



Measurement of Rate of Return in Education. Research Directions¹

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There is a need to measure the efficiency and effectiveness of higher education in its various aspects, including in the area of non-monetary benefits of higher education. Education relates to wider economic and social effects and human welfare depends partly on earnings but also on non-monetary outcomes that all trace back to education in various ways. There exist positive relationships between education and health, the health of family members, the schooling of one's children, life choices made, fertility choices and infant mortality. Increasing the education level also has a positive effect on the environment and has a strong influence on crime reduction. Article is a review of the impact of intangible benefits of higher education, particularly non-monetary private and social rates of return on investment in education. The traditional, Humboldtian type of the University faces serious criticism. Main weaknesses of such concept includes outdated governance style with fragmented structure and management, insulated, extensive state dependency, overregulated legal status, heavily underfunded budget; uniformity and egalitarianism confronted with strong hierarchical human resource structure. It is accompanied with mono-disciplinary specialization; traditional learners approach; ineffective or lack of knowledge transfer; accompanied with little world-class excellence.

The definition of the Universities new role of in the society is based on the triple helix concept. It covers Education; with the priority activity in higher level education. The task is to provide trained people for the needs of contemporary society. The second helix is Research. The role of the university is the knowledge generation, especially on the frontier research. This gives or extends limits of the conceptual or technological basis for new products and services. It works, provided functional processes of knowledge transfer via agencies or people are available and are efficiently working. Third Mission of the university is Society. The traditional role of the university covers regional support inclusive business advice for politics. It is ever growing, grand challenge. The answer of the European commission to the need of the university modernization is the policy promoting three main reforms. First of them is under way for some time now. It consists of radical curricular reform symbolized with the Bologna Process. The second is the governance reform. It promotes transformation from the traditional, Humboldt type of the university towards new, entrepreneurial concept of the university. The governance reform is essential for new challenges formulated for university system. The implementation of the entrepreneurial concept of the university is impossible with current funding system. The funding reform is designed to enable change

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from input oriented towards output oriented budgeting. The latter needs adequate measurement system of the output in all three activity fields. Only research has more or less functioning assessment indicators. The education and third mission results indicators need to be designed.

Keywords: Rate of Return in Education; monetary benefits of learning, non monetary benefits of learning, accountability measures, tertiary education, tripple helix, univeristy modernisation; Bologna process; university governance

1 European union policy directions

Council Resolution of 23 November 2007 on modernizing universities for Europe's competitiveness in a global knowledge economy² ends the initial phase of defining the European Union policy in the field of tertiary education. In the Resolution, the most important policy statement declares that member states need to take the necessary measures to modernize higher education institutions by granting them autonomy and greater accountability³. The European Council indicates the main tools of achieving the ambitious goals listed in the document. European commission indicates the need of the university modernization by promoting three main reforms. First of them is under way for some time now. It consists of radical curricular reform symbolized with the Bologna Process. The second is the Governance reform. It promotes transformation from the traditional, Humboldt type of the university towards new, Entrepreneurial concept of the university. The implementation of the entrepreneurial concept of the university is impossible with current funding system. The Funding reform is designed to enable change from input oriented towards output oriented budgeting. The latter needs adequate measurement system of the output in all three activity fields. Only research has more or less functioning assessment indicators. The education and third mission results indicators need to be designed.

2 Official discussion was started with the document: Communication ... [2006]. It was summarized in the Council Resolution of 23 November 2007 On modernizing ... [2007].

3 The definition of the Universities new role of in the society is based on the triple helix concept. The first helix is Education; with the priority activity in higher level education. The task is to provide trained people for the needs of contemporary society. The second helix is Research. The role of the university is the knowledge generation, especially on the frontier research. This gives or extends limits of the conceptual or technological basis for new products and services. It works, provided functional processes of knowledge transfer via agencies or people are available and are efficiently working. Third Mission of the university is Society. The traditional role of the university covers regional support inclusive business advice for politics. For more details see: Dziechciarz [2012; 2011; 2010] and Dziechciarz et al. [2009].

2 Curricula reform

Curriculum reform consists of individual; national reforms of degree structures. Its key feature is the move from one-cycle to two- or three-cycle degree structures. New structure requires appropriate curricular change. Those changes concentrate on competence based learning, flexible learning paths, mobility and recognition. The described set of tasks and goals is known in the context of curricula reforms as the Bologna and Lisbon processes. The concept of the curricula is understood as (*Curricular Reform ...* [2006]) as all the learning which is planned and guided by the higher education institution, whether it is carried on in groups or individually, inside or outside the institution. The adopted definition includes both the content; in most cases taking the form of a syllabus, and the organization of the content (Figure 1).

Bologna – Lisbon process	Curricular reform in five areas of study	Indicators
	— Structure	— Access
	— Competence based learning	— Graduation
	— Flexible learning paths	— Employability
	— Recognition	— Mobility
	— Mobility	— Quality of education
		— Cost effectiveness

Figure 1

Schematic model of the Curricular Reform

Source: *Curricular Reform ...* [2006], part II, p. 7.

The five dimensions of curricular reform listed in Figure 1 are closely interrelated and partly overlapping. They contain the set of sub-dimensions. The two- or three-cycle programme structure should be constructed in such a way, that first degrees can be completed after a minimum of three years and should enable that acquired qualifications are relevant to the (European) labour market; access to the second degree (Master) should be limited and selective; curricula should be reorganized to account for the adjusted structure of the national and European society (labour market).

Competence-based learning; curricula should be redefined in terms of competencies, possibly in line with national qualifications frameworks and the European qualification framework (introduction of knowledge, skills and attitudes components). Additionally, Europe-wide transparency of acquired skills and knowledge needs to be increased.

Flexible learning paths requires diversity of teaching modes is to be increased, with stress on flexibility of chosen courses. Introduction of the excellence tracks for those highly qualified and talented is needed and should be promoted. National and international mechanism guaranteeing possibilities for the validation of prior

learning, increasing permeability from vocational/professional education and for mature learners with prior professional experience should be developed⁴.

To enhance recognition, diploma supplements has been introduced, the task was to increase readability of curricula, creating transparency in curriculum content. modularization and ECTS are introduced as facilitators for recognition.

The mobility task consists in a system enhancing efforts to increase international student mobility (Erasmus). Mobility of teaching staff with the goal for internationalizing the teaching experience is among the strategic goals of the system.

The impact of the reform is measured by the set of indicators. The policy statement lists six issues (for each of the five study areas). Access; consists in measurement of the impact on entry rates; the impact on admission policies and criteria for access to the three cycles; widening of participation to include underrepresented groups. Openness of the programmes measures the rate of possibilities for students to enrol in the second cycle from other disciplinary backgrounds or from other institutional types. Graduation; measurement covers the impact of the reform on graduation rates; the impact on time span to a degree; extending flexibility of graduates; adaptability to the needs on the (inter)national labour market increased; the impact on time to employment. Employability is measured with the information whether first cycle degrees actually qualify graduates for immediate employment; to what extent the concept of transferable skills has been implemented and/or institutionalized⁵. Mobility measurement should illustrate the impact of the reform on student mobility within Europe and across continents; the mobility of graduates and of teaching staff. Quality of education measurement illustrates the impact of the reform on development of scores and performance indicators regarding quality; to what extent there is adjustment in institutional and national quality assurance mechanisms. Cost-effectiveness should guarantee that the reforms in the study areas should lead to better results (given unchanged financial inputs or lower levels of financial inputs).

Curricula reform is most widely introduced in many countries and in numerous high education institutions is either on the way to its introduction or already introduced in a wide spectrum of issues.

4 See Dziechciarz [2015a]; [2015b]; [2015c] and [2015d] for details.

5 For discussion see: (Dziechciarz–Duda; Przybysz [2011] and [2014]).

3 Governance reform⁶

The Council of the European Union adopted resolution on modernizing universities for Europe's competitiveness in a global economy. The resolution emphasizes how modernizing higher education and research is needed to increase its role in a knowledge-based society and its mirror, a knowledge-based economy. The resolution was the summit of long lasting discussion⁷. As outlined in (DeBoer, File [2009]), three types of changes in national higher education systems have been recognized: changes in national governance frameworks; changes in institutional autonomy and changes in internal governance and management. Many governments were trying to find new, performance-based steering. Since the role of ministries of education, institutional leadership, the European Commission, industry and business, and national agencies/bodies has become more prominent, the number of stakeholders influencing higher education policies has increased. The demographic processes (decline of the number of potential students) accompanied by an increase of the size and number of higher education institutions lead to growing competition for the recruitment of (high performing) academic staff, for the recruitment of (talented) students, for public funding for teaching and research. This lead to new funding arrangements. As a rule, in general there is no visible reduction in the level of public funding. On the other hand, due to an increase in absolute numbers, the amount per student has declined, albeit the methods of allocation have changed and are now more performance-based. Additionally, one may observe an increase in private (family) contributions. Quality assurance has moved up on the agenda⁸, which is the case both at national and institutional levels. Institutional autonomy and strengthening the strategic capacities of higher education institutions is the area where differences among countries are most visible and can be grouped in two lines: freedom to determine internal structures, and the degree of (internal and external) stakeholder involvement. Regarding the institutional autonomy, eight areas were identified to assess the levels of institutional autonomy: institutional mission/strategy development; internal governance structures; introduction of new study programmes; quality of teaching and learning; internal financial policies; conditions of employment of staff; access and admission policies; and development of public-private partnerships. In most member states, the governance reform is in an initial stage. The way from Humboldtian towards modern entrepreneurial university is still long. It needs legal, managerial and first of all mental change among all stakeholders. One of the most important conditions needed is funding reform.

6 The text of this and the next chapter is heavily based on the results of the project The Higher Education Governance Reforms across Europe [2006]. The second source is results of EURYDICE Project Higher Education... [2008]; Two Decades... [2000].

7 Investing efficiently ... [2003]; The role of universities ...[2003]; Mobilising ... [2005]; The Modernization Agenda ... [2006].

8 Dziechciarz J. [2012b; 2015a].

4 Funding reform

Funding reform is part of the HEI⁹ modernization along with curricula and governance reforms. Funding reform consists of several strategic goals: the need for more (diversified) funding in HE; updated strategic framework E&T: new benchmark public – private investment of at least 2% of GDP.

Investment in HE is one of the best financial investments an individual can make. However, a wide differentiation by university or faculty may be observed. Returns on investment into education are higher in developing countries relative to advanced industrial countries. Returns to HE are rising in most dynamic economies, unfortunately these are non European OECD states. Private returns exceed social returns. This is a reflection of the public subsidization of HE, the tuition fees are an option followed by more and more countries. As a social compensation, a system of grants and loans is accompanied by the introduction (increase) of fees. It is obvious, that an improvement of the public funding mechanism is needed. Table 1 shows the classification according to cost sharing and student support systems. The most unusual is the group consisting of Croatia; Estonia; Poland; Russia, where some students are obliged to pay fees while others do not.

Extent of cost sharing		universal support systems	family-based funding
	important and uniform across students	Australia; Chile; the Netherlands; New Zealand; UK	China; Japan; Korea
	non-uniform across students		Croatia; Estonia; Poland; Russia
	minor and uniform across students	Finland; Iceland; Norway; Sweden	Belgium; the Czech Republic; France; Greece; Mexico; Portugal; Spain; Switzerland

Table 1.

The classification of cost sharing; student support systems. Basis for student support

Source: based on MODERN Project results (2010).

Funding tools may be classified into following groups:

- *Formula based funding*. In many countries public funds are delivered to institutions as a lump sum based on a set of variables related to costs but also to basic outcomes. These experiences have shown a positive effect on institutions and on their results.
- *Performance based funding*. Performance funding is the generalized way for funding research but it is less usual for funding teaching activities. In some countries a portion of the funds granted to higher education institutions are

⁹ HEI, E&T – higher education institution; education and teaching.

linked to the achievement of certain standards which were previously agreed between public authorities and institutions. The results of these experiences are also very positive.

- *Competitive and targeted funds.* In spite of the fact that research in Europe is heavily under-financed compared with the US, indicators of research outputs show that the gap is lower in results than in funds. This indicates that the efficiency of European basic research is relatively good.
- *Negotiation based on budget estimate.* Although at first glance the mechanism seems to be vulnerable to arbitrarily used criteria, the mechanism works well in most countries.

5 Rate of return. Concepts

Measurement of the monetary and nonmonetary benefits from education is not possible without agreement on conceptual and methodological issues. There is general agreement that graduates not only have more employability and receive higher earnings, but also acquire higher social status, greater efficiency in consumption, better health, greater access to technological change and a broad set of cultural benefits including better opportunities for leisure. Benefits from education are also gained by enterprises. General education reduces the need for training and retraining when new technologies are incorporated. The higher productivity of more educated people, especially those having the abilities and skills that transmit higher education, is spilled out to other workers having an important effect on the whole productivity of the enterprise. A considerable part of the externalities that higher education graduates produce is captured not only by society in general (which justifies the public funding of higher education), but specifically by enterprises and graduates. Classification of research directions in measurement of return in education lists following types: the private return, the social return and the labour productivity return. The direct (private) and indirect (social) non-monetary aspects of learning are called “non-monetary returns”. Non-market returns are the combination of Private non-market effects and Community non-market effects. Still measurement and methodology remain important problem to researchers. Some researchers represent approach to measure education in terms of years of schooling while other scientists’ measurement is based upon qualifications gained (Extensive discussion is given in Dziechciarz [2011]; Dziechciarz et al. [2015]; Owens [2004], p. 1).

	DIRECT/PRIVATE (directly captured by individual with higher levels of human capital)	INDIRECT/SOCIAL (aggregation of human capital across individuals, organizations and communities)
MONETARY (sometimes referred to as economic)	Enhanced economic productivity of individuals	Enhanced economic output reflecting the effect on organizations, firms and societies (including interactions between different agents and spill-over effects)
NON-MONETARY	Improves health and aspects of individual well-being	Social cohesion and well-being including the effect of spillovers

Table 2.
Classifying the impact of human capital
Source: OECD 2000, p. 3.

The monetary benefits include the economic benefits, among them greater competitiveness in the labor market and higher earnings and the related more satisfying quality of life. The non-monetary (or personal) category of benefits is associated with the implementation of their own interests, personal development, consciousness determine their own future. Social benefits include the recognition, respect the environment and a sense of prestige. Related classifications are also proposed in other works (Dziechciarz [2011]; Psacharopoulos [2007]; McMahon [2006].

The most widely discussed is the concept of private returns, which is based on the costs and benefits of education realized by the individual student. It is measured by how much the individual (together with his family) actually pays to a higher education institution, relative to what returns are gained back after taxes. In most cases it is measured in terms of increased earnings, relative to a control group, as a rule, earnings of a secondary school graduate who did not pursue tertiary education studies. The most widespread approach towards assessment of the lifelong benefits from the investment into education has two main methods. They are referred to as *the full-discounting or elaborate method*, based on the NPV concept and the *Mincerian earnings function method*¹⁰. Although there is a fear of unemployment and over-education yield in an observed, large growth in numbers of university graduates, there is strong evidence that higher education in Europe continues to be a profitable investment opportunity, both privately and socially. Non-monetary returns are an important part of outcomes of education's costs.

10 Net Present Value; Mincer [1974].

Benefits	Private	Social
Market	<ul style="list-style-type: none"> - better employability - higher earnings - less unemployment - labour market flexibility - greater mobility 	<ul style="list-style-type: none"> - higher productivity - higher net tax revenue - less reliance on government financial support
Non market	<ul style="list-style-type: none"> - better consumer efficiency - better own and family health - better children quality 	<ul style="list-style-type: none"> - reduced crime - less spread of infectious diseases - lower fertility - better social cohesion - voter participation

Table 3.

A classification of the benefits of education

Source: Psacharopoulos [2007], p. 29; Rates of Return... [2007], p. 27; Psacharopoulos, Mattson [1998].

As the leading researchers show¹¹ the value of the estimates of returns to investment in higher education need to be improved and steadily monitored. This statement would be (most probably) reinforced in a situation where data availability would allow estimating *wide* rates of returns. This statement is especially important, since one may observe a decrease of public financing of higher education systems. Establishing (or increasing) tuition fees is a topic currently being debated in many countries. Higher education public funding should not be equal across the board, e.g. tuition-free for all students, regardless of their socio-economic background. There is obvious possibility of establishing a broad European programme, similar to the research framework programmes, for developing quality and competition among European institutions for developing teaching excellence. One should not avoid national, public discussion towards inspiring political will for more efficient and equitable university funding policies. The advance in bringing about the modernization of Europe's universities, addressing their interlinked roles in education, research and innovation, as a key element of Europe's drive to create a new, knowledge-based society and economy and improving its competitiveness is still *in statu nascendi* in the EU.

The concept of social returns is based on the costs and benefits of education, as these are realized by the state or society as a whole. The costs are measured all inclusive. They refer to what education really costs, regardless of the sources of covering them. Social rates of return should be based on productivity differentials, rather than earnings. The social returns from education are used to assess the efficiency of public spending on education, and as a guide on whether to expand or

11 Psacharopoulos [2007], p. 29; Rates of Return... [2007]; Psacharopoulos, Mattson [1998]; p. 27; McMahon [1997] p. 268; Wegner [1979], p. 6.

contract a particular university faculty. The concept of fiscal returns is based on a narrow measure of costs and benefits – those relating to public expenditures. It may be used to assess how well the Treasury is doing when spending on education. They relate to the country’s public finances and are not estimated as widely as private or social rates.

The return may be considered as an effect of investments (costs). The idea of cost (investment) in education is equally complex as the return.

	INDIVIDUAL	SOCIETY
COSTS	Direct costs Including school fees	Public subsidy Net of cost recovery and adjusted for possible deadweight losses of tax-financed public spending
	Forgone production Lost earnings or other production	Spillover effects in worker productivity As when a person's education enhances the work productivity of his or her co-workers

Table 4

Generic education costs and benefits and their accrual to individuals and the rest of society

Source: Mingat and Tan [1996], p. 7.

6 Concluding remarks

In many cases investment in higher education is justified almost exclusively in terms of expected nonmarket benefits rather than increased income for graduates. Obviously tertiary education offers much more possibilities to get better job and consequently achieve significant material benefits. But there are many non-monetary reasons why individuals wish to achieve tertiary education. So equally important are non-economic motivations, such as desire to self-realization of young people, a wish to broaden knowledge and realize passions and dreams, get an interesting job, social prestige and have satisfaction and pleasure of their future profession is extremely significant.

Described potential nonmonetary effects of having tertiary education usually are not captured in traditional estimates of the private economic returns of education. Research studies document the main direction of the relationship and in many issues the strength of the evidence is not that obvious. Among the most substantial influences that can be mentioned are the relationships between parents’ level of education and health, schooling, and childbearing of their children. Widely discussed and well recognized is also the linkages between one’s own schooling and own health. Nevertheless level of education gives substantial benefits beyond those usually employed measures of labor market productivity (More details in: Dziechciarz–Duda; Król [2012] and [2013]).

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