Performance Measurement For Entrepreneurial University

Józef Dziechciarz
jozef.dziechciarz@ue.wroc.pl
Wroclaw University of Economics (Poland)

Abstract

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 Main weaknesses of such concept includes outdated governance style with fragmented structure and management, insulated, extensive state dependency, overregulated legal status, heavily underfunded budget;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.

The answer of the European Commission to those weaknesses is the Modernization concept with a goal of transformation from Humboldtian towards Entrepreneurial University. Modernization concept 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 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.

In the article, the discussion of concept and some possible solutions of performance measurement of the efficiency and effectiveness in the education system is given. Special attention is concentrated on rate of return measurement in education, in the first place in the tertiary education.

1. Background

In the countries of European Union, 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 Main weaknesses of such concept includes outdated governance style with fragmented structure and management, insulated, extensive state dependency, overregulated legal status, heavily under funded budget;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 (first helix); with the priority activity in higher level education. The task is to provide trained people for the needs of contemporary society.
Research is considered as the second helix. The primary 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 is functioning, provided core processes of knowledge transfer via agencies or people are available and are efficiently working.
Third part (third helix) of the university's Mission is Society. The traditional role of the university covers regional support inclusive business advice for politics. It is ever growing, grand challenge.
New concept formulates additionally fourth helix which is government and its institutions. Tertiary education system is one of key tool for creating new, knowledge based society and economy.

The answer of the European commission to the need for the university modernization is the policy promoting three main reforms.
First reform 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 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 most popular measures are: bibliometers (count of publications, often weighted by the points associated with the Journal or publication type); patent count; citation indices, spin offs and spin outs, etc.
The education and third mission results indicators need to be designed. First attempts to assess education effectiveness cover: the indicators counting diplomas issued; the average length of study period; rate of dropouts, etc. Recently, a new concept of ECTS taximeter has been introduced in Norway and Denmark. The impact on the ECTS taximeter pressure on the diploma quality has not been assessed yet.
Neither governance reform, nor the funding reform is possible without measurement of the efficiency and effectiveness in the education system. Prior to measurement, it is needed to agree on concept and definitions of the efficiency and effectiveness. The second step will be defining possible solutions in measurement and assessment. Very little has been done in this respect. The few existing publications concentrate on rate of return measurement in education, in the first place in the tertiary education.

2. Rates of Return. Estimation Techniques

The most widespread approach towards assessment of the lifelong benefits from the investment into the education is two main methods. They are referred to as the full-discounting or elaborate method, based on the Net Present Value (NPV) concept, and the Mincerian earnings function method (see [24]). Historically, the elaborate method was used in the beginning of the economics of education in the early sixties, followed by the Mincerian method in the seventies. The NPV approach consists in calculating the internal rate of return based on individual age-earnings profiles that vary over time (t).

$$\sum_{t=m+1}^{n} \frac{(W_u - W_s)_t}{(1+r)^t} = \sum (W_s - C_u)(1+r)^t; \quad (1)$$

where (r) is the discount rate that equates the benefits from the extra education (proxied by earnings differentials in the economy), to the sum of opportunity costs (foregone earnings of the student while studying), and the direct resource costs of schooling at a given point in time. Thus, $(W_u - W_s)_t$ shows the difference in earnings between two levels of education. Symbols u; and s; stand for University (tertiary) level and Secondary level of education, respectively.
The Mincerian earnings function method starts by fitting a regression in the form (2) to the data.

$$\ln W_i = \alpha + \beta_p D_p + \beta_s D_s + \beta_u D_u + \gamma_1 EX_i + \gamma_2 X_i^2 + \varepsilon_i; \quad (2)$$

where EX stands for years of labor market experience, defined as Age − School starting age, and D is a 0–1 dummy variable corresponding to the subscripted level of schooling [24]. The private rate of return to higher education can then be calculated from the earnings function given by the formula (3).

$$r_u = \frac{\beta_u - \beta_s}{S_u - S_s}; \quad (3)$$

The discounting of actual net age-earnings profiles is the most appropriate method of estimating the returns to education because it takes into account the most important part of the early earnings history of the individual. However, this method requires comprehensive data – one must have a sufficient number of observations in a given age-educational level cell for constructing age-earnings profiles, not intersecting with each other.
The advantage of the Mincerian way of estimating the returns to education is that it can smooth out and handle incomplete cells in an age-earnings profile matrix by level of education. The disadvantage,

of course, is that it requires a sample of individual observations, rather than pre-tabulated mean earnings by level of education. Out of the above methods, the Mincerian one has been prominent in the applied literature.

Crucial for calculations of social rate of return is assumption wages are a feasible proxy for the marginal product of labour. It introduces politics into the issue. It may be true in a competitive economy with data from the private sector. Jobs paid from the taxpayer money (civil servants) have pay scales irrelevant for a social rate of return calculation. The reason is that they do not represent marginal productivity. Earnings of government paid employees might be used in calculating private returns to education where of interest is what people actually get, regardless of productivity.

Widely discussed issue is, whether it may be neglected, that beyond education, there is large list of factors that may affect earnings, such as differential ability. Calculation of the rates of return for samples of twins proved, that there is statistically significant link between education and earnings. For more details, one may consult [2], [3], [18] and [20].

Table 1. Some estimates of calculation of private rate of return (from higher education) with change in time

Country	Year	Rate of return (%)	Change (% points)	Source
Austria	1981 1997	2.4 6.6	4.2	Fersterer et al. (2003), Table 2
Bulgaria	1986 1993	6.3 6.5	0.2	Giddings (2002), Table 4
Croatia	1996 2004	2.3 2.1	-0.2	Vujcic and. Sosic (2009), Table 3
Cyprus	1994 2004	5.7 8.7	3.0	Eliophotou (2008), Table 2
Czech Rep.	1984 1992	0.4 3.8	2.3	Newell and Reilly (1999), Table 3
Greece	1994 1999	6.3 9.0	2.7	Prodromidis and Prodromidis (2008), Table 5
Hungary	1986 1998	6.2 11.2	5.0	Campos and Jolliffe (2003), Table 2
Ireland	1994 2001	11.9 11.0	-0.9	McGuinness et al. (2008), Table 6
Latvia	1997 2002	9.9 10.6	0.7	Hazans (2005), Table 32
Poland	1998 2004	6.8 8.8	2.0	Strawinski (2007), Table 6
Romania	1952 2000	3.1 8.5	5.4	Andrén et al. (2005), Table 3
Slovakia	1984 1992	2.3 4.2	1.9	Newell and Reilly (1999), Table 3
Slovenia	1994 2004	8.9 10.2	1.3	Polanec and Ahcan (2007), Table 7
Spain	1981 1991	7.5 13.5	6.0	Lassibille and Gomez (1998), Table 5
Sweden	1992 2001	4.6 6.3	1.7	Gustavsson and Österholm (2006), Table 3
Turkey	1987 2005	14.0 22.9	8.9	Tansel (2008)

Source: [28] p. 10.

Investigations for Belgium [25]; Greece [23]; Slovenia [26]; Turkey [29], and [13] for some other OECD countries show, that there is not much variation in returns for different tertiary education levels. It may be interpreted as existence of some kind of equilibrium across levels. In average, rate of return to a first degree is around one percentage point higher than the second cycle of tertiary education.

3. Implications

The transformation from Humboldtian towards Entrepreneurial University is the core idea of the modernization concept of the European Commission. It is defined in three areas: curricula; governance and funding reforms. Governance Reform includes strategic goals: state involvement in HE sector; with caution against overregulation and micromanagement; institutional autonomy and full accountability; strategic priorities to be set by institution; involvement of stakeholders (employers, business); building and rewarding good management and leadership.
Although fear of unemployment and overeducation yield by observed, large growth of university graduates number, there is strong evidence that higher education in Europe continues to be a profitable investment opportunity, both privately and socially.
The value of the estimates of narrow social returns to investment in higher education means that the sector is underfunded. Statement would be (most probably) reinforced in situation, where data availability would allow estimating wide social rates of returns.
The value of the estimates of private returns to investment in higher education means that part of the increased funding could come from private sources, such as increased student fees. This statement is especially important, since one may observe decrease of public financing of higher education systems.
Establishing (or increasing) tuition fee is a topic currently being debated in many countries. Charging tuition fees, however, has proved to be a very difficult policy from a political standpoint since it challenges many of the fundamental precepts of egalitarianism and could raise conflicts with students. Higher education public funding should not be equal across the board, e.g. tuition free for all students, regardless of their socio-economic background. Students from low-income families should receive a subsidy while others should pay the full cost of their education. The evidence shows that such additional cost is easily recovered later in life through higher wages.
The way, public funds are granted to higher education institution should promote effectiveness, efficiency and quality. In Europe and some OECD countries most widespread funding tools that have been experimented in include: formula based funding, performance based funding and competitive and targeted funding. In case of competitive and targeted funding, 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 excellence. One should not avoid national, public discussion towards inspiring political will for more efficient and equitable university funding policies. One have to keep in mind, that knowledge progresses, also in issue what are the most effective ways to improve social welfare by tertiary education. It may lead to continuously fine-tuned policies in the direction of most effective modes for public funding.
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 new, knowledge based society and economy and improving its competitiveness is still in *statu nascendi* in EU.

References

[1] Andrén D. Earle J. Săpătoru D. [2005] The wage effects of schooling under socialism and in transition: Evidence from Romania, 1950–2000 Journal of Comparative Economics 33 (2): 300-323
[2] Ashenfelter O. Krueger A. [2004] Estimates of the economic return to schooling from a new sample of twins, American Economic Review, 84 (5), 1157-1174
[3] Ashenfelter O. Rouse C. [1998] Income, schooling and ability: Evidence from a new sample of identical twins, Quarterly Journal of Economics, 113 (1), 253-284
[4] Campos N. Jolliffe D. [2003] After, before and during: Returns to education in Hungary 1986-1998 Economic Systems 27: 377-390

[5] Communication from the Commission to the Council and the European Parliament. Delivering on the Modernisation Agenda for Universities: Education, Research and Innovation [2006] Com(2006) 208 Final; Brussels, 10.5.2006
[6] Council Resolution of 23 November 2007 on modernizing universities for Europe's competitiveness in a global knowledge economy [2007] General Secretariat; No. prev.doc. 15007/07 RECH 358 EDUC 212 COMPET 378; Brussels, 6 December 2007; 16096/1/07; REV 1
[7] Curricular Reform [2006] Final Report to the Directorate-General for Education and Culture of the European Commission Contract: 2006–1394/001–001S02-81AWB; part I-IV
[8] Delivering on the Modernisation Agenda for Universities: Education, Research and Innovation [2006] (No. Com 2006, 502). European Commission, Brussels
[9] Dziechciarz, J. [2011] From Humboldtian towards Entrepreneurial University. The Modernization Concept of the European Commission; in: Klucznik-Toro A. Bodis K. Pal I. (eds.) [2010] Management and Entrepreneurship in a Changing Market; Publikon; Budapest; 2010; pp. 13-35
[10] Dziechciarz, J. [2011] On Rate of Return Measurement in Education; Ekonometria; (in print)
[11] Eliophotou M. [2008] Perceived rates of return to higher education: Further evidence from Cyprus, Economics of Education Review 27(1): 39-47
[12] Fersterer J. Winter-Ebmer R. [2003] Are Austrian returns to education falling over time? Labor Economics, Elsevier 10(1): 73-89
[13] Giddings L. [2002] Changes in gender earnings differentials in Bulgaria's transition to a mixed-market economy Eastern Economic Journal 28 (4): 481-497
[14] Gustavsson M. Österholm P. [2006] Hysteresis and non-linearities in unemployment rates, Applied Economics Letters, 13(9): 545-548
[15] Hazans M. [2005] Unemployment and the earnings structure in Latvia World Bank, Working Paper 3504
[16] Klucznik-Toro A. Bodis K. Pal I. (eds.) [2010] Management and Entrepreneurship in a Changing Market; Publikon; Budapest; 2010
[17] Lassibille G. Gomez L. [1998] The evolution of returns to education in Spain 1980-1991, Education Economics, 6(1)
[18] Martin J. [1998] Education and Economic Performance in the OECD Countries: An Elusive Relationship Journal of the Statistical and Social Inquiry Society of Ireland, XXVII, Part V
[19] McGuinness S. McGinnity F. O'Connell P. [2008] Changing returns to education during a boom? The case of Ireland ESRI Working Paper No. 227
[20] Miller P. Mulvey C. Martin N. [1995] What do twin studies reveal about the economic returns to education? A comparison of Australian and U.S. findings, American Economic Review, 85(3): 586-599
[21] Miller P. Mulvey C. Martin N. [2005] The return to schooling: Estimates from a sample of young Australian twins Labour Economics, 2005
[22] Mincer J. [1974] Schooling, Experience and Earnings, Columbia University Press, New York
[23] Mitrakos T. Tsakloglou P. Cholezas I. [2008] Earnings determinants in Greece, Economics University, Athens
[24] Newell A. Reilly B. [1999] Rates of return to educational qualifications in the transitional economies Education Economics 7 (1): 67-84
[25] Nonneman W. Cortens I. [1997] A note of the rate of return to investment in education in Belgium Applied Economics Letters 4: 167-171
[26] Polanec S. Ahcan A. [2007] Evolution of returns to tertiary education during transition: Evidence for Slovenia, Efficiency and Equity of Higher Education, Portoroz
[27] Prodromidis K. Prodromidis P. [2008] Returns to education: The Greek experience, Applied Economics, 40:1023-1030
[28] Psacharopoulos G. [2009] Returns to investment in education: An European Survey CHEPS, Enschede
[29] Strawinski P. [2007] Changes in the return to higher education in Poland, 19982004, Efficiency and Equity of Higher Education, Portoroz
[30] Tansel A. [2008] Changing Returns to Education for Men and Women in a Developing Country: Turkey, 1994, 2002-2005 ESPE, London
[31] Vujcic B. Sosic V. [2009] Return to education and the changing role of credentials in the Croatian labor market Transition Studies Review (2009)