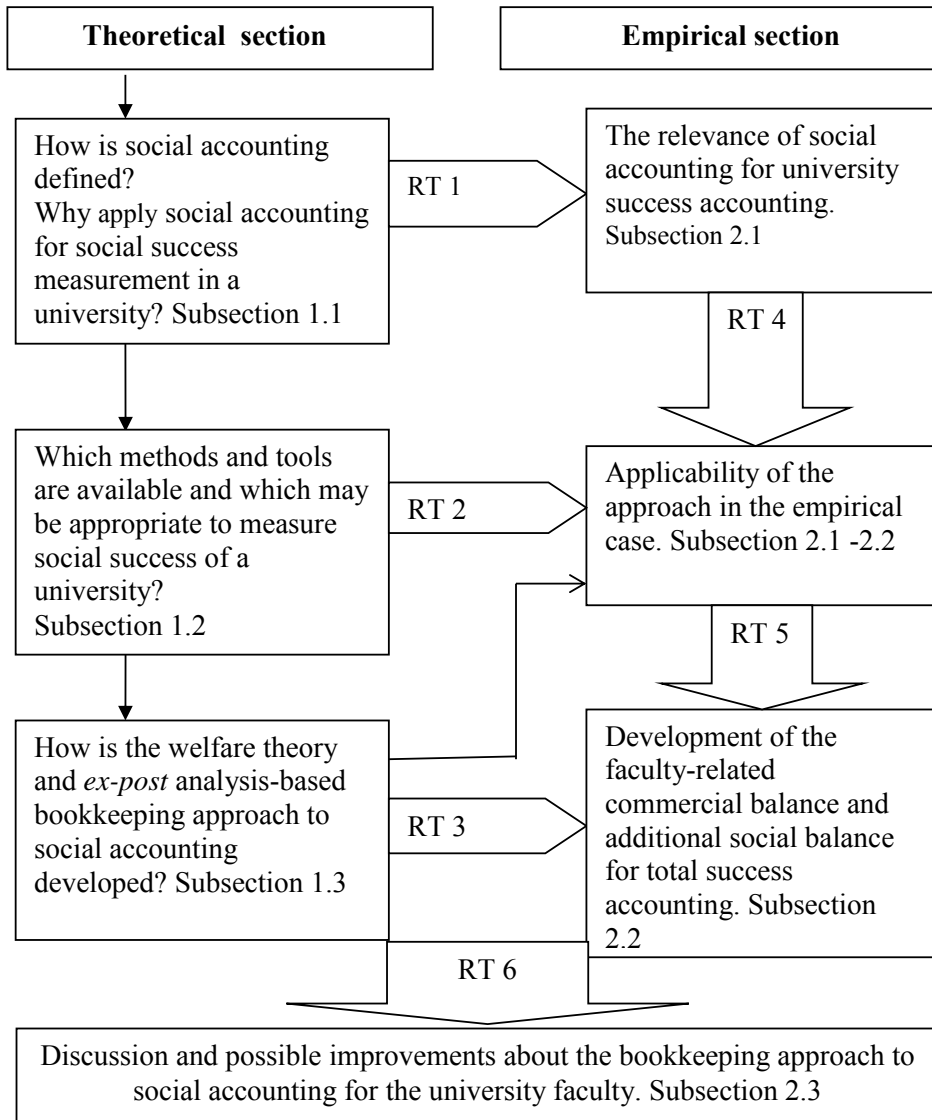


Figure 1. The structure of the thesis

Source: Compiled by the author

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I. THEORETICAL FRAMEWORK OF SOCIAL ACCOUNTING

I.1. Defining social accounting

For theoretical framework building, different social accounting approaches and definitions of social accounting found in the literature will be reviewed and observed. The reason for applying social accounting to social success measurement in the case of a university will also be explained.

Accounting can be seen as the language of business and economics that allows the communication of information about how companies, public enterprises, public offices, NGO units, households, and groups of such economic units perform to all interested parties. By one of the definitions, it is the process of identification, measurement, and communication of economic information to permit judgments and decisions by users of the information (Riahi-Belkaoui 2004: 38). Different forms of accounting systems exist in economics and business administration. They also have different purposes and objectives. For example, in national accounting, the economic production measurement is considered. It is the economic accounting directed towards identifying production – the measured income of sectors and a country by national accounting; national wealth accounting determines the value of the assets and liabilities of a country and the accounting of financial transactions of a country take place. In the literature, national accounting is sometimes termed “social accounting” (Stone 1951, 1984; Vanoli 2005) and so-called social accounting matrices (Cohen 2002; Mitra-Kahn 2008) to show how the macroeconomic flows of factors, goods, etc., between economic sectors circulate and are mapped.

Accounting in a more narrow sense deals with the *ex-post* analysis of economic activities of one economic unit or groups of economic units. *Ex-post* analysis exists for commercial accounting, cameral accounting (public administrative accounting, plant-type accounting, extended accounting), and national accounting (income accounting, finance accounting, and wealth (property) accounting), but it does not exist for social accounting. It means that no definition, behavior, or technical and legal equations are available for such analysis in social accounting.

Commercial (financial) accounting has been developed for use in the business sector, and over time it has changed from representing financial (monetary) accounts to performance (profit) accounts. Commercial accounting concentrates on profit and loss identification and the change in the wealth of an individual economic unit such as a firm. Therefore, in the case of commercial (financial) accounting, a profit assessment takes place.

In the literature on commercial accounting one also may find a generalization about the accounting systems stating that there exists so-called conventional accounting, which is meant to include managerial¹³, financial¹⁴, and other types of accounting. Here managerial accounting or cost accounting is meant to be a central tool and basis for most internal management decisions and is not usually directly available to external stakeholders. Financial accounting is designed to satisfy the information requirements of external stakeholders of firms with respect to financial impacts. Other types of conventional accounting systems are used to cover specific accounting systems such as tax accounting and bank regulatory accounting (Schaltegger and Burritt 2000). However, they are mainly oriented to profit and cost determination and are specified as commercial accounting.

Cameral accounting has been developed for use in the governmental sector, and its evolution shows that the original monetary focus has been supplemented with a performance focus (Monsen 2002, 2006). The cameral type of accounting monitors public administration and tends to have a narrow approach to public enterprises.¹⁵ Cameral accounting has been specifically designed to help carry out budget control (Monsen 2008).

Social accounting concentrates specifically on social success and the change in the social value of the assets and liabilities of an economic unit. Social accounting (Gray 2001) has a wider approach compared to commercial and cameral accounting, in other words, conventional accounting, measuring the social success of firms, public enterprises, and public offices.

¹³ According to Management Accounting Official Terminology (2000: 15) management accounting is the application of the principles of accounting and financial management to create, protect, preserve, and increase value so as to deliver that value to the stakeholders of profit and not-for-profit enterprises, both public and private. Management accounting is an integral part of interpretation and use of information relevant to: formulating business strategy, planning and controlling activities, decision making, efficient resource usage, performance improvement and value enhancement, safeguarding tangible and intangible assets, and corporate governance and internal control. Management accounting helps organizations establish viable strategies and convert them into profit (in a commercial context) or into value for money (in a not-for-profit context).

¹⁴ According to the abovementioned source (2000: 14) under the financial accounting definition is meant the classification and recording of the monetary transactions of an entity in accordance with established concepts, principles, accounting standards, and their presentation, by means of profit and loss accounts, balance sheets, and cash flow statements, during and at the end of an accounting period.

¹⁵ Cameral accounting is a specific government accounting model that was traditionally developed for cash accountability. It has historical roots and practice in German-speaking continental European countries (Austria, Germany, and Switzerland). It has been indicated that the Latin word “camara” or “camera” referred to the place where the master stored his treasures, and the German expression “kammer” in this connection denoted the room where those persons who were responsible for administering the revenues assembled.

Thus, the expressions cameralistic and cameral accounting have always been closely linked to both cash and revenue as well as their administration (Monsen 2008).

Social accounting grew out of a critique of conventional accounting and is particularly based on the critique of a limited range of items that financial accounting considers, its exclusion of items that do not have an established monetary value, and its focus on shareholders and other providers to the exclusion of other stakeholders – employees, users, or consumers of the service, society, government, and volunteers, and members. (Mook *et al.* 2003; Richmond *et al.* 2003) The concept was originated in the late 1960s and 1970s, when scholars referred to this approach as either environmental or social and environmental, because one of its concerns was the organization's impact on the natural environment.

Several authors have indicated that social and environmental accounting (SEA) grew out of a broader business and social debate in the 1960s and early 1970s (Epstein *et al.* 1976; Gray 1994, 2001, 2002; Mathews 1997; O'Connor 2006; Kaya and Yayla 2007). It is quite clear that the two first decades played a crucial role in the development of the subject when the social aspect was introduced between business and society through the corporate social responsibility literature. The term "social accounting" was also brought into use.

The term social and environmental accounting has evolved over decades. According to Linowes (1968) the term "socio-economic accounting" has been explained as a paradigm that has a significantly broader scope than conventional accounting in terms of its sociological, political, and economic aspects. This approach has also been applied by Mobley (1970) and Estes (1976), but in a more specified way. Later, during the 1970s and 1980s, the term was extended by several authors as "social responsibility accounting" (Anderson 1977) and "social and environmental accounting" (Gray *et al.* 1987; Gray 2002 – "the universe of all possible accountings" and (2008) "as the accounting one gets when the artificial limits of conventional accounting are removed"). According to Anderson (1977) this accounting should include "the impact of corporate decisions on environment, the consumption of non-renewable resources and other ecological factors, on the rights of individuals and groups; on the maintenance of public service; on public safety; on health and education; and on many other such social concerns." According to Mathews (1993), the definition of social accounting has been extended even more towards political aspects.

Therefore, the term has been evolved by several authors during the last four decades and is still quite wide, including social and environmental aspects and sharing the common features of expanding the range of criteria that have been taken into consideration in measuring the performance and impact of an economic entity (Table 3).

Table 3. Definitions of social accounting (in chronological order)

Definition	Reference	Focus of the definition
Accounting provides a dual function of evaluation and verification of social and economic events.	Linowes 1968	Evaluation and verification of social and economic events
Social accounting refers to the ordering, measuring, and analysis of the social and economic consequences of governmental and entrepreneurial behavior. Social accounting is seen as encompassing and extending present accounting. Traditional accounting has limited its concern to selected economic consequences – whether in the financial, managerial or national income areas. Socio-economic accounting expands each of these areas to include social consequences as well as economic effects which are not presently considered.	Mobley 1970: 762	Extension of conventional accounting towards social consequences
	Eichhorn 1974	Measuring the impact of firms' activities on stakeholders and society by referring positively and partly to methods of welfare measurement
The measurement and reporting, internal or external, of information concerning the impact of an entity and its activities on society.	Estes 1976: 3	Impact of an entity and its activities on society
The identification, measurement, monitoring and reporting of the social and economic effects of an institution on society.	Epstein <i>et al.</i> 1976: 24	Social and economic effects on society
The process of selecting firm-level social performance variables, measures, and measurement procedures; systematically developing information useful for evaluating the firm's social performance; and communicating such information to concerned social groups, both within and outside the firm.	Ramanathan 1976: 519	Evaluation of a firm's social performance within and outside the firm
As providing a description in both monetary and non-monetary terms of the positive and negative effects that human beings or groups of human beings perceive as stemming from a company's operations.	Grojer and Stark 1977: 349–350	Positive and negative effects stemming from a company's activities
As a systematic assessment and reporting on those parts of a company's activities that have a social impact.	Anderson 1977: 6	Social impact of the company

Table 3. Continuation

Definition	Reference	Focus of the definition
Measuring the impact of firms' activities on stakeholders and society based on welfare measurement.	Schmitz 1980; Tsimopoulos 1989; Friedrich 1991	Refinement of welfare-based methods of evaluation, extensions to develop an <i>ex-post</i> description of social success-relevant activities and the conditions of an economic unit and to its shareholders
The process of communicating the social and environmental effects of organizations' economic actions to particular interest groups within society and to society at large. As such it involves extending the accountability of organizations (particularly companies), beyond the traditional role of providing a financial account to the owners of capital, in particular, shareholders. Such an extension is predicated upon the assumption that companies do have wider responsibilities than simply to make money for their shareholders.	Gray <i>et al.</i> 1987: ix; Gray <i>et al.</i> 1996: 3	Evaluation of organizations' economic actions to particular interest groups and to society; Extension of conventional accounting.
Voluntary disclosures of information, both qualitative and quantitative, made by organizations to inform or influence a range of audiences. The quantitative disclosures may be in financial or non-financial terms.	Mathews 1993: 64	Qualitative and quantitative disclosure
Social accounting means an extension of disclosure into non-traditional areas such as providing information about employees, products, community service and the prevention or reduction of pollution. The term is also used to describe a comprehensive form of accounting that takes into account externalities.	Mathews and Perera 1995: 364	More specific compared to the previous definition and points out importance of accounting for externalities
Social accounting in the context of corporate accountability as an approach to reporting a firm's activities that emphasize the need for the identification of socially relevant behavior, the determination of those to whom the company is accountable for its social	Crowther 2000: 20	A company's social performance and its reporting techniques

Table 3. Continuation

Definition	Reference	Focus of the definition
performance and the development of appropriate measures and reporting techniques.		
Social accounting is a systematic means of accounting for the social impact of an organization. It can be compared to the way that financial accounting provides the means for an organization's financial performance.	Traidcraft 2000: 1	Accounting for the social impact of an organization
Social and ethical accounting is concerned with learning about the effect an organization has on society and about its relationship with an entire range of stakeholders – all those groups who affect and/or are affected by the organization and its activities.	Institute of Social and Ethical AccountAbility 2000: 1	The effects of an organization on society
A systematic analysis of the effects of an organization on its communities of interest or stakeholders, with stakeholder input as part of the data that is analyzed for the accounting statement.	Mook <i>et al</i> 2007: 2	A systematic analysis of the effects of organization

Source: Compiled by the author

The presented definitions of the term “social accounting” show the common features of widening the domain of accounting and attempting to take into consideration a broader circle of stakeholders. These definitions lead to the understanding that the conventional accounting can be seen as a sub-set of social accounting as it is illustrated by Figure 2. This understanding is also supported by Seidler's (1975) statement that social accounting measurement would be made from the point of view of society or some subset of society, or as a particular body or given group in the population.

In the discussions about how to broaden the conventions of accounting beyond its boundaries, Gambling (1978: 2) has identified the main thrust of the argument in societal accounting (definition from Gambling in the meaning of society's point of view) “that accounting theory and culture are not very readily separable.” He explains that this was achieved by defining accounting theory broadly, so that it comprises our “semantics of welfare,” conception of environment, how the entire system interacts, and how we evaluate situations and possible outcomes (Gambling 1978).

If in enterprise accounting the entity is the focus of measurement, then in social accounting the undertaking is not a specific business or public enterprise as in conventional accounting. The definition of the entity varies with the

circumstances and with the definition of “society.” Another distinction in social accounting lies in the terms of measurement (see Seidler 1975:4). In this thesis it is considered that social accounting measures the change in general welfare resulting from the activities that have been measured, rather than concern with the changes in the economic resources of a group of shareholders. Concentration is on the activities related to an economic unit.

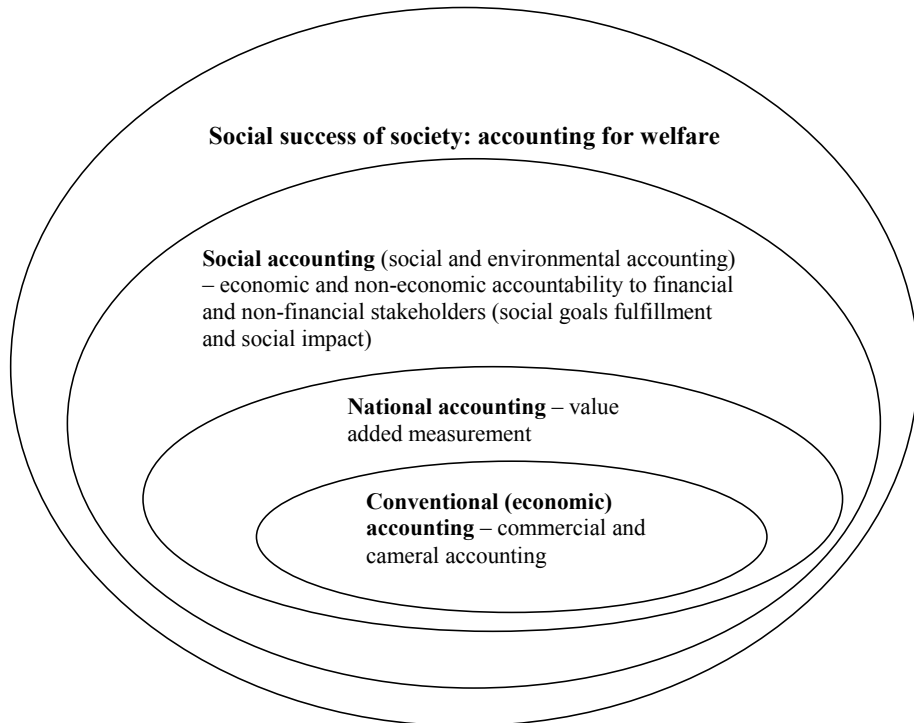


Figure 2. Conventional accounting as a subset of social accounting

Source: Compiled by author based on O’Connor (2006:6); O’Connor and Adams (2007:37); Grojer and Stark (1977:350); and Mobley (1970) with the author’s contribution

Note: Concerning national accounting, if dealing with one economic unit, it forms an assessment of value added for this economic unit. National accounting is an *ex-post* analysis using aggregates and sectors that are built up from individual units.

Later the concept of social accounting was further developed and shifted to an even broader spectrum of social concerns. The most widespread application of social accounting involves the use of qualitative and descriptive statistics to assess how an organization is meeting its stakeholders’ expectations in executing its mission, and this approach has been used by socially oriented business. (Richmond, Mook and Quarter 2003)

In general, social accounting seeks to broaden the scope of accounting (in particular, commercial accounting) in the following ways:

- concerns with more than only economic activities;
- not being exclusively expressed in financial terms;
- being accountable to a broader group of stakeholders and even to all stakeholders in society;
- broadens its purpose beyond reporting financial success;
- activities of the economic unit are taken under observation from internal and external points of view.

Social accounting pays attention to the fact that companies or economic units influence their external environment positively as well negatively through their actions and should therefore account for these effects as part of their standard accounting practices. In this sense the concept is closely related to the concept of externality (an economic concept of market failure). But the author deals with the term in the more narrow sense as analyses look at periodical success within the *ex-post* analysis.

Therefore, to summarize presented definitions about social accounting, social accounting represents a systematic analysis that considers both economic and social effects within and outside an economic unit.

The current thesis defines social accounting as an *ex-post* analysis that considers the welfare change of the economic activities. In this approach social success accounting for welfare is considered (see in Figure 2).

A wide variety of terms have been employed in social accounting. Historically, the terms “social audit” (Medawar 1976), “social responsibility accounting” (Benston 1982), “corporate social reporting” (Dierkes 1979; Tinker and Lowe 1980; Tinker *et al.* 1991; Gray, Kouhy and Lavers 1995), and “corporate social accounting” (Epstein *et al.* 1976; Estes 1976; Ramanathan 1976; Guthrie and Mathews 1985) have been in use. Recently emphasized are the terms “social audits” (Harte and Owen 1987) or “social audit and social accounting” (Owen 2001; Cooper *et al.* 2005), “ethical statements” (Adams 2004), “values report,” and “social statement.” A large variety of terms at different levels (perspectives) of economy have been used as research objects: firms/the micro perspective (Dierkes and Preston 1977); a specific industry or sector (Owen 1990; Adams and Kuasirikun 2000), which means a meso perspective, including the role of local governments (Harte and Owen 1987; Marcuccio and Steccolini 2005); as well an interesting retrospective review on corporate social reporting (Maltby 2005). From the 1990s the focus of interest in social accounting in general has shifted remarkably towards environmental accounting (Gray 1992; Cooper 1992; Gray and Kouhy 1993; Gray, Walters and Bebbington 1995; Burritt 1997; Chan and Milne 1999; Gray and Bebbington 2000; Jones and Matthews 2000; Gray and Bebbington 2001; Wilmshurst and Frost 2001; Owen 2003, 2007; Ball 2003; Everett 2004) and/or ecological accounting (Mauders and Burritt 1991; Birkin 1996), reporting (Gray and Bebbington 2000; Owen 2003; Buhr and Reiter 2006; Gray 2006)

and environmental audit (Power 1997; Owen 2003) so that other aspects seem to have less attention in the SEA subject.

There have already been early attempts to classify social accounting into major content areas, for instance by Dilley (1975), who suggested that there are five possibly overlapping categories, as follows:

- National social income accounting (macro accounting): has existed since the 1930s and pursues the measurement of the national quality of life¹⁶ on a macro basis.¹⁷ This category is not considered social accounting according to the delineation in this thesis (see Table 10).
- Social auditing: an approach at the level of the firm by attempting to assess an entity's responsiveness to its social responsibilities over such matters as pollution control, minority employment, and employee welfare.
- Financial/managerial social accounting for non-profit entities: similar to social auditing except that performance evaluations are restricted to not-for-profit organizations.
- Financial social accounting: primarily concerned with external disclosures by firms in social responsibility areas including human resource asset accounting and compliance with Securities Exchange Commission regulations concerning environmental impact standards.
- Managerial social accounting: emphasizes the development of social responsibility measurements and a reporting system geared towards internal decision-making purposes.

The categories mentioned and suggested above are rather general and still lack clear explanation and allocation in the social accounting research domain.

Later, in analyzing the thirty years of social accounting, reporting and auditing research experience, Rob Gray (2001) differentiated between three sorts of social accounting, which have been in usage through these decades in varying degrees. These stages are the following:

- The “social audits” – those public analyses of accountable entities undertaken (more or less systematically) by independent bodies and typically without the approval of the entity concerned. Here the social audit is being done in the broadest sense, by society or a group within society.
- The “silent social accounts” – organizations have steadily increased their areas of voluntary disclosure, most obviously on environmental issues, but also on matters as consumers, product safety, and interactions with the community. These types of social accounts increase the possibility to use the data that is apparently in use in any active way.

¹⁶ Today, decades later, the concept of national happiness by Bruno S. Frey is discussed. He sees in it as the opposite of something that was considered a revolution in economics in the 1930s (Frey 2010).

¹⁷ In the current thesis the first mentioned category of social accounting is not considered as the category under research because it covers the macro-level accounting.

- The “new wave” of social accounting – developed from the 2000s. This “new wave” has characterized much of the social accounting of the 1970s, where organizations (companies, value-based organizations, and NGOs) make significant attempts to produce systematic social accounts. This stage is driven by a wide diversity of influences, encouraged and supported by new organizations and initiatives and learning from the experiences.

At the same time, there was under discussion the accounting context in a broader sense (Hopwood 1978), for example, the aspect of social accounting and the social processing of information. As accounting represents one way of providing information for the social control of businesses and public organizations and given the social and organizational importance of its roles (evaluation, review, control, and justification of organizational performance), the extent of the accounting function and its social significance cannot be considered in isolation of social processes and other institutions. It also created a need for finding alternative modes of accounting (Figure 3). These kinds of attempts showed a tendency to broaden conventional accounting towards the social accounting approach of finding alternative accounting methods.

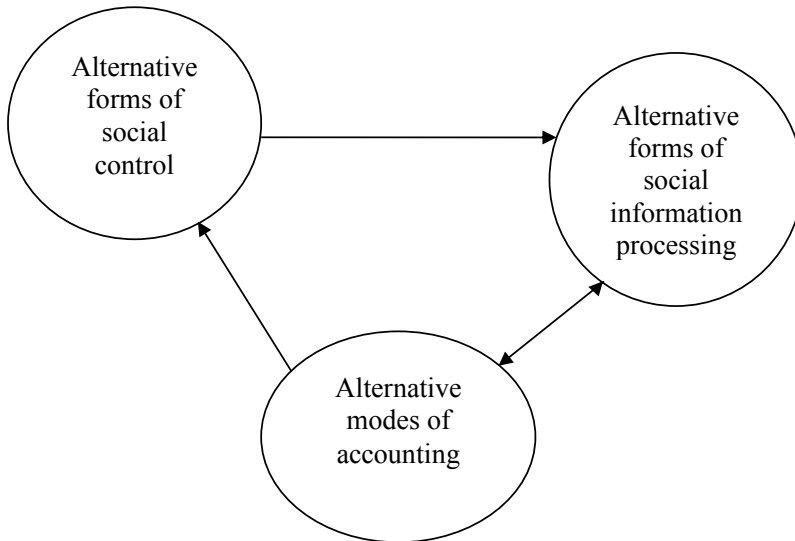


Figure 3. The accounting context

Source: Compiled by the author based on Hopwood (1978: 58)

An accountability-based conceptual framework of accounting (Ijiri 1983) points to the issue that an accountability relationship may exist outside a firm or inside a firm as a firm may be accountable to shareholders, creditors, government, labor unions, consumers, and the public in general. Within a firm, officers and employees are accountable to their respective supervisors in the basis of the organizational hierarchy of authorities and responsibilities.

Explaining the term “social accounting,” one has to avoid confusion between social accountability and social accounting and auditing (Medawar 1976). In this thesis the concentration is on social accounting as an *ex-post* analysis.

In the 1970s the objectives and concepts for social accounting were formed and proposed for the purposes of better integrating the goals of financial and social accounting. According to Ramanathan (1976) the objectives for social accounting at the micro level of firms were stated as follows:

- An objective of corporate social accounting is to identify and measure the periodic net social contribution of an individual firm, which includes not only the costs and benefits internalized by the firm, but also those arising from externalities affecting different social segments.
- An objective of corporate social accounting is to help determine whether an individual firm’s strategies and practices that directly affect the relative resource and power status of individuals, communities, social segments, and generations are consistent with widely shared social priorities, on the one hand, and individuals’ legitimate aspirations, on the other.
- An objective of corporate social accounting is to make available in an optimal manner, to all social constituents, relevant information on a firm’s goals, policies, programs, performance, and contributions to social goals. Relevant information is that which provides for public accountability and also facilitates public decision making regarding social choices and social resource allocation. Optimality implies a cost/benefit-effective reporting strategy which also optimally balances potential information conflicts among the various social constituents of a firm.

As found in the literature social accounting aims to assess the impact of an organization or company on individuals and groups of individuals – both the internal and external participants of environments – as shown in Table 4. In general, construction of the social audit and social accounting helps to clarify purposes for organizations’ clear vision.

Social accounting and auditing is a framework that allows institutions and organizations to change their existing forms. It gives opportunities to build on an existing system of documentation and reporting and develop a process. Largely, the essence of social accounting and auditing is accounting for an organization’s performance and considers what other parties have to say about future performance in order to be more effectively targeted at achieving the chosen objectives.

Table 4. Approaches to social accounting

Report for the consumption of: (A and B)	Report Compiled by Internal Participants (A)	Report Compiled by External Participants (B)
Internal participants (A)	<ul style="list-style-type: none"> • Social accounts • Program evaluation • Performance indicators • Attitudes audit • Compliance audit • Environment audit and accounting 	<ul style="list-style-type: none"> • Environmental consultants • Waste and energy audits
External participants (B)	<ul style="list-style-type: none"> • Social accounts • Social reports <ul style="list-style-type: none"> - narrative - quantitative - qualitative - financial • Mission statements • Environmental reports • Employee reports 	<ul style="list-style-type: none"> • Social audit limited • Counter info services • Journalists • New consumer • Consumer’s association • Ethical investment

Source: Compiled by the author based on Shaikh and Jakpar (2007); Gray *et al.* (1997)

Ramanathan (1976) has also proposed main concepts for social accounting since found that positive and negative externalities have not been handled through the market:

- A *social transaction*¹⁸ represents a firm’s utilization or delivery of a socio-environmental resource that affects the absolute or relative interests of the firm’s various social constituents and is not processed through the market place.
- *Social overheads (returns)* represent the sacrifice (benefit) to society from those resources consumed (added) by a firm as a result of its social transactions. In other words, social overheads are the measured value of a firm’s negative externalities, and social returns are the measured value of its positive externalities.
- *Social income* represents the periodic net social contribution of a firm. It is computed as the algebraic sum of the firm’s traditionally measured net income, its aggregate social overheads and its aggregate social returns.
- *Social constituents* are the different distinct social groups with whom a firm is presumed to have a social contract.

¹⁸ According to Ramanathan the term “transaction” is used in a more general way compared to the application in this thesis. Transaction in the context of bookkeeping *ex-post* analysis means the change of flows and stocks to determine social success.

- *Social equity* is a measure of the aggregate changes in the claims which each social constituent is presumed to have in the firm.
- The *net social asset* of a firm is a measure of its aggregate non-market contribution to society's well-being less its non-market depletion of society's resources during the life of the firm.

These concepts have been useful for framework building in social accounting and demonstrate clearly what opportunities social accounting can offer. The concepts suggested by Ramanathan seem to be more focused even compared to some later contributions in social accounting. One example in this sense is the contribution almost three decades later presented by Shaikh and Jakpar (2007) where they have set up a so-called model of reporting of social accounting and social audit (see Table 5). In this contribution the emphasis is on social reporting and the objects of social reporting overlap with triple bottom line reporting in some degree as shown further.

Table 5. Model set for reporting of social accounting and social audit

(Object of) Social Report on	Aspect covered	Example
Performance	Objectives	Targeted goals
Environment	Resources	Minimizing resources' cost
Equal opportunities	Implementation	Objective of social encouragement
Quality and standard	Statutory and procedural matters	Accounting standards, rules and regulations
Community	Impact	People's reaction

Source: Based on Shaikh and Jakpar (2007)

In the broader sense one probably may find similarities between social accounting and triple bottom line (TBL – people, planet, profit) reporting, which captures an expanded spectrum of values and criteria for measuring organizational success in economic, ecological and social spheres. Triple bottom line reporting was first introduced by John Elkington (1995) with the argument that companies should prepare and report at three bottom lines (Elkington 1997, 1999): one is the traditional measure of the profit and loss accounting; the second, a measure in some shape or form of how socially responsible organization has arranged its activities; and the third bottom line measures environmental responsibility of the firm (Figure 4). From the second half of 1990s the concept of TBL (Brayshaw 1999; Deegan 1999, 1999a; Elkington 2007; Henriques 2007; Gray and Milne 2007; Richardson 2007; Adams, Frost and Webber 2007) become a popular reporting approach for the external reporting purposes for measuring the impact of an organization's

activities on the world. Triple bottom line reporting has become a substantial approach to public sector full-cost accounting recently (see Sustainability: A guide to triple bottom line reporting (2003)).

Figure 4 shows what components are necessary to ensure the triple bottom line approach.

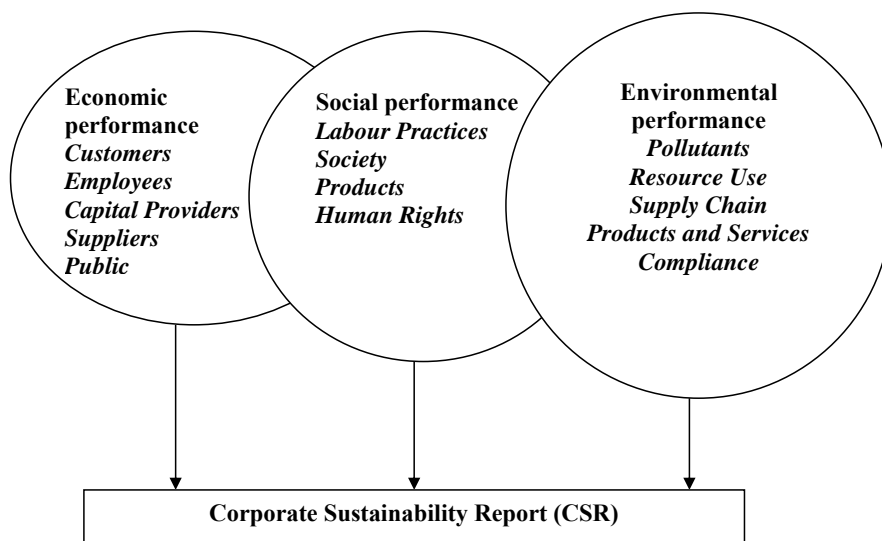


Figure 4. The triple bottom line approach to social reporting

Source: Compiled by the author based on Elkington (1997, 1999); Savitz and Weber (2006)

According to some authors (Savitz and Weber 2006) the triple bottom line is characterized as a kind of balanced scorecard (the measurement method is explained in subsection 1.2), which includes economic, environmental, and social qualitative and quantitative data that a company is or is not contributing to / creating as value for its shareholders and for society as a whole. Typical measures applied are as shown in Table 6.

Table 6. Typical measures of the triple bottom line

Economic measurer	Environmental measurer	Social measurer
Sales, profits, return on investment	Air quality	Labor practices
Taxes paid	Water quality	Community impacts
Monetary flows	Energy usage	Human rights
Jobs created	Waste produced	Product responsibilities

Source: Compiled by the author based on Savitz and Weber (2006)

The main problem with the triple bottom line is that these three separate measurement groups of accounts cannot be added up. It is complicated to measure the planet (environmental) and people (social, for example, human rights) accounts in the same terms as profits – that is, in monetary terms. Therefore, all dimensions are measured in their own unit. Also, some of the mentioned measurers in Table 6 are too broad and need a specific technical approach for sub-measurers. Moreover, from the point of view of the current thesis there is no possibility for the direct bookkeeping of a period social net-benefit.

At first glance one may say that there is not enough connection between the TBL approach and social accounting in any measurement component, for example, human rights. At the same time, several academic researchers (Gray *et al.* 2011) have proposed the future of social accounting in the academy as giving more attention to the development of accounting of human rights amongst the other development suggestions. Still, regardless of the extensive range of measures that are considered in the TBL approach, it does not cover the question of welfare change in society as do most other approaches to social accounting and social auditing found in the literature.

Nevertheless, the triple bottom line approach offers a suitable framework for external flows accounting besides financial accounting. Traditional accounting focuses on the internal flows of an organization in a summarized profit and loss account format, which is the first interest of the shareholders. Therefore, since the financial value-added statement covers only those financial flows that accrue to the individual firm, it does not take into account the externalities, both positive and negative, which accrue to third-party stakeholders. The externalities may be economic, environmental or social by their nature.

The concept of externalities is widely introduced in micro-economics (Acocella 2005; Stiglitz 2000; Weimer and Vining 1999). An externality is any valued impact (positive or negative) resulting from any action (whether related to production or consumption that affects someone who did not fully consent to it through participation in a voluntary exchange (Weimer and Vining 1999). The definition of externality allows for the conclusion that the absence of payment for benefit (positive externality or external economy) or harm (negative externality or external diseconomy) caused to others signifies the absence of a market (Acocella 2005). Typical cases of negative externalities caused by joint consumption (*consumption externalities*) are the noise pollution caused by someone listening to a radio at full volume or the air pollution produced by automobiles (this type of externality is considered in the empirical part calculations). Examples of activities that can give rise to external consumption economies are tending one's garden or getting an education. The last mentioned example is captured in many aspects in the empirical calculations. Production diseconomies include factory waste disposal (industrial pollution), while examples of external economies are the technological knowledge imparted by staff training programs and the free dissemination of

technological information or the construction of communications infrastructure open to all (*production externalities*). (Acocella 2005)

In the present thesis the term “externality” has meant any social and environmental impact associated with an organization’s / a company’s activities that have not been internalized as an economic cost or liability in the company’s financial statements. This application is similarly applied earlier by O’Connor (2006).

For social (and environmental) accounting purposes it is extremely relevant to have a framework for additional accounting, where the costs and benefits are of an economic, social, or environmental type that may accrue to a third party, have been taken account of as a result of the company’s operations, goods and services.

Calculating the triple bottom line in financial terms requires converting the externalities into monetary values. Many efforts have been devoted to methodological development and empirical estimates of these external impacts (Richardson 2007), in other words, accounting for externalities (Milne 1996). Formulating the framework for accounting for externalities is an inevitable starting point for the social accounting approach. One general example of such a framework is presented as follows in Table 7.

Table 7. Accounting for externalities

	Examples of External Costs and Benefits		
	Economic	Social	Environmental
Customers	(*) Consumer surplus over and above the market price / <i>it may also be outside effect</i>	(*) Ethical, social and health costs or benefits associated with the product/service	Environmental costs or benefits in the use and disposal of products
Suppliers	Stimulation of economic growth through the supply chain / <i>not external effect</i>	Ethical, social, and health costs or benefits associated with the production of purchased goods and services.	Environmental impacts associated with the production of purchased goods and services
Employees	Employment creation through the economic multiplier effect / <i>it may be outside effect not external one</i>	(*) Workplace social costs (such as unpaid overtime) and benefits (such as training and development)	(*) Environmental benefits or risks associated with the workplace
Community	(*) Urban and rural regeneration; infrastructure (e.g., transport links and congestion) / <i>outside effect</i>	Community health impacts; wider social impacts of redundancy and closure; nuisance and disturbance	(*) Emissions, effluents and waste to land, air and water (local, regional, national, and international)

Table 7. Continuation

	Examples of External Costs and Benefits		
	Economic	Social	Environmental
Public sector	Public-sector economic multiplier effects / <i>outside effect</i>	Social benefits from public-sector investment of corporate taxes in health, education and social programs	Environmental benefits from publicsector investment of corporate taxes in environmental protection
Investors	(*) Risks to investors from poor corporate economic reputation / <i>outside effect</i>	(*) Risks to investors from poor corporate social and ethical reputation	(*) Risks to investors from poor corporate environmental reputation

Source: Adapted from Richardson (2007: 38) with the author’s comments on possible difference in approach compare to context of the thesis, marked in italics

Quite many of the examples presented in Table 7 are relevant to consider in the case of university social accounting. These parts are marked in Table 7 (with (*)).

Besides the TBL approach that is too broad and measurers applied are not sufficiently integrated with each other exist some specific developments of social accounting in social success accounting as shown in Table 8. In general, specific applications are better focused on particular aspects or sectors, but they are still incomplete in terms of *ex-post* analysis, which has a related bookkeeping system. They are also somewhat setting limits on social accounting itself.

The determination of these specific applications of social accounting may vary in different sources of literature. Also, some sub-divisions or streams of developments may be possible if a specific application is observed more closely. For example, in the case of corporate social accounting, the major objective of which is declared to identify and measure the periodical net social contribution of an individual, which includes not only the costs and benefits internalized by the firm, but also those arising from externalities. There the four streams of corporate social accounting are distinguished (Gupta 1995).

Table 8. Specific applications of social accounting

Specific application	Main idea	References
Social audit	concentrates particularly on a statement of favorable and unfavorable social effects	Abt 1972, 1977; Solomons 1974; Blake, Frederick, Myers 1976; Medawar 1976; Schmitz 1980; Harte and Owen 1987
Human resource accounting	focuses on special aspects of social life or factors of production	Flamholtz 1971, 1972, 1974, 1985, 1999; Neubauer 1974; Conrads 1976; Cuthbert and Whitaker 1977; Johanson <i>et al.</i> 1998; Day and Woodward 2004
Corporate social accounting	concentrates on a firm's contributions to social success	Linowes 1968, 1972, 1973; Eichhorn 1974; Estes 1976; Epstein <i>et al.</i> 1976; Ramanathan 1976; Tinker 1984; Guthrie and Mathews 1985; Puxty 1986, 1991; Gray <i>et al.</i> 1995; Gupta 1995; Collison 2003; Mühlkamp 2007
Environmental (and ecological) accounting	special emphasis on environmental aspects of social accounting (e.g., negative externalities)	Parker 1971, 1991; Dierkes and Preston 1977; Hines 1991; Gray <i>et al.</i> 1995; Gray, Owen, Adams 1996; Milne 1996; Odum 1996; Burritt 1997; Garrod and Willis 1999; Schaltegger and Burritt 2000; Gray and Bebbington 2000; Larrinaga-Gonzalez and Bebbington 2001; Wilmshurst and Frost 2001; Everett 2004; Azuma 2007
Health accounting	Special concentration on health issues (e.g., an individual's health, positive externalities from consumption of health services)	Hartunian, Smart and Thompson 1980; Henke 1986; Weinstein 1990; Tengs, Adams, Pilskin <i>et al.</i> 1995; Genduso and Kotsanos 1996; Wille 1996; Breyer and Leidl 1997; Hunter and Fairfield 1997; Kossow 1998; Schöffski, Glaser and Graf von der Schulenburg 1998; Schöffski and Uber 1998; Claes 1998; Claes, Uber, Greiner 1998; Rychlik 1999; Brent 2004; Helmig 2005
Education accounting	special focus on education aspects of social accounting (e.g., positive externalities of education)	Weisbrod 1964; Seidler 1975; Estes 1976; Belkaoui 1984; Psacharopoulos 1987; Küpper 2001; Ammermüller and Dohem 2004; Waltenberger 2006; Westlund 2006; Spraul 2006; Alstadsaeter and Sievertsen 2009; Bauder and Jungen 2009; Eide and Showalter 2010

Source: Compiled by the author

These four streams of corporate social accounting are described as follows (Gupta 1995).

The first stream – micro social accounting was initiated with suggestions from Linowes (1968) to use accounting tools and techniques for better functioning in respect to programs of the state. In this phase it was also suggested that the entities in the business sector would be included in the proposal.

The second stream of development took place as a result of the increase of corporate accounting for environmental degradation. Industries had to meet government interference and the public pressure to minimize pollution. In this phase many attempts were made to develop models and approaches of accounting for environmental issues (e.g., pollution, etc.).

The third stream of development was much more practical in the sense that was centered on the proposal of the social audit of the businesses. Developments in the fourth phase were more focused on the academic approach on Pigouvian private and social costs. It made a call for the measurement of the social income contribution of an organization and the evaluation of its total performance from society's point of view.

Besides several specific applications of social accounting (shown in Table 8) authors have had concentration on different sectors. Here it appears that attention related to social accounting for nonprofits (Richmond, Mook, Quarter 2003; Mook *et al.* 2007) has become more noticeable in the 2000s. Richmond *et al.* (2003) found that scholars have not paid attention to nonprofits concerning the social accounting application. They have created an approach of social accounting for nonprofits and cooperatives to assess nonprofit impact, which was followed by three social accounting statements:

- The socioeconomic impact statement, an adaptation of an income statement;
- The socioeconomic resource statement, an adaptation of a balance sheet;
- The expanded value-added statement, an adaptation of a value-added statement.

In their research outputs within three categories were considered:

- Primary: direct effects of an organization's services on its clients
- Secondary: indirect effects on the clients
- Tertiary: effects on groups other than the clients

These three categories of effects are relevant to consider in all spheres where the social accounting approach is applied, as well as for the welfare-based bookkeeping approach.

As offered approaches to the reporting in social accounting (reporting of social activities) dominate four (Dilley and Weygant 1973):

- The inventory approach
- The cost approach

- The program approach
- The cost-benefit approach

The inventory approach measures the socially relevant information in the descriptive form. Under this approach there is no emphasis on the measurement of the information and therefore its scope is restricted to being subjective in nature. The cost approach measures costs of social activities undertaken by companies. The program approach concentrates on social groups who are affected by special programs and here the impacts of programs on these social groups are measured. With the cost-benefit approach the measurement of the social effects in terms of the net social welfare gain and loss takes place, which is the relevant approach for the social accounting approach presented in the thesis.

Since the definition of social accounting is very broad in the literature and researchers have applied different notions in order to cover this particular topic, they have created a foundation of a diversified and complex system of theories (Figure 5). For example, Gray, Kouhy, and Lavers (1995) have determined that for the empirical investigations of corporate social reporting the theoretical sources have taken from three groups of theoretical context:

- Decision-usefulness studies;
- Economic theory studies;
- Social and political theory studies.

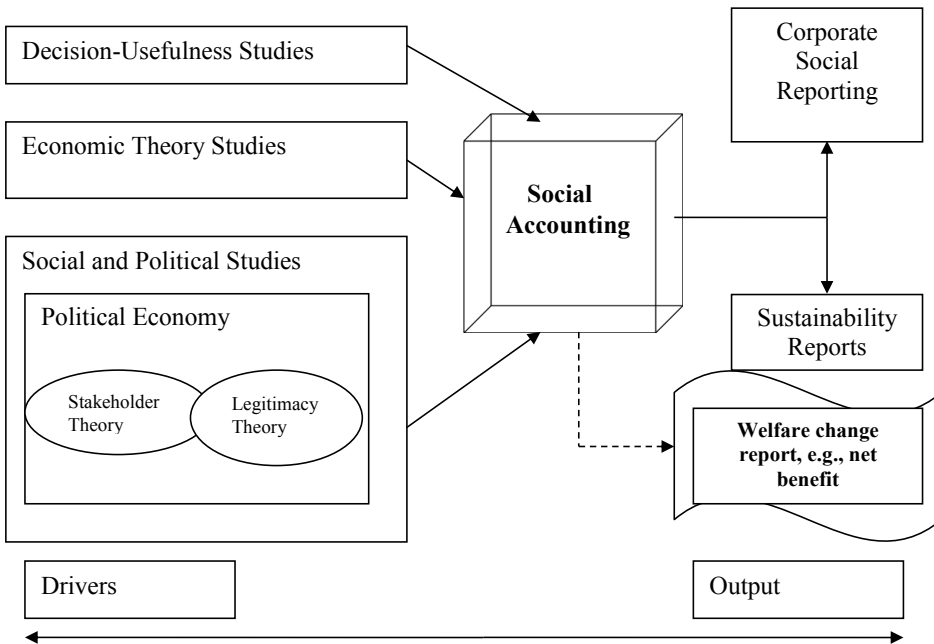


Figure 5. Literature bases for social accounting studies

Source: Adopted from McGrath and Mathews (2006: 13) with the author's contribution on the topic

Since the 1970s many published studies have been dedicated to analyzing corporate social disclosure (CSD) as well environmental performance and disclosure practices (Ullman 1985; Blacconiere and Patten 1994; Brown and Deegan 1998; Neu *et al.* 1998; Chan and Milne 1999; Gray 2006) in developed countries – Germany (Scheenfeld 1978; Dierkes 1979;), the United Kingdom, Ireland (O’Dwyer 2002), the United States (Epstein *et al.* 1976; Rockness 1985; Ullman 1985), Canada (Buhr 2002) and Australia (Guthrie and Mathews 1985; specifically on social accounting – Holdaway 2010), and some have pointed to contradictions in the use of such disclosures by the public (Lindblom 1993). The role of CSD has been seen as providing an input to the economic, social, and political decisions faced by individuals and groups both inside and outside of the reporting organization and have taken for a basis user utility and political economy theory approaches (Guthrie and Parker 1990).

The stakeholder theory approach has been taken as starting point of analysis in corporate responsibility disclosure by Roberts (1992) and legitimacy theory by Brown and Deegan (1998). The first mentioned theory, defined by Freeman (1984), states a stakeholder is “any group or individual who can affect or is affected by the achievement of the firm’s objectives.” Stakeholders of the firm include stockholders, creditors, employees, customers, suppliers, public interest groups, and governmental bodies. Stakeholder theory has been applied to analytical and empirical analyses of the firm and the environment in which the firm operates. (Roberts 1992). The legitimacy theory posits that organizations continually seek to ensure that they operate within the bounds and norms of their respective societies. These bounds and norms are not fixed but change across time, thereby requiring the organization to be responsive (Brown and Deegan 1998). The theory approach has elements of institutional economics (North 1999; Vatn 2005). It sees that there is a “social contract” between the organization and those affected by the organization’s operations. The organization is expected to comply with the terms of this “contract” and these expressed terms are not static (Brown and Deegan 1998). Therefore both theory approaches are relevant for the social accounting of a higher education organization.

The majority of the literature, which describes and offers the concepts for different social accounting approaches and suggests classifications for social accounting, does not show an approach that concerns welfare change. Therefore, the author of this thesis allocated a social accounting approach based on welfare change in society for the framework in Figure 5, which is in line with other approaches.

Several authors have collected and analyzed empirical studies on social and environmental accounting (Mathews 1997; O’Connor 2006; Kaya and Yayla 2007; McGrath and Mathews 2006; Eugénio *et al.* 2010). These overviews indicate that research on corporate social accounting and reporting has been conducted predominantly in the UK, Australia, and the USA. O’Connor (2006) has observed the SEA studies from 1974 to 2006, finding that the empirical

studies published during the 2000–2006 period nearly doubled the number that had been published during the preceding decade. The conducted review covered respectively by decades the following number of empirical studies: 1970s – 26, 1980s – 18, 1990s – 64, and post 2000 – 132. The majority of these studies (75%) have been based on data collected in Western developed countries and amongst them one-third represent studies on the USA. The majority of analyzed studies (65%) in the review were motivated by a description of the practice and only 0.04 % were dedicated to theory building.

In order to differentiate between commercial and social accounting approaches one should analyze their objectives as well. The main objectives of commercial accounting are: internal identification of profit; giving information to owners, creditors, and the public; having a basis for taxation; and the protection of creditors. In the case of commercial accounting success, profit and valuation of flows and stocks takes place with respect to profit.

Social accounting is needed for economic units where advantages of their activities appear with other economic units and not only within the producing one. It is also the case with many public enterprises and/or with the production of merit goods or those that have higher external effects. Social accounting also shows the usefulness of social activities for the subjects, which are not coordinated through markets. Through social accounting the usefulness of public activities by public administrative units are shown.

To specify more concretely, social accounting should be compared with so-called conventional accounting as commercial (financial) – business accounting and cameral accounting on the bases of certain relevant criteria how they identify and measure success (Table 9).

From this kind of comparison it appears that conventional (commercial/financial – business) accounting is limited to market transactions that are specific to the organization or firm and focuses on profit generation. In other words, business accounting describes the financial success of a company at the end of the year in terms of profit or increase in wealth. It also is concerned about whether resources are being used efficiently, but it does not pay attention to positive and negative externalities caused by the activities of the organization/firm or the market effects outside the firm.

Social accounting shows that corporate activity can have both beneficial (social benefits), and disadvantageous (social costs) impacts on society as well as the environment in monetary terms that are not covered by the conventional method of business accounting (Eichhorn 1974). It has been suggested about the uses of social accounting that, regardless of the interpretation given to social accounting, these systems will be of interest to social indicator analysts and social scientists more generally only if they serve specific purposes (Stone 1981, 1984).

Table 9. Social accounting vs. commercial accounting and cameralistic accounting

Criteria	Social Accounting	Commercial (business) Accounting	Cameralistic/Cameral Accounting¹⁹
Success	Success of society	Profit (net wealth)	Meeting public financial plan requirements
Success identification	Out-and inside the economic unit	Inside the economic unit	Inside the economic unit according to objectives of revenues and expenditures
Financial effects	Financial and other effects	Only financial ones	Only in the frame of budget plan
Groups of stakeholders	Groups whose welfare should be increased	Group of owners or owner of an economic unit	Not considered, if not special measures for groups considered, e.g transfer payment

Source: Compiled by the author

Up till now, many general approaches of accounting and specific approaches of social accounting have been presented. The author finds it relevant to ascertain what components for analysis are available in these approaches compared to the approach that is set to the target in the current thesis (Table 10).

¹⁹ Two main approaches of cameral accounting exist: administrative cameralistics and enterprise cameralistics (Monsen 2002). The first was developed for use by the core part of a governmental organization, which is primarily financed through the annual budget (agreed on by a parliament) by tax revenues. The main objectives of this original and core version of cameral accounting are cash management, budgetary control and payment control. Therefore, administrative cameralistics should help to ensure that public (tax) revenues are managed within the boundaries of a politically adopted budget (budgetary control). When an increasing number of governments established their own enterprises, which were more similar to business enterprises than to the core of government, then a more sophisticated version of cameral accounting (cameral accounting developed a special account for use in cameral single-entry bookkeeping) was developed. In contrast with the two sides of the account within commercial accounting, the cameral account as a general rule is single sided: it has either a receipts or payments side. It carries the objective of providing the same type of information for government enterprises as is prepared when using the double-entry bookkeeping. (Monsen 2008).

Table 10. Components of analysis in accounting approaches

Type of accounting	Stakeholders	Economic units	Success	Time-frame	Measures
National accounting (1)	national, regional, sectoral	aggregated units, sectors, macro level	production, wealth	periodical	measures/projects
Commercial accounting (2)	investors	one economic unit or trust	profit and commercial wealth increase	periodical	commercial investment accounting
Cameral accounting (3)	public, parliaments	jurisdiction, one and several public offices	correct execution of financial plans	periodical	measures/projects
Various types of social accounting (4)	groups	one economic unit (firm oriented)	single goals, group of goals	only seldom periodical	non-commercial investment accounting, seldom measures/projects
Social accounting considering welfare change (5)	society	one economic unit	welfare	should be periodical, but it has to be developed	economic

Source: Compiled by the author

Therefore, there are four basic systems of accounting available to identify the success of an economic unit such as a faculty of a university (or a university as a unit):

(1) Economic (national) accounting, which is directed towards identifying the production-measured income of sectors and a country by national accounting, national wealth accounting towards determining the value of assets and liabilities of a country, and the accounting of financial transactions of a country. In the literature national accounting is sometimes called “social accounting.” However, it stresses only a type of national accounting and is not focused on identifying the social success of one economic unit such as a faculty or university. In the present thesis the term “social accounting” is used as the accounting system under the classification numbers (4) and (5) in the text, which follows. The economic accounting system applied to a university would

mainly show what income would be created and distributed by the university itself or by its effects throughout the whole economy. All income-influencing activities would be considered. High incomes might be desired. Universities are embedded in national accounting, but they are not shown as disaggregated as an individual economic entity. Social success is only partly identified by economic accounting.

Concerning the *ex-post* analysis, national accounting offers a complete set of equations to determine the value added of a country or sector, or even for one firm.

(2) Commercial/business accounting is concentrated on profit and loss identification and the change in wealth of an individual economic unit such as a firm. The commercial accounting system of a university shows whether the university has achieved profits or losses and whether the commercial value of its assets or debts has been changed during its activities. Instead of social success only financial success is shown. Therefore, the essential elements of social success such as the accumulation of knowledge are not considered.

Commercial accounting also has a complete equation system for *ex-post* analysis to show all commercial success-relevant flows and stocks.

(3) Cameral accounting was designed for checking whether public plans formulated in financial and fiscal terms, e.g., a budget plan, are realized and how the realization proceeds. It refers to jurisdictions or single public economic units. The cameral accounting system would show whether the university has kept to its financial plan, mainly its budget plan, and what kinds of deviations in expenditures and revenues occur at what stages of realization. Whether the plan itself is to achieve desirable goals is not questioned. In some countries public universities use cameral accounting. Social success is not verified in terms of achieved social goals. Cameral accounting cannot serve as a basis for determining social success. Still, it has an *ex-post* analysis available that shows all budget plan-relevant financial flows to monitor budget performance.

(4) Social accounting attempts to identify the social success of an individual economic unit.

Social accounting concentrates particularly on social success and the change in the social value of assets and liabilities of an economic unit. Therefore, a social accounting system is relevant for university accounting because of social objectives and consequences. However, different types of social accounting are possible. They are called social accounting approaches in this thesis. For social accounting, the literature offers no complete equation system to show all social success-relevant flows and stocks that lead to a welfare change originating from the activities of an economic unit.

(5) Social accounting considers welfare change to identify the social success of a period, for example, a year. This kind of complete equation system that shows all social success-relevant flows and stocks that lead to a welfare change

originated from the activities of an economic unit has to be developed and transformed into a bookkeeping approach. By such a social accounting approach a social bookkeeping chart that fits to that social accounting approach is necessary to assess the welfare change stemming from a university or a university faculty.

In general, social accounts give the qualitative and quantitative information necessary to highlight the performance of the company or organization and the perception of society toward the company. The information received via social accounting demonstrates not only the performance of organization, but also how it intends to improve. Therefore, the social accounting approach is relevant for university accounting because of multiple objectives and reasons. And last but not least for the application of social accounting is the fact that most academic studies about social accounting and reporting, over more than forty years of social accounting, have been done in the context of developed countries such as the USA, Australia, and those in Western Europe (see also Kaya and Yayla 2007). In the Central and Eastern European countries social accounting as a field of research still needs to be introduced.

Therefore, an adequate social accounting approach has to be found or elaborated and an appropriate method and measurement techniques have to be developed. In the next subsection, different methods applied for the measurement of an economic entity's social contribution and success will be analyzed.

1.2. Methods applied in social accounting and their relevance for university social accounting

Several methods exist to measure social success in different social accounting approaches. Here these will be reviewed and analyzed from the point of view of their appropriateness for university social accounting. Especially important is to analyze from the point of view which of them may have relevance for social accounting considering welfare change and evaluate whether methods available fulfill requirements of period-oriented *ex-post* analysis.

In general social accounting allows an organization or economic entity to prove its benefits to its clients, to people and to the community and/or environment, and at the same time to improve its performance. Possibilities created via social accounting's additional accountability lead to a growing interest in social accounting.

Despite the growing interest in social accounting practices, as different attempts to apply the social accounting approach makes obvious, there still exist many major problems as summarized by Kaya and Yayla (2007):

- Disclosures of social and environmental information tend to be fragmentary;
- Voluntary reporting does not produce widespread, consistent, and systematic practices;
- Definition problems with most of the social accounting terms;
- Presenting values and intentions without supporting details;
- Reporting only good news;
- Making inaccurate claims;
- The difficulties in measuring social “externalities.”

The author of the current thesis would like to highlight from the mentioned problems information fragmentary issues, definition problems with social accounting terms, and difficulties in measurement, especially the measurement of externalities. An extension towards welfare change is still missing and should be added to this list of major problems. Application of welfare theory-based social accounting can diminish information fragmentary problems in social accounting.

The indication for the mentioned problems is obvious because the issue of research methodologies has been raised in only a few publications in the SEA literature where combined research methods have been applied (Guthrie and Abeysekera 2006). Limitations of content analysis have been also pointed out.

The development of performance indicators in SEA reporting, financial and/or non-financial, objective and/or subjective, depending on the data and the information captured, has been under observation by several authors (Burritt 1997). Burritt (1997) has stressed that each indicator has the potential to be of use singly and/or in combination with other indicators. Gray *et al.* (1997) has stressed the crucial and urgent issue of the social accounting practice for every researcher: how should social accounting be done? Nowadays, seventeen years later, this crucial question has the same actuality or is even more topical.

The discussion in SEA was also treated with the issue of usefulness and relevance of proper accounting standards (Benston 1982), especially towards social accounting standards (Gray *et al.* 1997). Benston (1982) points to the well-known fact that measurement affects motivation, and if the measurement is inappropriate, then managers are likely to be inappropriately motivated. Accounting standards might establish a preferable alternative viewpoint to historical cost because this historical cost appears often to be a poor measurement of economic and social values.

Already in the first phase of social accounting, amongst early theoretical reflections (Solomons 1974; Medawar 1976; Ramanathan 1976; Hopwood 1978), Hopwood (1978) have shown some possibilities for the elaboration of accounting methods towards a social accounting application (Figure 6).

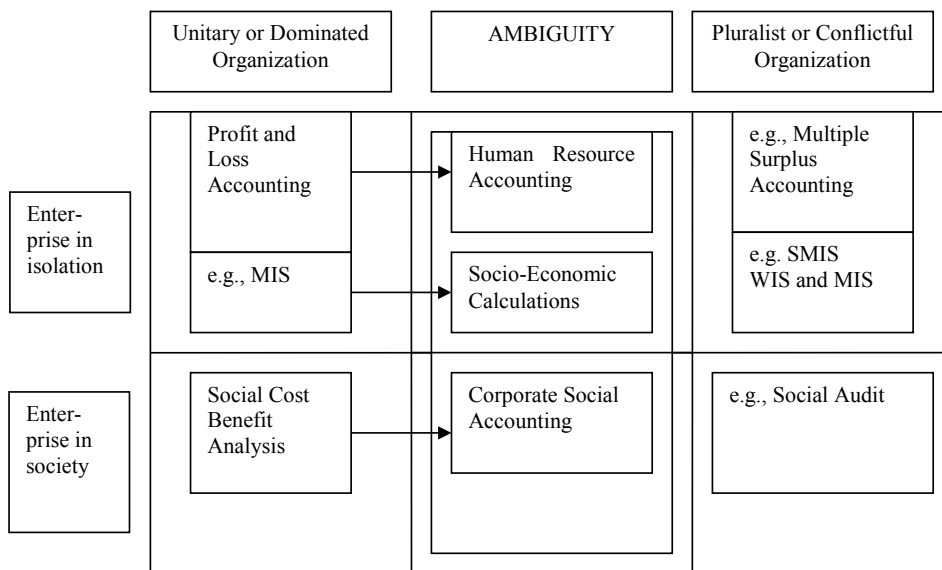


Figure 6. Elaboration of accounting methods (Hopwood 1978: 62)

Note: MIS – Management Information Systems; WIS – Workers’ Information Systems; SMIS – Self Management Information Systems

Figure 6 illustrates possibilities how, with human resource accounting, various forms of socio-economic calculations and some types of corporate social accounting, the existing forms of profit and loss accounting, management accounting, and social cost-benefit analysis can be enriched. Still, according to Hopwood (1978) there has been some ambiguity represented over social accounting in forms of human resource accounting, socio-economic-calculus, and corporate social accounting in this period because it has often been found to represent a response to uncertainty over the social conditions of an economic unit. One may also recognize endeavors to move from a unitary accounting approach, where profit and loss accounting dominates, to a more pluralist (wider) accounting approach and method.

Keeping in mind that social accounting can be seen as a process where an organization may monitor and evaluate its work, report its achievements to stakeholders, and improve its performance, for such enrichments it is necessary to find a method for measuring social success.

Social success could be expressed in different ways (see Figure 7), by:

- An evaluation function (welfare function, goal function concerning firms, private households, public administration units);
- Individual goals (effectiveness analysis);
- A bundle of goals (cost-effectiveness analysis, utility analysis);
- One social indicator (net-benefit analysis).

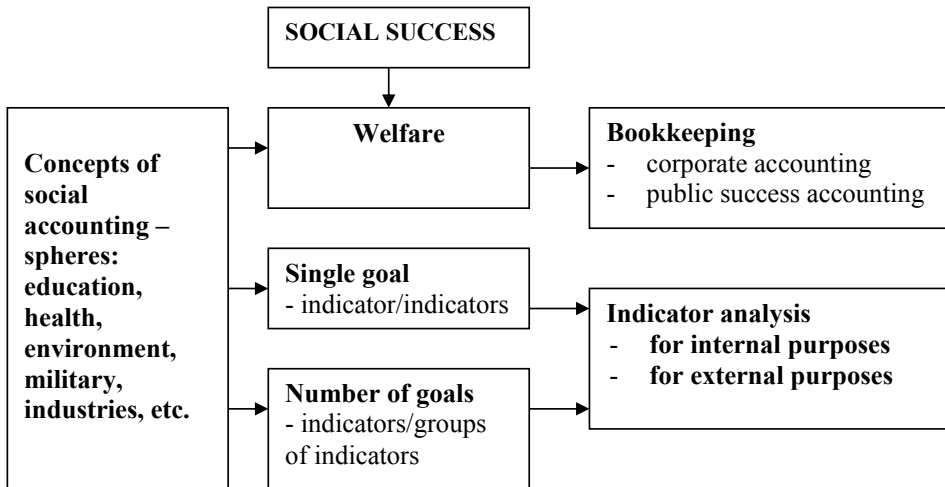


Figure 7. Concepts and methods of social accounting for social success measurement

Source: Compiled by the author

In the review conducted by O'Connor (2006) where the SEA studies from 1974 to 2006 were observed, methodologies of these studies were also looked at. It appears that a prevailing majority of observed studies (49%) have used content analysis. Other types of methodology such as model testing, field study, surveys, and interviews were used from 9% to 12% of the time.

Mook *et al.* (2007: 57) has concluded that a distinct characteristic of the predominant tradition in social accounting has been its separation from financial statements, which focus on economic issues. That is true not only for profit-oriented businesses, but also of social organizations. In the earlier conceptual developments by Grojer and Stark (1977: 350), it has been even stated that the authors are disinclined to consider financial accounting as a subset of social accounting because they think that it is neither possible nor desirable to separate economic factors from social factors (see Figure 2, subsection 1.1). Therefore, several authors have looked for an integrated approach to social accounting.

Within social accounting there are many contributions that attempt to measure social success, the usefulness of social accounting, and the effects on management and decision making. Here general approaches to consider are economic investment accounting to evaluate projects and measures for a number of periods using benefit-cost, cost-effectiveness and utility analysis, and the social accounting approach using social audit, human resource and corporate social accounting, social indicators, and citizen value analysis methods (Table 11). Decisions about which type of analysis and methods can be applied depend on the objectives of the analysis. For example, if a firm wants to express how it influences internal and external stakeholders by

effects not expressed in financial accounting, then it leads to social audits, which offer mostly a form of reports and the listing of advantageous and disadvantageous effects. If the focus is on demonstrating that the knowledge and stock of labor are of a special value to a firm or society, then human resource accounting is evolved.

Table 11. Types of analysis applied in the general approaches of social accounting

Approach	Reference	Type of analysis applied		
		Net-benefit analysis	Cost-effectiveness analysis	Utility analysis
Economic investment accounting				
Benefit-cost analysis	Inter-Agency Committee on Water Resources 1958; Friedrich 1969; Dasguptha, Sen, Marglin 1972; Hanusch 1987; Marggraf, Streb 1997; Flores 2003	yes	no	no
Cost-effectiveness analysis	Meyke 1973	no	yes	no
Utility analysis	Zangemeister 1976	no	no	yes
Social accounting				
Social audits	Abt 1972; Schmitz 1980; Shaikh, Jakpar 2007	no	no	no
Human resource accounting	Hermanson 1964; Brummert 1969; Flamholtz 1971; Neubauer 1974; Conrads 1976	no	no	no
Corporate social accounting	Linowes 1968, 1972, 1973; Abt 1972; Monsen 1972; Elliot-Jones 1973; Eichhorn 1974; Tinker 1984; Estes 1976; Mühlenkamp 2007	partly	no	no
Social indicator analysis	Dierkes 1974; Mintrop 1976, Fischer-Winkelmann 1980, Wysocki 1981; Schmitz 1980; Friedrich 1991; Schauer 2007; Richmond, Mook, Quarter 2003; Ates, Büttgen 2011; Greiling 2011	no	partly	partly
Citizen value analysis	Schwalbach, Schwerk 2008; Schwalbach, Schwerk, Smuda 2009	no	no	no

Source: Adapted from Friedrich and Eerma (2012) with the author's contributions

Corporate social accounting considers the social effects of public and private firms and public offices and shows the different forms according to the way the social value of effect is being measured. Citizen-value analysis measures effects on the jurisdiction city and its population by supplementing profits and losses by the financial effects on the city.

Some corporate social accounting approaches are presented in Table 11 (by Linowes, Abt, and Estes) that have roots in earlier contributions and have been taken into discussion as relevant models²⁰ of social accounting in the current time practice for nonprofits (Mook *et al.* 2007). These include a Socio-Economic Operating Statement (Linowes 1972, 1973) that could be added to the profit and loss statement and balance sheet. Voluntary expenditures were pointed out because those required by either law or a contract were perceived as the necessary costs of doing business. The statement was to include “expenditure made voluntarily by a business aimed at the improvement of the welfare of the employees and public, safety of the product, and/or conditions of the environment.” (Linowes 1973: 40) The Socio-Economic Statement differentiated between “improvements” and “detriments.” To arrive at the “total socio-economic contribution or deficit for the year” the estimated market value of the “detriments” is subtracted from the “improvements,” leading to either a positive or negative balance. The Socio-Economic Operating Statement looks at these “improvements” and “detriments” in relation to people, the environment, and products but lacks the attention of stakeholders.

Another variation of the Socio-Economic Operating Statement was undertaken by Estes (1976). It was referred to as a Social Impact Statement. In his development the “social benefits” and the “social costs” of the organization were subtracted from each other and the outcome then was either a “social surplus” or “deficit.” Both Estes’s and Linowes’s approaches develop a cost-benefit analysis.

The third, an integrated social and financial balance sheet and income statement, the Abt model (Abt and Associates Inc 1974) was produced on a balance sheet that tried to estimate an organization’s impact on staff, clients, owners, the neighboring community, and the general public. Similar to the socio-economic operating statement, the impacts are shown through monetary bases and the balance sheet does not attempt to create a financial statement that is additional to those that are normally done. It modifies existing statements by adding items what broaden the issues regularly included. (Mook *et al.* 2007) The sum of the net social benefits (after the setting of social costs) to all the above component groups of society represented the net income. The balance sheet (called social balance sheet) consists of two parts: human assets and social

²⁰ Here and in the following analysis the term “model” is taken from original uses according to reference authors (Linowes, Abt, Seidler, and Estes). The author of this thesis acknowledges that the term “model” is fixed in economics and means a mathematical description of reality to allow explanations or scientific prognosis (*ex-ante* analysis) or to identify the size of variables in the course of *ex-post* analysis.

capital investments. The representation of social capital investments were characterized by organizational equity and human assets by “social equity.” In Abt’s model the measurement objects have been taken at the “social effects” level. Therefore, Abt produced a social and financial income statement applying the same principles as for the balance sheet. Some examples of social items that were constructed by Abt (1972) and included in the statement were:

- “inequality of opportunity” treated as a cost to the stakeholder staff and calculated by the difference of earnings between a minority or female member and a non-minority or male;
- “layoffs and involuntary terminations” – treated as a social cost to the stakeholder staff. This item is valued at one month’s salary for those who found employment within 60 days and two months’ salary for those who found employment after 60 days;
- “staff overtime worked but not paid” – a subsidy of the staff to the stakeholders, society and clients;
- “environmental resources used through pollution” – treated as a social cost to the stakeholder society because these are effects of production for which the company does not pay.

In the model created by Abt the approach was based on the existing financial statement, which was modified with social variables that normally are not included in the financial statement. Some limitations and shortcomings of the Abt model were pointed out later (Gupta 1995) concerning inconsistency in the measurements, validity of the conceptual framework, reliability of measurement, and the fact that the model does not make a distinction between direct and indirect social benefits.

According to Mook *et al.* (2007) though the Abt model was used by relatively few organizations and was directed largely at the business sector, it might have had greater interest for social organizations.

Lee J. Seidler (1975) suggested two formats of social income statements (Gupta 1995). One of them was for profit-seeking organizations and the other for non-profit organizations. The idea for the first format was based on value added. There the social income statement deducts the socially undesirable effects not paid for and adds the socially desirable outputs for which no money is received. The result is the net social profit or loss reflecting the net contribution of the organization to society. The second format is simply divided into two parts: revenues and costs. The format covers both financial and non-financial items. The non-financial items are measured in monetary terms using shadow pricing. The major limits of Seidler’s model are that in the first format, social benefits from direct economic activities are taken equal to the amount of the value added. The consumer’s surplus and the social costs of the input not reflected in the market price are not taken into account. Also, the distributional aspects of the organizational activities are not taken into account.

These four contributions described above are compared in Table 12 by their objective, measurement level, measurement object, and measurement approach applied.

Table 12. Models in the corporate social accounting

Model	Objectives of model	Measurement level	Measurement objects	Measurement approach
<i>Linowes's model</i>	External	Input level	Financial	Financial cost, internal prevention cost
<i>Seidler's model</i>	External	Social effect	Economic	Social cost-benefit analysis
<i>Abt's model</i>	External	Social effect	Economic	Social cost-benefit analysis
<i>Estes's model</i>	External	Social effect	Social utility, Gains and loans	Social cost-benefit analysis and opportunity cost

Source: Compiled by the author based on Gupta (1995)

The salient idea from these previous models and their applications for the current work is that they suggested of supplemental or additional social accounting, but they are still incomplete in the sense of welfare. Also, these models were not designed to be applied to a university.

Two decades later Belkaoui (1984: 167) presented a model of an income statement for a university based on an adaptation of Lee J. Seidler's work that integrates social benefits and costs with those that are generally found in conventional income statements. On the social benefits side are the "value of instruction to society" and the "value of research to society." On the social cost side are "tuition paid to the university" and "cost of research and state aid."

From the second half of the 1980s several attempts were made to develop social accounting in specific sectors such as the environmental, health, and education sectors (see Table 13). Some of these attempts are only project oriented using a welfare function, utility analysis, or benefit-cost analysis. On the basis of benefit-cost analysis, evaluation techniques for a social bookkeeping system was developed for energy provision (Tsimoupolos 1989), for convention halls (Friedrich, Jahn, Valjak, Wonnemann 1993), tourist facilities (Friedrich, Feng, Wonnemann, Jahn, Valjak 2000), and ecological banks²¹ (Friedrich, Kosiński, Türk 2003).

²¹ These are banks that attempt to improve environmental conditions. These banks may have public, private, or mixed ownership, but they concentrate on banking for environmental purposes.

Table 13. Types of analysis applied in special approaches of social accounting

Approach	References	Types of analysis applied		
		Net-benefit analysis	Cost-effectiveness analysis	Utility analysis
Special social accountings				
Environmental accounting	Seidel, Zenus 1990; Gray <i>et al</i> 1995; Burritt 1997; Schaltegger and Burritt 2000; Milne 1996; Wilmshurst and Frost 2001; Asuma 2007	partly	yes	yes
Health accounting, measure oriented	Müller-Bohn, Ulrich 2000; Schöffski, Graf von der Schulenburg 2007	partly	yes	partly
Health accounting, Net benefit	Greiner, Uber, Graf von der Schulenburg 1995; Wille 1996; Greiner, Schöffski 1998, Brent 2004	yes	no	no
Health accounting, cost-effectiveness analysis	Weinstein 1990; Tengs, Adams, Pilskin <i>et al.</i> 1995; Wille 1996; Schöffski, Uber 1998; Rychlik 1999; Brent 2004	no	yes	no
Health accounting, utility analysis	Schöffski 1990, Birch, Gafni 1992; Greiner, Schöffski 1998; Brent 2004; Graf von der Schulenburg 2007	no	no	yes
Education, rate of returns to higher education	Psacharopoulos 1987; Spraul 2006; Alstadsaeter and Sievertsen 2009; Eide, Showalter 2010;	partly	partly	partly
Education, private rate of return	Cohn, Geske 1992; Belfield 2000; Alstadsaeter, Sievertsen 2009	no	partly	partly
Bookkeeping oriented approaches				
Elderly homes	Schmitz 1980	yes	no	no
Energy provision	Tsimopoulos 1989	yes	no	no
Convention halls	Friedrich, Jahn, Valjak, Wonnemann 1993	yes	no	no
Tourist facilities	Friedrich, Feng, Wonnemann Jahn, Vajak 2000	yes	no	no
Ecological banks	Friedrich, Kosiński, Türk 2003	yes	no	no

Source: Adapted from Friedrich and Eerma (2012) with the author's contributions

In education a sector benefit-cost analysis was applied by Psacharopoulos (1987a), specifically to measure the net benefits from different types of education and institutions (Spraul 2006). Rarely an analysis covers the whole bundle of services that a university provides, including research. There are so-called impact studies for universities (Wonnemann 1989; Leslie and Lewis 2003). However, they refer not to the total social success, but to the achievement of special goals. An educational approach like the social or private return of education does not signal comprehensive social success. The rate of returns is usually assessed on the basis of income change caused by educational measure. The benefit-cost analysis offered in the economics of education normally does not lead to a bookkeeping system.

For the social impact measurement, many other methods not mentioned previously have been introduced. Some overview of quantitative methods is available in the literature (Epstein 2008; Clark *et al.* 2004; Schaltegger and Burritt 2000). Difficulties in selecting the proper method may rise from the lack of consensus on the definition of social impact since the notion is too broad. Also, the majority of methods tend to focus on the environmental accounting measurement, which is just one component of the research in this study. Still, for comparison it is necessary to analyze some of the methods that allow the measurement of social impact and consider their suitability for application to higher education social accounting. The starting point for classification and an analysis of the discussed methods has been taken as shown (characteristics) in Table 14 and from five dimensions of environmental accounting methods, which are general enough to consider for characterizing measurement methods in other sectors, suggested by Schaltegger and Burritt 2000:

- Type of information: monetary versus physical;
- Scope: internal versus external;
- Length of time frame: short-term versus long-term focus (here the author of the research would add: project focus);
- Time frame: past orientated versus future orientated;
- Frequency of information: routinely generated information versus *ad hoc* information.

These suggested dimensions for social accounting purposes are in one way or another relevant to the framework of measurement design. The preferable type of information produced is monetarily based and should include both internal and external effects of activities.

In order to distinguish between the discussable methods, the following relevant dimensions are available: purpose, time frame, orientation, length of time frame, perspective, and approach. These main characteristics of measurement methods are introduced in Table 14. The author has assessed whether these types of measurement characteristics are relevant to the approach developed in the thesis and chose the set of characteristics for the analysis of

social impact measurement methods available in the literature. The latter is presented in Table 15.

Table 14. Main characteristics of social impact measurement methods

Charac- teristic	Types	Explanation/examples	Relevance for the <i>ex-post</i> social success accounting
Purpose	Screening	For evaluation of investment opportunities and their performance with respect to investors' specific social and financial objectives.	partly
	Monitoring	Assist management with ongoing operational decision-making and provide data for investor oversight. Supports entrepreneurs in identifying business model modifications or market opportunities.	no
	Reporting	Particularly relevant for external stakeholders – potential investors, the public or other entities that require or request performance reports on a regular basis.	no
	Evaluation	For a retrospective view, <i>ex-post</i> impact assessment of achievements for academic purposes and for organizational learning.	yes
Time frame	Prospective <i>Ex-ante</i>	To assess impacts, which can be expected from planned reforms and programs; decide and choose amongst the options which fit the best (kind of normative approach of economic theory)	no
	Ongoing	Useful for testing assumptions along the process.	no
	Retrospective <i>Ex-post</i>	Useful for evaluation of past activities.	yes
Orien- tation	Input	Useful to assess differences in input, for example, expenditure saved by increased employee satisfaction, as a result of a social activity.	less
	Output	Useful to assess differences in output as a result of a social activity, for example, higher knowledge.	yes

Table 14. Continuation

Characteristic	Types	Explanation/examples	Relevance for the <i>ex-post</i> social success accounting
Length of time frame	Short term	In more traditional measurement methods the focus is on the short term, but real and/or total impacts may not occur after a short time.	yes
	Long term	In the case of a short project a long-term impact may not be the first focus of measurement.	partly
Perspective	Micro (individual)	From a business (firm) perspective, but may also include different indicators of social impact measurement from a socio-economic perspective.	yes
	Meso (corporation)	Corporation or sector-specific perspective.	yes
	Macro (society)	Socio-economic perspective	yes
Approach	Process methods	Monitoring the efficiency and cost-effectiveness of ongoing operational processes. This way they do not provide an absolute measure of social returns. It leads to a cost-effectiveness analysis.	no
	Impact methods	Measures operational outputs and their impact. The incremental outcome beyond and above what would have happened if the organization did not exist.	less
	Monetization methods	Quantifying social and environmental indicators and translating those indicators into a monetary value to be comparable with traditional financial data. These methods lead to benefit-cost and utility analysis in general.	yes

Source: Compiled by the author based on Maas and Liket (2011), Clark *et al.* (2004) with the author's contribution

From these characteristics in Table 14, the purpose (focus), suggested tools under the particular method, time frame, scope of analysis, type of information provided, and additionally, the earlier applications in higher education and/or universities are relevant to building a framework (Table 15) for the analysis of methods that have been applied in the social impact measurement and have relevance concerning the thesis topic. Methods under observation are the Acumen scorecard, Atkisson compass assessment, balanced scorecard, social cost-benefit analysis, and social cost-effectiveness analysis.

By their functioning approach the Acumen scorecard, Atkisson compass assessment and balanced scorecard methods serve more as process methods because they track and monitor the efficiency and effectiveness of output variables or indicators that management uses for an ongoing operational process. Outputs can be evaluated by the extent to which they correlate with or cause the desired social outcomes. Benefit-cost analysis belongs to the category of impact and monetized methods. All discussed methods are based on indicator analysis and partial utility analysis without social weights.

Since the balanced scorecard has been largely applied to nonprofits, including the education sector and universities (one example of the balanced scorecard method related to the research object of the current thesis is shown in Annex 2), then more attention to it is justified. The balanced scorecard (BSC) approach is one relevant to the indicator-based approach, which takes into account mainly internal resources (or resources available for internal use), processes, and developments, and suggests measures to assess internal target results (goals). This internal reporting method was introduced for businesses in the first place by Kaplan and Norton (1992, 1993). Later the method has been applied in the public sector (Kaplan 1999; Corrigan 1998; Greiling 2006), for non-profits (Kaplan 2001, 2002; Greiling 2010, 2011), and in education, for universities (Stewart and Carpenter-Hubin 2001; Karathanos and Karathanos 2005; Mikhail 2005; Farid *et al.* 2008; Nistor 2009).

In general, the balanced scorecard is a strategic planning and management method used to align business activities with the vision and strategy of the organization, improve internal and external communications, and monitor organization performance against strategic goals (Kaplan and Norton 1993, 1996).

Table 15. Comparison of some relevant to the topic methods of social impact measurement

Method of measurement	Reference remarks	Purpose/focus	Tool provided	Scope of analysis	Time frame	Type of information provided	Applied in higher education/universities	Usefulness for <i>ex-post</i> analysis of welfare change
1. Acumen scorecard	Clark <i>et al.</i> 2004; Maas and Liket 2011	Strategic management system for screening, monitoring, and reporting on the meso level. Application for profit and non-profit companies.	Focus on actions that deliver immediate results and improve corporations' long-term competitive positioning in changing and dynamic marketplaces.	Internal process method	Prospective and ongoing	Outcome milestones and benchmarks	Not found	No
2. Atkinson compass assessment for investors	Clark <i>et al.</i> 2004; Maas and Liket 2011	For assessment of the sustainability of communities. For monitoring and reporting on the micro and meso level. Application for profit companies.	Incorporates 5 key elements: nature (N) – environmental benefits and impacts; society (S) – community impacts and involvement; economy (E) – financial situation, economic influence; well-being (W) – effect on individual quality of life; synergy – links between the other 4 areas and networking.	Internal and external process method	Prospective and ongoing	A point-scale rating system on each of 5 key areas, which have several specific criteria for indicators.	Not found	Partly as it shows impact areas and points to types of benefit and cost
3. Balanced Scorecard (BSC)	Kaplan and Norton 1992, 1993, 1996, 1997; Kaplan 1999, 2001, 2002; Epstein and Manzoni 1997; Fonvielle and Carr 2001; Greiling 2011	For measurement of operational performance in terms of financial, customer, process, and learning and growth outcomes for profit and non-profit companies.	Performance indicators that are focused on measuring user satisfaction.	Mainly for internal management uses, process method	Prospective, ongoing and retrospective	Mutually non-related performance indicators.	Stewart and Carpenter-Hubin 2001; Karathanos and Karathanos 2005; Farid <i>et al.</i> 2008; Nistor 2009	No

Table 15. Continuation

Method of measurement	Reference remarks	Purpose/focus	Tool provided	Scope of analysis	Time frame	Type of information provided	Applied in higher education/universities	Usefulness for ex-post analysis of welfare change
4. Social cost-benefit analysis	Clark <i>et al.</i> 2004; Maas and Liket 2011; Hof <i>et al.</i> 2012	A general economic tool for performance measurement. For screening, reporting and evaluation.	The costs and social impacts of an investment are expressed in monetary terms and assessed according to one or more of the following three measures: 1) net present value (the aggregate value of all costs, revenues, and social impacts, discounted to reflect the same accounting period); 2) benefit-cost ratio (the discounted value of revenues and positive impacts divided by discounted value of costs and negative impacts); 3) internal rate of return (the net value of revenues plus impacts expressed as an annual % return on the total costs of the investment.	Process, impact and monetization method.	Prospective, ongoing and retrospective.	Impacts upon society.	Levin, M. H. and Belfield, C. 2010	Yes, but only for ex-post analysis
5. Social cost-effectiveness analysis	Clark <i>et al.</i> 2004; Maas and Liket 2011	An economic tool for performance measurement. Generally refers to the economic analysis of an intervention. For reporting and evaluation.	To determine if an intervention is cost-saving or cost-effective. Here the costs and resources needed to implement interventions are treated separately.	Process and monetization method.	Retro-spective.	Impacts upon society.	Levin, M. H. and Belfield, C. 2010	No

Source: Compiled by the author

The balanced scorecard considers 4 critical perspectives of business (Kaplan and Norton 1992, 1996):

1. Learning and growth: includes training, learning, corporate culture and attitudes, and self-growth. Individual are the main repository of the knowledge of an organization and the critical resource. Communication among workers is key, as is avoiding brain drain.
2. Internal business process: metrics based on internal business processes allow management to monitor how well the business is running and whether its products/services are well-accepted by clients.
3. Customer: indicators on customer satisfaction and tools to improve and monitor customer relations are critical.
4. Financial: timely and accurate financial data is still a key to managing the business. Data should be centralized and fast and easy to access, but financial data should not be the only indicator, thus the original intention of the word “balanced.”

A general overview of the BSC is presented in Figure 8.

The balanced scorecard measures for universities have been built analogous to business. Here customer-focused results are substituted with student learning results, product and service results are meant as student-and-stakeholder-focused results, financial and market results are quite the same with addition budgetary results, human resource results are focused on faculty and staff results, but organizational effectiveness results and governance and social responsibility results have remained rather similar as shown by Karathanos and Karathanos (2005). The method is not explicitly related to welfare, but to management or university goals.

There have been several discussions about how to make balanced scorecards work so that they are not just a set of unrelated performance measures (Kaplan and Norton 1996, 1997, 2001), as well as comparisons with the management tool for the measurement of key parameters to support decision making – the *Tableau de Bord* – taken into use in France (Epstein and Manzoni 1997). The last one has been in use for more than seventy years.

In these discussions and comparisons attention has been drawn to the shortcomings of the balanced scorecard method as the fact that financial and non-financial indicators cannot substitute for each other and financial measures are lagging in performance indicators (Epstein and Manzoni 1997), but also to the issue that balanced scorecards are complicated to design in a way that supports confidence in their design. The main general problem mentioned has been the missing cause-and-effect relationship (Greiling 2011).



Figure 8. General Concept of the Balanced Scorecard

Source: Compiled by the author based on Kaplan and North (1992, 1996); Fonvielle and Carr (2001)

The conclusion to draw here is that the balanced scorecard is not a suitable method when one needs to value positive and negative externalities caused by an economic unit in order to measure social success. The BSC method represents strategic planning and a management tool for an economic unit's internal uses, including different indicators to measure internal processes, customer satisfaction, financial results, and learning and growth in the economic unit. These indicators stand apart from conventional accounting and cannot be integrated into an accounting and bookkeeping system for social accounting, because measurement indicators are not in monetary terms. Different units for measurement have been used, for example, achievements in percentage terms (for example, share of), number of participants, growth in comparison with the previous year, etc. Also, the activities of the economic unit and their related effects are not linked with each other. Therefore, a more detailed analysis of bookkeeping-relevant social accounting is necessary (Tables 16 and 17).

In tables 16 and 17, respectively, general and specific approaches of social accounting are observed from the points of view of whether social effects are considered, the accountings are measure- and/or project-oriented or refer to all

activities of an economic subject, and if they are applied to private and public firms and public offices. Still, one of the most important questions is: do the approaches offer hints for evaluating some effects of university faculty's activities and creating a complete bookkeeping system that fulfills the basic requirements of social bookkeeping?

Social accounting bookkeeping should identify the social value stemming from the operations of the university/faculty. The social audits (Table 16) of universities do not use evaluation methods to express social success systematically. The idea that universities have activities which are useful for society through indicators such as the number of students is typically stressed. Therefore, social audits are not based on the definition of social success. They show the social effects of a university and deal with private and public economic units.

Table 17 also contains some educational approaches, but they are more project-oriented, considering some important effects, and contain some useful hints to evaluate faculty activities since they deal with university education. Still, they are not oriented to a periodical comprehensive university social success measurement and they do not meet bookkeeping requirements.

The *ex-post* analysis of welfare improvement (social success) requires a definition of the steps of analysis and a mathematical treatment of the data to be collected. As the *ex-post* analysis has to consider all the data to be collected to determine social success features, it depends on the definition of social success, its components, and its delineation to the period under observation and to the economic unit under research.

The *ex-post* analysis needs the design of an equation system (see Tables 25 and 26) that shows the definition of social success and the variable it depends on (e.g., the kind of social benefits and costs). The equations have to be designed in such a way that all social success-relevant flows and stocks are considered. They have to be related to the variables in the equations and have to be completely defined and related to the period of *ex-post* analysis. For practical purposes, a set of techniques for the choice and evaluation of transactions must be applied to determine the size of variables. Conventions are needed to consider the equal application of variables specification within the *ex-post* analysis and among different *ex-post* analyses to allow comparison. Also, the conventions for comprising deferral rules to identify social success due to the economic unit under observation and to allocate the transaction to a period of analysis are necessary. The variables must have unilateral dimensioning to allow the formation social benefits and social costs that can be agglomerated by addition and subtraction. The equations should be formulated in such a way that allows group for social benefit- and social cost- relevant variables. The variables should reflect social success-relevant flows and stocks and actual transactions and stocks.

Table 16. Bookkeeping relevant characteristics in general social accounting approaches

Accounting approaches	Reference	Effects	Project oriented	Private firm	Public firm	Public office	Some effects evaluation	Complete bookkeeping system and ex-post analysis	Usable for the social accounting of university (faculty)
General approaches									
Economic investment accounting									
Benefit-cost analysis	Inter-Agency Committee on Water Resources 1958; Friedrich 1969; Dasguptha, Sen, Marglin 1972; Hanusch 1987; Marggraf, Sireb 1997; Flores 2003	yes	yes	no	no	no	yes	no	partly
Cost-effectiveness analysis	Meyke 1973	yes	yes	no	no	no	partly	no	no
Utility analysis	Zangemeister 1976	yes	yes	no	no	no	no	no	no
Social accounting									
Social audits	Abt 1972; Schmitz 1980; Shaikh , Jakpar 2007	yes	no	yes	yes	no	partly	no	no
Human resource accounting	Hermanson 1964; Brummert 1969; Flamholtz 1971; Neubauer 1974, Conrads 1976	yes	no	yes	no	no	yes	no	no

Table 16. Continuation

Accounting approaches	Reference	Effects	Project oriented	Private firm	Public firm	Public office	Some effects evaluation	Complete bookkeeping system and ex-post analysis	Usable for the social accounting of university (faculty)
Corporate social accounting	Linowes 1968; 1972, 1973; Abt 1972; Monsen 1972; Elliot-Jones 1973; Eichhorn 1974; Estes 1976; Mühlkamp 2007	yes	no	yes	yes	no	yes	no	partly
Social indicator analysis	Dierkes 1974; Mintrop 1976, Fischer-Winkelmann 1980; Wysocki 1981; Schmitz 1980; Friedrich 1991; Schauer 2007; Richmond, Mook, Quarter 2003; Ates, Büttgen 2011; Greiling 2011	yes	no	yes	yes	no	yes	no	no
Citizen value	Schwalbach, Schwark 2008; Schwalbach, Schwark, Smuda 2009	yes	partly	yes	yes	partly	yes	no	no

Source: Adapted from Freidrich and Eerma (2012) with the author's contribution

Table 17. Bookkeeping relevant characteristics in special (sector) social accounting approaches

Accounting approaches	Reference	Effects	Project oriented	Private firm	Public firm	Public office	Some effects evaluation	Complete book-keeping system and <i>ex-post</i> analysis	Usable for social accounting of university (faculty)
Special social accountings									
Environmental accounting	Seidel, Zenus 1990; Gray <i>et al.</i> 1995; Burritt 1997; Wilmshurst and Frost 2001; Azuma 2007	yes	yes	yes	yes	yes	yes	no	partly
Health accounting, measure oriented	Müller-Bohn, Ulrich 2000; Schöffski, Graf von der Schulenburg 2002	yes	yes	yes	yes	yes	yes	no	partly
Health accounting, Net- benefit	Greiner, Uber, Graf von der Schulenburg 2007; Wille 1996; Greiner, Schöffski 1998, Brent 2004	yes	partly	yes	yes	yes	yes	no	partly
Health accounting, cost-effectiveness-analysis	Tengs, Adams, Pilskin <i>et al.</i> 1995; Weinstein 1996; Wille 1996; Schöffski, Uber 1998; Rychlik 1999; Brent 2004	yes	partly	yes	yes	yes	yes	no	partly
Health accounting, utility analysis	Schöffski 1990, Birch, Gafni 1992; Greiner, Schöffski 1998; Brent 2004; Graf von der Schulenburg 2007	yes	partly	yes	yes	yes	yes	no	partly

Table 17. Continuation

Accounting approaches	Reference	Effects	Project oriented	Private firm	Public firm	Public office	Some effects evaluation	Complete book-keeping system and <i>ex-post</i> analysis	Usable for social accounting of university (faculty)
Education, rate of return to education	Haveman, Wolfe 1984; Psacharopoulos 1987; Spraul 2006; Heiling 2007; Eide and Showalter 2010	yes	yes	yes	yes	yes	yes	no	partly
Education, private rate of return	Belfield 2000; Alstadsaeter and Sievertsen 2009	yes	yes	no	no	no	yes	no	partly
Bookkeeping oriented approaches									
Elderly homes	Schmitz 1980	yes	no	yes	yes	yes	yes	yes	yes
Energy provision	Tsimopoulos 1989	yes	partly	no	yes	no	yes	yes	yes
Convention halls	Friedrich, Jahn, Valjak, Wonnemann 1993	yes	no	no	yes	partly	yes	yes	yes
Touristic facilities	Friedrich, Feng, Wonnemann Jahn, Vajak 2000	yes	partly	yes	yes	partly	yes	yes	yes
Ecological banks	Friedrich, Kosinski, Türk 2003	yes	no	yes	no	no	yes	partly	partly

Source: Adapted from Freidrich and Eerma (2012) with the author's contribution

The equation system should be able to be solved (variables should appear at least two times). The equation system should also correspond to a bookkeeping system that allows for the recording of the transactions (e.g., double sided) completely (success and stocks). It should have links to other bookkeeping systems to ease transaction gathering.

Therefore, the approaches in the two last tables (16 and 17) do not fulfill the requirements of an *ex-post* analysis and a bookkeeping chart. This particular approach requires a single social success measurement, comparability of social success, periodical assessment of social success, transaction, the definition of flows and stocks that show the period overlapping social values, and the deferral of social success due to other economic units.

As shown in Table 17 some attempts presented in the special social accounting approaches have several weaknesses. Particularly, education and social value approaches do not sufficiently consider the mentioned aspects and requirements (Friedrich, Feng, Wonnemann, Jahn, Valjak 2000), especially:

- The social success of the faculty within one year;
- A complete consideration of transactions;
- A set of techniques for the choice and evaluation of transactions to be applied to all of them;
- Conventions dealing with an equal application to all institutions involved;
- Deferral of social successes and failures to individual institutions, e.g., enterprises;
- Conventions, where transactions have to be verified;
- A periodical specification of transactions;
- A unilateral dimensioning of advantages and disadvantages;
- A common and specified assignment and grouping system;
- A periodically specified financial bookkeeping of changes in success and stock, bookkeeping system;
- Efficient links to other bookkeeping systems.

In the next subsection the basic decisions about how to identify the social success of the university faculty and the requirements of the period-oriented bookkeeping to determine the structure of the social accounting approach are developed.

1.3. A welfare-based bookkeeping approach to social accounting in the case of a university faculty

In higher education, economic units may try to achieve private goals (goals of an organization), or/and their tasks are oriented towards social success. The last means that the economic unit has to follow public goals, and for that purpose methods are required for discovering how its operations meet the fulfillment of

public goals and to assess their social successes. However, as shown before, these instruments are not developed satisfactorily yet. In particular, a public goals-oriented bookkeeping system, which allows for the assessment of periodical success, is not available. Some attempts have been debated for identifying the social success of projects or single operations or to account for external effects, for example, ecological successes and environmental effects.

This task becomes even more complicated if one considers that universities undergo changes that enrich their role in, and engage with, society (see Table 18). The university as the research object is in transition and there is a need for integrated methods that measure and help to evaluate the fulfillment of objectives within society. Therefore, for evaluation one needs a method that has a systematic approach, taking into account these activities that characterize the third-generation university. For example, universities operate more internationally and are multicultural, and this impacts their effects on the local level.

Table 18. Characteristics of the second- and third-generation university

Characteristics of:	
Second-generation university	Third-generation university
1. Two objectives: research and education. No interest in the use of the knowledge created.	1. Exploitation of knowledge is core and becomes the third objective.
2. Operate on the local market. Other universities are seen as colleagues.	2. Operate on an international, competitive market.
3. Stand-alone institutions with no formal links with other organizations.	3. Open universities, collaborating with many partners.
4. Mono-disciplinary research and dominance of faculties.	4. Trans-disciplinary research and rise of university institutes.
5. Mainly elite education for well to do students	5. Multicultural organizations; mass and elite education.
6. National university.	6. Cosmopolitan university.
7. Important role of state financing and state interference.	7. No direct state financing. No state interference.

Source: Based on Wissema (2009: 32)

Under the topic of framework building it is also important to consider how higher education is approached: the university as a firm or the university not as a firm. There are some important similarities as well differences between these two approaches (Brada 2012: 65–73). In the first case the product has to be identified, and in the second case the objective is most important, but in both cases effects and externalities appear.

In general higher education externalities are the public benefits of education that spill over to benefit others in society, including in the future. Education

externalities can be either positive or negative, but they are mainly positive. In analyzing the benefits of education, direct and indirect effects, and the point of view of private or public must be distinguished as shown in Table 19.

Table 19. Benefits of a university education

Direct effects	Indirect effects
Market benefits to earnings and growth Direct effects (private benefits)	Indirect effects on earnings and growth – Indirect effects
Private non-market benefits – Direct effects	Indirect effects on non-market benefits – Private effects
Non-market social benefits – Direct effects (public goods)	Indirect effects on non-market social benefits

Source: Based on McMahon (2010: 69)

There have been more concretely focused studies in identifying a specific set of metrics for university externalities. For example, one that has relevance on the current topic is metrics of knowledge transfer (from university to industries, firms, and businesses), where higher education effects are approached in a more detailed way. In certain studies (Finne *et al.* 2011; Jensen *et al.* 2009), the purpose has been to find out what data should be collected given the focus on long-term objectives associated with economic prosperity and wellbeing.

The main groups in these metrics of effects of activities are the following (Jensen *et al.* 2009: 2–3):

- *Networks* – contains the number of attendances and/or presentations at conferences/seminars as well as the number of cooperation contract research projects as a result of a knowledge exchange or networking activities;
- *Continuing professional development* – contains the number of courses held for a particular research field;
- *Consultancy* – contains the number of consultancy contracts and the number of research projects generated by consultancies, and the value associated with consultancy contracts;
- *Collaborative research* – contains the number and value of other collaborative research agreements;
- *Contract research* – contains the number and value of contract research projects and the length of client relationship;
- *Licensing* – contains the number of patents granted, the number of licenses, and the income stream from licenses;
- *Spin-outs* – contains the number of spin-outs formed, the value of revenues generated by the spin-out, the value of external investment raised, the market value at flotation, the exit value and survival rate or viability of spin-outs, and the growth rate of spin-outs;

- *Teaching* – contains the number of students, the rate at which students are hired, student satisfaction (after employment), and employer satisfaction with graduates;
- *Other* – contains the number of research student placements in a particular field, the number of funded post-graduates positions/scholarships, and the number of staff working on commercialization activities and in supporting roles, the provision of training in research commercialization, research publications, and citations received.

These metrics give hints for relevant activities, transactions, and opportunities to monetize.

Considering that knowledge transfer is important to account for a university’s social success, the author has found these main groups, as well most included components, relevant to take into account in developing an approach for social accounting purposes. Still, one has to recognize the fact that in the above recommended set of metrics the components are kept in the form of separate indicators. Therefore, the content of the metrics transmits information mainly on positive effects and in different forms of measurement.

One earlier monetized example of the university considered in a social accounting context has been given by Seidler (1975: 6). As shown in Table 20, it is based on two income statements. From a social point of view, the educational outputs of the university consist of better-educated citizens who are therefore of greater value to society, but society will also benefit from the assumed increased social and intellectual productivity of graduates.

Table 20. Conventional and social income statements of the university

Conventional income statement	Social income statement
Revenues: - Tuition paid to university - Research grants - State aid	Revenues: - Value of instruction to society - Value of research to society
Less Costs: - Instructional - Research costs - Student aid - Overheads	Less Costs: - Tuition paid to university - Cost of research - State aid - Other – Lost production
Result: (Deficit)	Result: Profit

Source: Based on Seidler (1975: 6)

Since the approaches described in the previous subsection are not appropriate enough in general and are not as specific as required for university social accounting, it is necessary to develop an approach of social accounting for the university (faculty) accounting purposes.

Next, a welfare-based development of social accounting for a university is discussed (in the case of a faculty). Such a social accounting approach should identify the social value stemming from the operations of the university faculty.

The bookkeeping approach, which is based on welfare economics, has to compensate for these deficits, which means several basic decisions have to be made and basic methodological problems have to be solved. Since benefit-cost analysis (BCA) involves an analysis of welfare changes (Zerbe and Bellas 2006), and its objective is to increase public welfare because it often encompasses non-market goods (for example, the value of a recreational visit to town), and for that purpose required data are often not found in market transactions (Farrow and Zerbe 2013: 2), it forms a suitable general theoretical starting point for such a methodological discussion. One can start with basic questions such as:

- Which social benefits and social costs have to be included?
- How are these social benefits and social costs to be evaluated?
- What are the relevant constraints?

Essential references for general BCA and especially for the wider scope for a social BCA application in terms of these methodological issues are Acocella (2005), Brent (2006), Brent (2009), Farrow and Zebre (2013), Zerbe and Bellas (2006), and Zerbe and Dively (1994).

The crucial question for the whole approach is a measurement of social success. This measurement task leads to welfare economics. The basis of normative economic welfare, which evaluates the state of society, is a social welfare function (SWF). It is a function that ranks social states as less desirable, more desirable, or indifferent for every possible pair of social states. However, there is no agreement about how such a social welfare function can be scientifically obtained and whether or not there ought to be one such function. Also, the social welfare function is not unique. Inputs of the SWF may include variables that are considered to affect the economic welfare of society. The SWF is considered to be a traditional means for representing the values of the community in economics (Mueller 2003: 563; Forte 2010: 75–77). The SWF has an individualistic form. Various types of SWFs have been suggested. There are three main types of welfare functions:

- Paternalistic – one party fixes all evaluations (characterized by a dictatorship, for example, a representative consumer, a dictator). Here the utility levels of individuals play no role.
- Individual – using welfare measures of the individual in society as inputs (Bentham's SWF, Rawlsian SWF);
- Society-weighted individual utilities (Bergson-Samuelson SWF; Harsanyi's SWF).

In the second case society's welfare is equal to the sum of the utilities of different individuals (Bentham's social welfare). This is known as utilitarianism, which was introduced by Jeremy Bentham (1748–1832). For changes in the sum of utilities, cardinal measurability and comparability are assumed. Here society is willing to give up one unit of individual 1's utility for a gain of one unit of individual 2's utility (Johansson 1991: 34), (see the first example in Figure 9). In welfare theory what kind and whether cardinality is really necessary is debated. Measurable utility is called cardinal utility and does not exist except as an abstract concept since there is no agreed-on method of measurement. A cardinal measure of utility implies the ability to measure welfare across different activities and individuals. An ordinal measure of utility is one in which the utilities of different positions can be ranked (Zerbe and Dively 1994: 74–75).

By Bergson (1938) and later, by Samuelson (1947), the SWF has been written as the following formula: $W = W(z_1, z_2, \dots, z_n)$, where W is a real valued function of all variables, and z_i s and W are chosen to represent the values of society or of the individuals in it (by Samuelson). The objective is to define W and set for z_i s and then the constraints to yield meaningful first- and second-order conditions for a maximum W . In general, any variable that is related to a society's well-being (for example, accident statistics, years of schooling) might be included into the SWF, but economists have focused on economic variables. The SWF literature has adopted the same assumptions about consumers, producer functions, and so on, and has been made the center of this analysis. (Mueller 2003: 563).

The Bergson-Samuelson SWF has been constructed for the individual's utility function. It means that society has to choose an allocation of commodities across individuals to maximize its welfare, and the value judgments give the SWF its normative content (Mueller 2003: 582; Suzumura and Xu 2003).

The third type of the SWF – the weighted sum of the individual utilities – is presented by Harsanyi (1955). It is a view towards inequality expressed by indifference curves, where society should be willing to accept a decrease in the utility of the poor only if there is a much larger increase in the utility of the rich. Then the SWF, which is able to represent such indifference curves, is written in the following form (Johansson 1991; Hammond 1992; Mueller 2003):

$W = a_1U_1 + a_2U_2$, where a_1 and a_2 are welfare weights that depend on the level of utility attained.

Another extreme is the concept of the welfare of society presented by (Sir) John Rawls (1971). The Rawlsian measure of society's welfare equals the utility of the individual who is the worst off (Rawls 1971, 1999).

The SWFs can be described graphically using indifference curves, where each point represents an equal amount of welfare. In a two-individual society the indifference curves for the SWFs are shown in Figure 9, respectively 1) substitutive example of SWF, for example Bentham's SWF, 2) complementary SWF and 3) socially weighted SWF, showing utility level of Pareto type, according to Graaff (1963) is Bergson SWF.

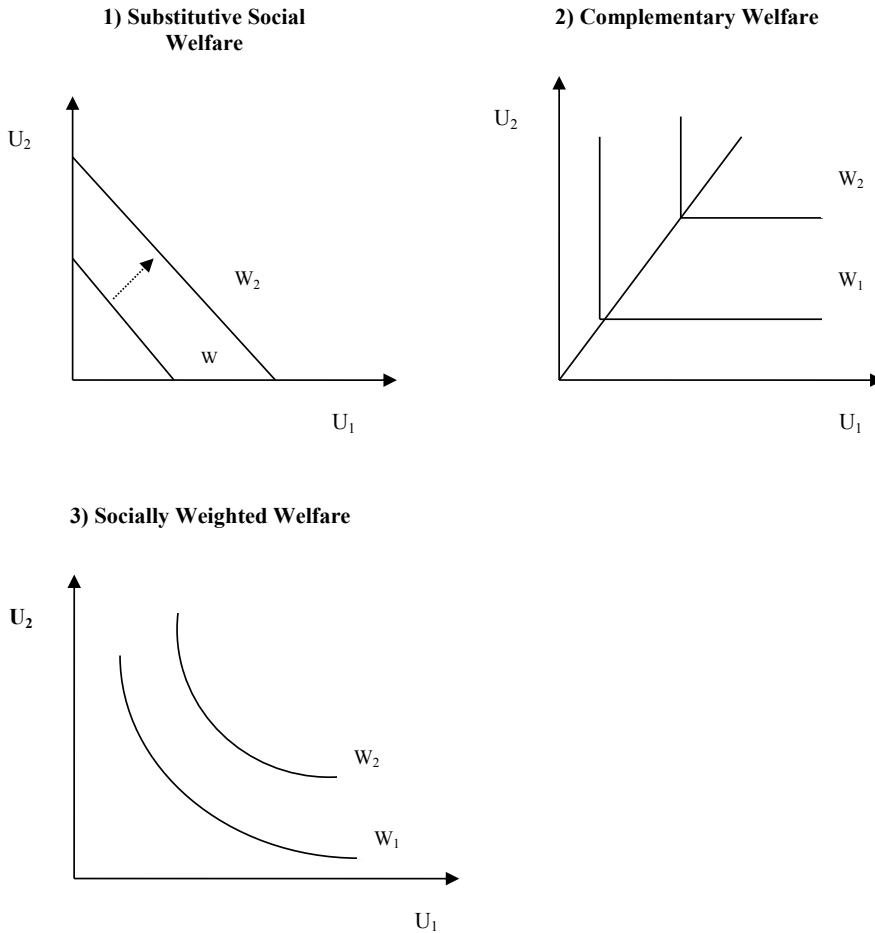


Figure 9. Types of social welfare

Source: Compiled by the author based on Johansson (1991:33) and Mueller (2003)

In measuring welfare change, a usual basic problem is that the social welfare function based on individual utility functions is not observable. It means that there is no direct way to observe gains and losses. Indirect measures which reflect changes in welfare are needed.

To apply the welfare function a decision has to be made about whether to choose an additive or multiplicative form. The initially considered (additive) one is the individualistic postulate that society's welfare depends on the welfare or utility of all the individuals in society. Symbolically it is formed in an additive form, as follows:

$$W = U_1 + U_2 + \dots U_n,$$

where W is social welfare, the U_s are the individual utility functions and n is individuals in society (Brent 2006; Mueller 2003; Usher 2003: 262). In this case, social welfare is the unweighed sum of individual utilities. It is the simple utilitarian social welfare function. Another format:

$W = U_1 \times U_2 \times U_3$ – is problematic for the benefit-cost analysis because if one individual evaluates zero the whole welfare of society is considered to be zero.

The individual- and society-weighted individual SWFs lead to a Pareto optimum according to the Pareto criterion. The welfare basis of BCA is grounded on Paretian value judgments. The Pareto criterion is often considered to be the common core of welfare economics based on individualistic welfare functions. According to the Pareto criterion, it is possible to evaluate changes that improve or deteriorate the welfare of individuals, but nothing can be said about a policy change that makes some better off and others worse off.

This criterion is illustrated for a society of two individuals (1) and (2) in Figure 10, where U_1 and U_2 mean utilities of these two individuals respectively.

The utility levels are expressed in monetary terms and can then be added and subtracted. The idea that the marginal utility of money should be the same for all individuals, which shows willingness to pay for welfare change is discussed in the literature (Brent 2006; Johansson 1991; Mishan 1971).

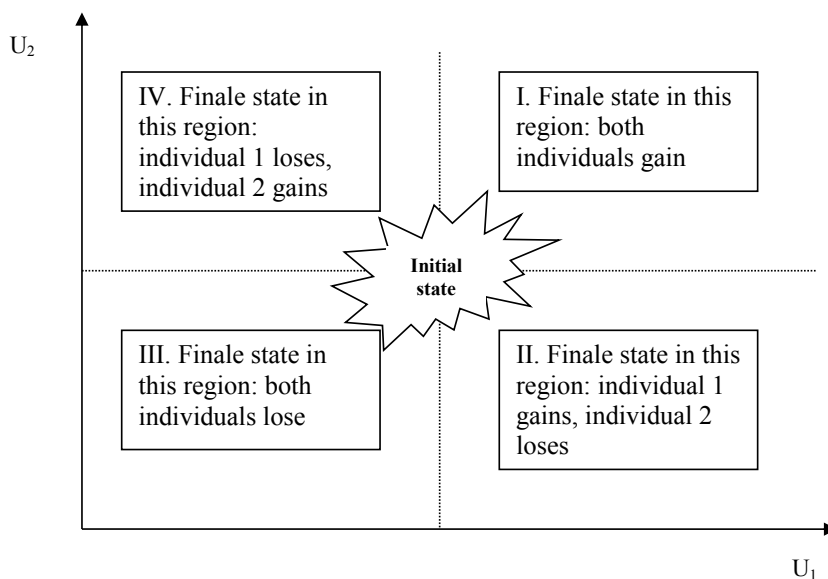


Figure 10. Pareto criterion with 2 individuals in welfare economics

Source: Compiled by the author based on Johansson (1991: 11)

The relevant social welfare function may vary from individual to individual, and most such functions are expected to satisfy Pareto's criterion; that is, a change making at least one individual better off without making any other worse off is considered a social improvement (Tisdell and Hartley 2008: 28).

For the BCA criteria, it is necessary to group the n individuals into two groups: these who gain and those who lose. Since the Pareto criterion is considered to be too restrictive for social choices in many real-world situations because it cannot handle mixed outcomes of the results (in Figure 10, in quadrants III, IV, and II the movement that signals a Pareto improvement is from the initial state to quadrant I), (Johansson 1991: 22; Brent 2006). Therefore, the traditional BCA has been founded on the principle of potential Pareto improvement (Mishan 1976) because a Pareto improvement is fundamental to BCA since helps to find an efficient project (Brent 2006).

The concept of the Pareto improvements is based on four Pareto value judgments (Millward 1971; Brent 2006):

- An individualistic conception of social welfare. This means that to make society better off we must make individuals better off. In order to accept the first Paretian value judgment the utilities will originate from interdependent individual utility functions.
- Non-economic causes of welfare (for example, freedom and democracy) are often ignored. It is a progression of steps: if it is necessary to make individuals better off in order to make society better off, then non-economic factors are either assumed to change and have a small impact on utility, or they have a potentially large impact but are assumed not to change. This assumption is in principle not necessary.
- "Consumer sovereignty" requires that individuals are the best judge of their welfare and therefore, their choices affect individual utility functions. This raises three questions: do individuals accept the idea that they are the best judges of their own welfare, are individuals able to make judgments about their welfare, and do they want to make these judgments?
- Pareto optimality as the final step to ascertain when social welfare has improved given changes in individual welfare. Society is better off when a change makes one individual better off, and no one is made worse off. In this case a Pareto improvement has resulted. And if all possible Pareto improvements have been implemented, then Pareto optimality has been achieved.

But in order to extend the last Pareto value judgment to cases where there are also losers, compensation tests are needed. Compensation tests are considered to be the best-known attempts to formulate a principle for aggregating preferences (Zerbe and Dively 1994). Compensation tests are concerned to ensure that Pareto improvements can be derived from economic changes that generate positive net benefits (Brent 2006).

The compensation principle has been suggested by Hicks (1939), Kaldor (1939), Scitovsky (1941), Little (1955) and Samuelson (1983). The Kaldor-Hicks compensation test (see Figure 11) relied on potential Pareto improvement and suggests that it would be sufficient if the size of the benefits be such that the gainers could compensate the losers and the compensation did not actually have to be carried out (Brent 2006: 40; Forte 2010: 113–115). The losers are better off after compensation than before. This test is also called the “overcompensation” test because the gainers can compensate the losers and have something positive left over (Brent 2006).

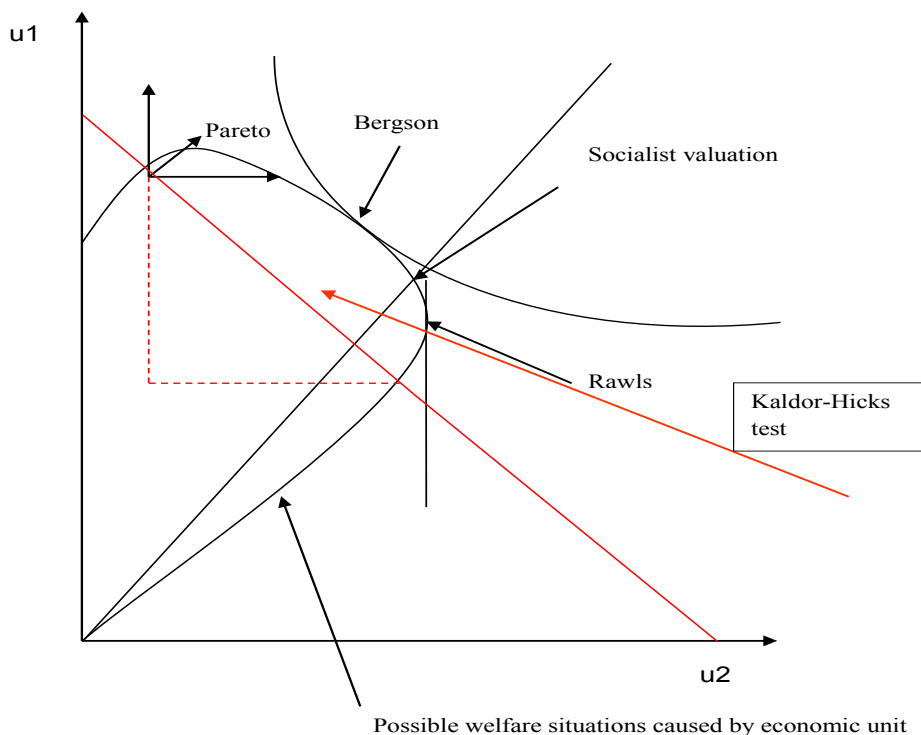


Figure 11. Social welfare functions in a possible welfare situation

Source: Compiled by the author

Scitovsky (1941) has found that the hypothetical compensation test may be ambiguous because the compensation criterion might be satisfied both for the change from situation one to situation two and the reverse move from situation two to one. This kind of possibility is known as the Scitovsky “paradox” (Lipsev 2010). This paradox occurs when two utility-feasible curves cross each other (double-edged criterion), for example because of a government policy change. Scitovsky criterion, or the so-called double test, finds that the losers are not able to compensate the winners after compensation to reach a situation in which the losers are so well off as to compensate the winners. The Samuelson

test finds that the situation must lay on a higher social indifference curve. Little's test adds to Scitovsky's principle that the income distribution should be improved as well.

The conditions of Pareto optimality cannot be used to measure welfare change in monetary terms. Therefore, the BCA framework has to be applied. Here the individual utilities are measured by the willingness to pay for advantages.

The Kaldor-Hicks principle, which is also called the potential Pareto criterion, is the standard criterion most often used in the BCA analysis. It assumes, based on utilitarianism, that everyone's utility should be counted equally but adds the assumption that the marginal utility of income is the same for everyone. The expression for the Kaldor-Hicks measure is the same as the efficiency part of the utilitarian equation. If constant marginal utility of income is assumed, then the utilitarian function is the same as the Kaldor-Hicks function. However, this approach does take into account interdependent utilities. (Zerbe and Dively 1994: 258)

Therefore, the Kaldor-Hicks criterion solves the social welfare problem by assuming that each person has the same marginal social utility of income. A monetary unit (EEK, euro or dollar) is counted the same regardless of who receives it.

Benefit-cost analysis measures the utility of society by measuring willingness to pay (WTP) in monetary terms. The marginal value of the euro or EEK is the same to all revealing willingness to pay; only those who can or are willing to pay influence the social value.

Based on welfare economics, a logical cycle for the measurement of social success (change in welfare), if starting from social welfare function, can be constructed. These steps are concluded in figure 12. As for real circumstances there is no such social welfare function available, because we cannot derive it, for example, from individual preferences. This problem occurs for the mentioned example because one should use an ordinal measure of utility that ranks the utilities of different positions in society. Kenneth J. Arrow (1950) has asserted that these social indifference curves reflecting the preferences of society in a form of a SWF are impossible to achieve. In other words, it is impossible to have an individual social welfare function that meets the specific rationality criteria.

The Pareto optimal criterion is not considered a practical solution because usually one is worse off. Compensation tests can be avoided with the Kaldor-Hicks criterion used in the framework of BCA. In the Kaldor-Hicks test concerning the welfare change, welfare increases, which means there is welfare improvement if the willingness of winners to pay for a measure is higher than the willingness of the losers to pay to avoid the measure. This is the basis of BCA. Criticism of the Kaldor-Hicks criterion and difficulties in assessing WTP caused analyst to look for a different possibility, or if alternatives cause the same costs, one alternative must be better with respect to all alternatives, otherwise it cannot be considered the best choice.

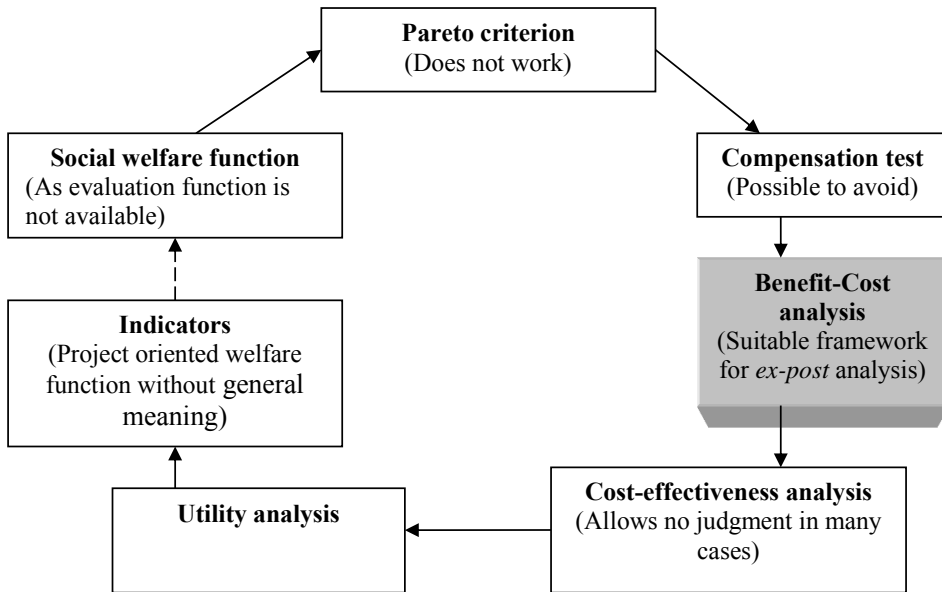


Figure 12. Steps of logical cycle for social success measurement

Source: Compiled by the author

Cost-effectiveness analysis and utility analysis may seem to be options. Cost-effectiveness looks at both the consequences as well as the costs. On the consequences side, there has to be a main objective in common or many objectives achieved to the same extent (Brent 2006). Therefore, with several goals it is necessary to weight them, but that is not the case in the BCA. A cost-utility analysis has an output measurement in only one dimension, and this kind of utility analysis leads to indicators (one or several). With indicators designed for single or several goals achievement measurements (for example, with the balanced scorecards) we will have an evaluation that considers project-oriented effects or the fulfillment of some management target, but the disadvantage is that we cannot have a general meaning in a sense that is socially worthwhile. We will have a kind of project-oriented social evaluation function. However, to compare projects there should be a general evaluation function. A SWF would be necessary again for the last one.

In the BCA the consequences and effects of activities are expressed in monetary terms. This means that it is possible to calculate the net benefit of the activities considering both social benefits and social costs. Therefore, the BCA is a suitable framework for social success measurement in the period-oriented *ex-post* analysis.

For all evaluation possibilities one runs in a circle (Figure 12) and ends up by necessity at the welfare function again. Therefore, the BCA framework forms the basis for the *ex-post* analysis and bookkeeping approach.

The next problem is how to measure the willingness to pay. Welfare economics has paid attention to the fact that WTP may be different from actual payments in the market. The actual market price is what the individual has to pay for one unit of the product or service. The difference between what one is willing to pay under the condition of total price discrimination and what one has to pay is called consumer surplus (CS). See Figure 13.

The concept of consumer surplus was first formulated by the French engineer Dupuit (in 1844²²) who described consumer surplus as being the difference between the price actually paid when purchasing a commodity and the price the consumer would have been willing to pay (Hanley and Spash 1993: 27; Ng 2010: 97).

Even if some authors have mentioned that CS has been regarded “as superfluous or debatable theoretical foundation” (see Ng 2010), it is widely used in the BCA analysis and has an important role to play in the BCA framework. A social justification for providing goods and services that would otherwise be rejected by a private market can be supplied through this concept. Initially the CS was introduced by Dupuit²³ as a guide to public investment decision-making (Brent 2006: 73).

The starting point for analysis is the demand function, which expresses the quantity purchased as a function of the main determinants as price of good, other prices, income, tastes, and so on.

Neoclassical economist Alfred Marshall was concerned with finding the conditions under which a money measure of consumer welfare would equal the “true” utility surplus (Mishan 1982; Hanley and Spash 1993: 29).

There are three main measures of consumer surplus: the Marshallian measure (from the 1920s), the compensating variation, and the equivalent variation. There is a current level of satisfaction with the product/service and a level of satisfaction without the product/service. The difference is the Marshallian measure (Brent 2006). The Marshallian consumer surplus (P_0BA in Figure 13) is defined as the excess of the price that the consumer is willing to pay rather than stay without the good or service over what he or she actually does pay (Marshall 1925: 124, 1958: 79).

Here (see Figure 13) the producer exploits the factor owner by paying a lower factor price, lower marginal cost curve (S). The usual producer surplus is p_0BC . Therefore, the correction must be $C_1CDB_1 + 1/2(Q_1 - Q_0) * B_1D$, producer surplus change as distortion of factor price.

²² Dupuit, J. “On the Measurement of the Utility of Public Works”.

²³ He was the first who suggested bridge pricing based on the idea that a bridge has been built, and the operating expenses are low and need to be covered as people use the bridge (Brent 2006: 73).

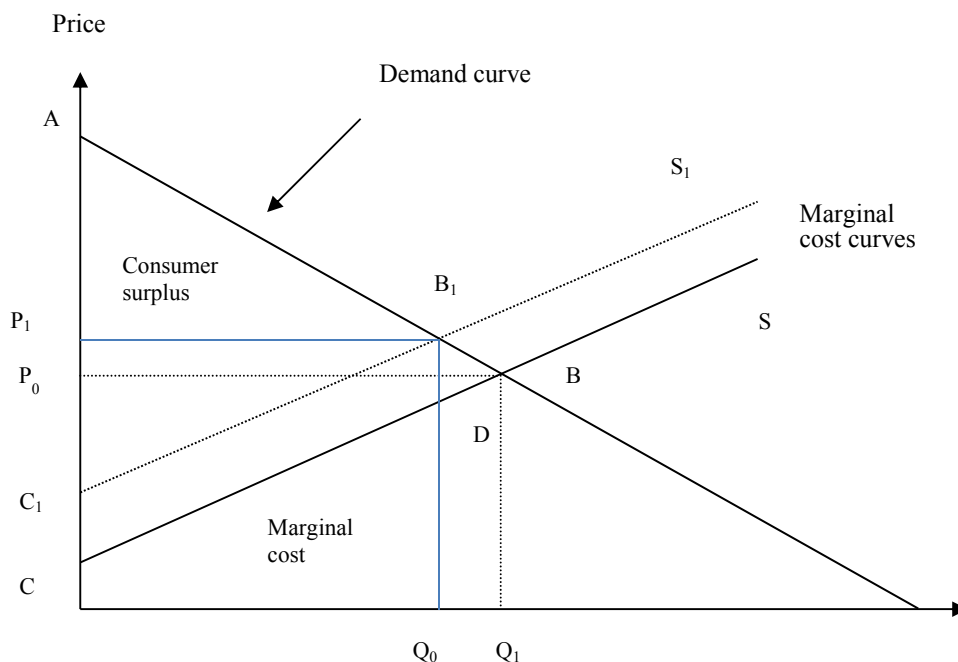


Figure 13. Consumer surplus and producer surplus from economic unit perspective

Source: Compiled by the author

In general deficiencies in monetary measures based on ordinary demand functions have led to the search for other less-restrictive money measures of utility change, and also, many economists want to avoid the interpretation of the utility function that seems to be implied by marginal utility of income or money. (Johansson 1991)

The compensating variation (CV) and equivalent variation (EV) concepts were introduced by John R. Hicks (1941, 1943). Compensation variation is the maximum (minimum) amount of money that can be taken from (must be given) to an individual so as to leave the person just as well off as he or she was before a fall (rise) in prices. Equivalent variation is the minimum (maximum) amount of money that must be given to (taken from) a household to make it as well off as it would have been after a fall (rise) in prices. (Johansson 1991; Karier 2010) There are also Laspeyres and Paasche variations²⁴.

²⁴ Laspeyres: faced with an income reduction, the consumer should sacrifice after a price reduction so that he is able to buy the same volume at the new price as before the price reduction. Paasche: faced with an income increase, the consumer can buy a new volume at the old price. The Marshallian measure = (Laspeyres variation + Paasche variation) / 2.

The difference is that the compensation variation measures the maximum WTP of an individual and the equivalent variation measures the minimum that must be received by the individual (Brent 2006: 77). Willingness to pay is usually associated with a desirable change, and the willingness to accept (WTA) compensation is associated with a negative change. The willingness to pay and accept as measured by the compensating and equivalent variations is considered the correct theoretical measure for welfare changes. In practice these measures are complicated to obtain because deriving compensated demand curves requires holding utility levels constant. For practical purposes ordinary demand curves in which income is held constant are more likely to be used.

Which measure of CS should be chosen depends on the purpose of the work. The CV is the preferred measure in theoretical works (Brent 2006: 80). The author of the current work has found that the Marshallian measure is most often used at the practical level to measure the welfare change in the BCA framework (Hanley and Spash 1993; Zerbe and Dively 1994: 84; Brent 2006: 81). In the Marshallian measure of CS the marginal utility of money is declared approximately constant, where in the frame of the Marshallian concept of partial equilibrium the *ceteris paribus* clause has an important role. For aggregation over different goods and different consumers Marshall's assumptions were that utility from a particular good is not affected by the utility of other goods and it is possible to aggregate the total surplus of consumers at a particular market (Svoboda 2008).

Since the Marshallian measure of CS is an all-or-nothing comparison between not being able to buy any units and buying the desired number of units at the prevailing price, and its solutions for aggregation over different goods and consumers, it is applied in calculations for the empirical case, in subsection 2.2. Into the discussion about whether using the Marshallian measure is justified, based on its relative simplicity and practical experiences of other researchers, the author would add the Willig (1976) calculation as the relevant justification. Willig developed a calculation that shows the extent to which the Marshallian CS may differ from the CV measure.

Willingness to pay (WTP) is defined here as the amount that one or more persons are willing to pay for a good. Some terms that are closely related to WTP in the benefit-cost analysis are explained as follows based on Zerbe and Bellas (2006: 8). Willingness to accept (WTA) or willingness to pay against is the amount one or more persons is willing to accept for a good.

Social benefit is the sum of the WTPs for changes that are seen as gains and of the WTAs for changes that are seen as a restoration of losses. Social cost is the sum of the WTAs for changes that are seen as losses and of the WTPs for changes that are seen as forgone gains. The economic benefits are usually measured by the "willingness to pay" of those individuals who are affected positively. The willingness to pay seeks to provide a quantitative indication of an individual's intensity of preferences. The welfare theoretical basis of the willingness-to-pay (WTP) approach has been discussed in the literature on the

welfare theory (Arrow 1963; Mishan 1966; Sen 1982; McKenzie 1983; Samuelson 1983; Johansson 1991) and on benefit-cost analysis (Jochimsen 1961; Graaff 1963; Mishan 1971; 1987; Dasgupta and Pearce 1972; Zerbe and Bellas 2006; Kleinewerfers 2008; Brent 2006, 2009; Rus 2010; Angner 2011).

The dimension of advantages and disadvantages may be reflected in money, time, or other dimensions such as number of students and the number of events. As there is no social welfare function for the faculty available, such an accounting approach must be based on a substitute benefit-cost-analysis, as the mentioned analysis – where utilities are measured. If a social welfare function referring to the achievement of goals, expressed by social indicators is available, a utility analysis may be possible. As most of the information in commercial bookkeeping is available in terms of payments development, a bookkeeping system and accounts in monetary terms are most reasonable. In order to assess the faculty's activities of social value the willingness-to-pay approach to identify social values in money is applied.

Using the BCA analysis framework there are several methodological challenges for the period-oriented bookkeeping approach of social accounting that need attention. These challenges and possible solutions for the current thesis are presented in Table 21. From this table two questions (the first and the last) need discussion and explanation on a general level. Therefore, both questions are dealt with in this section because the first involves evaluation methods, and the last will present the bases for the entire social bookkeeping system that is an essential part of the period-oriented social bookkeeping approach.

Further into this section will be discussed the evaluation methods measuring social success in general (the first question in Table 21). More detailed content development of the following questions takes place at the beginning of the empirical section (2.1.3) because the solutions to these questions (from 2 to 10) are more concretely connected with the empirical research object. Also, the development on the last question (the 11th from Table 21) will be explained in this section as explained above, and for that purposes the offered short general solutions (in Table 21) are necessary.

Table 21. Methodological challenges and solutions for the period-oriented bookkeeping approach of social accounting

Methodological question to be solved	Offered solution
1. How should social success be measured?	To assess the faculty's activities to one measure of social value, the willingness-to-pay approach identifying social values in monetary terms is applied.
2. What activities have to be assessed?	The operations and activities of the faculty concerning teaching, research, publications, and consultancy with their social implications.
3. How should social benefits and social costs be classified and divided?	In order to avoid double accounting, deferral criteria ²⁵ to spin off social benefits and costs not caused by the faculty have to be developed.
4. How have social benefits and costs been deferred?	Create rules to assign social success and to identify the social effects of the faculty's activities.
5. What booking techniques should be applied?	Social accounting bookkeeping is needed to account for the values of social effects (externalities).
6. How are long-lasting effects considered?	The chart considers the time horizon of the generations involved, which means those affected by the faculty's activities. Evaluation of future well-being has to be done by the present generation.
7. How is the group in which welfare becomes measured delineated?	The region in which the faculty is located by its performance operations, delivery, and procurement activities and where the faculty service consequences are noticed.
8. Which sequence of effects should be taken into account?	The sequences of transactions and effects to be included are those that are more directly related to the faculty.
9. How should the problem of alternative situations be handled?	One alternative taken (to measure welfare) is the situation in which the faculty would not be active.
10. To what principle should the chart of accounts be oriented?	As the aim is to identify the social net benefit ²⁶ due to the faculty, then the closing principle is applied.
11. Which basic structure should social accounting approach present?	Social accounting consisting of commercial ²⁷ accounting and of the part of social accounting not considered in commercial bookkeeping. This part is called additional social accounting.

Source: Compiled by the author

²⁵ It is relevant because the BCA does not consider the deferral between an analyzed object and its cooperating economic units concerning the project for which analysis is done.

²⁶ WTP is measured in social net benefit (SNB). SNB = social benefits – social costs.

²⁷ Cameral accounting is not considered because no preconditions for this approach are fulfilled and the present thesis is not focused on cameral accounting.

According to the decisions for the first and tenth question in Table 21 the social net benefit has to be formulated.

The willingness to pay (social net benefit) = turnover + consumer surplus + monetary value of positive external effects – costs – producer surplus (defined in terms of a factor price distortion) – monetary value of negative external effects

When rearranged, social net benefit consists of:

Social Net Benefit (SNB) = (consumer surplus - producer surplus) + (additional social accounting) + (external benefits - external costs) + (additional social accounting) + (turnover - costs) (commercial profit assessment)

Source: Based on Friedrich (1991)

The social benefits consist of turnover, consumer surplus, and evaluation of positive external effects (willingness to pay in favor). The social costs include costs, producer surplus expenses as willingness to pay for special purchase advantage, and evaluation of negative external effects (willingness to pay against).

In the last (rearranged) formula the components are defined as following:

- Consumer surplus is the amount that the consumer is willing to pay under the existing price in order not to totally lose the consumption of the good. Or, it is the gains from trade accruing to consumers in a market. Here is an analogy to producers' profit. Consumer surplus is equal to the difference between consumers' maximum willingness to pay for some quantity of the good and their total expenditure for that quantity.
- Usual produce surplus is the amount that producers benefit by selling at a market price that is higher than the least that they would be willing to sell for. Produce surplus here is the rent that the buyer of production factors achieves because he or she did not pay competitive factor prices (less payment).
- Turnover is expressed in terms of payment. Here the payments that get actually paid demonstrate best the willingness to pay, and therefore, turnover is the actual sum of payments.

The terms “benefit” and “cost” are meaningless without some social objective function, in other words social welfare function. This criterion by economists is the well-being of the members of society. Thereby well-being is defined as the individuals’ preferences and their willingness to pay for gains or to accept compensation for losses. The methodology of economic valuation is the set of analytical tools designed to measure the net contribution. (Freeman 2003:2)

In the literature the main methods of nonmarket valuation are divided into two broad categories (Boyle 2003; Brown 2003; Freeman 2003; Garrod and Willis 1999): 1) stated preference methods that are based on statements individuals make in response to questions about hypothetical situations, for example, contingent valuation²⁸, attribute-based methods, paired comparison, and 2) revealed preferences methods which rely on observations how people are acting in real-world settings where people live with the consequences of their choices, for example, travel cost method²⁹, hedonic market, or defensive behavior.

The main difference between these stated preference methods and revealed preference methods is the type of data to estimate values.

Value of benefits from external effects can be expressed by several methods³⁰:

- lower costs (Dasgupta and Pearce 1972; Brent 2006),
- less damage, lower insurance payments (Mishan 1971),
- increase in property value (Brent 2006),
- lower insurance (Friedrich 1969),
- time savings, income increases (Brent 2006),
- questioning (Dasgupta and Pearce 1972; Breidert, Hahsler and Reutterer 2006),
- willingness to pay used in similar projects (Brent 2006),
- opportunity costs³¹ (Hekiman and Jones 1967; Brent 2006; Stiglitz 2000),
- taxation amounts or expenditure amounts (Flores 2003),
- shadow prices (Flores 2003; Brent 2006), etc.

The idea that the evaluation of external effects is divided by its evaluation methods for external benefits and external costs evaluation can be found in the literature (see Champ, Boyle and Brown 2003).

²⁸ One example of the contingent value method application is survey, which measures the willingness to pay of individuals for environmental goods (see Pädam and Ehrlich (2011)).

²⁹ An example of the travel cost method application is based on decisions to visit recreation sites that differ in travel cost and quality (Boyle 2003: 260-261).

³⁰ There may be more methods available, but methods listed here have more connection to the current work.

³¹ The loss of potential gain from other alternatives, when one alternative is chosen (for more details Henderson (2008) and Roberts (2007)).

It has been acknowledged that consumer surplus can be defined differently (see, for example, Hausman 1981) as a price compensating measure, quantity compensating measure, price equivalent variation, quantity equivalent variation, the Paasche variation, Laspeyres variation and Marshallian consumer surplus (Hicks 1961; Mishan 1965). For example, these measures were applied to public goods in the case of the environment (Flores 2003). However, the deliveries and services of the university are not public goods. They are private goods showing many external effects. Therefore, the Paasche variation divided by 2 as approximation of consumer surplus is used.

Producer surplus is used to determine human capital. Opportunity costs of hiring personnel are compared to actual payments to determine the additional willingness to pay for the staff. To evaluate the willingness to benefit from external effects or to pay against existence and impacts of external effects some methods are in use. To evaluate external social benefits one applies (Eichhorn and Friedrich 1971) cost savings, the money value of avoided damages, inquiries of willingness to pay to benefit from external effects, the estimation of value increases of property, the use of shadow prices, the willingness to pay for time savings, and the use of opportunity cost savings.

Using an analogy, the willingness to pay against external effects can be expressed by higher costs, the value of damages, inquiries of the willingness to pay against external effects, value losses of property, shadow prices, the money value of time losses, and higher opportunity costs. The questioning may refer directly to willingness to pay, or it takes the form of a stated preference method that occurs as a contingent valuation; an attributes-based method, paired comparison method (Brown 2003), or revealed preference methods are applied for the evaluation in monetary terms (Boyle 2003).

Hypothetical demand curves are sometimes determined by econometric methods based on market information as a hedonic method. Mostly they show dependencies between a price and some dependent variables. In education, income variables may depend on special attributes like schooling time, social background, equipment of the college, and teaching staff quality, etc. (Heckman, Lochner and Todd 2006; Grossman 2006; Cunha, Heckman, Lochner and Masterov 2006; Lange and Topel 2006). The parameters of the price function are determined. They are also used to compute consumer surpluses.

Some of the stated methods have developed rather sophisticated statistical approaches. Since a university faculty offers many different services, it is too complicated to apply several scientific evaluation methods to them because of restricted available data. In addition, in the current thesis the evaluation is necessary in the framework of a bookkeeping system that should not be costly. Therefore, as in commercial bookkeeping some simple evaluation rules should be applied. Research concerning the application of some methods is possible but cannot be performed for all evaluations of social transactions of the faculty and the related institutions.

According to Eichhorn (2011: 139–140), the most important evaluation methods for external benefits are: the questioning method (determined by the WTP in favor), cost saving, damage prevention, secondary value adjustment, and shadow price approach. For external costs the evaluation methods suggested are similar in logic: the questioning method (determined by the WTP against), additional expenses, damage cause, secondary value adjustment, and opportunity cost approach.

In general, the WTP estimation methods can be divided as direct and indirect (nonmarket). With direct methods the respondent is asked to state how much she or he would be willing to pay for some product or service. In the case of the indirect method some sort of rating or ranking procedure for different products and services is applied in order to estimate a preference structure from which the WTP can be derived.

Indirect methods have to be applied if there are no market evaluations available in the case of external effects. Indirect methods can be structured according to the data collection methods used to find a substitute to express the willingness to pay. In practice, selecting a feasible method for measuring WTP is often restricted by time, monetary constraints, or the research object. Data collection often determines the time and the costs of the method. For example, one cannot organize a tender to identify the willingness to pay for a transaction.

Therefore, simpler methods that are appropriate to use in evaluations in the course of the bookkeeping system have to be applied for indirect evaluation. A direct connection between the transactions and some willingness to pay is assumed. If a transaction takes place the willingness to pay is actually touched because of necessary payments or the savings of payments are touched.

Direct social benefits are measured directly by consumer surplus and turnover related to a faculty's operations. Some social benefits are measured indirectly. Income increases, money value of time savings, decrease of costs, for example, of self-instruction, less compensation from insurance companies, reductions in contributions of other institutions, or higher values of shadow prices, higher values based on hypothetical demand functions (Dasguptha, Sen and Marglin 1972; Flores 2003), increases in property values, and higher leases express higher ability to pay for external effects of faculty operations because of improved faculty services. Social costs incurred by the faculty are determined by costs and input-oriented producer surpluses. Methods used to identify social benefits serve to measure external social costs as well (Table 22).

To conclude in general, the social viewpoints compared to financial ones can be illustrated with a simple figure (Figure 14) where relations between a university and society are shown in the framework of social benefit-cost analysis framework.

Table 22. Methods to identify WTP in a university

Type of evaluation	Direct Evaluation	Indirect Evaluation
Social benefits	Consumer surplus Turnover	Income increase, cost reduction, lower insurance premium, lower value of damages, value of time gains in monetary terms, shadow prices, hypothetical demand curves, questioning of willingness to pay, others
<i>Examples of social benefits: bachelor, master, and doctoral knowledge</i>	Consumer surplus Payment of students	
Social costs	Producer surplus (factor distortion)	Income decrease, cost increase, higher insurance premium, higher value of damages, value of time losses in monetary terms, shadow prices, questioning willingness to pay, and the other
<i>Examples of social costs: writing research and project proposals, preparing new courses</i>	Costs	Additional willingness to pay for risk taking and efforts

Source: Compiled by the author

Figure 14 gives a general starting point for the framework of the social accounting approach that is based on an *ex-post* analysis and leads to a bookkeeping system showing that the university's activities as an economic entity cause utility for society. This utility can be measured *via* social benefits that result in a change in society's welfare. At the same time, social costs appear with these activities done by a university. Figure 14 illustrates how financial accounting and social accounting viewpoints can be integrated when measuring social success.

In developing a social accounting bookkeeping system the following connections must be considered:

- (1) Social accounting = additional social accounting + commercial bookkeeping
- (2) Current social net-benefit = additional social success operating statement + commercial profit and loss account
- (3) Total social balance = additive social balance + commercial balance

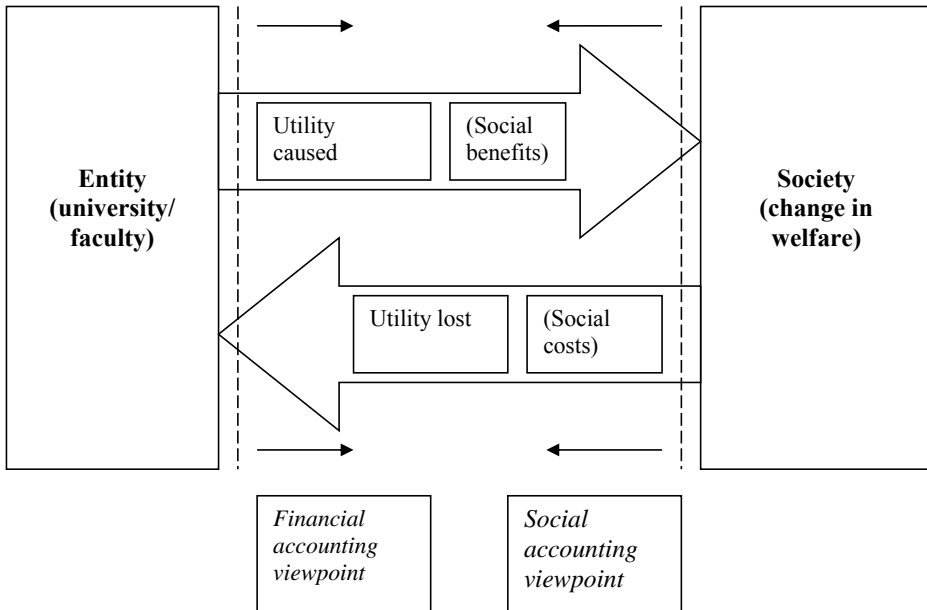


Figure 14. Financial and social viewpoints in a comprehensive social benefit-cost framework

Source: Based on Estes (1976: 93), with the author's specification

As the commercial bookkeeping system is known to managers, economists, business administrators and institutions of private or public law, then the concentration on additive social accounting (in (1)) and to total social balance (3) integrating social and commercial success is highlighted. As in commercial bookkeeping, additive social accounting transactions are considered relating to flows on the one hand and stocks on the other, and are booked by double entry. Both bookkeeping systems lead to the total social balance signaling total social net-benefit as demonstrated in Figure 15 and more detailed overview in Figure 16.

The bookkeeping system shows revenue accounts and expense accounts and a profit assessment account and balances. The items booked according to these accounts must be partially arranged.

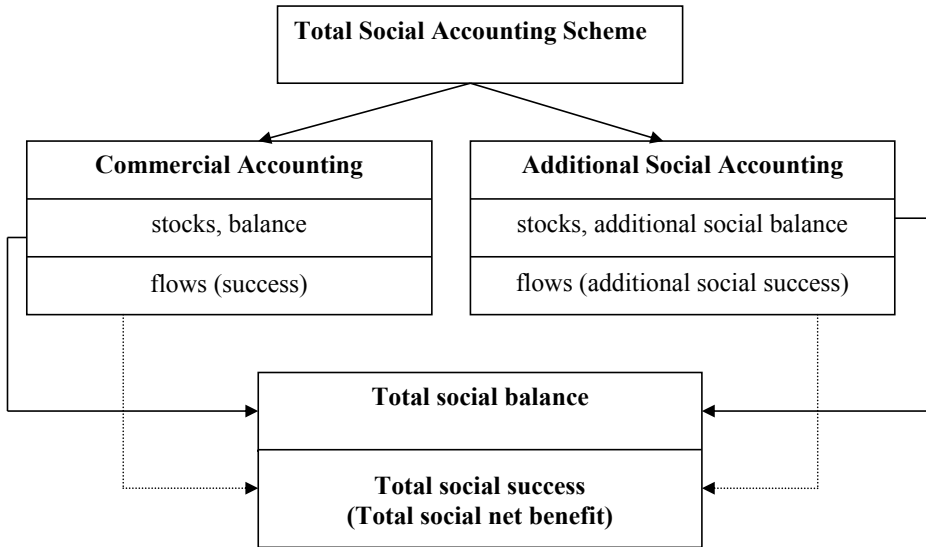


Figure 15. Framework for the social accounting bookkeeping approach

Source: Compiled by the author

One methodological question to be solved based on the accounting theory is: what is considered as the period for social success accounting? In other words, when should the system be started, when should it be closed, and which transactions should be considered for a period? That means the *ex-post* analysis and the transactions booked there need to be timed to the analysis and the transactions concerning flows and stocks. This problem is tackled in the accounting theory for commercial accounting when discussing balance sheet theories. The answer can be found in balance sheet theories for commercial accounting (Dumitru and Doina 2008, Neculescu 2011, Onica and Domnitanu 2009). There are three most significant, so-called classical, theories on the balance sheet in commercial accounting (Dumitru and Doina 2008) that create an analogy for additional social accounting:

- The static theory on the balance sheet, presented by Walter le Coutre, suggests drawing up the balance sheet in a way that it shows the situation of the assets and the financial results at a particular moment, that is to say the faculty's wealth, in commercial accounting. The relationship for social balance is defined as the following formula:

$$\text{Social assets} - \text{social liabilities} = \text{social capital} + \text{current social net benefit}$$

This theory is supported by scientists H. V. Simon and H. Nicklisch, who have defined it as the organic theory of the balance sheet of commercial accounting.

- The dynamic theory, initiated by E. Schmalenbach, states that the determination of annual economic results is the main objective of the commercial balance sheet. Applying this theory to social accounting, less attention would be paid to the amount and the structure of the faculty's social capital worth and more attention should be paid to the changes it is subjected to during a specific period (current social net benefit) and change in social capital.

It argues for the need to set the standards of evaluation for each item's patrimony, which will allow for stating the results in their entirety, and results are comparable with previous years. It points to the need for a delimitation of the period for social costs and the social benefits from previous ones due to future periods. (Onica and Domnitanu 2009: 276)

- The organic theory of the balance sheet, started in commercial accounting by F. Schmidt, represents a dual concept that supplies the balance sheet with two functions: finding the results at a certain period and acquiring knowledge of the means and the resources at work. It means that the balance sheet displays both the faculty's social capital wealth at a particular moment and some results calculations in commercial accounting and in an analogy to additional social accounting.

Besides these three main theories described above are more forms of presenting the balance sheet. Some of them (economic theory, nominal theory, theory of the financial balance sheet, theory of perspective calculation) are briefly presented with three main types in Table 23.

In this thesis the static interpretation is mainly used, but some features of the dynamic theory and the organic theory are used as well. These understandings of the balances are also the basis for the *ex-post* analysis. The *ex-post* analysis considers all variables and the dependences between them. These dependencies lead mostly to definition equations because the technical relations and behavioral equations, which are dominant in *ex-ante* analysis, are not needed. Also, equations solving legal relations do not appear. Such circumstances are reflected in the transactions that already happened when considered in the *ex-post* analysis.

The equations for accounts have to be defined and the accounts chosen to receive an equation system, which can be solved for the variables concerning social success. This requires appropriate equations, accounts, and their grouping to an adequate chart. The chart of accounts has to fit with the types of activities of a faculty and, correspondingly, with social benefits and social costs. As these connections depend on the research object, they are developed at the beginning of empirical part.

The formation of accounts is based on the equation system, where equations have to be solved for all variables. Based on these relations the social bookkeeping system is formed (see Figure 16).

Table 23. The forms of the balance sheet based on balance sheet theories and their relevancy for the current *ex-post* analysis of commercial and additional social accounting

Theory	Asset	Liability	Relevancy for current <i>ex-post</i> analysis
Static theory	1. Fixed assets 2. Circulating assets 3. Loss	1. Own sources 2. Obligations 3. Profit	Relevant
Dynamic theory	1. Payments that have not yet become expenditures 2. Payments that have not yet become revenue 3. Economic results of benefits that have not yet become revenue 4. Economic results of benefits that have not yet become expenditures 5. The balance of cash 6. Result – loss	1. Expenditures that have not yet become payments 2. Revenues that have not yet become results or benefits 3. Revenues that have not yet become payments 4. Expenditures that have not yet become results or benefits 5. Own sources 6. Result – profit	Only gradually worked out whether apply in commercial bookkeeping of faculty or in additional social bookkeeping
	1. Expenditures paid in the respective period 2. Expenditures paid in the previous period 3. Expenditures paid for the future period 4. Total expenditures 5. Result – profit	1. Revenue collected during the respective period 2. Revenue collected during the previous period 3. Revenue collected during the future period 4. Total revenue 5. Result – loss	Not elaborated in detail
Organic theory	Current account	Own sources Modification of the value of goods Profit	Partly used
Economic theory	Fixed wealth Circulating wealth	Total own capital Foreign capital	Not relevant
Nominal theory	1. Potential revenue (preliminary) 2. Negative result	1. Potential expenditures (preliminary) 2. Positive result	Not relevant
	Asset available at dissolution, liquidation, sale Negative result	Liability outstanding at the dissolution, liquidation, sale Positive result	Not relevant
Theory of financial balance sheet	Financial fixed assets of the funds	Sources of financing of the funds	Partly, minor role
Theory of perspective calculation	Inputs of goods, services, and cashing expected to occur in the following period	Output of goods, services, and payment expected to occur in the following period Positive sold	Partly, with stocks has relevance

Source: Compiled by the author based on Neculescu (2011: 100–101) and Dumitru and Doina (2008) with the author’s contribution to relevance for *ex-post* analysis of commercial and additional social accounting

There are equations that deal with the situation at the beginning and at the end of the period, showing the value of stocks as variables. Some equations deal with the size of success (profit, current net benefit). These equations are shown in Table 24 on the equations of the commercial and in Table 25 on the additional social *ex-post* analysis part under the technical accounts grouping. The other equations related to stocks (assets or liabilities, additional social stocks, additional social liabilities) and to flows (revenues, expenses, additional social benefits and additional social costs). There is one equation system for the commercial part (Table 24) and one for the additional social part (Table 25).

Table 24. Equations of *ex-post* analysis for commercial bookkeeping part

Type of equation (account)	Description of equation/formula
Technical account	For opening and final balance: <i>non-current assets (building, land, etc.</i> ³²) + <i>financial assets</i> ³³ + <i>circulating capital</i> ³⁴ + <i>accrued income</i> ³⁵ = <i>net assets (capital, etc.)</i> ³⁶ + <i>liabilities</i> ³⁷ <i>Profit (final value) = all revenues (final values)</i> ³⁸ – <i>all expenses (final values)</i> ³⁹
Asset account (stock accounts)	<i>asset in final balance = value of asset in opening balance + increase of asset – decrease of asset</i> , solve for all assets, (for example: buildings)
Liability account	<i>liability in final balance = value of liability in opening balance + increase in liability – decrease in liability</i> , solve for all liabilities (for example: capital)
Relations for flow accounts	<i>revenue</i> ⁴⁰ <i>from operational activities (final value) = increase of revenue – decrease of revenue</i> <i>expense</i> ⁴¹ <i>from operational activities (final value) = increase of expense – decrease of expense</i>

Source: Compiled by the author

³² See account IFT 711 in table 33 and Annex 7 for commercial accounts: variables from IFA 001 to IFA 071.

³³ See account IFT 711 in table 33 and Annex 7 for commercial accounts: variables from IFA 101 to IFA 121.

³⁴ See account IFT 711 in table 33 and Annex 7 for commercial accounts: variables from IFA 201 to IFA 281.

³⁵ See account IFT 711 in table 33 and Annex 7 for commercial accounts: variable IFA 291.

³⁶ See account IFT 711 in table 33 and Annex 7 for commercial accounts: variables from IFL 301 to IFL 341.

³⁷ See account IFT 711 in table 33 and Annex 7 for commercial accounts: variables from IFL 351 to IFL 381.

³⁸ See account IFT 721 in Annex 7 for commercial accounts: variables from IFR 501 to IFR 541.

³⁹ See account IFT 721 in Annex 7 for commercial accounts: variables from IFE 601 to IFE 661.

⁴⁰ See Annex 7 for commercial accounts: variables from IFR 501 to IFR 541.

⁴¹ See Annex 7 for commercial accounts: variables from IFE 601 to IFE 661.

Table 25. Equations of *ex-post* analysis for the additional social bookkeeping part

Type of equation (account)	Description of equation/formula
Social asset account (stock accounts)	$final\ value\ of\ social\ asset^{42} = value\ of\ social\ asset\ in\ opening\ balance + increase\ of\ social\ asset - decrease\ of\ social\ asset - adjustment\ (depreciation)$, solve for all social assets, (for example: knowledge of master)
Social liability account	$final\ value\ of\ social\ liability^{43} = value\ of\ social\ liability\ in\ opening\ balance + increase\ of\ social\ liability - decrease\ of\ social\ liability - adjustment\ (appreciation)$, solve for all social liabilities
Relations for flow (current) accounts	$final\ value\ of\ social\ benefit^{44} = increase\ in\ benefit - decrease\ in\ benefit$
	$final\ value\ of\ social\ cost^{45} = increase\ in\ cost - decrease\ in\ cost$
Equation for split (deferral accounts)	$value\ of\ total\ deferral = deferral\ of\ social\ assets - deferral\ of\ social\ liabilities + deferral\ of\ current\ benefits - deferral\ of\ current\ costs$
Equation for social cash	$final\ value\ of\ additional\ social\ capital = increase\ of\ social\ stocks - decrease\ of\ social\ stocks + increase\ of\ current\ social\ benefits - decrease\ of\ current\ social\ benefits - increase\ of\ current\ social\ costs + decrease\ of\ current\ social\ costs - total\ deferral$
Technical accounts	$adjustments\ on\ assets = depreciation$
	$adjustments\ on\ liabilities = appreciation$
	$total\ depreciation = sum\ of\ all\ depreciations^{46}$
	$total\ appreciation = sum\ of\ all\ appreciations^{47}$
Technical relationships on current social success statement	$final\ current\ success = social\ current\ benefits + appreciations - social\ current\ costs - depreciations$
	For final social balance as for opening balance: $sum\ of\ all\ social\ assets + value\ adjustments = sum\ of\ all\ social\ liabilities + additional\ current\ net\ benefit + additional\ social\ capital + value\ adjustments\ to\ social\ assets$
Total social balance	$non-current\ assets + financial\ assets + current\ assets + accrued\ income + all\ social\ assets + value\ adjustment\ to\ social\ liabilities = capital + liabilities + all\ social\ liabilities + additional\ current\ net\ benefit + additional\ social\ capital + value\ adjustment\ to\ social\ assets$

Source: Compiled by the author

⁴² See account IIFT 7301 in table 41 and Annex 8 for additional social accounts: variables from IIFA 0101 to IIFA 0612.

⁴³ See account IIFT 7301 in table 41 and Annex 8 for additional social accounts: variables from IIFL 4001 to IIFL 4511.

⁴⁴ See Annex 8 for additional social accounts: variables from IIFB 5101 to IIFB 5542.

⁴⁵ See Annex 8 for additional social accounts: variables from IIFsC6101 to IIFsC 6552.

⁴⁶ See depreciation account IIFsC 6701 in Annex 8.

⁴⁷ See appreciation account IIFB 5801 in Annex 8.

The equation system for the additional social part has more equations. There are equations to specify and defer those stock and flow value parts that are not due to the economic unit under observation. Moreover, there is an equation called “social cash,” in which it becomes necessary to be able to note a transaction two times in the equation system. A transaction appears in the equation for that variable and in this social cash equation. This guarantees that the variables appear two times in the additional social equation system. This is necessary to solve the equation system. There is also an equation that aggregates all stocks plus profit and current social success. It unites the commercial and additional social *ex-post* analysis (see Table 25).

After having determined variable values by the willingness to pay for transactions in a period, the commercial equation system is solved for the profit, the assets, and the liabilities. The same has to be done for the additional social equation system. For the purpose of handling the *ex-post* analysis without solving the equation system, the *ex-post* analysis is turned into bookkeeping systems. The equation system represents a chart of accounts and the equations are reflected by accounts. The value of transactions is booked on two sides in the accounts and the variable values for successes and stocks are determined by closing the accounts and assembling them in the final balances.

For the requirements of *ex-post* analysis, the equation system and the equations (presented in the two previous tables) the following decisions on the *ex-post* analysis lead to a corresponding bookkeeping system:

- A one-year period is considered for social success accounting in order to define account equations that enable success to be derived.
- The relevant transactions must be considered to define the equations and complete appropriate accounts.
- Transactions have to be chosen that determine the relevant changes (flows) and to find the volume of stocks.
- Whether social success should be determined by relying on the current success-influencing transaction within a period or as detecting the difference between the stocks at the beginning of a period (an equation on opening balance) and at the end of a period (equation on the final balance) has to be decided.
- Techniques and rules that are to decide which transaction belongs to which period and if it therefore influences social success. That means a periodical specification of transactions and appropriate equations and accounts are necessary.
- In social accounting, it is necessary to determine which economic unit the transactions are within and therefore, the extent of social accounting has to be booked. Deferrals of transactions and social successes (social benefits, social costs) have to be made. For these activities rules need to be developed.
- To be able to add and to subtract values there should be a unilateral dimensioning of transactions showing advantages. Here it has been decided

that, due to the BCA framework and preconditions in the form of financial accounting, to choose a dimension in monetary terms.

- That parts of a social success value may appear in two bookkeeping systems – in the commercial and in the additional social bookkeeping system – has to be considered.

Now the task is to form additional social accounting based on the welfare evaluation of the transactions and the additional social success operating statement. Flows are accounted for in additive current social benefits accounts and in additive current social cost accounts (as seen in Figure 16). Cross entries have to be made in an additive social cash account. Special deferral accounts help to spin off social benefits and social costs, which are not only due to the operation of the faculty.

Stocks are included as social assets and social liabilities. Social assets comprise social benefits, which last longer than one period. Social liabilities are defined as social costs that prevail longer than one period. Therefore, stock accounts include longer-lasting additional social benefits and longer-lasting additional costs. There are also deferral accounts for social assets and liabilities not caused by the faculty.

As explained before in this subsection, the willingness-to-pay approach seems a suitable approach to express the will of all involved economic units. Therefore, this basis is used for all evaluations in the empirical case. A detailed development description of social bookkeeping on the faculty example takes place in the second section, particularly in subsections 2.1 and 2.2. Methodological challenges that have been pointed out in this chapter in Table 21 will reveal more detailed explanations in subsection 2.1.3 and subsection 2.2 in relation to the research object.

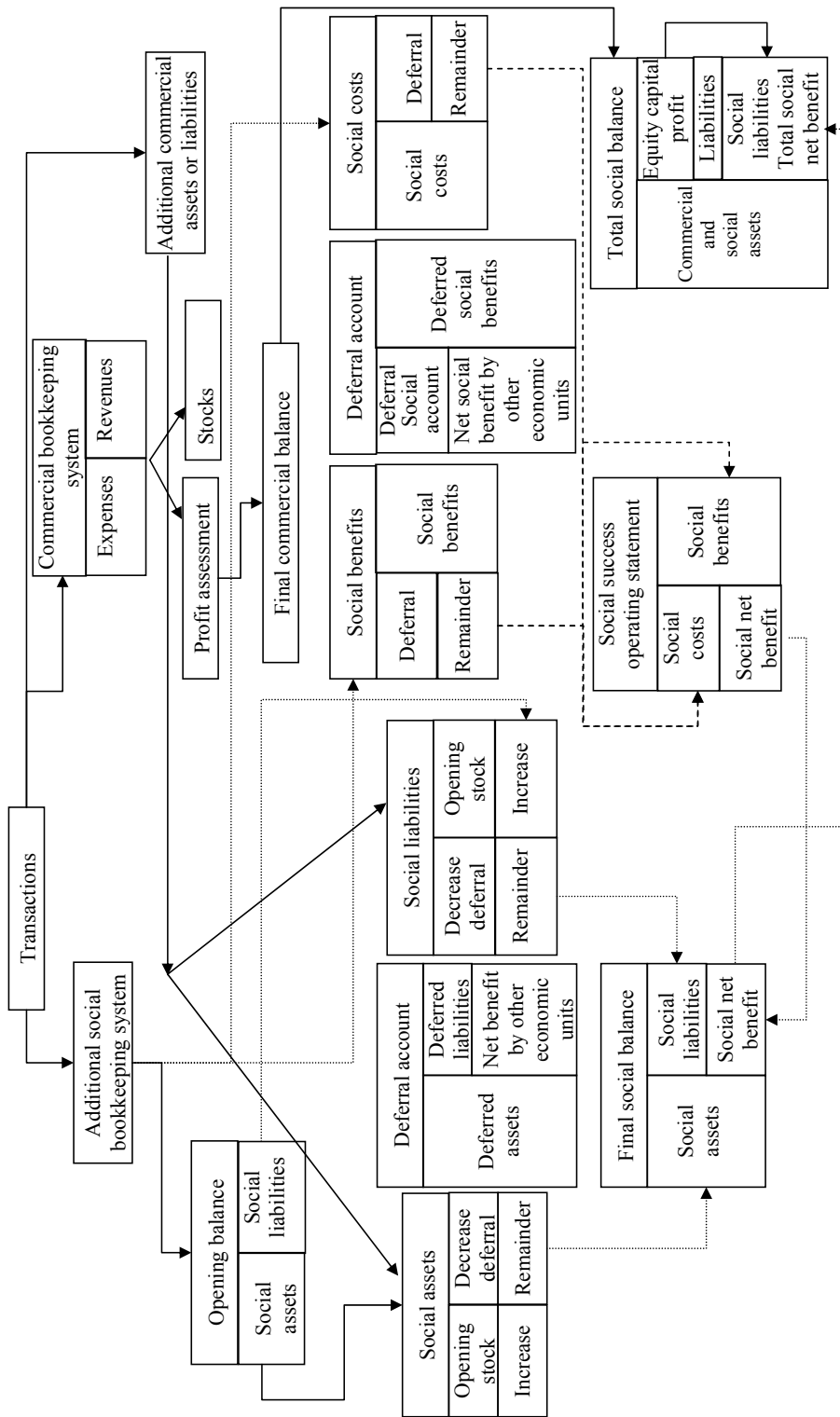


Figure 16. Total social bookkeeping system. Source: Based on Friedrich and Eerma (2012)

2. DEVELOPMENT OF BOOKKEEPING-BASED SOCIAL ACCOUNTING IN THE EMPIRICAL CASE

2.1. Background for the empirical case: object, process of data collection and methods/techniques

2.1.1. The object of the empirical case

The object of the empirical case development is the Faculty of Mathematics and Computer Science (FMCS) of the University of Tartu (UT). UT is a legal person in public law operating in accordance with the Estonian Constitution, the Universities Act, the University of Tartu Act, and the Statutes. These Statutes outline the aims and tasks of UT, its structure, the rules applicable to university governance, the basic principles of the organization of study at the university, the basic rights and obligations of members of the university, the rules applicable to possession and dispositions of university assets, the foundations of university finances, and its systems of internal reporting and auditing. (Annual Report 2006:8)

The core activities of UT are the provision of research-based higher education at all levels of study by professional academics, the advancement of learning in all its areas of activity and the provision of training, research and development services to society. (*Ibid.*) These main activities were carried out in eleven faculties (in 2006): the Faculty of Theology, the Faculty of Law, the Faculty of Medicine, the Faculty of Philosophy, the Faculty of Biology and Geography, the Faculty of Physics and Chemistry, the Faculty of Education, the Faculty of Exercise and Sport Sciences, the Faculty of Economics and Business Administration, the Faculty of Mathematics and Computer Science, and the Faculty of Social Sciences. Nowadays nine faculties exist: instead of the Faculty of Biology and Geography and the Faculty of Physics and Chemistry, the Faculty of Science and Technology fill the functions of both faculties; the Faculty of Social Sciences and the Faculty of Education form one faculty – the Faculty of Social Sciences and Education. Besides faculties the academic structure includes colleges and institutes as well central service structural units such as the UT Library and Museums. The support structure has eleven administrative units: the Administrative Office, Estates Office, Financial Office, Information Technology Office, Lifelong Learning Centre, Marketing and Communication Office, Office of Academic Affairs, Office of Research and Development, Personnel Office, Rector's Office, and Student Council. (Faculties, colleges and other units)

UT is only partly directly financed and controlled by the central government.

For internal management purposes and in order to achieve set objectives UT has introduced a balanced scorecards evaluation for the whole university and for faculties as academic units. The design of balanced scorecards (BSC) in UT follows the structure of 4 critical perspectives described in the theoretical subsection 1.2. The faculties are not required to copy UT's balanced scorecard, but in general the result indicators are divided into seven main groups: teaching activity, doctoral and complementary study, research and development activity, internalization, evaluation and optimization of resources, and direction to the public. One example of a faculty's BSC is presented in Annex 2.

The FMCS has been chosen for the empirical development of bookkeeping-based social accounting in the thesis because it has not undergone such major structural changes as some other faculties, as mentioned above, during the last five years. This choice of research object is justified by the fact that the FMCS may be considered a so-called classical faculty of a classical university, where in terms of social externalities no particular specialties appear. This is also important in the light that initial testing of the method and system was done on the Faculty of Economics and Business Administration⁴⁸ (Friedrich and Eerma 2010, 2012) at UT.

The history of the Faculty of Mathematics as an independent faculty at UT started in 1967. In 2001 the faculty was renamed the Faculty of Mathematics and Computer Science and continues to operate under that name.⁴⁹

The FMCS consisted of four institutes in the year of research (www.math.ut.ee):

- Institute of Computer Science
- Institute of Mathematics
- Institute of Mathematical Statistics
- Institute of Applied Mathematics

Also, there is the Centre of Excellence in Computer Science within the structure of the FMCS.

In 2006 the faculty had 772 students, including 533 at the bachelor's level, 188 at the master's level, and 51 doctoral students. The academic staff consisted of 17 professors and 24 docents, 12 lecturers, 11 assistants, and 18 researchers as well as a support staff, in total 102. (Information from Dean's Office of the FMCS).

The FMCS's main tasks are the creation of knowledge at all levels of study (bachelor's, master's and doctoral) as well research and preparation to support the academic careers of candidates. The main tasks include the improvement of the knowledge of the teaching staff, scientists, and researchers as well

⁴⁸ The reason for this object choice was that the authors, including the author of the current thesis, had more detailed information in use to start a pilot case.

⁴⁹ More information about the FMCS during the time-period 1967-2007 is available in the publication *Matemaatika-informaatikateaduskond 40*, 2007.

producing publications and long-lasting research results. Through the activities of the main tasks, the increase in the capacity for international co-operation, staff, buildings, and equipment takes place.

Other tasks involve information provision to the public about research results and advice to firms, government, and municipalities, and the promotion of business, contributions to research centers, and the achievement of European funds. The faculty should offer its capacities to political and public decision making and should create income and an economic contribution to South Estonia and to other parts of Estonia.

Based on the abovementioned tasks in society, the network for the FMCS in society is formed (Figure 17).

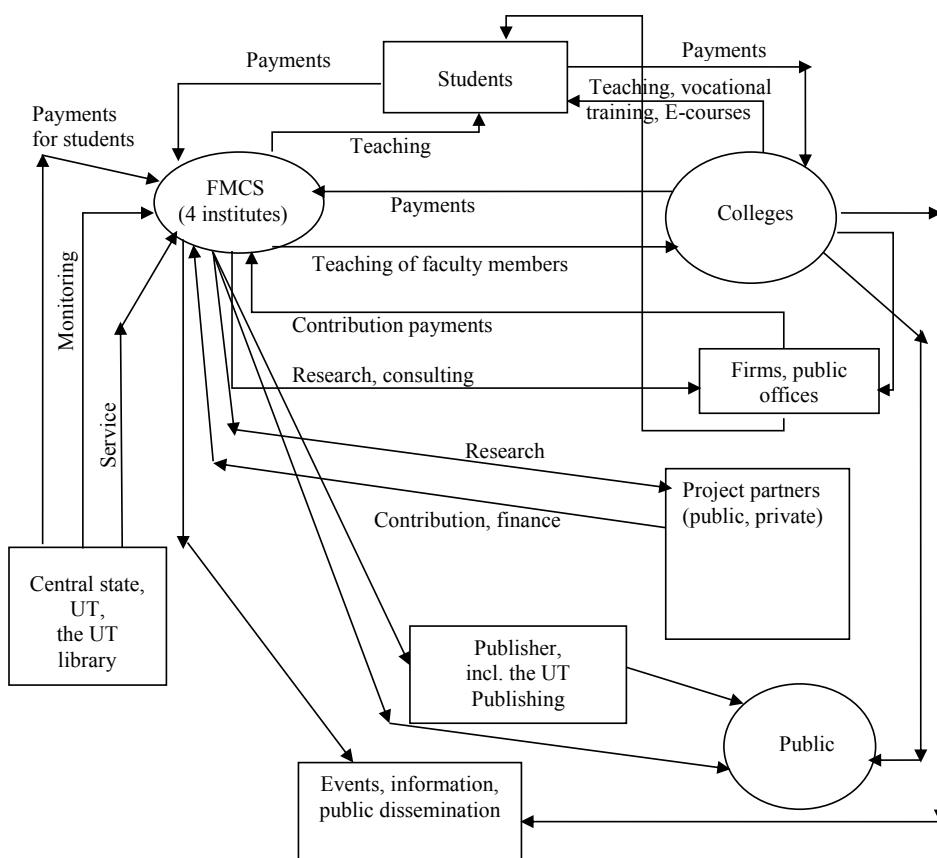


Figure 17. Network of the FMCS with other institutions in society

Source: Based on Friedrich and Eerma (2010: 47) with the author's contribution

The fulfillment of the abovementioned tasks is mostly linked to social success, whereas failures like bachelor's, master's and doctoral education without success, research failures, unfinished international projects, accidents, emissions, the leaving of staff, unsuccessful consultancy, the loss of resources through personal consultancy, the blocking of resources for users, political activities, and incidences for the location region represent social disadvantages.

The activities of the FMCS are mainly financed by grants from the central government, donations from the UT budget, contributions in the framework of projects from Estonian ministries, European Union funds, firms, foundations, student fees, and consultancies. In the year 2006, for teaching activities grants from central government formed 90% of financial resources, and for research activities support from different sources of public funding was approximately 75% (*Eelarvete statistika*). Therefore, the faculty itself acts like a public enterprise. It has partly to sell and finance its activities comparable to a firm. It uses its financial, procurement, production and sales (marketing) instruments and treats closely related institutions such as structure units of the university, students, etc., as clients.

2.1.2. The data and process/methodology of its collection

The data about the empirical object – the FMCS – for development of bookkeeping-based social accounting was collected for the year 2006. This decision was made because in this case the information collected (for example, from the Financial Office) does not have such a crucial impact on management and decision-making issues as prior time periods. Therefore, such a decision helps to reduce subjective reflexivity (Flick 2009:16), which may appear in the processes of data collection and research, and assure neutrality in the information collection task.

Data collection for the empirical case was started in March-April, 2011. Then the first official request for access to the necessary initial information and data available (the initial questions for orientation into the topic are found in Annex 3) was sent to the Dean of the FMCS. The next steps were mainly in the form of meetings as presented in Table 26. By October 2012 mostly all of the data that was required for the empirical case calculations were collected.

An overview in the seven main steps of the process, how the data for the empirical case was collected, and the methodological base for this is described in Table 26.

Table 26. Process and methodological base for data collection

No of step	Research procedure	Methods applied	Time and/or institution	Result/product for the data collection and research process
1.	Initial request letter via e-mail	Written questionnaire for initial orientation into the research topic (Annex 3)	March 17, 2011, to the Dean of the FMCS	Agreement for meeting
2.	Meeting	Interview with the Dean of the FMCS	April 14, 2011, The Dean's Office of the FMCS	Permission to get data from the UT Financial Office and the Dean's Office of the FMCS
3.	Meeting	Interview for initial orientation and necessary financial data (chart of accounts, revenue, benefits and costs of the FMCS)	June 28, 2011 In the Financial Office of the UT	Input data for the faculty-related commercial balance of the FMCS received.
4.	Additional meeting	Additional questions.	November 2, 2011. In the Financial Office of UT	Additional input data for the faculty-related commercial balance of the FMCS received.
5.	Preparation for meeting in the Dean's Office of the FMCS	Semi-structured interview. Questions available in Annex 4.	Contacted on January 10, 2012	Agreement to meet
6.	Meeting	Request for institutes' activity reports. Semi-structured interview (Annex 4).	January 16, 2012 with the Head of the Dean's Office of the FMCS	Input data for additional social balance for the FMCS received. Permission to schedule additional meeting if necessary.
7.	Meeting	Additional interview questions (Annex 5) and request for the institutes' activity reports repeated.	August 29, 2012 with the Dean of the FMCS	Input data for additional social balance for the FMCS and activity reports of the institutes received.

Source: Compiled by the author

Therefore, as suggested in the methodology for case study research (Yin 2003: 85–86) multiple sources of evidence – financial documents, reports and interviews – have been used.

Reports of the institutes (Institute of mathematical statistics, Activities in 2006; *Arvutiteaduse instituudi 2006. aasta aruanne*; *Puhta matemaatika instituudi 2006. aasta aruanne*; *Rakendusmatemaatika instituudi 2006. aasta aruanne*) are the initial sources for additional social accounting. The available data forms for the researcher-relevant preconditions for the evaluation methods applied in empirical case development.

2.1.3. The methods and techniques of empirical case development

The thesis is based on a single case development. This approach in the empirical study is justified from the point of view of research questions – how and why (Yin 2003: 5–7), because the main focus here is to show how such a bookkeeping system should be applied, operated, and used in order to measure the social success of the university faculty.

Figure 18 describes the methodology of data collection and the empirical case development as well as connections to results in the research.

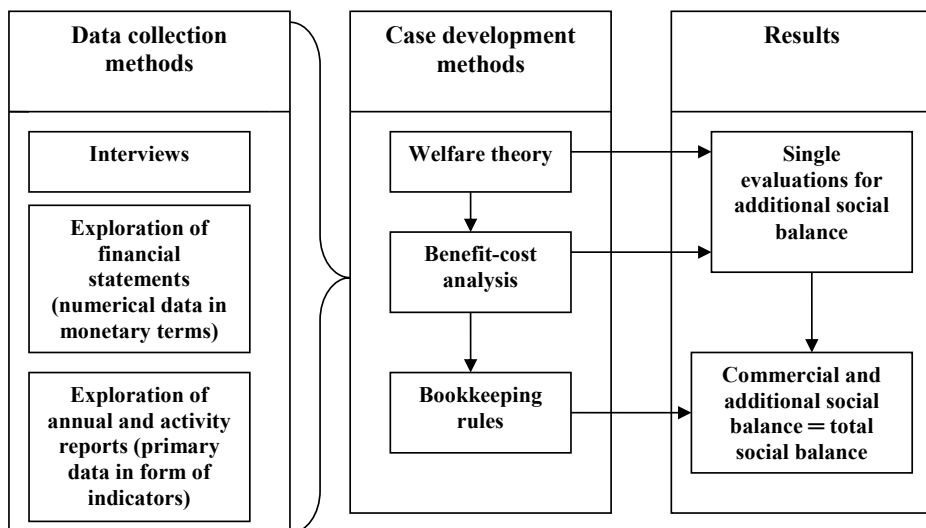


Figure 18. Methodology for empirical case development

Source: Compiled by the author

Since the empirical case is developed on the university faculty, there is a need to identify the objects of the targets of the effects. In other words, solve the second (What activities have to be assessed?) and the seventh (How should the group in which welfare becomes measured be delineated?) corresponding methodological questions in Table 21 (subsection 1.3).

The delineation of the group of persons whose willingness to pay must be determined is rather complicated (Friedrich and Jutila 2001). As faculty operations/activities concentrate on Estonia, the welfare of Estonian inhabitants should be maximized, and not welfare on an EU-wide or global basis. The willingness-to-pay approach uses prices, and some of the services refer to other states, which are partly determined on a national or EU-wide basis, and as European capital markets become more integrated. Here the decision was made so that persons affected by the existing prices when applying the willingness-to-pay approach are referred to.

To include long-lasting effects (the methodological challenge number 6 from Table 21 in subsection 1.3) and corresponding social advantages and disadvantages the stocks of advantages (social benefits, social assets) and the stocks of disadvantages (social costs, social liabilities) have been defined.

To evaluate the stocks of social benefits and costs the analyst has to decide in favor of which generation the analysis should be made. The chart considers the time horizon of generations involved because normally all of those are affected by a faculty's activities. However, the evaluation has to be done by the present generation.

Effects, and through them social benefits, arise from the operations of the FMCS in four main groups: teaching, research, consulting, and management. The operations of the FMCS have many social implications. Its mission explicitly includes public, economic, social, and political goals as it serves as an instrument of public policy. In order to solve methodological question number 2 from Table 21 in subsection 1.3, Tables 27 and 28 were formed, where the tasks, and linked to them, the social effects, are listed. According to Tables 27 and 28, social effects impact the students and their families; other economic units involved, such as firms, and counties; and the central state of Estonia as well as research institutes.

The tasks that cause effects are grouped into the two following tables based on their character: these are individual tasks of the FMCS (Table 27) and tasks that are common with other institutions (Table 28). Effects on certain abovementioned groups are marked (X). The content of the four main groups of tasks can be described as follows, starting from individual tasks.

Teaching as a task concerns such activities as: teaching bachelor's students, teaching master's students, vocational training, open university teaching, teaching in joint projects, teaching doctoral students, distance teaching, examinations, production of teaching materials, and writing text books.

Research of the faculty deals with activities such as the education of scientists, the publication of research results, getting information to the public, consulting with institutions, increasing international co-operation capacities, increasing research capacities through staff, increasing research capacities through equipment, increasing research capacities through buildings, increasing research capacities through the library, raising funds, writing articles and books, reporting, and organizing conferences and meetings.

Consulting as a task refers to activities such as consulting to firms; consulting to jurisdictions and public administration in public management and economics; participation in planning (regional planning, urban planning, sector planning); participation in parliament, chambers, firms, and councils of public institutions; and establishing and maintaining contacts with the EU and scientific bodies, etc.

Common tasks of the FMCS and other institutions concern the management as this task of the faculty involves monitoring activities, the administration of financial means, the management of staff, participation in management decision making and faculty planning and infrastructure, participation in UT decision making, sufficient management of computer labs and special departments, contacts to other faculties, support of colleges, and representation of the faculty.

Other tasks concern activities such establishing and maintaining contact with schools, attracting of visitors, public relations, advertisement, etc.

As an economic unit, the faculty uses stocks of production factors. Assets such as location, buildings, installations, parking lots, etc., but also current assets and factor inputs are not available for other social or economic purposes. On the other hand, capacities are built up to increase knowledge and improve social conditions. Thus, the realization of social goals or welfare is affected. These social effects predominantly deal with social stocks. The effect on education and innovations are very important.

Sometimes, social effects add up to social stocks, but often they only last one period and influence social welfare only within this period. These can be treated as flows. Some effects have an influence on different economic units as also shown in Table 28. Therefore, the analyst assesses and evaluates several effects in various ways. To create favorable or unfavorable effects, economic units work together. This causes difficulties when trying to identify the degree to which they are responsible for creating such effects. Therefore, management tools for example, accounting systems, must be available to identify the social effects and to find out the advantages and disadvantages (Bräuning and Eichhorn 2002; Bräuning 2004) of the faculty's activities.

Table 27. Individual tasks and effects of the FMCS

	Effects on						
	Stu- dents	Fami- lies	Firms	Counties	State	Uni- versity	Other institutions
I. Individual tasks of the FMCS							
1) Individual Tasks in Teaching							
Teaching bachelor's students	X	X	X	X	X	X	
Teaching master's students	X	X	X	X	X	X	
Vocational training	X	X	X	X		X	X
Open University	X	X	X	X		X	X
Teaching in joint projects	X	X	X	X		X	X
Teaching in doctoral studies	X	X	X	X	X	X	X
Distance teaching	X	X	X			X	
2) Individual Tasks in Research							
Education of scientists	X	X				X	
Performance of projects	X		X	X	X	X	X
Publication of research results			X	X	X	X	X
Informing the public		X	X	X	X	X	X
Consulting for institutions			X	X	X	X	X
Increase of international co-operation capacities	X		X		X	X	X
Increase of research capacities: staff	X				X	X	X
Increase of research capacities: equipment			X		X	X	X
Increase of research capacities: building			X			X	X
Increase of research capacities: library	X				X	X	X

Source: Compiled by the author based on Friedrich and Eerma (2010)

Table 28. Common tasks and effects of the FMCS with other institutions

	Effects on						
	Stu- dents	Fami- lies	Firms	Counties	State	Uni- versity	Other institutions
I. Common tasks of the FMCS and other Institutions							
Planning of university development for growth	X	X	X	X	X	X	X
Institutional long-term co-operation	X	X	X	X	X	X	X
Influencing public decision making in legislation	X		X	X		X	
Monitoring of the FMCS and related institutions	X		X	X	X	X	X
Enforcing infrastructure, innovation, and firms	X	X	X	X	X	X	X
Developing Estonian as a language of science	X		X		X	X	X
Strengthening of regions of location	X		X	X	X	X	X
Planning and public relations for higher education and research	X	X	X	X	X	X	X
II. Management tasks							
Engagement in faculty management and decision making	X					X	X
Engagement in university decision-making bodies						X	X
Establishing contacts with schools to attract students and increase knowledge of pupils	X	X					X
Sufficient operation of labs, computer department, library	X				X	X	X
Successful public relations	X	X	X	X	X	X	X

Source: Compiled by the author based on Friedrich and Eerma (2010)

As social benefits are determined according to the willingness to pay for the results of such activities, their social benefits are partly reflected in the revenues of the faculty. This willingness to pay is pointed out in the contribution of the central government, the Estonian research foundations, and in the payments from other institutions, such as local government, firms, parents and students' relatives. The payments of institutions are made partially according to their collective decision, for example, the contribution of the central government or other faculties. A willingness to pay for services such as the payments of other institutions like the chambers of industries or associations, etc., are therefore imputed. Most of them are corporations where members' willingness to pay for the tasks of the institution has to be considered. An imputed willingness to pay is also due for private payments. These payments, if they are made by the faculty, are considered in the commercial bookkeeping. Therefore, additional social benefit accounts concentrate on the effects not accounted for in the bookkeeping systems of the institutions involved. Apart from purely financial operations, most of the activities in teaching, research, and consulting show many educational and external effects, thus leading to additional social benefit accounts.

There are other additional social benefits, which stem from the management and investment of the faculty and social effects related to the activities of the management and other task groups. The effects causing social benefits occur with households, for example, the students, their relatives and families, as well as with firms in many sectors, and infrastructure service facilities, insurance, public offices, and other public institutions. Tax receipts of the host town, and social benefits from indirect tax receipts are considered as well.

Social costs are related to the abovementioned faculty operations. Social costs comprise the costs of teaching, research, consulting, etc. These costs show a willingness to pay for factor inputs. They are partly reflected in the expenses of the faculty and in the existing commercial accounting. Commercial accounting shows losses compensated by a public owner, the university, and more easily the depreciation of faculty building and installations. Willingness-to-pay approaches have to be applied to specify depreciation of knowledge, social costs of accidents, additional travel costs, and time losses, etc., which represent additional social costs.

Sponsoring also leads to additional social benefits and social costs. There must be some costs included, which are not considered with the faculty in commercial bookkeeping such as depreciation of fixed and current assets. Some of them do not occur in commercial accounting because they are under other public ownership.

In additional social bookkeeping the equations of the *ex-post* analysis are presented in chart format. These charts are needed depending on the transactions and their contribution to success. Social success is related to the welfare measurement and the transactions are related to activities that took place in the period under observation. The equations and bookkeeping approach have to show the relationships between special activities and the type of social

benefits and social costs that show the result of the activities. These social benefits and social costs are related to some stocks of benefits and costs that are centered in a performance field that is a kind of social benefit and social cost center. The latter can be defined according to tasks.

Some transactions lead to stock in terms of the benefits and costs of the tasks and others lead to the current benefits and costs connected with the tasks. These steps lead to two matrices: one for stocks and one for current social benefits and social costs. The additional social stocks are called additional social assets (future social benefits) and additional social liabilities (future social costs). The current additional social benefits and additional social costs appear in the period only under consideration.

The stocks according to the tasks are shown in the rows and the activities leading to transactions are demonstrated in the columns (in Tables 29 and 30). As an *ex-post* analysis can consider a limited number of variables, the number of transactions to be identified and the evaluations made and booked have to be limited. This also concerns the number of accounts. Therefore, only those transactions can be considered that are relevant in the sense that the influence on welfare is more intensive. The degree of intensiveness is defined as described below.

Fulfillment of tasks leads to activities and thus to willingness to pay in favor of and against. Activities cause benefits and costs. Therefore, benefits and costs are observed from the point of view of task fulfillment. Relations between transactions and types of additional social benefits and costs are demonstrated on the example of stocks in the matrix in Annex 6 and Tables 29 and 30. This annex and the tables help to explain how the methodological question number 8 from Table 21 in subsection 1.3 has been solved. Briefly, it shows the different relationships between a transaction and the resulting additive social benefits (B) and costs (C). They all are different in relationship intensity, marked by B1, B2, B3 and C1, C2, C3. In the matrix the number 1 indicates a weak relationship, 2 – a medium relationship and 3 – a strong relationship level. If no relationship between activity and social value of task fulfillment exists, then there is no symbol in a cell. As the different dependencies should be reduced for the bookkeeping system, only stronger relationships have been concentrated on and taken into account, those of type B3, B2 and C3, C2.

The additional social asset accounts and additional social liability accounts showing stocks of social benefits and social costs are reflected in the rows, whereas current accounts of social benefits and costs are reflected in the columns of the matrix in Annex 6 and in Tables 29 and 30. Some operations cause several kinds of additional social benefits and social costs, for example payments, not captured within the commercial bookkeeping system. The evaluation has to be made by applying the methods mentioned above.

Table 29. Examples of the FMCS activities and their related social benefits (B) and costs (C) in teaching

Stocks/Current benefits and costs	Teaching									
	Bachelor students	Master students	Vocational training	Open University	Joint teaching projects	Doctoral students	Distance teaching	Examinations	Production of teaching materials, text books	
Additional social assets and liabilities										
Knowledge of bachelor's students	B3 C3				B2			B2	B2	
Knowledge of master's students	B2	B3 C3			B2		B2;C2	B2	B2	
Knowledge of doctoral student		B2				B3 C3		B2		
Knowledge from Open University	B1	B1		B3 C3			B2;C2	B2	B2	
Knowledge from vocational training, distance teaching	B1	B1	B3 C3		B2		B2;C2	B2	B3	
Knowledge of teaching staff		B2		B1	B2	B2	B1	B1	B3 C3	
Knowledge of scientists						B3 C3	B1	B1	B1	
Lasting research results						B1			B1	
Development of Estonian language	B1	B1	B1	B1	B1	B1	B2	B1	B3 C3	
European funds							B1			

Source: Compiled by the author

Table 30. Examples of the FMCS activities and their related social benefits (B) and costs (C) in research

Stocks/Current benefits and costs	Research (I)									
	Education of scientists	Publication of research results	Information of the public	Consulting for institutions	Increase of international cooperation capacities	Increase of research capacities: staff	Increase of research capacities: equipment	Increase of research capacities: buildings	Increase of research capacities: library	Re-viewing
Knowledge of bachelor's student	B2	B1				B2		B2		
Knowledge of master's student	B3	B2	B1	B1	B1	B2	B1	B1	B2	
Knowledge of doctoral student	B3	B3	B2	B2	B2	B3	B2	B1	B3	B2
Knowledge from Open University	B1	B1	B1	B1		B1		B2	B1	
Knowledge from vocational training, distance teaching	B1	B1	B1	B1		B2	B1	B1	B1	
Knowledge of teaching staff	B2	B2	B2	B2	B2	B3	B1		B2	
Knowledge of scientists	B3 C3	B3	B2	B2	B3	B3	B2	B1	B3	B3
Lasting research results	B1	B3 C3	B2	B2	B3	B3 C3	B2	B2	B2	B1
Development of Estonian language	B2	B3 C3	B1	B1	B1	B1			B1	
European funds			B1	B1	B3	B2	B1	B2	B1	B1

Table 30. Continuation

Stocks/Current benefits and costs Additional social assets and liabilities	Research (2)				
	Raising funds	Writing proposals	Writing articles, books	Reporting	Organizing conferences, meetings
Knowledge of bachelor's student					
Knowledge of master's student	B1	B1	B2		
Knowledge of doctoral student	B1	B1	B3	B1	B3 C2
Knowledge from Open University			B1		
Knowledge: vocational training, distance teaching			B1		
Knowledge of teaching staff	B2	B3 C3	B3 C3	B2	B2 C2
Knowledge of scientists	B2	B3 C3	B3	B2	B3
Lasting research results		B1 C1	B3	B2	B2
Increasing international cooperation capacities	B3	B3 C3	B2	B2	B3 C3
European funds	B2	B3 C3		B3	B2

Source: Compiled by the author

Obviously there is no relationship between the teaching of master's students and the welfare contribution by bachelor's students. But this relationship is very high for teaching the bachelor's students. Therefore, a B3 and C3 appear there.

Concerning the research the relationships are more complicated because there are more activities involved that lead to transactions. Therefore, examples are presented in two parts in Table 30.

The relationship intensity determines the decisions for which accounts and equations are needed be used.

When relationship-based decisions are made on the issue of which social benefits and social costs have to be chosen for the formation of a chart of accounts, then one can start operationalizing social success measurement on the bookkeeping approach. In the next subsection period-oriented social success accounting based on welfare evaluations and bookkeeping for the university faculty (the FMCS) is explained.

2.2. Social success accounting for the university faculty (the FMCS)

According to the explanation in subsection 1.3 the social accounting approach presented in the thesis consists of the commercial bookkeeping results and the additional social accounting based on net-benefit analysis. Correspondingly to this basic decision the following basic evaluation relationship, where direct and indirect measurement has been distinguished between, is applied:

$$\begin{aligned}
 \text{Social Net Benefit (SNB)} &= \text{consumer surplus} + \text{turnover} + \text{monetary value} \\
 &\qquad\qquad\qquad \text{of positive external effects} \\
 &\qquad\qquad\qquad \text{(Direct measurement)} \qquad \text{(Indirect measurement)} \\
 &- \text{producer surplus} - \text{costs} - \text{monetary value of negative} \\
 &\qquad\qquad\qquad \text{external effects} \\
 &\qquad\qquad\qquad - \\
 &\qquad\qquad\qquad \text{(Direct measurement)} \qquad \text{(Indirect measurement)}
 \end{aligned}$$

(Formula applied earlier for ecological banks (Friedrich, Kosiński and Türk (2003)) and tourist facilities (Friedrich, Feng, Wonnemann, Jahn and Valjak (2000)).

Therefore, the first task is to introduce the commercial bookkeeping system of the faculty. The bookkeeping system as well as the budget structure is organized according to the accounting laws relevant for public administration and public firms in Estonia.

At first the commercial bookkeeping system of the FMCS at UT has to be taken into use. Here a main task is to split the FMCS from the commercial

bookkeeping system of UT because commercial balances for the institutions, including the faculties, do not exist.

For this purpose the bookings of flows by UT (Information from the Financial Office of the UT) and information about the total commercial balance of UT and some relevant stocks of assets and liabilities (Information of the Financial Office of the UT and the Dean's Office of the FMCS) are available. Useful information is provided in the Annual Report (2006) of UT.

The structure of the commercial balance of UT is presented in Table 31, and it is reasonable to apply the same structure for the commercial balance of the FMCS.

Flow accounts related to assets and liabilities and flow accounts related to the commercial success of the faculty must be formed. As technical bookkeeping by single item is done, then there is a need to book only aggregated items referring to revenues and expenses of the whole of 2006 and to aggregated stocks related to the 31st of December of the year 2006. After that it is possible to show the aggregated flows in 2006 and the final commercial balance of 2006. The bookkeeping system is concentrated and shortened in such a way that the relevant information needed for the commercial part of social bookkeeping is presented.

There exist two reasons to extend the commercial bookkeeping within the additional social bookkeeping. Commercial bookkeeping does not incorporate all the commercially necessary assets or those assets that have importance for social success but do not belong to UT. In the additional accounting, aggregated flow and stock data that concern the year 2006 or the 31st of December of 2006 is referred to as well.

The equations for the commercial part have been presented in Table 24 (subsection 1.3) and Annex 7. For this purpose the structure of the commercial balance has to be formed. The commercial chart is based on the chart and classification of accounts that have been used by the UT Financial Office. The relevant classification is applied by the central accounting of UT. It was declared by the rector, director of finance and the chief accountant that (Annual Report 2006):

“The accounting policies applied on the preparation of the consolidated financial statement comply with accounting principles generally accepted in Estonia (the Estonian GAAP).”

The commercial bookkeeping is done centrally by the Finance Office of UT, but with respect to many flows and transactions the bookings are also allocated to the faculties, departments, and other institutions belonging to the university totally or partially. The university chart of accounts is called “*Kontoplaan*” (Kontoplaan 2006).

Table 31. Structure of the commercial balance of UT

Commercial Balance	
<p>1. Non-current assets</p> <p>a) Buildings (buildings)</p> <p>b) Property (land, assets under construction, investment property, investment property)</p> <p>c) Machinery and equipment (equipment and vehicles, capitalized expenses on leased assets, prepayment for property and equipment, other items of property and equipment)</p> <p>2. Financial assets</p> <p>a) Participations (investment in associates) Long-term claims (long-term finance Finance lease receivables)</p> <p>b) Credit granted by faculty</p> <p>3. Circulating capital</p> <p>a) Total inventories</p> <p>– raw materials, etc.(materials)</p> <p>– work in progress</p> <p>– manufactured goods (finished goods, goods purchased)</p> <p>b) Other current assets</p> <p>– marketable securities (non-current assets for sale)</p> <p>– Advances (prepayments for services and inventories, other receivables)</p> <p>– receivables from services (customer receivables)</p> <p>– bill holdings</p> <p>– Checks (card payments, units in SEB funds)</p> <p>– Cash (cash on hand, current account and overnight deposits)</p> <p>– Deposits (Term deposits of a short maturity)</p> <p>– Others (intangible assets)</p> <p>4. Accruals and deferred incomes (accrued income)</p>	<p>1. Capital of the university</p> <p>2. Reserves</p> <p>– legal reserves (statutory capital reserve)</p> <p>– other reserves (accumulated surpluses, surplus for the period (profit))</p> <p>3. Value adjustments (restatements)</p> <p>4. Allowances</p> <p>5. Long-term debt (loans, borrowings, finance leases, other non-current liabilities)</p> <p>6. Other liabilities, Current liabilities</p> <p>– supplier’s credit</p> <p>– debts with banks (loans and borrowings)</p> <p>– received allowances (suppliers payables)</p> <p>– other debts (tax liabilities, accrued expenses)</p> <p>7. Transitory items (deferred incomes (current), deferred incomes from grants and other transfers)</p>
(loss)	(profit)

Source: Based on the Annual Report (2006)

This chart has to be adapted to the needs of the research task. The accounts are aggregated to achieve relevant accounts for research purposes in a way that information can be used for additional social accounting as well. Moreover, there is a need for accounts that fit with the final commercial balance. In some cases success is caused by other economic units. This is mainly considered within additional social accounting, but there is an indication to that problem in account coding.

The accounts are grouped in the following way (Table 32). The first digits refer to commercial accounting, the letter F symbolizes the faculty (FMCS), the second letter A symbolizes asset accounts, and L is related to liabilities. R expresses revenues and C expenses (mostly commercial costs). V refers to the adjustment of assets, W to adjustments of liabilities, T to technical accounts, and S to aggregated total accounts. The first number of an account refers to the following category of accounts.

Table 32. Classification of accounting groups for commercial accounting

Group	Code of classification	Account
Assets (A)	0	material assets
	1	financial assets
	2	claims, cash, circulating capital
Liabilities (L)	3	equity capital
	4	financial liabilities
Revenues (R)	5	financial revenues
Expenses (C)	6	material and staff costs
Technical accounts (T)	7	opening balance, final balance, profit operating statement

Source: Compiled by the author

The second and third number signals a type of revenue and expenses, the fourth shows by 1 that no deferral is necessary and by 2 that a split needs to be made.

UT uses a commercial bookkeeping system with cross-bookings. Therefore, all these individual bookings do not need to be repeated, but aggregated transactions and the strikes of the accounts are concentrated on. The strikes are then booked to the technical account for profit assessment IFT721 or are to be assigned to the final balances IFT711. An opening balance for the year 2006 is not needed as the stocks are reflected in the strikes. A strike equals for stocks an amount in the opening balance plus increases minus decreases.

In general the commercial chart follows the profit assessment assignments and the balance scheme of UT (Annual Report 2006). The strikes have been arranged and aggregated according to the main classification used there. This is true for profit assessment. With respect to the final balance the categories used

by UT are assigned to the general balance scheme. As UT has such a broad variety of commercial, teaching, vocational, and scientific functions, not all stocks concern the faculty, and the related institutions are not touched because they need no long-term loans for their purposes. Long-term loans are widely used for establishing or substantial renovation of buildings. There the accounts show mostly a value of zero.

Some of the stocks are not delineated to individual institutions such as faculties. In those cases the information is based on reports of the Financial Office of the UT and of the Dean's Office of the FMCS to estimate stocks. One of these items concerns inventories (for example, IFA021). UT had inventories of 9.2 million EEK, but 7.4 are due to the university bookshop and the university pharmacies and 0.518 to the university publisher. Therefore, it was decided to use 1/12 of the yearly expenses for material. Another problematic item is the cash that must be held at the end of the year (IFA281). Here is based on the chief accountant's expert opinion, that cash is mostly needed for the payment of expenses for guest professors and lecturers in the institutions concerned. Because of the commercial losses of the institutions involved it was decided to keep a liquidity reserve as necessary to avoid difficulties that may stem from commercial activities not caused by the institutions dealt with. Therefore, it is assumed that cash is necessary in the size of 1/12 of the expenses of the institutions included. Accrued incomes stem mostly from foundations. Most of them are not directed at the faculty activities and deal explicitly with other faculties. Three percent of the sum of the total university has been taken into account.

Some assets, such as books of the UT library stock related to the issues of the FMCS and houses used belonging to other owners are considered in the additional social accounting.

The aggregated values of strikes of current accounts stem from the accounts that are allocated to the faculty. Those transactions that are not covered are also considered in the additional social accounting.

The chart of individual commercial accounts is presented in Annex 7.

Results of commercial bookkeeping are shown in the individual accounts, but mainly in the profit assessment account (IFT721) and the final balances (account IFT711). The commercial balance for the FMCS is shown in Table 33.

Table 33. Commercial Balance of the FMCS (in million EEK)⁵⁰ for 2006

IFT711 Commercial Balance of the FMCS					
	1. Non-current assets		1. Net Assets		
IFA001	Building	112.870	IFL301	Capital	101.543
IFA011	Property land	0.109	IFL311	Statutory capital Reserve	0
IFA021	Investment property	0	IFL321	Accumulated surpluses	0
IFA031	Vehicles	0	IFL331	Value adjustments, restatements	0
IFA041	Machinery, equipment	3.979			
IFA051	Capitalized expenses on leased assets	0			
IFA061	Prepayment for Property	0			
IFA071	Other items of property, equipment	0			
	2. Non-Current Assets – Financial Assets				
IFA101	Investment in associates	0			
IFA111	Long-term claims	0			
IFA121	Credit granted	0			
			IFL341	Profits /loss	
	3. Circulating Capital – Current Assets			2. Liabilities	
IFA201	Inventories: Materials	0.296	IFL351	Allowances	0
IFA211	Work in progress	0	IFL361	Loans	15.640
IFA221	Manufactured goods	0	IFL371	Leasing	0
IFA231	Non-current assets for sale	0	IFL381	Tax liabilities	0.991
IFA241	Pre-payments for sale, services, inventories	0	IFL391	Short term debts with banks	2.791
IFA251	Customer and other receivables	0			
IFA261	Intangible assets	0.246			
IFA271	Cheques and SEB funds	0			
IFA281	Cash on hand, current account, short-term deposits, overnight deposits	3.306			
	4. Accrued				
IFA291	Accrued income	0.159			
		120.965			120.965
				Net-capital	78.993
				With loss compensation by the UT	

Source: Compiled by the author

⁵⁰ Numerical calculations for the empirical case development are in EEK because this was the currency in use in the year 2006.

It occurs that all payments to UT institutions and those that stem from the central government are interpreted as revenues. It is assumed that UT sells or delivers services to the central state and other public bodies such as a public enterprise. The students and the households of parents experience burdens two times – by tax payment of their families and the fees that many of them have to pay for the educational services. Some of them are affected even three times as they also have to work in firms, etc., to gain income to pay the fees. Moreover, increases in capital by contributions of the central state are treated as revenues as well. A contribution for loss compensation was not necessary in 2006 because UT showed a surplus partly due to the re-evaluation of property. From the point of view of commercial success, the success is more related to real estate activities, commercial activities such as the pharmacies, participations, etc., due to the success assessment of the commercial bookkeeping system (Annual Report 2006). The balances also clearly show that the net assets are mainly influenced by the ownership of buildings. Without the ownership of the building the final balance of the faculty would not show a considerable amount of net-assets.

But does the success and potential of a university depend on building ownership? Also, other internal values, especially of stocks of the faculty are not considered in the commercial accounting. The knowledge and skills of the teaching, research, and managing staff – as part of human and social capital – is partly interpreted as stemming from an external resource providing services to the faculty.

While the chart and accounting system is fundamentally influenced by the style of accounting that is for the faculty – a commercial one, still the commercial bookkeeping system applied is not totally complete for case development. Some changes of assets and stocks of assets and liabilities have to be completed. These corrections will be done within additional social bookkeeping. The principle of bookkeeping – double entry booking – will be used because this is already in use for commercial bookkeeping oriented to the abovementioned principle of closing.

A sub-conclusion here will be that the commercial accounting expresses at least partly the social success in terms of willingness to pay, expressed by payments considered commercially. The resulting ramifications should be overcome by the help of additional social accounting that should provide a more detailed overview of social success mainly of social benefits and social costs outside the faculty.

Additional social accounting refers to the structure of equations and accounts developed for this purpose presented in Table 25 and Annex 8. However, problems may cause the evaluation of transactions leading to stocks (social benefits, assets, social costs obligations) or to flows (current social benefits, current social costs). The analysis here has no opening balance, because this bookkeeping was formed the first time; therefore, there were no past stocks from former years.

The split between stocks and flows refers to whether a social advantage or disadvantage occurs for more than one period or just within one period. Thus, some sophisticated questions are raised. The same is true with respect to the deferral methods to be applied. Here the author has tried to follow a principle of causation, being aware that the application of this principle is limited in the social network of an economy with a high degree of division of labor. Sometimes an adequate split of social success is easier but in other cases nearly impossible. In the latter case a split along the line of the number of main actors involved or the share of value added contributed seems helpful.

Through the booking of transactions and stocks, striking the accounts, and forming a final additional social balance that is integrated with the commercial balance to a final social balance, the results for the social success of the faculty are obtained.

Questions about which evaluation methods and data should be applied to identify the items to be booked cause problems. To solve each of them would require extensive research. Statistical data is mostly not available, because it is not collected for these research purposes. Therefore, data collecting methods are used that have been described in subsection 2.1.2. in Table 26 (Process and methodological base for data collection), that approximate values and for which data or indicators for data are found.

For a choice of which valuation method to apply, a decision was made in three steps:

- 1) Considering the transaction evaluation method for each transaction amongst direct and indirect valuation methods which have straightforward connection to WTP;
- 2) Check data availability;
- 3) Make actual measurement in the additional social bookkeeping.

About these decisions (1, 2, and 3) some examples are presented in Table 34.

For the first decision some pre-choices have already been made in order to sort out those indirect methods that show a meaningful reason to apply. This choice has been made amongst indirect methods to measure WTP such as: income increase, time savings in monetary value, cost decrease, less compensation from insurance companies, reduction in contribution, higher values of shadow prices, increase in property values, higher leases, questioning of WTP, using WTP from other projects, opportunity costs, taxation payments.

Table 34. Some examples of transactions' evaluation

Group of trans- actions	Evaluation methods		Data ava- ilable	Decision in actual measuring	Examples of accounts (in Annex 8)
	Direct method	Indirect method			
Student knowledge	CS		yes	In additional SA	IIFA0201; IIFA0211; IIFA0222
	turnover		yes	In commercial accounting	
		Increase in income	no	–	
		Lower costs	no	–	
		Time saving	no	–	
		Hypothetical demand curve	no	–	
		Questioning WTP	no	–	
		Opportunity costs	yes	In additional SA	IIFA0222
Know- ledge of teaching staff	PS		yes	In additional SA	IIFA0251
	turnover		yes	In commercial accounting	
		Increase in income	no	–	
		Lower costs	yes	In additional SA	IIFA0251
		Time saving	no	–	
		Hypothetical demand curve	no	–	
		Questioning WTP	no	-	
		Opportunity cost	yes	In additional SA	IIFA0251
Increasing inter- national coope- ration capacities	CS		yes	In additional SA	IIFA0312
	turnover		yes	In commercial accounting	
		Future income	no		
		Lower costs	yes	In additional SA	IIFA0312
		Time saving	no	–	
		Hypothetical demand curve	no	–	
		Questioning of WTP	no	–	
		Opportunity cost	no	–	

Table 34. Continuation

Group of transactions	Evaluation methods		Data available	Decision in actual measuring	Examples of accounts (in Annex 8)
	Direct method	Indirect method			
Organizing conferences, meetings					IIFB5242
	turnover		yes	In commercial accounting	
		Future income	no	–	
		Lower costs	yes	In additional SA	
		Time saving	no	–	
		Hypothetical demand curve	no	–	
		Questioning of WTP	no	–	
	Opportunity cost	no	–		
Attraction of visitors					IIFB5512
	turnover		yes	In commercial accounting	
		Future income	no	–	
		Lower costs	yes	In additional SA	
		Time saving	no	–	
		Hypothetical demand curve	no	–	
		Questioning of WTP	no	–	
	Opportunity cost	no	–		

Source: Compiled by the author

The basic structure of additional social accounting is similar to the commercial bookkeeping chart. However, the chart of additional social accounting has to consider the following main aspects:

- The necessity to differentiate between social stocks and current transactions that deal primarily with social success in the period (one year) considered.
- To consider the socially relevant willingness to pay in favor or against the activities and services of the faculty.
- The split of these kinds of “willingness to pay” from those due to other faculties and institutions of UT.

- The deferral of social benefits and social costs caused by other economic units.

Therefore, a set of accounts needed is one that does not occur in commercial accounting that deals with deferrals. Different individual accounts differently named occur because of the different transactions and their results treated in the social accounting case developed. The classification of accounts in the framework of the chart follows.

The first number of an account refers to categories of additional social assets, social liabilities, social benefits, and social costs not captured in commercial bookkeeping. The classification numbers (shown in Table 35) 0 to 2 refer to additive social assets, whereas those expressing social liabilities have the number 3 or 4. Current additive social benefits and costs are booked in accounts numbered 5 or 6. The technical accounts for additional opening balances and additional social final balances and additional social operating successes as well as total social balance are mentioned in number 7. Deferrals of stocks are referred to in accounts numbered 8 and deferrals of current successes are fixed in accounts numbered 9.

Table 35. Classification of accounting groups for additional social accounts

Group	Code of classification	Account
Assets (A)	0	material social assets, human social assets
	1	social cash
	2	social claims
Liabilities (L)	3	social equity, value adjustments
	4	social liabilities and social net benefit
Social benefits (B)	5	social benefits
Social costs (sC)	6	social material and staff costs
Technical accounts (T)	7	opening social balance, final social balance, social success operating statement
	8	deferral stocks
	9	deferral successes

Source: Compiled by the author based on Friedrich and Eerma (2009)

The second digit (I) of an account refers to additional social accounting, the third number signals a sub-type oriented to the kind of social benefits and social costs or to those caused by special faculty operations. The fourth digit (number) shows with 1 that no deferral is necessary and with 2 that a split needs to be made, and again the letter F symbolizes the FMCS. The second letter corresponds: A - symbolizes social asset accounts and L is related to social

liabilities, B expresses additional social benefits and sC additional social costs; V refers to the adjustment of social assets and W to adjustments of social liabilities, T to technical accounts and S to aggregated total accounts.

In the additional social accounting cross-bookings are necessary to have enough variables available to solve the equation system. It means that one booking is on an asset or on a success account and the counter booking occurs in the social cash account. The same basic relationship as with commercial accounting has been used: final stock equals opening stock plus increase minus decrease of stock. As the bookings have been done only for the year 2006 and there is no opening balance, then the whole stock (opening and increase jointly) is booked and considered the decrease by depreciation, special deductions and in the final balance mainly by value adjustments.

Accounts in the chart are defined in the case of stocks to the long-lasting social benefits and social costs (see part a) in Annex 8) meaning that stock accounts are due to the consequences. In the case of flows the accounts are defined according to the activities of the FMCS that lead to current social benefits (see part c) in Annex 8) and current social costs (see part d) in Annex 8) in the period under the research. These activity-oriented current social benefits and costs form an additional operating social success statement (see Table 39 and part e) in Annex 8) showing social benefits and costs grouped under the groups of tasks of the FMCS (teaching, research, consulting, management activities, and other activities). The following analysis deals with the evaluation of stock accounts as well as the flows. The activity-oriented current social benefits and current social costs get booked on the current accounts (in Annex 8 part c) and d)). As most of the evaluation methods are the same or similar to the evaluation of stock accounts the current accounts are also described in more detail in the Annex 8 footnotes.

The split between the stocks and flows is sometimes not easy to distinguish and needs deeper leading investigations for some transactions, for example, knowledge gained through teaching. A distinction has been made between long-lasting and short-lasting effects. In respect to students (A0201, A0211, A0231, and A0242) the most knowledge, which is needed in a final examination, is longer lasting. Knowledge that is needed to achieve points and is not necessarily needed for further examinations may be predominantly short lasting. Knowledge gained through self-teaching or a person's own research (A0222, A0251, A0261) appears to a large extent to be long lasting. Knowledge related to vocational training (A0242) is oriented to application and lasts at least for the medium term. Knowledge from conferences is mostly of the consumption type that is related to an individual's own research or publication that lasts longer. According to these experiences the split between changes in stocks and current benefits has been made.

Under value of assets not booked in commercial bookkeeping (A0111) a dominant part concerns the human capital of the staff. The amount needed to buy the services of the staff is already booked in the commercial bookkeeping;

however, the “staff” as an asset has to be considered as well. This human capital is available for a longer time, as the longest are available professors. In some way they are engaged for their whole working time. Therefore, they represent a high investment. The lecturers, researchers, and senior researchers are available for a shorter period, mostly up to 3–5 years. As long as they are not paid through European funds they are considered here. The willingness to pay for them is considered as long as it is not financed by international research contracts – as an asset, and the leave of staff is considered under social liabilities (L4301). The human capital, as well as increases in knowledge, underlies a high rate of depreciation. Therefore, the high human resource assets are reduced yearly to a considerable extent. Also, assets not booked in commercial accounting refer to the books the libraries possess. Therefore, the books that are present at the faculty library and the books concerning mathematics in their content that are in the stocks of the Central library of UT are included.

Lasting research results (A0301) are defined as those that are published in some format, especially in the form of books and printed reports, although such results are available on the internet. However, in general printed materials are more carefully checked and screened.

Increasing international cooperation capacities (A0312) related to staff members that are additionally financed through projects with international participation (these which have longer contracts, for example, for a duration over one year), are considered as an increase in human capital. Current payments concerning social benefits and social costs are mostly reflected in the commercial accounting. Additional equipment (A0331) is mainly concerned with commercial accounting, but still, the additional equipment may open new opportunities for research, for example, computer programs that have not been available so far. Increased research capacities by new buildings (A0341) are added if the owner is not UT. Otherwise they will be considered in commercial accounting. There may be an additional advantage through new types of research that can be performed. Consequently, an increase in assets is in the results. Similar identification problems arise with increased research capacities because the library is increased (A0351). However, as books are normally not considered in the commercial bookkeeping system of UT; they form an additional asset. But only the books bought in the period are concerned as the others are considered in additional social assets.

In respect to the contribution to research centers (A0361) some synergy effects may occur that may lead to a further potential to attract projects. As this effect is longer lasting, it is treated as an asset. The capacity to consult firms (A0401) is related especially to experienced staff like professors or experienced experts. As they have long-term contracts their ability to consult forms a social asset. Consulting affords that occur occasionally by researchers, etc., are treated as a flow. The same is applied to the consulting of government and local governments (A0411).

The rise of European funds (A0421) is treated as receipts in the commercial bookkeeping system. However, there are additional advantages and further chances for project work and experience gathering. This forms additional human capital that is considered, as above, as an asset. Some advantages to improving human capital that are occasional and not long lasting are treated as flows, for example, social benefits from meetings and conference participation. Contributions to the development of the Estonian language (A0501) are not explicitly considered in the commercial bookkeeping. They are a stock of assets mainly related to the publication of scientific research work. These publications lead to social assets. Other more political publications or an appearance on radio or television also support language development but for a short-term period. Therefore, the latter are treated as flows.

The activities of the faculty lead to employment effects. They consist of the direct effect that appears from the number of employees in the faculty and an indirect effect initiated in other economic subjects. To determine these effects, an effect measurement model that considers the special features of institutions (or investment) and the regions where they are located (Wonnemann 1989; Friedrich and Wonnemann 1985) is necessary. By this approach economic and fiscal effects are measured. Since such a model is not yet available for the current research in Estonia, then experience gained from other applications is used. Income in cities of the size of Tartu is nearly related to the expenses. In smaller places these relationships are smaller. Therefore, it is possible to have some hints about indirect effects. These effects can be measured for an establishment phase and an operating phase. Here the employment effect from operations within one year as an asset is interpreted as this employment is linked to long-lasting employment contracts.

Increased infrastructure (A0521) concerns the information potential available to other institutions. This potential forms an asset if it is created for the long term. The willingness to pay for it is partly reflected in long-term transfers paid by the government for its existence independently from special services received. It is an asset. Some other payment motivated occasionally express flows. Changes of profits, rents of other firms (A0621) and the increase of tax receipts, etc., of governments (A0612) can be identified in a similar way as the employment effect. Those that refer to permanent expenses form an asset. The rest is related to flows. Social cash is an asset account that collects the entire cross bookings.

The stock of previous net benefits (L4001) and the additional benefits show the stock of total additional net-benefits. They express the additional social net assets. It is gained by reducing from the additional social assets the additional social liabilities (a stock result). Longer lasting impacts of accidents (L4011) are stocks; the costs that occur only during the period are social costs and treated as flows. The same holds for environmental losses (L4021) in the form of emissions and other environmental impacts. Some of them are long lasting; others occur only within one period. Future financial obligations (L4101) are

stocks. Some of them are considered in the commercial accounting; however financial obligations (L4101) for the faculty not in the commercial bookings of UT, for example, for buildings in use, but belonging to another jurisdiction or public office, have to be additionally included. If consultancy institutions are closed down (L4201) then the potential for consultancy gets lost because experienced staff loses opportunities for consulting. As stock becomes reduced or social liabilities increased – when the consulting of several years is concerned. Similar additional social liabilities (L4301) occur with a loss of staff. In an analogy to consultancy assets there are consultancy liabilities through the active political engagement of researchers and professors (L4401). Here opportunities in teaching and research that represent social liabilities are lost. They can be determined in a similar way as the related social assets. Employment losses (L4501) and infrastructure reductions (L4511) form social liabilities are identified as similar to their increase.

The adjustment of social stocks and social liabilities occurs through depreciations that for the purpose of simplicity are considered as a straight line (linear).

According to the formula presented in the beginning of subsection 2.2., the willingness to pay reflected in commercial accounting, where “turnover” and “costs” are expressed for the case purposes by revenues and expenses, express mainly direct measurements to specify this part of social benefits and social costs.

Direct measurement is also relevant to those assets that have been left out in commercial booking such as the value of buildings (IIFA0101) and the value of books in the account (IIFA0111). Also to direct measurement is allocated consumer surplus and producer surplus. Here producer surplus is defined differently from the usual measurement. It represents factor rents that are gained because the university or its institutions can buy resources more cheaply than on the factor market participants.

A simpler method is used for consumer surplus to measure knowledge changes. The actual amount paid by different student types is already considered in commercial bookkeeping as student payments or payments by central government, which refers to the consumer surplus. The amount one student has to pay is known by the faculty Dean’s Office, the experts for pricing of the faculty and education who propose the price policy have estimated at what price the demand is going to become zero. According to Paasche’s consumer surplus the number of students is multiplied by the difference between the limiting price and the actual price divided by 2.

This method was used to determine following accounts:
IIFA0201, IIFA0211, IIFA0222, IIFA0231, IIFA0242.

This is also applied for social benefits not leading to a stock such as:
IIFB5101, IIFB5111, IIFB5132.

In some cases the actual payment consists not of fees but of actual costs that persons who are undergoing education have to finance themselves. The difference is the maximum amount he or she is willing to pay until relinquishing education. These types of benefits are IIFA0251, IIFA026, and IIFB5122. If part of the costs is paid by the university, these costs are already considered in commercial accounting. The rest that has to be financed by the student is social costs: IIFsC6122 or deducted from IIFA0251 and IIFA0261.

A kind of producer surplus is booked as human capital. Here the difference between the incomes to be paid outside the university minus the payment of staff within the university that shows the willingness to pay for human capital is booked. Also, to measure human capital there exist various methods (Schmitz 1980) such as the future income of staff (Lev and Schwartz 1972), the staff satisfaction indicator (Flamholtz 1972, 1974, 1985, 1999), past labor costs (Brummert 1973), the behavioral variable method (Likert 1967) where an indicator based on labor capacity and work climate is used, contribution to production value, human resource accounting by comparing the future and present value of the firm (Hermanson 1964), and the opportunity cost method (Hekiman and Jones 1967). Most of them are directed to the contribution of human capital to profit. The last one is more appropriate for expressing the willingness to pay from a point of view of the benefit-cost evaluation. Therefore, chosen a similar approach to book these assets in the account IIFA0111 is chosen.

The human capital caused due to international cooperation is not booked here. The social costs to increase human capital are already booked in commercial bookkeeping. As far as there are individual private expenses for that purpose, they can be booked in the account IIFsC6421.

Willingness to pay for lasting research benefits is reflected in book prices that are not booked with the faculty in commercial accounting. Some consumer surplus might occur that can be considered as well. They are booked in the account IIFA0301 (lasting research results). The costs not considered in commercial bookkeeping may lead to social costs that are booked in the account IIFsC6421.

The benefits from increasing cooperation capacities are part of human capital that is not booked above, but appearing due to new research contracts enabled by international cooperation and accepted international research proposals. Other benefits may be evaluated by amounts paid to participants from the faculty visiting meetings and conferences. These payments can be due to the university or to other partners. As they are short term, they are considered in the account IIFB5242 (organizing conferences, meetings).

The funds achieved from the European Union that are longer lasting and dedicated to financing some additional professorships at the faculty can be treated as stocks and evaluated by the human capital approach. The difference between the payment by the EU that is booked in commercial bookkeeping and

the earnings what the faculty has to offer to attract a foreign colleague is referred to here. It is booked in the account IIFA0421 (foreign projects).

Those funds that are achieved and used in the period under research for materials or staff hours are booked in commercial bookkeeping as revenues and expenses. However, their social benefit opens possibilities to achieve further benefits in terms of teaching and publication. Therefore, an average of knowledge gained per time unit financed and publication benefits related to the funds dedicated to research is booked. However, this leads to current benefits. Payment for student exchange by booking an average knowledge increase in the account IIFB5242 is also included.

Writing research proposals leads to social costs that are considered partly in the commercial costs. As far as additional time is used, the value of leisure time hours is valued in income terms and booked in the account IIFsC6222. In some rare cases current knowledge improvements are made that can lead to additional incomes. If this situation appears, then it can be booked in the account IIFB5222 (writing proposals).

Increase in staff capacity is considered through additional human capital that is gained and not considered above. The same evaluation method is applied and the booking occurs in the account IIFA0321.

The publication of education materials and study papers leads to benefits. If they are only in copy form, then they are considered as social benefits, that amount. If they had to pay, the receiver would at least pay the copy costs (accordingly in accounts IIFB5152 and IIFB5202). As the costs are sometimes paid by the faculty, they appear in commercial accounting as expenses. If this is not the case or costs for private research appear, then the booking is done under the social costs of printing in the accounts IIFsC6152 and IIF sC6202.

The increase of research capacity if it is not booked in the commercial accounting can be added as expenses. If the new equipment enables new applications, the costs for licenses can express the willingness to pay for the related advantages. These benefits are considered in the account IIFA0331.

Extended library capacities can be evaluated by the product of additional book prices, and average price, if not included above, are considered in the account IIFA0351.

The organization of conferences leads to current social benefits. They can be measured by consumer surplus of participants and the turnover from fees and are booked in the account IIFB5242. If part of the costs are expenses of the university, then costs paid for by participants and third parties should be gathered in the account IIFsC6242. As far as the faculty supports research centers that do not appear totally in the commercial bookkeeping, the money support of the faculty can be interpreted as willingness to pay for advantages and booked in the account IIFA0361.

The willingness to pay for the consultancy of faculty members – mainly academic staff – is measured by estimated average income received for their consulting work over a period of 3 years. Some are specialized in private firms

and others in governmental institutions consultancy (IIFA0401). This stock is adjusted. If the consultancy is only occasional then benefits measured in incomes are fixed in IIFB5301 (consulting to firms) and IIFB5311 (consulting with public institutions). Respective social costs are booked in IIFsC6301 (consulting with firms) or IIFsC6311 (consulting to public institutions). Consultancy for public institutions, for EU institutions and for scientific bodies can be evaluated by the value of time in income terms allocated to these activities or by incomes due to these consultancies that are booked in IIFB5321 (consulting for Parliament), IIFB5331 (consulting for EU institutions), and IIFB5341 (consulting for scientific bodies). At the same time, costs covered by the consultants or other institutions not booked in commercial bookkeeping are gathered correspondingly in current social cost accounts: IIFsC6321, IIFsC6331, or IIFsC6341.

The contribution to the development of the Estonian language is measured in the monetary value of research volumes published in Estonian. This data is booked in IIFA0501.

Increased employment will be captured by employment multipliers that are gained from the experiences of towns of similar size. Then the number of positions is multiplied by average income per job. Here only employment that is related to the operating phase of the university is looked for. The booking appears in account IIFA0511.

The location of tax multipliers will be adapted to determine the respective values of tax receipts. As an approximation of it is referred to the tax income per job in the respective cities. The tax amount equals the value of services provided to society as a minimum value that is booked in IIFA0531.

The main productive factor for infrastructure services in the university is the staff available. The infrastructure increase is measured by the number of students that can be taught more that is multiplied by an academic average income. This proportion is related to the per capita staff size and multiplied by staff increase to receive the increase in infrastructure. It is booked in the account IIFA0521.

It is problematic to determine the management-related current social values. The payment for management is already booked in commercial bookkeeping. However, management does not comprise the main function of academic staff. The administrative functions could partly be done by special support staff, which has not been hired, because the academic staff does these tasks as well. Therefore, there is a kind of producer surplus. For that the administrative time of the academic staff is estimated, the number of administrative staff to be additionally employed is determined, and their income taken as value and split into the management functions according to the time consumption. The results are booked as follows: monitoring and control (IIFB5401), financial management (IIFB5411), staff management (IIFB5421), faculty decision making (IIFB5431) and management of labs (IIFB5441). The social benefits of contacts with other faculties (IIFB5452) and support of colleges and the

representation of the faculty are taken into account respectively (IIFB5461 and IIFB5471).

The work time that is needed and exceeds the official work load is not considered in the commercial expenses of the university accounting. Therefore, it is booked as social costs accordingly in the accounts: IIFsC6401, IIFsC6411; IIFsC6421, IIFsC6431; IIFsC6441, IIFsC6451; IIFsC6461 and IIFsC6471. In a similar way the current social benefits of contacts with schools, public relations, and advertisement are detected in the following current accounts: IIFB5501, IIFB5522 and IIFB5532. As far as costs are not reflected in commercial bookkeeping because of payment made by another institution or the use of additional (sometimes leisure) time of academic staff, the additional social costs are booked in IIFsC6501, IIFsC6522, and IIFsC5532.

The attraction of visitors leads to a higher willingness to pay for goods and services. They can be valued by the expenses of the visitors, booked in account IIFB5512. However, not all expenses for the goods of visitors are related to goods produced in the town proper. Therefore, the imports necessary to meet this demand are booked in the social cost account (IIFsC6512).

Fiscal social costs are already considered as expenses in commercial accounting. There may be additional ones because of the administrative costs of institutions of social insurance. They can be booked in the account IIFsC6542. Fiscal social benefits are reflected in the provision of social goods, etc., which do not occur in the commercial university accounting. Here they are calculated as a minimum of their value the amount of social tax and booked in IIFB5542. Other social benefits and costs are evaluated in cost savings, incomes, or by more costs that are not revenues or expenses for the commercial bookkeeping. The items are found in IIFB5552 and IIFsC6552.

The additional social net assets are determined as remarked below.

Accidents are evaluated by the damages caused and expressed by the costs that are induced, booked in account IIFL4011. Emissions and damaged environment are evaluated by the damages or the insurance premiums paid. They are reflected in account IIFL4021. Future financial obligations are booked using the value of the loan or credit in account IIFL4101.

The closing down of the consultancy of the institution is evaluated in the same way as detected: the value of an increase in the potential for consultancy. In the case of closing down the consulting activity, the consultancy income within three years is lost. This social liability is considered in account IIF4201. A loss of staff corresponds to a loss of human capital and is evaluated as above and expressed in account IIFL4301. The loss of resources may be expressed by the costs of hiring additional staff for some period (for example, political engagement). The social benefits are considered in the consulting benefits. Therefore, the booking of the cost term takes place in account IIFL4401. Decreases of employment and in infrastructure are evaluated in the analogy as the increases. These are shown in the accounts IIFL4501 and IIFL4511.

For value adjustments and corresponding depreciations and appreciations the certain years (y) and resulting percentages as shown in Table 36 are applied.

Table 36. Terms of value adjustments applied in accounting

W3001	Value adjustment to previous net benefits	V3101	Value adjustment of buildings, 50 years (y.) 2,5 %
W3011	Value adjustment to accidents 3y, 33 (1/3) %	V3111	Value adjustment of current assets not booked with faculty, depending on asset, 5y. 20%, to 50y. ,2,%. .
W3021	Value adjustment to emissions 5y. , 20%	V3201	Value adjustment to knowledge of baccalaureate 5y , 20%
W3101	Value adjustment to future financial obligations, 20y. 5%	V3211	Value adjustment to knowledge of master 10y. 10%
W3201	Value adjustment to closing down of consultancy institutions 3y, 33 (1/3) %	V3222	Value adjustment to knowledge of doctor 10y. 10%
W3301	Value adjustment to loss of staff 3y. 33 (1/3) %	V3231	Value adjustment to knowledge from Open University 4y. 25%
W3401	Value adjustment to loss of resources through political activities 4 y., 25%	V3241	Value adjustment to knowledge vocational training distance teaching 5 y. 20%
W3501	Value adjustment to employment losses 3 y. 33 (1/3) %	V3251	Value adjustment to knowledge teaching staff 10y. 10%
W3511	Value adjustment to reduced infrastructure	V3261	Value adjustment to knowledge of scientists 20y., 5%
		V3301	Value adjustment to lasting research results 20y., 5%
		V3312	Value adjustment to increasing international cooperation capacities 5 y., 20%
		V3321	Value adjustment to increase of research capacities: staff 5 y. 20%
		V3331	Value adjustment to increase of research capacities: equipment 5 y., 20%
		V3341	Value adjustment to increase of research capacities: equipment 5 y., 20%
		V3351	Value adjustment to increase of research capacities: library 50y. 2%
		V3361	Value adjustment to contribution to research centers 3 y. , 33 (1/3) %

Table 36. Continuation

		V3401	Value adjustment to capacity to consult firms 5.y., 20%
		V3411	Value adjustment to capacity to consult governments 5 y., 205
		V3421	Value adjustment to European funds 3 y. 33 1/3 %
		V3501	Value adjustment to development of Estonian language 5 y. , 20%
		V3511	Value adjustment to increased Employment 10 y., 10%
		V3521	Value adjustment to increased infrastructure 10 y. 10%
		V3602	Value adjustment to changes of profits, rents of other firms 5 y., 20%
		V3612	Value adjustment to increase of tax receipts, etc. of governments 10 y. 10%

Source: Compiled by the author

All described bookings are shown in the accounts in Annex 8 and are formed into an additional social final balance of the FMCS (see part f) in Annex 8).

One of the most problematic decisions in additional social accounting is the deferral of social benefits and social costs due to other economic units involved (according to methodological questions number 3 and 4 in Table 21, subsection 1.3). The commercial accounting concentrates on successes and losses that are mostly directed at the institution itself. The additional social successes are sometimes due to activities of other economic units and occur outside the faculty. Therefore, some of the stocks, especially social assets, and current social benefits and social costs have to be deferred.

One way to split these items would be to define a welfare function that has a format that shows social success as a dependent variable and the factors leading to such success as independent variables. These factors may be related to the economic units involved in producing success. It assumes a type of production function where the economic units symbolize the factors. By econometric methods one might estimate the parameters of such a function that express the contribution of the economic units to the total social success. The type of function might be of Cobb-Douglas, CES,⁵¹ etc. A similar attempt is made in the case of learning functions (Heckman, Lochner and Todd 2006; Grossman

⁵¹ CES – constant elasticity of substitution production function. For Cobb-Douglas and CES production functions see Miller (2008).

2006; Cunha, Heckman, Lochner and Masterov 2006; Lange and Topel 2006) or production functions for schools⁵² (Hanushek 2007, 2010).

However, these approaches require a significant amount of data that are not available for the purposes here and need considerable detailed research. Another basis would be a reduction to a value added chain and allocating the whole success proportionally according to the value added of the economic unit involved. This seems a more reasonable approach. But many of the additional social benefits and social costs are related to external effects and indirect social benefits and social costs measurement, where it is rather difficult to clarify which economic unit is responsible and to what extent to the total success.

Therefore, as is common in economics in the situation where definite solutions to problems do not exist, it is possibility to escape to the application of various principles. Two guiding principles could be applied to identify the part of social benefits or social costs to be deferred. One is the causation principle, and the other is the result principle, which points to the economic unit where social success occurs (for example, the one using a research result, reading a book, applying knowledge in a production process). As the user of a more consumption-oriented approach needs an overwhelming amount of information for the application, then the following causation principle is applied. The main contributor to success is determined by restricting within the faculty, because for deferral purposes there is no need to distinguish in a detailed way between all the contributors.

The next task is to fix a deferral percentage with respect to some assets in the form of the additional social stocks. The knowledge achieved through a doctoral studies program is partly achieved in cooperation with programs with the Tallinn University of Technology. Forty percent of the costs by EU programs are allocated to this university. Therefore, 40% has been chosen for the deferral percentage. The knowledge gained by vocational training and distance learning is also influenced by firms that pay for these services, which offer experience to learn and economic units that assist in overcoming distances such as postage, e-mail, and transportation operators. Also, other faculties that provide lecture halls, training facilities, and to some extent teachers or learning materials. If the commercial costs of these activities that are caused inside the faculty and outside are turned to, a deferral rate of 30% of these activities must be estimated. This part of knowledge has to be booked on the right side of the account IIFA0242 and on the left side of the deferral account IIFT8202 (see technical accounts in Table 37). In the analogy it is treated as the knowledge gained by a doctoral studies program. Some of the teaching is done by professors that originate from abroad or from other universities. Therefore, a deferral percentage of 15% that leads to a deduction at account IIFA0222 and is

⁵² A function that relates various inputs to education including those of families, peers, and schools to the maximum level of student achievement that can be obtained (Hanushek 2010: 407).

booked on the deferral account IIFT8202 has been assumed. Increasing international cooperation capacities are directly related to other research institutions. There is a high percentage of third activities leading to success and the usage of these capacities. This is deferred at 50% using the accounts IIFA0312 and IIFT8202.

Changes in profits, rents of other firms are due to the activities of the faculty, but also to activities of the other economic units. Here a guideline is created for the relationship between the profit changes of the other units in total and the profit (loss) change of the faculty. A deferral percentage is approximately 40% for the faculty. The deferral is booked in accounts IIFA0602 and IIFT8202. A similar process has been completed concerning the increase of tax receipts. The relation of the tax payments of the faculty and the average tax receipts achieved from pre-services delivered by others has been looked at. The percentage is about 80% and booked in IIFA0612 and IIFT8202. With respect to the value adjustment, the same percentages can be applied or the value adjustment made only with respect to the non-deferred part.

With additional social liabilities stocks no necessities for deferrals occur.

Deferrals are to be made for some additional current social benefits. With respect to the current knowledge achieved from doctoral studies programs the same percentage of 15% as with the knowledge stock has been applied. This leads to a deduction in the account IIFB5122 and is booked in the deferral account IIFT9302. With respect to the social costs, most of them occur for the faculty and the doctoral candidates. External economic units are less involved. Therefore, a deferral is calculated at only 10% and booked in accounts IIFsC6132 and IIFT9132. In Open University a small part of willingness to pay does not originate with the students. Therefore, 5% of the benefits by deferrals is eliminated. The account IIFB5142 gets less and the account IIFT9302 receives a higher amount. The same percentage has been used for the deferral of the social costs of Open University activities: a reduction of IIFsC6142 and a higher deferral results in IIFT6132 correspondingly.

The publication of teaching materials has a small percentage arranged through the university or other publishing houses. Therefore, 5% is considered on the social benefit and the social cost side. The resulting amounts are booked on the left hand sides of IIFB5152 or on the right hand side of IIFsC6152, and in the deferral accounts IIFT9302 and IIFT9132. The publication of research results takes place through articles in journals, books, copied reports, or the internet. With respect to journals and books, publishing companies are involved. However, most of these activities lead to knowledge stock, considered above. Those articles that are more informative for a wide public are published just on the internet. They provide the distribution of knowledge. Therefore, the deferral percentage is orientated to the distribution costs and a percentage of 5% for the social costs as well as for the social benefits is used. The booking takes place in IIFsC6202 and n IIFB5202, and the cross-bookings in IIFT9312 and IIFT9302.

Rising funds are due to donators and also due to grants for scientists not belonging to the faculty staff. Looking at the additional social costs, one can find that these are partly financed by other institutions, for example, by EU funds. In some cases those social costs are related to the faculty members alone. Therefore, deferral is 20% of the social costs. On the benefit side the participation is mostly less as the stronger partners have access to benefits. There a deferral is assumed to be 30%. Booking again takes place in the right hand on IIFsC6212 and on the left of IIFB5212, and the cross-bookings in IIFT9312 and IIFT9302. For writing research applications the same percentages have been chosen and the bookings are analogous.

Organizing conferences and meetings is normally a joint activity. Some conferences taking place in the faculty are predominantly organized there. With conferences abroad the faculty is engaged at a smaller scale. The social costs are in a share of 15% due to other institutions. Therefore, the same percentage for the benefit side is assumed. Accordingly the accounts IIFsC6242 and IIFB524, and the technical accounts IIFT9312 and IIFT9302 are touched. The majority of contacts with other faculties are two sided. Therefore, a deferral of 50% of the costs and benefits has been accounted. This leads to bookings in IIFsC6452 and IIFB6452 and the technical accounts IIFT9312 and IIFT9302.

Attraction of visitors is mostly due to the inviting faculty. Therefore, deferral is only 10% of social costs and social benefits, which lead to bookings in IIFsC6452 and IIFB6452, and the technical accounts IIFT9312 and IIFT9302.

Although public relations are the main initiatives on the side of the faculty, the necessary deferral turns out to be low. There 5% is deducted to other economic units. Again the following accounts play a role: IIFsC6522, IIFB6522, and the technical accounts IIFT9312 and IIFT9302. Concerning advertisement there are press articles and television reports concerning the faculty. They deal mainly with the faculty's events, but reporters and media are involved. The deferral is again 10%. The respective accounts are: IIFsC6532 and IIFB6532, and the technical accounts IIFT9312 and IIFT9302. Fiscal social costs and social benefits are deducted. About 50% of payments are by the faculty. Therefore, a large deferral has to be made concerning accounts IIFsC654, IIFB6542 and the technical accounts IIFT9312 and IIFT9302. The deferral for other social costs and benefits vary according to the kind of social costs and benefits, which are considered and booked additionally. All aforementioned deferrals and other technical accounts in the chart of additional social accounts are presented in Table 37.

Table 37. Technical accounts in the chart of additional social accounts (in Annex 8)

IIFT7101	Additional opening social balance
IIFT7201	Additional operating social success statement (see table 39)
IIFT7301	Additional social final balance
IIFT7401	Total social balance (see table 41)
IIFT8202	Deferral to assets (stocks)
IIFT8212	Deferral to liabilities (stocks)
IIFT9302	Deferral to social benefits
IIFT9312	Deferral to social costs

Source: Compiled by the author based on Friedrich and Eerma (2009)

The procedures concerning additional social bookkeeping are illustrated by some examples which represent both stock accounts as well current accounts in Table 38.

Table 38. Examples of transactions

A0222 Knowledge from doctoral studies	
Higher income from PhD degree (A1001)	Deferral of costs paid by other institution treatment (T8202) Remainder to social balance (T7301)
V3302 Value adjustment to knowledge from doctoral studies	
Remainder to social balance (T7301)	Depreciation of income increase from higher knowledge of doctoral studies (C6501)
L4101 Social liabilities from future financial obligations	
Deferrals of the sum of future financial obligations (T8202) Remainder to social balance (T7301)	Sum of future financial obligations (pensions partly financed by faculty) (A1001)
W3302 Value adjustment from future financial obligations	
Appreciation of financial obligations (B5801)	Remainder to social balance (T7301)
T8202 Deferral to social assets and liabilities (stocks)	
Deferral of costs paid by other institution's treatment (A0222)	Deferrals of sum of future financial obligations (L4101) Remainder to social cash (A1001)
T9302 Deferral to social benefits	
Remainder to social cash (A1001)	Deferral of incomes of assisting persons (other economic units) (B5152)

Table 38. Continuation

T9312 to social costs (other economic units)	
Deferral to writing proposals by non-faculty members time (sC6222)	Remainder to social cash (a1001)
sC6701 Depreciation	
Depreciation of income increase from higher knowledge of doctor studies (V3302)	Remainder to social operating success statement (T7101)
B5801 Appreciation	
Reminder to social operating statement (T7201)	Appreciation of financial obligations (W3302)
A1001 Social cash	
Sum of future financial obligations (pensions partly financed by faculty) (L4101) Income from publication of teaching materials (B55152) Deferral to social assets and liabilities (stocks) Remainder from (T8202) Remainder from deferral to costs (T9312)	Higher income from doctor decree (A0222) Value of time dedicated to writing proposals (sC6222) remainder from deferral to social benefits (T9302) Remainder of social cash to social balance (T7301)
T7201 Social operating success statement	
Remainder from social costs of writing research proposals (sC6222) Remainder from depreciation (sC6501) Net social benefit to (T7301 through B4871)	Remainder from social benefits of publication of teaching materials (B5152) Remainder from appreciation (B5801)
B5152 Social benefits from publication of teaching material	
Deferral of incomes of other economic units (T9312) Remainder to operating success statement (T7201)	Income from publication of teaching materials (A1001)
sC6222 Social costs of writing research proposals	
Value of time dedicated to writing proposals (A1001)	Deferral to writing proposals by non-faculty members time (T9302) Remainder to social operating success statement (T7101)
T7301 Additional social balance of faculty	
Remainder from knowledge from doctor studies (A0222) Value adjustment from future financial obligations (W3302) Remainder from social cash (A1001)	Remainder of social liabilities from future financial obligations (L4101) Value adjustment to knowledge from doctor degree (V30222) Net social benefit from (T7201)

Source: Compiled by the author

According to transactions in the examples in Table 38, social assets related to the improvement of knowledge of doctoral studies A0222 increase because of the willingness of employers to pay for services of managers with a PhD degree. A stock of social benefits is created, which is booked to A0222 on the left side. The benefits are A1001 at the right. As professors from other universities are involved in the doctoral courses, the social benefits have to be split and booked into the right of A0302 and the left of T8202, deferral to other institutions such as other universities.

A value adjustment of the improvement of knowledge has to be made and expressed by a percentage of the reduction of knowledge related to the rate of losing knowledge annually. The amount is booked as depreciation, to the right of the value adjustment account V3202. The cross booking takes place in the social depreciation account sC6701. Its remainder is extended to the social operating success statement T7201 on the left.

For some employees the faculty has to take care of future pension payments. This demonstrates a social liability to future financial burdens, which are booked in the right of L4101 and marked at the right side of social cash A1001, too. A deferral of burdens of finance has to be made if the payments of other institutions reduce the pension burden. On the left hand of L4101 and the right hand of deferral account T8202 the amount deferred is booked. The remainder of L4101 extends to the social balance T7301 to the right.

A value adjustment needs to be made to social liabilities connected to the burdens of finance when the related burden is lowered in the case of the death of a pensioner or person accumulating pension rights. This means that a social burden will be lowered. Therefore, an appreciation of the financial burden is accounted for and booked in the value adjustment of liabilities of financial burden in the left side of W3302 and the right side of B5801. The remainder of W3302 is extended to the social balance T7301 on the left. The remainder of B5801 is booked to the right of the social operating success statement T7201.

The publication of teaching materials may lead to a higher income for authors not paid by the faculty. The social benefits consist of the publisher's monetary willingness to pay for publishing these materials. The respective amount is booked in social benefits account B5152 and the cross entry is at social cash A1001 on the left. As the material may be written with the help of assistants who have to be paid, however, and are not paid by the faculty, a part of the benefit is due to them. The willingness to pay can be measured by the income they receive. Therefore, a deferral is considered on the left of account B5152 and in the deferral account to benefits T9302 on the right side. The remainder of social benefits B5152 extends to social operating success statement T7201 to the right side.

Social costs are linked to writing proposals because additional time has to be used that is not available for other purposes and opportunities to earn money. Therefore, the willingness to pay for this time is used to formulate a monetary value term. The value is booked on the left side of sC6622 and in

social cash A1001 on the right side. As many proposals are made for joint projects, the efforts of colleagues from other universities might be involved. Deferrals are necessarily right of sC6622. Cross entry takes place on the left side of the deferral account T9312. The remainder of sC6222 again extends to the social operating success statement.

The consolidated remainders of the deferral accounts T8202, T9302, and T9312 show the net benefit of other economic units. These remainders of T8202, T9302, and T9312 are extended to the social cash account A1001. Its remainder is transmitted to the social balance T7301, where it is normally found on the right side as social cash.

The strike of the social operating success statement (Table 39) shows additional social net benefit as a remainder on the left side, which is extended to the net social benefit, account B4871 and through its remainder extended to the right side of the additional social balance (see Table 40). The additional social balance is consolidated with the commercial to the total social balance, where the total social net benefit results as the sum of consolidated commercial profit and additional social net benefit. This is shown in table 41.

Table 39. Additional operating social success statement of the FMCS (in million EEK) for the year 2006

IIFT7201	Social Costs from		Social Benefits from		
Teaching (1)					
sC6101	Bachelor's studies	1.600	B5101	Bachelor's studies	6.396
sC6111	Master's studies	0.188	B5111	Master's studies	3.243
sC6122	Doctoral studies	0.153	B5122	Doctoral studies	7.076
sC6132	Promotion of skills	0.014	B5132	Vocational training	0.043
sC6141	Open University	0.020	B5141	Open University	0.300
sC6152	Publ. teaching materials	0.194	B5152	Publ. teaching materials	2.680
Research (2)					
sC6202	Publ. research results	0.015	B5202	Publ. research results	0.030
sC6212	Rising funds	0.842	B5212	Rising funds	1.776
sC6222	Writing research proposals	0.778	B5222	Writing research proposals	1.297
sC6231	Writing articles, books	1.048	B5231	Writing articles, books	0.750
sC6242	Organizing conferences	0.215	B5242	Organizing conferences	0.626
Consulting (3)					
sC6301	To firms	0.477	B5301	To firms	1.193
sC6311	To public institutions	0.308	B5311	To public institutions	0.769
sC6321	To parliament	0	B5321	To parliament	0
sC6331	To EU	0.001	B5331	To EU	0.016
sC5341	To scientific bodies	0.002	B5341	To scientific bodies	0.045

Table 39. Continuation

IIFT7201	Social Costs from		Social Benefits from		
<u>Management activities (4)</u>					
sC6401	Monitoring, control	0.025	B5401	Monitoring, control	0.381
sC6411	Financial management	0.026	B5411	Financial management	0.393
sC6421	Staff management	0.021	B5421	Staff management	0.321
sC6431	Faculty decision making	0.061	B5431	Faculty decision making	0.914
sC6441	Management of labs	0.003	B5441	Management of labs	0.046
sC6452	Contacts to other faculties	0.003	B5452	Contacts other faculties	0.054
sC6461	Support of Colleges	0	B5461	Support of Colleges	0
sC6471	Representation	0.012	B5471	Representation	0.024
<u>Other faculty activities (5)</u>					
sC6501	Contact to schools	0.041	B5501	Contact to schools	0.062
sC6512	Attraction of visitors	0.045	B5512	Attraction of visitors	0.151
sC6522	Public relations	0	B5522	Public relations	0.674
sC6532	Advertisement	0.004	B5532	Advertisement	0.108
sC5542	Fiscal social costs	0	B5542	Fiscal social benefits	5.222
sC6552	Other social costs	0.140	B5552	Other social benefits	0
sC6701	Depreciation	10.431	B5801	Appreciation	0.861
B4871	<u>Add. social net benefit</u>	18.784			
		35.451	35.451		

Source: Compiled by the author

In the very beginning of a period the final total social balance of the last period, the underlying final additive social balance, and the final commercial balance as a starting point for additive social bookkeeping and the related commercial bookkeeping have been used. Transactions are accounted for with their commercial consequences within the commercial bookkeeping. The additive social assessment takes place in the additional social accounts mentioned above. After striking the additive social benefit and additive social cost accounts, the remainder of these accounts, including social depreciation, is extended to the additive operating social net benefit account (B4871, this corresponds to Figure 16 (at the end of subsection 1.3) and Table 39). The additive operating social net benefit account remainder is closed to the additional final social balance (in Table 40)

Table 40. Additional social final balance of the FMCS, (in million EEK) for the year 2006

IIFT7301	Additional Social Final Balance of the Faculty			
Additional Social Assets			Additional Social Liabilities	
IIFA0101	Value of buildings	0	IIFL4001 Stock of previous net benefits	0
IIFA0111	Value of assets not booked with the Faculty	40.340	IIFL4011 Accidents	0
IIFA0201	Knowledge of bachelor	4.477	IIFL4021 Emissions, spoiled environment	0.736
IIFA0211	Knowledge of master	2.820	IIFL4101 Future financial obligations	14.280
IIFA0222	Knowledge of doctor	1.516	IIFL4201 Closing down of consultancy institutions	0
IIFA0231	Knowledge from Open University	0	IIFL4301 Loss of staff	0
IIFA0242	Knowledge vocational training distance teaching	0	IIFL4401 Loss of resources through political activities	0
IIFA0251	Knowledge teaching staff	0.653		
IIFA0261	Knowledge of scientists	0.620		
IIFA0301	Lasting research results	24.563		
IIFA0312	Increasing international cooperation capacities	0.401		
IIFA0321	Increase of research capacities: staff	1.470		
IIFA0331	Increase of research capacities: equipment	0.099		
IIFA0341	Increase of research capacities: buildings	0		
IIFA0351	Increase of research capacities: library	0.060		
IIFA0361	Contribution to research centers	0		
IIFA0401	Capacity to consult with firms	1.749		
IIFA0411	Capacity to consult governments	1.113		
IIFA0421	European funds	0.016		
IIFA0501	Development of the Estonian language	0.479		

Table 40. Continuation

IIFT7301	Additional Social Final Balance of the Faculty		
Additional Social Assets			Additional Social Liabilities
IIFA0511	Increased Employment 2.346	IIFL4501	Employment losses 0
IIFA0521	Increased infrastructure 4.234	IIFL4511	Reduced infrastructure 0
IIFA0601	Changes in profits, rents of other firms 1.338		
IIFA0612	Increase of tax receipts, etc., of governments 5.051		
IIFA1001	Social cash	IIFL1001	Social cash (social capital) 49.975
IIFW3001	Value adjustment to previous net benefits 0	IIFV3101	Value adjustment to buildings 0
IIFW3011	Value adjustment to accidents 0	IIFV3111	Value adjustment of current assets not booked with faculty 3.778
IIFW3021	Value adjustment to emissions 0.147	IIFV3201	Value adjustment to knowledge of bachelor 0.895
IIFW3101	Value adjustment to future financial obligations 0.714	IIFV3211	Value adjustment to knowledge of master 0.282
IIFW3201	Value adjustment to closing down of consultancy institutions 0	IIFV3222	Value adjustment to knowledge of doctor 0.152
IIFW3301	Value adjustment to loss of staff 0	IIFV3231	Value adjustment to knowledge from Open University 0
IIFW3401	Value adjustment to loss of resources through political activities 0	IIFV3241	Value adjustment to knowledge vocational training distance teaching 0
IIFW3501	Value adjustment to employment losses 0	IIFV3251	Value adjustment to knowledge of teaching staff 0.065
IIFW3511	Value adjustment to reduced infrastructure 0	IIFV3261	Value adjustment to knowledge of scientists 0.062
		IIFV3301	Value adjustment to lasting research results 2.456
		IIFV3312	Value adjustment to increasing international cooperation capacities 0.080
		IIFV3321	Value adjustment to increase of research capacities: staff 0.294

Table 40. Continuation

IIFT7301	Additional Social Final Balance of the Faculty	
	Additional Social Assets	Additional Social Liabilities
		IIFV3331 Value adjustment to increase of research capacities: equipment 0.020
		IIFV3341 Value adjustment to increase of research capacities: buildings 0
		IIFV3351 Value adjustment to increase of research capacities: library 0.001
		IIFV3361 Value adjustment to contribution to research centers 0
		IIFV3401 Value adjustment to capacity to consult firms 0.577
		IIFV3411 Value adjustment to capacity to consult governments 0.371
		IIFV3421 Value adjustment to European funds 0.005
		IIFV3501 Value adjustment to development of Estonian language 0.096
		IIFV3511 Value adjustment to increased Employment 0.235
		IIFV3521 Value adjustment to increased infrastructure 0.423
		IIFV3602 Value adjustment to changes of profits, rents of other firms 0.134
		IIFV3612 Value adjustment to increase of tax receipts, etc. of governments 0.505
		IIFB4871 Additional social net benefit 18.784
	94.206	94.206

Source: Compiled by the author

There, the remainder of the additive social assets and social cash, and the remainder of the additive social liabilities, along with the additive social value adjustments to additive social assets (Table 40), is assembled in the additional final social balance. The following step includes the additive social balance

together with the final commercial balance to form the total final social balance (Table 41).

Table 41. Total social balance of the FMCS (commercial and additional social balance), (in million EEK) for the year 2006

IIFT7401	Total Social Balance				
IIFT711	Commercial Balance				
IIFT711	Commercial Assets		IIFT711	Commercial Liabilities	
1.	Non-current assets	116.958	1.	Net assets, capital	101.543
2.	Financial assets	0	2.	Liabilities	19.422
3.	Current assets	3.848			
4.	Accrued income	0.159			
FT7301 Additional Social Balance					
IIFT7301	Additional Social Assets		IIFT7301	Additional Social Liabilities	
IIFA0101	Value of buildings	0	IIFL4001	Stock of previous net benefits	0
IIFA0111	Value of assets not booked	40.340	IIFL4011	Accidents	0
IIFA0201	Knowledge of bachelor	4.477	IIFL4021	Emissions, etc.	0.736
IIFA0211	Knowledge of master	2.820	IIFL4101	Future financial obligations	14.280
IIFA0222	Knowledge of doctor	1.516	IIFL4201	Closing down consultancy	0
IIFA0231	Knowledge Open University	0	IIFL4301	Loss of staff	0
IIFA0242	Knowledge vocational training	0	IIFL4401	Loss of resources by political activity	0
IIFA0251	Knowledge teaching staff	0.653	IIFL4501	Employment losses	0
IIFA0261	Knowledge of Scientists	0.620	IIFL4511	Reduced infrastructure	0
IIFA0301	Lasting research results	24.563	IIFL1001	Soc. cash (add. social capital)	49.975
IIFA0312	Incr. intern. cooperation: capacity	0.401	IIFV3101	<u>Value adjustment:</u>	10.431
IIFA0321	Incr. research capacities: staff	1.470	-3612		

Table 41. Continuation

IIFA0331	Incr. research capacity: equipment	0.099		
IIFA0341	Incr. research capacities: buildings	0		
IIFA0351	Incr. research capacities: library	0.060		
IIFA0361	Contribution to research centers	0		
IIFA0401	Capacity to consult firms	1.749		
IIFA0411	Capacity to consult government	1.113		
IIFA0421	European funds	0.016		
IIFA0501	Dev. Estonian language	0.479		
IIFA0511	Increased Employment	2.346		
IIFA0521	Increased infrastructure	4.234		
IIFA0601	Changes of profits of other firms	1.338		
IIFA0612	Increase of tax receipts	5.051		
IIFW3001-3511	<u>Value adjustment:</u>	0.861		
			IIFB4871	Additional social net benefit
				18.784
		215.171		215.171

Source: Compiled by the author

From total social balance of the FMCS (Table 41) it appears that the additional social net benefit is positive and high due to social benefits. The faculty's total social net benefit depends mainly on the additional social benefits from research and educational activities. The total social net benefit is considerably high, approximately 19 million EEK, because of the high amount of additional social capital (approximately 50 million EEK).

2.3. Discussion and improvement possibilities on the bookkeeping approach to social accounting for a university faculty

Social accounting approaches found in the literature and reviewed by the author have not considered the bookkeeping approach. The BCA offered in the economics of education does not lead to a period-oriented bookkeeping system involving equations. The social accounting approach presented in the current thesis is integrated in its format basing on welfare valuation. This approach takes into account all activities of an entity for a certain period as shown in Table 42.

Table 42. The welfare-based bookkeeping approach in comparison with other methods for analysis in social accounting

Result of accounting Object of accounting	Heterogeneous in format of different indicators	Integrated/synthetic in format of welfare change
Project or investment in its whole period	Single goal/target reports	Benefit-cost analysis, cost- effectiveness analysis, cost- utility analysis
All activities of an entity for a certain period (e.g., one year)	Balanced scorecard, social audits, triple bottom line reports, sustainability reports, intellectual capital reports	<i>Total/full accounting, welfare based bookkeeping approach of social accounting</i>

Source: Compiled by the author

The social accounting approach developed here points to the social success of the faculty. It also points to additional social success that is caused by the activities of the faculty in the additional operating social success account (IIFT7201, in Table 39). There could be shown social success for teaching, for example, by adding the social benefits (B5101 to B5152) and subtracting the social costs (sC6101 to sC6152) that are not expressed in commercial bookkeeping. Together with the revenues and the expenditures considered in the commercial part of the accounting, they add up to a total social success of these activities (see relationship in subsection 1.3, Figure 15).

This may lead to task-related social accounting. A social cost and social success unit accounting becomes possible as well. In this case the faculty as such is the social success accounting center of a university. The social success accounting approach demonstrated is a type of social success center accounting. If the faculties are interpreted as a social success center, then, after defining the central university institutions and bodies not covered by the faculties as further

social success centers and the participations of the university as another one, the adding up of the social success of all the centers yields the total social success of the university. Also, the faculty could be split into institutes or chairs as social success centers. Moreover, the individual social benefit and social cost accounts point to kinds of social benefit, of social cost, and to social success-type accounting. Then the social success is directed at the service production or task fulfillment. Examples are the net-benefit per student from teaching, or the net-benefit per research project. Similar techniques as used in commercial accounting can be developed on the basis of the approach demonstrated. One of the main advantages of this social accounting approach refers to the following fact that because of the chosen welfare measure of social success social successes can be compared and integrated. Therefore, further information can be gained about social successes related to institutions such as faculties, the university, and a university system.

Social success comparisons with other institutions are possible if the willingness to pay evaluation methods are used and the same approach is applied. Therefore, social accounting of this type turns out to be innovative as it comprises features of the economic accounting approach, which allow the aggregation of economic units. This kind social accounting approach can also be developed for types of stakeholders and groups of clients such as students, research clients, and others (Tsimopoulos 1989). The results can show the social usefulness of actions, enlargement of departments, and the reshuffling of activities by managers. It may be useful to support the public relations of faculties or the university. It could serve to allocate financial or personal resources, etc., and may be treated as a social success indicator for regional or sector planning, the monitoring of activities, and task fulfillment.

In all of them the social success definition used and the approach developed fits well for the needs of university accounting. Such a social success measure is demanded as much exchange and co-ordination within the university is not based on market exchange in monetary terms within the university. Horizontal and vertical transfers of goods and money, commands by managers, and external effects occur internally, but also in external relationships. To consider such transactions in a bookkeeping approach the evaluation methods of benefit-cost analysis offers the most developed evaluation scheme.

However, some limitations are related to this tool to express social success. As the bookkeeping system uses welfare theory-based evaluations it is related to the individualistic welfare theory (Jochimsen 1963; Graaff 1963; Sen 1982; Samuelson 1983; Mishan 1987). The role of social groups (e.g., administrators, trade unions, entrepreneurial associations) in determining the content of social welfare is seldom emphasized. Therefore, the values identified by the willingness-to-pay approaches do not necessarily reflect the true evaluation in society. Moreover, the assumption of a constant marginal utility of money that means ignoring the fact that a currency unit (previously EEK, at the current time the euro) may stem from a rich or poor household, points to a strong

assumption. Further debates concern the so-called compensation tests discussed in the literature on welfare theory. But other evaluation attempts based on cost-effectiveness and utility-indicator analysis have to overcome these difficulties as well as long as there is no welfare (evaluation) function available. Many times compensation tests are assumed implicitly. For example, net-increase of an employment indicator of one region can be a result of an increase of employment in a sub-region accompanied by an employment reduction in another sub-region. It is questionable whether the net increase of an indicator signals a positive effect unless we assume that the employment (value) of those who gain jobs are as high as those who lose jobs. Therefore, the stated difficulties are also with other approaches to measure performance (Greiling 2011). However, in practice social auditing and reporting exist, where indicators in physical terms and costs are used without reference to compensation tests. Although the net-benefit-based evaluations used in the bookkeeping approach need improvement, they allow the determination of social success systematically within a bookkeeping system. The approaches to education accounting used in reporting are rather weak concerning identification of social success. This is especially true concerning the usual evaluation of faculty services (such as number of courses and some other indicators in balanced scorecards).

If the bookkeeping approach suggested for one faculty should also be applied to several faculties and the university itself, the chart has to be adapted. Then, the conventions of deferral become evidently much more specific and complicated. Also, the chart of social accounts needs further elaboration, when isolated social net-benefits of the group of clients, such as types of students or of research clients, should be assessed. Some social benefits and costs are to be excluded. More group-specific conventions for the deferral of social benefits and costs have to be developed. Additional corrections of social benefits and costs, which are booked in commercial bookkeeping, have to be made and considered in the additional social accounting. Total social net-benefit and total social assets and liabilities can be assessed in principle.

Some general challenges impacting the adoption of the bookkeeping-based social accounting for a university are shown with the merits in the Table 43.

Table 43. Merits and challenges impacting the adoption of the bookkeeping-based social accounting for a university

Focus of the aspect	Merits	Challenges
<i>General</i>	Affirming social success and possibility to measure it in practice; Enhances opportunities for social reporting in society based on scientific evaluations	Consulting to stakeholders; Gathering the qualitative and quantitative data/information; Development of bookkeeping rules (legal points)
<i>Particularly connected with the/a university</i>	Enhances opportunities to measure the social success of the faculty/ university stresses welfare change; Enhances visibility of the faculty/university in the society based in scientific evaluations	Clarification of the methodology; Cooperation in all levels of organization; Measurement rules; Documentation fixing
<i>Other specific</i>	Opportunities for further <i>ex-post</i> analysis: dynamic and comparative views to research object	Time and other resources needed: time consuming; Measurement rules have to be followed

Source: Compiled by the author

Some managers may argue that social accounting on the basis of benefit-cost analysis tries to integrate too many evaluations and is not appropriate for stressing the social implications of a faculty's activities. Moreover, it is an argument in the case of several faculties and the university as a whole. However, the abovementioned goal structure of the faculty and its role in society require such a broad additional social accounting approach combined with commercial bookkeeping. Therefore, the social accounting approach presented here opens the road to more precise and systematic social accounting of the university.

Last but not least, some efforts are necessary to complete the social bookkeeping approach. All the bookings in the commercial part of the social accounting have to be checked whether they reflect really willingness to pay. With respect to the additional social part more sophisticated criteria to split social benefit and costs and to allocate them to the institutions causing the social net-benefit should be available. Further research is needed to improve the evaluation approaches to the following transactions. They include identification of effects; the determination of depreciation values for the knowledge of students, scientists, researchers, and professors, etc.; the assessment of consumer surpluses for individual services; and methods to evaluate stocks and the allocation of pre-services to faculties, colleges and the university. Possibilities to improve the database of information should be evolved. For the

purpose of developing the approach, the bookings should be undertaken for several years and for other faculties as well. This becomes evident when including more faculties. For the preparation of aggregation and the success assessment of the total university more experience is needed.

Further fields of research concern the dependencies of social success on business cycles, inflation, etc. These are similar problems to those that appear for commercial accounting. Some further improvements are more general, but others more related to the research object.

There are some issues in the additional social accounting part that need further attention, since these were not covered in the benefit-cost analysis framework, but had to have solution in the current *ex-post* analysis. One example for this kind of issue is deferral rules (methods) between cooperating units concerning the analysis/project for which the study will be completed.

In terms of content items in social success accounting an analyst may consider adding valuations of patents, non-monetary awards, etc., depending on research object.

EU declarations and directives (e.g., the European Directive on Environmental Impact), national laws (e.g., Budget Codes) and fiscal stress increase the demand for a social welfare-oriented management of the faculty and the university. To overcome difficulties with respect to the type of information gathered and to apply the same evaluation standards to all institutions involved, certain regulations are required similar to those concerning commercial accounting. Then a better base is detected for contributing to the discussion about whether social accounting is useful for university management or not. The meaning of the information and ways to use this information in planning, realization and monitoring become highlighted. Then one may try to argue how the management welcomes or dislikes the social accounting approach and how the management applies it in negotiations within the university, with the central government, and other stakeholders. According to the aims of negotiation partners, such as the central government, research financing foundations, etc., the needs for information and the interpretation of social success may vary. Also, barriers of implementation of bookkeeping might be identified more clearly. The concept is developed for internal auditing. Whether it should be used for external auditing (e.g., court of auditors) has to be decided when all features of the bookkeeping approach have become designed. An aggregated version of the additional social success operating statement, the additional social balance and the total social balance using the same conventions for social accounting should be published.

CONCLUSION

Social accounting is explained as a paradigm that has a significantly broader scope than conventional accounting in terms of ecological, sociological, political, and economic aspects. The term “social accounting,” as well “social and environmental accounting,” has evolved over decades. During these decades the notion has also evolved under different names, as firstly by Linowes (1968) as “socio-economic accounting.” It was explained as a paradigm that has a significantly broader scope than conventional accounting in terms of sociological, political, and economic aspects. This approach was applied later by Mobley (1970) and Estes (1976), but already in a more specified way. During the 1970s and 1980s, the term was further introduced and extended by several authors as “social responsibility accounting” (Anderson 1977) and “social and environmental accounting” (Gray *et al.* 1987, Gray 2002). According to Anderson (1977) this type of accounting was defined and expanded from the corporate point of view and it was suggested that it should include “the impact of corporate decisions on environment, the consumption of non-renewable resources and other ecological factors, on the rights of individuals and groups; on the maintenance of public service; on public safety; on health and education; and on many other such social concerns.”

After analyzing several approaches and methods of social accounting the author of the thesis reached the understanding that social accounting should represent a systematic analysis that considers both economic and social effects, as well internal and external effects, of an organization’s or economic unit’s activities.

The need for social accounting can be clearly explained for economic units where advantages of their activities appear with other economic units and not within the one which produces them. It is also the case with many public enterprises or/and with the production of merit goods or the ones that have higher external effects. Social accounting also shows the usefulness of social activities for subjects that are not coordinated through markets. Through social accounting the usefulness of public activities by public administrative units can be shown.

As existing approaches to social accounting developed during the last 40 years such as human capital accounting, social auditing, etc., applied to public transportation, the chemical industry, the energy industry, health services, and even to education institutions, have used methods that are not sufficiently appropriate for a university, the particular issue was under the observation.

The main difference between the abovementioned approaches is the fact that social accounting considers that economic units (companies, educational institutions, and NGOs, etc.) influence the external environment through their actions and therefore should account for these effects as part of their standard accounting practices.

Still, the majority of the literature on the so-called models for different social accounting approaches and classifications of social accounting does not deal with the approach concerning welfare change in society. Therefore, the author of this thesis suggests adding the social accounting approach based on welfare change in society in line with other approaches.

Since universities have different engagements and tasks in society that cause welfare changes, social accounting seems inevitable for them. It is justified by the social accounting attempts to identify the social success of an individual economic unit. Social accounting concentrates on social success and the change in the social value of the assets and liabilities of an economic unit. Therefore, a social accounting system is relevant for university accounting because of social objectives and reasons. However, different types of social accounting and different methods are available and possible.

In order to fulfill the aim of the current dissertation that is to develop a period-oriented bookkeeping approach that applies *ex-post* analysis and is based on welfare economics evaluations and a bookkeeping system measuring the social success of a university faculty, the various methods applied for the measurement of an economic unit's social contribution and/or social success were analyzed.

Within social accounting there are many contributions that attempt to measure social success, the usefulness of social accounting, the effects on management, and decision making. Here general approaches to consider are economic investment accounting using benefit-cost, cost-effectiveness and utility analysis, and the social accounting approach using social audit, human resource and corporate social accounting, and social indicators and citizen value analysis methods.

Decisions for which type of analysis and which methods can be applied depend on the objectives of the analysis. For example, if some economic unit wants to express how it influences internal and external stakeholders by effects not expressed in financial accounting, then it leads to social audits, which offer mostly a form of reports and a listing of advantageous and disadvantageous effects. If the focus is on demonstrating that the knowledge and stock of labor are of a special value for an economic unit or society, then human resource accounting is evolved.

Several general problems connected with social accounting approaches and measurement methods appeared, particularly: information fragmentary issues, definition problems of the social accounting terms, and difficulties in measurement, especially in measuring external effects. It is relevant to add to this list of major problems that extension towards the welfare change (improvement) was still missing. Particularly obvious is the need for combined research methods in social success measurement that offers an integrated solution for university faculty social accounting.

Some attempts presented in the special social accounting approaches have several weaknesses. Particularly, education and social value approaches do not

sufficiently consider several aspects relevant to social success accounting. These deficits led to methodological challenges that are concluded in Figure 19.

The need to shape an accounting approach, which allows identifying the social success of an economic unit within a period of time, was looked for. The investigation shows that the existing kinds of social accounting do not meet this requirement as they do not offer bookkeeping for such an assessment. Therefore, the author had to find solutions for the methodological questions.

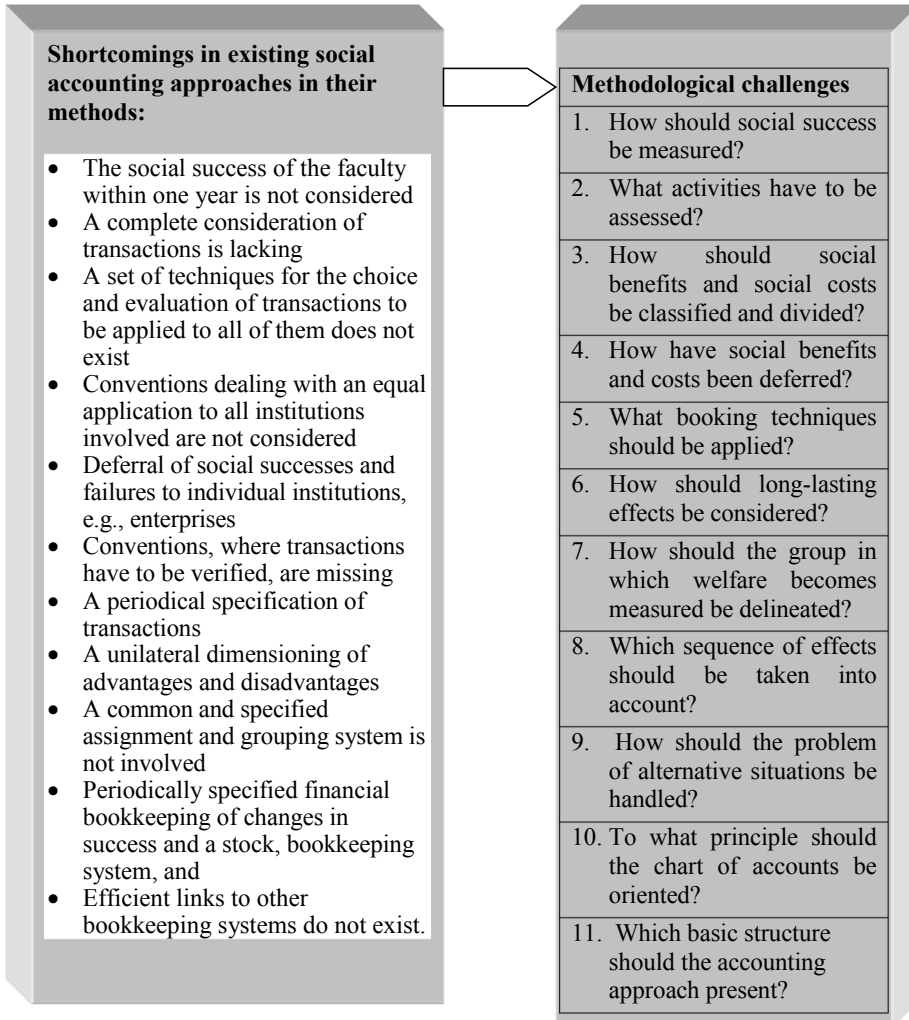


Figure 19. Methodological challenges that helped to solve the shortcomings of existing social accounting approaches

Source: Compiled by the author

To assess the faculty's activities to one measure of social value the willingness-to-pay approach identifying social values in monetary terms has to be applied. Considered operations and activities of the faculty should concern teaching, research, publications, and consultancy with their social implications. In order to avoid double accounting deferral criteria to spin off social benefits and costs not caused by the faculty had to be developed. For that purpose necessary rules were created to assign social success and to identify the social effects of the faculty's activities. Social accounting bookkeeping was applied to account for the values of social effects (externalities). The chart considered the time horizon of generations involved. It refers to those affected by the faculty activities. The evaluation of future well-being has to be done by the present generation. Delineation of the group in which welfare was measured was the region in which the faculty locates its performance operations and delivery and procurement activities and where the faculty service consequences are noticed.

The sequences of transactions and effects to be included into evaluation were limited to those that are more directly related to the faculty. An alternative situation (to measure welfare) to handle the problem was taken under the situation where the faculty would not be active.

As the aim was to identify the social net-benefit due to the faculty, the closing principle was applied.

The developed social accounting system consists of commercial accounting and of the part of social accounting not considered in commercial bookkeeping. This part is called additional social accounting.

In the empirical part the social accounting approach for the university accounting purposes was operationalized. For that a case of a faculty the FMCS of the University of Tartu in Estonia – was taken under consideration as an example. The activities of the faculties and the whole university have social implications, which are not reflected by conventional – commercial bookkeeping system. Therefore, more sophisticated social accounting and related bookkeeping tools for higher education, offering more insight into faculties' activities, are necessary. Such an approach is lacking for universities in particular.

An innovative approach was developed considering the requirements of bookkeeping on the basis of welfare theory and. The exchange and coordination of social and economic goods with a faculty is not only limited to markets and transactions booked in monetary commercial terms. As a faculty's activities are accounted for in financial dimensions, net-benefit analysis seems adequate where evaluations are done by determining the willingness to pay in favour or against an activity. The net-benefit analysis is the best-developed social evaluation scheme existing. It enables the measurement of social success and not only the fulfilment of public goals chosen in the sense of public university managers as is normally the case with indicator-based public performance solutions.

There are two basic approaches to shape social accounting using the willingness-to-pay approach. One possibility is to develop a totally new *ex-post* analysis and social accounting approach as developed by Schmitz (1980) and Tsimopoulos (1989). Another possibility is to use commercial accounting and to develop additional social accounting as suggested by Friedrich (1991). The last strategy has been followed here and developed in detail for a university faculty (the FMCS). The *ex-post* analysis on the basis of willingness to pay is already reflected in the commercial accounting of the faculty and the university. Therefore, an additional social accounting part was developed to express the willingness to pay not considered in the commercial accounting of the faculty. For both parts an *ex-post* analysis that enables the consideration of all transactions relevant to determine a change in social capital and the current net-benefit was developed the first time for social accounting. A bookkeeping approach was evolved: a chart of account suggested and the approach was presented by booking actual transactions for the year 2006. Therefore, a first basic practical attempt of social accounting and bookkeeping is available and presented here for further discussion.

The study shows how to identify relevant transactions, demonstrates the application of available evaluation methods, and develops bookkeeping techniques, which allow the underlying equation system to be solved. The suggested approach can be followed by bookkeeper who is interested in applying it. The links to the already existing university bookkeeping are demonstrated.

The approach opens the way to identify social capital and the current net-benefit in terms of net-benefit the first time. Possible extensions, but also limits of the provided approach, were discussed. More attention should be devoted to the development of more sophisticated deferral methods.

The arguments concern the effectiveness of the basic approach and the necessity to adapt the chart of account and bookkeeping rules when applying it to several faculties and the university itself. Then, the conventions of deferral are evidently much more specific and complicated. More sophisticated criteria serve to split social benefits and costs and allocate them to the institutions causing the social net-benefit. The approach offered here opens the way to specify a “type of benefit-cost assessment,” task-related “benefit-cost accounting,” “benefit-cost centre accounting” – as for a faculty or a university department – and “benefit- cost unit accounting.” Special accountings can be developed for social success for client groups or stakeholder groups or for special management decisions such as projects or extensions of a faculty, the closing down of activities, etc. Other research is necessary to broaden the welfare theoretical basis as well. This was done here only with respect to necessary evaluation techniques for transactions.

The presented bookkeeping approach contributes to the social accounting in several ways as well as allows further expansion of the approach. This is illustrated with the concluding Figure 20.

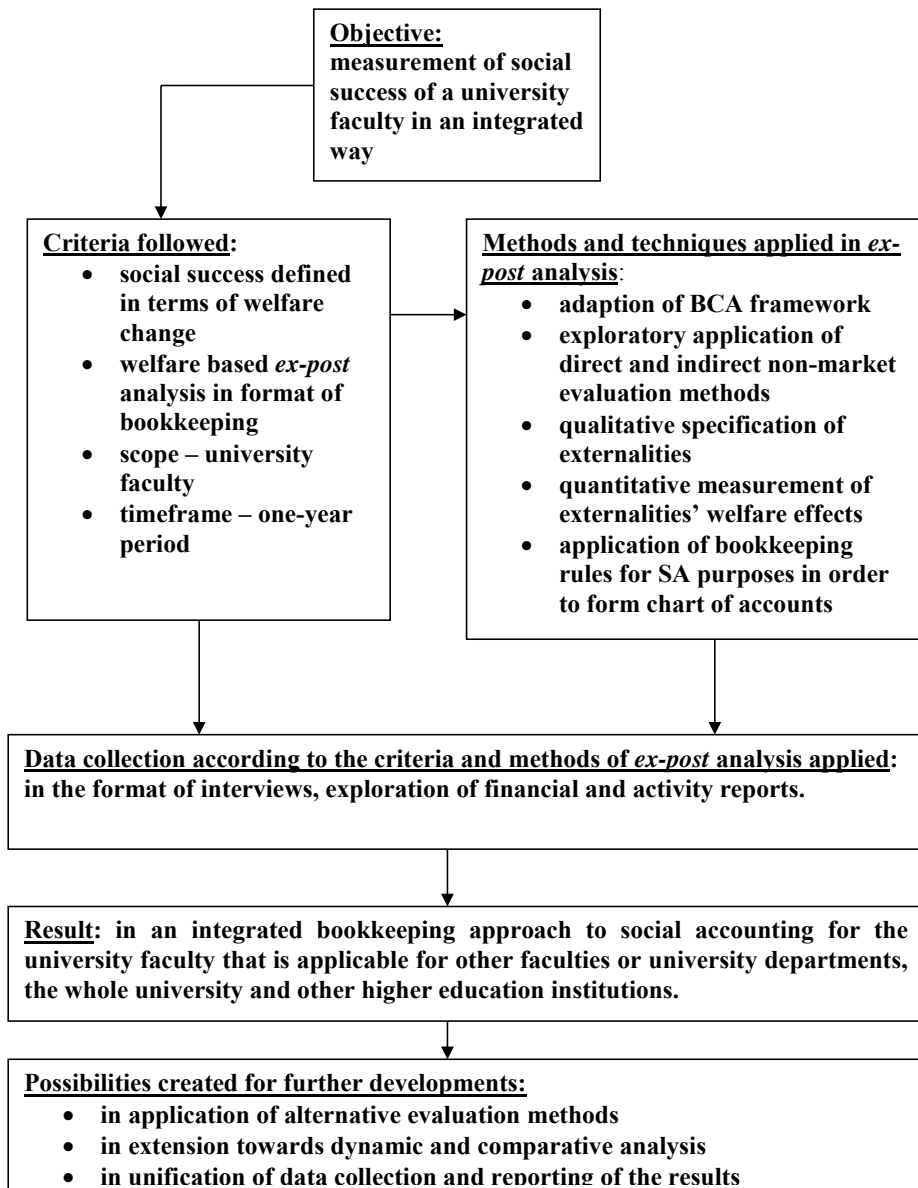


Figure 20. Contribution to social accounting by the bookkeeping approach developed for a university faculty

Source: Compiled by the author

In the future this approach might be used to formulate a normative welfare-oriented management theory of faculties or universities. The analyst could detect welfare maximal management behaviour when the social capital and/or net-benefit are going to be maximized. Similar to public finance theory, optimal conditions for changes and values of parameters as, for example, teaching, research, and finance might be considered.

These research activities are urgent as EU declarations and social accounting best practices from developed countries, national laws, and fiscal stress situations increase the demand for a social welfare-oriented management of the faculty and the university. For that purpose the social accounting approach developed here seems to be a suitable approach and starting point.

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APPENDICES

Annex I. Definitions of the key terms

Term	Definition (in the context of the current thesis)
Connected with accounting and bookkeeping	
<i>Account</i>	A structured record of transactions in monetary terms, kept as part of an accounting system.
<i>Accounting</i>	<p><u>Conventional definition</u>: The classification and recording of monetary transactions, and the presentation and interpretation of the results of those transactions in order to assess performance over a period and the financial (monetary) position at a given date.</p> <p><u>Wider definition</u>: The systematic development, tracking, and analysis of information about the social, ethical, environmental, and economic affairs of an organization for the benefit of one or more of its stakeholders.</p>
<i>Accounting period</i>	The time period covered by the accounting statements of an entity.
<i>Accounting standard</i>	Authoritative statement of how particular types of transactions and other events should be reflected in statements.
<i>Accounting system</i>	The series of tasks and records of an entity by which the transactions are processed as a means of maintaining financial records. Systems for identification, assembly, calculation, classification, recording, analysis, summarization and reporting transactions and events.
<i>Accrued expenses</i>	Charges that are brought into the financial/commercial statements at the end of a period, because although goods and services have been provided, they have not yet been charged for by the suppliers. For example, electricity, invoiced in arrears, generally requires accrual at the end of each accounting period.
<i>Assets</i>	Rights or other access to future economic benefits controlled by an entity as a result of past transactions or events. Usually divided into intangible assets – non-financial fixed assets that do not have physical substance, but are identifiable and are controlled by the entity through custody or legal rights, and tangible assets, which have a physical identity, e.g., buildings and machinery.
<i>Audit</i>	A systematic examination of the activities and status of an entity, based primarily on investigation and analysis of its systems, controls, and records.
<i>Bookkeeping</i>	The recording and summarizing of records in accordance with agreed procedures. / Recording of monetary transactions, appropriately classified, in the financial records of an entity, either by manual means or otherwise.
<i>Balance (on an account)</i>	The difference between the totals of the debit and credit entries in an account.

Annex 1. Continuation

Term	Definition (in the context of the current thesis)
<i>Chart of accounts</i>	A comprehensive and systematically arranged list of the named and numbered accounts applicable to an enterprise.
<i>Code</i>	A system of symbols designed to be applied to a classified set of items to give brief, accurate reference, and facilitate entry, collation, and analysis.
<i>Commercial/financial accounting</i>	The classification and recording of the monetary transactions of an entity in accordance with established concepts, principles, accounting standards, and legal requirements and their presentation, by means of profit and loss accounts, balance sheets and cash flow statements, during and at the end of an accounting period.
<i>Concept</i>	Principles underpinning the preparation of accounting information.
<i>Corporate social accounting</i>	The reporting of the social and environmental impact of an entity's activities upon those who are directly associated with the entity (employees, customers, suppliers, etc.) or those who are in any way affected by the activities of the entity, as well as an assessment of the cost of compliance with relevant regulations in this area.
<i>Current asset</i>	Cash or other assets, e.g., stock, debtors, and short-term investments, held for conversion into cash in the normal of activity.
<i>Current liabilities</i>	Liabilities that fall due for payment within one year. They include the part of long-term loans due for repayment within one year.
<i>Double entry book-keeping</i>	The most commonly used system of bookkeeping based on the principle that every financial transaction involves the simultaneous receiving and giving of value, and is therefore recorded twice.
<i>Entity/economic unit</i>	An economic unit that has a separate, distinct identity.
<i>Ex-ante</i>	Before the event. An <i>ex-ante</i> standard, budget, or analysis is set or done before a period of activity commences, and is based on the information available at that time on expected levels of cost, performance, etc.
<i>Ex-post</i>	After the event. An <i>ex-post</i> standard, budget, or analysis is set or done after the end of a period of activity.
<i>Human resource accounting</i>	The identification, recording and reporting of the investment in, and return of the employment of, the personnel of an organization.
<i>Liabilities</i>	An entity's obligations to transfer economic benefits as a result of past transactions or events.
<i>Net assets</i>	The excess book value of assets over liabilities, including loan, capital.

Annex 1. Continuation

Term	Definition (in the context of the current thesis)
<i>Non-current assets</i>	Any asset, tangible or intangible, acquired for retention by an entity for the purpose of providing a service to the business, and not held for resale in the normal course of activity.
<i>Social responsibility accounting</i>	The identification, measurement, and reporting of the social costs and benefits resulting from economic activities.
<i>Stakeholders</i>	Groups or individuals having a legitimate interest in the activities of an organization, generally comprising customers, employees, the community, and shareholders.
<i>Transaction</i>	A change which shows flow or change in stocks.
Connected with welfare economics and benefit-cost analysis	
<i>Consumer surplus</i>	The difference between the amount a consumer is prepared to pay and the amount actually paid.
<i>Cost-benefit analysis/benefit-cost analysis</i>	A comparison between the cost of the resources used, plus any other costs imposed by an activity (e.g., pollution, environmental damage) and the value of the financial and non-financial benefits derived.
<i>Society</i>	All elements of the environment external to the reporting and accounting entity, including individuals, other companies, and the population.
<i>Social resources</i>	Tangibles or intangibles that have a net positive value to society.
<i>Social benefits</i>	Any benefit to society (or to any element of society), whether economic or non-economic, internal or external. Thus social benefits include those benefits provided by an entity for which it is compensated as well as those external economies and bargains for which no compensation or inadequate compensation is received.
<i>Social cost</i>	Any cost, sacrifice, or detriment to society or to any element of society, whether economic or non-economic, internal or external. Social costs include sacrifices for which compensation is made as human services used and paid for as well as detriments not paid for, for example, air pollution.
<i>Utility</i>	The benefit received from a good or service. It can be an objective benefit in the sense of usefulness or a subjective satisfaction.
<i>Value</i>	Quantified worth or utility. The value of any resource depends on the existence of some social welfare function. It means that measurement of any benefit or cost partially reflects such a function.
<i>Welfare economics</i>	A study of the determinants of individual or social welfare.

Source: Compiled by the author based on Management Accounting Official Terminology (2000); Institute of Social and Ethical AccountAbility (2000); Estes (1976); Rutherford (2007)

Annex 2. An example of a balanced scorecard for a faculty of the University of Tartu (in the year 2011)

	Activity or objective	Measurer of result	Target value
Interest groups	Interest of student candidates	Total intake	Stable in comparison with the previous year
	Student satisfaction	Opinions in the electronic study-information system (<i>SIS</i>)	Limit value $x \geq$ than in the previous year
	Services for other faculties	Given ECTS	Growth in comparison with the previous year
	Exploiting schooling market in Tallinn	Number of students in Tallinn	Growth in comparison with the previous year
	Offering applied research for economic practices	Volume of contracts	Growth in comparison with the previous year
Processes	Actuate teaching of entrepreneurship in other faculties	Deadline	Fall 2011
	Opening additional specialty in export management	Deadline	2012
	Marketing of the English Bachelor of Arts curriculum	Number of students	Growth in comparison with the previous year 100%
	Application of the second target financed science theme	Deadline	2011
	Raising the number of publications in scientific journals	Number of 1.1 and 1.2 publications	50
	Formation of the center for mentoring science policy	Deadline	2011
	Actuate system for complementary training of entrepreneurship teachers	Deadline	2011
	Science cooperation with the Centre for Applied Social Science (CASS)	Number of faculty staff involved	Growth in comparison with the previous year
	Increase visibility of the faculty in Estonia	Number of authors who have published popular-scientific publications	20

Annex 2. Continuation

	Activity or objective	Measurer of result	Target value
Deve- lopment pre- sumption	Retaining staff satisfaction	Evaluation for dean's work	Stability in comparison with the previous year
	Taking into account students evaluations on remuneration of teaching staff	Deadline	2011
	Creating distant-training center for actuation of intensive business management course in Tallinn	Deadline	2011
	Renewing the homepage	Deadline	Fall 2011
	Integration with the university IT-system	Deadline	Fall 2011
Finances	Application of state teaching offer	Amount of money	Growth in comparison with the previous year
	Application of science finance	Amount of money	Growth in comparison with the previous year

Source: *Akadeemiliste üksuste tulemuskaardid* (2011). Intra information system of the University of Tartu (<http://www.ut.ee>)

In general the result indicators in scorecard are divided into seven main groups:

1. Teaching activity
2. Doctoral study
3. Complementary study
4. Research and development activity
5. Internalization
6. Evaluation and optimization of resources
7. Directed to public

And under these groups the following indicators are applied:

1. Students satisfaction
2. Staff satisfaction
3. Volume of contracts concluded with entrepreneurs
4. Share of research and development (R&D) benefit in the faculty budget
5. Share of international funds in the R&D benefit
6. Income per academic staff member
7. Share of students who have graduated from the BA level in the nominal time
8. Share of students who have graduated from the Master level in the nominal time
9. Share of students who have graduated from the PhD level in the nominal time
10. Number of high-level publications per academic staff member
11. Share of ordinary staff holding PhD
12. Share of international scientists and teaching staff
13. Share of international students in Master study program
14. Share of international students in Doctoral study program

Source: *Ibid.*

Annex 3. Overview of topics for introduction sent for the first meeting at the FMCS

1. Access to commercial bookkeeping results/accounts concerning the year 2006 (possibility to approach the Financial Office of the UT).
2. General activity report of the FMCS (including the information about study programs in all levels of teaching).
3. Accreditation report if there exists one.
4. Structure of academic staff, including guest academic staff.
5. Number of students in all study levels.
6. Information about research and cooperation programs and projects.
7. Information about publications.
8. Cooperation with other faculties, colleges, and institutions of UT and others in teaching and research.
9. Organizing conferences and participation in conferences.
10. General information about buildings and facilities.

Annex 4. Questions for additional social balance development for the Faculty of Mathematics and Computer Science for the year 2006

- 1) Who owns the buildings, what is the value of the building, which depreciation rate is applied?
 - a) Size (m²)? (All levels)
 - b) Average rent in Tartu for m²?
 - c) Construction costs
 - d) Who is the owner?
 - e) Way of financing, e.g., public debts?

- 2) Do the buildings block other activities?
 - a) Is extended parking needed?
 - b) Are there other developments, e.g., house construction, road or constructions blocked?

- 3) Are the buildings used for other events apart from the activities of the faculty, e.g., city, associations, clubs, meetings, etc.?
 - a) How many events? What is number of rooms and persons?
 - b) Are there special rents?

- 4) Does the building offer parking possibilities to people not associated with the faculty?
 - a) If, yes, then:
 - b) How many?
 - c) How much have to be paid (e.g., training)?

- 5) Does the building features enable special cost reductions, fewer emissions?
 - a) Yes?
 - b) Have there been cost assessment of saving, by paper collection, central heating, special isolations?

- 6) Does the faculty building serve as a tourist attraction?
 - a) Yes or No?
 - b) Are there visiting groups of architects?
 - c) How many? (An expert opinion)

- 7) Does the faculty attract tourists and visitors related to the activities of UT? How many?
 - a) Other visitors? (events of other institutions, guest lectures, etc. How many?)

- 8) How much do they cost for the faculty? How much do they spend in Tartu? (In town, accommodation, transport, conference fees, shopping, etc.)?
 - a) Costs?
 - b) How much do visitors spend in Tartu? (In town: accommodation, transport, conference fees, shopping, etc.)

- c) What other activities for which visitors come are situated in the faculty?
(Cafeteria, rented rooms to business, associations)
Are these considered in the commercial bookkeeping of UT?
- 9) How much yearly payment is received from bachelor's students in the different institutes and fields of education?
a) Fields of studies, a number of students of different subjects and courses leading to different examinations?
b) How many achieve diplomas, etc.?
c) How much have to pay for courses?
- 10) How many of these students are financed by the state? How much is received for a year per student?
a) Please give information.
b) How many places?
c) What amount per capita?
- 11) How much do students who are not financed by the state pay?
a) Per studies a year according to different educations?
b) Per capita?
- 12) Please give an expert opinion at what amount of fees per students the faculty would lose the whole demand?
a) 50% or more?
b) Are there competitors in Tartu?
c) Are there competitors in other regions?
- 13) Please answer questions (9) to (12) for master's students.
(9) How much yearly payment is received from master's students in the different departments and fields of education?
a) *Fields of studies, a number of students of different subjects and courses leading to different examinations?*
b) *How many achieve diplomas, etc.*
c) *How much have they to pay for courses?*
- (10) How many of these students are financed by the state? How much is received for a year per student?*
a) *Please give information.*
b) *How many places?*
c) *What amount per capita?*
- (11) How much do students who are not financed by the state pay?*
a) *Per studies a year according to different educations?*
b) *Per capita?*
- (12) Please give an expert opinion at what amount of fees per students the faculty would lose the whole demand?*
a) *50% or more?*
b) *Are there competitors at Tartu?*
c) *Are there competitors in other regions?*

- 14) How much more do students (9) to (13) earn than those without these qualifications if they successfully passed their respective examinations (baccalaureate, master)?
- In the public sector?
 - In private sectors?
- 15) Is there any information about cost savings for industries because the students are educated nearby?
- Tailor made courses for industries?
 - Saved travel costs and fees for competitive vocational training?
- 16) Are there especially supported industries such as tourism, hotels, etc.?
- Holiday industries
 - Hotels
 - Spa
 - Other industries?
 - Any information about cost savings, etc.?
- 17) Do students work with local industries?
- How many or what share of full time students?
 - How much, how many hours of work?
 - Earning per hour? (An expert opinion)
- 18) Do students stay after graduation in the Tartu region?
- How many/ (%)?
- 19) How many move to Tallinn?
- How many/ (%)?
- 20) How many move to other regions?
- How many/ (%)
- 21) How many go abroad?
- How many/ (%)?
- 22) Do students save money, income, etc., through studying in the faculty? How many come from other regions?
- From which regions do they come? How many? (%)
 - Is there an investigation about the advantages of students who study at Tartu?
- 23) Is the faculty engaged in distance learning and teaching? How many students? Questions (9) to (13).
- E-courses, distance bachelor?
 - What are the cost advantages for students?
 - For the faculty?
- 24) How high are the payments (expenses) of students in town?
- Costs for housing
 - Food, free time
 - Transportation

- d) Shopping
 - e) Are there investigations of tourist department and/or town?
- 25) How much money is attracted by the staff through research projects accounted for in the faculty and university? Is that considered totally in the official bookkeeping of UT?
- a) How much, in commercial accounting?
 - b) Additional projects not accounted (An expert opinion)
- 26) Is there an inflow apart e.g., personal – that is not considered in UT accounting? What percent should be assumed?
- a) e.g., language teachers,
 - b) Percent?
- 27) Are there effects of such projects on the quality of teaching?
- a) Yes?
 - b) How are additional costs/benefits received from labor market measured?
- 28) Are there cost savings because experts offering the knowledge have to be attracted from outside of the faculty?
- a) How many cases?
 - b) What is the wage difference?
- 29) How much does the income of academic staff vary according to their publications or research success exemplified by publications? Is there any point system of the faculty or a similar system applied? What are the monetary effects on income?
- a) Please indicate the point system, if it is applied.
 - b) How many points per type of publication? (EEK, income calculation considered)
- 30) Is there information about monetary value and the number of books, copies printed and sold, articles, reports, etc.?
- a) Number, subjects
 - b) Copies
 - c) Average book prices
- 31) What are expenses of scientific co-operation and of vocational training together with industries? Which co-operations do exist?
- a) Amount in millions of EEK?
 - b) Erasmus program?
 - c) Other projects?
 - d) Educational program with practices in firms, etc.?
- 32) How much money was attracted but not stated in the official bookkeeping?
- a) Do you have an associated institution that takes care of such opportunities?
 - b) Are there legally independent institutes, associations of teachers, researchers involved in attracting and managing projects, vocational programs, etc.?

- 33) What kinds of conferences were organized? How many guest lecturers were invited?
- Number of conferences?
 - Fees of participants?
 - How were they considered in commercial bookkeeping?
- 34) Does the faculty – as an institution – do consulting? Does consulting take place on the personal level of employees, academic staff including researchers?
- If yes, then:
 - What kinds?
 - What is the approximate value in monetary terms (EEK)?
 - Is it considered in commercial bookkeeping?
- 35) Is there an average percentage of additional income of academic staff, teachers, and researchers?
- From consulting (teachers, employees, researchers)?
 - Teaching at other institutions?
 - What is the percent (an expert opinion)?
- 36) Does income exist from patents and donations to the faculty? Are there other measures to support such activities? Do staff members receive such support at the personal level?
- Yes or no?
 - Is it considered in the point system?
- 37) Where are the nearest opportunities to get the same education as in the faculty?
- Other institution
 - Please name, activity in which field?
 - How many students?
- 38) Has the faculty in some way contributed to the development of the Estonian language?
- Have the institutes and departments, and academic staff published – dictionaries, handbooks, vocational handbooks?
 - Have they developed plans, publications for the city?
 - Other specialized topics?
- 39) Have any accidents occurred in the faculty? What damages were caused?
- Fires, etc.
 - Costs of repairs
 - Accidents by staff,
 - Students,
 - Visitors of events, etc.
- 40) What travel costs and accident costs have been avoided?
- Travel costs to alternative education schools, etc.?
 - Tallinn
 - Others

- 41) What share of staff belonging to other fields of science is located in the faculty?
Which staff originates from other faculties?
- a) Size of staff according to categories, e.g., administration, academic staff, teachers, researchers, housekeeping, persons engaged in projects not belonging to the faculty?
 - b) Size of staff in departments;
 - d) Teaching by faculty members located in Tartu (number, payments);
 - e) Teaching from other faculties of the UT;
 - f) Import of non-mathematicians for teaching, from
 - Tartu
 - Other institutions
- 42) What are the expenses for these groups?
- a) Please give at least percentages.
 - b) Please state where they are considered in the commercial accounts.
- 43) Are there specific activities of the faculty not mentioned in the foregoing questions?
- a) Which ones?
 - b) How many?
 - c) What is an indicator for these activities in money terms?

Thanks for your kind cooperation!

**Annex 5. Additional questions for the Faculty
of Mathematics and Computer Science after
the interview at the Faculty (16.01.2012)
for a meeting on August 29, 2012**

1. Prohibitive fee for studies in PhD, Master and BA level? Assumption about opportunity cost.
2. Doctoral School: how many courses are from the FMCS of UT (or proportion by the FMCS of UT) in doctoral school?
3. How many courses on average has the academic staff to teach per year: professors, docents, lecturers, researchers, and assistants.
4. Resources from international grants and funds of doctoral school, in budget?
5. Participation in the research centers/contribution to the research centers.
6. Consulting to firms and public administration institutions.
7. Size (average) of seminar groups?
8. Estonian grants and projects in 2006?
9. Is there any payment for project application writing? For the Estonian and the EU projects?
10. How many staff members participated in international conferences outside of Estonia?
11. How many events per month have Scientific Schools? Do the pupils come to the faculty or vice versa? How many pupils are involved in these Scientific Schools? Where do the events take place?
12. Number of members on the faculty board and council.
13. Councils of institutes (one was found at the webpage of the FMCS – Institute of Mathematical Statistics – with 11 members).
14. How much time they spent per month?
15. Calculate for monitoring and control 10 or 11 month?
16. Have there been accidents at the FMCS?
17. Does the faculty (institutes) have a self-analysis report or any accreditation report for the year 2006?

Annex 6. The FMCS activities and their related social benefits (B) and costs (C)

Stocks/Current benefits and costs	Teaching (1)									
	Bachelor's students	Master's students	Vocational training	Open University	Joint teaching projects	Doctoral students	Distance teaching	Examinations	Production of teaching material text books	
Knowledge of bachelor	B3 C3				B2			B2	B2	
Knowledge of master	B2	B3 C3			B2		B2 C2	B2	B2	
Knowledge of doctor		B2				B3 C3		B2		
Knowledge from Open University	B1	B1		B3 C3			B2 C2	B2	B2	
Knowledge vocational training, distance teaching	B1	B1	B3 C3		B2		B2 C2	B2	B3	
Knowledge of teaching staff		B2		B1	B2	B2	B1	B1	B3 C3	
Knowledge of scientists						B3 C3	B1	B1	B1	
Lasting research results						B1			B1	
Increasing international cooperation capacities						B2				

Annex 6. Continuation

Stocks/Current benefits and costs	Teaching (I)									
	Bachelor's students	Master's students	Vocational training	Open University	Joint teaching projects	Doctoral students	Distance teaching	Examinations	Production of teaching material	text books
Increase of research capacities: staff										
Increase of research capacities: equipment										
Increase of research capacities: buildings										
Increase of research capacities: library									B2	
Contribution to research centers									B1	
Capacity to consult firms										
Capacity to consult governments										
Development of Estonian language	B1	B1	B1	B1	B1	B1	B2	B1	B3	C3
European funds							B1			
Buildings										
Increased employment										

Annex 6. Continuation

Stocks/Current benefits and costs	Teaching (I)									
	Bachelor's students	Master's students	Vocational training	Open University	Joint teaching projects	Doctoral students	Distance teaching	Examinations	Production of teaching material	text books
Additional social Assets and Liabilities										
Increased infra-structure	B2	B2	B2	B2	B2	B2	B2		B1	
Changes of profits, rents of other firms	B2	B2	B2	B2	B2	B2	B2		B1	
Increase of tax receipts. of governments										
Value of current assets not booked with faculty										
Future financial obligations										
Closing down of consultancy institutions		C1	C1	C1	C1	C1	C1			
Loss of staff	C2	C2	C2	C2	C2	C2	C2	C2	C1	
Loss of resources through political activities	C1	C2	C1	C1	C1	C2	C1	C1	C1	
Accidents	C2	C1	C2	C2	C1	C1	C1	C1	C1	
Emissions	C2	C1	C2	C2	C1	C1	C1	C1		

Annex 6. Continuation

Stocks/Current benefits and costs	Research (2)									
	Edu- cation of scien- tists	Publi- cation of research results	Infor- mation of the public	Con- sulting of institutions	Increase of international cooperation capacities	Increase of research capacities: staff	Increase of research capacities: equipment	Increase of research capacities: buildings	Increase of research capacities: library	Re- viewing
Knowledge of bachelor	B2	B1				B2		B2		
Knowledge of master	B3	B2	B1	B1	B1	B2	B1	B2	B2	
Knowledge of doctor	B3	B3	B2	B2	B2	B3	B1	B3	B3	B2
Knowledge from Open University	B1	B1	B1	B1		B1	B2	B1	B1	
Knowledge Vocational training distance teaching	B1	B1	B1	B1		B2	B1	B1	B1	
Knowledge of teaching staff	B2	B2	B2	B2	B2	B3	B1	B2	B2	B3
Knowledge of scientists	B3 C3	B3	B2	B2	B3	B3	B2	B1	B3	B3
Lasting research results	B1	B3 C3	B2	B2	B3	B3 C3	B2	B2	B2	B1
Increasing international cooperation capacities	B2	B3	B3	B1	B3 C3	B3	B1	B2	B2	B3
Increase of research capacities: staff	B3	B3	B1	B2	B3	B3 C3	B1	B3	B2	B1

Annex 6. Continuation

Stocks/Current benefits and costs	Research (2)									
	Edu- cation of scien- tists	Publi- cation of research results	Infor- mation of the public	Consulting of institutions	Increase of international cooperation capacities	Increase of research capacities: staff	Increase of research capacities: equipment	Increase of research capacities: buildings	Increase of research capacities: library	Re- viewing
Increase of research capacities: equipment	B1	B1		B1	B1	B1	B3 C3	B3	B1	
Increase of research capacities: buildings							B1	B3 C3		
Increase of research capacities: library	B2	B2	B1	B1	B1	B2		B3	B3 C3	B1
Contribution to research centers		B3	B2	B2	B3 C3	B3 C3	B3	B3	B2	
Capacity to consult firms	B3	B2	B3	B3 C3	B1	B1	B1	B1	B2	B1
Capacity to consult governments	B3	B2	B3	B3 C3	B1	B1	B1	B1	B2	B1
Development of the Estonian language	B2	B3 C3	B1	B1	B1	B1			B1	
European funds			B1	B1	B3	B2	B1	B2	B1	B1
Buildings							B1	B3 C3	B2	
Increased employment	B1	B1		B2	B1	B3 C3		B2	B2	

Annex 6. Continuation

Stocks/Current benefits and costs	Research (2)									
	Edu- cation of scien- tists	Publi- cation of research results	Infor- mation of the public	Consulting of institutions	Increase of international cooperation capacities	Increase of research capacities: staff	Increase of research capacities: equipment	Increase of research capacities: buildings	Increase of research capacities: library	Re- viewing
Increased infrastructure		B2	B1	B3 C3	B1	B2	B2	B3		
Changes of profits, rents of other firms	B1		B1		B1	B2			B1	
Increase of tax receipts of governments		B2			B3	B2	B2	B1		
Value of current assets not booked with faculty		B3								
Future financial obligations				B1 C1	B1 C1	C2	C2	C3	C1	
Closing down of consultancy institutions	C2	C2	C1	C3	C1	C1	C1	C1	C1	C1
Loss of staff	C3	C3	C3	C3	C3	C1	C1	C1	C1	C1
Loss of resources through political activities	C1	C2	C1		C1					
Accidents	C1						C1	B1	C1	
Emissions						B1 C1	B1	B2		

Annex 6. Continuation

Stocks/Current benefits and costs	Research (2)				
	Rising funds	Writing proposals	Writing articles, books	Reporting	Organizing conferences, meetings
Additional social assets and liabilities					
Knowledge of bachelor					
Knowledge of master	B1	B1	B2		
Knowledge of doctor	B1	B1	B3	B1	B3 C2
Knowledge from Open University			B1		
Knowledge: vocational training distance teaching			B1		
Knowledge of teaching staff	B2	B3 C3	B3 C3	B2	B2 C2
Knowledge of scientists	B2	B3 C3	B3	B2	B3
Lasting research results		B1 C1	B3	B2	B2
Increasing international cooperation capacities	B3	B3 C3	B2	B2	B3 C3
Increase of research capacities: staff	B3	C2	B3	B2	C1
Increase of research capacities: equipment	B3 C3				
Increase of research capacities: buildings					
Increase of research capacities: library	B2		B2	B1	B1
Contribution to research centers	B3 C3	B1	B2	B2	B3
Capacity to consult firms	B1		B1		B1

Annex 6. Continuation

Capacity to consult governments	B1		B1		B1	B1
Development of Estonian language		B1	B1			B1
European funds	B2	B3 C3		B3		B2
Buildings	B1					
Increased employment	B2	B3 C3	B1			B1
Increased infrastructure	B2					
Changes of profits, rents, etc., of other firms			B1			B1
Increase of tax receipts of governments	B1		B1			B1
Value of current assets not booked with faculty						
Future financial obligations	C1					
Closing down of consultancy institutions	C2	C1	C1	C1	C1	C1
Loss of staff	C1	C3	C3	C2	C2	C2
Loss of resources through political activities		C1	C1	C1		
Accidents						C1
Emissions						

Annex 6. Continuation

Stocks/Current benefits and costs	Consulting (3)									
	To firms	To jurisdictions, public offices in management, economics	Participation in regional, urban, sector planning	Participation in parliaments	Participation in chambers	Participation in councils of public institutions	Contacts with the EU	Contacts with scientific bodies		
Additional Social assets and Liabilities										
Knowledge of bachelor	C1	C1	C1	C1	C1	C1				
Knowledge of master	B1 C1	B1 C1	B1 C1	B1 C1	B1 C1	B1 C1				
Knowledge of doctor	B1	B1	B1	B1	B1	B1	B3 C3	B2		
Knowledge from Open University	B1	B1 C1	B1 C1	B1 C1	B1	B1	B1			
Knowledge Vocational training distance teaching	B1	B1			B1	B1				
Knowledge of teaching staff	B3 C3	B3 C3	B3	B3 C3	B2	B3 C3	B1	B2		
Knowledge of scientists	B2	B2 C1	B3 C3	B2	B1	B2	B1	B3 C3		
Lasting research results	B1	B1	B2	B1				B2		
Increasing international cooperation capacities	B1	B1	B1				B3 C3	B3		
Increase of research capacities: staff	B3 C3	B3 C3	B3	C1			B1	B3 C3		
Increase of research capacities: equipment	B1		B1				B1	B1		

Annex 6. Continuation

Stocks/Current benefits and costs	Consulting (3)							
	To firms	To jurisdictions, public offices in public management, economics	Participation in regional, urban, sector planning	Participation in parliaments	Participation in chambers	Participation in councils of public institutions	Contacts with the EU	Contacts with scientific bodies
Additional Social assets and Liabilities								
Increase of research capacities: buildings								
Increase of research capacities: library	B1	B1	B1				B1	B1
Contribution to research centers	B2	B2	B2	B1		B1	B3 C3	B3 C3
Capacity to consult firms	B3	B1		B3	B3	B2	B1	
Capacity to consult governments	B1	B3 C3	B3 C3	B2	B2	B2	B1	
Development of Estonian language	B1	B1	B1	B1	B1	B1		
European funds	B1	B1	B1		B1		B3	B1
Buildings								
Increased employment	B2	B2	B2				B1	B1
Increased infrastructure	B2	B2	B2	C1			B1	B1
Changes of profits, rents of other firms	B3							
Increase of tax receipts of governments	B1	B1	B1			B2		

Annex 6. Continuation

Stocks/Current benefits and costs	Consulting (3)							
Additional Social assets and Liabilities	To firms	To jurisdictions, public offices in public management, economics	Participation in regional, urban, sector planning	Participation in parliaments	Participation in chambers	Participation in councils of public institutions	Contacts with the EU	Contacts with scientific bodies
Value of current assets not booked with faculty								
Future financial obligations								
Closing down of consultancy institutions	C3	C3	C3	C2	C2	C2	C2	C2
Loss of staff	C3	C3	C3	C3	C2	C2	C2	C3
Loss of resources through political activities			B3 C1	B3 C3		B3 C3		
Accidents								
Emissions								

Annex 6. Continuation

Stocks/Current benefits and costs	Management activities (4)									
	Monitoring activities	Financial management	Staff management	Faculty decision-making and planning	University decision making	Management of labs, special departments	Contacts with other faculties	Support of Colleges	Repre-sentation of faculty	
Knowledge of bachelor	B3 C3	B1 C1	B1 C1	B1 C1		B3 C3	B3 C3	B3 C3		
Knowledge of master	B3 C3	B1 C1	B1 C1	B1 C1		B3 C3	B1 C1 C3	B3 C3		
Knowledge of doctor	B3 C3	B2 C2	B2 C2	B1 C1	B1 C1	B3 C3	B3 C3		B1	
Knowledge from Open University	B3 C3	B1 C1	B1 C1	B1 C1		B3 C3	B3 C3		B1	
Knowledge vocational training, distance teaching	B3 C3	B1 C1	B1 C1	B1 C1		B3 C3	B1 C1	B3 C3		
Knowledge of teaching staff	B3 C3	B2 C2	B3 C3	B3 C3	B1 C1	B3 C3	B1 C1 C3	B1 C1 C3	B1	
Knowledge of scientists	B3 C3	B2 C2	B3 C3	B3 C3	B1 C1	B3 C3	B1 C1 C3	B1 C1 C3	B1	
Lasting research results	B3 C3	B2 C2	B2 C2	B2 C2	B1 C1	B3 C3	B1 C1 C3	B2 C2 C3		
Increasing international cooperation capacities		B1 C1	B3 C3	B3 C3	B3 C3	B3 C3	B2 C2 C3	B2 C2 C3	B3 C3	
Increase of research capacities: staff	B3 C3	B2 C2	B3 C3	B3 C3	B3 C3	B2 C2	B1 C1 C3	B2 C2 C3	B3 C3	

Annex 6. Continuation

Stocks/Current benefits and costs	Management activities (4)									
	Monitoring activities	Financial management	Staff management	Faculty decision-making and planning	University decision making	Management of labs, special departments	Contacts with other faculties	Support of Colleges	Repre-sentation of faculty	
Additional social assets and liabilities										
Increase of research capacities: equipment	B3 C3	B2	B1 C1	B3 C3	B3 C3	B3 C3	B3 C3		B1	
Increase of research capacities: buildings		B2	B2 C2	B3 C3	B3 C3	B1 C1	B3 C3		B2	
Increase of research capacities: library		B2	B1 C1	B3 C3	B3 C3	B1 C1	B1 C1			
Contribution to research centers	B3 C3	B2 C2	B3 C3	B3 C3	B3 C3	B3 C3	B2 C2 C3	B3 C3	B2	
Capacity to consult firms		B1 C1	B3 C3	B1 C1		B1 C1	B1 C1		B3 C3	
Capacity to consult governments		B1 C1	B3 C3	B1 C1		B1 C1	B1 C1		B3 C3	
Development of Estonian language			B1	B1		B1	B3 C3			
European funds		B3C3	B2 C2	B3 C3	B1 C1	B2 C2	B1C1	B2 C2	B1	
buildings	B3C3	B3C3	B1 C1	B3 C3	B3 C3	B2 C2	B3C3		B3	
Increased employment		B2 C2	B3 C3	B2 C2	B1 C1	B2 C2	B1 C1		B2	
Increased infra-structure		B2 C2	B2 C2	B2 C2	B2 C2	B2 C2	B3 C3	B3 C3	B3 C3	

Annex 6. Continuation

Stocks/Current benefits and costs	Management activities (4)									
	Monitoring activities	Financial management	Staff management	Faculty decision-making and planning	University decision making	Management of labs, special departments	Contacts with other faculties	Support of Colleges	Representation of faculty	
Additional social assets and liabilities										
Changes of profits, rents of other firms		B1 C1		B1 C1	B1 C1	B1 C1				
Increase of tax receipts of governments		B1 C1	B1 C1	B1 C1	B1 C1	B1 C1				
Value of current assets not booked with faculty										
Future financial obligations		B3 C3	B3 C3	B2 C2	B2 C2	B2 C2	B3 C3	B2 C2	B1 C1	
Closing down of consultancy institutions		C2	B3 C3	C2	B1 C1	C2	C1	C1		
Loss of staff		C3	B3 C3	B2 C2	C2	C2	B1B1		B1 C1	
Loss of resources through political activities		C1	B3 C3	B1 C1	B1 C1	B2 C2	B1 C1	B1 C1	B1 C1	
Accidents			B1 C1			B1 C1				
Emissions		B1C1				B1 C1				

Annex 6. Continuation

Stocks/Current benefits and costs	Further activities (4)			
Additional social assets and liabilities	Contacts with schools	Attraction of visitors	Public relations	Advertisement
Knowledge of bachelor	B3 C3	B1		B1
Knowledge of master	B1	B1	B1	B1
Knowledge of doctor			B1	B1
Knowledge from Open University		B1	B1	B1
Knowledge from vocational training, distance teaching	B1		B1	B1
Knowledge of teaching staff	B1			B3 C3
Knowledge of scientists				
Lasting research results		B1	B1	
Increasing international cooperation capacities		B2	B2	B3 C3
Increase of research capacities: staff		B1	B3 C3	B2
Increase of research capacities: equipment		B1	B1	
Increase of research capacities: buildings		B1		
Increase of research capacities: library		B1		
Contribution to research centers		B1	B3 C3	B3 C3
Capacity to consult firms			B3 C3	B3 C3
Capacity to consult governments	B1		B3 C3	B3 C3
Development of Estonian language	B3 C3			

Annex 6. Continuation

Stocks/Current benefits and costs	Further activities (4)			
Additional social assets and liabilities	Contacts with schools	Attraction of visitors	Public relations	Advertisement
European funds				
Buildings				
Increased employment		B3 C3		B1
Increased infrastructure	B3 C3			B3 C3
Changes of profits, rents of other firms		B3 C3		
Increase of tax receipts of governments		B3 C3		
Value of current assets not booked with faculty				
Future financial obligations	B1			
Closing down of consultancy institutions	C1			C1
Loss of staff	C1	C1		C1
Loss of resources through political activities		B1 C1		B1 C1
Accidents				
Emissions				

Source: Compiled based on Friedrich and Eerma (2009)

Annex 7. The chart of individual commercial accounts of the FMCS

a) Stock Accounts –Non-Current Assets (in million EEK)

Building	IFA 001		
112.870		IFT 711	112.870
112.870			112.870

Land property	IFA 011		
0.109		IFT 711	0.109

Investment property	IFA 021		
0		IFT 711	0

Vehicles	IFA 031		
0		IFT 711	0

Machinery and equipment	IFA 041		
3.979		IFT711	3.979
3.979			3.979

Capitalized expenses on leased assets	IFA 051		
0		IFT711	0
0			0

Prepayment for property	IFA 061		
0		IFT711	0
0			0

Other items of property, equipment	IFA 071		
0		IFT711	0
0			0

b) Stock Accounts – Non-Current Assets – Financial Assets (in million EEK)

Investment in associates IFA 101

0	IFT711	0
0		0

Long-term claims IFA 111

0	IFT711	0
0		0

Credit granted by faculty IFA 121

0	IFT711	0
0		0

c) Stock Accounts – Circulating Capital – Current Assets (in million EEK)

Inventories: Materials IFA 201

0.296	IFT711	0.296
0.296		0.296

Work in progress IFA 211

0	IFT711	0
0		0

Manufactured goods IFA 221

0	IFT711	0
0		0

Non-current assets for sale IFA 231

0	IFT711	0
0		0

Pre-payments for sale and inventories IFA 241

0	IFT711	0
0		0

Customer, and other receivables IFA 251

0	IFT711	0
0		0

Intangible assets IFA 261

0.246	IFT711	0.246
0.246		0.246

Cash on hand, current account, short-term deposits, overnight deposits IFA281

3.306	IFT711	3.306
3.306		3.306

Accrued income IFA 291

0	IFT711	0.159
0		0

d) Stock Accounts – Net Assets (in million EEK)

Capital IFL 301

IFT711	0	0
	0	0

Statutory capital reserve IFL 311

IFT711	0	0
	0	0

Accumulated surpluses of faculty IFL 321

IFT711	0	0
	0	0

Value adjustments, restatements IFL 331

IFT711	0	0
	0	0

Losses IFL341

22.500	IFT711	22.500
22.500		22.500

e) Liabilities (in million EEK)

Allowances IFL 351

IFT711	0	0
	0	0

Loans IFL 361

IFT711	15.640	15.640
	0	0

Leasing IFL 371

IFT711	0	0
	0	0

Tax liabilities of faculty IFL 381

IFT711	0.991	0.991
	0.991	0.991

Short term debts with banks IFL 391

IFT711	2.791	2.791

f) Flow Accounts – Revenues (in million EEK)

Revenues from operational activities of the faculty IFR 501

IFT721	2.094	2.094
	2.094	2.094

State budget transfers for academic activities of the faculty IFR 511

IFT721	1.100	1.100
	1.100	1.100

State budget transfers for research activities of the faculty IFR 521

IFT721	6.008	6.008
	6.008	6.008

Grants and transfers related to assets of the faculty IFR 531

IFT721	0		0
	0		0

Other revenues of the faculty IFR 541

IFT721	0.001		0.001
	0.001		0.001

g) Flow Accounts – Expenses (in million EEK)

Costs of materials IFE 601

	3.527	IFT721	3.527
	3.527		3.527

Operating expenses IFE 611

	4.179	IFT721	4.179
	4.179		4.179

Scholarships IFE 621

	0.381	IFT721	0.381
	0.381		0.381

Salaries IFE 631

	17.188	IFT721	17.188
	17.188		17.188

Social charges IFE 641

	5.612	IFT721	5.612
	5.612		5.612

Depreciation, amortization IFE 651

	0.480	IFT721	0.480
	0.480		0.480

Other expenses IFE 661

	0.387	IFT721	0.387
	0		0

h) Technical Accounts (in million EEK)

IFT 721 Profit Assessment of the faculty					
IFE601	Costs of materials	3.527	IFR501	Revenues from operational activities	2.094
IFE611	Operating expenses	4.179	IFR511	State budget transfers for academic activities	1.100
IFE621	Scholarships	0.381	IFR521	State budget transfers for research activities	6.008
IFE631	Salaries	17.188	IFR531	Grants and transfers related to assets	0
IFE641	Social charges	5.612	IFR541	Other revenues	0.001
IFE651	Depreciation, amortization	0.480	IFL341	Loss	22.551
IFE661	Other expenses	0.387			
		31.754			31.754

IFT711 Commercial Balance of the FMCS					
	1. Non-current assets			1. Net Assets	
IFA001	Building	112.870	IFL301	Capital	101.543
IFA011	Property land	0.109	IFL311	Statutory capital reserve	0
IFA021	Investment property	0	IFL321	Accumulated surpluses	0
IFA031	Vehicles	0	IFL331	Value adjustments, restatements	0
IFA041	Machinery, equipment	3.979			
IFA051	Capitalized expenses on leased assets	0			
IFA061	Prepayment for Property	0			
IFA071	Other items of property, equipment	0			
	2. Non-Current Assets – Financial Assets				
IFA101	Investment in associates	0			
IFA111	Long-term claims	0			
IFA121	Credit granted	0			
			IFL341	Profits /loss	
	3. Circulating Capital – Current Assets			2. Liabilities	
IFA201	Inventories: Materials	0.296	IFL351	Allowances	0
IFA211	Work in progress	0	IFL361	Loans	15.640
IFA221	Manufactured goods	0	IFL371	Leasing	0

IFA231	Non-current assets for sale	0	IFL381	Tax liabilities	0.991
IFA241	Pre-payments for sale, services, inventories	0	IFL391	Short term debts with banks	2.791
IFA251	Customer and other receivables	0			
IFA261	Intangible assets	0.246			
IFA271	Checks and SEB funds	0			
IFA281	Cash on hand, current account, short-term deposits, overnight deposits	3.306			
	4. Accrued				
IFA291	Accrued income	0.159			
		120.965			120.965
				Net-capital	78.993
				With loss compensation by the UT	

Source: Compiled by the author based on data *Tulem kontode lõikes* (2006)

Annex 8. The chart of additional social accounts of the FMCS

a) Additional Social Stock Accounts –Non-Current Assets (in million EEK)

Value of building IIFA 0101

IIFL1001	IIFT7301
0	0

Value of assets not booked with the Faculty IIFA 0111

IIFL1001	IIFT7301	40.340
Books in the FMCS library ⁵³		6.500
IIFL1001		
Books in the UT library ⁵⁴		15.600
IIFL1001 Human capital ⁵⁵		18.240
40.340		40.340

Knowledge of bachelor⁵⁶ IIFA 0201

IIFL1001	4.477	IIFT7301	4.477
	4.477		4.477

Knowledge of master⁵⁷ IIFA 0211

IIFL1001	2.820	IIFT7301	2.820

⁵³ Information of the FMCS library: $16800 * 25 * 15.6 = 6\,552\,000$.

⁵⁴ Part of the UT library: $1000000 * 0.2 * 25 * 15.6 = 15\,600\,000$ (information from libraries).

⁵⁵ Salaries 17 118 plus social tax 5612 = $22\,800 * 0.2$ (20% opportunity costs) = $4.560 * 4$ (average availability of staff in years) = 18 240.

⁵⁶ Number of students $533 * ((0.060 \text{ (prohibitive fee)} - 0.020 \text{ (actual fee)}) / 2) = 10.66 * 0.42$ (% of students passing the examination in the normal amount of time, information of the Dean's Office) = 4.477.

⁵⁷ Number of students $188 * ((0.08 \text{ (prohibitive fee)} - 0.020 \text{ (actual fee)}) / 2) = 5.64 * 0.5$ (% of students passing the examination in the normal amount of time, information of the Dean's Office) = 2.820.

Knowledge of doctor⁵⁸ IIFA0222

IIFL1001 (support of the UT)	IIFT7301	1.516
IIFL1001	IIFT8202	1.010
2.526		2.526

Knowledge from Open University⁵⁹ IIFA0231

IIFL1001	0	IIFT7301	0
IIFL1001			

Knowledge from vocational training, distance teaching⁶⁰ IIFA0242

IIFL1001	0	IIFT7301	0
		IIFT8202	

⁵⁸ The number of doctoral students in 2006 was 51 and they all were active. Nine students passed the PhD examination (17; 64%) and got official support of 60,000 EEK per year. This appears in the commercial accounting of UT as receipts and expenses. But it does not show in commercial accounting as the willingness to pay for the output. Therefore, this information for the willingness to pay for 9 students is used. The other students get the services free of charge; however, they have to bear opportunity costs of 20,000 EEK monthly if they do not work outside of the faculty (240,000 per a year). Those who get the support have opportunity costs of 140,000 per a year. Some are working, but they have then to use additional time to study, which is also expressed in opportunity income. Therefore 20,000 EEK for the active students is used. Therefore, the calculation is as follows: 50 (number of active students) $\times 60\,000 \times 0,1764 = 0.529$ + opportunity costs per year $140\,000 \times 50 \times 0,1764 = 1.235$ + 1 has opportunity costs of 240,000 EEK: $240,000 \times 0,1764 = 0.042$. There is assumed that if the opportunity costs get up to 400,000 EEK per year the demand for doctoral studies vanishes. Therefore, the consumer surplus for 9 students $\times (0,400 - 0,240)/2 = 0.720$ is added to the sums above. Since the doctoral program is organized in cooperation with the Tallinn University of Technology, a deferral of 40% is applied.

⁵⁹ The faculty had no students in Open University for master studies, but the logic of calculations would be the following (number of students $\times (0.08$ (prohibitive fee) $- 0.030$ (actual fee) $)/2 = *0.33$ (% of students who pass the examination in a nominal period of time, information from Dean's Office).

The faculty had no students in Open University in baccalureate studies, but the logic of calculations would be the following (number of students $\times (0.08$ (prohibitive fee) $- 0.028$ (actual fee) $)/2 = *0.4$ (% of students passing the examination in a nominal period of time, information from Dean's Office).

⁶⁰ The faculty had no students, but the logic for calculations would be (number of students $\times (0.005$ (prohibitive fee) $- 0.002$ (actual fee) $)/2 = *0.42$ (% of students passing the examination from the Dean's Office information).

Knowledge teaching staff⁶¹ IIFA0251

IIFL1001	0.653	IIFT7301	0.653
	0.653		0.653

⁶¹ The relation of evaluation between bachelor courses in terms of money is about 1 (bachelor's) to 1.5 (master's) to 2 (doctor) by the faculty. This relation can be also used to point out the necessity to learn on the side of the teachers. Professors have to teach 3 courses that are mostly on the master's and doctoral level. There is assumed a relation of 1 (doctoral), 1 (master's) and 1 (bachelor's). Docents have 5 courses to offer, where 3 are at the master's and 2 at the bachelor's study level. Lecturers have 6 courses: 2 at the master's and 2 at the bachelor's study level. Assistant have to give 11 courses where 2 may be at the master's level and 8 at the bachelor's level. Researcher may have 3 courses where 1 is in the master's and 2 are in the bachelor's program (information from the Dean's Office).

Professors have to spend about 40% of their time teaching. Their monthly salary was about 18,250 EEK. Therefore their teaching income measured in time was about $18,250 \cdot 0.4 = 7300$. According to their courses, this amount has to be divided by 4,5. The result is 1622,22. That leads to allocation where a bachelor's course is worth 1622,22, a master's course 2433,33 and a doctoral course 3244,44. It is assumed that a professor does not receive essential knowledge through bachelor's courses, and that he or she has to accumulate human capital through additional knowledge and this knowledge is (opportunity costs 20% more) more cheaply available – multiplied: $(2433,33 + 3244,44) \cdot 0,2 = 1135,55$, 0.001 for one professor. There were 17 professors at the faculty ($0.0013555 \cdot 17 = 0.0230 \times 10$ (month)) → 0.230 as knowledge of teaching increase in the case of professors.

Docents had to spend 70% of their time teaching. Their monthly salary was about 13,650 EEK. The teaching income was $13,650 \cdot 0,7 = 9555$. According to the courses (5) the division is: $9555:5 = 1911$, and allocated to a docent only for master courses $3 \times 1911 = 5733$. With opportunity costs this means $5733 \cdot 0.2 = 1146,6$. There were 24 docents in the faculty. Therefore $(0.0011466 \cdot 24) \times 10 = 0.275$ is received as knowledge increase of teaching in case of docents.

Lecturers had to spend 90% of their time teaching. Their monthly salary was 9,100 EEK. Therefore teaching income was $9100 \cdot 0.9 = 8190$. According to the courses: $8190:6 = 1365$, allocated to the master courses $1365 \times 3 = 4095$, with opportunity costs is received $4095 \times 0.2 = 819$. In the faculty were 12 lecturers: $0.000819 \cdot 12 = 0.009828 \times 10$, → 0.098 as knowledge increase in case of lecturers.

Assistants had to spend 100% of their time on teaching. Their monthly salary was 7600 EEK. Divided by 11,5 the result is 660, 870. The engagement in master courses came up to $660,870 \times 1,5 = 991,305$. Considering opportunity costs: $\times 0,2 \rightarrow 198,261$. The number of assistants was 11. $0.000198261 \cdot 11 \times 10$ (number of months) → 0.022 as knowledge increase from teaching in case of assistants.

Researcher received monthly 9,100 EEK. They had to spend 20% of their time for teaching, in monetary terms 1,820 for teaching. Divided by 3.5 - according to their courses - gives 520. For master's courses is obtained 780. The opportunity costs 156. There were 18 researchers in the faculty ($0.000156 \cdot 18 \times 10 = 0.028$), 0.028 as knowledge increase of teaching in case of researchers.

In total: $0.230 + 0.275 + 0.098 + 0.022 + 0.028 = 0.653$

Knowledge of Scientists⁶² IIFA0261

IIFL1001	0.620	IIFT7301	0.620
	0.620		0.620

Lasting Research Results⁶³ IIFA0301

IIFL1001	24.563	IIFT 7301	24.563
	24.563		24.563

⁶² Professors allocate 40% of their time to research. The monthly salary was about 18250 EEK, so that the research income measured in monetary terms was about $18250 \times 0.4 = 7300$. Here it is assumed that a professor has to accumulate human capital through additional knowledge and this knowledge is (opportunity costs 20% more) more cheaply available, then multiplied $7300 \times 0.2 = 1460$, $\rightarrow 0.001460$ for one professor. There were 17 professors at the faculty ($0.001460 \times 17 = 0.02482 \times 10$ month) $\rightarrow 0.248$ as knowledge increase of scientific work of professors.

A docent had to spend 20% of time for research. The monthly salary was about 13650. Then research income was $13650 \times 0.2 = 2730$. With opportunity costs this means $2730 \times 0.2 = 546$. There were 24 docents in the faculty. Therefore is received $0.000546 \times 24 = 0.0131 \times 10$, $\rightarrow 0.131$ as knowledge increase of researching in case of docents.

A lecturer had to spend 5% of time for research. The monthly salary was 9100. The research income was $9100 \times 0.05 = 455$, with opportunity costs 91. In the faculty were 12 lecturers, $0.000091 \times 12 = 0.00109 \times 10 \rightarrow 0.0109$ as knowledge of lecturers from research.

Assistants had to spend 100% of their time teaching. Therefore there is no official time left for research.

Researcher received 9100 income per month. They had to spend 70% of their time to research, which means 6370 for research. The opportunity cost give 1274 There were 18 researchers ($0.001274 \times 18 = 0.0229 \times 10$), $\rightarrow 0.229$ as knowledge increase of scientific work of researchers

In total: $0.248 + 0.131 + 0.011 + 0.0 + 0.229 = 0.620$

⁶³ According to the evaluation system the first 10 staff members have an average of 3 articles in international journals. The average cost of an international journal is about 5000 EEK for 4 issues with 16 articles. Therefore, the willingness to pay for one article is about 312.5 EEK. The number of international articles is 131 (data from interview in the Dean's Office of the FMCS) Number of the copies is 600 (average edition). The calculation is following: $0.0003125 \times 131 \times 600 = 24.563$

Increasing International Cooperation Capacities⁶⁴ IIFA0312

IIFL1001	0.802	IIFT7301	0.401
		IIFT8202	0.401
	0.802		0.802

Increase of Research Capacity Staff⁶⁵ IIFA0321

IIFL1001	1.470	IIFT7301	1.470
	1.470		1.470

Increase of Research Capacity Equipment⁶⁶ IIFA0331

IIFL1001	0.099	IIFT7301	0.099
	0.099		0.099

Increase of Research Capacity Buildings IIFA0341

IIFL1001	0	IIFT7301	0
	0		0

⁶⁴ The additional advantages of international cooperation capacities are twofold. There are possibilities to hire additional staff, doing larger expenses and having higher chances to attract more money in the future. The expenses financed by the international cooperation are partly expressed by the payments reflected in commercial accounting and they are also partly considered in human capital of the staff. However, there are special advantages which can be considered. These are chances for master and doctoral students to study abroad, the lectures of foreign professors joining the doctoral school program and the master program. The faculty has received 2.420 thousand EEK for the doctoral school and 1.589 by international contracts and grants (information from the FMCS Dean's Office). To achieve these sums without the international contacts of the faculty and staff would have been rather costly. Therefore, there is assumed that about 20% of this sum 4.009 would have been necessary to establish these contacts through special contact agencies ($4.009 \times 0.2 = 0.802$). The deferral is 50%.

⁶⁵ The expenses of the doctoral school are up to 70% for foreign lecturers. They would be much more expensive to attract without international cooperation relations. The expenses may be up to 40% higher. Therefore, here the calculation is $2.420 \times 0.7 \times 0.4 = 0.6776$ due to international contracts. Additionally, 3 extraordinary professors were attracted who would have been without international contract also 40% more expensive. Calculation: $0.660 \times 0.4 \times 3 = 0.792 \rightarrow 0.6776 + 0.792$

The research staff and its additional stock of benefits is already with human capital. Only the three that are not permanent or attracted from abroad were not considered yet.

⁶⁶ Five percent of the research funds available are spent for equipment: 3.978 (from commercial accounts) $\times 0.05 = 0.1989$. The expenditures for equipment are considered in the commercial accounting. Additional advantages occur because of better quality of new equipment, new software programs, faster communications, and less costs and brake-downs. The new equipment allows time savings, etc., not considered in commercial accounting. Therefore has taken 50% as the value of those advantages, it means $0.5 \times 0.1989 = 0.099$

Increase of Research Capacity Library⁶⁷ IIFA0351

IIFL1001	0.060	IIFT7301	0.060
	0.060		0.060

Contribution to Research Centers IIFA0361

IIFL1001	0	IIFT7301	0
	0		0

Capacity to Consult Firms⁶⁸ of faculty IIFA0401

IIFL1001	1.749	IIFT7301	1.749
	1.749		1.749

Capacity to Consult Governments⁶⁹ IIFA0411

IIFL1001	1.113	IIFT7301	1.113
	1.113		1.113

European funds⁷⁰ IIFA0421

IIFL1001	0.016	IIFT7301	0.016
	0.016		0.016

⁶⁷ One percent of revenue for research activities will be used to purchase books for research activities. These are 6008 EEK.

⁶⁸ The academic staff in the faculty gets sums of money for services they offer to the private sector, consultation, and for working and editing for publishing companies. Here it is assumed that they receive 500 EEK per hour of activity. Part of the income they can expect to have normally and others may vary from year to year. It is assumed that they work permanently 2 hours per week and 53 weeks (here and onward this approximation is applied in calculations, because some may choose to work more hours) in a year. In 2006 this kind of weekly work was more, assumed three hours more. But this amount is not permanent as 2006 was a boom period. This is booked as flows. As stock are treated: $2 \times 500 \times 53 \times 33$ (number of staff members consulting firms, mainly in computer science) = 1.749.

⁶⁹ Here the concentration has been on consulting for public institutions such as central banks, local and central governments and institutions such as chambers of commerce, parties, etc. This consulting takes place mainly in the Institute of Mathematical Statistics. Here also is considered as a stock the consulting possibility of 2 hours per week. The more varying part is booked on the current benefit. Twenty-one staff members are involved in this kind of consulting. Calculation: $2 \times 500 \times 21 \times 53 = 1.113$

⁷⁰ Consulting for the EU and contacts takes place mainly through research projects financed by the EU. This is especially the case with the doctoral program and the EU projects. The faculty discusses that these contacts are of especial value, they want to pay between 1% to 5% of the project some at the applications disposal. Therefore, 1% as stock has been chosen and 1 % as benefit flow. Calculation: 1% of amount of foreign projects, which is 1.589

Development of Estonian language⁷¹ IIFA0501

IIFL1001	0.479	IIT7301	0.479
	0.479		0.479

Increased Employment⁷² IIFA0511

IIFL1001	2.346	IIFT7301	2.346
	2.346		2.346

Increased Infrastructure⁷³ IIFA0521

IIFL1001	4.234	IIFT7301	4.234
	4.234		4.234

Changes of profits, rents of other firms⁷⁴ IIFA0602

IIFL1001	2.676	IIFT7301	1.338
		IIFT8202	1.338
	2.676		2.676

⁷¹ About 40% of all the publications have been in Estonian. The willingness to pay for Estonian articles is much lower than for international ones. Therefore, is started with a journal price of 1000 EEK per a year. If there are four copies, then achieved for a copy 125 EEK and for an article 31.5 EEK. As there are shorter articles, but also some books in Estonian then is taken the value as an average figure. Number of publications in Estonian is 38 (information from the FMCS reports). If the number of copies is about 400, then calculation is following: $38 \cdot 400 \cdot 31.5 = 0.479$

⁷² Measuring the employment effect by savings of unemployment social insurance support is applied. Is assumed 500 EEK per month. The basic employment effect is measured as follows. From other studies (Buckl, Friedrich, Wonnemann 1984) is known that the relation between income effect in Tartu and additional expenditure is about 0.7. The additional expenditures are 30.506 and 7.72 by students (some are from Tartu 40%) = 38.226. The incomes at Tartu are counted $38.226 \cdot (\text{expenditure}) \cdot 0.7 = 26.758$. There is a relation 1.2 between income and primary income at Tartu. Therefore, 26.758 divided by 1.2, which gives 22.299. There is another relation of 1 between primary income at Tartu and the income in rest of Estonia. Therefore, an income effect of about 44.598 in Estonia. If the average income is 0.114 per year (9500 EEK per month). There are 391 jobs. One job saves app. 6000 EEK or 2.346 per year.

⁷³ The capacity of teaching students was given by 42.19 (on the FMCS information) per capita of teaching staff. The teaching staff is given with 53. Therefore, 1197 students could be taught. Actually there were in 2006 in the faculty and 772. There is an additional possibility to teach of 425. If this possibility is evaluated with a low academic income (number of staff members 29) of 10000 EEK, then the result will achieved 4.234.

⁷⁴ The share of profits in value added is about 6% (according to studies of Buckl, Friedrich, Wonnemann 1984) and as known the relationship between income effect in Tartu and additional expenditure is about 0.7. The additional expenditures are 30.506 and 7.72 by students (some are from Tartu 40%) = 38.226. The incomes at Tartu are $38.226 \cdot 0.7 = 26.758$. There is a relation 1.2 between income and primary income at Tartu. Therefore, 26.758 divided by 1.2, which gives 22.299. There is another relationship of 1 between primary income at Tartu and income in the rest of Estonia. Therefore, an income effect of about 44.598 in Estonia and the caused change in profits is about 2.676.

Increase of tax receipts, etc. of governments (10% of social charges) IIFA0612

IIFL1001	5.612	HFT7301	5.051
		IIFT8202	0.561
	5.612		5.612

b) Additional social liabilities

Stock of previous net benefits IIFL4001

IIFT 3701	0	IIFL1001	0
	0		0

Accidents IIFL⁷⁵4011

IIFT7301	0	IIFL1001	0
	0		0

Emissions, spoiled environment⁷⁶ IIFL4021

IIFT7301	0.736	IIFL1001	0.736
	0.736		0.736

Future financial obligations of faculty⁷⁷ IIFL4101

IIFT7301	14.280	IIFL1001	14.280
	14.280		14.280

Closing down of consultancy institutions IIFL4201

IIFT7301	0	IIFL1001	0
	0		0

Loss of staff IIFL4301

IIFT7301	0	IIFL1001	0
	0		0

⁷⁵ Severe damages did not take place. There are some smaller damages by car crashes taking place on lots or trips to the faculty. They are current damages and are going to be booked with other social costs.

⁷⁶ Here the CO₂ emissions of cars are referred to. A 1 km drive causes 251 g CO₂ emission. The value of 1 ton of emission is 231 € or 3604 EEK (0.003604), (in literature are stated different values according to different prices and emission assessments (for example, HEATCO (2006)), here taken price is for reason of conservative one). Assumed: there are 90 cars of employees coming 300 days per year, driving about 10 km back and forth from the faculty: 270 000 km result. Times 0.251 kg results to 67770 kg. or 67,770 tons. One ton values 0.003604 EEK and therefore is received 0.244 for staff. For students is assumed that 260 are coming at 200 days by car. They also may go 10km. Then result for students is 0.470. Other: 120 - visitors, taxi, etc., may drive to the faculty and back on 20 days per year driving 10 km. For them is received 0.022. In total the monetary damage is 0.736.

⁷⁷ Loan left to pay.

Loss of resources through political activities IIFL4401

IIFT7301	0	IIFL1001	0
	0		0

Employment losses IIFL4501

IIFT7301	0	IIFL1001	0
	0		0

Reduced infrastructure IIFL4511

IIFT7301	0	IIFL1001	0
	0		0

Value adjustment to buildings IIFV3101

IIFT7301	0	IIFsC6701 Building	0
	0		0

Value adjustment of current assets not booked with faculty IIFV3111

IIFT7301 books ⁷⁸	0.130	IIFsC6701 current assets	3.778
IIFT7301 Human capital ⁷⁹	3.648		0
	3.778		3.778

Value adjustment to knowledge of baccalaureate⁸⁰ of faculty IIFV3201

IIFT7301	0.895	IIFsC6701 baccalaureate	0.895
	0.895		0.895

Value adjustment to knowledge of master⁸¹ of faculty IIFV3211

IIFT7301	0.282	IIFsC6701 master	0.282
	0.282		0.282

Value adjustment to knowledge of doctor⁸² of faculty IIFV3221

IIFT7301	0.152	IIFsC6701 doctor	0.152
	0.152		0.152

Value adjustment to knowledge from Open University⁸³ of faculty IIFV3231

IIFT7301	0	IIFsC6701 open University	0
	0		0

⁷⁸ Books adjustment 0,02 % (6.500x0.02=0.130).

⁷⁹ Human capital =0,2 % (18.240x0.2=3.648).

⁸⁰ Adjustment rate 20% .

⁸¹ Adjustment rate 10% .

⁸² Adjustment rate 10%.

⁸³ Adjustment rate 25 %.

Value adjustment to knowledge of vocational training distance⁸⁴ of faculty IIFV3241

IIFT7301	0	IIFsC6701 open University	0
	0		0

Value adjustment to knowledge teaching staff of faculty⁸⁵ IIFV3251

IIFT7301	0.065	IIFsC6701 staff	0.065
	0.065		0.065

Value adjustment to Knowledge of Scientists of faculty⁸⁶ IIFV3261

IIFT7301	0.062	IIFsC6701 scientists	0.062
	0.062		0.062

Value adjustment to long lasting research results of faculty⁸⁷ IIFV3301

IIFT7301	2.456	IIFsC6701 research	2.456
	2.456		2.456

Value adjustment to increasing international cooperation of faculty⁸⁸ IIFV3312

IIFT7301	0.080	IIFsC6701 cooperation	0.080
	0.080		0.080

Value adjustment to increase of research capacities: staff of faculty⁸⁹ IIFV3321

IIFT7301	0.294	IIFsC6701 research s.	0.294
	0.294		0.294

Value adjustment to increase of research capacities: equipment of faculty⁹⁰ IIFV3331

IIFT7301	0.020	IIFsC6701 equipment	0.020
	0.020		0.020

Value adjustment to increase of research capacities: building of faculty⁹¹ IIFV3341

IIFT7301	0	IIFsC6701 building	0
	0		0

Value adjustment to increase of research capacities: library of faculty⁹² IIFV3351

IIFT7301	0.001	IIFsC6701 library	0.001
	0.001		0.001

⁸⁴ Adjustment rate 20%.

⁸⁵ Adjustment rate 10%.

⁸⁶ Adjustment rate 10%.

⁸⁷ Adjustment rate 10%.

⁸⁸ Adjustment rate 20%.

⁸⁹ Adjustment rate 20%.

⁹⁰ Adjustment rate 20%.

⁹¹ Adjustment rate 20%.

⁹² Adjustment rate 2%.

Value adjustment to contribution to research centers of faculty⁹³ IIFV3361

IIFT7301	0	IIFsC6701 centers	.. 0
	0		0

Value adjustment to consulting to private firms of faculty⁹⁴ IIFV3401

IIFT7301	0.577	IIFsC6701 consulting pr.	0.577
	0.577		0.577

Value adjustment to consulting to governments of faculty⁹⁵ IIFV3411

IIFT7301	0.371	IIFsC6701 consulting g.	0.371
	0.371		0.371

Value adjustment to EU funds of faculty IIFV3421

IINT7301	0.005	IIFsC6701 EU funds	0.005
	0.005		0.005

Value adjustment to development of Estonian language faculty⁹⁶ IIFV3501

IIFT7301	0.096	IIFsC6701 Estonian	0.096
	0.096		0.096

Value adjustment to increased employment faculty⁹⁷ IIFV3511

IIFT7301	0.235	IIFsC6701 incr. employment	0.235
	0.235		0.235

Value adjustment to increased infrastructure faculty⁹⁸ IIFV3521

IIFT7301	0.423	IIFsC6701 incr. infrastructure	0.423
	0.423		0.423

Value adjustment to changes of profits, rents of other firms⁹⁹ faculty IIFV3602

IIFT7301	0.134	IIFsC6701 profit	0.134
	0.134		0.134

Value adjustment to increase of tax receipts, etc. of government¹⁰⁰ faculty IIFV3612

IIFT7301	0.505	IIFsC6701 tax	0.505
	0.505		0.505

⁹³ Adjustment rate 2%.

⁹⁴ Adjustment rate 33 1/3 % (1.060*0.333=0.124).

⁹⁵ Adjustment rate 33 1/3 % (1.060*0.333=0.124).

⁹⁶ Adjustment rate 20%.

⁹⁷ Adjustment rate 10%.

⁹⁸ Adjustment rate 10%.

⁹⁹ Adjustment rate 10%.

¹⁰⁰ Adjustment rate 10%.

Value adjustment to future financial obligations faculty IIFW3101

IIFB5801	0	IIFT7301 future obligation	0.714
	0		0

Value adjustment to emissions faculty IIFW3021

IIFB5801	0.147	IIFT3701 emissions	0.147
	0.147		0.147

Value adjustment to closing down of consultancy institutions of faculty IIFW3201

IIFB5801	0	IIFT3701 closing down	0
	0		0

Value adjustment to loss of staff of faculty IIFW3301

IIFB5801		IIFT3701 loss staff	

Value adjustment to loss of resources through political activities¹⁰¹ of faculty IIFW3401

IIFB5801	0	IIFT3701 loss staff	0
	0		0

Value adjustment to employment losses of faculty IIFW3501

IIFB5801		IIFT3701 employment loss	

Value adjustment to reduced infrastructure of faculty IIFW3601

IIFB5801		IIFT3701 red. infrastructure	

Social cash IIFL1001

IIFL4001 Stock of prev. benefits	0	IIFA0101 value of buildings	0
IIFL4011 Accidents	0	IIFA0111 Books in own library ¹⁰²	6.500
IIFL4021 Emissions	0.736	IIFA0111 Books in university library ¹⁰³	15.600
IIFL 4101	14.280	IIFA0111 Human capital	18.240
IIFL4201	0	IIFA0201 bachelor's	4.477
IIFL4301	0	IIFA0211 master's	2.820
IIFL4401	0	IIFA0222 doctoral	2.526
IIFL4501	0	IIFA0231 knowl. – Open Univ.	0
IIFL4511	0	IIFA0242 distance teaching	0
IIFT8202	3.310	IIFA0251 staff	0.653
IIFA1001	45.928	IIFA0261 scientists	0.620
	64.254		
		IIFA0301 lasting. research	24.563

¹⁰¹ Rate of adjustment 25%.

¹⁰² Information on the FMCS library: 10000* 25*15.6=3900000.

¹⁰³ Part of University library: 1000000*0,2*25*15,6=15600000, information to be given.

IIFT 7301	49.975	IIFA0312 international cooperation	0.802
		IIFA032 research capacity	1.470
		IIFA 0331 incr equipment	0.099
		IIFA0341 incr. of research capacity buildings	0
		IIFA 0351 library capacity	0.060
		IIFA0361 contributions to research centers	0
		IIFA0401 consult. firms	1.749
		IIFA0411 consult govern.	1.113
		IIFA0421 European funds	0.016
		IIFA0501 dev. of Est. language	0.479
		IIFA0511 employment	2.346
		IIFA0521 incr. infrastructure	4.234
		IIFA0602 profit	2.676
		IIFA0612 tax	5.612
		IIFT9302	10.639
		IIFL1001	6.935
			107.729

Deferral social stocks of Faculty IIFT8202

IIFA0222	1.010	IIFA1001	3.310
IIFA0242	0		
IIFA0312	0.401		
IIFA0602	1.338		
IIFA0612	0.561		
	3.310		3.310

c) Current Social Benefits

Bachelor's studies¹⁰⁴

IIFT7101	6.396	IIFL1001	6.396
	6.396		6.396

Master's studies¹⁰⁵

IIFT7101	2.820	IIFL1001	2.820
IIFT7101	0.423	IIFL1001	0.423
	3.243		3.243

¹⁰⁴ Number of students $533 * (0.060 \text{ (prohibitive fee)} - 0.020 \text{ (actual fee)}) / 2 * 0.6$ (% of students not achieving examine in nominal time) = 6.396 (information from Dean's Office).

¹⁰⁵ Number of students $188 * (0.080 \text{ (prohibitive fee)} - 0.020 \text{ (actual fee)}) / 2 * 0.5$ (% of students not achieving examine in nominal time) = 2.820 (information from Dean's Office).

Doctoral studies ¹⁰⁶		IIFB5122	
IIFT7101	7.076	IIFL1001 (support)	11.794
IIFT9302 ¹⁰⁷	4.718		
	11.794		11.794

Vocational training, distance teaching ¹⁰⁸		IIFB5132	
IIFT7101	0.043	IIFA1001	0.043
IIFT9302	0		
	0.043		0.043

Open University ¹⁰⁹		IIFB5141	
IIFT7101	0.300	IIFA1001	0.300
	0.300		0.300

Publications of teaching materials ¹¹⁰		IIFB5152	
IIFT7301	2.680	IIFA1001 (for master)	0.902
IIFT9302	0.141	IIFA1001 (bachelor)	1.919
	2.821		2.821

Publications of research results ¹¹¹		IIFB B5202	
IIFT7301 (journals)	0.030	IIFA1001	0.032
IIFT9302	0.002		

¹⁰⁶ Number of students $51 * (0.04 \text{ (prohibitive fee)} - 0.015 \text{ (actual fee)}) / 2$.

¹⁰⁷ As the Tallinn University of Technology was involved to 40 % in the doctoral program co-financed by the EU, and some students study partly abroad, then is taken the 40 % as deferral %.

¹⁰⁸ Teachers' training 17 students $(0.005 * 17) / 2 = 0.043$.

¹⁰⁹ The faculty had 10 students in open university for master studies. $(\text{number of students } 10 * (0.08 \text{ (prohibitive fee)} - 0.030 \text{ (actual fee)}) / 2 = 0.300$.

¹¹⁰ The faculty provides 30 pages per one credit point. A master's student has to achieve 15 credit points per year. There were 533 bachelor's and 188 master's students in 2006. One copy is about 2 EEK. For the bachelor's students is assumed a provision of 30 pages per credit point, for master's students 40 pages. Result of calculation: for master's students 0.902 and for bachelor's students 1.919. Deferral is 5%.

¹¹¹ Publications of research results that are mainly relevant for one period are mainly those appearing in daily journals, newspapers, etc. Here the faculty has evaluated about 100 points. For one article it allocates 25 points. They have about 10 typed pages each. For one page the journals pay about 200 EEK. There were 11 publications which were not scientific ones and 16 in general journals. Again a deferral rate of 5% is applied for the publisher, but the result becomes very small (0.030).

Rising funds¹¹² IIFB5212

IIFT9302	0.564	IIFA1001	2.340
IIFT7301	1.776		
	2.340		

Writing proposals¹¹³ IIFB5222

IIFT9302	0.423	IIFA1001	1.720
IIFT7301	1.297		

Writing articles, books¹¹⁴ IIFB5231

IIFT7101	0.750	IIFA1001	0.750
	0.750		0.750

Organizing conferences, meetings¹¹⁵ IIFB5242

IIFT7101	0.626	IIFL1001	0.128
IIFT9302	0.111	IIFL 1001	0.033
		IIFL1001	0.576
	0.737		0.737

¹¹² The faculty discusses paying out a reward of 20,000 EEK for each project that was obtained a year. There have been 23 Estonian projects and 7 foreign projects. However, there are partners from other countries involved. As this causes special difficulties, then for them is accounted 40,000 EEK. The success is due to partners and donors as well; 30% are going to be deferred. Therefore 2.340 and deferral 0.564

¹¹³ The faculty discusses paying out a reward also to those proposals that are not accepted as projects. The participants are going to learn and have to increase their knowledge concerning the research questions and to prepare networks, and they risk their reputation, etc. Therefore, a premium of 10,000 EEK for each project might be obtained for an application. As the success rate is about 1.25 (information from the Dean's Office) proposals to one acceptance. The learning success is due to partners and donors as well; 30% are going to be deferred.

¹¹⁴ The faculty considers the writing of articles and books as of social value. Although the focus is more on publication-accepted articles and books, the writing as such may also lead to future publications. For the activities which were successful the faculty assigned 30,949 points to faculty members. A point was valued in numbers by 30 EEK. However, this is an internal evaluation which helps to allocate a part of the budget. Therefore, 50 EEK is taken. A dissertation is then valued by 75,000 EEK. In 2006 there were 9 dissertations defended and one book issued, therefore $75,000 \times 10 = 0.750$

¹¹⁵ Moreover the international contacts allow staff participants to join international conferences. Without these contacts it would be much more expensive to attain. During the year 2006, 180 foreign conferences and 136 Estonian conferences have been attended by the staff. According to the relationship between foreign research means to Estonian research means about 20% of these participations are financed through money from international contacts. There are about 36 participations. With average costs 12,500 EEK for a foreign conference. If the participants would have paid this from their own resources it would have been more expensive, e.g., 25%. The Estonian conferences with average costs 2,000 EEK, also accounted 25% more in individual participations. Deferral is 15%.

Consulting to firms ¹¹⁶		IIFB5301	
IIFT7101	1.193	IIFL1001	1.193

Consulting to public institutions ¹¹⁷		IIFB5311	
IIFT7101	0.769	IIFL1001	0.769
	0.769		0.769

Consulting to Parliament ¹¹⁸		IIFB5321	
IIFT7101	0	IIFL1001	0
	0		0

Consulting to EU ¹¹⁹		IIFB5331	
IIFT7101	0.016	IIFL1001	0.016
	0.016		0.016

Consulting to scientific bodies ¹²⁰		IIFB5341	
IIFT7101	0.045	IIFL1001	0.045
	0.045		0.045

¹¹⁶ The academic staff has worked on average three hours a day for services not booked with the university apart from the usual 2 hours. These three hours are tackled as flows. Therefore in 53 weeks and an hourly income of 500 EEK, result a willingness to pay of 79,500 a year. There are 15 academics in computer science and statistics who consult firms, therefore $15 \times 79,500 = 1.193$.

¹¹⁷ The academic staff has worked on average three hours a day for services not booked with the university apart from the usual 2 hours. These three hours are tackled as flows. Therefore in 53 weeks and an hourly income of 500 EEK results a willingness to pay of 79,500 EEK a year. There are 20 academics who are consulting to public institutions.

¹¹⁸ No academic staff members have consulted for Parliament.

¹¹⁹ Consulting with the EU and contacts take place through research projects financed by EU. This is especially the case with the doctoral program and the EU projects. The faculty discusses that these contacts are of especial value; they want to pay between 1% to 5% of the project some at the applicant's disposal. Therefore is chosen 1% as stock and 1% as benefit flow.

¹²⁰ Consulting with scientific bodies in Estonia takes place through research projects financed by these institutions. This is the case with Target funding research, Estonian Science Foundation grants, and research and development contracts. The faculty discusses that these contacts are of especial value; they want to provide between 1% to 5% of the project some at the applicant's disposal. Therefore is chosen 1% as benefit flow.

Monitoring, control¹²¹ faculty IIFB5401

IIFT7101	0.381	IIFA1001	0.381
	0.381		0.381

¹²¹ Twenty-three faculty members have been on the faculty board and in the faculty council. There they have to work about 6 hours two times per month in meetings. If considered that the management functions they have to perform they had to spent 30 minutes on monitoring and control, 30 minutes on financial matters, 30 minutes on staff management, 20 minutes on labs management, and 3 hours and 40 minutes for decision making on academic exams, regulations, projects, etc. Therefore, the result is from 12 hours 1 hour on monitoring and control, 1 hour on financial matters, 1 hour on staff management, 40 minutes on labs and 7 hours + 20 minutes for decision making. Moreover there are 18 heads of chairs. They need 6 hours weekly for chair management. Here monitoring and control is 1 hour, financial matters concern 1 hour, staff management 3 hours, nearly no lab problems and 1 hour for decision making. Therefore there are 4 hours for management and control, 4 hours for financial matters, 12 hours for staff management, and 4 hours for decision making. There were 4 heads of institutes who need 3 hours per week. Here is assumed that 30 minutes for management and control, 30 minutes for financial matters, 30 minutes for staff management, and 1 hour 30 minutes for decision making. From 12 hours per month we get 2 hours monitoring and control, 2 hours for financial matters, 2 hours for staff management, and 6 hours for decision making. The dean has to work an additional 8 hours on these tasks per week. One hour for monitoring and control, 2 hours on financial matters 1 hour in staff management and 4 hours on decision making in the faculty and other university bodies. The vice deans spend an additional 2 hours per week. They are engaged in monitoring and control 1 hour and in staff management 1 hour. As far as monitoring and control is concerned. Then here from council and board $23 \times 1 \times 10$ (month) = 230 hours. The chair leaders spend $18 \times 4 \times 10$ (month) = 720 hours. The institute heads deal $4 \times 2 \times 10 = 80$ on monitoring and control. The dean works $4 \times 10 = 40$ hours on monitoring and control. The vice deans are engaged with $2 \times 4 \times 10 = 80$ hours. Therefore 1,270 hours are dedicated to monitoring and control. As the actual income per hour is about 200 EEK from normal income the market value of the managers is about 500 EEK. The social willingness to pay would be $1,270 \times 300 = 0.381$ in addition.

Financial management¹²² faculty IIFB5411

IIFT7101	0.393	IIFA1001	0.393
	0.393		0.393

Staff management ¹²³ faculty IIFB5421

IIFT7101	0.321	IIFA1001	0.321
	0.321		0.321

Faculty decision making¹²⁴ faculty IIFB5431

IIFT7101	0.914	IIFA1001	0.914
	0.914		0.914

¹²² Twenty-three faculty members have been on the **faculty board** and on the faculty council. There they have to work about 6 hours two times per month in meetings. If considered that the management functions they have to perform they had to spent 30 minutes on monitoring and control, 30 minutes on financial matters, 30 minutes on staff management 20 minutes on labs management, and 3 hours and 40 minutes for decision making on academic exams, regulations, projects, etc. Therefore, one gets from 12 hours 1 hour on monitoring and control, 1 hour on financial matters, 1 hour on staff management, 40 minutes on labs and 7 hours + 20 minutes for decision making. Moreover there are **18 heads of chairs**. They need 6 hours weekly for chair management. Here monitoring and control is 1 hour, financial matters concern 1 hour, staff management 3 hours, nearly no lab problems and 1 hour for decision making. Therefore there are 4 hours for management and control, 4 hours for financial matters, 12 hours for staff management, and 4 hours for decision making. There were **4 heads of institutes** who need 3 hours per week. There is assumed 30 minutes for management and control, 30 minutes for financial matters, 30 minutes for staff management and 1 hour 30 minutes for decision making. From 12 hours per month we get 2 hours monitoring and control, 2 hours for financial matters, 2 hours for staff management, and 6 hours for decision making. The **dean** has to work an additional 8 hours on these tasks per week. One hour for monitoring and control, 2 hours on financial matters 1 hour in staff management and 4 hours on decision making in the faculty and other university bodies. The **vice deans** spent 2 hours additionally per week. They are engaged in monitoring and control 1 hour and in staff management 1 hour. As far as financial management is concerned, here from council and board $23 \times 1 \times 10$ (month) = 230 hours. The chair leaders spend $18 \times 4 \times 10$ (month) 720 hours. The institute heads deal $4 \times 2 \times 10 = 80$ on financial matters. The dean works $4 \times 2 \times 10 = 80$ hours on financial matters. The vice deans are not engaged so much. Therefore 1,190 hours are dedicated to monitoring and control. As the actual income per hour is about 200 EEK from normal income the market value of the managers is about 500 EEK. In total hours dedicated for financial management 1,310, the social willingness to pay would be 0.393 in addition.

¹²³ Hours dedicated to staff management total 1070, therefore, the social willingness to pay 0.321 in addition.

¹²⁴ Hours dedicated to decision making: 3,045. The social willingness to pay is $3,045 \times 300 = 0.914$ in addition.

Management of labs, etc.¹²⁵ faculty IIFB5441

IIFT7101	0.046	IIFA1001	0.046
	0.046		0.046

Contacts to other faculties¹²⁶ faculty IIFB5452

IIFT7101	0.054	IIFL1001	0.108
IIFT9302	0.054		
	0.108		0.108

Support of Colleges¹²⁷ faculty IIFB5461

IIFT7101	0	IIFL1001	0
	0		0

¹²⁵ Twenty-three faculty members have been on the **faculty board** and on the faculty council. There they have to work about 6 hours two times per month in meetings. If considered that the management functions they have to perform they had to spent 30 minutes on monitoring and control, 30 minutes on financial matters, 30 minutes on staff management 20 minutes on labs management, and 3 hours and 40 minutes for decision making on academic exams, regulations, projects, etc. Therefore, we get from 12 hours 1 hour on monitoring and control, 1 hour on financial matters, 1 hour on staff management, 40 minutes on labs and 7 hours + 20 minutes for decision making. Moreover there are **18 heads of chairs**. They need 6 hours weekly for chair management. Here monitoring and control is 1 hour, financial matters concern 1 hour, staff management 3 hours, nearly no lab problems and 1 hour for decision making. Therefore, there are 4 hours for management and control, 4 hours for financial matters, 12 hours for staff management, and 4 hours for decision making. There were **4 heads of institutes** who need 3 hours per week. We assume 30 minutes for management and control, 30 minutes for financial matters, 30 minutes for staff management and 1 hour 30 minutes for decision making. From 12 hours per month we get 2 hours monitoring and control, 2 hours for financial matters, 2 hours for staff management, and 6 hours for decision making. The **dean** has to work an additional 8 hours on these tasks per week. One hour for monitoring and control, 2 hours on financial matters, 1 hour in staff management, and 4 hours on decision making in the faculty and other university bodies. The **vice deans** spend 2 hours additionally per week. They are engaged in monitoring and control 1 hour and in staff management 1 hour. As far as labs are concerned, from council and board $23 \cdot 0.66 \cdot 10$ (month) = 151.8 hours. As the actual income per hour is about 200 EEK from normal income the market value of the managers is about 500 EEK. The social willingness to pay would be $151.8 \cdot 300 = 0.046$ in addition.

¹²⁶ The contacts of the dean to other faculties are already considered in decision making. However, the 18 head of chairs also contact other faculties. Suppose $\frac{1}{2}$ hour per week. They need 2 hours a month and 360 hours yearly. Therefore, 0.054 in addition to the FMCS and the same amount for the other faculty.

¹²⁷ The support of colleges is already booked in the commercial bookkeeping. Therefore 0 is booked as social benefits for the faculty.

Representation ¹²⁸ faculty IIFB5471			
IIFT7101	0.024	IIFL1001	0.024
	0.024		0.024

Contact to schools ¹²⁹ faculty IIFB5501			
IIFT7101	0.062	IIFL1001	0.062
	0.062		0.062

Attraction of visitors ¹³⁰ faculty IIFB5512			
IIFT7301	0.151	IIFL1001	0.168
IIFT9302	0.017		
	0.168		0.168

Public Relations ¹³¹ faculty IIFB5522			
IIFT7301	0.674	IIFL1001	0.749
IIFT9302	0.075		
	0.749		0.749

¹²⁸ The faculty is mostly represented by the dean and his reputation as a well-known professor. On the average he needs 2 hours a week, or 80 hours a year. For this management function a social value of $80 \times 300 = 24,000$, 0.024 is received. The social value of additional attracted students is already considered with other social values considered above.

¹²⁹ The dean might need 10 hours a year. For this management function a social value of $10 \times 300 = 3000$, 0.003 is received. The staff (14 people – information from the FMCS Dean’s Office) might need 20 hours per month. It is 30% less market value compared to the dean. Therefore, $280 \times 210 = 0.059$, in total 0.062.

¹³⁰ The faculty had 1 annual conference (2 days) with 200 participants. Twenty-seven international project meetings. These are financed partly through the faculty. Therefore, relatively low expenditure standards for additional expenses by the participants is referred to. We refer to 750 EEK per visitor (food 150 EEK, accommodation 500 EEK, gifts 100 EEK). Assumed that about 20% are accompanied by persons (spouses, friends, etc.) who spend (food 150, 300 accommodation more, 150 other expenses) 800 EEK. Therefore, conference accounted 0.135 and 0.033 accounted for international project meetings. The deferral is 10%.

¹³¹ The faculty reports about results, interviews professors, etc., distributes information about its work research, etc. There is a willingness to pay for such information. A minute on television costs about 7,800 EEK. The faculty may appear 8 minutes per month on television. Per year 96 minutes, which are worth 0.749. The deferral is 10%.

Advertisement¹³² faculty IIFB5532

IIFT7301	0.108	IIFL1001	0.120
IIFT9302	0.012		
	0.120		0.120

Fiscal social benefits¹³³ faculty IIFB5542

IIFT7101	5.222	IIFA1001	10.443
IIFT9301	5.221		
	10.443		10.443

d) Current Social Costs

Bachelor's studies¹³⁴ IIFsC6101

IIFL1001	1.600	IIFT7101	1.600
	1.600		1.600

¹³² The faculty advertises through the articles of the members of staff in written Estonian journals. The social value of these advertising activities is already captured by the evaluation of published articles. Announcements in TV are also tackled before. However, there is also information in newspapers concerning events that take place in the faculty such as conferences, staffing, examinations, and research results. Therefore, it is assumed that this takes place two times a month. As a newspaper costs about 18 EEK the monthly value as 0.1 EEK is detected. As the edition of the newspaper is about 100,000, then the result is 0.120. The deferral is 10%. There might be overtime of 2 hours per month; that gives us 20 hours a year. We end up with 0.004. The deferral amount is too small to be booked. There might be for the staff 10 hours overtime. However, only 2 hours a year for the subject, its 0.004 that is too small to be mentioned.

¹³³ From other studies (Buckl, Friedrich, Wonnemann 1984) is known that the relationship between income effect in Tartu and additional expenditure is about 0.7. The additional expenditures are 39.767 and 7.72 by students (some are from Tartu 40%) = 38.226 by students. The incomes at Tartu are 38.226*0.7=26758. There is a relationship of 1.2 between income and primary income at Tartu. Therefore, we divide 26,758 by 1.2, which gives 22.299. There is another relationship of 1 between primary income at Tartu and the income in the rest of Estonia. Therefore, an income effect of about 44.598 in Estonia. Multiplied by 0.36 (Tax/GDP) relation gives 16.055. Subtract from this amount the taxes paid for the faculty of 5.612 and receive 10.443. Deferral is 50%.

¹³⁴ The number of students 533 * 0.60 (% of students not passing the examination in a nominal time period, information according to the Dean's Office). Social costs are measured in commercial accounting, however, not the living costs of the students. Assumed that most of the students are working and earn 2,500 EEK per month. The living costs are 3,000 EEK per month. Therefore, 500 EEK have to be met from elsewhere, e.g., parents. Result for the additional costs will be 533x0.6x10x500 = 1.600

Master's studies ¹³⁵		IIFsC6111	
IIFL1001	0.188	IIFT7101	0.188
	0.188		0.188

Doctoral studies ¹³⁶		IIFsC6122	
IIFL1001	0.255	IIFT7101	0.153
		IIFT9302	0.102
	0.255		0.255

Vocational training, distance teaching ¹³⁷		IIFsC6132	
IIFL1001	0.017	IIFT7301	0.014
		IIFT9302	0.003
	0.017		0.017

Open University ¹³⁸		IIFsC6141	
IIFL1001	0.02	IIFT7301	0.02
	0.02		0.02

Publications of teaching materials ¹³⁹		IIFsC6152	
IIFL1001	0.204	IIFT7310	0.194
		IIFT9302	0.010
	0.204		0.204

¹³⁵ The number of students 188 * 0.50 (% of students not passing the examination in normal time, information according to the Dean's Office) and 200 EEK had to meet additionally per student, therefore in total 0.188.

¹³⁶ The number of students 51, assumed that most of the students are working and earn 2,800 EEK per month. The living costs are 3000 EEK per month. Therefore, 200 EEK have to be met from elsewhere, e.g., parents. Therefore, accounted as social costs 0.255.

¹³⁷ The number of students in teachers' training is 17; these students are working. Therefore, they can pay themselves to cover living expenses. However, there are additional costs to reach the faculty, etc. On the average this might be 100 EEK per month per person. Calculation: $17 \times 10 \times 100 = 17000$, $\rightarrow 0.017$

¹³⁸ The faculty had 10 master's students in Open University for master's studies. Ten hours for one credit point, 200 EEK cost if buying them outside (social costs).

¹³⁹ The faculty provides 30 pages per one credit point (from reports). A master's student has to achieve 15 credit points per year. Number of master's students 188, bachelor students 533, number of courses for which materials are produced. Some of the texts are newly prepared, others are just copies or available from prior teaching sessions. Therefore, assumed 10 hours per teaching material per credit point. $10 \times 60 \times 200 \rightarrow 0.120$. For bachelor's students there are 7 hours necessary. $7 \times 60 \times 200 \rightarrow 0.084$, in total 0.204; Deferral is 5%.

Publications of research results¹⁴⁰ IIFsC6202

IIFL1001	0.016	IIFT7301	0.015
	0	IIFT9302	0.001
	0.016		0.016

Rising funds¹⁴¹ IIFsC6212

IIFL1001	1.124	IIFT7301	0.842
		IIFT9302	0.282
	1.124		1.124

Writing proposals¹⁴² IIFsC6222

IIFL1001	1.032	IIFT7301	0.778
		IIFT9302	0.254
	1.032		1.032

Writing articles books¹⁴³ IIFsC6231

IIFL1001	1.048	IIFT7101	1.048
	1.048		1.048

¹⁴⁰ The publication of research results that are mainly relevant for one period are mainly those appearing in daily journals, newspapers, etc. Here the faculty has evaluated about 100 points. For one article it allocates 25 points. There are 16 articles. They have about 10 typed pages each. For one page the journals pay about 200 EEK. There are additional costs because of lost time of 100 EEK for one page. A deferral rate of 5% is considered for the publisher. Calculation: $16 \times 10 \times 100 \rightarrow 0.016$

¹⁴¹ The faculty discusses paying out a reward of 20,000 EEK for each project that was obtained a year. There have been 23 grants by Estonian scientific institutions. The amount: 460,000 EEK (0.460). Moreover about 47 international projects are reported. However, there are partners from other countries involved. As this causes special difficulties, but accounted with 40,000 EEK. Result: 1,880,000 EEK. The success is due to partners and donors as well. Thirty percent are going to be deferred. Normally there are about 3 persons included in an application. Cost part calculated: $40 \times 23 \times 200 + 100 \times 47 \times 200 \rightarrow 1.124$, deferral with international projects 0.282

¹⁴² The faculty discusses paying out a reward also to those proposals that are not accepted as projects. The participants are going to learn and have to increase their knowledge concerning the research questions and to prepare networks, and they risk their reputation, etc. Therefore a premium of 10,000 EEK for each project might be obtained for an application. Twenty-five percent of projects fail in application (Information from the Dean's Office). Learning success is due to partners and donors as well. Thirty percent are going to be deferred. For the non-successful is assumed a preparation time of 30 hours. Therefore was accounted 47×3 (additional hours of work) $\times 200 \times 30 \rightarrow 0.846$ for international and 0.186 for Estonian projects, in total 1.032, with deferral 0.254

¹⁴³ The faculty considers the writing of articles and books to be of social value. Although the focus is more on articles and books accepted for publication, the writing as such may lead to future publications. For social costs accounting: overload 40 hours \times 131 articles \times 200 opportunity cost $\rightarrow 1.048$

Organizing conferences, meetings¹⁴⁴ IIFsC6242

IIFL1001	0.253	IIFT7101	0.215
		IIFT9302	0.038
	0.253		0.253

Consulting to firms¹⁴⁵ IIFsC6301

IIFL1001	0.477	IIFT7101	0.477
	0.477		0.477

Consulting to public institutions¹⁴⁶ IIFsC6311

IIFL1001	0.308	IIFT7101	0.308
	0.308		0.308

Consulting to Parliament¹⁴⁷ IIFsC6321

IIFT7301	0	IIFL1001	0
	0		0

Consulting to EU¹⁴⁸ IIFsC6331

IIFT7301	0.001	IIFL1001	0.001
	0.001		0.001

¹⁴⁴ International contacts allow staff participants to join international conferences. The social cost part is calculated in following way: attendance in international conferences $41 * 15(\text{hours}) * 200(\text{value per hour}) \rightarrow 0.123$; attendance in Estonia $66 * 5 * 200 \rightarrow 0.066$; overload from teaching in special events (mathematical school for secondary schools) $14(\text{staff members}) * 20(\text{hours}) * 0.1(\text{overtime for organizational issues}) * 0.1(\text{overtime from teaching}) \rightarrow 0.064$, in total 0.253 with deferral 15%.

¹⁴⁵ The academic staff of the faculty has worked on average three hours a week for services not booked with the university apart from the usual 2 hours. These three hours are tackled as flows. Therefore in 53 weeks and an hourly income of 500 EEK, additional costs 20 000 EEK. There were 15 staff members involved in consulting to firms (information from the Dean's Office). Therefore, social costs are $53 * 3 * 200 = 31800$, $0.032 * = 477,000$, $\rightarrow 0.477$.

¹⁴⁶ The academic staff of the faculty has worked on average three hours a week for services not booked with the university apart from the usual 2 hours. These three hours are tackled as flows. Therefore in 53 weeks and an hourly income of 500 EEK, additional social costs 200 EEK. There were 20 (9+11, worked correspondingly 2 hours and 1 hour based on information from the Dean's Office) members of academic staff involved in consulting to public institutions. Therefore, social costs calculation $9 * 2 * 53 * 200 \rightarrow 0.191$ and $11 * 1 * 53 * 200 \rightarrow 0.117$, in total 0.308

¹⁴⁷ No one worked as members of central state and in city council.

¹⁴⁸ Consulting with the EU and contacts take place through research projects financed by the EU. This is especially the case with the doctoral program and the EU projects. The faculty discusses that these contacts are of especial value; they want to pay between 1% to 5% of the project sum to the applicant's disposal. Therefore, 1% of administrative costs are considered.

Consulting to scientific bodies¹⁴⁹ IIFsC6341

IIFL1001	0.002	IIFT7101	0.002
	0.002		0.002

Monitoring, control¹⁵⁰ faculty IIFsC6401

IIFL1001	0.025	IIFT7101	0.025
	0.025		0.025

Financial management¹⁵¹ faculty IIFsC6411

IIFL1001	0.026	IIFT7101	0.026
	0.026		0.026

¹⁴⁹ Consulting with scientific bodies in Estonia takes place through research projects financed by these institutions. This is the case with Target funding research, Estonian Science Foundation grants, and research and development contracts. The faculty discusses that these contacts are of special value; they want to provide between 1% to 5% of the project, some at the applicant's disposal. Therefore choose 1% as benefit flow. Five percent are used for administration costs, data from the UT Financial Office for Estonian foundation support 4446710 EEK →0.002

¹⁵⁰ Twenty-three faculty members have been on the faculty board and on the faculty council. There they have to work about 6 hours two times per month in meetings. If is considered for the management functions they have to perform they had to spent 30 minutes on monitoring and control, 30 minutes on financial matters, 30 minutes on staff management 20 minutes on labs management, and 3 hours and 40 minutes for decision making on academic exams, regulations, projects, etc. Therefore, we get from 12 hours 1 hour on monitoring and control, 1 hour on financial matters, 1 hour on staff management, 40 minutes on labs and 7 hours + 20 minutes for decision making. Moreover there are 18 heads of chairs. They need 6 hours weekly for chair management. Here monitoring and control is 1 hour, financial matters concern 1 hour, staff management 3 hours, nearly no lab problems, and 1 hour for decision making. Therefore there are 4 hours for management and control, 4 hours for financial matters, 12 hours for staff management, and 4 hours for decision making. There were 4 heads of institutes who need 3 hours per week. Here is assumed 30 minutes for management and control, 30 minutes for financial matters, 30 minutes for staff management, and 1 hour 30 minutes for decision making. From 12 hours per month we get 2 hours monitoring and control, 2 hours for financial matters, 2 hours for staff management, and 6 hours for decision making. The dean has to work an additional 8 hours on these tasks per week. One hour for monitoring and control, 2 hours on financial matters, 1 hour in staff management, and 4 hours on decision making in the faculty and other university bodies. The vice deans spend an additional 2 hours per week. They are engaged in monitoring and control 1 hour and in staff management 1 hour. As far as monitoring and control is concerned. In total 1,270 hours are dedicated to monitoring and control. As the actual income per hour is about 200 EEK. Although to perform this management function, the managers have to work more than they have to officially. Therefore, assume 10% over workload. This means 1,270 hours, which would be paid by 200 EEK gives the social willingness to pay as $1,270 * 200 * 0.1 = 0.025$ in addition. External social costs are not related explicitly. The producer surplus in the sense of using to low income is already considered.

¹⁵¹ For financial management in total 1,310 hours per a year has been dedicated in the faculty. The actual income per hour is about 200 EEK and 10% work overload. The additional social costs are 0.026.

Staff management¹⁵² faculty IIFsC6421

IIFA1001	0.021	IIFT7101	0.021
	0.021		0.021

Decision making¹⁵³ faculty IIFsC6431

IIFL1001	0.061	IIFT7101	0.061
	0.061		0.061

Management of labs, etc.¹⁵⁴ faculty IIFsC6441

IIFL1001	0.003	IIFT7101	0.003
	0.003		0.003

Contacts to other the other faculties¹⁵⁵ IIFsC6452

IIFL1001	0.007	IIFT7101	0.003
		IIFT9302	0.004
	0.007		0.007

Support of Colleges¹⁵⁶ faculty IIFsC6461

IIFT7301	0	IIFL1001	0
	0		0

¹⁵² For the staff management in total 1,070 hours were dedicated in the faculty. As the actual income per hour is about 200 EEK and 10 % overload work, additional social costs are $1070 \cdot 200 \cdot 0.1 \rightarrow 0.021$.

¹⁵³ For decision making in total 3,046 hours were dedicated. As the actual income per hour is about 200 EEK from normal income, the overload 10% social costs are $3046 \cdot 200 \cdot 0.1 = 0.061$ in addition.

¹⁵⁴ For management of labs in total 2700 hours were dedicated in the faculty and as following the same logic as above then the result will be 0.001 in addition.

¹⁵⁵ The contacts of the dean to other faculties are already considered in decision making. However, the 18 heads of chairs also contact other faculties. Suppose $\frac{1}{2}$ hour per week. They need 2 hours a month and 360 hours yearly. With overload 10%, and 200 EEK per hour, then $\rightarrow 0.007$. The deferral is 50%.

¹⁵⁶ The support of colleges is already booked in the commercial bookkeeping.

Representation ¹⁵⁷ faculty		IIFsC6471	
IIFL1001	0.012	IIFT7101	0.012
	0.012		0.012

Contact to schools ¹⁵⁸ faculty		IIFsC6501	
IIFL1001	0.041	IIFT7101	0.041
	0.041		0.041

Attraction of visitors ¹⁵⁹ faculty		IIFsC6512	
IIFL1001	0.05	IIFT7101	0.045
		IIFT9302	0.005
	0.05		0.05

Public Relations ¹⁶⁰ faculty		IIFsC6522	
IIFL1001	0	IIFT7101	0
		IIFT9302	0
	0		0

Advertisement ¹⁶¹ faculty		IIFsC6532	
IIFL1001	0.004	IIFT7101	0.004
		IIFT9302	0
	0.004		0.004

¹⁵⁷ The faculty is mostly represented by the dean and his reputation as a well-known professor. On the average he needs 2 hours a week, or 80 hours a year. For this management function: a social value of $80 \cdot 300 = 24,000$, 0.024 . The social value of additional attracted students is already considered with other social values considered above. As far as the representation takes place in Tartu there are only a few additional time losses for representation. If representation takes place in Tallinn or other places like Pärnu, Narva, etc., the travel costs will be compensated and are considered in commercial accounting. However, the travel time loss is not compensated. If one time a month the representation takes place outside Tartu, with travel time of 6 hours, we account 60 hours. These are 12,000, additional social costs $\rightarrow 0.012$.

¹⁵⁸ The dean might need 10 hours a year. This is an additional duty. For this management function: receive a social cost of $10 \cdot 200 = 2000$, 0.002 . Additionally social costs connected with contacts to school of other staff members: $28 \cdot 10 \cdot 140 \rightarrow 0.039$, in total 0.041 .

¹⁵⁹ This is a social cost as these services, etc., cannot be used for other purposes. Therefore, a value of $0.168 \cdot 0.3 = 0.050$, with deferral 10%.

¹⁶⁰ The faculty reports about results, interviews professors, etc., distributes information about its work research, etc. There was no report on that.

¹⁶¹ The faculty advertises through the articles of the staff members written in Estonian journals. The social value of these advertising activities is already captured by the evaluation of published articles. Announcements in TV are also tackled before. However there is also information in newspapers concerning events that take place in the faculty such as conferences, staffing, examinations, and research results. Therefore, it is assumed that this takes place two times a month. As a newspaper costs about 18 EEK, detected the monthly value as 0.1. As the edition of the newspapers is about 100,000 we achieve 0.120. The deferral is 10%. There might be overtime of 2 hours per month that gives us 20 hours a year. Calculation ends up with 0.004. The deferral amount is too small to be booked.

Other social costs¹⁶²

IIFsC6552

IIFLT1001	0.140	IIFT7301	0.140
	0.140		0.140

Depreciation

IIFsC6701

IIFV3101	0	IIFT7101 building	0
IIEV3111	3.778	IIFT7101 current assets	3.778
IIFV3201	0.895	IIFT7101 baccalaureate	0.895
IIFV3211	0.282	IIFT7101 master	0.282
IIFV3222	0.152	IIFT7101 doctor	0.152
IIFV3231	0	IIFT7101 open university	0
IIFV3241	0	IIFT7101 vocational	0
IIFV3251	0.065	IIFT7101 staff	0.065
IIFV3261	0.062	IIFT7101 scientists	0.062
IIFV3301	2.456	IIFT7101 last research	2.456
IIFV3312	0.080	IIFT7101 cooperation	0.080
IIFV3321	0.294	IIFT7101 research staff	0.294
IIFV3331	0.020	IIFT7101 equipment	0.020
IIFV3341	0	IIFT7101 building	0
IIFV3351	0.001	IIFT7101 library	0.001
IIFV3361	0	IIFT7101 centers	0
IIFV3401	0.577	IIFT7101 consulting private firms	0.577
IIFV3411	0.371	IIFT7101 consulting government	0.371
IIFV3421	0.005	IIFT7101 consulting the EU	0.005
IIFV3501	0.096	IIFT7101 Estonian	0.096
IIFV3511	0.235	IIFT7101 employment	0.235
IIFV3521	0.423	IIFT7101 incr. infrastructure	0.423
IIFV3602	0.134	IIFT7101 profit	0.134
IIFV3612	0.505	IIFT7101 tax	0.505
	10.431		10.431

Appreciation of faculty IIFB5801

IIFT7301	0	IIFW3001 previous net-benefit.	0
IIFT7301	0	IIFW3011 accidents	0
IIFT7301	0.142	IIFW3021 emissions	0.147
IIFT7301	0	IIFW3101 financial obligations	0.714
IIFT7301	0	IIFW3201 closing consulting	0
IIFT7301	0	IIFW3301 loss staff	0
IIFT7301	0.005	IIFW3401 political activities	0
IIFT7301	0	IIFW3501 employment losses	0
IIFT7301	0	IIFW3511 reduced infrastructure	0
	0.147		0.861

¹⁶² On the parking lot and on the way to the faculty car accidents occur. Seven accidents occurred (information from interviews). The damage is about 20000 EEK per accident. Social costs →0.140

Deferral of the Faculty benefits and costs IIFT9302

IIFsC6122	0.102	IIFB5122	4.718
IIFsC6132	0.003	IIFB5132	0
IIFsC6152	0.010	IIFB5152	0.141
IIFsC6202	0.001	IIFB5202	0.002
IIFsC6212	0.282	IIFB5212	0.564
IIFsC6222	0.254	IIFB5222	0.423
IIFsC6242	0.038	IIFB5242	0.111
IIFsC6512	0.005	IIFB5452	0.054
IIFsC6522	0	IIFB5512	0.017
IIFsC6532	0	IIFB5522	0.075
IIFsC6452	0.004	IIFB5532	0.012
IIFA1001	10.639	IIFB5542	5.221
	11.338		11.338

Social cash IIFA1001

IIFB5101 bachelor's	6.396	IIFA1001	
IIFB5111 master's	3.243		
IIFB5122 doctoral	11.794		
IIFB5132 vocational	0.043		
IIFB5141 Open University	0.300		
IIFB5152 publishing of teach materials	2.821		
IIFB5202 publishing of research mater	0.032		
IIFB5212 rising funds	2.340		
IIFB5222 writing proposals	1.720		
IIFB5321 writing art.	0.750		
IIFB5242 org. conferences	0.737		
IIFB5301 cons. firms	1.193		
IIFB5311 consult pub. institutions	0.769		
IIFB5321 consult Parliament	0		
IIFB5331 consult the EU	0.016		
IIFB5341 consult scientif. bodies	0.045		
IIFB5401 monitoring	0.381		
IIFB5411 financial	0.393		
IIFB5421 staff management	0.321		
IIFB5431 decision making	0.914		
IIFB5441 management of labs	0.046		
IIFB5452 contacts to other faculties	0.108		
IIFB5461 support to Colleges	0		
IIFB5471 representation of the faculty	0.024		
IIFB5501 contacts to schools	0.062		
IIFB5512 attraction of visitors	0.168		
IIFB5522 public relations	0.749		
IIFB5532 advertisement	0.120		
IIFB5542 fiscal benefits	10.443		
	45.928		45.928

Social cash IIFL1001

IIFA1001	IIFsC6101 bachelor's	1.600
	IIFsC6111 master	0.188
	IIFsC6122 doctor	0.255
	IIFsC6132 vocational	0.017
	IIFsC6141 open university	0.020
	IIFsC6152 teaching materials	0.204
	IIFsC6202 publication of resul	0.016
	IIFsC6212 rising funds	1.124
	IIFsC6222 writing proposals	1.032
	IIFsC6231 writing articles	1.048
	IIFsC6242 conferences	0.253
	IIFsC6301 consulting firms	0.477
	IIFsC6311 consult public instit	0.308
	IifsC6321 consulting Parliament	0
	IIFsC6331 consulting EU	0.001
	IIFsC6341 consulting scientific bodies	0.002
	IIFsC6401 monitoring	0.025
	IIFsC6411 financial management	0.026
	IIFsC6421 staff management	0.021
	IIFsC6431 decision making	0.061
	IIFsC6441 management of labs	0.003
	IIFsC6452 contacts to other faculties	0.007
	IIFsC6461 support to Colleges	0
	IIFsC6471 representation of the faculty	0.012
	IIFsC6501 contacts to schools	0.041
	IIFsC6512 attraction of visitors	0.050
	IIFsC6522 public relations	0
	IIFsC6532 advertisement	0.004
	IIFsC6552 other social costs	0.140
	6.935	6.935

e)

IIFT7101 Additional Operating Social Success Statement of the Faculty					
VII. Social Costs from			VIII. Social Benefits from		
Teaching (1)					
sC6101	Bachelor's studies	1.600	B5101	Bachelor's studies	6.396
sC6111	Master's studies	0.188	B5111	Master's studies	3.243
sC6122	Doctoral studies	0.153	B5122	Doctoral studies	7.076
sC6132	Promotion of skills (vocational training)	0.014	B5132	Vocational training, distance teaching	0.043
sC6141	Open University	0.020	B5141	Open University	0.300
sC6152	Publication of teaching materials	0.194	B5152	Publications of teaching materials	2.680
Research (2)					
sC6202	Publication of research Results	0.015	B5202	Publication of research results	0.030
sC6212	Rising funds	0.842	B5212	Rising funds	1.776
sC6222	Writing proposals	0.778	B5222	Writing proposals	1.297
sC6231	Writing, articles, books	1.048	B5231	Writing articles, books	0.750
sC6242	Organizing conferences meetings	0.215	B5242	Organizing conferences, meetings	0.626
Consulting (3)					
sC6301	To firms	0.477	B5301	To firms	1.193
sC6311	To public institutions	0.308	B5311	To public institutions	0.769
sC6321	To parliament	0	B5321	To parliament	0
sC6331	To EU	0.001	B53312	To EU	0.016
sC5341	To scientific bodies	0.002	B5341	To scientific bodies	0.045
Management activities (4)					
sC6401	Monitoring	0.025	B5401	Monitoring, control	0.381
sC6411	Financial management	0.026	B541112	Financial management	0.393
sC6421	Staff management	0.021	B5421	Staff management	0.321
sC6431	Faculty decision making	0.061	B5431	Faculty decision making	0.914
sC6441	Management of labs	0.003	B5441	Management of labs, etc.	0.046
sC6452	Contacts to other faculties	0.003	B5452	Contacts to other faculties	0.054
sC6461	Support of Colleges	0	B5461	Support of Colleges	0
sC6471	Representation	0.012	B5471	Representation	0.024
Other Faculty activities (5)					
sC6501	Contact to schools	0.041	B5501	Contact to schools	0.062
sC6512	Attraction of visitors	0.045	B5512412	Attraction of visitors	0.151
sC6522	Public relations	0	B5522	Public Relations	0.674
sC6532	Advertisement	0.004	B553234	Advertisement	0.108
sC6542	Fiscal social costs		B5542	Fiscal social benefits	5.222
sC6552	Other social costs	0.140	B5552	Other social benefits	
sC6701	Depreciation		B5801	Appreciation prev. n. b.	0

	0	Appreciation fin. obligations	0.714
	3.778	Appreciation accidents	0
	0.895	Appreciation emissions	0.147
	0.282	Appreciation closing c.	0
	0.152	Appreciation loss staff.	0
	0	Appreciation pol. act.	0
	0	Appreciation employ loss	0
	0.065	Appreciation red. infrastructure	0
	0.062		
	2.456		
	0.080	Sum:	0.861
	0.294		
	0.020		
	0		
	0.001		
	0		
	0.577		
	0.371		
	0.005		
	0.096		
	0.235		
	0.423		
	0.134		
	0.505		
	(10.431)		
B4871	Positive additional social net benefit	18.784	
		35.451	35.451

f)

IIFT7301	Additional Social Final Balance of the Faculty			
Additional Social Assets		Additional Social Liabilities		
IIFA0101	Value of buildings	0	IIFL4001 Stock of previous net benefits	0
IIFA0111	Value of assets not booked with the Faculty	40.340	IIFL4011 Accidents	0
IIFA0201	Knowledge of bachelor's	4.477	IIFL4021 Emissions, spoiled environment	0.736
IIFA0211	Knowledge of master's	2.820	IIFL4101 Future financial obligations	14.280
IIFA0222	Knowledge of doctoral	1.516	IIFL4201 Closing down of consultancy institutions	0
IIFA0231	Knowledge from Open University	0	IIFL4301 Loss of staff	0
IIFA0242	Knowledge vocational training distance teaching	0	IIFL4401 Loss of resources through political activities	0
IIFA0251	Knowledge teaching staff	0.653		
IIFA0261	Knowledge of Scientists	0.620		
IIFA0301	Lasting research results	24.563		
IIFA0312	Increasing international cooperation capacities	0.401		
IIFA0321	Increase of research capacities: staff	1.470		
IIFA0331	Increase of research capacities: equipment	0.099		
IIFA0341	Increase of research capacities: buildings	0		
IIFA0351	Increase of research capacities: library	0.060		
IIFA0361	Contribution to research centers	0		
IIFA0401	Capacity to consult firms	1.749		
IIFA0411	Capacity to consult governments	1.113		
IIFA0421	European funds	0.016		

IIFA0501	Development of Estonian language	0.479			
IIFA0511	Increased Employment	2.346	IIFL4501	Employment losses	0
IIFA0521	Increased infrastructure	4.234	IIFL4511	Reduced infrastructure	0
IIFA0601	Changes of profits, rents of other firms	1.338			
IIFA0612	Increase of tax receipts, etc. of governments	5.051			
IIFA1001	Social cash		IIFL1001	Social cash (social capital)	49.975
IIFW3001	Value adjustment to previous net benefits	0	IIFV3101	Value adjustment to buildings	0
IIFW3011	Value adjustment to accidents	0	IIFV3111	Value adjustment of current assets not booked with faculty	3.778
IIFW3021	Value adjustment to emissions	0.147	IIFV3201	Value adjustment to knowledge of baccalaureate	0.895
IIFW3101	Value adjustment to future financial obligations	0.714	IIFV3211	Value adjustment to knowledge of master	0.282
IIFW3201	Value adjustment to closing down of consultancy institutions	0	IIFV3222	Value adjustment to knowledge of doctor	0.152
IIFW3301	Value adjustment to loss of staff	0	IIFV3231	Value adjustment to knowledge from Open University	0
IIFW3401	Value adjustment to loss of resources through political activities	0	IIFV3241	Value adjustment to knowledge vocational training distance teaching	0
IIFW3501	Value adjustment to employment losses	0	IIFV3251	Value adjustment to knowledge teaching staff	0.065
IIFW3511	Value adjustment to reduced infrastructure	0	IIFV3261	Value adjustment to knowledge of scientists	0.062
			IIFV3301	Value adjustment to lasting research results	2.456
			IIFV3312	Value adjustment to increasing international cooperation capacities	0.080
			IIFV3321	Value adjustment to increase of research capacities: staff	0.294

		IIFV3331	Value adjustment to increase of research capacities: equipment	0.020
		IIFV3341	Value adjustment to increase of research capacities: buildings	0
		IIFV3351	Value adjustment to increase of research capacities: library	0.001
		IIFV3361	Value adjustment to contribution to research centers	0
		IIFV3401	Value adjustment to capacity to consult firms	0.577
		IIFV3411	Value adjustment to capacity to consult governments	0.371
		IIFV3421	Value adjustment to European funds	0.005
		IIFV3501	Value adjustment to development of Estonian language	0.096
		IIFV3511	Value adjustment to increased Employment	0.235
		IIFV3521	Value adjustment to increased infrastructure	0.423
		IIFV3602	Value adjustment to changes of profits, rents of other firms	0.134
		IIFV3612	Value adjustment to increase of tax receipts, etc. of governments	0.505
		IIFB4871	Additional social net benefit	18.784
	94.206			94.206

Source: Compiled by the author

SUMMARY IN ESTONIAN – EESTIKEELNE KOKKUVÕTE

Raamatupidamislik käsitus ülikooli teaduskonna sotsiaaltulemuse arvestuseks Tartu Ülikooli näitel

Töö aktuaalsus ja motivatsioon

Tavapärane majandusüksuse edukuse mõõdupuu on kasum. See näitab edukust vahetusprotsessis, ent eirab seda edu, mis ei tulene turust, vaid jääb sellest väljapoole. Majandusüksuse tegevuse välismõjusid üksikisikutele, leibkondadele, ühiskonnale ja loodusele kasumis ei arvestata.

Sotsiaaltulemuse mõiste hõlmab majandusüksuse tegevuse välismõjusid üksikisikutele, leibkondadele, ühiskonnale ja ka looduskeskkonnale (Eichhorn 2011). Finantstulemusega võrreldes puudutab see hoopis laiemat edutegurite rida. Käesoleva doktoritöö autor määratleb sotsiaaltulemust (ja ka sotsiaalset edukust) healuteooria alusel kui majandusüksuse tekitatud heaolu muutu (parentust) ühiskonnas.

Sotsiaaltulemuse arvestus on kasvanud välja kriitikast majandustulemuste tavapärase mõõtmise (Schaltegger ja Burritt 2000: 76; Richmond *et al.* 2003), eriti finants- ja juhtimisarvestuse kohta, sest need loovad majandusüksuste ja ühiskonna vastastikmõjust liiga kitsa pildi. Mõnikord kirjeldatakse sotsiaaltulemuse arvestust isegi kui vastuhakku tavapärastele arvestuspõhimõtetele ja -tavadele, sest nii saadakse uuendustest paremini aru (Geddes 1992). Sotsiaaltulemuse arvestusega on tegeletud viimased 40 aastat, mille jooksul on rõhutatud vajadust rakendada laiemat käsitusviisi arvestuse pidamises (Linowes 1968, 1973; Hopwood 1978; Burchell *et al.* 1985; Gray *et al.* 1997) ning teha muudatusi arvestuse metoodikas (Cooper *et al.* 2005; Mook *et al.* 2007; Bebbington *et al.* 2007; Lehman 2007).

Sotsiaaltulemuse arvestuse tähtsus ja mõju on sektoriti erinev. Gray *et al.* (2011) on märkinud, et „sotsiaaltulemuse arvestus- ja auditeerimisprojekt” kui üldine suundumus on viimase 40 aasta jooksul olnud keskendunud selle panusele „lennukasse diskursusesse kriisidest räsitud sotsiaalse ja keskkonnakonteksti valguses ning praeguse arvestussüsteemi puudustele ja selle uurimisele”. On osutatud probleemile, et sotsiaaltulemuse arvestust käsitlev kirjandus ja empiirilised uuringud on olnud kallutatud erasektori tegevuse suunas. Samas peaksid ka avalik ja kolmas sektor arendama meetodeid ja vahendeid oma põhitegevuse kajastamiseks ja võtmetulemuste hindamiseks, et õigustada oma olemasolu ühiskonnas ja keskkonnas (Pestoff 2011). Arutelu teemal, kuidas laiendada avaliku sektori sotsiaaltulemuse arvestuse käsitlemist, algatati alles üsna hiljuti (Ball 2003; Marcuccio ja Steccolini 2005; Gray *et al.* 2011). Gray ja tema kolleegid (2011) on jätkanud debatti selle üle, milline võiks olla sotsiaaltulemuse arvestuse uuem kontseptsioon.

Praegustes sotsiaaltulemuse arvestuse käsitusviisides, nagu inimkapitali arvestus, sotsiaalaudit, mida on rakendatud ühistranspordi, keemiatööstuse (Adams ja Kuasirikun 2000), energeetikatööstuse (Tsimopoulos 1989; Larringa-Gonzalez ja Bebbington 2001) ja tervishoiuteenuste ettevõtetes ning isegi haridusasutustes, on kasutatud meetodeid, mis ei ole ülikooli puhul piisavad ülesannete ja tegevuste tõttu, mis on seotud nende ülesannete täitmisega. Sel põhjusel uuritakse käesolevas doktoritöös just seda teemat.

Majandusüksustel tuleb sageli tõendada oma sotsiaalset edukust ühiskonnale tervikuna, selle eri rühmadele, sidusrühmadele ja teistele majandusüksustele. Ülikooli puhul on oluline saavutada ja näidata mõõdetavat sotsiaaltulemust, sest ülikoolidel on ühiskonna ees täita olulisi ülesandeid, mis sisaldavad laiemat mõõdet kui finantstulemus mõõta võimaldab. Need ülesanded võib jagada kolmeks (Watson 2007, 2010). Esmatähtis ülesanne hõlmab ülikoolide põhirolli anda lõpetajaid, kes lähevad tööle ja täidavad oma osa kodanikuühiskonnas, kus nende panus on tõenäoliselt suurem kui siis, kui nad ei oleks ülikoolis õppinud. Seega maksavad nad ka makse ja lõpetanutena annavad maksude kaudu tagasi osa oma keskmisest suuremast sissetulekust. Ülikoolide põhiülesandega seoses võib esile tuua ka teisi suundi, mis on olulised kohalikule kogukonnale, kodanikuühiskonna institutsioonidele, valitsusele, maailma kodanikkonnale (poliitiliste, majandus- ja keskkonnaküsimustega järkjärgulise tegelemise kaudu) ja teiste kõrgharidusasutuste rühmadele (kohalikul, piirkondlikul, riiklikul või rahvusvahelisel tasandil).

Teine oluline ülesanne on seotud ülikoolide kohustusega anda lõpetajaid vajalikel erialadel ja kutsealadel. See tähendab, et ülikoolid osutavad teenuseid, tegelevad uurimis- ja arendustegevusega ning nõustavad.

Kolmas ülesanne on seotud ülikooli ja selle liikmete vaheliste kohustustega. Üldjoontes tähendab see, et nii üliõpilastel kui ka töötajatel on ühiskonna ees kohustusi, nt akadeemilised tavad, sh teiste inimeste arvamuste ja seisukohtade ärakuulamine ning nendega arvestamine.

Väidetakse, et praegu on ülikoolid liikumas teisest põlvkonnast kolmandasse põlvkonda (Wissema 2009: 23) ja see mõjutab ka nende rolli ühiskonnas ning avaldab mõju ülesannetele ja tegevusvaldkondadele, mida hõlmab sotsiaaltulemuse arvestus. See tähendab, et ülikoolid on oma arengus võtnud suuna rahvusvahelistumisele ja interdistsiplinaarsemale õpetamisele. Seega on nende mõju ühiskonnale ja ülesanded ühiskonna ees laiemad, kui finantsarvestuse ja -edu kaudu on võimalik väljendada. Ülikoolide sotsiaaltulemuse käsitlemise ja mõõtmise juures on asjakohane nende suundumustega arvestada.

Kuna ühiskonna ees seisvate ülesannete täitmist on vaja hinnata, tuleb leida sobiv arvestusmeetodika, mis võtaks sisemõjude kõrval arvesse ka välismõjusid, mida tavapärase finantsarvestus ei kaasa. Seda eesmärki aitab täita sotsiaaltulemuse arvestus. Peale selle võimaldab sotsiaaltulemuse arvestus leida lisavõimalusi, kuidas anda aru nende ülesannete täitmise kohta.

Eelnimetatud käsitluste kõige suurem uuendus on asjaolu, et sotsiaaltulemuse arvestus võtab arvesse majandusüksuste (ettevõtted, haridusasutused,

valitsusvälised organisatsioonid jne) mõju oma väliskeskonnale ja üritab arvestussüsteemi raames selliseid mõjusid selgitada. Siinkohal tuleb aga rõhutada, et vastavates uuringutes otsitakse jätkuvalt sotsiaaltulemuse arvestuse täiuslikumat (Bebbington *et al.* 2007) ja terviklikumat käsitusviisi (Mook *et al.* 2007). See näitab selgelt lünki kõnealuses uurimisvaldkonnas. Sotsiaaltulemuse arvestuse valdkonnas esineb probleeme nii sotsiaaltulemuse eri aspektide määratlemise kui ka mõõtmisega. Autori väidet kinnitavad Kaya ja Yayla (2007).

Käesolevas töös keskendutakse eelkõige kahele konkreetsele lüngale sotsiaaltulemuse uuringutes: ülikooli sotsiaaltulemuse sisulisele spetsiifikale ja selle tulemuse perioodipõhise üldistava sünteetilise mõõtmise meetodikale.

Kirjanduse analüüs näitas, et ülikoolide sotsiaaltulemuse arvestuse senised käsitlused ei võta arvesse heaolu muutust järelanalüüsi (*ex-post*) vormis ega anna terviklikku (sünteetilist) periooditulemust. Töös pakutakse selle lünga ületamiseks järelanalüüs koos seonduva raamatupidamissüsteemiga, mis viib perioodipõhise sotsiaaltulemuse arvestuseni.

Peale selle on uurimisvaldkonnas veel üks nn kohalik lünk, mida saab samuti täita käesoleva tööga. Suurem osa teaduskirjandusest ja uuringutest sotsiaaltulemuse arvestuse kohta pärineb Lääne-Euroopast, USAst ja Austraaliast. Eestis on sotsiaaltulemuse arvestuse olulisuse teema veel avastamisjärgus.

Doktoritöö teema on aktuaalne seetõttu, et töös tõstatatud küsimustele – mida ülikoolid kulude ja tuludena ühiskonnale pakuvad ning kuidas mõõta seda panust majandusteoreetilise heaolu kategooria kaudu – pole seni rahuldavat vastust. Avaldatud on uuringuid ülikoolide kohta (Leslie ja Lewis 2003; Wonnemann 1989) ja ka ülikoolide jätkusuutlikkuse aruandeid, kuid need ei käsitle ülikooli tulemuslikkust üldistavalt (sünteetiliselt), vaid ainult konkreetsete eesmärkide saavutamist. Selles doktoritöös soovitatakse kasutada perioodipõhist raamatupidamismetoodikat, et mõõta ülikooli poolt konkreetsetel perioodil tekitatud heaolu muutust ehk sotsiaalset edu. Kuigi konkreetseks uurimisobjektiks on töös valitud ülikooli teaduskond, siis saab ülesandeid ja tegevust arvestades ning väljatöötatud käsitusviisis muudatusi tehes kasutada seda ka teiste teadus- ja uurimisorganisatsioonide puhul.

Töö eesmärk ja uurimisülesanded

Sotsiaaltulemuse arvestus on ülikoolile oluline, sest selle abil saab hinnata sotsiaalset edukust oma eesmärkide ja tegevuse põhjendatuse alusel. Kõikides ülikoolides on teaduskonnad ja osakonnad ehk teisisõnu üksused, mis täidavad peamisi ülesandeid ja ülikooli kohustusi ühiskonna ees. Seetõttu on mõistlik alustada ülikooli sotsiaaltulemuse arvestust teaduskonna (või osakonna) tasandil.

Doktoritöö eesmärk on töötada välja perioodipõhine-raamatupidamismetoodika sotsiaaltulemuse *ex-post* arvestuseks, mis põhineb majandusteaduslikul heaoluteoorial ja mõõdab ülikooli teaduskonna sotsiaalset edukust. Metoodika töötatakse välja ning seda rakendatakse konkreetse teaduskonna –

Tartu Ülikooli (TÜ) matemaatika- ja informaatikateaduskonna – andmete teadustegutsines.

Eesmärgi saavutamiseks püstitati järgmised uurimisülesanded:

- Uurida sotsiaaltulemuse arvestuse kirjandusest leitud käsitusviise ning selgitada, kas ja miks peaks ülikooli puhul kasutama sotsiaaltulemuse arvestust.
- Analüüsida olemasolevaid sotsiaaltulemuse arvestuse meetodeid nende vastavuse seisukohalt perioodipõhise järelanalüüsi nõuetele.
- Selgitada heaoluteoorial põhinevat sotsiaaltulemuse arvestuse raamatupidamis–metoodikat ülikooli näitel (käsitluse formaalne struktuur, täiendava sotsiaaltulemuse arvestuse kontoplaan, peamised hindamismeetodid jne).
- Selgitada empiirilise näite tausta TÜ matemaatika- ja informaatikateaduskonna põhjal sotsiaaltulemuse arvestuseks.
- Töötada välja heaolumuutuste hindamisel põhinev järelanalüüsi raamatupidamis–metoodika ning rakendada seda TÜ matemaatika- ja informaatikateaduskonna puhul (matemaatika- ja informaatikateaduskonna bilansi koostamine, perioodi kajastava sotsiaaltulemuse aruande ja kogu sotsiaalbilansi koostamine);
- Tuua välja heaoluteoorial põhineva perioodipõhise raamatupidamis–metoodika eelised ja puudused ülikooli sotsiaaltulemuse arvestuses ning teha ettepanekuid sotsiaaltulemuse arvestuse võimalikuks edasiarendamiseks (täiendava sotsiaalse bilansi täiustamiseks).

Töö uudsus ja praktiline tähtsus

Ülikooli sotsiaaltulemuse arvestuse teemaga tegeletakse sotsiaaltulemuse arvestust käsitlevas kirjanduses suhteliselt harva, sest levinud arvamuse kohaselt on niigi selge, et ülikoolid avaldavad ühiskonnale positiivset mõju ning seda ei ole vaja lähemalt uurida. Sellise olukorra tekkele aitas kaasa ka 1980. aastatel alanud ja 1990. aastateni valitsenud suundumus, mis keskendus sotsiaaltulemuse arvestuse teema käsitlemisel eelkõige keskkonnaaspektidele ja jätkusuutlikkusele, kus on tegemist negatiivse välismõjuga (nende aastakümnete arengusuundumustest on koostanud ülevaate Rob Gray (2001)).

Üldiselt on turuga mitteseotud tegureid ja välismõjusid haridusvaldkonnas raske kindlaks määrata, kuid nende mõõtmine on veelgi keerulisem. Seetõttu napib eriti uurimusi, kus välismõjude heaoluefekte mõõdetakse maksevalmiduse alusel (vt näiteks Psacharopoulos ja Patrinos 2007).

Jätkusuutlikkuse aruandluse on võtnud kasutusele paljud USA ülikoolid (vt Sustainability Reporting of the Top U.S. Universities (2012); Campus Sustainability Report, University of California (2013); Sustainability Report for Ball State University (2012); Sustainability Progress Report, Brown University (2012); Sustainability Progress Report, University of Michigan (2012)), Kanada ülikoolid (Fonseca *et al.* 2011) ning Lääne-Euroopa ülikoolid (Sterling, Maxey ja Luna 2013). Alates 1990. aastatest on ülikoolide jätkusuutlikkuse aruannete

koostamine USAs pidevalt hoogustunud. Lääne-Euroopa puhul on leitud, et jätkusuutlikkuse aruandluse olukord ülikoolides on varajases arenguetapis veel ka aastakümneid hiljem ning seda nii aruandeid avaldatavate asutuste arvu kui ka aruandluse taseme poolest (Lozano 2011). Siiski ei keskendu sellised aruanded oma iga-aastaste jätkusuutlikkusmõõdikute ülesehituses ülikooli põhiülesannetele ja tegevusvaldkondadele ning nende tegevuse välismõjudele kogu ulatuses. Jätkusuutlikkuse aruannete keskmes on looduskeskkond ja näitajad kirjeldavad jätkusuutlikkust energiatarbimise ja kliimamuutuste, veetarbimise, toodetud jäätmete ja transpordi kasutamise ning looduskeskkonnale kahju tekitamise seisukohalt. See tähendab, et ka sellised jätkusuutlikkuse aruanded järgivad eespool mainitud sotsiaaltulemuse arvestuse suundumust: keskendumist keskkonnanäppektidele. Need aruanded ei ole tavapärase aruandluse osa ning neid ei saa liita arvestus- ja raamatupidamissüsteemiga, sest mõõtühikud ei ole rahalised. Mõõtmiseks on kasutatud eri ühikuid, nt protsente, tonne, kilovatt-tunde.

Üldiselt näitavad eelnimetatud aruanded, et kasutatud näitajad ei moodusta ühtset raamistikku ning näitajate valimisel on lähtutud mitmesugustest põhimõtetest.

Kui jätkusuutlikkuse aruannetes esitatakse näitajad, mis kirjeldavad ülikoolide tegevust väga laiaast vaatenurgast, siis intellektuaalse kapitali aruandluse lähtepunkt on asjaolu, et ülikooli põhiväljund on teadmised. Intellektuaalset kapitali käsitletakse seejuures kui inimkapitali, struktuurse kapitali ja suhtekapitali kogumit. Intellektuaalse kapitali aruandluses hinnatakse ülikoolide immateriaalset vara näitajate abil, mis on seotud teadustegevuse, hariduse ja teadmussiiirdega. Sama moodi nagu jätkusuutlikkuse aruannetes, kasutatakse ka siin eri näitajaid. Kõik need aruandlusnäitajad esitatakse eri mõõtühikutes, nt publikatsioonide arv teadustegevuse, lõpetajate arv hariduse, ekspertarvamuste arv teenuste korral. See tähendab, et võrreldavuse ja üldistamise ehk integreerimise probleem tekib ka siin. Intellektuaalse kapitali aruandluse asjakohasust ülikoolide puhul saab rõhutada asjaoluga, et Austria ülikoolides on sellised aruanded kohustuslikud alates 2002. aastast (Leitner 2004: 130), kuid nendes aruannetes piirdub hindamine vaid teadmiste loomise ja siirdega, jättes arvesse võtmata ülejäänud ülesandeid ja nende välismõju.

Käesoleva doktoritöö uudsus seisneb sotsiaaltulemuse arvestuse käsitusviisi väljatöötamises ülikooli teaduskonnale. Käsitusviisi aluseks on healoteooria ja tulu-kulu analüüsi hindamismeetodid, mida rakendatakse raamatupidamissüsteemis. Väljatöötatud ja teaduskonna näitel rakendatav käsitusviis on uudne, sest tegemist on metodoloogiaga, mis ühendab majandusteooria ja ettevõtte-majanduse analüüsimetodeid. See lahendab probleemid, mis esinevad jätkusuutlikkuse, intellektuaalse kapitali ja muudes aruannetes, kus kasutatakse tulemusnäitajatel põhinevaid mõõtmismeetodeid. Käsitusviisi kasutuselevõtuks tuli langetada olulised otsused selle kohta, kuidas määratleda teaduskonna sotsiaaltulemust ning määrata kindlaks raamatupidamismetoodikale esitatavad nõuded. Selle ülesande empiiriliseks täitmiseks tuli välja töötada põhjalik

järelanalüüs ja piisav raamatupidamissüsteem. Sotsiaaltulemuse raamatupidamise puhul kasutati heaoluteooriast pärinevat maksevalmiduse põhimõtet.

Uurimistööd saab kirjeldada ja piiritleda järgmiselt.

Sisu

- Keskendatakse heaolust lähtuvale sotsiaaltulemuse arvestusele, kasutades järelanalüüsi (*ex-post* analüüsi) osi ja elemente; mikro- ja makroökonomika teooriat edasi ei arendata, heaoluteooriat kasutatakse, kuid seda ei arendata edasi.
- Väljatöötatud käsitusviis kui järelanalüüs tugineb perioodipõhisele arvestus- ja raamatupidamissüsteemile. Selles ei tegeleta laiendatud investeeringute arvestuse ning riskide ja tulu-kulu analüüsi määramatuse probleemidega.
- Heaolu muutumisele keskenduvaid hindamisi koos olemasolevate hindamis- meetodite kohandamisega rakendatakse vastavalt teaduskonna sotsiaaltulemuse algandmetele, mis tulenevad maksevalmidusest ning mida väljendavad teaduskonna ülesanded ja sihtotstarbelised maksed ning kättesaadav teave.

Meetodid

- Peamiselt kasutatakse mikroökonomika teooriat ja meetodeid ning ettevõtte-majanduslikke raamatupidamiseeskirju ja makromajanduslikke mõjusid, võttes arvesse hinnatavaid mõjusid ja tehinguid.
- Mõju hindamise majanduslikke mudeleid, nt arvutusliku üldise tasakaalu mudel või võrranditega asukoha valiku mudel, edasi ei arendata.
- Käesolevas uurimuses ei kasutata ökonomeetrilisi meetodeid, vaid üksnes statistikaandmeid koos mitteturu põhiste hindamismeetodite kasutamiseega.

Empiiriline uuring tehti 2006. aasta kohta, kirjanduse allikaid analüüsiti kuni 2013. aasta lõpu seisuni. 2006. aasta valiti empiirilise uuringu jaoks seetõttu, et nii välditakse igasugust võimalikku sekkumist tegelikku juhtimisprotsessi, tagades nii uuringu neutraalsuse.

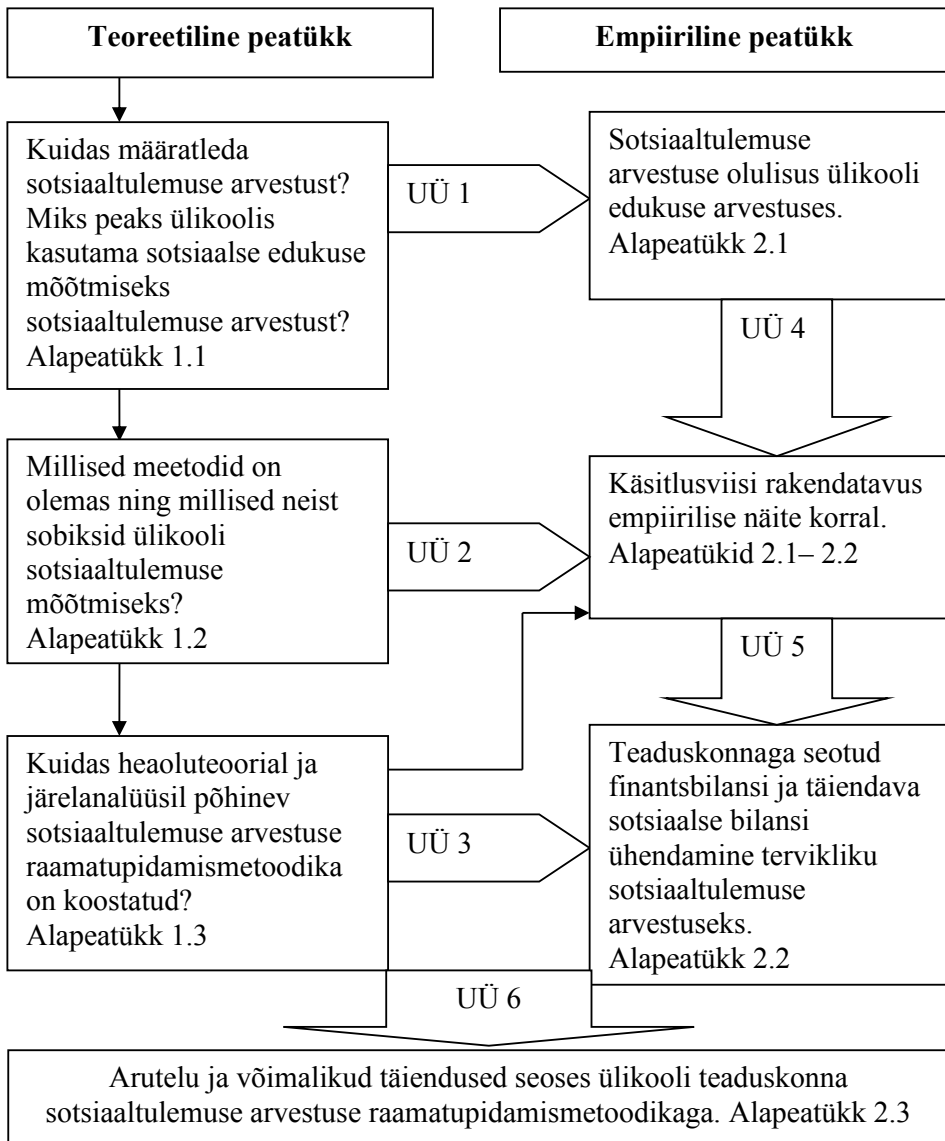
Mõjuala piiritlemine: vaadeldakse peamiselt Eestit ja siin valitsevat hinnasüsteemi ning arvestatakse muutusi Eesti elanike heaolus.

Doktoritöö piiranguks võib lugeda asjaolu, et kuna empiiriline osa on eksperimentaalne, siis ei paku see lahendusi, mida saaks automaatselt üldistada ja laialdaselt rakendada.

Sellest hoolimata on selline sotsiaaltulemuse arvestuse käsitusviis mitmel põhjusel asjakohane, sobides ülikooli sotsiaaltulemuse arvestuseks. Esmajoones võimaldab see süsteemselt ja terviklikult hinnata ning mõõta ülikooli välismõjusid tema tegevuse kaudu. Teiseks aitab see näidata sellise sotsiaalse tegevuse kasulikkust, mida turg ei koordineeri. Kolmandaks võimaldab see mõista, kuidas täidab ülikool või selle teaduskond eespool (uurimistöö motivatsiooni osas) kirjeldatud põhiülesandeid ühiskonna ees. Samuti annab see teadusliku aluse ülikooli või selle teaduskonna panuse muutmiseks ühiskonnas nähtavamaks.

Töö ülesehitus

Doktoritöö koosneb kahest peatükist. Esimene peatükk on teoreetiline ja selles esitatakse kirjanduse põhjal ülevaade sotsiaaltulemuse arvestuse käsitlustest ning sotsiaaltulemuse arvestuse vahekorra muude arvestuse liikidega (finants-, rahvamajanduse ja kameraal-arvepidamine). Sotsiaaltulemuse arvestuse käsitlusviisi selgitamiseks võrdleb autor sotsiaaltulemuse arvestuse määratlusi ning määratleb sotsiaaltulemuse arvestuse ülikooli jaoks (vt alapeatükk 1.1). Seejärel kirjeldatakse ja võrreldakse esimeses osas (alapeatükk 1.2) eri meetodeid, mida on kasutatud sotsiaaltulemuse arvestuses. Sotsiaaltulemuse mõõtmises kasutatavate meetodite kohta tehtud tähelepanekute alusel töötatakse välja heaolul põhineva järelanalüüsi ja sotsiaaltulemuse arvestuse raamatupidamise metodoloogiline raamistik ning kirjeldatakse seda (alapeatükk 1.3). Teine peatükk hõlmab empiirilise näite edasiarendamist: teaduskonna tegevuse välismõjude heaoluefektide hindamiseks rakendatakse meetodit, mis lähtub heaoluteooriast ja tulu-kulu analüüsist (alapeatükk 2.1), ning esitatakse teaduskonna näite tulemused (alapeatükk 2.2). Selleks arendatakse edasi järelanalüüsi ja perioodipõhist raamatupidamissüsteemi, mis põhineb kahekordse kirjendamisega finantsraamatupidamisel ning täiendaval sotsiaaltulemuse arvestusel. Peamised ülesanded sealjuures on kontoplaani koostamine, tuludel ja kuludel põhinevate sotsiaalsete hindamiste tegemine, tehingute, varade ja voogude väljaselgitamine, kirjendamis- ja saldeerimismeetodid, ning tulemuste tõlgendamine. Selles osas arutletakse ka väljaarendatud käsitlusviisi vajalikkuse ning eeliste ja puuduste üle (vt alapeatükk 2.3). Joonisel 21 on esitatud doktoritöö üldine struktuur, kus teoreetilise ja empiirilise osa vahelisi seoseid on kujutatud uurimisülesannete (UÜ) abil (UÜ – joonisel 21).



Joonis 21. Doktoritöö struktuur ja osade seosed uurimistülesannetega (UÜ)

Allikas: autori koostatud

Töö teoreetiline taust

Kõrghariduses võivad majandusüksused püüda saavutada enda eesmärke (organisatsiooni eesmärke) ja samas on nende ülesanded suunatud sotsiaalsele edule. Viimane tähendab, et majandusüksusel tuleb järgida avalikke eesmärke ja selleks on vaja meetodeid, et teha selgeks, kuidas üksuse tegevus vastab avalike eesmärkide täitmisele, ning hinnata nende sotsiaalset edukust. Kuid nagu eespool on näidatud, ei ole sellised meetodid veel rahuldaval tasemel. Eeskätt puudub avalikele eesmärkidele keskenduv raamatupidamissüsteem, mis võimaldaks hinnata sotsiaaltulemust perioodipõhiselt. Väidetavalt on tehtud mõned katsed projektide või üksiktegevuste sotsiaaltulemuse kindlakstegemiseks või siis välismõjude, näiteks keskkonnaalase edukuse või keskkonnamõjude kirjeldamiseks.

Et korvata heaoluökonomikal põhineva raamatupidamismetoodikaga neid puudujääke, tuleb teha mitu põhimõttelist otsust ja lahendada põhilised metodoloogilised probleemid. Kuna tulu-kulu analüüsis sisaldub heaolu muutuste analüüs (Zerbe ja Bellas 2006) ja selle eesmärk on suurendada ka üldsuse heaolu, sest sageli hõlmab see mittemateriaalset toodet või teenust (nt puhkusereisi väärtust) ning turutehingutes selleks vajalikke andmeid sageli ei leidu (Farrow ja Zerbe 2013: 2), on see sobiv teoreetiline lähtepunkt selliseks metodoloogiliseks aruteluks. Alustada võiks järgmistest põhiküsimustest:

- milliseid sotsiaalseid tulusid ja sotsiaalseid kulusid tuleks arvesse võtta?
- kuidas selliseid sotsiaalseid tulusid ja sotsiaalseid kulusid tuleks hinnata?
- millised on asjaomased piirangud?

Tähtis küsimus seejuures on sotsiaalse edu mõõtmine. See mõõtmise ülesanne viib meid heaoluökonomika juurde. Normatiivse majandusteooria alus, mis hindab ühiskonna seisundit, on sotsiaalse heaolu funktsioon. Paraku puudub üksmeel selles, kuidas sellist sotsiaalse heaolu funktsiooni saaks teaduslikult kindlaks teha ja kas selliseid funktsioone peaks olema üks.

Üldjuhul tekib heaolu muutumise mõõtmisega seoses probleem, et üksikutel kasulikkusfunktsioonidel põhinevat sotsiaalse heaolu funktsiooni ei saa mõõta. See tähendab, et puudub otsene võimalus kasu ja kahju jälgimiseks. Seega on vaja kaudseid hinnanguid, mis väljendaks heaolu muutumist.

Asjakohane sotsiaalse heaolu funktsioon võib erineda ja eeldatakse, et enamik selliseid funktsioone vastab Pareto kriteeriumile, mille kohaselt käsitletakse sotsiaalse täiustusena muutust, mis parandab vähemalt ühe inimese olukorda, ilma et sellega halveneks teise inimese olukord (Tisdell ja Hartley 2008: 28).

Tulu-kulu analüüsi jaoks on vaja liigitada üksikisikud kahte rühma: need, kes saavad kasu, ja need, kes kannavad kahju. Kuna Pareto kriteeriumi peetakse paljude tavaelus tehtavate sotsiaalsete valikute puhul liiga piiravaks, sest see ei võta arvesse tulemuste eri tagajärgi (Johansson 1991: 22; Brent

2006), on tavapärase kulu-tulu analüüs koostatud võimaliku Pareto parenduse põhimõttel (Mishan 1976).

Ent selleks, et laiendada Pareto hinnangut olukordadele, kus esineb ka kaotajaid, on vaja kompensatsioonitesti. Kompensatsioonitesti peetakse kõige tuntumaks katseks sõnastada eelistuste summeerimise põhimõte (Zerbe ja Dively 1994). Nii saab teha kindlaks, et positiivset puhastulu loova majandusliku muudatuse tulem saab olla potentsiaalne Pareto parendus.

Kompenseerimise põhimõtet on käsitlenud Hicks (1939), Kaldor (1939), Scitovsky (1941), Little (1955) ja Samuelson (1983). Kaldor-Hicksi kompensatsiooni kriteerium tugines võimalikule Pareto täiustusele ning lähtus ideest, et piisab sellest, kui tulud on nii suured, et need võimaldavad tulu saanutel hüvitada kaotajatele kahju ning kompenseerimist realselt ei peagi toimuma (Brent 2006: 40; Forte 2010: 113–115). Kaotajad on pärast kompenseerimist paremas olukorras kui enne. Sellist kompenseerimist nimetatakse ka „üle-kompenseerimiseks”, sest võitnud võivad kaotajatele kahju hüvitada ning neile jääb ikkagi midagi veel alles (Brent 2006).

Kaldor-Hicksi kriteerium lahendab sotsiaalse heaolu probleemi, eeldusel, et kõikide inimeste sissetuleku sotsiaalne piirkasulikkus on sama. Rahauhikut (Eesti kroon, euro või dollar) arvestatakse ühtemoodi, olenemata sellest, kes selle saab.

Tulu-kulu analüüsiga hinnatakse ühiskondlikku kasulikkust, mõõtes maksevalmidust rahas. Euro või Eesti krooni piirkasulikkus on samasugune kõikidele inimestele, kes näitavad oma maksevalmidust, kuid sotsiaalset väärtust mõjutavad ainult need, kes on suutelised või valmis maksma.

Tulu-kulu analüüsis väljendatakse tegevuse tagajärgi ja mõju rahas. See tähendab, et meil on võimalik arvutada tegevuse puhastulu nii sotsiaalset tulu kui ka kulu arvesse võttes. Seega on tulu-kulu analüüs sobiv raamistik sotsiaaltulemuse mõõtmiseks perioodipõhise järelanalüüsi korral.

Kuna teaduskonna kohta ei ole sotsiaalse heaolu funktsiooni, peab selline arvestusviis põhinema millelgi muul – mainitud tulu-kulu analüüsil –, kus kasulikkust mõõdetakse sotsiaalsete näitajate alusel. Eeliste ja puuduste suurust saab väljendada rahas, ajas või muudes ühikutes, nt üliõpilaste arv ja sündmuste (konverentside korraldamine) hulk. Kuna finantsraamatupidamises on suurem osa teabest olemas rahaliste maksete kujul, on kõige otstarbekamad rahaline raamatupidamissüsteem ja arvepidamine. Selleks, et hinnata teaduskonna tegevuse sotsiaalset väärtust, rakendatakse sotsiaalsete väärtuste rahas väljendamiseks maksevalmiduse põhimõtet.

Tulu-kulu analüüsi raamistiku kasutamisega kaasnevad mitmed metodoloogilised probleemid, millele tuleb sotsiaaltulemuse arvestuse perioodipõhise raamatupidamis–metoodika korral tähelepanu pöörata. Käesoleva doktoritöö seisukohalt on need probleemid ja võimalikud lahendused esitatud tabelis 44.

Tabel 44. Metodoloogilised probleemid ja nende lahendused sotsiaaltulemuse arvestuse perioodipõhise raamatupidamismetoodika korral

Lahendamist vajav metodoloogiline küsimus	Pakutav lahendus
1. Kuidas mõõta sotsiaaltulemust?	Selleks, et hinnata teaduskonna tegevust sotsiaalse väärtuse ühe mõõtühiku järgi, rakendatakse maksevalmiduse põhimõtet, mis väljendab sotsiaalseid väärtusi rahas.
2. Millist tegevust peab hindama?	Kõiki teaduskonna tegevusvaldkondi, mis on seotud õpetamise, teadustegevuse, publitseerimise ja nõustamisega koos nende kaudse sotsiaalse mõjuga.
3. Kuidas rühmitada ja liigitada sotsiaalseid tulusid ja kulusid?	Kahekordse arvestuse vältimiseks tuleb töötada välja ositamiskriteeriumid subjektipõhiseks eristamiseks, et eraldada sotsiaalsed tulud ja kulud, mis ei tulene ainult arvestusealusest teaduskonnast.
4. Kuidas ajatada sotsiaalseid tulusid ja kulusid?	Tuleb koostada eeskirjad teaduskonna tegevuse sotsiaaltulemuse määramiseks ja sotsiaalse mõju kindlakstegemiseks.
5. Milliseid kirjendamis-meetodeid peaks kasutama?	Sotsiaalse mõju (välismõjude) kohta arvestuse pidamiseks on vajalik sotsiaaltulemuse raamatu-pidamine.
6. Kuidas arvestada pikaajalisi mõjusid?	Kontoplaanis on arvestatud asjaomaste põlvkondade ajahorisonti. See tähendab neid, keda teaduskonna tegevus mõjutab. Edasise heaolu hindamise peab tegema praegune põlvkond.
7. Kuidas kirjeldada rühma, kelle heaolu mõõdetakse?	Piirkond, kus teaduskond oma tegevuse, saavutuste ja hanketegevuse järgi asub ning kus teaduskonna teenuste tagajärjed on märgatavad.
8. Milliseid mõjusid peaks arvesse võtma?	Arvestada tuleb selliste tehingute ja mõjudega, mis on teaduskonnaga kõige otsesemalt seotud.
9. Kuidas lahendada alternatiivsete olukordade probleemi?	Üks alternatiiv (heaolu mõõtmiseks) on selline olukord, kus teaduskond ei tegutseks.
10. Milliseid põhimõtteid peaks järgima kontoplaan?	Kuna eesmärk on teha kindlaks teaduskonnast saadav sotsiaalne puhastulu, siis lähtutakse kontode sulgemise põhimõttest.
11. Millist põhistruktuuri peaks sotsiaaltulemuse arvestuse käsitusviis väljendama?	Sotsiaaltulemuse arvestust, mis koosneb finantsarvestusest ja sellest sotsiaaltulemuse arvestuse osast, mida finantsraamatupidamises arvesse ei võeta. Seda osa nimetatakse täiendavaks sotsiaaltulemuse arvestuseks.

Allikas: autori koostatud

Välismõjudest kasu saamise või välismõjude olemasolu ja nende toime eest maksmise valmidust hinnatakse eri meetoditega. Väliste sotsiaalsete tulude hindamiseks kasutatakse (Eichhorn ja Friedrich 1971) kulusäästu, välditud kahjude rahalist väärtust, välismõjust kasu saamise eest maksmise valmiduse uurimist, vara väärtuse suurenemise hindamist, varihindu, aja säästmise eest maksmise valmidust ning alternatiivkulu säästu.

Samamoodi saab välismõjude eest maksmise valmidust väljendada suuremate kulude, kahju suuruse, välismõju vältimise eest maksmise valmiduse uurimise, vara väärtuse vähenemise, varihindade, ajakao rahalise väärtuse ja suuremate alternatiivkuludega. Küsitlemisel võib esitada otseseid küsimusi maksevalmiduse kohta või kasutada väljendatud eelistuste uurimise meetodit, mille korral on tegemist tingimusliku hindamisega, tunnustepõhist meetodit või paarisvõrdluse meetodit (Brown 2003). Rahas hindamiseks kasutatakse avalikustatud eelistuste meetodit (Boyle 2003).

Selles doktoritöös mõeldakse otseseid sotsiaalseid tulusid tarbija hinnavaru ja teaduskonna tegevusega seotud käibega. Mõningaid sotsiaalseid tulusid mõeldakse kaudselt. Näiteks sissetulekute suurenemine, ajasäästu rahaline väärtus, kulude vähenemine, nt iseõppimise tõttu, kindlustusseltside antavate hüvitiste vähenemine, teiste institutsioonide panuse vähenemine või varihindade suurenemine, väärtuse suurenemine hüpoteetiliste nõudlusfunktsioonide alusel (Dasgupta, Sen ja Marglin 1972; Flores 2003). Vara väärtuse ja renditasude suurenemine näitavad suuremat suutlikkust maksta teaduskonna tegevuse välismõjude eest selle tõttu, et teaduskonna teenuste tase on parem. Teaduskonna kantud sotsiaalsed kulud määratakse kindlaks kulude ja sisendipõhise tootja hinnavaru alusel. Põhimõtteliselt saab sotsiaalsete tulude kindlakstegemise meetoditega mõõta ka välismõju sotsiaalseid kulusid (tabel 45).

Tabel 45. Maksevalmiduse kindlakstegemise meetodid ülikoolis

Hindamise liik	Otsene hindamine	Kaudne hindamine
Sotsiaalsed tulud	Tarbija hinnavaru Käive	Sissetulekute suurenemine, kulude vähenemine, väiksemad kindlustuspreemiad, kahju vähenemine, rahas väljendatud ajavõit, varihinnad, hüpoteetilised nõudluskõverad, maksevalmiduse uurimine jne
<i>Sotsiaalsete tulude näited: bakalaureuse-, magistri- ja doktoriõppes omandatud teadmised</i>	Tarbija hinnavaru Üliõpilaste maksed	
Sotsiaalsed kulud	Tootja hinnavaru (teguri moonumine)	Sissetulekute vähenemine, kulude suurenemine, suuremad kindlustuspreemiad, kahju suurenemine, rahas väljendatud ajakadu, varihinnad, maksevalmiduse uurimine jne
<i>Sotsiaalsete kulude näited: uurimis- ja projektiettepanekute koostamine, uute kursuste ettevalmistamine</i>	Kulud	Lisavalmidus maksta riskide võtmise ja täiendavate jõupingutuste (nt täiendavalt panustatud aja) eest

Allikas: autori koostatud

Sotsiaaltulemuse arvestuse raamatupidamissüsteemi väljatöötamisel on arvestatud järgmisi seoseid:

- 1) sotsiaaltulemuse arvestus = täiendav sotsiaaltulemuse arvestus + finantsraamatupidamine
- 2) jooksva sotsiaalse puhastulu arvestus = täiendava sotsiaaltulemuse aruanne + finantskasumi ja -kahjumi aruanne
- 3) sotsiaalne kogubilanss = lisanduv sotsiaalne bilanss + finantsbilanss

Järelanalüüsi, võrrandisüsteemi ja valemite vajadusest tingitult võimaldavad järgmised järelanalüüsi kohta tehtavad otsused luua asjakohase raamatupidamissüsteemi:

- sotsiaaltulemuse arvestuses lähtutakse üheaastasest perioodist, et määrata kindlaks kontode valemid, mille abil saab tulemust mõõta;
- valemite koostamisel tuleb võtta arvesse asjakohaseid tehinguid ja teha vastavad kanded;
- valida tuleb sellised tehingud, mis määravad asjaomased muutused (vood), ning leida varade maht;
- on vaja otsustada, kas sotsiaaltulemust peaks määrama tuginedes vaid jooksva perioodi tehingutele, või tuleks leida vahe varade vahel perioodi alguses ning perioodi lõpus;
- tuleb määratleda meetodid ja eeskirjad, mille alusel saab otsustada, milline tehing kuulub millisesse perioodi ning kuidas mõjutab sotsiaaltulemust. See tähendab tehingute perioodipõhist liigitamist ning selleks on vaja asjakohaseid valemid ja kontosid;
- sotsiaaltulemuse arvestuses on vaja määrata kindlaks, milliste majandusüksustega tehinguid tehakse, ning seega on vaja kirjendada sotsiaaltulemuse arvestuse ulatust. Tehingud ja sotsiaaltulemus (sotsiaalsed tulud, sotsiaalsed kulud) tuleb ositada objektipõhiselt. Selleks on vaja koostada eeskirjad;
- arvvärtuste liitmiseks ja lahutamiseks tuleks kasu toovad tehingud ühismõõtsustada. Selles töös on tulu-kulu analüüsi raamistiku ja finantsarvestuse eeltingimuste tõttu otsustatud valida rahaline mõõde;
- arvesse tuleb võtta seda, et sotsiaaltulemuse väärtuse osad võivad ilmuda kahes raamatupidamissüsteemis: finantsraamatupidamises ja täiendavas sotsiaaltulemuse raamatupidamissüsteemis.

Uurimisobjekt, andmed ja meetodika

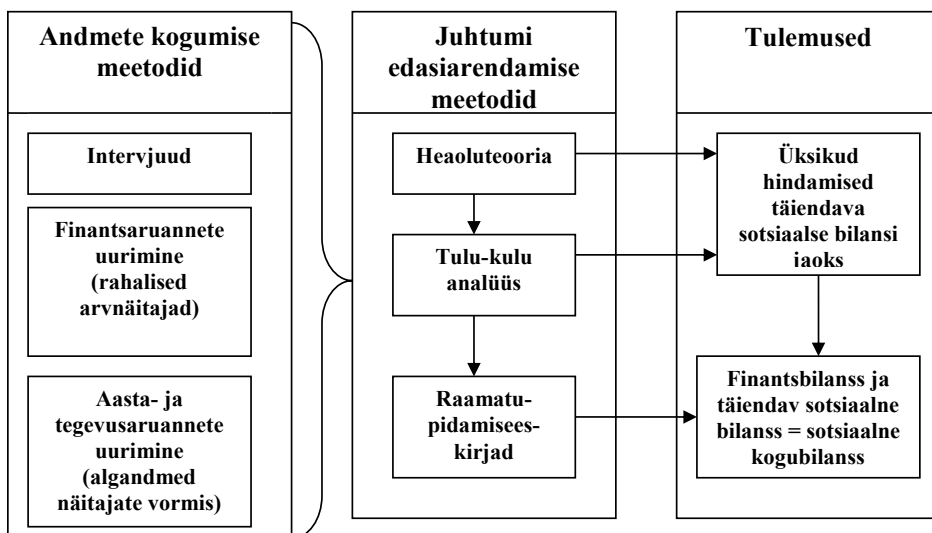
Doktoritöö rakenduslikuks aluseks on juhtumiuuringu arendamine ehk teisisõnu meetodika edasiarendus üksikjuhtumil. Uurimistöö empiirilises osas on selline meetod põhjendatud uurimisküsimuste *kuidas?* ja *miks?* seisukohalt (Yin 2003: 5–7), sest käesolev doktoritöö keskendub eeskätt sellele, et näidata, kuidas kõnealust raamatupidamissüsteemi tuleks rakendada ja kasutada ülikooli teaduskonna sotsiaaltulemuse mõõtmiseks.

Teoreetilise raamistiku kujundamiseks on autor uurinud teoreetilisi artikleid ja kirjandust sotsiaaltulemuse arvestuse, heaoluteooria ja tulu-kulu analüüsi kohta kuni 2013. aastani (kaasa arvatud). Teavet on analüüsitud ja käsitatud doktoritöös esitletud sotsiaaltulemuse arvestuse ja raamatupidamismetoodika seisukohalt, mis moodustab doktoritöö formaalobjekti. Teoreetilisi pidepunkte, olemasolevaid mõõtmismeetodeid, loogilist raamistikku empiirilise juhtumi edasiarendamiseks ja teisi teoreetilisi aspekte tutvustatakse alapeatükkides 1.1–1.3.

Empiirilise juhtumiuuringu reaaloobjektiks on Tartu Ülikooli (TÜ) matemaatika- ja informaatika-teaduskond. Seetõttu on empiirilises osas kasutatud nimetatud teaduskonna ning selle instituutide kirjalikke aruandeid, TÜ aastaaruannet, TÜ finantsosakonna aruandeid ja dokumente 2006. aasta kohta. Sotsiaaltulemuse aruande ja täiendava sotsiaalse bilansi koostamiseks tehti 2011. aasta märtsist kuni 2012. aasta augustini intervjuud Tartu Ülikooli finantsosakonna ning matemaatika- ja informaatikateaduskonna deканаadi töötajatega.

Uurimismetoodika põhineb järelanalüüsil. Kuna teaduskonna tegevus toimub põhiliselt Eestis, keskendutakse analüüsimisel Eesti elanike heaolu muutusele. Seetõttu on võetud arvesse neid inimeste rühmi Eestis, keda teaduskonna tegevus mõjutab ning kelle maksevalmidus on vaja kindlaks teha.

Joonisel 22 on kirjeldatud andmete kogumise meetodikat, empiirilise juhtumiuuringu arendamist ja seoseid uurimistulemustega.



Joonis 22. Empiirilise juhtumi edasiarendamise meetodika

Allikas: autori koostatud

Üksikasjalik ülevaade uurimuses kasutatud andmete liigist, nende rakendamise eesmärgist ja seostest saavutatud tulemustega on esitatud tabelis 46.

Tabel 46. Uurimuse ülevaade

Andmete liik	Rakendamine/ eesmärk	Tulemused alapeatükkides
Teoreetilised artiklid ja materjalid sotsiaaltulemuse arvestuse, heaoluteooria ja tulu-kulu analüüsi kohta	Doktoritöö teoreetilise raamistiku kujundamiseks	Leiti teoreetilised pidepunktid sotsiaaltulemuse arvestuseks (alapeatükk 1.1), analüüsiti sotsiaaltulemuse arvestuse meetodeid (alapeatükk 1.2) ja selgitati heaoluökonomikal põhinevat raamatupidamismetoodikat sotsiaaltulemuse arvestamiseks (alapeatükk 1.3)
Kirjalikud aruanded (Tartu Ülikooli aastaaruanne, teaduskonna instituutide aastaaruanded)	Uurimisobjekti tutvustamiseks ning teaduskonna finantsbilansi ja täiendava sotsiaalse bilansi koostamiseks	Kirjeldati uurimisobjekti (alapeatükk 2.1) ja koostati teaduskonna terviklik sotsiaaltulemuse arvestus (alapeatükk 2.2)
Tartu Ülikooli finantsosakonnalt saadud (finantsiline) kontoplaan	Teaduskonna finantsbilansi koostamiseks	Koostati teaduskonna finantsbilanss koos otseste ja kaudsete finantsvoogude ja varade hindamisega (alapeatükk 2.2)
Tartu Ülikooli finantsosakonnalt saadud raamatupidamisaruanded ja -dokumendid	Finantsraamatupidamise tehingute hindamiseks	Koostati teaduskonna finantsbilanss otsesteks ja kaudseteks hindamisteks (alapeatükk 2.2)
Teaduskonda ja selle instituute käsitleva küsimustiku vastused	Täiendava sotsiaalse bilansi, kontoplaani, raamatupidamiskannete koostamiseks	Koostati sotsiaalne kogubilanss ja kohandati seda (alapeatükk 2.2)
Täiendavad teabepäringud teaduskonna kohta	Täiendava sotsiaalse bilansi, kontoplaani, täiendavaid voogusid ja varasid kajastavate raamatupidamiskannete koostamiseks	Koostati sotsiaaltulemuse aruanne ja sotsiaalne kogubilanss ning kohandati neid (alapeatükk 2.2) ja analüüsiti alternatiivseid hindamismeetodeid (alapeatükid 2.2 ja 2.3)

Allikas: autori koostatud

Analüüsi tulemused ja võimalikud edasiarendused

Pärast sotsiaaltulemuse arvestuse mitme käsitusviisi ja meetodi võrdlevat analüüsi jõudis doktoritöö autor arusaamani, et sotsiaaltulemuse arvestus peaks kujutama endast süsteemset analüüsi, mis võtab arvesse nii organisatsiooni või majandusüksuse tegevuse majanduslikke kui ka sotsiaalseid mõjusid, nii sisekui ka välismõjusid.

Sotsiaaltulemuse arvestuse vajadust saab selgelt põhjendada selliste majandusüksuste puhul, mille tegevuse kasulikkus ilmneb teiste majandusüksuste juures, mitte ainult selle üksuse juures, kes seda kasu tekitab. Sama kehtib ka paljude avalike asutuste ja/või avalike hüviste või suurema välismõjuga toodete (teenuste) tootmise kohta. Sotsiaaltulemuse arvestus näitab sotsiaalse tegevuse kasulikkust ka nende subjektide korral, mida turg ei koordineeri.

Kõnealust teemat uuriti, sest olemasolevad sotsiaaltulemuse arvestuse käsitusviisid, nt inimkapitali arvestus, sotsiaalaudit, mida on kasutatud ühis-transporti, keemiatööstuse, energeetikatööstuse ja tervishoiuteenuste ettevõtetes ning isegi haridusasutustes, ei ole ülikooli jaoks piisavalt asjakohased.

Paraku ei lähtu enamik kirjanduses käsitletud sotsiaaltulemuse arvestuse mudelid üldistatud heaolu muutumisest ühiskonnas. Seetõttu teeb doktoritöö autor ettepaneku lisada ühiskonna heaolu muutumisel põhinev sotsiaaltulemuse arvestus teiste käsitusviiside hulka.

Kuna ülikoolidel on ühiskonna ees mitmesuguseid ülesandeid ja kohustusi, mis põhjustavad muutusi heaolus, on sotsiaaltulemuse siinkäsitletav arvestusviis nende jaoks otstarbekas. See on põhjendatud sotsiaaltulemuse arvestuses tehtud katsetega teha kindlaks üksiku majandusüksuse sotsiaalne edu. Sotsiaaltulemuse arvestus keskendub eelkõige majandusüksuse sotsiaalsele edukusele ning tema varade ja kohustuste sotsiaalse väärtuse muutumisele.

Et täita doktoritöö eesmärk ja koostada perioodist lähtuv raamatupidamis- metoodika, milles kasutatakse järelanalüüsi ning mis põhineb heaoluökoonoomikas käsitletud hindamistel ja raamatupidamissüsteemil, mis mõõdab ülikooli teaduskonna sotsiaaltulemust, analüüsiti eri meetodeid, mida kasutatakse majandusüksuse ühiskondliku panuse ja/või sotsiaalse edukuse mõõtmiseks.

Sotsiaaltulemuse arvestuse valdkonnast võib leida palju avaldatud töid, milles üritatakse mõõta sotsiaalset edu, sotsiaaltulemuse arvestuse kasulikkust ning selle mõju juhtimisele ja otsuste tegemisele. Siin tuleks arvestada selliseid üldisi käsitusviise nagu majanduslike investeeringute arvestus tulu-kulu, kulu-efektiivsuse ja kasulikkusanalüüsi abil ning sotsiaaltulemuse arvestuse käsitusviisi, milles kasutatakse sotsiaalset auditit, inimressursi ja ettevõtte sotsiaalse vastutuse aruandlust, sotsiaalsete näitajate ja kodanikuväärtuse analüüsi meetodeid.

Otsused selle kohta, millist analüüsi ja meetodeid tuleks kasutada, sõltuvad analüüsi eesmärkidest. Näiteks kui majandusüksus tahab näidata, kuidas ta mõjutab sisemisi ja väliseid sidusrühmi, mida ei kajastata finantsarvestuses, siis tuleb kasutada sotsiaalauditeid, mis võimaldavad koostada eri aruandeid ning

loetleda soodsad ja ebasoodsad mõjud. Kui eesmärk on näidata, et töötajate teadmised ja töötajad ise on majandusüksuse või ühiskonna jaoks eriliselt väärtuslikud, siis tuleb kasutada inimressursi arvepidamist.

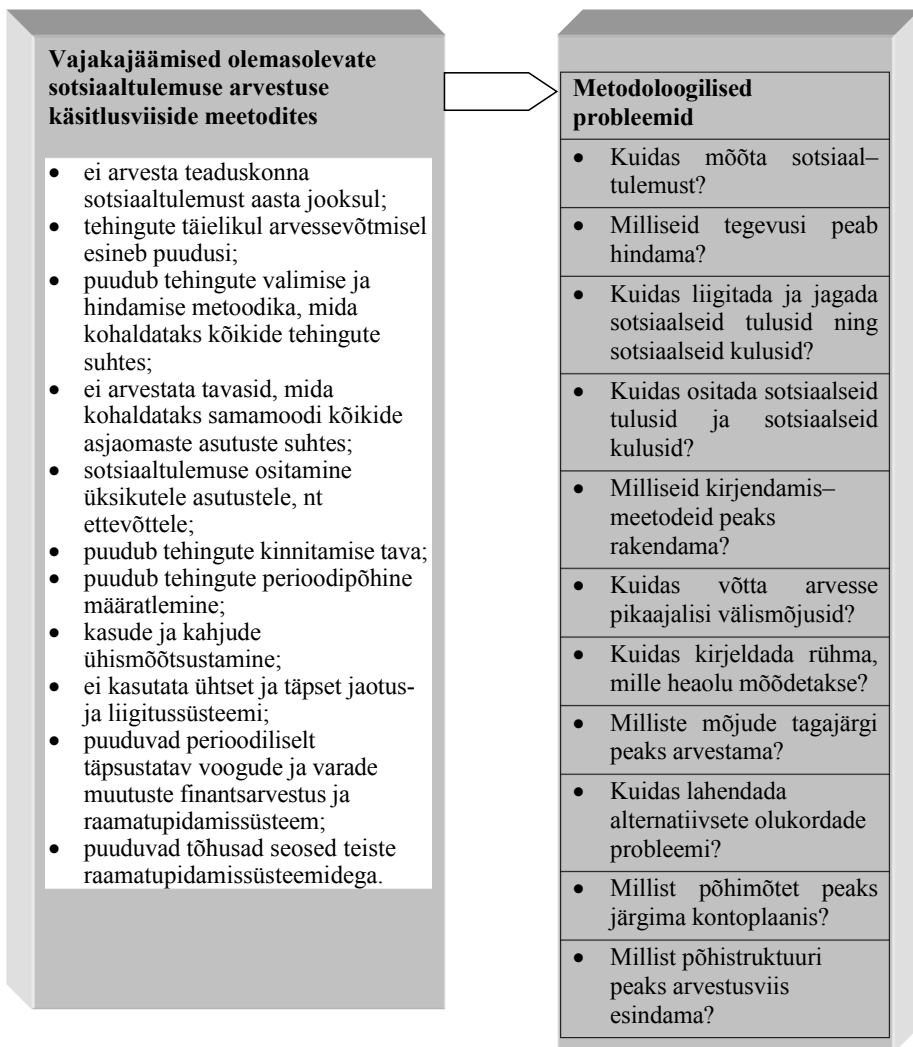
Ilmnes mitu üldist probleemi, mis on seotud sotsiaaltulemuse arvestuse käsitusviiside ja mõõtemetoditega, eriti seoses teabe killustatuse, sotsiaaltulemuse arvestuse mõistete määratlemise ja mõõtmisraskustega, eeskätt välismõjude mõõtmisel. Selle oluliste probleemide loetelusse on asjakohane lisada, et endiselt puudus käsitluste hulgas heaolu muutust arvesse võttev käsitlus. Eriti ilmne on vajadus kombineeritud uurimismeetodite järele sotsiaaltulemuse mõõtmisel, mis pakuks terviklikku lahendust ülikooli teaduskonna sotsiaaltulemuse arvestuseks.

Konkreetsetes sotsiaaltulemuse arvestuse käsitusviisides tutvustatud katsetustel on mitu puudust. Täpsemalt ei võeta hariduse ja sotsiaalse väärtuse käsitusviisides piisavalt arvesse sotsiaalse edu arvestuse mitut asjakohast aspekti. Need puudujäägid tekitasid metodoloogilisi küsimusi, mis on esitatud kokkuvõtvalt joonisel 23.

Lähtuti vajadusest kujundada selline arvestuse käsitusviis, mis võimaldaks teha kindlaks majandusüksuse sotsiaaltulemust kindlal ajaperioodil. Doktoritöö tulemusel selgus, et olemasolevad sotsiaaltulemuse arvestuse liigid seda nõuet ei täida, sest need ei võimalda selliseks hindamiseks vajalikku raamatupidamist. Seetõttu leidis autor allpool kirjeldatud lahendused tekkinud metodoloogilistele küsimustele.

Selleks, et hinnata teaduskonna tegevuse sotsiaaltulemust ühe mõõtühiku järgi, rakendati maksevalmiduse põhimõtet, mis väljendab sotsiaalseid väärtusi rahas. Arvesse tuli võtta teaduskonna tegevusvaldkondi, mis on seotud õpetamise, teadustegevuse, publitseerimise ja nõustamisega koos nende kaudse sotsiaalse mõjuga. Mitmekordse arvestuse vältimiseks tuli välja töötada ositamiskriteeriumid, et eraldada sotsiaalsed tulud ja kulud, mis ei tulene teaduskonnast. Selleks koostati vajalikud eeskirjad teaduskonna tegevuse sotsiaaltulemuse määramiseks ja sotsiaalse mõju kindlakstegemiseks. Sotsiaalse mõju (välismõjude) näitajate üle arvestuse pidamiseks rakendati sotsiaaltulemuse arvestuse raamatupidamist. Kontoplaani koostamisel võeti arvesse asjaomaste põlvkondade ajahorisonti. See tähendab neid, keda teaduskonna tegevus mõjutab. Edasise heaolu hindamise peab tegema praegune põlvkond. Rühma, mille heaolu mõõdeti, kirjeldati piirkonnana, kus teaduskond oma tegevuse, saavutuste ja hanketegevuse järgi asub ning kus teaduskonna teenuste tagajärjed on märgatavad.

Hindamisel arvesse võetavad tehingud ja mõjud piirati sellistega, mis on teaduskonnaga otsesemalt seotud. Probleemi lahendamiseks käsitleti alternatiivse olukorrana (heaolu mõõtmiseks) sellist olukorda, kus teaduskond ei tegutseks. Kuna eesmärk oli teha kindlaks teaduskonnast saadav puhastulu, siis lähtuti kontode sulgemise põhimõttest.



Joonis 23. Metodoloogilised küsimused, mis aitasid lahendada vajakajäämisi olemasolevates sotsiaaltulemuse arvestuse käsitlusviisides

Allikas: autori koostatud

Välja töötatud sotsiaaltulemuse arvestus koosneb finantsraamatupidamisest ja sotsiaaltulemuse arvestuse osast, mida finantsraamatupidamises pole arvestatud. Seda osa nimetatakse täiendavaks sotsiaaltulemuse arvestuseks.

Empiirilises osas lähtuti sotsiaaltulemuse arvestuse rakendamisel ülikooli aruandluse eesmärkidest. Selleks kasutati näitena Tartu Ülikooli matemaatika- ja informaatika-teaduskonda. Nii teaduskondade kui ka kogu ülikooli tegevusel on kaudsed sotsiaalsed mõjud, mida tavapärane finantsraamatupidamissüsteem ei kajasta. Seetõttu on kõrghariduse puhul vaja keerulisemaid sotsiaaltulemuse

arvestuse ja sellega seonduva raamatupidamise vahendeid, mis annaks põhjalikuma pildi teaduskondade tegevusest. Senini selline käsitlusviis ülikoolide jaoks puudus.

Heaoluteooria põhjal ja raamatupidamise nõudeid järgides töötati välja uudne metoodika. Sotsiaalsete ja majanduslike toodete vahetus ja koordineerimine teaduskonnaga ei piirdu turgude ja tehingutega, mille üle peetakse arvestust rahas ja äripõhimõtete alusel. Kuna teaduskonna tegevuse üle peetakse arvestust finantsnäitajate alusel, tundub puhastulu analüüs asjakohane siis, kui hindamisel määratakse kindlaks valmidus tegevuse eest maksta või mitte maksta. Puhastulu analüüs on kõige parem olemasolev väljatöötatud sotsiaalse hindamise skeem. See võimaldab mõõta sotsiaaltulemust ja mitte üksnes avalike ülikoolide juhtide valitud avalike eesmärkide täitmist, mis on üsna tavaline näitajatepõhiste lahenduste korral, millega hinnatakse avalike asutuste tulemuslikkust.

Maksevalmidusest lähtuva sotsiaaltulemuse arvestuse kujundamiseks on kaks põhiviisi. Üks võimalus on töötada välja täiesti uus järelanalüüs ja sotsiaaltulemuse arvestuse käsitlusviis, nagu seda tegid Schmitz (1980) ja Tsimopoulos (1989). Teine võimalus on kasutada finantsraamatupidamist ja töötada välja täiendav sotsiaaltulemuse arvestus, nagu pakkus Friedrich (1991). Selles doktoritöös on järgitud viimast strateegiat ja arendatud seda üksikasjadeni edasi ülikooli (matemaatika- ja informaatika) teaduskonna jaoks. Maksevalmidusel põhinevat järelanalüüsi kajastatakse juba teaduskonna ja ülikooli finantsraamatupidamises. Seetõttu arendati edasi täiendavat sotsiaaltulemuse arvestuse osa, mis väljendaks maksevalmidust, mida ei võeta arvesse teaduskonna finantsraamatupidamises. Sotsiaaltulemuse arvestuseks töötati esimest korda välja mõlema osa järelanalüüs, mis võimaldab võtta arvesse kõiki tehinguid, mis on olulised sotsiaalse kapitali muutuse ja jooksva puhastulu kindlaksmääramisel. Töötati välja raamatupidamismetoodika: koostati kontoplaan ja metoodikat tutvustati 2006. aasta tegelike tehingute kirjendamisega. Seega on tehtud esimene praktiline katse sotsiaaltulemuse arvestuses ja raamatupidamises, mis esitatakse selles töös edasiseks aruteluks.

Töös selgitati, kuidas teha kindlaks asjakohased tehingud ja rakendada olemasolevaid hindamismeetodeid, ning täiustati raamatupidamismeetodeid, mis võimaldavad lahendada aluseks oleva võrrandisüsteemi. Pakutud metoodikat võib järgida raamatupidaja, kes on huvitatud selle rakendamisest. Esitatakse seosed ülikooli praeguse raamatupidamisega.

Metoodika võimaldab puhastulu mõistes teha esimest korda kindlaks sotsiaalse kapitali ja jooksva sotsiaalse puhastulu ülikooli teaduskonna kohta. Viimatimainitu saadi jooksvate sotsiaalsete tulude ja sotsiaalsete kulude arvestuse alusel TÜ matemaatika- ja informaatikateaduskonna 2006. aasta andmetel peamiste tegevusvaldkondade lõikes (tabel 47). Doktoritöös käsitleti esitatud metoodika võimalikke laiendusi ja piiranguid. Suuremat tähelepanu tuleks pöörata keerulisemate ositamismeetodite väljatöötamisele.

Table 47. Täiendava jooksva sotsiaaltulemuse arvestuse aruanne TÜ matemaatika-informaatikateaduskonna 2006. aasta kohta, (miljonit EEK)

IIFT7201		Sotsiaalsed kulud		Sotsiaalsed tulud	
<u>Õpetamine (1)</u>					
sC6101	Bakalaureuseõpe	1.600	B5101	Bakalaureuseõpe	6.396
sC6111	Magistriõpe	0.188	B5111	Magistriõpe	3.243
sC6122	Doktoriõpe	0.153	B5122	Doktoriõpe	7.076
sC6132	Kutseoskuste edendamine	0.014	B5132	Kutseoskuste edendamine	0.043
sC6141	Avatud ülikool	0.020	B5141	Avatud ülikool	0.300
sC6152	Õppematerjalide väljaandmine	0.194	B5152	Õppematerjalide väljaandmine	2.680
<u>Teadustöö (2)</u>					
sC6202	Teadustöö tulemuste publitseerimine	0.015	B5202	Teadustöö tulemuste publitseerimine	0.030
sC6212	Osalus teadusprojektides	0.842	B5212	Osalus teadusprojektides	1.776
sC6222	Projektitaotluste koostamine	0.778	B5222	Projektitaotluste koostamine	1.297
sC6231	Artiklite, raamatute kirjutamine	1.048	B5231	Artiklite, raamatute kirjutamine	0.750
sC6242	Konverentside korraldamine	0.215	B5242	Konverentside korraldamine	0.626
<u>Nõustamistegevus (3)</u>					
sC6301	Firmadele	0.477	B5301	Firmadele	1.193
sC6311	Avaliku sektori asutustele	0.308	B5311	Avaliku sektori asutustele	0.769
sC6321	Riigikogule	0	B5321	Riigikogule	0
sC6331	Euroopa Liidu institutsioonidele	0.001	B5331	Euroopa Liidu institutsioonidele	0.016
sC5341	Teadusasutustele	0.002	B5341	Teadusasutustele	0.045
<u>Juhtimisalased tegevused (4)</u>					
sC6401	Seire, järelevalve	0.025	B5401	Seire, järelevalve	0.381
sC6411	Finantsjuhtimine	0.026	B5411	Finantsjuhtimine	0.393
sC6421	Personalijuhtimine	0.021	B5421	Personalijuhtimine	0.321
sC6431	Teaduskonna otsuste tegemine	0.061	B5431	Teaduskonna otsuste tegemine	0.914

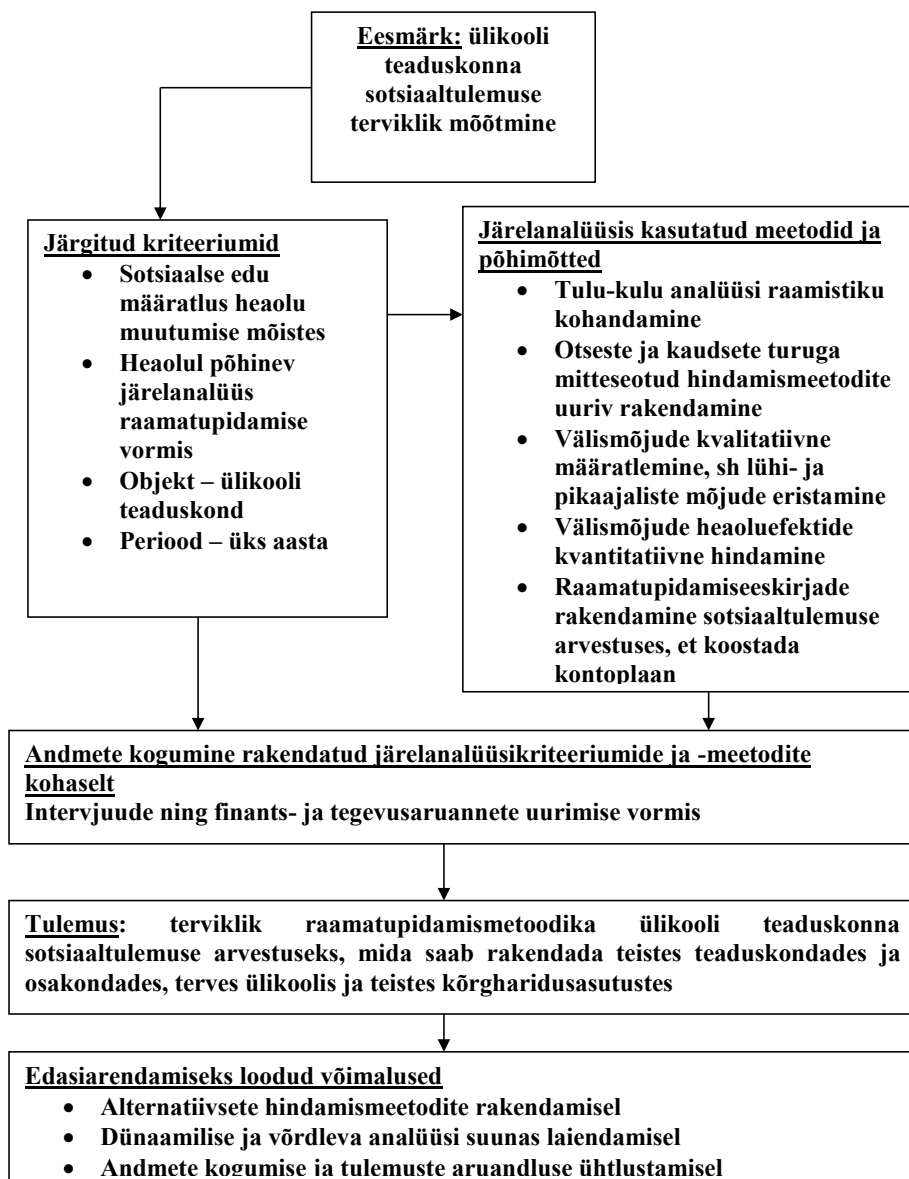
Table 47. Järg

IIFT7201	Sotsiaalsed kulud		Sotsiaalsed tulud		
sC6441	Laborite juhtimine	0.003	B5441	Laborite juhtimine	0.046
sC6452	Kontaktid teiste teaduskondadega	0.003	B5452	Kontaktid teiste teaduskondadega	0.054
sC6461	Kolledžite toetamine	0	B5461	Kolledžite toetamine	0
sC6471	Esindamine	0.012	B5471	Esindamine	0.024
<u>Teised teaduskonna tegevused (5)</u>					
sC6501	Kontaktid koolidega	0.041	B5501	Kontaktid koolidega	0.062
sC6512	Külastajate kaasamine	0.045	B5512	Külastajate kaasamine	0.151
sC6522	Suhtlemine avalikkusega	0	B5522	Suhtlemine avalikkusega	0.674
sC6532	Reklaamitegevus	0.004	B5532	Reklaamitegevus	0.108
sC5542	Sotsiaalsed fiskaalkulud	0	B5542	Sotsiaalsed fiskaaltulud	5.222
sC6552	Teised kulud	0.140	B5552	Teised tulud	0
sC6701	Amortisatsiooni arvutus	10.431	B5801	Ümberhindamine	0.861
B4871	<u>Täiendav sotsiaalne puhastulu</u>	18.784			
		35.451			35.451

Allikas: Autori koostatud

Arutelu osas käsitleti alusmetoodika tõhusust ja kontoplaani ning vajadust raamatupidamiseskirjade kohandamise järele meetoodika rakendamisel mitmes teaduskonnas ja ülikoolis tervikuna. Sel juhul oleksid ositamisreeglid ilmselt hoopis keerulisemad ja spetsiifilisemad. Keerulisemad kriteeriumid aitavad jagada sotsiaalseid tulud ja sotsiaalseid kulusid ning seostada neid asutustega, kes loovad sotsiaalset puhastulu koostöös uuritava objektiga. Selles töös pakutud meetoodika võimaldab määrata kindlaks „tulude-kulude hindamise liigi” – see ülesanne on teaduskonna või ülikooli osakonna puhul seotud „tulude-kulude arvestusega”, „tulu-kulukeskuse arvestusega” – ning „tulu-kulu-üksuse arvestuse”. Kliendi- või sidusrühmade või konkreetsete juhtimisotsuste, nt projektide või teaduskonna laiendamise, tegevuse lõpetamise tarbeks võib sotsiaaltulemuse mõõtmiseks töötada välja oma arvestusmetoodika.

Nagu selgus, aitab esitatud raamatupidamismetoodika sotsiaaltulemuse arvestusele kaasa mitmel viisil ning võimaldab seda veelgi laiendada. Seda on näidatud kokkuvõtval joonisel 24.



Joonis 24. Ülikooli teaduskonna jaoks välja töötatud raamatupidamismetoodika panus sotsiaaltulemuse arvestusse

Allikas: autori koostatud

Tulevikus võib seda metoodikat kasutada teaduskondade või ülikoolide normatiivse healukeskse juhtimisteooria sõnastamiseks. Analüütik võib leida heaolu maksimeeriva juhtimiskäitumise sotsiaalse kapitali ja/või tulude-kulude maksimeerimise korral. Sama moodi nagu riigirahanduse teooria puhul, saab ka praegusel juhul tegeleda muudatuste tegemiseks vajalike optimaalsete tingimustega ja näitajate väärtusega, nt seoses õpetamise, teadustegevuse ja rahastamisega.

Selline uurimistegevus on hädavajalik, sest ELi sotsiaaltulemuse arvestuse parim praktika arenenud riikides, riikide õigusaktid ja rahalise surve olukorrad suurendavad nõudlust teaduskonna ja ülikooli sotsiaalsele healule keskenduva juhtimise järele. Selles doktoritöös välja töötatud sotsiaaltulemuse arvestuse käsitusviis on selleks sobiv lähtepunkt ja lahendus.

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II. Education

- 2011–2013 • **University of Tartu, Estonia**
2001–2005 *Doctoral Studies in Economics*
- June 1999 – May 2000 • **Columbia University, School of International and Public Affairs, New York, USA**
Master of International Affairs in Economic Policy Management, 2001
- Sept 1997 – May 1999 • **University of Tartu, Economics Department and Eurofaculty, Estonia**
Academic Master Studies in Economics
- Sept 1982 – June 1986 • **University of Tartu, Economics Department, Estonia**
Bachelor of Science in Economics, Cum Laude

III. Professional Training

- 2012 • Development program for mentor trainers/educators
2009–2010 • Courses on educational development, mentoring and teaching in a university, and in multicultural environment
- June 2004 • *Institution Building for EU Membership, The NISPAcee Training Course for Advisors, Bulgaria*
- September 2003 • *Workshop 'Institutional Analysis, Comparative Research.'* Sofia, Bulgaria
- July 2003 • **University of Joensuu, Finland**
Economic Instruments for Environmental Protection, Intensive Course, 6 ECTS
- July 2001 • **CEU Summer University, Budapest, Hungary**
Competition Policy in Transition

- Nov 1997 – May 1999 • **Team Europe-Estonia, Estonia and Denmark**
Studies in European Union Issues
- May 1997,
Sept 1997 – Nov 1997 • **Dalhousie University, Halifax, Canada**
Baltic Economic Management Training Program
- Nov 1996 – Dec 1996 • **Denmark Public Administration School**
Educational and Management Course

IV. Work Experience

- 2007–present • **University of Tartu, Institute of Economics, Estonia**
 - *Lecturer on Economic Policy, lecturing Economic Policy (including Regional Economics and Policy), Law and Economics, and History of Economic Thought (master level), courses in Estonian and English*
- 2001–2006 • *Researcher in the Chair of Economic Policy*
- 2011– present • Research and Innovation Policy Monitoring Program, WP3
- 2011 • **Centre for Applied Social Sciences (CASS), Eurocollege, Estonia** – *Intermediate evaluation of structural funds in the period 2007–2013, expert*
- March 2005 – 2008 • Project management (including Financial Management for Partner 13 – University of Tartu) for Interreg IIIB Program Project -*Baltic Business Development Network (BBDN) for Partner 13 – University of Tartu*
- July 2002 – Dec 2003 • **Enterprise Estonia,**
Dec 2004 – present *Expert for Regional Program Projects*
- July 2002 – April 2003 • **Nomisma SpA, Italy**
Project – Administrative Capacity Study Phase 2 – Phare Region, Consultant in international team
- April 2001 – June 2001 • **Center for Policy Studies (PRAXIS), Estonia**
Research for Action Permits Project
- June 2000 – Nov 2000 • **World Bank, Washington D.C., U.S.A.**
Rural Development and Natural Resources Unit East Asia and Pacific Region (EASRD), Short-term Consultant
- 1997–1999 • **Valga County Government, Estonia**

- 1994–1997 *Chief Specialist of Foreign Relations*
Chief Specialist of Land Department
- 1992–1994
1988–1992 • **Valga Co-operative Society, Estonia**
Chief Economist
Head of Planning and Economic Department
- 1986–1988 • **Elva Co-operative Society, Estonia**
Economist

IV. Publications and other activities

- 2001–2014 • Articles on economic policy, theory of regulation, structure of economy, social accounting, one book and one textbook on Economic Policy (List of publications (59) included)
- Supervised 23 baccalaureate thesis and 6 master thesis
- September 2007, 2008, 2009–2012 • Lectures in Law and Economics in Intensive Program: *General Problems of Transnational Law and Its Implications for the Companies in International Trade*, at University of Deusto, Bilbao, Spain
- October 2003, 2004 • Lectures in Law and Economics on the topic ‘Application of the Regulation Theory in Economy’ at University of Joensuu, Finland
- 2005 • One of the main organizers of the International Conference in Economics of Education in Tartu, Estonia

V. Languages

- Native Estonian
- Fluent English and Russian
- Basic German, French and Spanish

VI. Membership

- 1997–2009 • Team Europe – Estonia
- 2001 – present • Member of Association of Estonian Economists

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Haridus

- | | |
|------------------------|--|
| 2011–2013
2001–2005 | • Tartu Ülikool, Majandusteaduskond,
doktorantuur |
| Juuni 1999 – mai 2000 | • Columbia Ülikool, New York, U.S.A.
Rahvusvaheliste Suhete ja Haldusjuhtimise Kool (SIPA)
<i>Rahvusvaheliste suhete magister majanduspoliitika juhtimises, MIA (Master of International Affairs in Economic Policy Management) 2001</i> |
| Sept 1997 – mai 1999 | • Tartu Ülikool, Majandus- ja Euroteaduskond
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| Sept 1982 – juuni 1986 | • Tartu Ülikool, Majandusteaduskond
<i>Bakalaureus majandusteaduses, Cum Laude</i> |

Täiendharidus

- | | |
|---------------------|---|
| 2012 | • Mentorõppejõudude koolitajate arendusprogramm |
| 2008–2010 | • Täiendkoolitused TÜ-s: <i>Õppimine ja õpetamine kõrgkoolis; Mentorikoolitus; Õpetamine multikultuurilises auditooriumis.</i> |
| Juuni 2004 | • NISPAcee, Bulgaaria
<i>Nõustajate koolitus, Institution Building for EU Membership</i> |
| September 2003 | • Sofia Ülikool, Bulgaaria
<i>Seminar – Vördlev institutsionaalne analüüs</i> |
| Juuli – august 2003 | • Joensuu Ülikool, Soome
<i>Intensiivkursus Keskkonnakaitse majanduslikud instrumendid</i> |
| Juuli 2001 | • Kesk-Euroopa Ülikool, Budapest, Ungari
<i>Konkurentsipoliitika siirderiikides</i> |

- Nov 1997 – mai 1999 • **Team Europe Eesti, Eesti ja Taani**
Euroopa Liidu alane koolitus
- Mai 1997,
Sept 1997 – nov 1997 • **Dalhousie Ülikool, Halifax, Kanada**
Majanduse juhtimise koolitusprogramm Balti riikidele
- Nov 1996 – detš 1996 • **Taani Haldusjuhtimise Kool**
Juhtimisalane haridus- ja koolitusseminar riigiametnikele

Teenistuskäik

- 2007 – k.a • **Tartu Ülikool, majandusteaduskond,**
majanduspoliitika lektor (majanduspoliitika, sh regionaalökonomika ja – poliitika, õigusökonomika loengukursused eesti ja inglise keeles, majandusmõtte ajaloo loengukursus magistriõppes)
Juhendanud 23 bakalaureusetööd ja 6 magistritööd
- 2001–2006 • **Tartu Ülikool, majandusteaduskond, teadur**
- Juuni 2000 – nov 2000 • **Maailmapank, Washington D.C, USA**
Ida-Aasia ja Vaikse ookeani regiooni maaelu arengu ja loodusressursside osakond, *konsultant*
- 1997–1999 • **Valga Maavalitsus, arengu- ja planeeringuosakond,**
välissuhete peaspetsialist
Euroopa Liidu alase informatsiooni edastamine, töö erinevate regionaalsete ja rahvusvaheliste programmide ja projektidega
- 1994–1997
maaosakond, *peaspetsialist*
maade tagastamise ja erastamise temaatika
- 1992–1994 • **ETK Valga Tarbijate Ühistu, peaökonomist**
- 1988–1992
plaani- ja ökonomikaosakonna juhataja
- 1986–1988 • **ETK Elva Tarbijate Ühistu, ökonomist**

Projektid ja lepinguline tegevus

- 2011–k.a. • Teadus- ja innovatsioonipoliitika seire programm, WP3
- 2011 • **Sotsiaalteaduslike rakendusuuringute keskus; RAKE** – Struktuurivahendite (2007–2013) vahehindamine, *ekspert*
- Märts 2005 – dets 2007 • **Interreg IIIB programmi projekt *Baltic Business Development Network***, koordineerimine ja aruandlus
- Juuli 2002 – dets 2003 • **EAS Regionaalarengu Agentuur**, *ekspert*
- Dets 2004 – k.a. • **EAS**, *regionaalarengu ja turismivaldkonna ekspert*
- Juuli 2002 – mai 2003 • **Nomisma SpA, *Administrative Capacity Study – Phase 2 – Phare Regiooni*** projekt, *konsultant*
- Aprill – juuni 2001 • **Poliitikauringute keskus PRAXIS**, kaastöö projektile “*Erinõuetega tegevusaladel tegutsemise regulatsiooni korrastamine ja uue haldusõigusega kooskõlla viimine*”

Loengud välisülikoolides

- September 2007, 2008, 2009 – 2012 • **Deusto Ülikool, Hispaania**, osalemine, üliõpilaste kaasamine ja loengud rahvusvahelises intensiivprogrammis ‘*General Problems of Transnational Law and Its Implications for the Companies in International Trade*’
- Oktoober 2003, 2004 • **Joensuu Ülikool, Soome**, loengud teemal *Reguleerimisteooriate rakendamisest majanduses* (‘*Application of the Regulation Theory in Economy*’)

Võõrkeeled

- Inglise ja vene keel
- Saksa, prantsuse ja hispaania keel

Osalemine ühingutes

- 1997–2009 • MTÜ Team Europe Eesti liige
- 2001–k.a. • Eesti Majandusteadlaste Seltsi liige

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