Student Financing, Opportunity Growth, and Equity in Access to Higher Education

A Czech-Dutch comparative study of student support systems and their effects on the development of inequity in access to higher education[1]

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Abstract

This article explores the possible effects of student financing on the development of inequalities in access to higher education. Though it is recognized that financial issues like tuition fees and student support are only a few among the many factors that influence student choice and access, financial policies are an important instrument that can influence student choice. This article analyzes the impact of financial conditions on higher education participation among students from different socio-economic backgrounds by comparing the Czech Republic and the Netherlands. These are two countries with important similarities and differences in education systems, student financing and participation patterns in higher education. It is found that the context of steadily increasing tuition fees, accompanied by an efficient student support system (the case of the Netherlands), does not generate inequalities in access, whereas a tuition free system accompanied by mainly indirect (parent-based) student support did not manage to reduce high inequalities in participation after the fall of the communist regime in the Czech Republic.

1. Introduction

This article provides evidence that ways in which student financing mechanisms are structured may be of influence on access to higher education and as such helps bridging the gap between social science and day-to-day policy reality. Edward Shils, one of the world's most influential sociologists engaged in bridging between social sciences and policy, urged social scientists to get more involved in the research of policy-making. As he put it in his classic work *The Calling of Sociology and Other Essays on the pursuit of Learning:* „social scientists cannot avoid doing research which is relevant to policy because their disciplines deal with facts about which policies are made, and they cannot avoid this as long as they interest themselves in society. (...) In that sense all social science is potentially relevant to policy, however empirical or theoretical it might be.“ (Shils, 1980, pp. 286-7). Though this message has been widely recognized, academic sociological research of policy processes is still rather rare.

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One of the reasons of lasting reluctance to get more deeply involved in the social research of policy-making could be that scholars who take this challenge often also take a risk arising particularly from the fact that the route from theory to the research results (and back to theory) in the studies bridging between sociology and policy-making leads not only through high quality data, clear-cut hypotheses and up-to-date methodologies, but also through encompassing complex social, economic and political circumstances and processes mediating between the antecedents (concrete policy measures) and their effects (dependent variables in our jargon), be it behavior of individuals, social relations or social structures.

In this comparative study of the Czech Republic and the Netherlands we consciously take this risk and try to seek to assess the influence of student financing arrangements and the expansion of tertiary education opportunities for individuals from lower socio-economic backgrounds. We pose the question whether student financing instruments, have an impact on the likelihood of attaining tertiary education for students from different socio-economic origins. The presumed role of tuition fees and student support in the decision of students to attend college has been addressed by a wealth of both sociological and economic studies (e.g. Dynarsky and Clayton, 2006; Kane, 2003; Bound and Turner, 2006; Vossensteyn, 2005). In a *sociological* perspective, student choice is mainly driven by family background characteristics and peer opinions whereas the *economic* perspective puts way more emphasis on the relative price of education (Hossler et al, 1999). Regardless of these perspectives and research results, public policies and debates assume arguably an important *ex ante* role for financial issues to shape enrolment decisions. Our study argues that the impact of financing instruments might be particularly pronounced for lower socio-economic background students, not only through the absolute level of the expected student support but particularly in the way it is delivered and conditioned in terms of flexibility and accessibility.

This article is structured as follows. In section 2 a brief theoretical reflection on access to higher education is provided. Section 3 discusses the major empirical findings relating to the impact of recent shifts in tuition and student support policies on participation patterns in tertiary education. In section 4 two interesting case studies – the Czech Republic and the Netherlands – are selected and justified to further explore the issue of cost-sharing and social inequalities in higher education participation. In sections 5 and 6 we describe the two cases after which in section 7 a comparison of the two student financing systems and their outcomes are made. Finally, section 8 presents and discusses the main results and conclusions of our analyses.

2. Access, student choice and cost-sharing: a theoretical perspective

Access to higher education can be dependent on a multitude of factors at macro level as well as micro level. At a macro level one can think of:

- demographic developments, e.g. the number of people in the relevant age group
- the relative number of people qualifying for higher education
- macro-economic developments, like the demand for higher educated employees
- the budget and number of study places made available for higher education

This means that the demand for and access to higher education can be influenced by a number of factors. In addition, whether students who qualify for higher education will actually attend higher education is subject to another set of variables, namely student choice variables. These are variables that impact on the individual decision whether or not to enrol in higher education and are widely studied in student choice literature. Student choice models traditionally are divided into the status-attainment or sociological models and the economic models (Hossler *et al*., 1999).

The status attainment or sociological models are rooted in sociology and consider (prospective) students as a '*homo sociologicus*'. Individuals are assumed to act according to what they think is expected of them. As such they associate themselves with the norms, purposes, duties, procedures, methods, practices and techniques of their constituent group (March and Olsen, 1995). So these models focus on the socialisation processes that shape the possibilities and ambitions of students, including family conditions, peer interactions, and school environments (Hossler et al., 1999). The following variables are said to be dominant to explain student choice: learning performance, aspirations, motivation, family background characteristics (parental encouragement, parents' income, education and occupation), gender, ethnicity, and influence of peers (e.g. teachers, friends).

The economic models focus more on the rationality of individual decision-making, regarding individuals – students – as a *'homo economicus'* with clear goals and transparent and consistent preferences. Rational decision-makers take action if and only if the marginal benefit of the action exceeds the marginal costs (Mankiw, 2004). Therefore economic college choice models argue that students choose to attend higher education and select particular institutions or programs if and only if the perceived benefits of that choice outweigh the perceived benefits of other alternatives (opportunity costs). Economic college choice models focus on how individuals with certain characteristics (e.g. gender, ability and parental socio-economic status) differ in the extent to which financial variables are deemed important in college choice. Key variables here are: tuition fees, other study costs (e.g. books and equipment), living expenses, foregone earnings (opportunity costs), financial support (grants / scholarships, loans), expected future earnings and prestige.

More recent models integrate both perspectives into a more comprehensive model of student choice with a multitude of factors that can have an impact on individual choices on whether or not to enrol, what institution and study programme to choose, whether to stay enrolled (persist) and to graduate. These are the combined models.

Since the 1990s, the impact of economic factors has gained importance in student choice research as a result of the growing role of private contributions to the costs of higher education. Not only in the U.S. or in Europe, but more on a global scale, this tendency, called cost-sharing, shows that the costs of higher education are being increasingly borne by students and their parents rather than by governments and tax payers (Johnstone, 2008). Cost sharing can take various forms, such as the introduction or increase of tuition fees or other user charges, a reduction or abolition of grants, an increasing emphasis on student loans, parental contributions or students' own resources, e.g. from job earnings. This shift in funding higher education has occurred in most developed economies, including the Netherlands and the Czech Republic.

The reasons for cost-sharing are threefold: the often high private benefits of higher education, limited public budgets, and improved efficiency (Johnstone, 2008). A number of studies have documented that the private benefits of higher education in the form of increased lifetime income, higher prestige, labour market opportunities and lifestyle options often are considerable (Blöndal et al., 2002; Card, 1999; Machin and McNally, 2007; Munich, Švejnar and Terrell, 2005; Švejnar, 1999). This private benefit argument also contains an important equity dimension, as a disproportionate number of higher education participants come from higher socio-economic status families, which implies that public subsidies to higher education might to a large extent benefit relatively well-off families, particularly in societies with relatively flat tax systems.

The second rationale for cost-sharing relates to the sheer need for additional resources in fast growing higher education systems whereas public budgets in many developed economies face other important investment areas like health or pension systems. In transition economies this strain has become even more prominent as the modernization of the economic infrastructure

requires prime attention. Finally, cost-sharing is said to provide efficiency gains as (higher) private contributions to the costs of education make individuals more conscious about their choices. Both in the Czech Republic and the Netherlands this argument is particularly significant due to perceived long average duration of studies and high dropout rates.[3]

The notion of cost-sharing is of particular interest for studying issues of access, as it introduces the dynamics of policies and perceptions into the theoretical and analytical frameworks. Cost-sharing implies a change in policy and practice with relation to tuition fees and student support which create more instability and uncertainty among (prospective) students about the costs of attending higher education. In addition, recent student choice literature recognises the fact that particularly changes in student financing rather than absolute levels of fees, grants and loans may have an impact on students' perceptions of their financial positions (Hoxby, 2004; Vossensteyn, 2005; Johnstone, 2008). The extent and nature of cost-sharing developments in the Czech Republic and the Netherlands will be an important explanatory variable in the present comparative study.

Before proceeding with the actual analysis, the next section first reviews the major empirical findings relating to the impact of recent cost-sharing shifts on participation patterns in tertiary education.

3. Cost-sharing, student support policies and higher education participation

In recent years, developed countries as well as transition countries aimed to increase their participation rates in tertiary education while the relative budget available for higher education was under pressure. The policymakers were therefore boggled over the question as to how to attract sufficient funds to higher education, including student support. In this section, we will show some international facts on the relationship between participation, cost-sharing and student support policies.

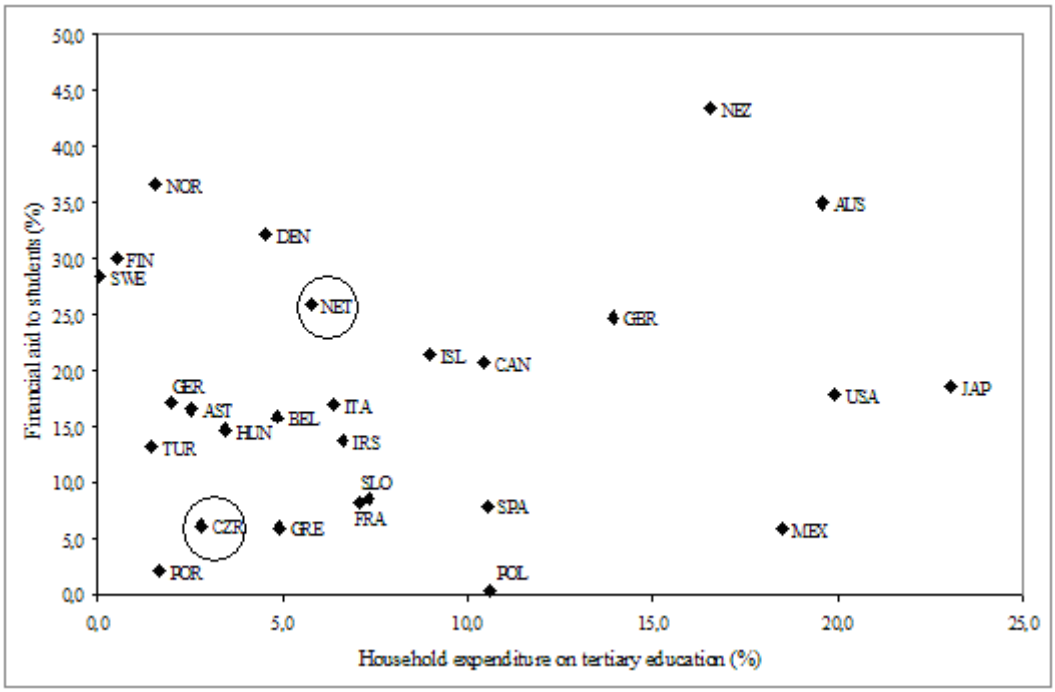
Funding shortfalls can generally be alleviated either by lowering costs (e.g., increasing student-faculty ratios, merging institutions, etc.) or by supplementing public revenues with private revenues (Johnstone, 2008). The first class of measures has already been embodied in the reform agendas of many governments. Therefore nowadays greater attention goes to the latter set of measures, usually identified with tuition fees and student financial aid schemes. Tuition fees are becoming increasingly common, even among the traditionally tuition free European higher education systems. The UK, which implemented its first-ever tuition in 1998, was followed by Austria in 2001, while Germany allowed their states (*Länder*) the possibility of introducing fees in 2005. In addition to the UK, Austria and Germany, there are other European countries where tuition fees are a core element of tertiary education financing, such as the Netherlands with relatively high tuition fees (€1565 in 2008). The Czech Republic has no tuition at public universities.

To visualise the notion of cost-sharing, Figure 1 depicts the share of household expenditure spent on tertiary education on the horizontal axis and financial aid to students on the vertical axis. The figure shows some interesting results. Financing tertiary education in the Czech Republic is characterized by a very small share of private funds and a similarly negligible amount of student financial aid. By contrast, the Netherlands and Scandinavian countries provide most student financial aid in Europe as a share of public funds. If we assume student

[3] In the Czech Republic, the survival rate is quite low (65% in 2004), whereas the Netherlands ranked among the top of OECD countries with a 76% survival rate (Education at a Glance 2007, Table A3.6). This hides the fact that many students drop out of an initial programme and later continue in studies that better suits their interests and capacities.

support to be a major mechanism to stimulate access to higher education, this introductory figure indicates differences in priority given to access to tertiary education.

Figure 1. Financial aid to students as a percentage of total public expenditure on tertiary education and household expenditure on tertiary education (tuition fees) as a percentage of total expenditure on tertiary education in OECD countries (2003).



Source: OECD, *Education at a Glance 2006* (Tables B3.1 and B5.2)

Empirical evidence on the relationships between student financing (incl. cost-sharing) and participation generally leads to the conclusion that higher private contributions in general do not negatively impact on access to tertiary education. A prominent example can be found in the UK where the introduction of tuition fees and the replacement of student grants with loans in the 1990s did not have a significant effect on application and participation rates (UCAS, 2000; Universities UK, 2007). On the contrary, the enrolment rate of ethnic minorities and women slightly rose. Even though students from lower socio-economic backgrounds indicate to be more adverse to debt (Callendar, 2006), their participation rates did not decline after the policy shift from grants to tuition and loans (UK Department for Education and Employment, 2001).

A similar picture holds for Australia where tuition fees were re-introduced in 1989 (Vossensteyn and Canton, 2001). Though some voices indicated that without tuition fees application rates would have been 14% higher (Andrews, 1997), most other research revealed the opposite and even stronger results that applications and participation in Australia went dramatically up without a negative change in the socio-economic composition of the student body both after 1989 as well as after major increases and differentiation in tuition tariffs 1997 (Chapman, 1997 and 2006).

New Zealand's 1992 introduction of tuition and a loan scheme has coincided with an increase in participation rates for all groups (Barr, 2004), including those of Maori and Pacific Island minorities. While the study by New Zealand Ministry of Education (1999) remained rather conservative on the matter, it still concluded that the 1992 policy shift had no observable effect on participation growth.

The OECD's tertiary education review (Blöndal et al. 2002) covering a number of country experiences claims that a simultaneous increase in tuition fees accompanied by more student

loans might promote equity while keeping the efficiency of the system intact. They conclude that easier access to student loans may be important for improving opportunities for all individuals to develop their full potential, particularly for those from disadvantaged backgrounds.

The aim of the present article is to provide complementary empirical evidence on student support, cost-sharing and participation in the context of two countries with relatively similar secondary education systems but different systems of tertiary education financing: the Czech Republic and the Netherlands. Do financing differences have an impact on participation and can we detect differences for students from various socio-economic backgrounds?

4. Two interesting cases

To analyse the relationships between access and student financing, we compare two country cases with important similarities and differences: the Czech Republic and the Netherlands. As far as the justification of our selection concerns, the two countries show similar long-term historical development with democratic traditions rooted in religious movements in the 16th century. Despite different paths of economic development, their cultural and social developments have had much in common. Before WWII, both nations belonged to highly industrialized and culturally developed countries. After the war, the former Czechoslovakia started the period of "building socialism," while Dutch society followed the pattern of other advanced European industrial nations with market economies. It is important to know that in former Czechoslovakia social and educational reforms explicitly followed the communist ideology of "mitigating class inequality" including to redistribute educational opportunities among social classes (e.g. by introducing the so-called "quota system").

Secondly, Czech – Dutch comparative studies on educational mobility and educational attainment published in the early 1990s (Matějů, 1990; Matějů and Peschar, 1990; Matějů, 1993) have shown different patterns in the development of educational inequalities in the two countries. Surprisingly, these data revealed higher social inequality in access to higher education in the Czech Republic than in the Netherlands. Educational mobility analyses showed, unexpectedly, higher levels of educational inequality in socialist countries, including former Czechoslovakia, and showed higher equality in the Netherlands (Boguszak, Matějů and Peschar 1990). Furthermore Matějů and Peschar (1990) concluded that, though the direct effect of socio-economic status on educational attainment was weaker in Czechoslovakia than in the Netherlands, the role of the economic resources of families on educational attainment turned out to be stronger in Czechoslovakia (Matějů and Peschar, 1990).

Thirdly, comparative studies on developments in educational inequality suggest that the Netherlands belongs to a very small cluster of countries in which inequality decreased over the last few decades, while in most countries, including the Czech Republic, there has been either stability or an increase of inequality. Shavit and Blossfeld (1993:15) conclude:

> "In one country, in particular (the Netherlands), there is a decline in the effect of both father's education and father's occupation across cohorts. In six of the societies examined there has not been any significant change in the effects of either indicator of social origins on educational attainment (Germany, England and Wales, Switzerland, Hungary, Poland and the case of the Israeli Arabs). The remaining five studies report mixed results: a decrease in the effect of one variable, and stability or increase in the effect of the other (United States, Italy, Taiwan, Japan, and Czechoslovakia). Interestingly, the study for Czechoslovakia reports a decline in the effect of father's education on educational attainment for cohorts educated immediately after the introduction of the socialist reform. However, this was followed by an increase in the effects for more recent birth cohorts."

However, Maas and Ganzeboom (2007) found that there has been a decrease in inequality in participation in Dutch tertiary education. An analysis of a large data set combining 35 survey

data files proved that the association between the completion of tertiary education (HBO and WO) and the father's occupational status weakened between the 1920 and 1970 birth cohorts.

Fourthly, comparing the Czech Republic and the Netherlands is relatively easy as both countries maintain highly stratified systems of secondary education generating substantial levels of social selectivity. In fact, an analysis by Matějů et al. (2007) looking at upper secondary education enrolment, number of school types, participation in vocational programs and expenditure on educational institutions found that the two countries have among the most stratified and selective secondary education systems in the 31 countries that participated in the OECD PISA project. These similarities in secondary education systems provide good grounds for comparing the effects of financing policies on access to tertiary education.

Finally, a Czech - Dutch comparative analysis is worthwhile because for a time both student support systems were mainly based on indirect forms of support through students' families. Only in 1986, when the Dutch government implemented the Student Finance Act (WSF), Dutch policies went into another direction and re-channelled all support directly to students. (Vossensteyn and De Jong, 2006). In the Czech Republic direct cash support to students remained a relatively small proportion of the overall amount of support. Most are tax benefits and family allowances as in pre-1986 Netherlands.

In the remainder of the article we will explore whether differences in student financing policies in relatively similar education systems and relatively similar social structures may have contributed to other outcomes in terms of access to higher education. We start the analysis with a short description of the respective student financing mechanisms in the Czech Republic and the Netherlands.

5. Student financing in the Czech Republic[4]

There are no official tuition fees in the Czech Republic, as the state assumes financial responsibility for all studies at public higher education institutions. However, there are *quota* that determine the maximum number of students than can be enrolled each year under existing financial limits (i.e. the state subsidy to public universities). Until recently the quota implied quite serious admission restrictions: In 2004/05 the admission rate (admitted/applied) was only 60%. Though in the year 2000 the Czech Republic introduced the so called "dual track system" permitting public public universities to admit students above the quota, who then have to pay tuition fee set by the institution, due to restrictions applied to such students (their status is not identical to regular students, they are not entitled to some student benefits, etc.) their number is negligible and not even statistically reported.

Student support in the Czech Republic is largely (though not entirely) an indirect and parent-based system. In particular, before the amendment to the Higher Education Act of 2005 (effective from 2006), which introduced rather modest social stipends for students from low-income families and housing allowances granted on the basis of distance of permanent residence from the school, the legal status of a student did not imply any special financial aid geared directly towards a student due to his or her status of a tertiary education student. The entitlement to social benefits is rather connected with the financial situation of a person dependent on his/her parents (family). Furthermore, the entitlements to certain social benefits, such as social grants, state-paid health insurance, tax relief etc., are subject to an age limit stipulated by law.

[4] More details on the Czech and Dutch systems of student finance can be found in country reports on the Czech Republic and the Netherlands in "Public/private funding of higher education: a social balance," ed. by Astrid Schwarzenberger (2008).

The student welfare system thus consists of three main pillars: a) benefits distributed directly to students, b) benefits to families with students, c) other forms of indirect student support.[5]

Benefits distributed directly to students include scholarships and tax benefits. A scholarship is a grant student may receive from the higher education institution. Social assistance scholarships are given to only a few students (less than 2%) and due to such scholarships families may loose entitlements to other social benefits. Students younger than 26 years old, or a Ph.D. candidate younger than 28 years old, can increase non-taxable earned income about 30% above the basic non-taxable income. In 2005 student's non taxable income was 49,440 CZK, (about 1,700 €), the basic non-taxable income was 30,040 CZK (1,060 €).

Benefits to families with students take two main forms: child allowances and tax relief. *Child allowance* is a subsidy designed to help compensate a family's costs of raising and nursing a child.[6] A family is eligible for child allowance for students under the age of 26 if its average income per household member was lower than a certain amount. If the student is physically disabled and needs special care under social legislation, the tax relief amount is multiplied by two. In 2006 the tax relief was 25,560 CZK (about 900 €) per year [*Act on Income Taxes (1992)*, Sec. 15 (1 / b)].

There were a number of other forms of student support:

a) Subsidized accommodation and meals.[7]
b) Health insurance: For students under 26, insurance premiums in publicly organized and compulsory health insurance system are paid from the state budget.
c) Public transport discounts: Students up to the age of 26 get discount on public transportation (bus or train) from home to the higher education institution.[8]
d) Pension insurance: Students at higher education institutions are included in pension insurance during the period of six years of study after the age of 18 without having to pay any premiums.
e) Health insurance up to the age of 26 covered by the State.

6. Student financing in the Netherlands

Unlike the Czech case, students of publicly funded higher education in the Netherlands have had to pay a uniform tuition fee set by the government since 1945. The nominal value of the fees remained rather low and stable up to the 1972. It was increased to NLG 500 (€227) in 1974 and remained stable again until 1980. Since then, tuition levels have gradually increased to €1565 in 2008/09. Annual increases often exceeded the rate of inflation. As a result, a larger share of the costs of higher education has been gradually shifted to students and their families which may be seen as a threat to access.

Until the mid 1980s, student support was characterised by mainly tax benefits and family allowances for students' parents and small bursary and loan programmes. In 1986, a new and relatively generous system of student aid was implemented in which all indirect support was changed into direct support to students themselves. The major characteristics of the system since then are:

[5] Since the analysis is based on the data collected in 2004, we describe the system of student financial aid as it existed in the Czech Republic before 2005 Higher Education Act amendment.
[6] However, *dependent children* over the age of 18 (which applies generally to students) are qualified to receive this social grant directly.
[7] Until 2005, accommodation was provided to students by the public higher education institutions through their own publicly subsidized accommodation facilities. Since 2006, public subsidies for accommodation are distributed by universities to students in need as subsidies for accommodation.
[8] While overall public support in this category might prove relatively important, neither official statistics nor public budgets contain adequate information on this matter. For that reason we also decided to exclude funding in form of public transport discounts from our further analysis.

1. A basic grant (basisbeurs) for all full-time students, which varies in amount between students who live with their parents and those who do not;
2. A means-tested supplementary grant for a limited number (about 30%) of students;
3. Loans that can be taken up on a voluntary basis, carrying a below-market interest rate;
4. Parental contributions and students' own income. The parental contributions are strongly interrelated with the (parental) means-tested supplementary grants and loans;
5. Finally, students can earn up to €10,631 per annum (in 2006) before they start being disqualified from receiving any of their grant entitlements.

The components together add up to a given amount that students are expected to need for their studies and living costs according to annual estimates of the Ministry of Education, Culture and Sciences.

On the basis of demographic developments the government expected a decline in the number of students after 1986 and thus believed that a relatively generous system for students would be feasible from the viewpoint of public finances. But the opposite happened resulting in a large number of changes in the system (Vossensteyn, 2002):

1. Tuition fees were increased in real terms.
2. Basic grants were reduced several times.
3. Supplementary grants were increased to compensate for tuition increases, inflation, and reductions in the basic grants. This is to guarantee access for students from disadvantaged backgrounds (about 30%, based on a means-test).
4. The duration of grants was reduced (in 1991 and 1996) to the nominal duration of courses (4-6 years).
5. Student loans gained in importance, also compensating reductions in the basic grant, increases in tuition fees and inflation. In addition, since 1995 students can replace (assumed) parental contributions with student loans, and since 2007 students can take additional loans to pay tuition fees (*collegegeldkrediet*).
6. Performance requirements were imposed in 1993 and 1996, implying that one is only entitled to grants if one graduates within a limited time frame (10 years), otherwise grants are regarded as loans.

Due to these developments and substantially increasing patterns in students' expenditure, emphasis on parental contributions and students' own resources gradually increased. This means a real situation of cost-sharing, but with an attempt to compensate socially disadvantaged students.

7. A comparison of the Czech and Dutch student financing arrangements

Our analysis of the effects of financing arrangements on higher education participation begins with a description of the data used and an outline of our quantification of individual forms of public support at the per capita level. In the following subsections, we compare student support systems and then focus on participation patterns by socio-economic background in the two concerned countries.

Data and methodology

We distinguish between several kinds of student support: grants, public loans, earnings, family contributions in cash and in kind, and public subsidies (both direct and indirect, cash and non-cash).[9]

Our analysis uses a number of different data sources. Overall income figures have been obtained from the Survey on Income and Living Conditions of Households (EU-SILC) database for 2005. The following specifications have been made for the EU-SILC data. We focused only on households with children, and our income variable was household income (not earnings). Negative income cases were excluded, but no further modifications were made at the ends of the spectrum for either country. Within each country, quartiles using EU-SILC data were used to establish four income groups.

The remaining data came from national statistical sources and the Eurostudent database. We adopted several filter criteria for the purposes of our study. We included only students of the typical respective national freshman age (according to OECD), plus or minus three years. Given the abnormally high tuition fees at many private institutions, only students at public higher education institutions are referred to (studying at a public higher education institution is the normal case in both the Netherlands and the Czech Republic). To prevent distortions in the way spending patterns are depicted, students with severe disabilities are excluded from the analysis. Only ISCED 5A students are taken into consideration. Owing to differences in income and spending patterns, only the respective national as opposed to foreign students are looked at in each country. When certain means of support are granted only during a single term, they have been adjusted to a full year, following the guideline that "a student is a student for 12 months." Arithmetic means (not the median) are used for the survey data. Lastly, to calculate indirect subsidies, we consider all items of support for the given household for which student status of a child plays a role. For the sake of comparability we focused only on a typical family of two parents (married, living together and both working) and one child, i.e., the student). The data refer to whole years.

Data on students' income and expenditures were taken only from the Eurostudent data file. We had to use different sources for public subsidies. Data on direct cash support is from Eurostudent, whereas direct non-cash support could only be calculated using the respective macro-level computations for each country. Indirect subsidies were calculated on the basis of EU-SILC median income per income group.

As for family income, both Czech and Dutch students in the Eurostudent survey were asked to provide information on their parents' per month income. For both countries, we transformed the SILC data into monthly amounts, and all households with at least one dependent child were divided into 4 income quartiles. Corresponding cut-off points were used to define four "income groups" of students in the Eurostudent data.

Finally, the reference year for our comparison is 2004. Data from other years have been adjusted for inflation, using Eurostat data for the applicable inflation rate. Furthermore, to facilitate country comparison, the relevant purchasing power parities (OECD Purchasing Power Parities Data)[10] were applied.

Structure of student income in the Czech Republic and the Netherlands

Chyba! Nenalezen zdroj odkazů. and **Chyba! Nenalezen zdroj odkazů.** present the structure of students' income according to their families' position in the income distribution

[9] Further details describing the methodology and the construction of individual items are available in Schwarzenberger (2008).

[10] The OECD's Purchasing Power Parities Data are available at the OECD website: http://www.oecd.org/document/47/0,3343,en%20_2649_34357_36202863_1_1_1_1,00.html#ppp

in the two respective countries. Students' income consists of direct cash support from the state, subsumed into grants and social allowance categories, followed by loans, students' earnings, family contributions and other (minor) sources. In addition, direct non-cash income in the form of health-care subsidies and subsidies for facilities consisting of housing and meal subsidies likewise contribute to students' income. We treat the two forms of support as direct, since these items would have had to be paid by students themselves, and thus de facto raise students' purchasing power. Furthermore, both health-care subsidies and subsidies for facilities are considered to be non-cash, as they obviously do not take the form of cash-on-hand. The lower part of the two tables aggregates different types of public subsidies per student, adding all items from direct support (either cash or non-cash), plus indirect cash support, which reflects tax exemptions.

Table 1. Student income and support in the Czech Republic, figures based on all students regardless of residence (in €, 2004)

	Family income						
Direct cash support	Low	Lower medium	Higher medium	High	Total	F-ratio	P-value.
Grants	288	227	178	255	225	1.79	-
Social allowances	311	242	168	65	157	25.96	***
Loans	14	59	24	76	48	0.59	-
Earnings	466	630	690	1038	784	9.79	***
Family contributions	1095	1279	1089	1467	1262	4.06	***
Other	19	36	36	67	45	0.91	-
Direct non-cash support							-
Health care subsidies	180	180	180	180	180	n.a.	n.a.
Subsidies for facilities	52	54	51	50	51	1.82	-
Total income	**2425**	**2707**	**2416**	**3179**	**2747**	**5.59**	***
Public subsidies							
Direct cash support	600*	469	346	321	382	5.45	***
Direct non-cash support	232	234	231	230	231	1.82	-
Indirect cash support	133	157	176	221	185	984.31	***
Tax exemptions students	4	7	8	13	10	10.85	***
Tax exemptions parents	128	150	167	207	175	n.a.	n.a.
Total public subsidies	**964**	**860**	**752**	**772**	**798**	**3.02**	***
Public subsidy as % of income	**39.8**	**31.8**	**31.1**	**24.3**	**29.1**		

*Small discrepancies between the sums and individual numbers are due to rounding.

The figures in **Chyba! Nenalezen zdroj odkazů.** and **Chyba! Nenalezen zdroj odkazů.** indicate that both in the Czech Republic and the Netherlands, total student income increases, and total public subsidies decline, with family income. In absolute levels, Dutch total student income is approximately five times larger than its Czech counterpart (€13748 vs. €2747 on average). Income inequality between students from different family income groups is relatively higher in the Czech Republic. More specifically, mean student income of the highest family income quartile is 31% more than the lowest quartile in the Czech Republic, versus 19% in the Netherlands. While this variation in total income of Czech students can be attributed largely to increasing earnings from gainful employment, in the Dutch case the main differences arise from rising family contributions. One can observe that family contributions

are only one third higher for Czech students from the top quartile vis-à-vis the lowest quartile. In the Dutch case, on the other hand, the absolute amount nearly doubles.

Nonetheless, family contributions play a relatively more important role in the budget of Czech students, which is particularly the case for students from lower income families. This is generally consistent with the student support system, based mostly on indirect forms of support.

Table 2. Student income and support in the Netherlands, figures based on all students regardless of residence (in €, 2004)

	Family income						
Direct cash support	Low	Lower medium	Higher medium	High	Total	F-ratio	P-value
Grants	2549	2059	1857	1761	1988	60.8	***
Public loans	2046	1876	1830	1905	1919	0.9	-
Earnings	3023	2989	3275	2889	3017	2.0	-
Family contributions	2666	3366	3823	5263	4198	179.3	***
Other	1908	1722	1812	1715	1783	0.7	-
Direct non-cash support							
Subsidies for facilities	3	3	3	3	3		
Subsidies for transportation	833	871	847	836	840		
Total income	**13028**	**12886**	**13447**	**14372**	**13748**		
Public subsidies							
Direct cash support	2702	2200	1994	1904	2132		
Grants	2549	2059	1857	1761	1988		
Loan subsidies	153	141	137	143	144		
Direct non-cash support	836	874	850	839	843		
Indirect cash support	63	83	83	103	83		
Tax exemptions	63	83	83	103	83		
Total public subsidies	**3601**	**3157**	**2927**	**2846**	**3058**		
Public subsidy as % of income	**27.6%**	**24.5%**	**21.8%**	**19.8%**	**22.2%**		

Note: The direct non-cash support data show no significance scores as they are individualised macro-data. The public subsidies also are calculations using some individualised macro data, like on loan subsidies which cannot be surveyed.

While Czech students can only make use of standard loans available on the market, Dutch students can supplement their earnings and family contributions with state-supported student loans. This translates into a notable 15% contribution to total student income, which remains relatively stable (even in absolute terms) across family income groups.

If we take a look at relative shares in more detail, we can observe a number of other interesting differences between the countries. The share of public subsidies in Czech student income is substantially higher, especially for lower income groups (Czech 29.1% vs. Dutch 22.2% for all students, and 39.8% vs. 27.6% for the lowest income group). However, after adding student loans as an instrument of student finance, this pattern reverses both on average (30.8% vs. 36.2%) and for students from the poorest families (40.3% vs. 42.2%, respectively).

Figures 2 and 3 illustrate major differences in the channels through which student support is provided. We have already mentioned that students in the Czech Republic receive a substantially larger share of income from their parents (reflecting the system's emphasis on indirect support) and for higher income groups through their own earnings. The sum of the two items comprises 71%-84% of total student income. In the Netherlands, the emphasis on

direct forms of support and student loans translates into a correspondingly lower share of earnings and parental contributions (varying between 47%-60%) in total student income. In both countries, nonetheless, these percentages increase with the family income.

Figure 2. Structure of student income in groups defined by family income

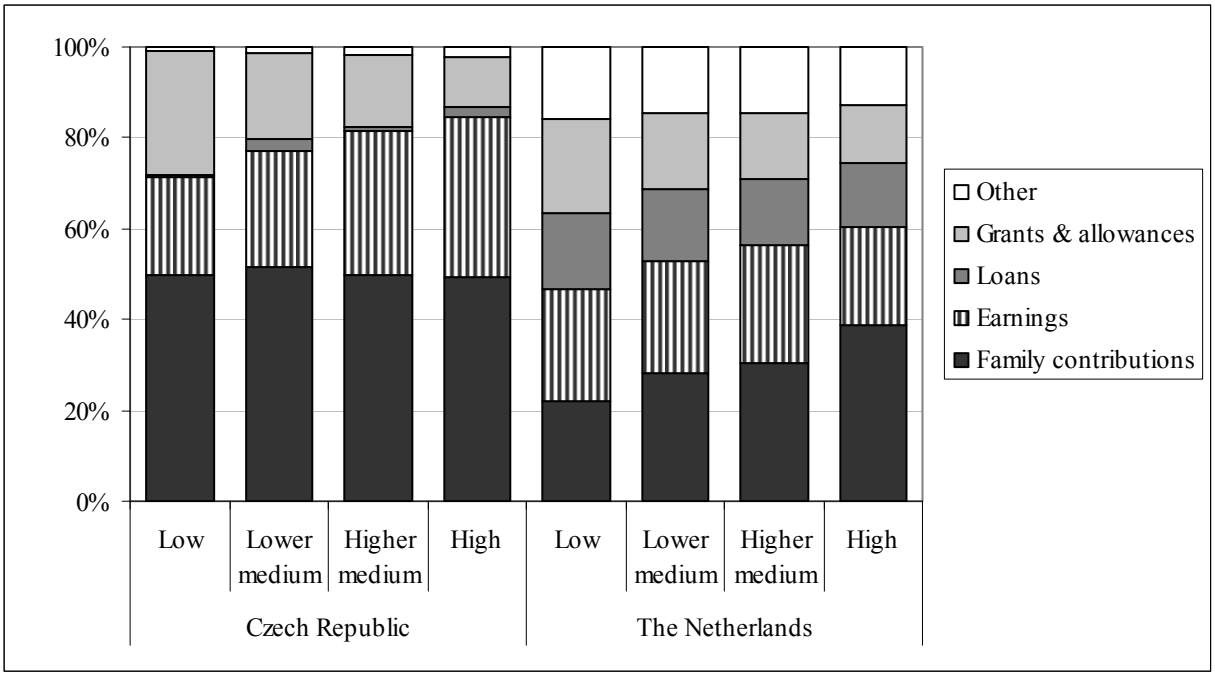
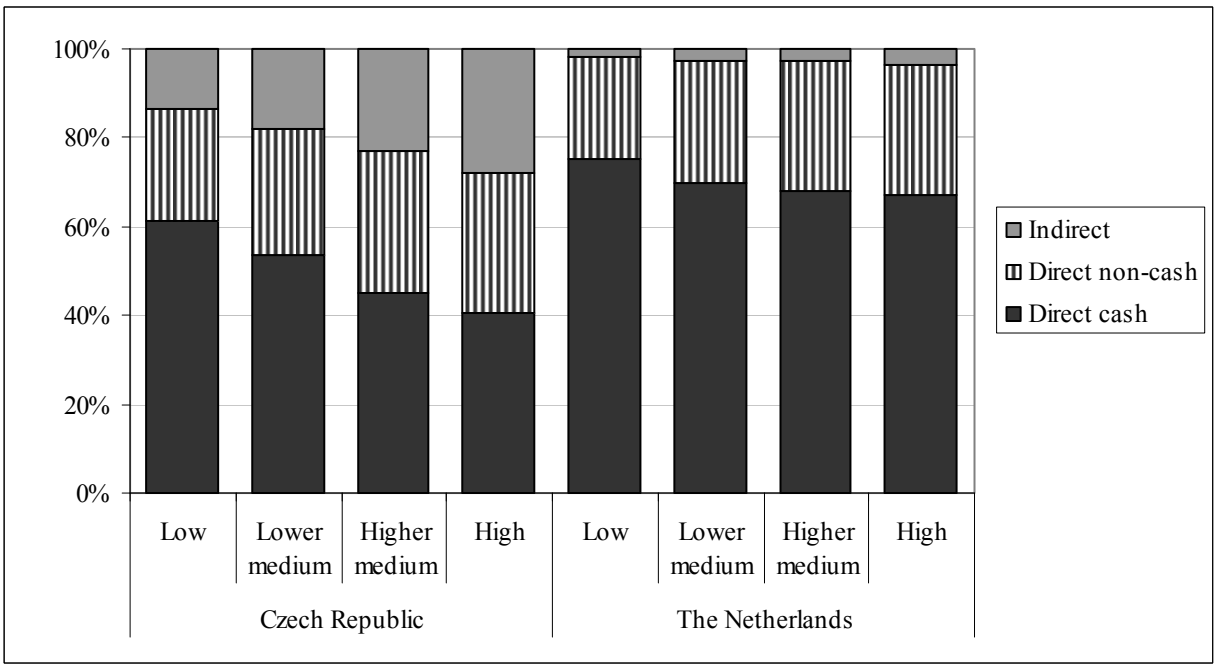


Figure 3. Structure of public subsidies to students in groups defined by family income



The Czech focus on indirect forms of support is also neatly captured in Figure 3, which shows the structure of public subsidies to students with different family incomes. As one can immediately observe, the share of direct student support in the Czech Republic is substantially lower compared to the situation in the Netherlands. In fact, only a negligible fraction of public subsidies targeting Dutch students takes the form of indirect student support. In the Czech

Republic, on the other hand, the share of indirect support exceeds 13% regardless of income group.

Importantly, apart from general differences in the forms of student support used in the two countries, we can also observe notable differences in the structure of support *across* the four family income groups. In particular, while the direct forms of support (whether cash or non-cash) decline or remain flat with increases in students' family income in both countries, in the Czech case indirect support *gains* in significance as the family income rises. Moreover, this result holds both in absolute as well as relative terms so that in terms of indirect subsidies students from wealthier backgrounds are more subsidized than poorer students in the Czech Republic.

In the following subsection we link the structure of the respective student support systems and their impact on student incomes to the development of inequality in access to tertiary education in the two countries. Our attention will mostly focus on the odds of attaining tertiary education for respondents coming from different socio-economic backgrounds.

Socio-economic background and participation patterns

In the Netherlands, the introduction of the direct student support mechanisms in the mid 1980s coincided with the notable opening of the system, particularly for those coming from lower socio-economic backgrounds. By contrast, after the fall of the communism the relatively less open Czech tertiary education system relied more heavily on indirect forms of support and did not improve access for the incoming cohorts.

To analyze changes in the odds of attaining tertiary education for individuals of different socio-economic backgrounds, we use data from the Survey on Income and Living Conditions of Households (EU-SILC) for 2005 and its module "Inter-generational transmission of poverty" in which questions were asked on parents' education and occupation, and financial problems in the household when the respondent was a teenager. The same data are used to show the development of the proportion of secondary and tertiary education graduates, which we use as a proxy for the expansion of tertiary education.

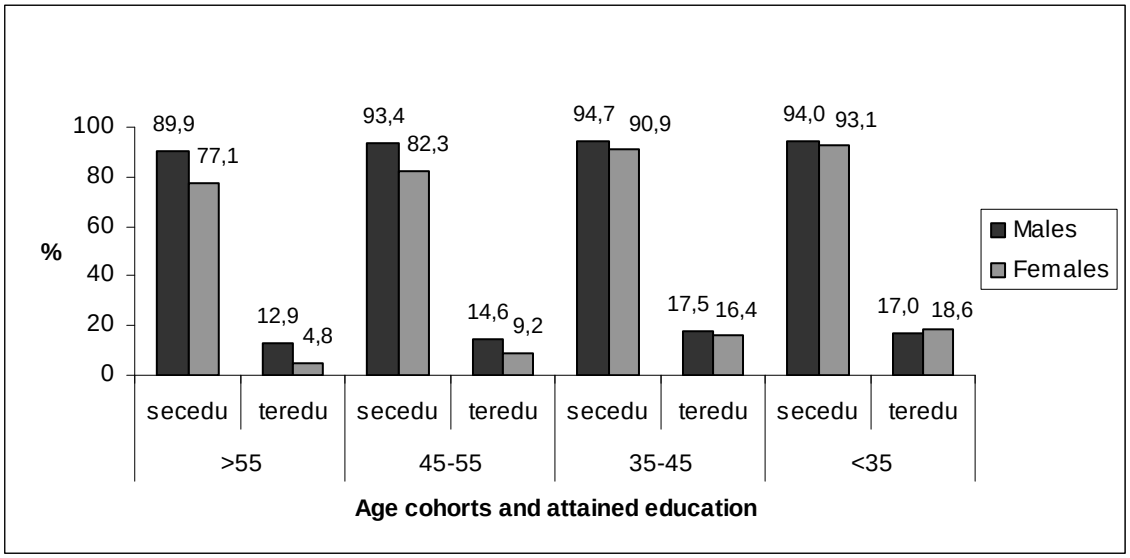
The analyzed data files cover a population between 25–65 years of age. Data for the Czech Republic contained 8,628 cases representing 5,844,895 individuals, while the Dutch data file contained 17,853 cases representing 9,163,936 individuals. The overall distributions of variables used in the analysis are displayed in the appendix in Table A 1. The education of the respondent (variable REDU) and the respondent's mother and father (MEDU and FEDU) were originally coded according to the ISCED classification. For our analysis, these education variables were recoded into four main categories representing primary, lower secondary, upper secondary and tertiary education. The information on respondent's education (REDU) has been used for a dummy variable TEREDUC equalling one if the respondent had tertiary education and zero otherwise. In order to obtain comparable figures across cohorts, for the youngest cohort (25-35 years), in which some individuals were still continuing in their studies, respondents with completed higher secondary education who at the time of the survey were university students were also treated as individuals with tertiary education. We employed the variable TEREDU as our dependent variable in all subsequent estimations.

For the evaluation of the relative chances for transition between the secondary and tertiary education level, a similar indicator variable SECEDU has been created. SECEDU equals one in case the respondent has completed or has been in course of upper secondary education and zero otherwise.

To proxy socio-economic dimension of social background, we entered two variables in the analysis: father's class (FCLASS) and a variable indicating financial problems in the household when the respondent was a teenager (POOR). Respondent's age was transformed into a ten year age-cohort variable (AGE4: >55, 45-55, 35-45, and <35). Note that Dutch respondents aged between 35 and 45 years are the first to benefit from the 1986 Student

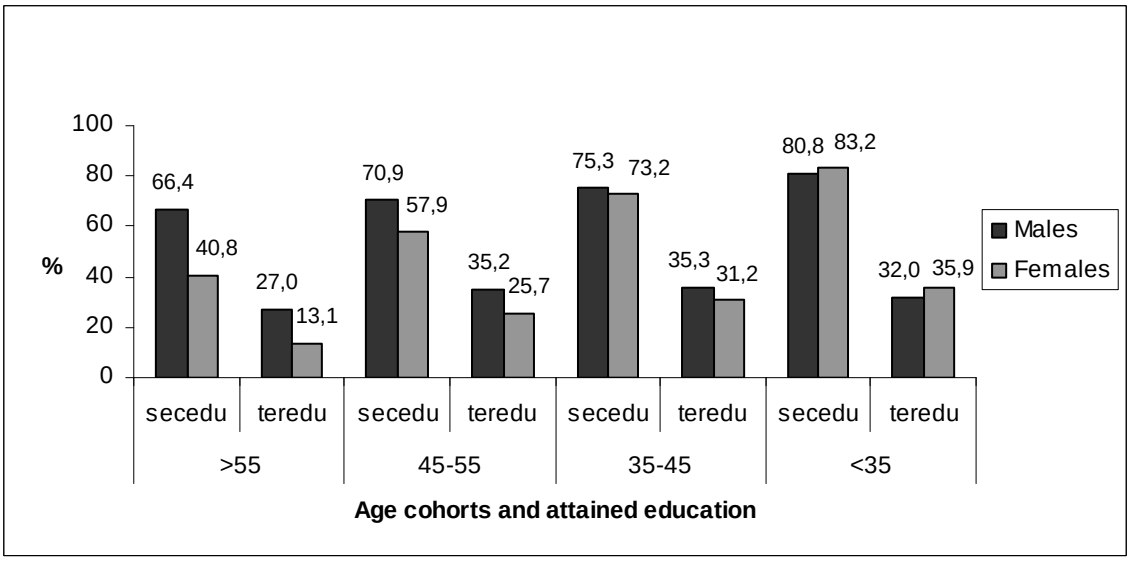
Finance Act, which introduced a substantial shift towards direct forms of student support. In 1989, the corresponding Czech cohort experienced the introduction of market reforms in the context of economic and political transition.[11]

Figure 4. Proportion of individuals attaining secondary and tertiary education in the Czech Republic by gender and age cohort



Note: Variable "SECEDU" stands for completed secondary education (including those who continued and/or completed tertiary education), variable "TEREDU" stands for completed tertiary education (in the youngest cohort this includes those who were still students of tertiary education at the time of the survey).

Figure 5. Proportion of individuals attaining secondary and tertiary education in the Netherlands by gender and age cohort



Note: Variable "SECEDU" stands for completed secondary education (including those who continued and/or completed tertiary education), variable "TEREDU" stands for completed tertiary education (in the youngest cohort this includes those who were still students of tertiary education at the time of the survey).

[11] As a complementary exercise, we also used alternative age ranges spanning >51, 41-51, 31-41, and <31 years, where the cohort aged 31-41 was the first one to experience the fall of the Communism. The subsequent estimation nonetheless did not lead to any qualitative change in our results. These results can be provided to an interested reader upon request.

As the distributions of key variables displayed in Table A 1 suggest, there are particularly large differences between the two countries in the background variables (father's and mother's education, father's occupation). A similar problem was identified comparing age cohorts, namely due to significant changes that occurred after WWII. To reduce the effects of these different distributions of individual background variables, as well as to link the odds of attaining tertiary education to relative position in the society, we decided to create one composite variable FAMSES representing the socio-economic status of the background family centred (z-standardized) for each country and each cohort separately. Therefore, we applied principal component analysis on the four background variables (FEDU, MEDU, FCLASS, POOR) for each country and cohort separately. As reported in Table A 2 in the appendix, the factor structures are very similar, both across countries and cohorts, particularly in terms of the role of father's and mother's education, and father's class.[12] The resulting latent variable (FAMSES) was then transformed into quartiles, again within each cohort separately (FAMSES4).

Since the participation of different social classes in tertiary education to a large extent depends on overall enrolment rates, we will start with the development of opportunities to study both at the secondary and tertiary level. As Figures 4 and 5 indicate, the proportion of people with completed secondary education is higher among Czechs than among the Dutch, across all cohorts. The figures likewise suggest that while secondary education enrolment in the Czech Republic seems to have achieved a saturation point, in the Netherlands it is still on rise. On the other hand, the percentage of respondents with completed tertiary education is higher among Dutch than among Czechs for all cohorts. These figures correspond to the most recent OECD statistical data on tertiary education enrolment: according to *Education at a Glance* (OECD, 2007), net entry rates in the Czech Republic in 2005 were only 38% (36% for men, 41% for women), while in the Netherlands it was 56% (52% for men, 61% for women).[13] As a result, we can conclude that, over all cohorts, there generally is a higher participation rate in Dutch higher education as opposed to Czech tertiary education. Whether this also reflects higher accessibility will be analyzed below.

We will run sample-weighted logit regressions conditioned on sex for all cohorts in the respective country, and then compare the estimated odds ratios.[14] In particular, for each country and age cohort separately we use binomial logistic regressions maximizing the following Log-likelihood functions:

$$L=\sum^{N}_{i=1}[w(i)y(i)ln\ \pi(i) + w(i)\ (1-y(i))ln\ (1-\pi(i))], \quad (1)$$

where

[12] We decided to keep variable POOR in the analysis even though its factor loadings turned out to be lower than those associated with MEDU, FEDU and FCLASS, particularly in younger cohorts. Though it is based on subjective assessment, it is the only available indicator of economic situation of the background family at the time when respondent's decision to study at the tertiary level had been formed. The decision was also supported by the principal component analysis, which proofed that all four variables create a single dimension (factor loadings for CZ: FEDU 0.844, MEDU 0.750, FCLASS 0.761, POOR 0.511; for NL: FEDU 0.856, MEDU 0.779, FCLASS 0.655, POOR 0.407).

[13] OECD average in 2005 was 53%, (48% for men, 59% for women).

[14] The odds represents the ratio of the probabilities of success and failure of an event with a dichotomous outcome. In other words, if the probability of success equals 75% and the probability of failure 25%, the odds are equal to 0.75/0.25=3. The odds ratio is the ratio of odds. If the explanatory variable in a logit equation is dichotomous e.g. sex, the odds ratio corresponds to exp(β) and tells us how much the estimated odds of men and women differ. In our specification, the relative odds in Figure 8 correspond to the odds ratio of students e.g. with the socio-economic backgrounds in the third quartile relative to students with the lowest (1st) quartile. The lower their odds ratio, the more equal the participation ratios are between students from the two respective socio-economic groups.

$\pi(i)=exp(\boldsymbol{x_i'\beta})/[1+ exp(\boldsymbol{x_i'\beta})]$

and

$\boldsymbol{x_i'\beta} = \beta_0+ \beta_1*famses4(i)+ \beta_2*sex\ (i),$

w(i) stands for the sample weight of individual *i, y(i)* is an indicator variable equal to one if an individual has tertiary education and zero otherwise, and $\pi(i)$ represents the probability of attaining tertiary education assumed to be a function of famses4 and sex.

Since we are interested not only in the odds of attaining tertiary education, but also in the relative chances for transition between the secondary and tertiary level, we will run our regressions both on a full sample and its restricted version containing only respondents with completed (or at least pursuing) upper secondary education as distinguished by the variable SECEDU.

Figure 6 contrasts the estimated odds ratios for the Czech Republic and the Netherlands across age cohorts, using the full sample. These odds ratios have been obtained from our specification in (1) with TEREDU as dependent variable. One can immediately observe that during the communist era, tertiary education in the Czech Republic absorbed relatively more individuals with lower socio-economic backgrounds than in the Dutch case. In particular, the relative chances of those from the lowest socio-economic background for the cohorts 45-55 and >55 were generally higher in the Czech Republic than in the Netherlands, which can be at least partly explained by the proletarian ideology of the regime. The shift towards direct forms of student support in the Netherlands in 1986 and the collapse of the Communism in 1989, however, coincides with the reversal of the above-mentioned pattern immediately after the second cohort (45-55). For the two younger Dutch cohorts (aged less than 45 years), the odds ratios begin to fall considerably and ultimately go below or at least stick to the levels observed in the Czech Republic. This trend is particularly pronounced for the relative odds between the highest and the lowest quartile of socio-economic background (4/1), but visible also in other contrasts displayed in the figure (3/1, 2/1).

To see whether our conjectures gain some statistical support, we pooled the data for the two older cohorts (45-55 and >55), that received education largely before the mid 1980s, and the two younger cohorts (<35 and 35-45), and then tested for the statistical difference between their respective odds ratios. For estimation purposes we define two auxiliary variables. A dummy variable Post-1986 equals one in the case that individual *i* belongs to the cohort <35 or 35-45. The interaction term FAMSES_86 is the product of Post-1986 and the variable FAMSES4 described in previous paragraphs. As before, the estimation controls for the respondent's gender. Our objective is to compare the corresponding odds ratios of the two pooled cohorts and check for their statistical difference.
This reduces to testing the following null hypothesis:
H0: $exp(\beta_{Famses\_86(j/1)})= 1$ or $\beta_{Famses\_86(j/1)}= 0$ for quartiles $j=2,3,4$
against
H1: $exp(\beta_{Famses\_86(j/1)})\neq 1$ or $\beta_{Famses\_86(j/1)} \neq 0,$
where $exp(\beta_{Famses\_86(j/1)})$ is the ratio of two odds ratios (post- and pre-1986) for *j*'s quartile relative to the lowest quartile *j*/1. If the two odds ratios are equal, $exp(\beta_{Famses\_86(j/1)})=1$.

Figure 6. Comparison of the relative odds of different SES groups in the Czech Republic and Netherlands: logit, whole population

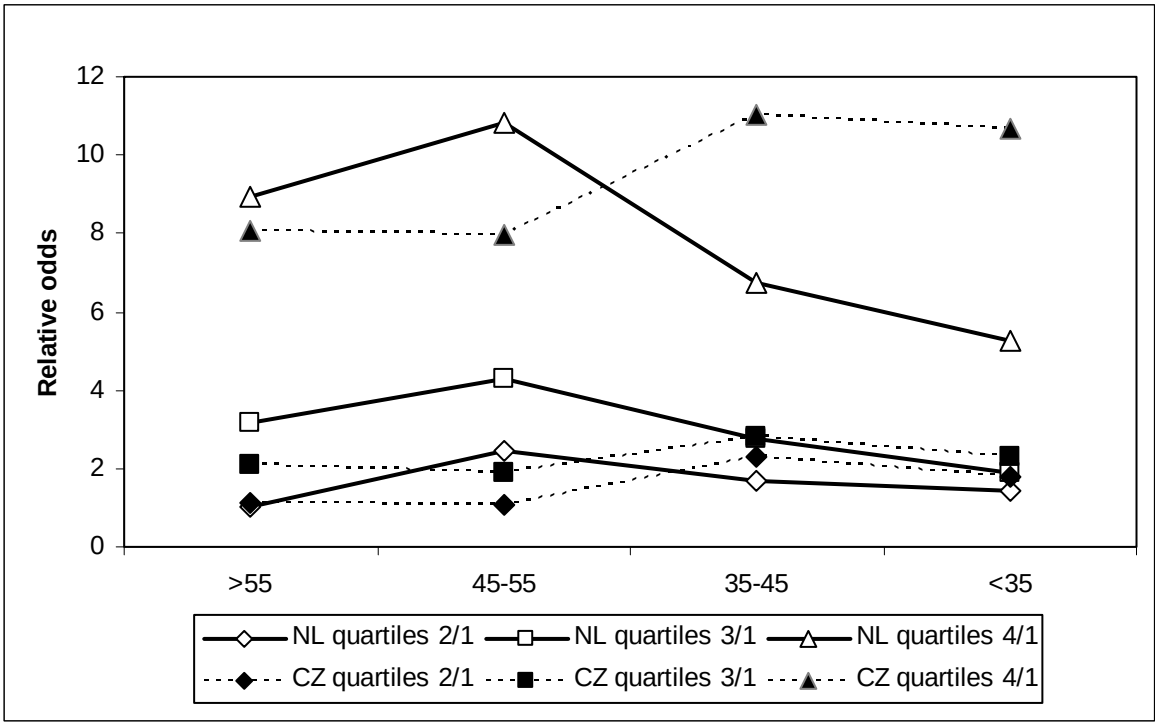


Table 3. Contrasts from logit regressions for the whole population, pooled cohorts (45-55/>55 and 35-45/<35). Dependent variable TEREDU

Country		β	Std. dev.	Wald statistics	P-value	Exp(β)
CZ	Famses4(2/1)	0.148	0.009	285.364	0.000	1.159
	Famses4(3/1)	0.640	0.008	6479.338	0.000	1.897
	Famses4(4/1)	2.045	0.007	84027.394	0.000	7.729
	Famses_86(2/1)	0.612	0.011	3143.379	0.000	1.844
	Famses_86(3/1)	0.211	0.010	423.544	0.000	1.234
	Famses_86(4/1)	0.324	0.009	1258.449	0.000	1.383
	Post-1986	-0.216	0.008	676.997	0.000	0.806
NL	Famses4(2/1)	0.659	0.005	16566.529	0.000	1.933
	Famses4(3/1)	1.373	0.005	80006.697	0.000	3.946
	Famses4(4/1)	2.281	0.005	223806.488	0.000	9.783
	Famses_86(2/1)	-0.131	0.006	433.268	0.000	0.877
	Famses_86(3/1)	-0.472	0.006	6007.903	0.000	0.624
	Famses_86(4/1)	-0.423	0.006	4817.845	0.000	0.655
	Post-1986	-1.021	0.005	43707.071	0.000	0.360

Variable(s) entered: famses4, famses_86, post-1986, sex.

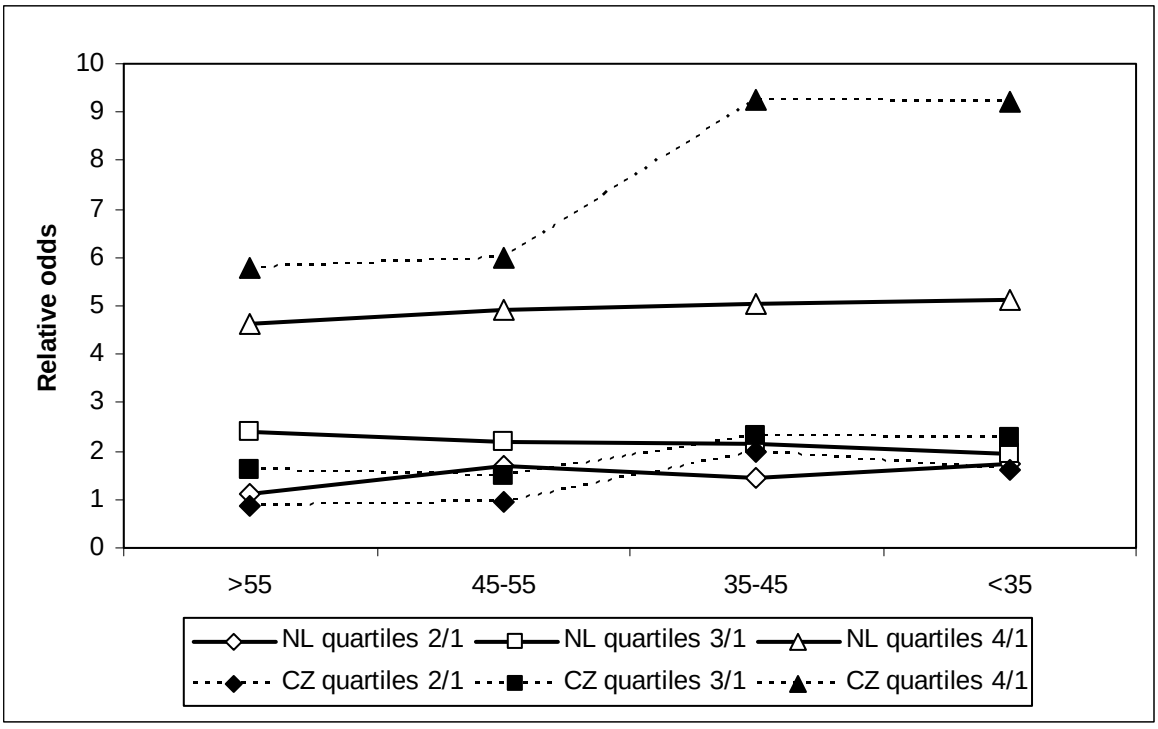
Chyba! Nenalezen zdroj odkazů. summarizes the results of pooled logit regressions covering the whole population. The exponential values of FAMSES4(*j*/1) represent the estimated odds ratios *j*/1 of the pooled 45-55 and >55 cohorts and serve as a static benchmark referring to the pre-1986 period. In years before 1986 for example, the relative chances of a student from the fourth quartile relative to a student from the lowest (1st quartile) socio-

economic background were almost eight times more (7.729) in the Czech Republic, whereas in the Netherlands the difference was even larger with a nearly 10-fold increase (9.783). FAMSES_86(*j*/1), the coefficients of primary interest to us, capture the dynamics between the pre- and post-1986 era. The trend-break in the late 1980s captured by FAMSES_86(*j*/1) coefficients is in fact statistically significant regardless of the relative odds *j*/1 and estimation technique. All odds ratios of the pooled 35-45 and <35 age groups have increased significantly in the Czech Republic, which is reflected in the positive coefficient estimates of FAMSES_86(*j*/1). Over the same time period, the Netherlands observed the opposite (and again statistically significant) trend.

A qualitatively similar situation can be observed for the transition between the secondary and tertiary education based on the variable SECEDU (see Table 4). In this case, the estimated odds ratios follow relatively similar paths in both countries until the 1980s. In the subsequent years, younger cohorts in the Czech Republic experienced a notable increase in the odds ratios and hence lower access to tertiary education for individuals with relatively low socio-economic backgrounds.

In the Netherlands, on the other hand, the odds ratios have basically stagnated or moved only slightly. Unlike the relative odds of attaining tertiary education, the trend break is unambiguous and statistically significant only for the Czech Republic. In the Netherlands, the odds ratios (though significant) moved in both directions. Nonetheless, the Czech shift towards more closed tertiary education and the most pronounced shift in odds ratios for the fourth quartile seem to have been preserved.

Figure 7. Comparison of the relative odds of different SES groups in the Czech Republic and Netherlands: logit, transition between secondary and tertiary education



In other words, in the Czech Republic, despite the fact that tertiary education is tuition free, individuals from the least privileged social strata (the lowest SES quartile) tend to lose against the most privileged (the highest SES quartile). This holds for the relative odds of attaining tertiary education as well as for the success of making the transition between secondary and tertiary education. On the contrary, in the Netherlands, the odds of attaining tertiary education

have been falling since the late 1980s, the period when tuition fees were rising and simultaneously the new system of student support was implemented.

Table 4. Contrasts from logit regressions for the transition between secondary and tertiary education, pooled cohorts (45-55/>55 and 35-45/<35). Dependent variable TEREDU

Country		β	Std. dev.	Wald statistics	P-value	Exp(β)
CZ	Famses4(2/1)	-0.059	0.009	45.475	0.000	0.942
	Famses4(3/1)	0.365	0.008	2064.297	0.000	1.440
	Famses4(4/1)	1.729	0.007	58774.034	0.000	5.635
	Famses_86(2/1)	0.702	0.011	4085.445	0.000	2.054
	Famses_86(3/1)	0.367	0.010	1267.012	0.000	1.443
	Famses_86(4/1)	0.494	0.009	2877.618	0.000	1.639
	Post-1986	0.001	0.008	.014	0.905	1.001
NL	Famses4(2/1)	0.407	0.006	5156.464	0.000	1.502
	Famses4(3/1)	0.858	0.005	25650.635	0.000	2.357
	Famses4(4/1)	1.562	0.005	86862.099	0.000	4.769
	Famses_86(2/1)	0.120	0.007	298.916	0.000	1.127
	Famses_86(3/1)	-0.106	0.007	255.504	0.000	0.899
	Famses_86(4/1)	0.093	0.007	195.688	0.000	1.097
	Post-1986	-0.395	0.005	5536.599	0.000	0.674

Variable(s) entered: famses4, famses_86, post-1986, sex.

8. Conclusions

The main objective of this article was to assess the possible effect of student financing models on the levels of inequality in access to higher education. We are aware of the complexity of the processes and enormous variety of factors determining educational decisions made by individuals and their parents, particularly regarding participation in tertiary education. The sociological models tell us that students' parents and other peers have an overriding impact on student choice. This is probably one of the reasons why in about all education systems around the world the proportion of lower-SES students decreases with the level of education. On the other hand, scholars inquiring into the possible role of policies in explaining differences in the likelihood of attaining higher education have traditionally utilized similar analytically traced and statistically proven differences between countries. To be sure, one of the key roles of the modern social sciences is to reduce the entropy about the effects of policies, and to contribute to debates about their efficiency.

Our decision to compare the development of the chances of attaining tertiary education on the basis of a detailed analysis of the Czech and Dutch student support systems was led by the following observations:

1. There is a great deal of similarity between the two countries in terms of their long term socio-cultural development;
2. But after WWII both countries underwent different socio-political developments and policies in terms of student financing with possible consequences for access;
    a) While during the early stages of the communist regime in the (now) Czech Republic the government implemented strong egalitarian policies, the post-communist transformation after 1989 has not brought any significant reforms in student financing.

b) In the Netherlands, without deep educational reforms in the post-war period there was a radical student finance reform in 1986 with substantially rising tuition fees, basic grants and universal loans since then.

This study has reached important results concerning the potential relation between student financing and equity in higher education participation in the two countries observed. It is shown that the communist reforms in the Czech Republic, based on a redistribution of relatively limited opportunities to study via the quota system, brought only a short-term decrease in inequality in access to higher education. The post-communist transformation period, particularly in the 1990s, has brought a significant increase in inequality. Despite increasing opportunities to enter tertiary education through more student places and the government's resistance to introduce tuition fees, inequality in participation grew. This reverse development can be explained by two other factors: a) a high level of stratification in the Czech secondary school system that has generated strong social background effects in participation in different types of schools and therefore in the transition decisions for continuation in higher education; b) student financial support in the Czech Republic is geared more towards parents than students themselves, with higher SES parents benefitting more than lower SES parents. We believe that tuition fees could be an instrument for generating more resources for opening up additional study places in higher education, as well as for targeting more direct student financial support to attract more lower SES students to higher education. Tuition fees bring the required extra resources to expand the higher education system, without negative effects on higher education access for underprivileged students as is shown in the Netherlands and many other countries.

As for the Netherlands, previous studies indicated a very slight decrease in the effect of social background on educational attainment, even before the 1986 student finance reforms. Our analysis demonstrated that despite gradually rising tuition fees, particularly after 1986, participation patterns of different socio-economic backgrounds reflect a significant decrease in inequality since the 1980s. This may be partially due to the changes towards direct student support, as other circumstances remained more or less constant (like the existence of tuition fees and a stratified secondary school system). Differences between the Dutch and Czech developments may be partially explained by one additional factor: next to universities, Dutch higher education has a relatively large number of students (65%) in universities of professional education, which to a larger extent attract students from lower SES groups. This segment of tertiary education had been missing in the Czech Republic until 2001, since when it gradually develops as part of Czech implementation of the Bologna process.

Though our research does not enable a direct causal relationship between student support systems and levels of inequality in access to tertiary education, we believe that the similarities in many aspects of Czech and Dutch societies and education systems accompanied with different student financing approaches lead to significant changes in access opportunities. It can be said to be at least striking that in the Czech tuition-free tertiary education system with predominantly indirect student financial assistance via parents has led to a significant increase in inequality.

Finally, the facts in access and student financing development shown in the Czech Republic and the Netherlands indicate that there is a strong need for theoretical and policy debates about the true role of tuition fees and student financial support in relation to access to higher education in order to develop better models of higher education financing incorporating the economic and social dimensions of efficiency and equity.

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Appendix

Table A 1. Distribution of variables used in the analysis (%)

Variable and categories	Czech Republic	The Netherlands
Number of analyzed respondents	8 628	17 853
Respondent's education (REDU)		
Primary or less	0.3	6.9
Lower secondary	10.0	21.3
Upper secondary	76.1	39.9
Tertiary	13.5	31.9
Attained secondary education (SECEDU)	89.7	71.4
Attained tertiary education (TEREDU)	14.3	32.6
Father's education (FEDU)		
Primary or less	0.9	34.4
Lower secondary	19.3	31.1
Upper secondary	71.4	17.8
Tertiary	8.3	16.6
Mother's education (MEDU)		
Primary or less	1.6	40.4
Lower secondary	40.2	40.9
Upper secondary	54.8	11.4
Tertiary	3.4	7.3
Father's class (FCLASS)		
Unskilled manual	8.1	6.2
Skilled manual	60.5	37.3
Non-manual	21.6	33.9
Professional	9.8	33.8
Financial problems when teenager (POOR)		
Most of the time	8.5	6.2
Often	12.3	9.6
Occasionally	29.1	17.2
Rarely	23.3	17.0
Never	26.8	49.9
Age cohort (AGE4)		
55 and higher	21.2	20.2
45 – 55	25.2	25.1
35 – 45	22.5	28.1
Less than 35	31.0	26.6

Source: Survey on Income and Living Conditions of Households 2005.

Table A 2. Principal component analysis: factor loadings after Varimax rotation.

	Czech Republic				The Netherlands			
	>55	**45-55**	**35-45**	**<35**	**>55**	**45-55**	**35-45**	**<35**
FEDU	0.829	0.832	0.847	0.853	0.851	0.846	0.847	0.847
MEDU	0.723	0.734	0.744	0.719	0.762	0.737	0.759	0.779
FCLASS	0.781	0.753	0.791	0.781	0.608	0.638	0.642	0.748
POOR	0.424	0.473	0.448	0.486	0.409	0.355	0.434	0.248
% of var.	50.0	50.5	52.4	52.3	46.0	44.8	47.3	48.6