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**ИКОНОМИЧЕСКИ АСПЕКТИ НА ВИСШЕТО ОБРАЗОВАНИЕ: РАЗМИСЛИ ВЪЗ
ОСНОВА НА СЪВРЕМЕННОТО РАЗВИТИЕ В САЩ И ГЕРМАНИЯ**

**ECONOMIC ASPECTS OF TERTIARY EDUCATION: DELIBERATIONS BASED ON
CURRENT DEVELOPMENTS IN THE USA AND GERMANY**

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Abstract: As a commodity, education in general and university education in particular fulfils key economic, societal and social functions. A high level of education is imperative for high economic growth, cohesion and social peace within a society as well as for the professional success of an individual and his or her status within the social fabric. The debate on the introduction and abolition – and also the size - of tuition fees is an expression of the conflict between the goals of funding and of social fairness. In the search for solutions, America's tertiary educational system is often cited as a comparative model or even as an exemplary role model for the necessary reforms. At first sight, the high level of tuition fees seems easily compatible with a continuously high level of university students. The objective of our analysis is to compare the tertiary education systems of Germany and the USA and thereby present the basic economic aspects of the current discussion. We intend to provide initial impetus for a further analysis which would examine in more detail the potential relationship between university financing and stratum-specific university attendance and would ascertain the extent to which personal financial contributions towards the necessary costs of a university education create and reproduce educational inequality at universities.

Key words: economic aspects of tertiary education, education systems, university funding, university costs

1. Classification of the Types of Universities and Colleges in USA and in Germany

The academic landscape in the USA features a high level of competition and accessibility to the education market, resulting in a wide variety of tertiary institutions, which can be categorized according to their different features. A

sufficient classification of the various institutions for the purposes of this analysis is that offered by the National Center for Education Statistics (NCES).¹ This

¹ Depending on purpose, there are several classifications available. One of these is that of the Carnegie Foundation for the Advancement of Teaching, which categorizes the different types of university and college according to the highest degree

classification differentiates between publicly and privately funded organizations and the official length of the study programmes, i.e. between the so-called 2-year and 4-year colleges. Out of a total of 4,409 universities and colleges in the USA, in the academic year 2008/09, 1,676 (38%) of these were public and 2,733 (62%) were private, whereby in both cases the number of 4-year colleges exceeded those of the 2-year institutions.² Although there are more private tertiary institutions, the majority (73%) of all the students in the USA are enrolled at public universities and colleges, whereas only 27% of them are at private institutions.³

Further to the NCES classification, American universities and colleges can be classified into their corresponding type of access policy, i.e. open or selective.⁴

Universities and colleges in the USA – depending on their role and mission – have totally different educational objectives.⁵ The very broadly defined American tertiary education sector comprises in addition to the academically oriented institutions numerous vocationally oriented institutions which – by German definition – would tend to be allocated to the level of secondary education rather than tertiary.⁶ This difference between the different interpretations of the word “university” (or “college”) must be kept in mind during the following comparison, as must also the resulting far-reaching differences between

the levels of education offered by the individual universities in the USA itself and the differences between those offered by USA and Germany.

The complex academic landscape in the USA contrasts sharply with the comparatively simply structured, state-dominated, binary system of traditional universities and universities of applied science in Germany.⁷ According to Germany's Federal Statistical Office (Statistisches Bundesamt), in the winter semester 2009/10, the German academic landscape consisted of a total of 410 tertiary institutions, 105 of which are traditional universities and 203 of which are universities of applied science. Despite this difference in numbers, of the 2.1 million students, there were substantially more studying at the former (1.4 million or 66%) than at the latter (644,005 or 30%).⁸ The hitherto rather undeveloped private tertiary education sector in Germany is gaining more importance; the number of students studying at private institutions has increased over the last few years up to 4.5%.⁹

2. Type and Scope of Tertiary Education Financing in USA and Germany

Spending on tertiary education in the USA has traditionally always been at a very high level. According to the OECD report on

they offer, the amount of research they undertake, and the disciplines they offer. This categorization is generally recognized and is usually applied in most cases. However, as it differentiates very finely, it is – for this particular study – too advanced. Cf. Carnegie Foundation for the Advancement Of Teaching, *The Carnegie Classification*, 2001.

² Cf. NCES, *Digest of Education Statistics 2009*, p. 398.

³ Cf. NCES, *Digest of Education Statistics 2009*, p. 284.

⁴ Cf. Rothfuß, A., *Hochschulen in den USA und in Deutschland. Ein Vergleich aus ökonomischer Sicht*, 1997, p. 49.

⁵ Cf. Gebhardt, J., *Jenseits von Humboldt – Amerika?* 2001, p. 7f.; Fallon, D., *Die Differenzierung amerikanischer Hochschulen*, 2001, p. 87.

⁶ Cf. Rothfuß, A., op. cit., p. 68.

⁷ Owing to their specific characters, we omit here the Pädagogische Hochschulen, (teaching training colleges), Theologische Hochschulen (theological universities), Musikhochschulen (universities of music) and universities of music. Similarly, we omit the “Duale Berufsakademien” (dual vocational academies) which were recently renamed as universities, and the Fachhochschulen für öffentliche Verwaltung (universities for the further education of civil servants).

⁸ Cf. Statistisches Bundesamt Deutschland, *Hochschulen insgesamt*, no year, Statistisches Bundesamt Deutschland, *Studierende insgesamt*, no year.

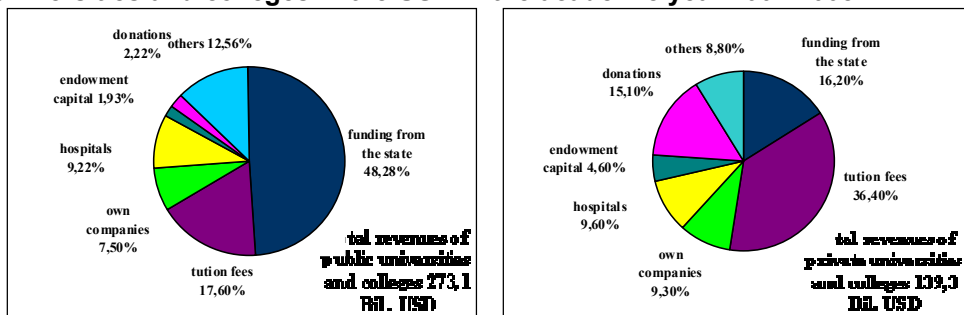
⁹ Cf. Statistisches Bundesamt Deutschland, 4.5% of students at private tertiary institutions, 15.03.2010. More information on the private tertiary sector is provided by a new survey by the Stifterverband für die Deutsche Wissenschaft in cooperation with McKinsey; Frank, A., et al., *Rolle und Zukunft privater Hochschulen in Deutschland*, 2010.

education 2010, the spending on USA tertiary educational institutions was – in 2007 - approximately 3.1% of the GDP. This means that the USA heads the OECD countries, and also spends more than twice as much as the OECD average of 1.5% for university spending. This prominent position of the USA derives in particular from the above average share of private financing. Whereas the USA with only its public share of 1.0% of the GDP holds a solid, midfield position, the private spending to the tune of 2.1% of the GDP secures the USA a vanguard position in the OECD comparison.¹⁰ The reasons behind this private financing pattern lie within the institutional structuring of American tertiary education. On account of their decentralized character and the limited responsibility of the government for educational issues, American tertiary institutions – particularly the private ones – have always been dependent on a multitude of different sources of revenue. Although both public and private universities and colleges are in the main

financed by the same sources, depending on their funding bodies, their weighting in the total budget is different.¹¹ Figure 1 illustrates the situation.

State university funding in the USA takes place on 3 levels: via national research funds – to which public and private tertiary education institutions have equal access, via individual state means for the current business operations, which are made available on the basis of performance-related financing formulae, and grants from the local community, which are awarded to the 2-year community-funded Community Colleges.¹² Although state funding at private colleges does not play a dominant role, (16.20%), it accounts for almost half of the total revenue of the public two- and 4-year universities in the USA, and is thus the main source of financing.¹³ The majority of the funding comes from the individual states. Depending on the number of students, the individual financing need of each institution is calculated and specifically allocated.¹⁴

Figure 1: Relative significance of the revenue sources for public and private universities and colleges in the USA in the academic year 2007/2008



Source: own illustration on the basis of data provided by NCES, The Condition of Education 2010, p. 316, online, accessed on 17.09.2010.

¹⁰ Cf. OECD, Education at a Glance 2010, p. 220; Busemeyer, M., *Bildungspolitik in den USA, Eine historisch-institutionalistische Perspektive auf das Verhältnis von öffentlichen und privaten Bildungsinstitutionen*, in: Zeitschrift für Sozialreform, Vol. 53, 2007, No. 1, p. 57f.

¹¹ Cf. Rothfuß, A., op. cit., p. 223; Busemeyer, M., op. cit., p. 70; Fallon, D., *Die Differenzierung amerikanischer Hochschulen nach Funktion und Bildungsauftrag*, 2001, p. 91.

¹² Cf. Rothfuß, A., op. cit., p. 227ff.

¹³ Cf. NCES, The Condition of Education 2010, op. cit., p. 316.

¹⁴ Cf. Rothfuß, A. op. cit., p.. 230ff.

Student fees are the primary source of income for the private institutions of tertiary education. In the course of a rapid increase in student fees during the last ten years, its share of the total budget has increased continuously. For private colleges, it was 36.40% in the academic year 2007/2008, and for public ones 17.60%.¹⁵

A further pillar of American university financing is that consisting of contributions from donations, sponsoring and endowment capital. Although barely relevant at public institutions, they contribute greatly to the financing of private universities. Following religious groups and church communities, the second most important source of finance is that of donations. The largest donation volume emanates from alumni of the university, who are contacted regularly by a college's internal fundraising department. Via the specific marketing of donations, private colleges aim to additionally attract influential, wealthy US citizens, companies and foundations as donors.¹⁶ In contrast with the mostly specifically allocated donation money, the endowment capital delivers steady revenues. Recent calculations by the NCES show that the endowment capital of all US universities and colleges in 2007 was 410 billion US\$, although the total volume is unevenly distributed over the American university landscape. The 120 colleges with the highest endowment capital hold over 310 billion US\$ of the total endowment capital.¹⁷

¹⁵ Cf. NCES, *The Condition of Education 2010*, op. cit., p. 316; NCES, *Postsecondary Institutions and the Price of Attendance*, 2010, p. 4.

¹⁶ Cf. HIS, *Warum sind die amerikanischen Spitzenuniversitäten so erfolgreich?* 2005, p. 33f.; Lenhardt, D., *Hochschulen in Deutschland und in den USA*, 2005, p. 131f., Rothfuß, A., op. cit. p. 238f. The great willingness to donate in the USA may be explained by the fiscal advantages it offers; American trusts law and inheritance law also act favourably towards bequests to charitable trusts and endowments, including those of universities and colleges. Cf. Busemeyer, M., op. cit., p. 70.

¹⁷ Among the "top five" we have Harvard University (35 billion US\$), Yale University (22 billion US\$), Princeton University (16 billion US\$) and the University of Texas

American colleges and universities receive further revenues from university companies which sell products and services to students, professors, administrative staff and the general public.¹⁸ Although direct costs are involved, to date universities have managed to secure themselves a financial contribution in this way.¹⁹

It is apparent that the state is increasingly withdrawing from university/college funding.²⁰

During the last few decades, the alternately increasing figures for revenues and expenditure have been described by Robert E. Martin as an endless "revenue-to-cost spiral".²¹ It has led to an almost uncontrollable cost development in tertiary education, in the course of which college costs in the USA have grown much more quickly than the rate of inflation, the consumer price index and health and energy costs. In order to cover the increasing college expenditure, additional revenues are needed, which on the other hand induce further spending. Incentives to save costs are limited, owing to the fear that a "saving" image might impact negatively on the image of a university and thus on third party financing.²²

This dependency on private financial sources, which has always been responsible for the power resources of

System (14 billion US\$). Cf. NCES, *Digest of Education Statistics 2009*, p. 509.

¹⁸ These companies include student halls of residence, restaurants, sports facilities, car parks, shopping malls, university printing companies, university hospitals. Cf. Rothfuß, A., op. cit., p. 241.

¹⁹ Sales of technologies to business and industry is becoming increasingly significant for the leading research universities with large natural sciences and engineering faculties – such as Massachusetts Institute of Technology (MIT). For all other institutions – and thus for US universities and colleges as a whole – this source of revenue has little relevance. Cf. Rothfuß, A., op. cit., p. 241ff.

²⁰ Cf. Ibid. Stern, A., *U.S. colleges punished by financial crisis*, 2008, Blumenstyk, G., *Public Colleges Turn to Tuition Increases to Offset Budget Squeezes*, 2010,; cf. Martin, R., *The Revenue-to-Cost Spiral in Higher Education 2009*, p. 11f.; Busemeyer, M., op. cit., p. 70.

²¹ Martin, R., op. cit., p. 3.

²² Cf. Martin, R., op. cit., p. 11ff.

American colleges and which has always been seen as their great strength, has proven to be a problem since 2009. As a result of the so-called “financial crash”, private donations diminished and also the endowment assets of many colleges shrank by 30%.²³ This slump is regarded among educational experts as “the greatest crisis in the history of American colleges”²⁴ and it is forcing tertiary educational institutions to implement saving measures and to increase tuition fees yet again. Thanks to substantial reserves in the form of endowment capital, savings of this kind are not so drastic for the wealthy, private elite colleges. However, the financial crisis could endanger the existence of the smaller

private colleges with endowment assets of less than 50 million US\$.²⁵

A similar look at the investment level for Germany's tertiary education shows that for 2007 the GDP share was 1.1%. Thus, German university spending both with regard to the USA (3.1% of the GDP) and to the OECD average (1.5% of the GDP) is rather low. This can be traced back mainly to the below-average private share: whilst in Germany it is only 0.2%, in the USA it is 2.1% of the GDP, and in the OECD average 0.5% of the GDP. In contrast, the share of public university spending is – at 0.9% - only just below the OECD country average of 1.0%.²⁶

Table 1: Share of public, private and total spending on universities per GDP in USA, Germany and the OECD average

| | Public | Private | Total |
|--------------|--------|---------|-------|
| USA | 1.0% | 2.1% | 3.1% |
| Germany | 0.9% | 0.2% | 1.1% |
| OECD average | 1.0% | 0.5% | 1.5% |

Source: Own illustration on the basis of Data from the OECD, Education at a Glance 2010, p. 220

²³ E.g. Oberlin College – an elite college in Ohio – reported that its endowment capital of 750 million US\$ had shrunk by 15% during 4 months. The University of Wisconsin in Madison had an initial endowment capital of 1.8 billion US\$ but this shrank by 18% within a few months. Harvard lost a third of its endowment capital. Cf. Stern, A., op. cit.

²⁴ Spiewak, M., Thuswaldner, G., *In Harvard wird gespart*, 13.01.2009.

²⁵ Cf. Ibid.; Stern, A., op. cit., Comparative USA-wide figures on the impact of the financial crisis on the American university system are not yet available. The diminishing revenues of private institutions from 182.4 billion US\$ in 2006/07 down to 139.3 billion US\$ in 2007/08 provide us with a good idea.

²⁶ Cf. OECD, Education at a Glance 2010, p. 220.

There is no evidence, then, of a noticeable under-financing of German tertiary education, despite under average total expenditure. Rather, it should be taken into consideration that on the one hand the share of the population in the regular student age-group in Germany is – on account of demographics – much lower than the OECD average and the corresponding share in the USA.²⁷ On the other hand, a lot of young people in Germany choose to switch to the “dual education” system rather than going on to university. Neither America nor a lot of other OECD nations offer a similarly attractive and respected vocational option.²⁸ In order to get a more precise picture of the scope of German university financing, it is therefore necessary to incorporate the costs per individual full-time student in 2007 in US\$ purchasing power parity as a further indicator. In this context, Germany is about 7% above the OECD country average; the USA more than doubles the percentage.²⁹

Universities in Germany are funded from three basic sources: by *Bund* and *Länder* (federal and state governments), administrative revenue and third party funding. The largest share of funding consists of basic state funding. As they are state-owned institutions, universities – in line with the principle of cultural autonomy – are the responsibility of the individual federal states, who maintain and manage them. Apart from the annual budget for universities, staff, material and financial resources are provided.³⁰ Preliminary

calculations for 2008 show that the basic financing of universities by the federal states amounted to 17.9 billion €.³¹

Since the federalism reform of 2006, the federal government has successively withdrawn from the financing of universities.³² Up to 2019 a transitional continuation of funding is intended as support for the states. Furthermore, the federal government continues to support the DFG – Germany’s largest research funding organization. In total, the federal government in 2008 spent 2.4 billion € on university funding.³³ Taking the spending by the federal and the state governments together, we have a public university funding sum of 20.3 billion €, which corresponds to a percentage share of 52.70% of the total budget.³⁴ A look at the weighting of the different types of revenue in the course of time shows that the basic funding is diminishing whereas third-party funding and administrative revenue are on the increase.³⁵

²⁷ The share of 15-19 year olds of the total population in 2006/07 was 5.8% in Germany, 7.1% in the USA, 6.6% was the OECD average; the share of 20-29 year olds in Germany was 11.9%, 14.0% in the USA, 13.9% was the OECD average. Cf. OECD, *Education at a Glance*, p. 219.

²⁸ Cf. Pechar, H., *Bildungsökonomie und Bildungspolitik, Studienreihe Bildungs- und Wissenschaftsmanagement*, Vol. 2, 2006, p. 77; Wiesler, A., *Reform der Finanzierung der Hochschulbildung, Eine finanzwissenschaftliche Analyse*, 2005, p. 18f.

²⁹ Cf. OECD, *Education at a Glance* 2010, p. 202.

³⁰ Cf. Wiesler, A., op. cit., p. 13ff.

³¹ Cf. Statistisches Bundesamt Deutschland, *Bildungsfinanzbericht* 2009.

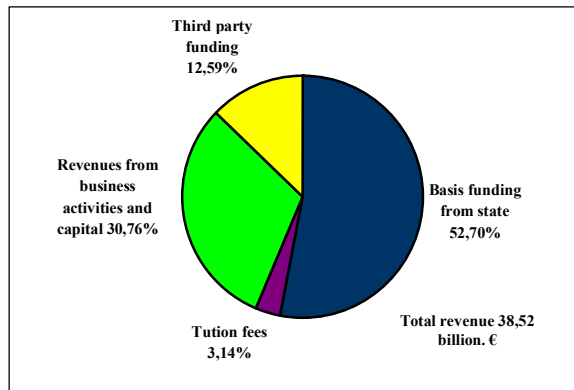
³² Within the framework of the *Gemeinschaftsaufgabe Aus- und Neubau von Hochschulen* policy, the federal government funded the extending of existing universities or the creation of new ones up to 2006. In the course of the federalism reform, this process passed into the sole hands of the individual states. Cf. Statistisches Bundesamt Deutschland, *Bildungsfinanzbericht* 2009, p. 52.

³³ Cf. *ibid.*, p. 52f.

³⁴ Cf. Statistisches Bundesamt Deutschland, *Monetäre hochschulstatistische Kennzahlen* 2007, 2009, p. 22.

³⁵ Cf. Statistisches Bundesamt Deutschland, *Bildungsfinanzbericht* 2009, p. 52; Wiesler, A., op. cit., p. 13; Köhler-Cronenberg, T.: *Das Hochschulwesen der Bundesrepublik Deutschland zwischen Markt und Staat, eine ordnungstheoretische Analyse der Handlungsmöglichkeiten*, 2008, p. 31.

Figure 2: Relative significance of sources of funding for German Universities in 2008.



Source: Own illustration and calculation on the basis of data provided by the Statistisches Bundesamt Deutschland, *Finanzen der Hochschulen* 2008, 2010, p. 145.

The universities' "administrative revenue" in this context consists up to and including the reporting year 2005 of the students' contributions³⁶ and revenue from business activities and assets. Since 2006, however, these two categories of revenue are treated separately. The latter category includes all the revenues from university sponsoring, the selling of material goods and assets, from publications, licenses and patents. About 90% of the revenue from services comes from healthcare in university hospitals.³⁷ According to the Statistisches Bundesamt, Germany-wide revenue from tuition fees in 2008 had risen in contrast to the previous year by 0.2 billion € to approx. 1.2 billion €. With regard to revenue from business activities and assets, a growth rate of 5% meant a total of 11.8 billion €. ³⁸ In all, this results in a share of 3.14% and 30.76%, respectively, of universities' total funding.

Universities generate further revenue in Germany by attracting third party funding

from public or private organizations. Third-party funding is provided in addition to basic financing for promoting teaching, research and development and also supporting young scientists. It normally serves specific research and promotional activities and is thus usually project-oriented and of limited duration. Accordingly, there is a lot of competition between the different university institutions for the gaining of financial means from industries and public bodies. In total, third-party funding in 2008 amounted to 4.9 billion € - an increase of 13.9% over the previous year. The most important third party funders were the DFG (1.6 billion €, 33.74%), industry (1.2 billion €, 24.78%) and the federal government (1.0 billion €, 19.85%)³⁹. If we consider that the DFG as the main third party funder, has 99.6% of its financial backing from the federal government and the state governments, it is obvious that the share of state financing is the largest for third-party funding and also for university financing as a whole⁴⁰. It is

³⁶ Excluding the contributions for Studentenwerke (student support services), Asta (students' union) and Semesterticket (student rail/bus pass).

³⁷ Cf. Statistisches Bundesamt Deutschland, *Finanzen der Hochschulen* 2008, p. 5 and p. 153; Wiesler, A. op. cit., p. 13.

³⁸ Cf. Bildungsspiegel, universities spent 36 billion € in 2008. 30.04.2010.

³⁹ Cf. Statistisches Bundesamt Deutschland, *Finanzen der Hochschulen* 2008, p. 27 and p. 153f; Bildungsspiegel, universities spent 36 billion € in 2008; Wiesler, A., op. cit., p. 13f; Köhler-Cronenberg, T., op. cit., p. 30; Konegen-Grenier, C., *Hochschulen und Wirtschaft*, 2009, p. 61ff.

⁴⁰ However, we can assume that the share of private third party funding is greater than the statistics show.

obvious, then, that Germany's universities are financed mainly by the state. As a result of increasing pressure for reform, Germany's university funding is becoming more open and flexible, even though the introduction of tuition fees has met with considerable opposition in some cases.⁴¹

3. Analysis of Tertiary Educational Financing in the Sense of Human Capital Theory

For an analysis of the financing of tertiary education, we must first ascertain the motivation of interests of the state and of individuals for a university education. We differentiate between two basic lines of thought: education as a consumer good or as an investment.⁴² Whereas the thesis of consumption sees the enjoyment value of educating oneself and the monetary advantages of a university education, human capital theory emphasizes the "investment" character of a university education as the reason behind demand for higher education. The gaining of an education, i.e. the acquisition of knowledge and skills through educational activities, is seen as a process of human capital accumulation. With increasing qualifications, the individual productivity and flexible adaptability to the changing

requirements of the labour market increase. More highly educated individuals do not only earn more money but regard themselves as being less likely to be unemployed. In the case of a university education, this means that a student consciously goes without consumer goods and a working income for the length of his/her study programme, carrying the cost of a university programme in order to earn more money at the end of the process.⁴³ The model on which this concept is based is that of the *homo economicus* – the rationally acting human who selects the most advantageous path of action based on the cost-benefit deliberations theory according to the principle of economic efficiency.⁴⁴ As investment in education is always a decision at the expense of alternative investment possibilities, rationally acting individuals will invest in their own education for as long as the expected return on education exceeds the return of other investments.⁴⁵

The extent of private returns on an academic education can be established in the sense of a business investment calculation. On the outgoing side we have tuition fees corresponding to the duration of the university course (minus potential non-repayable student loans) and study-related

The university financing statistics published by the Statistisches Bundesamt show only funding which is managed by the university budget or university suspense accounts. Not included are, amongst other things, direct payments to individual academics, items on loan, donations in kind, gifts – all of which will be found in considerable amounts at universities of technology in particular – money saved through co-rights of use in the framework of public private partnerships, and private payments into university endowment funds and their assets. Cf. Konegen-Grenier, T., *Hochschulen und Wirtschaft*, 2009., p. 65; Rothfuß, A., op. cit., p. 246.

⁴¹ For a detailed overview of reforms, particularly in the area of university budget management, where New Public Management has replaced the former cameralistic accounting methods, see Leszczensky, *Paradigmenwechsel in der Hochschulfinanzierung*, 2004, and Ziegel, F., *Budgetierung und Finanzierung in Hochschulen*, 2008.

⁴² Cf. Graßl, H., *Ökonomisierung der Bildungsproduktion*, 2008, p. 104; Hradil, S., *Die Sozialstruktur Deutschlands im internationalen Vergleich*, 2006, p. 136f.

⁴³ Cf. Timmermann, D., *Bildungsökonomie*, 2005, p. 84ff.; Steiner, V., Schmitz, S., *Hohe Bildungsrenditen durch Vermeidung von Arbeitslosigkeit*, 2010, p. 4; Stettes, O., *Bildungsökonomische Grundlagen*, 2006, p. 42f.; Hradil, S., op. cit., p. 136f.; Wiesler, A., op. cit., p. 19f.; Graßl, H., op. cit., p. 104ff.; Köhler-Cronenberg, T., op. cit., p. 76ff.

⁴⁴ Cf. Erlei, M., Leschke, M., Sauerland, D., *Neue Institutionenökonomik*, 2007, p. 2ff.; Pechar, H., op. cit., p. 38.

⁴⁵ The postulated self-regulatory power of the market is said to prevent an excessive expansion of demand for education. If – in this model – the number of highly qualified persons exceeds the demand for them on the labour market, the wages for this group of people will drop and the returns on education will correspondingly diminish. By the same token – according to this model, the demand for education would fall. Cf. Grin, F., *Grundzüge der volkswirtschaftlichen Bildungsökonomie*, 2005, p. 72ff.; Nagel, B., *Studiengebühren und ihre sozialen Auswirkungen*, 2003, p. 26; Hradil, S., op. cit., p. 137; Wiesler, A., op. cit., p. 20; Graßl, H., op. cit., p. 105f.

expenditure for materials, etc. In addition, opportunity costs are considered which arise from a lack of income during the years at university when compared with the next lowest level of vocational training. On the incoming side we have the increased income when compared to the next lowest vocational training level and the numerous indirect non-monetary returns of a higher education, e.g. increased social status, better health (from a statistical viewpoint), longevity, less risk of unemployment, more attractive further educational opportunities, etc.⁴⁶ As they are difficult to measure, these non-monetary effects are frequently omitted from calculations of returns, whereby private educational returns are often “underestimated”.⁴⁷

A comparison of private returns on tertiary education in USA and Germany shows the return on investment in both countries. Calculations by the Cologne Institute for Economic Research for 2007 show that the returns of an additional educational year for western Germany were 9.9% and for eastern German 9.6%. The annual rate of return for a university education is 7.5%, and for vocational training 10.2%. The reason for the latter being higher is that for this training there are lower opportunity costs than for a university education on account of the shorter duration and the money earned during vocational training. Thus, the vocational training path would seem to be more profitable. However, if we compare the financial yields of a university education (66,800 €) with those of a vocational training (23,700€), it becomes obvious that in Germany an academic education is the most beneficial investment for accumulating capital and maximizing life income. However, we have to bear in mind that the returns can vary according to what is

actually being studied at university. Earnings of “MINT” graduates⁴⁸ are far higher than the average earnings for German graduates.⁴⁹ It should also be observed that the higher the level of education, the lower the risk of unemployment: the unemployed rate for academics in Germany rose to 167,00 in 2009 on account of the crisis, but this is still low when compared to the 1.26 million people unemployed who have no job qualifications.⁵⁰

The USA shows even more clearly that university/college education brings more returns. The great educational bonuses of the liberal job market give special incentive to people to invest in their education. According to OECD figures for 2004, the private return on tertiary education in the USA is 11.0% for men and 8.4% for women.⁵¹ The rate of return on university attendance is also shown vividly in the income differences; a Bachelor graduate with a medium annual income of 55,700 US\$ earns around 61% more than a high school graduate with a medium annual income of 33,800.⁵² Education level related differences are also reflected in the unemployment figures: of the total 14.8 million unemployed in October 2010, 15.3% of them had no educational qualifications. 10.1% of them had only a high school diploma and 8.5% of them had an associate degree⁵³ or an unfinished university career. 4.7% held a Bachelor degree or higher.⁵⁴

⁴⁸ MINT stands for mathematics, informatics, natural sciences and technology.

⁴⁹ Cf. Anger, C., Plünnecke, A., Schmidt, J., *Bildungsrenditen in Deutschland*, 2010, p. 4f.

⁵⁰ Cf. Kuhn, P., *Erwerbslosigkeit steigt unter Akademikern besonders stark an*, 23.01.2010.

⁵¹ Cf. OECD, *Education at a Glance 2008*, p. 196. For the USA, more up-to-date calculations of returns are not available. On account of prohibited data publication, the OECD education report 2010 does not contain the rates of return on US tertiary education.

Due to a tendency to earn less and usually have a shorter working life, the returns on education for women are usually lower than for men.

⁵² Cf. Collegeboard, *Education Pays 2010*, 2010, p. 11.

⁵³ Associate degrees are awarded after 2 years at university. In the USA they are recognized as a first degree and entitle the holder to take a Bachelor

⁴⁶ Cf. Steiner, V., Schmitz, S., op. cit., p. 2ff.; Wieseler, op. cit., p. 21 ff.; Graßl, H., op. cit., p. 106; Pechar, H., op. cit., p. 37ff.; Timmermann, D., op. cit., p. 95f.; Grin, F., op. cit., p. 76f.; Köhler-Cronenberg, T., op. cit., p. 99ff.; Nagel, B., op. cit., p. 26.

⁴⁷ Cf. Wieseler, A., op. cit., p. 21f.; Steiner, V., Schmitz, S., op. cit., p. 4f.; Grin, F., op. cit., p. 80.

In view of the high returns on tertiary education in USA and Germany, we can definitely speak of education being an investment in the sense of human capital theory.

Despite sufficient evidence for the “investment” character of a university degree, we should emphasize here the consumption value – mentioned earlier – of tertiary education. This is reflected – amongst other things – in the demand for study programmes which have a lower economic usability on the labour market. Poor career and earning prospects result in the low, even negative rate of return on such decisions about what disciplines to study. These decisions are usually made without any particular career in mind or because a school leaver is interested in a particular subject.⁵⁵ To define education only as an investment good is not justified owing to the described consumptive aspects. There is a demand for education which stems from both investive and consumptive intentions.

However, human capital theory does not only regard the demand for education from a microeconomic viewpoint; it also provides an explanatory approach for a macroeconomic interest in education. The focus of this observation is the significance of education for the economic production process, in which an increasing human capital leads – via the gaining of qualifications – to an increase in the production and innovation ability and thus to positive growth effects in an economy.⁵⁶ This growth-promoting impact of education has been proven by various empirical

studies. Bassanini/Scarpetta⁵⁷ came to the conclusion that an average additional year of education increases the GDP per capital by approx. 6% in the long-term.⁵⁸ The educational standing of a society, i.e. the amount and quality of the available human capital, influences to a decisive extent the competitiveness and the ranking of a country in international competition. Measures taken by the state to extend, enhance and finance education can – then – be understood as investments, which the state implements in order to generate welfare and growth effects in the future.⁵⁹

Costs and benefits of state investment in education are as follows: from the viewpoint of the public sector (fiscal return on education) the costs are directly composed of university spending and financial aid for students and indirectly of lost tax revenue during a student's university life. Benefits are composed of the additional tax and social insurance revenue following the gaining of a university degree, because graduates incur higher taxation owing to their increased gross income.⁶⁰ OECD calculations of returns show that the public rate of return on education for 2003 was 12.9% for men and 9.1% for women in the USA, and in Germany 9.4% and 5.3% respectively.⁶¹

At the centre of the discussion on a state's role in education in the sense of financing, there is the issue of what positive extra effects exist as produced by educational activities. Due to its being

degree. They may be general, technological or more practically oriented.

⁵⁴ Cf. U.S. Bureau of Labour Statistics, *Employment Status by Educational Attainment*, 2010.

⁵⁵ Cf. Wiesler, A., op. cit., p. 26f.

⁵⁶ Cf. Klös, H.-P., Plünnecke, A., *Bildungsfinanzierung und Bildungsregulierung in Deutschland*, 2006, p. 11f.; Berg, R., *Staatliche Bildungsinvestitionen als Rechtfertigung für öffentliche Schuldaufnahme?* 2008, p. 108ff.; Köhler-Cronenberg, T., op. cit., p. 64ff.; Timmermann, op. cit., p. 96ff.

⁵⁷ Bassanini, A., Scarpetta, S., Does human capital matter for growth in OECD countries? A pooled mean-group approach, in *Economics Letters*, Volume 74, Issue 3, February 2002, p. 399ff.

⁵⁸ Cf. Klös, H.-P., Plünnecke, A., op. cit., p. 11.

⁵⁹ Cf. Graßl, H. op. cit., p. 104f.

⁶⁰ Cf. Wiesler, A., op. cit., p. 22f.; Steiner, V., Schmitz, S. op. cit. p. 2ff.; Berg, R. op. cit., p. 117.

⁶¹ Because the OECD education report 2010 was not permitted to include the public returns on education for the USA, here we use for purposes of comparison the rates of return for the 2008 report. Cf. OECD, *Education at a Glance 2008*, p. 198. According to the 2010 report, the public rates of return in Germany in 2006 on university education were 11.8% and 8.4%, respectively. Cf. OECD, *Education at a Glance 2010*, p. 150.

difficult to prove empirically and its far-reaching implications or educational financing, the existence of educational externalities is a very controversial subject in the literature. Positive external effects exist if the educational activities of individual persons impact on the benefits to the welfare of third parties without the latter having to contribute to the costs incurred.⁶² Revenue which is generated by educational investments is not limited to the student in question but extends out to society as a whole. Because it is not possible for consumers of education to fully internalize the benefits of their education, it cannot be ruled out that educational goods are demanded in economically insufficient amounts. This leads to a sub-optimal supply of the commodity "education".⁶³ We may

conclude that it is legitimate to claim that the state is responsible for the provision of education and the financing of it.⁶⁴ The extent to which it is responsible is a question of how external effects are defined and how their weighting is estimated with regard to internal private returns on education.⁶⁵ This paper, then, is intended to motivate research into the central question of the economics of tertiary education. Whether the prospect of greater returns on education provides sufficient motivation for society and particularly the lower status and lower income strata to engage in tertiary education will be revealed in a separate paper on social inequality in American and German tertiary education.

⁶² Vice versa, negative external effects impact on society by minimizing utility and welfare and thus incur costs. In the literature, the following potential negative external effects of tertiary education are identified: the creation of an academic proletariat, the danger of unrest due to student protests and so-called education theft. Cf. Wiesler, A., op. cit., p. 43f.

⁶³ Köhler-Cronenberg, T., op. cit., p. 101.

⁶⁴ Cf. ibid.; Nagel, B., op. cit., p. 21f.; Wiesler, A. op. cit., p. 33f.; Pechar, H. op. cit. p. 44; Berg, R., op. cit. p. 12f.; Stettes, O., op. cit., p. 46; Grin, F., op. cit. p. 82; van Lith, U., *Marktversagen, staatliche Bildungsfinanzierung und –produktion und die Verteilung von Verfügungsrechten im Bildungsbereich*, no year, p. 1.

⁶⁵ Cf. Pechar, H. op. cit., p. 45.

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