

Structural Growth of Inequality in Access to Higher Education in the Czech Republic¹

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Inhibited Reforms and Limits to Growth

The Czech Republic is one of the "transition" or "post-communist" countries where reforms of higher education systems were being implemented hand in hand with transitions from authoritarian to democratic political systems and from command-type to market-driven economies. Higher education system reforms in East-Central Europe display both common and unique features, with the commonality derived mostly from the similarity of tasks faced by the post-communist countries at the beginning of their transformation. One of these was the need to reform the soviet or communist model of higher education and research. But it has only now become obvious that transforming the communist-type higher education system into a modern one, well integrated into the democratic society and market economy, is a task far more difficult and demanding than expected by educational policy makers, international experts, and observers at the beginning of the post-communist transformation (Čerych 2002, Rupnik 1992).

The high level of resistance to change of the system and its structure, and self-interests of its major agents (rectors, university senates, faculty, staff, and even students) was combined with a gradual drop of higher education on the list of priorities of both governments and politicians. After more than ten years of transformation in the East-Central Europe, it became evident that issues related to the development of human resources (higher education, research, innovation, technological development, etc.) had a relatively low political and vote-gathering potential and as a result failed to make it to the top of government policies and political party agendas, although they are of utmost importance for the future competitiveness and economic growth of the post-communist countries.

This does not mean that no significant changes have taken place in higher education, its structure, governance, autonomy, openness, financing, and above all its spirit. To understand the difficulties of transforming the higher education systems in post-communist countries, we must take into account the key features that higher education systems inherited from the previous regimes:

- Higher education was heavily centralized and part of the central planning system, like every other area of economic and social reproduction. Its vital link to the labor market was set by the Central Committee of the Communist party. Consequently, the overall number of students and their allocation to major fields of study and programs were decided centrally.
- Bureaucratic control over the entire system, balancing the number of graduates with the number of jobs, displaced job competition. As a result, educational credentials (diplomas, certificates) became more important in job allocation than actual knowledge, skills, and competencies.
- Enormous emphasis on technology (engineering) education narrowed educational opportunities in humanities and social sciences, and emphasized fixed skills rather than dynamic ones and flexibility.
- Curriculum guidelines, research goals, and requirements for filling teaching positions (including political criteria) were defined and closely monitored by the Communist party and its state apparatus. The absence of academic freedom and autonomy seriously undermined the capacity of higher education and research to supply the economy with research results applicable to technological development and innovation.
- A unitary system of traditional university education lacked completely short bachelor's programs and did not recognize college or similar types of higher education institutions.
- Until the mid-1960s, decisions about the number of students admitted and enrollment procedures were based on central guidelines² and quotas set by the Communist Party Central

² A similar principle, based on so-called preferential points for social background and political activity, were applied even after the quota system was officially abolished, particularly during the "normalization period" after 1969.

Committee for controlling the proportions of students of various social backgrounds. The objective was to ensure an appropriate proportion of students from each social class corresponding to proportion of that class within the population at large.

- Higher education and academic research were artificially separated. The so-called basic research was carried out in research institutes of the Academy of Sciences, and universities were deprived of research funding and participation in research projects.
- Financing of universities was entirely dependent on the government, based on “incremental budgeting,” whereby the annual budget of each university was equal to that of the previous year (the budgetary base) plus a certain increment that depended much on the success of the institution in negotiations and on available resources.³

The stagnation of the socialist university system and its failure to respond to educational aspirations and the actual demand for tertiary education are demonstrated in Figure 1, which shows the numbers of secondary school graduates and enrolled university students as well as the ratio of enrolled university students to secondary school graduates between 1962 and 2001. The data clearly confirm the policy of keeping the number of university students very low until the collapse of the Communist regime in 1989, the only exception being the academic year of 1968/69, when because of the "Prague Spring" Communist Party control over the university system was less rigid. The chances of making the transition to tertiary education (defined as a ratio of enrolled students to high-school graduates) dropped in the 1980s, when the number of high-school graduates began to grow. Despite the sharp increase in the number of enrolled university students after the collapse of the Communist regime, in November 1989, the capacity of the university system, still trapped in its traditional unitary and elitist structure, was unable to cope with the quickly growing demand for tertiary education. Therefore, the relative chance of making the transition dropped again to its average pre-1989 level.⁴

Insert Figure 1 About Here

First Stage of the Reform: Toward Academic Freedom

Starting in 1989, the transition to democracy and market economy brought about significant changes in the society and also in the higher education system. The Higher Education Act of 1990 created the conditions for return to a democratic control of higher education. It eliminated political control over university activities and decision making processes and reduced significantly government authority over the academic bodies. The Act restored university senates as representatives of faculty, students, and staff, granting them a high level of control over the curriculum, hiring practices, and research goals. The Act also provided universities with the freedom to make their own financial decisions. Currently the Ministry of Education allocates funds to the universities, which are responsible for their distribution and spending. The fiscal freedom also implies that the government allocates the funding without stipulating what number of students the universities should educate (see Holda et al. 1994 for details).

Although this Act opened a possibility for the modernization of Czech higher education, many of the structural problems remained unresolved. First, the system did not change its unitary character. Unlike in most advanced countries, where bachelor's programs were established primarily to open the tertiary system to the sharply increasing numbers of applicants and to

³ This procedure and other aspects of change in financing higher education in the Czech Republic are documented in Holda, Cermakova, and Urbanek, 1994.

⁴ The immense growth in the number of high-school graduates after 1995, shown in Figure 1, can be explained, among others, by the creation of the so-called “long-gymnasia” established in 1990. These were academically oriented high schools with six to eight year programs, which enrolled students before they finished their nine years of elementary schooling. (The standard gymnasium lasts only four years, and students are enrolled after they complete their ninth grade.)

meet the changing demands for more practical skills, the number of students enrolled in bachelor's programs in the Czech Republic grew very slowly (Table 1). A faster transition to a binary (or two-tier) system would have been a key prerequisite for a significant growth of opportunity in tertiary education in the Czech Republic and it would have required a stronger legislative support for establishing a non-university sector within tertiary education. The Act of 1990 did not go that far.

Insert Table 1 About Here

The Act of 1990 did not introduce any standardized compulsory entry examinations. While universities had full autonomy in drafting their entry examinations and tests, the matriculation examinations at the end of secondary education remained incomparable in both structure and results. Given a significant surplus demand, the absence of nationally administered tests at the end of secondary education or at the entry to the tertiary level undermines the transparency of the admission process and creates an opportunity for more or less subtle forms of corruption.

The Act also failed to create a legislative framework for private universities or colleges. Although there were no legislative obstacles to establishing private colleges, the Act did not provide a mechanism for establishing eligibility to apply for state accreditation, which would allow institutions to award degrees recognized by the Ministry of Education. Neither did the Act make any major progress in resolving the institutional separation of teaching and research. Although universities were authorized to provide postgraduate training, most of the state-funded research remained concentrated at the Academy of Sciences, which is why the number of postgraduate students grew so slowly after 1990 (Table 1).

One positive, though at that time controversial, decision was to allow regional decentralization by establishing regional universities. The proportion of students in traditional university centers (Prague, Brno, Olomouc, Ostrava) began to drop as regional educational centers increased their enrollment in more practically oriented programs.

Assessment of the overall impact of the Higher Education Act of 1990 on the development of higher education in the Czech Republic should be cautious, in particular with respect to its effect on the financing and accessibility of higher education. One can agree that "The importance of the law... cannot be overstated. It put substantial decision-making power back into hands of the university and its faculty and students. The law emphasized academic rights and freedoms as important principles of democracy, and envisioned democracy in terms of self-government and autonomous decision making within the higher education community" (McMullen and Prucha 2000, p.63). There is, however, an equally justified objection that the almost full self-government granted to universities in advance of a much deeper and more consistent reform of the system made future reforms more difficult, if not impossible. The subsequent development justifies this concern. The Czech Republic was not the only country where "the autonomy granted to universities was used -- or perceived to be used -- to block reform" (Scott 2002:146).

The first signals that consistent and often painful reforms may not receive sufficient support appeared in 1994. At that time, universities began to experience serious austerity and the number of applications grew much faster than the capacity of schools to meet the rising demand (Figure 3). Supplementary financial resources remained either outlawed (tuition fees) or not sufficiently explored and used (commercialization of research). It became clear that the future growth of higher education would not be possible without a substantial reform of its financing. For this reason, in 1994, a group of economists and policy makers drafted a proposal for a substantive reform of university financing designed to implement a system similar to the Australian Higher Education Contribution Scheme (HESC). Although it was initially commissioned by the Committee for Education and Science of the Czech Parliament, this proposal was never submitted to Parliament for debate in the form of a bill. The primary reason

was strong lobbying of university rectors and senates against the idea, which they claimed would allow the state to dissociate itself from financing higher education and result in burdening the students and their families with steadily growing tuition fees. University administration was also uneasy about the idea of tuition fees being collected by the state and then redistributed to universities as part of the state subsidy. The economic incentives under this system were not seen as compensating for the pressure toward higher accountability and responsibility that tuition fees would certainly bring.

Insert Figure 2 About Here

Second Stage: Increased Autonomy but Barriers to Multi-source Financing

The new Higher Education Act, passed by the Czech Parliament in April 1998, went even further in strengthening the formal autonomy of universities, but without granting them greater fiscal autonomy or opening additional sources of financing. Although universities became “legal public entities” with extensive property rights, severe restrictions were imposed on the use of this property in generating revenues, especially through the participation of universities in private ventures. Together with the legal obstacles in collecting regular tuition fees from full-time students enrolled in accredited programs, this made it difficult to turn multi-source financing into reality.⁵ Although universities were allowed to generate revenue by various activities (conferences, consulting, publishing, research, bookstores, exams, licensing agreements, etc.) and to keep the income exempt from taxation in their institutional accounts (see, e.g., McMullen and Prucha 2000:64; McMullen 2000), the two principal sources of multi-source financing, tuition fees and profits from technology transfer, remained essentially untapped. In other words, Czech universities received more formal autonomy and even extensive property rights, but their financial dependence on the state remained unchanged.

A markedly pro-reform provision of the 1998 Act, the legal recognition of so-called “non-university institutions of higher education,” in other words colleges, offering primarily albeit not exclusively bachelor’s programs, allowed the formation of a non-university segment of tertiary education. Nonetheless, this provision did not trigger any significant change in the structure of Czech tertiary education. Although the demand for bachelor’s programs has steadily risen, and despite the recommendation of the Bologna Declaration that all European countries transition their tertiary systems from the unitary to the binary model, not a single *public* non-university institution of higher education has yet been established.⁶ Quite the contrary, the number of students enrolled in bachelor's programs in the existing universities dropped after 1997, and show no clear tendency for a steady growth (Table 1). It appears that there is massive resistance by public universities and the state administration to structural changes that would make possible the expansion of higher education in the Czech Republic.

Insert Table 2 About Here

Nevertheless, the non-university sector of tertiary education began to grow after 1998 owing to the rapidly increasing number of private colleges, whose state accreditation was made possible by the 1998 Higher Education Act. Although private colleges and universities received no

⁵ The Higher Education Act of 1998 allows charging regular tuition fees only from students enrolled in so-called “life-long education programs.” However, these programs are strictly separated from the accredited programs, which means that taking courses in these programs does not lead to bachelor's or master's degree, and participants cannot obtain students status with all its responsibilities and benefits.

⁶ The Bologna Declaration, signed in 1999 by the authorities responsible for higher education in 29 European countries, set as its main long-term goal the creation of a European Higher Education. The Declaration formulated the following objectives: adoption of a system of easily readable and comparable degrees; adoption of a system based essentially on two main cycles, undergraduate and graduate; establishment of a system of credits; promotion of mobility by overcoming obstacles to effective free movement; promotion of European cooperation in quality assurance; and promotion of the necessary European dimensions in higher education.

financial subsidy from the state (even though the Act does not explicitly prevent it), as of the academic year 2000/01 14 private colleges were established enrolling in total about 2,000 students and they slowly filled the gap in the non-university sector of tertiary education. This was a significant step toward further liberalization and diversification of higher education, but the Czech Republic still lags behind other Central and East European Countries in the size of the private sector in higher education, particularly in comparison with Poland, Hungary, Estonia, and Latvia, where the share of students in private colleges and universities is much higher (see Table 2 for comparison of countries in Central and Eastern Europe).

Third Stage: Financial Crisis Inhibits Growth While Fundamental Reforms Are Blocked

Both domestic and international statistical data show a lasting and deepening financial crisis of public tertiary education in the Czech Republic, which, in turn, inhibits the growth of educational opportunities. As a result, there is a shortage of adults with tertiary education in the Czech Republic while the chances of continuing studies beyond the secondary level are not improving.

After 1994, when the new mechanisms for financing tertiary education were implemented, the number of students at public universities grew steadily from 132,000 in 1994 to 211,000 in 2001 (Table 3). This increase in the number of students by about 60% was followed by a similar growth of state subsidy, from CZK 7.122 billion in 1994 to CZK 11.9 billion in 2001 (68% growth). However, inflation during this period grew at a similar rate (cumulative inflation rate between 1994 and 2001 was 68%). As shown in Figure 3, the state subsidy per student dropped in real terms from CZK 54,000 in 1994 to CZK 34,000 in 2001. These figures clearly indicate that the performance of Czech universities grew both in economic terms (real input/output ratio) and in teaching efficiency (student/teacher ratio).

Insert Table 3 About Here

The high budgetary deficit of the system of higher education in the Czech Republic is confirmed also by international comparisons. According to Education at a Glance (2001), the OECD countries invest on average 1.6% of their GDP into their tertiary education systems from both public and private sources. In the Czech Republic, this figure is 0.9% (or 0.7% if only the public sources are considered). The same yearbook points to a very low share of educational expenditures in the total public expenditures. While the Czech Republic invests approximately 1.8% of total public expenditures in tertiary education, the average in the OECD countries is 3%. The Czech Republic also falls behind other post-communist countries like Hungary (2.4%) and Poland (2.7%). The average expenditure per student in the tertiary sector in the Czech Republic amounts to USD/PPP 5,500 (USD calculated at purchasing power parity), which is fourth worst among the OECD countries (OECD average is USD/PPP 9,000 vs. 19,000 in the U.S., 13,000 in Sweden, 11,500 in Australia and Austria, 10,000 in Great Britain, 9,000 in Denmark, and 8,500 in Ireland).

While public funds remain the main source of financing public universities almost everywhere, the share of private sources in funding public tertiary education institutions is increasing worldwide. The Czech Republic lags behind in this respect too, as the share of private funding (14% of the total budget) is far below the average in advanced countries: the OECD average is almost 23%, and in countries where tuition fees are charged it reaches 30% to 50%.

Although universities were formally entitled to generate revenues from alternative resources, except regular tuition fees and investments in private ventures, the state budget remains the dominant source. Even the tightening budgets and rapidly growing austerity did not significantly soften the reluctance of public universities to adopt a two-tier (binary) system that would allow admitting a higher number of students in short programs. In fact, the opposite

trend occurred: after 1998, when the new Higher Education Act allowed the formation of non-university institutions of tertiary education to expand opportunities for study in bachelor's programs, the proportion of students in these programs decreased, and remains to this day below the level of the 1997/98 academic year despite a slight recovery (Table 1).

The rising austerity did not have a significant impact on the tendency of students to prolong their studies far beyond the limits set by the standard duration of study for each program. Data presented in Figure 3 confirm that the current system of financing of public tertiary education does not contain sufficient incentives for students to complete their studies within the specified time, blocking a large number of slots that could be otherwise made available to new entrants.

Insert Figure 3 About Here

The Czech Republic remains close to the bottom among OECD countries with respect to the number of adults with tertiary education and the number of young people of relevant age who can continue their studies after graduation from a secondary school.⁷ The reasons for this are continuing financial and structural obstacles that limit the growth of the number of educational opportunities at the tertiary level. We must bear in mind that the steeply rising aspirations for higher education originated, among others, from the profound change in the economic returns of higher education in post-communist countries, particularly in the Czech Republic. Jiří Večerník (2001) concluded that the effect of education on personal income doubled between 1988 and 1996. OECD data also confirm that the economic returns of tertiary education have grown after 1989. The average earnings of a person with tertiary education in the Czech Republic is 1.8 times higher than the earnings of a secondary education graduate, vs the OECD average ratio of 1.63 (with 1.84 in Hungary, 1.8 in the U.S., 1.69 in France, 1.57 in Germany, and 1.32 in Norway).⁸

All the processes mentioned above contribute to an extremely keen competition for entry into tertiary education, making the transition between secondary and tertiary education an ordeal for secondary school graduates and their families. This high competitiveness and the absence of professionally designed and nationally applied admission tests result in high social selectivity of tertiary education. Comparison of five OECD countries participating in the SIALS project (Figure 4) shows that the inequality is especially high between the children of professionals and of workers. There seems to be quite strong although only preliminary evidence for the hypothesis that the post-communist transformation increased the inequality in access to tertiary education.

Insert Figure 4 About Here

An amendment to the Higher Education Act of 1998 was submitted to the Czech Parliament in the fall of 2000 aimed at solving the most acute structural and fiscal problems of tertiary education in the Czech Republic. It provided for the universities to accomplish the transformation to the two-tier system by the end of 2003 (the process has not been completed until now) and allowed universities to invest capital into private joint ventures and spin-off companies (restrictions were imposed only on assets and funds transferred to universities from the state). The amendment also introduced more stringent rules for students exceeding the

⁷ According to OECD data sources (OECD 2002), the proportion of adults with tertiary education in the Czech Republic is 11%. OECD average is 18% (17% in Ireland, the Netherlands, and Finland, and 37% in the U.S.). Currently only 24% of young adults aged 20 are enrolled in school, vs the OECD average of 41%, and 45% in Finland, 41% in Ireland, and 38% in Hungary.

⁸ Education at a Glance (OECD 2002). Note, however, that a growing proportion of university graduates reduces the average wage premium for a university diploma, which is why educated people in countries undergoing a transformation may enjoy relatively better returns than those in more advanced countries. The premium for education in transition economies keeps growing together with the increasing supply of educated people.

standard length of study.⁹ Because of continued strong opposition to tuition fees, the amendment legalized the “dual-track system”, which some universities were in fact already operating. Students in the life-long learning programs, for which universities were already allowed to charge tuition fees, are now allowed to take courses in accredited programs and accumulate regular credits; under certain conditions these credits can be converted into a regular diploma. This part of the amendment in fact allows universities to admit students above the quota set every year by the Ministry of Education and to charge them a discretionary tuition fee, which is very close to the amount the school would otherwise receive as a state subsidy per student.

The Bill of Financing Higher Education, drafted in 1998 with the aim of introducing tuition fees, student loans, and student financial aid program, was submitted to the Czech Parliament in the spring of 2002.¹⁰ It did not pass, and no other significant changes have been proposed to the structure of the tertiary education system, its financing, and its admission procedures. Therefore, we cannot expect marked changes in the processes shaping the access to higher education in the Czech Republic.

In sum, extremely sharp competition for entry into tertiary education and the absence of clearly defined benchmarking criteria of success have very likely contributed to an increase in inequality in access to higher education after 1989. The extent of inequality, its main factors, and its dimensions are addressed in the following part of the chapter.

Accessibility and Class Inequality

In this part we address the central question of how the expansion of the higher education system (or the lack thereof) and recent policies (or their absence) affected the increase of inequalities in the chances of attending higher education, with particular emphasis on the role of gender and socioeconomic background. We focus on social class and gender because they were the two dimensions of the educational inequality that communist governments aimed to eradicate in the first place. We have shown already that the post-communist governments left the inequality in access to higher education to develop spontaneously, without a consistent policy addressing either the high level of inequality inherited from the socialist era or the recent form of inequality arising from the formation of the new class structure in the post-communist society.

The primary aim of the analysis is to compare the development of inequality in access to tertiary education during the *communist* and *post-communist* periods of development. We focus primarily on the Czech Republic, but comparison of the two periods may contribute to a better understanding of the more general question of how the two historically unique types of social change, transition to socialism and post-communist transformation, shaped the inequality in access to tertiary education. As shown in several recent analyses (e.g., Večerník 2001, Matějů, and Kreidl 2001), the role of education in the system of social stratification has changed markedly. Most important, a true revolution took place in the economic returns on higher education. While in 1988 each year of education brought a bonus of a 4% salary increase, in 1996 this bonus reached 8%. During the same period, the ratio of the wage of a person with a university education and that of a secondary school diploma holder increased from 1.48 to 2.37 (Večerník, 2001).

Changes in the economic returns on education resulted in a significant improvement in the position of education among the perceived attributes of life successes, which, in turn, brought about an increase in educational aspirations, particularly at the tertiary level. The growing *economic value* of education resulted in an increase of wage differentials. Its growing *social*

⁹ Those who exceed the standard length of study for more than a year are now charged a fee that is very close to the state's annual subsidy per student in a given program.

¹⁰ Detailed description of the Bill is provided by Mateju and Simonova (2003).

value is reflected by the growing consistency between education, prestige, social status, and self-perception (Matějů and Kreidl 2001). Together, they can act to enhance sensitivity to the limited supply of educational opportunities and especially to the significant class inequality in access to tertiary education. Consequently, *equity in access to education* is becoming a true social and political issue.

Theoretical Perspective

Official Marxist sociology did not adopt the main concepts of social stratification research, and the issue of unequal access to higher education was rather obscured by the official ideology of mitigation of class barriers; this issue was addressed by using data from various surveys. As far as the former Czechoslovakia was concerned, one of the most attractive and ideologically tolerated theories applied outside the official mainstream Marxist sociology was the *cultural reproduction theory* developed by Bourdieu (Bourdieu 1973, 1986). Research following from this theoretical background initiated a strong stream of analytical work attempting to assess the role of the transmission of *cultural* resources in the intergenerational transmission and reproduction of inequality at a time when class inequality was officially fading. But the attempt to show that socialism led to the decrease of the effect of socioeconomic background on the educational attainment of children failed. Matějů and Peschar (1990) found that, at the end of the 1980s, the overall effect of family socioeconomic status on the educational attainment of children was weaker in Czechoslovakia than in the Netherlands, but the effect of its economic dimension was stronger in Czechoslovakia than in the Netherlands. These results corresponded to the *hypothesis of socialist transformation*, which claimed that socialist reforms of education systems and corresponding policies (particularly the implementation of the quota system), caused an initial reduction of the effects of social origin on educational attainment. However, as soon as the new elite secured its privileges and took control of the education system, it ensured educational advantages for its own class. As a result, the effect of social origin in the later years of the socialist regimes returned to its original pre-socialist level (Matějů 1986, 1993).

Hanley (2001) challenged this hypothesis and attributed the initial reduction in the effect of social origin on educational attainment to the expansion of the education system, questioning the real effect of the quota system on the admission processes at the secondary and post-secondary level. His analysis confirmed that selection on the basis of political criteria was present during the “normalization” period after the Soviet invasion in 1968. The hypothesis about the role of redistribution policies, including the quota system, was supported also by Kreidl (2001), who showed that the effect of parental socioeconomic status on success in the transition from lower to upper secondary and technical schools decreased in the years 1948-1953.

The *trajectory maintenance* theory, which also referred specifically to socialist countries, claimed that members of the pre-communist elites (bureaucracy and professionals) were able to pass privileges to their children even under the new regime by making use of their social and cultural capital. Consequently, inequalities in the allocation of education did not decline (Hanley and McKeever 1997). This hypothesis also applied the theory of cultural reproduction to the socialist system. Wong (1998) also found a strong effect of various types of capital that individual families possessed and employed to secure the desired education for their offspring, and showed that it was social capital, such as membership in the Communist party, that played an important role as a mediator of intergenerational inequalities.

Gerber and Hout (1995) reached a similar conclusion for Russia, where similarly to other socialist countries the strictly controlled growth of opportunities in secondary and post-secondary education led to enormous pressure for entry into both secondary schools and universities. Thus, class differentials in the chances of attaining post-secondary education did not change through three post-war cohorts mainly as a result of excess demand and massive

competition and despite the strong political control over the selection process. Similar results emerged from analyses carried out on the Czechoslovak and Hungarian data (Boguszak, Matějů, and Peschar 1990, Simkus and Andorka 1982).

Two competing hypotheses can be formulated concerning the development of inequality in access to tertiary education during the socialist regime. The first refers to the socialist transformation hypothesis that found support in the data from the Czechoslovak stratification survey carried out in 1984 (Matějů 1993). If this hypothesis is true, we should be able to find a significant reduction of differentials in the chances individuals of different socioeconomic background have of making a transition between secondary and tertiary education. The second hypothesis concerning this stage of development, suggested by Hanley and McKeever (1997) and supported by Wong (1998) for the former Czechoslovakia, and by Gerber and Hout (1995) for Russia, rejects any change in the effect of socioeconomic background caused by socialist reforms and corresponding policies.

In discussing educational inequality during the post-communist transformation we must point out that post-communist countries are undergoing a development that can be characterized as the formation of genuine social classes.

The consequences of class formation in post-communist countries for educational stratification and inequality can be best described using the *theory of rational action* proposed by John Goldthorpe and Richard Breen (Goldthorpe 1996, Breen and Goldthorpe 1997). Goldthorpe's approach to the problem of persistence of class inequality in educational attainment is part of his effort to reorient the class analysis from both the Marxist and liberal traditions, focused primarily to macro-social explanations of the dynamics of class structure (*class formation* in the Marxist tradition, *class decomposition* in liberal theories) to an explanation based on the prevailing empirical evidence of the *stability* of class differentials in life-chances. This theory can also contribute to understanding the consequences of class formation in post-communist countries for the development of inequality in access to tertiary education. To account not only for *persisting inequality* but also for *increase in inequality*, we must address the *notion of rationality*, assuming that social actors have their goals and alternative means of pursuing them. In choosing among the means, actors tend to assess costs, risks, and benefits rather than merely follow social or cultural norms or values typical for the particular class to which they belong (Goldthorpe 1996:485).

This approach is consistent with the explicit assumption that educational expansion at lower levels (secondary education) brings ever higher number of children to the competition for tertiary education, where the demand has risen faster than the supply of educational opportunities. Therefore, the risk of failure is very high. As a consequence, class differentials in taking up these options may increase because cost-benefit evaluations made by children and parents in different class situations may become less favorable for lower social classes. In other words, although the relative benefit of achieving higher education from an underprivileged class position is higher (because of the expected upward mobility), the relative costs are also higher (the cost of education relative to family income), and so is the risk of failure, be it failure in the competition for entry to tertiary education after graduating from a school providing general education, or obstacles in achieving an expected occupational position. All this holds true regardless of the person's position in the scale defining primary factors (ability, actual school performance).

All available evidence and the main propositions of the rational action theory lead us to the hypothesis that class differentials in the chances of success in the transition between secondary and tertiary education increased after 1989. The following arguments support this hypothesis:

1. The Czech tertiary education system has not been transformed from a unitary to a binary model and still shows signs of an elitist tertiary education system.

2. Financing of public institutions of tertiary education is not sufficiently diversified between public and private resources; the extremely high dependence of universities on limited state budgets results in growing austerity, which has recently developed into a deep financial crisis.
3. Both the structural constraints (imposed by the unitary system) and the deepening austerity of tertiary education institutions (because of their extreme dependence on limited public funds) pose serious obstacles to further expansion of educational opportunities.
4. Growing educational aspirations and a steady growth in the number of secondary education graduates on the one hand, and constraints in the growth of educational opportunities at the tertiary level on the other, result in excessive demand and a high number of rejections in the admission process.
5. For the above reasons, *the transition between the secondary and tertiary level of education has become extremely competitive.*
6. The post-communist transformation has caused a significant increase in economic inequality, which resulted in the formation of genuine social classes.
7. The process of *objective* change in the class structure resulted in the formation of *subjectively* defined groups of winners and losers of the transformation, making the new property class (enterprise owners, the self-employed) and professionals the typical winners, and leaving skilled and unskilled workers among the typical losers (Matějů 1999).
8. The perceived role of education in building strategies for getting ahead has grown significantly, and achieving tertiary education has gradually developed into a principal strategy for success in life.
9. Despite indisputable democratization and gradual reinforcement of meritocratic principles in the social stratification, the massive privatization and accumulation of capital enabled the formation of new economic and political elites, recruited to a large extent from the privileged classes of the communist regime.¹¹ Consequently, the growth of the socioeconomic inequality was not always interpreted as just and legitimate, which seriously undermined the feeling of equal opportunity.
10. All these processes affecting class structure and social stratification in the post-communist Czech Republic brought about a growing awareness and assessment of the costs, risks, and benefits of decisions concerning the educational transition between secondary and tertiary education. This is especially true for large segments of the working class (semi-skilled and unskilled workers), the losers of the transition.

Based on the above arguments, we propose to test the following hypotheses:

H1: The socialist-regime period did not bring any change in the effect of socioeconomic background on the chance of making the transition between secondary and tertiary education. The only significant change was the reduction of inequality between men and women that occurred as a consequence of redistribution policies.

H2: The post-communist transformation caused a significant increase in the effect of social background on the chance of making the transition between secondary and tertiary education. The increase was due primarily to the increasing effect of the father's social class (representing

¹¹ The process of the creation of new elites in East-Central Europe was addressed by Eyal, Szelenyi and Townsley in their fascinating book *Making Capitalism Without Capitalists. The New Ruling Elites in Eastern Europe*. (Eyal, Szelenyi, and Townsley 1998).

the socioeconomic dimension of social stratification), while the effect of parents' education (representing the cultural dimension of social stratification) remained stable. The effect of gender remained stable.

H3: The increase of the class differentials in the chance of making the transition between secondary and tertiary education was caused in particular by the widening gap between the typical losers of the transformation (semi-skilled and unskilled workers) and other classes.

Data and Strategy of Analysis

To obtain a sufficiently large number of cases for cohort analysis that would allow a comparison of the pre-socialist, socialist, and post-socialist stages of development of the Czech Republic, data from three surveys were merged into one analytical file. These are the Transformation of Social Structure Survey 1991 (TSS-91), the Second International Adult Literacy Survey 1998 (SIALS-98), and the International Social Survey Program's survey module on Social Inequality 1999 (ISSP-99). All these surveys were carried out on random samples produced by two-stage stratified random sampling procedures.¹² The original effective sample sizes were: 1,870 cases for TSS-91 (in the Czech part of former Czechoslovakia), 3,132 cases for SIALS-98, and 1,834 cases for ISSP-99. The analytical data file contained 6,740 cases.

The variables created for the analyses were: COH (the year when the respondent reached 18 years of age: 1. before 1948, 2. 1948 - 1964, 3. 1965 - 1974, 4. 1975 - 1989, 5. 1990 - 1999); GEN (1. male, 2. female); PED (parents' education: the highest level of education achieved by the more educated parent: 1. lower secondary or lower, 2. upper secondary, 3. tertiary), RED (respondent's education: the highest level of education achieved by the respondent: 1. lower secondary or lower, 2. upper secondary, 3. tertiary);¹³ FCLS (father's class at the time the respondent was 16 years old: 1. semi-skilled and unskilled workers, farm workers (UW), 2. skilled workers (SW), 3. routine non-manual occupations (NM), 4. professionals, including self-employed (PROF)).¹⁴ The distributions of the key variables are shown in the Appendix.

Within the comparative context of our analysis, we proposed to examine five outcomes: (1) eligibility for tertiary education (graduation from upper secondary education); (2) admission into a bachelor's program of tertiary education; (3) completion of a bachelor's program of tertiary education; (4) admission into the second stage of tertiary education; (5) completion of the second stage of tertiary education. As discussed in the first part of the chapter, the typically socialist unitary system has not been significantly transformed into a binary one in the post-communist period. Therefore, we cannot distinguish between the first two levels of tertiary education (bachelor's and master's). Also, because of the low drop-out rate during the socialist era and its very slow increase after 1989, questions on achieved education in most of the large surveys did not contain the option "uncompleted tertiary." For all these reasons, our analyses were limited to eligibility for tertiary education (completion of upper secondary education) and completion of tertiary education (second transition). Therefore, our logit models addressed only two major educational outcomes: (1) *transition to (completed) tertiary education* (for those who completed upper secondary education, i.e., the conditional outcome), and (2) *achieving tertiary education* (for all respondents in a given cohort, i.e., the unconditional outcome).

¹² Detailed information about TSS-91 and ISSP-99 surveys and the corresponding data files can be found in the Sociological Data Archive (SDA), Institute of Sociology, Academy of Sciences of the Czech Republic (www.archiv.soc.cas.cz). The data from TSS-91 are stored as data file #0126, the ISSP-99 survey is stored under #0016. Information about SIALS can be obtained at the web pages of ETS Princeton: <http://www.ets.org/textonly/all/ials.html/>.

¹³ The analysis focused primarily on the transition between secondary and tertiary education, and therefore in all surveys respondents older than 19 years who reported having completed secondary education and a current status of "student" were assigned RED=3 (tertiary education).

¹⁴ This is the reduced version of the standard EGP class schema. The reduction of the number of categories was necessary to avoid extremely low frequencies in several classifications.

We wanted our analyses to cover both historically unique periods of social transformation in East-Central Europe: the socialist revolutions in 1948 and the post-communist transformations after 1989. We therefore constructed the age cohorts to distinguish the first “socialist” cohort (those who turned 18 after 1948) from those who completed secondary school and could thus enter tertiary education before 1948 (persons who turned 18 before 1948). Because of the problem of differential mortality by education of the earlier cohorts and of the fact that educational opportunities of the last pre-communist cohort were affected by WWII (a significant number of those who turned 18 before 1948), the last pre-socialist cohort served mostly as a benchmark for studying developments during the socialist period rather than as evidence about the openness of tertiary education system in the pre-socialist Czechoslovakia. This coincides with the main focus of our analysis, which is on the effects of the socialist policies during its periods of rigid socialism between 1948-1964, reform socialism between 1965-1974, and post-1968 normalization between 1975-1989.

Because of the dichotomous character of the dependent variable (success vs failure in the given transition), hypotheses about changes in the chances of achieving tertiary education were tested by logit models. This strategy allowed the transformation of categorical variables into a set of special contrast variables representing individual hypotheses.¹⁵ The goodness of fit of each logit model was assessed by a likelihood ratio test and by an evaluation of the adjusted residuals for individual cells of the multiple classification (i.e., by comparing observed frequencies with those derived from the given model). All the models presented showed very high levels of goodness of fit for both criteria.

Results

Basic Trends in Opportunity and Participation

The trends in two main educational transitions portrayed by the survey data match the statistical data presented in the first part of the chapter. As shown in Figures 5 and 6, educational opportunities at the upper secondary and tertiary level grew very slowly during the last five decades (from 34% to 52%). A marked rise in the probability of success in the transition between upper secondary and tertiary education after 1989 was due partly to a rather slow growth in the number of upper secondary school graduates. The patterns of development of differentials between men and women in their chances for completion of secondary education and for passing the second transition are typical of formerly socialist countries. As far as completion of secondary education is concerned, the first period of socialist development brought about a massive redistribution of educational opportunities between men and women, and as a result women’s chances of making this transition exceeded those of men. In a further development, the chances of men began to grow but not enough to reach the level of women. As far as the second transition is concerned, while women’s chances grew steadily during the socialist regime and men’s chance were decreasing, the odds of men and women were not reversed in favor of women.

Insert Figures 5 and 6 About Here

The limited growth of opportunities during the period under study did not create favorable conditions for a significant reduction of class differentials in the chances of making the transition between secondary and tertiary education (Figure 8) despite the fact that class differentials of success in the completion of secondary education diminished, mainly because

¹⁵ See Haberman (1979) for a description of this methodology. For example, replacing the variable “cohort” with the “repeated” contrasts made it possible to focus on differences in the chances of success between cohorts by making the explicit assumption that some of the adjacent cohorts did not differ significantly from each other. Similarly, replacing the variable “parents’ education” by orthogonal polynomial contrasts allowed to test the hypothesis that the effect of the parents’ education on the log odds of success was linear merely by declaring the respective contrast to be linear.

of the improving relative chances of individuals of working class origin (Figure 7). Results displayed in Figure 8 indicate that increasing participation of the lower social classes in upper secondary education led to an increase in the competitiveness of the subsequent transition, in which the lower social classes tended to lose. The chances of unskilled and semi-skilled workers (UW) making the transition actually dropped from 26% in the pre-socialist period to 16% for the last two cohorts (the last socialist and the first post-socialist cohort), while they grew rapidly for non-manual workers and professionals, who profited most from the growth of educational opportunities at the tertiary level. The problem of unskilled and semi-skilled workers appears even more serious when we take into account the size of the class: on average 36% of respondents reported this class origin (38% in the first cohort, 32% in the last one).¹⁶ Moreover, in the youngest cohort about 16% of fathers in this class reported upper secondary education.

Insert Figures 7 and 8 About Here

The social class showing the most significant improvement in its chances of success in the second transition was that of routine non-manuals, rising from 23% in the first cohort (below the two classes of manual workers) to 48% percent in the last (significantly above the chance of individuals of working class origin). The winners during the post-socialist stage of development were children of skilled workers, whose chances increased by a factor of 1.6 from 23% to 37%, and of professionals, whose chances increased by a factor of 1.3 from 45% to 60%. The real losers were individuals of unskilled and semi-skilled worker background, whose chances dropped in both real and relative terms: from 17% to 16% in real terms, and from 0.38 to 0.27 in the ratio of their chances to succeed vis-à-vis the professionals.

Testing Hypotheses about the Development of Inequality

The hypotheses about the two educational outcomes were tested using six logit models (see Models I to VI in the Appendix).

Model I tests the general hypothesis concerning the development of the chances of individual cohorts making the transition from secondary to tertiary education, then the hypothesis about the development of inequalities between men and women (H1), and finally the hypothesis about the stability of the effect of parental education (H2). The following constraints of individual interactive effects were introduced into the model to test these hypotheses:

1. Development of the chances of making the transition from secondary to tertiary education can be modeled as follows: there was no significant change in the overall chances between the first and the second cohort; during the period of 1965 – 1989 (the third and fourth cohorts) there was an overall slowdown, especially for men; the overall chances increased again only in last, post-socialist, cohort.¹⁷
2. As a result of a significant redistribution of educational opportunities in favor of women, the effect of gender changed between the second and third cohorts but remained stable thereafter.
3. The effect of parents' education remained unchanged throughout the entire period.

Because the model shows a very good fit ($L^2 = 20.5$, $df = 24$, $p=0.666$), we can present the odds based on the expected frequencies in two forms: the odds of making the transition (Table 4) and odds ratios for the main groups defined by parental education (Figure 9).¹⁸

¹⁶ See Appendix 2 for the distribution of variable FCL4.

¹⁷ The introduction of these constraints is supported by data presented in Figures 5 and 6.

¹⁸ Henceforth by odds we mean the ratio between the number of those who succeeded making a given transition (success=1) and those who failed (success=0) in each group, defined by categories of independent variables and their combinations. By “odds ratios” we mean the ratios between the odds of selected groups to make the transition.

Insert Table 4 and Figure 9 About Here

Results presented in Table 4 show, among others, that a significant drop in the odds of men making the transition, which occurred between the second and third cohort, brought about only a slow increase in the odds of women. This provides significant support to the hypothesis that the growth in women's chances of attaining higher levels of education under the socialist regime, when the overall growth of educational opportunities was limited, was at the expense of a reduction of the chances for men (Boguszak, Matějů, Peschar 1990). As illustrated in Figure 9, the inequality in making the secondary transition among individuals of different *educational* background has not changed throughout the entire period. Apparently the role of "cultural resources" remained stable and relatively strong, especially between those whose parents achieved tertiary education and those whose parents achieved lower secondary education.

Model II was designed to test the hypothesis about the development of social origin represented by father's social class. This model retained all the constraints imposed on the interaction terms from the previous model except the interaction between the father's cohort and social class, because assuming this interaction to be constant over time, the model returned a statistically unsatisfactory fit. But when the interaction term allowing a change in father's social class in the last cohort was introduced, – according to hypothesis H2, Model II showed a much better fit ($L^2 = 26.1$, $df = 31$, $p=0.718$).¹⁹ We derived the following conclusions from the odds and selected odds ratios shown in Table 5 and Figure 10:

1. The effect of social origin represented by father's social class did not change throughout the period of the socialist regime period.
2. Consistent with hypothesis H2, only during the post-communist transformation did a significant increase occur in inequalities caused by the socioeconomic background represented by father's social class.
3. Consistent with hypothesis H3, this development was caused primarily by the significant decrease of the relative odds of the children of unskilled and semi-skilled workers; the odds ratios between the other social classes remained unchanged (in most cases relatively high) throughout the entire period.

Insert Table 5 and Figure 10 About Here

A test of a model that introduced both variables representing social origin (parent's education, father's social class) generated unstable results because of very low or zero frequencies in certain cells of multi-dimensional classifications. Model III was designed to assess whether the *socioeconomic* background represented by father's social class had an effect independent of the *cultural* dimension of social origin represented by parental education. In this model we introduced the education and social class of both parents but collapsed the classifications of both variables into two categories. Parents' education was recoded to distinguish between a relatively large group of families where none of the parents attained upper secondary education from another group in which at least one parent did (PED2: 1. lower secondary or lower, 2. higher secondary and higher). Similarly, in the case of the father's social class, we distinguished between a group of unskilled and semi-skilled workers and the rest (FCLS2: 1. unskilled and semi-skilled workers, 2. rest).

Using these variables, we tested the model allowing an increase in the overall chance of making the transition between secondary and tertiary education only in the last cohort, blocking any change in the effect of parent's education throughout the entire period but

¹⁹ The specification of the logit Model II is included in the Appendix.

permitting the change in the effect of father's class in the last cohort.²⁰ As expected, this model showed very good fit ($L^2 = 12.8$, $df = 14$, $p=0.543$). We derived the following conclusions from the odds and selected odds ratios shown in Table 6 and Figure 11:

1. During the socialist regime educational background was more important than class origin in determining the odds of making the transition between secondary and tertiary education, and the effects of both factors were stable over time.
2. Starting in 1989, the effect of educational background remained constant while the effect of the father's class increased sharply (as confirmed by Figure 11). These results are consistent with our hypotheses regarding the transition between secondary and tertiary education.

Insert Table 6 and Figure 11 About Here

The conditional models (I, II, and III) tested our hypotheses only on the population of respondents eligible to make the transition to tertiary education (secondary school graduates). The unconditional models (IV, V, and VI) tested the same hypotheses on the entire population, and addressed the development of the chances of attaining tertiary education inclusive of the prior effect of unequal access to secondary education. Attaining a secondary education has also been contested in both periods under study; we therefore expected a generally higher level of inequality than in the conditional models, but similar trends.

Table 7 and Figure 12 show the results of Model IV addressing the effects of educational background and gender. Although the model allows for significant changes in the chances of attaining tertiary education between the first three cohorts (mainly because of the improvement in the chances of women vis-à-vis men) while it assumes stability of inequality subsequently (Table 7), the odds ratios between groups defined by educational background did not change throughout the entire period (Figure 12). Regardless of gender and cohort, the odds of attaining tertiary education for a person of the highest educational background (with at least one parent having achieved tertiary education) were 13 times higher than those of a person with the lowest educational background (with none of the parents having attained higher than lower secondary education). Odds ratios between consecutive categories of educational background were also stable over time both for men and women; they were 4.3 between the second and first category and 3.0 between the third and second category.

Insert Table 7 and Figure 12 About Here

The effect of father's class (Table 8 and Figure 13), as represented by Model V, shows more complex patterns of development (Table 8). But aside from changes in the odds between men and women, already described above, changes in odds ratios appear only between the first and second and between the second and third cohorts, after which odds ratios remain constant. The odds ratios between the skilled workers and the lowest social class show stability throughout the historical period (Figure 14). In the most recent cohort, the chances of a person of the most privileged class attaining tertiary education were 8.7 times higher than those of a person of the least privileged class, regardless of gender.

Insert Table 8 and Figure 13 About Here

The results of Model VI, which included both father's class and educational background (Table 9 and Figure 14), show that the net effect of educational background has been constant over the entire period while that of class origin grew significantly during the post-communist transformation. The odds ratios between the lowest social class (semi-skilled and unskilled

²⁰ A formal specification of the logit Model III is included in Appendix 2.

workers) and all other classes were stable at a level of 1.9 throughout the first four cohorts, but more than doubled (4.6) toward the last cohort.

Insert Table 9 and Figure 14 About Here

Conclusions

Czech higher education has changed profoundly since 1989. The most important and rapid change occurred in its *autonomy*. Universities were granted almost full autonomy as early as 1990, and the principle of their self-government has not been challenged since. Universities used the newly acquired autonomy primarily to reform their curricula, expanding programs in the humanities and social sciences, and to eliminate political criteria in the recruitment of both faculty and students. Most of the schools also rid themselves of the old “nomenclatura,” whose primary mission was to look after the ideological integrity of university education before 1989.

There were two significant *structural* changes in the Czech tertiary education system: *decentralization*, made possible by the establishment of regional universities, and *diversification*, mostly the result of private colleges gradually filling the need for bachelor’s degree programs. Public universities did not make any strong move toward implementing a two-tier (binary) system of tertiary education. The effects of the amendment of 2000 to the Higher Education Act, which set a time frame for this structural reform, can be already recognized in the growing proportion of students enrolled to bachelor’s programs, but could not affect the results of our analysis based on the data collected before 1998.

Despite an almost complete formal autonomy, universities remain dependent on the state to a high degree. Several attempts to expand the multi-source financing by introducing cost-sharing features (tuition fees, loans, student allowances) have failed. Reliance on the public budget, which is under increasing pressure from other political priorities and an accumulated deficit, has led to a severe financial crisis of public universities. Even in this critical situation, universities played an active role in generating strong public resistance to the implementation of the cost-sharing principle.

Although the number of students rose by almost 60% between 1989 and 2001, educational opportunities were too few to meet the steeply rising demand for tertiary education. The chances of being admitted did not change and remained at about 50%. Because of rapid growth in the number of secondary school graduates and the steady accumulation of unsatisfied demand, the transition from secondary to tertiary education has become the most critical moment in the educational career of young people seeking tertiary education.

Based on developments in the structure of Czech higher education, of its financing, and its general accessibility, we formulated a general hypothesis whereby the period of *persisting inequality* under socialism was followed by one of *increasing inequality* during the post-communist transformation.

Analysis of an extensive set of data acquired by merging data files from surveys carried out after 1989 focused on testing three hypotheses. The first one was derived from the “Maximally Maintained Inequality” theory (Raftery and Hout 1996). The core assumption of this hypothesis was that there were two reasons behind the absence of a decrease in socioeconomic inequalities in access to higher education during the socialist era:

1. Very slow growth of opportunity in university education prevented the saturation of the demand for higher-level education among groups with traditionally high educational aspirations. Thus, consistent with the arguments presented by Raftery and Hout, the tertiary education system remained highly selective, especially for potential candidates from lower social strata.

2. Despite initial efforts to demonstrate the advantages of the socialist system (an experiment to increase participation of the lower social strata through a quota system), the new socialist elite soon managed to press its advantages in attaining higher education for their own children.

This hypothesis found strong support in the results of logit models. The only significant change that occurred during the socialist regime was the decrease of inequalities between men and women, resulting in a marked drop of the men's odds of attaining tertiary education. Differences in the chances of making the transition from secondary to tertiary education of individuals with different sociocultural background represented by parents' education remained unchanged throughout the socialist period. The same applies to the socioeconomic dimension of the social origin, represented by the fathers' class.

As far as the short post-socialist period is concerned, the analysis corroborated the hypothesis that inequalities in the chances of making the transition between secondary and tertiary education increased significantly. This development was caused by three reciprocally reinforcing processes:

1. Although the change of the political system created an opportunity for major democratization and decentralization of the tertiary system and for an unprecedented growth of educational opportunity at the tertiary level, the autonomy granted to universities made it possible for them to scuttle reforms that would have transformed the tertiary education system from a unitary into a binary one, thereby preserving its elitist character.
2. Transition to mass tertiary education was slowed down, among other factors, by an absence of will on the part of university officials to adopt multi-source financing. Combined with the slow growth of tertiary education financing from public sources (the Czech Republic remained close to the bottom of the OECD scale), this triggered a severe financial crisis of the tertiary education system and an actual slowdown in the growth of opportunity. Despite a clear slowdown in the demographic growth of the relevant age group, the proportion of admitted applicants stabilized at 50% over the long term. As a result of these processes, competition for making the transition to the tertiary education system has become fierce.
3. The conspicuous growth of socioeconomic inequalities after the first stage of the post-communist transformation brought about the formation of genuine social classes, turned the class of manual workers into the of losers of the post-communist change. Consistent with the theory of rational action presented by Goldthorpe and Breen (Goldthorpe 1996, Goldthorpe and Breen 1997), we expected children from families of manual workers to lose in the strong competition and their relative odds to make the transition to tertiary education to diminish.

The analysis confirmed this hypothesis. After 1989, there was a noticeable increase of inequality in access to higher education, mainly because of the substantial decrease in the odds of children from manual worker backgrounds. The results of the analysis confirm that this change originated from the *socioeconomic* dimension of the inequalities, as described by Goldthorpe, rather than from the *sociocultural* dimension, as stressed by proponents of the theory of cultural capital (the effect of parents' education remained constant). Thus the increase of inequalities in access to higher education that occurred in the Czech Republic after 1989 was caused by factors that can be called *structural*: the rigid structure of the tertiary education system and the gradually shaping class structure of society.

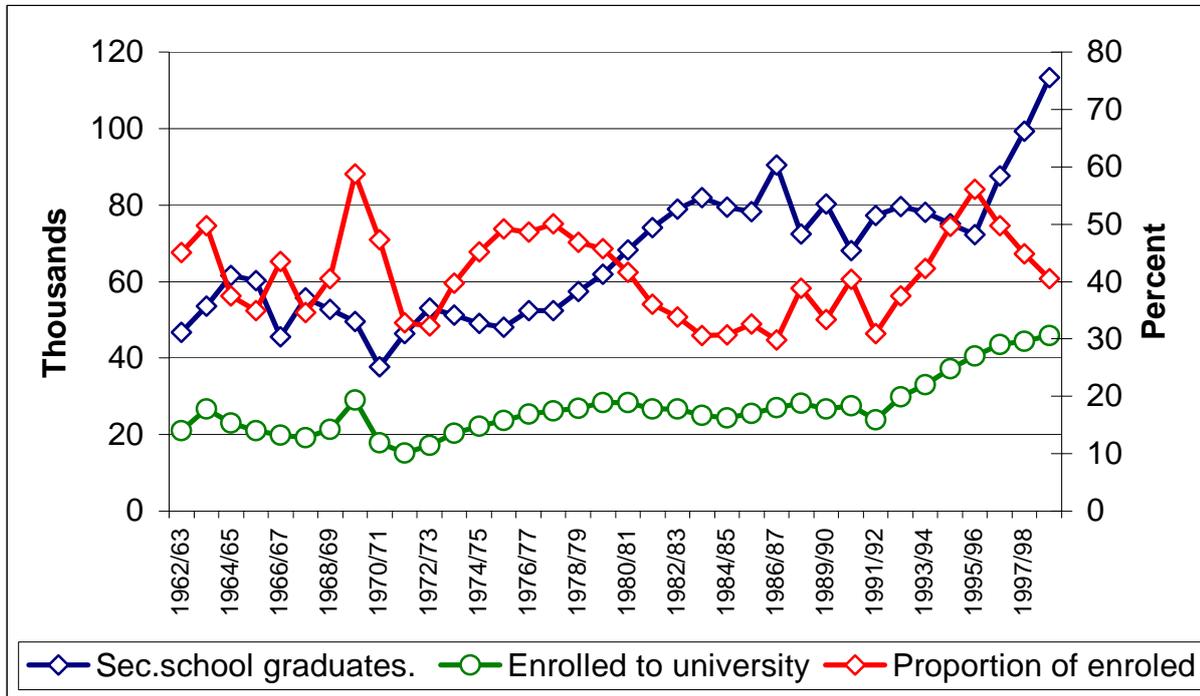
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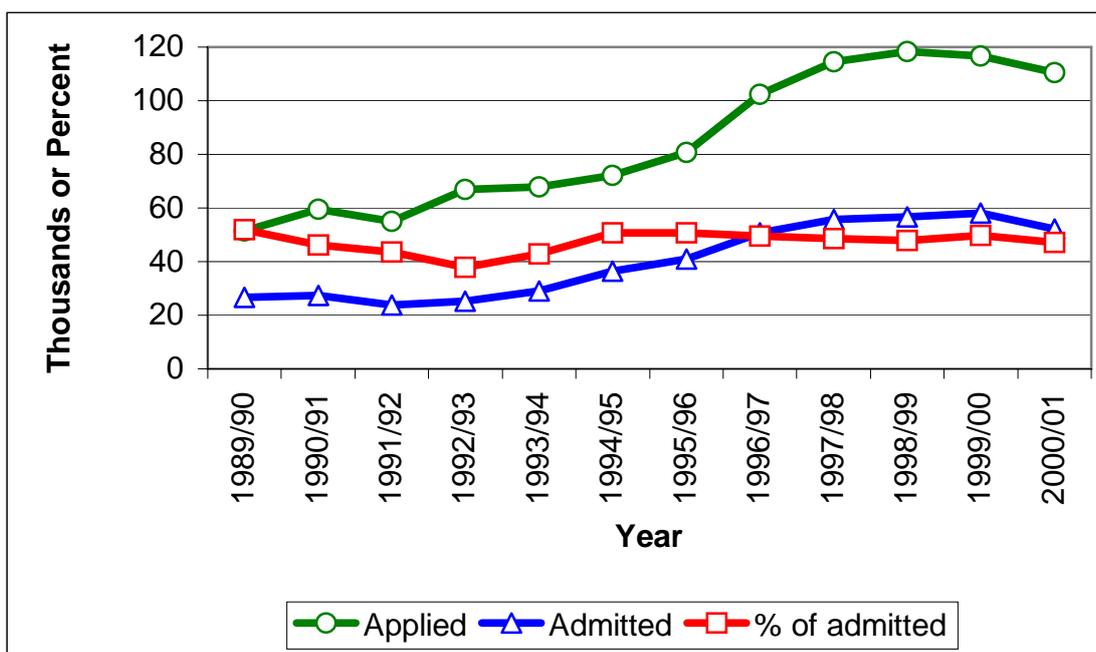
Tables and Figures

Figure 1: Secondary school graduates, enrolled in university, and the proportion enrolled between 1962 and 1999 in the Czech Republic, including part-time students.



Sources: Vývojová ročenka školství v České republice 1989/90 - 1998/99 [Yearbook of education development in the Czech Republic 1989/90 – 1998/99]. 1999. Praha: ÚIV. Statistika školství z let 1962 až 1989 [Education Statistics from the Years 1962 to 1989]. Praha: Ústav školských informací [Institute of Information on Education]. Historická ročenka školství v České republice 1953/54 – 1997/98 [Historical Yearbook of Education in the Czech Republic 1953/54 – 1997/98]. 1998. Praha: ÚIV.

Figure 2: Number of applicants for tertiary education, admitted students, and ratio of admitted to applicants after 1989 in the Czech Republic.



Source: UIV (Institute for Information in Education).

Table 1: Number of students at different levels of tertiary education in the Czech Republic: 1992-2002.

Academic year	All students	All undergraduate students	Proportion of students in bachelor's programs ¹	Proportion of postgraduate students ²
1992/1993	117,637	114,185	11.0	2.9
1993/1994	127,137	122,456	12.8	3.7
1994/1995	136,566	129,453	21.7	5.2
1995/1996	148,433	139,774	24.9	5.8
1996/1997	166,135	155,868	23.5	6.2
1997/1998	173,826	162,373	24.3	6.3
1998/1999	193,036	179,089	18.1	7.2
1999/2000	196,195	181,601	18.4	7.4
2000/2001	199,825	184,000	18.6	7.9
2001/2002	211,545	194,312	20.6	8.2

1. Proportion of students in bachelor's programs among all undergraduate students

2. Proportion of postgraduate students among all students

Source: Ministry of Education, Youth and Sport.

Table 2: Number of institutions and students in higher education in Central and Eastern Europe in the academic year 2000/01.

Country	Institutions				Students			
	Public		Private		Public		Private	
	Number	%	Number	%	Number	%	Number	%
Albania	11	100.0	0	0.0	23,704	100		0.0
Belarus	42	73.7	15	26.3	241,100	87	35,900	13.0
Bulgaria	79	89.7	9	10.3	215,676	88.5	27,916	11.5
Croatia	17	65.4	9	34.6	117,205	98.6	1,646	1.4
Czech Rep.	28	66.7	14	33.3	213,207	99.0	2,000	1.0
Estonia	14	40.0	21	60.0	38,511	74.8	12,963	25.2
Hungary	30	48.4	32	51.6	255,943	85.7	42,561	14.3
Latvia	20	60.6	13	39.4	78,156	87.3	11,353	12.7
Lithuania	38	90.4	4	9.6
Macedonia	2	66.7	1	33.3	39,978	97.7	923	2.3
Moldova	57	50.0	57	50.0	79,713	77.4	23,210	22.6
Poland	115	37.1	195	62.9	1,106,798	70.1	471,443	29.9
Romania	57	40.7	83	59.3	322,129	71.1	130,492	28.9
Russian Fed.	607	62.9	358	37.1	4,270,800	90.0	470,600	10.0
Slovak Rep.	18	90.0	2	10.0	125,054	99.3	842	0.7
Slovenia	2	18.1	9	81.9	64,989	95.7	2,900	4.3
Ukraine	816	83.3	163	16.4

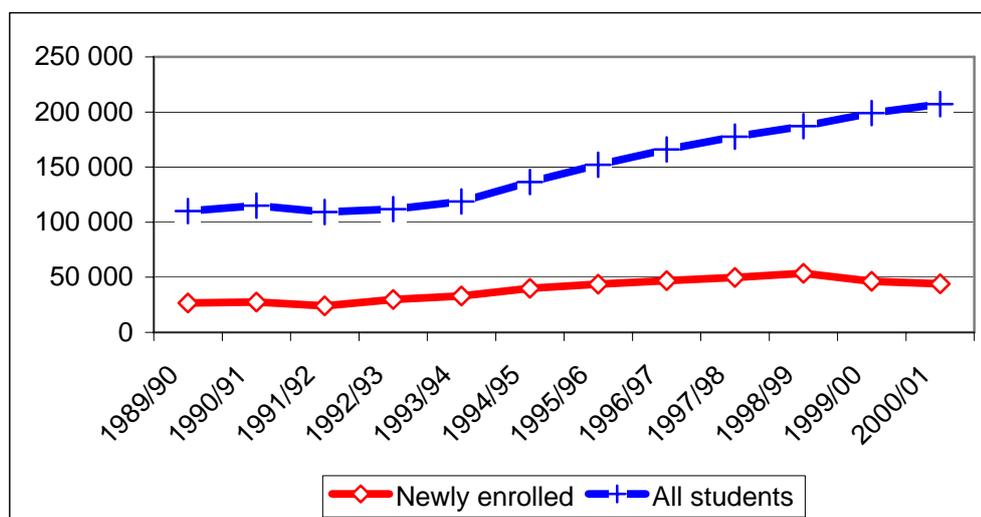
Source: UNESCO-CEPES

Table 3: Basic indicators of financing public tertiary education in the Czech Republic: 1994 - 2001.

Year	Number of students (thousand)	Nominal state subsidy (thousand CZK)	Cumulative inflation (%)	Real state subsidy per student (thousand)	Number of students per teacher
1994	132	7122	100	54	10.6
1995	144	7315	110	46	11.4
1996	157	9721	120	52	12.2
1997	169	9477	131	43	13.0
1998	179	9765	142	39	13.6
1999	191	10500	157	35	14.4
2000	197	10642	160	34	14.5
2001	211	11970	168	34	15.3

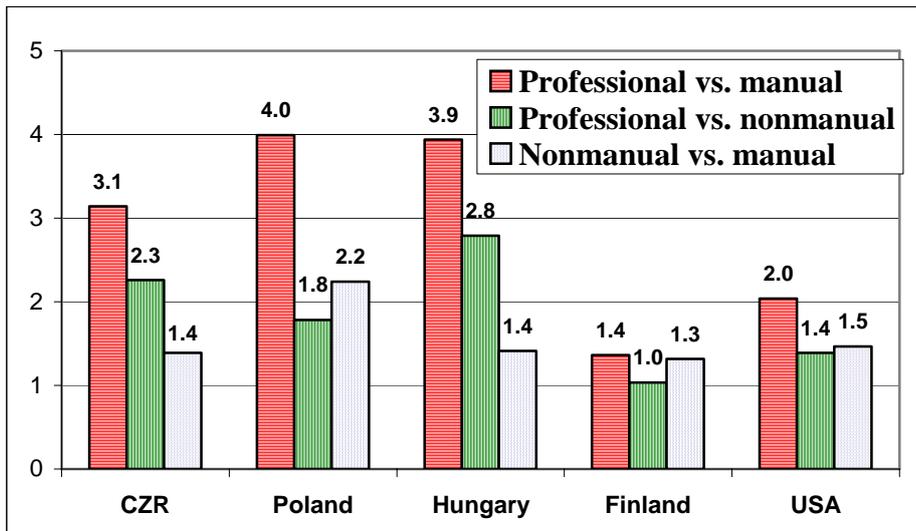
Source: Ministry of Education, Youth and Sport.

Figure 3: Number of newly enrolled and total number of students at public institutions of higher education.



Source: Ministry of Education, Youth and Sport.

Figure 4: Ratios of chances for achieving tertiary education between individuals of different family class background (father's occupation) in 1998: persons 20-35 years of age.



Source: SIALS
Source: ISSP 1992, 1999

Figure 5: Respondent's education by cohort.

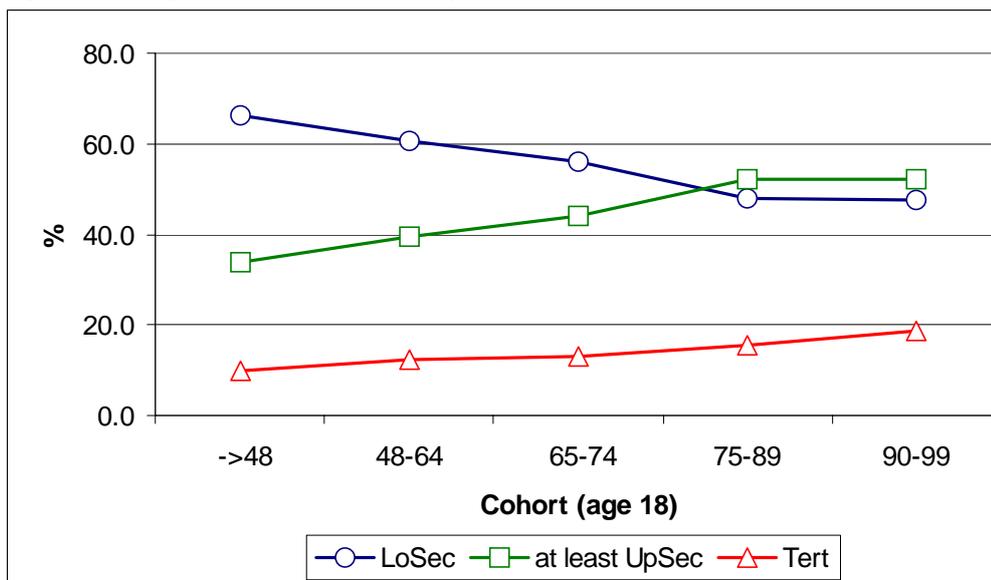


Figure 6: Individuals eligible to enter tertiary education (with completed upper secondary education) and those who passed the second transition (completed tertiary education) by gender and cohort (in %).

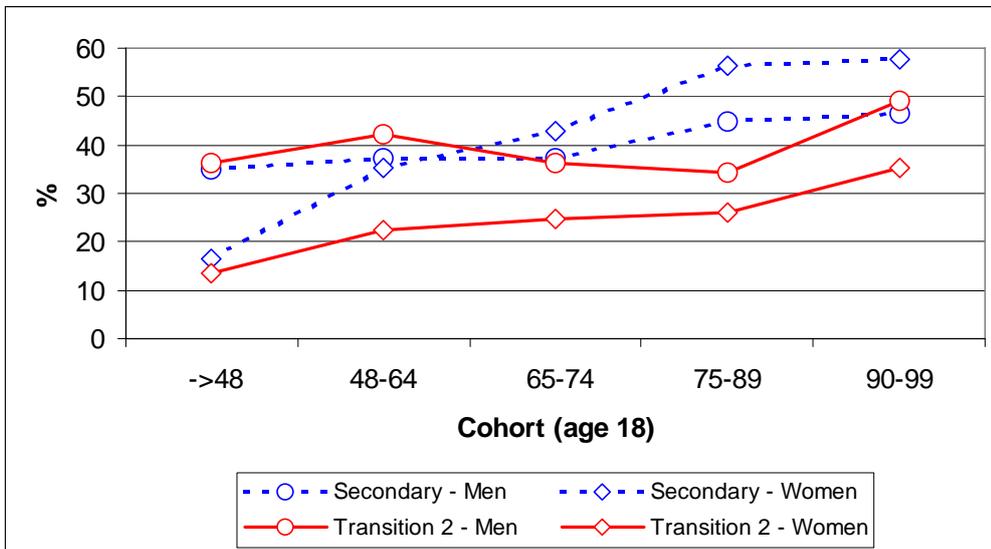


Figure 7: Individuals who completed upper secondary education by father's class and cohort (in %).

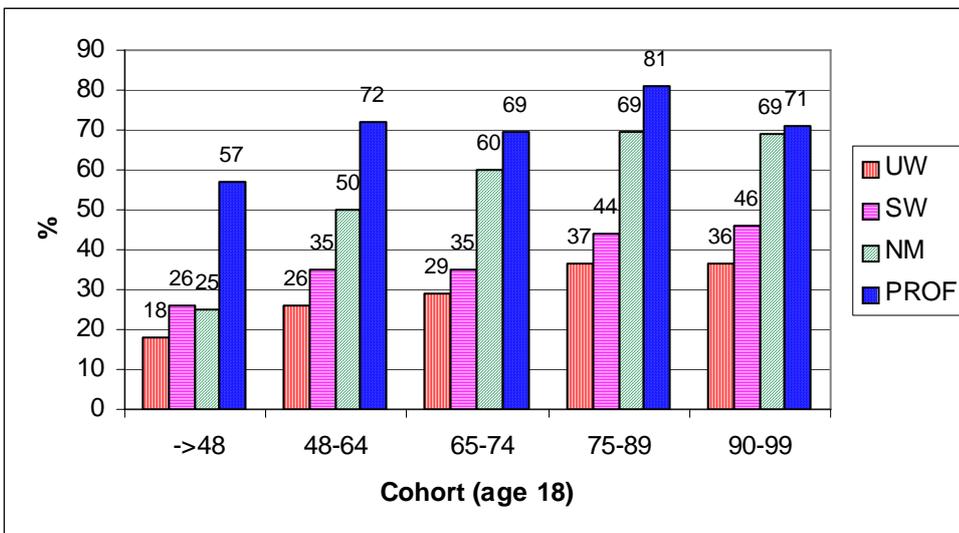


Figure 8: Individuals who succeeded in the second transition by father's class and cohort (in %).

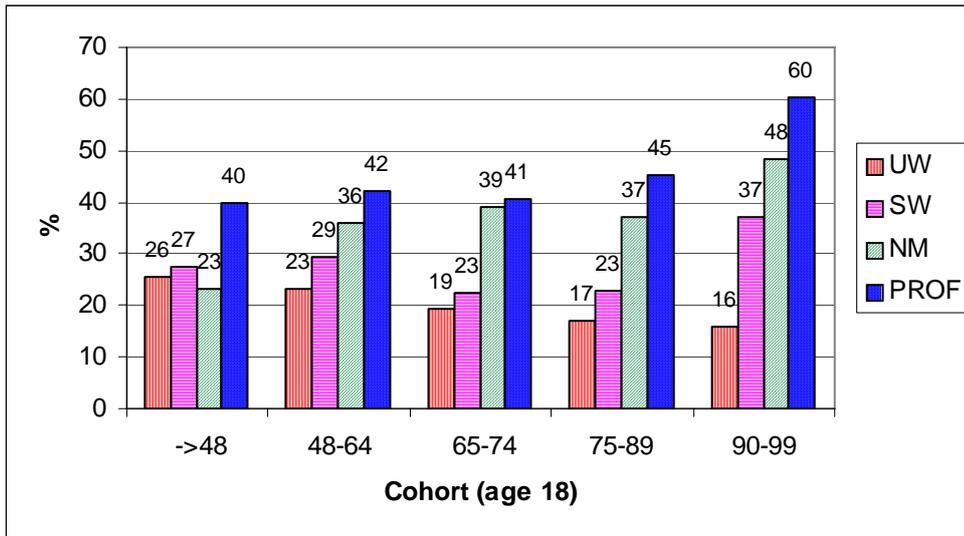


Table 4. Odds of making the second transition: effects of gender and parents' education (Model I).

COHORT	PARENTS' EDUCATION	GENDER	odds
(1), (2) before 1948, 1948 – 1964	(1) lower secondary or lower	(1) male	0.4988
		(2) female	0.1649
	(2) higher secondary	(1) male	1.1067
		(2) female	0.3667
	(3) tertiary	(1) male	2.4682
		(2) female	0.8135
(3), (4) 1965 – 1974, 1975 – 1989,	(1) lower secondary or lower	(1) male	0.2940
		(2) female	0.1845
	(2) higher secondary	(1) male	0.6529
		(2) female	0.4096
	(3) tertiary	(1) male	1.4494
		(2) female	0.9095
(5) 1990 – 1999	(1) lower secondary or lower	(1) male	0.3938
		(2) female	0.2470
	(2) higher secondary	(1) male	0.8744
		(2) female	0.5485
	(3) tertiary	(1) male	1.9409
		(2) female	1.2178

Model fit: L2 = 20.5, df = 24, p=0.666.

Alternative to Table 4.

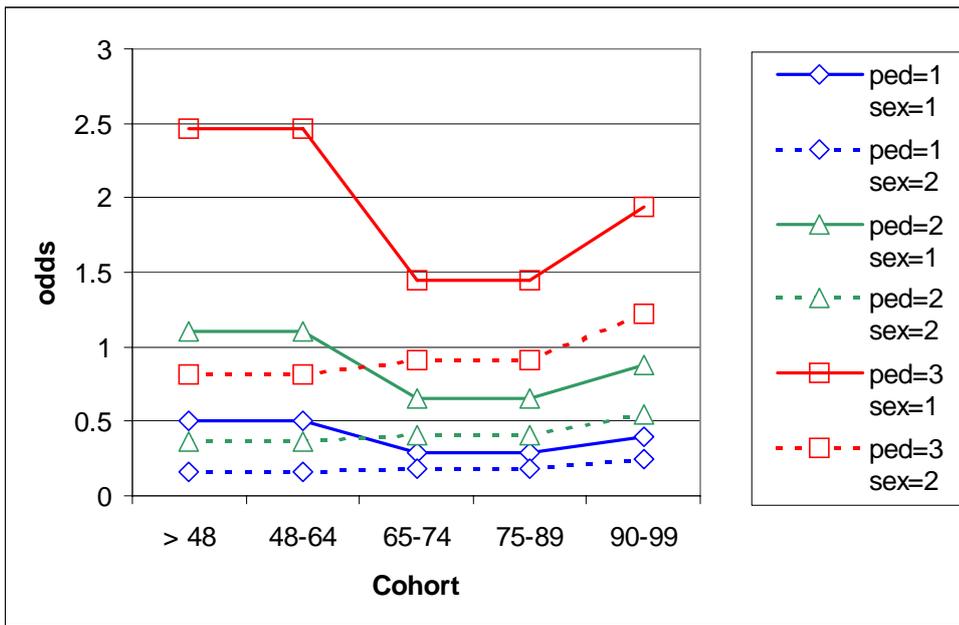


Figure 9: Odds ratios for the second transition between groups defined by parents' education, for both men and women, predicted by Model I.

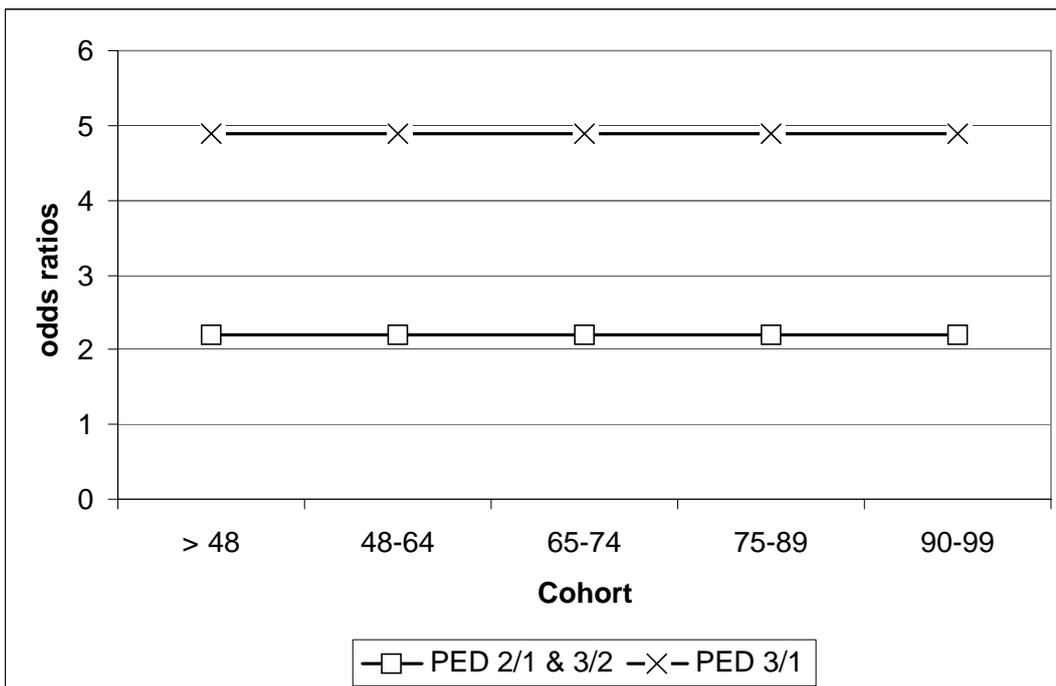


Table 5. Odds of making the second transition: effects of gender and father's class (Model II).

COHORT	FATHER'S CLASS	GENDER	odds
(1), (2) before 1948, 1948 – 1964	(1) unskilled, semi-skilled	(1) male	0.4245
		(2) female	0.1430
	(2) skilled workers	(1) male	0.5499
		(2) female	0.1852
	(3) routine non-manual	(1) male	0.9845
		(2) female	0.3316
	(4) professionals, self-employed	(1) male	1.3502
		(2) female	0.4545
(3), (4) 1965 – 1974, 1975 – 1989,	(1) unskilled, semi-skilled	(1) male	0.3110
		(2) female	0.1949
	(2) skilled workers	(1) male	0.4029
		(2) female	0.2523
	(3) routine non-manual	(1) male	0.7215
		(2) female	0.4520
	(4) professionals, self-employed	(1) male	0.9889
		(2) female	0.6197
(5) 1990 – 1999	(1) unskilled, semi-skilled	(1) male	0.2366
		(2) female	0.1482
	(2) skilled workers	(1) male	0.7416
		(2) female	0.4646
	(3) routine non-manual	(1) male	1.3277
		(2) female	0.8318
	(4) professionals, self-employed	(1) male	1.8201
		(2) female	1.1404

Model fit: $L^2 = 26.1$, $df = 31$, $p=0.718$.

Alternative to Table 5

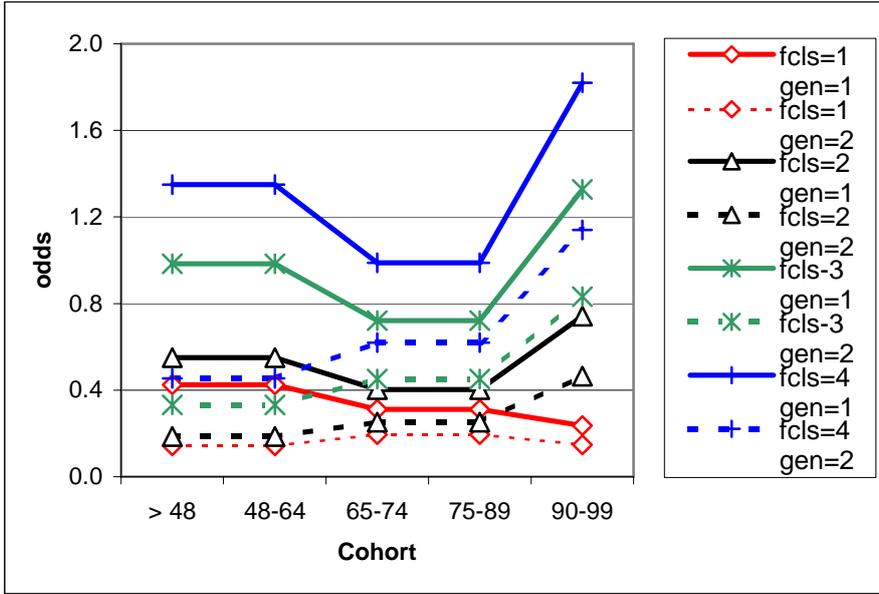


Figure 10: Odds ratios for the second transition between groups defined by father's class, for both men and women, predicted by Model II.

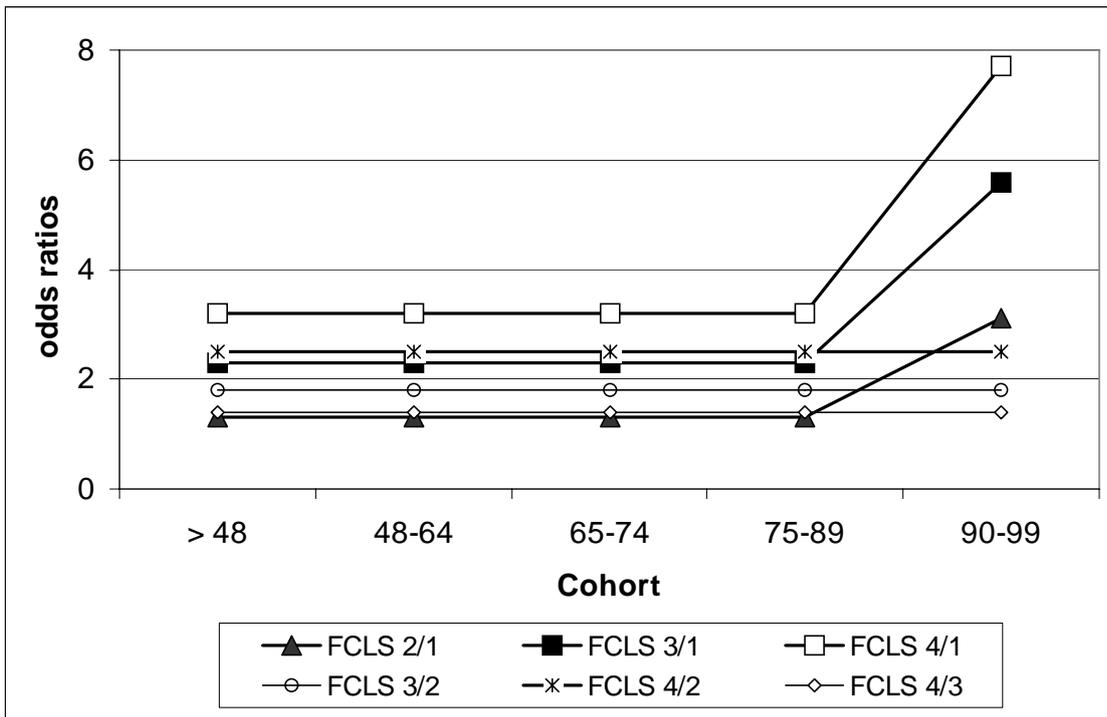


Table 6. Odds of making the second transition: effects of parents' education and father's class (Model III).

COHORT	PARENTS' EDUCATION	FATHER'S CLASS	odds
(1), (2) before 1948, 1948 – 1964	(1) lower secondary or lower	(1) unskilled, semi-skilled	0.2335
		(2) others	0.3384
	(2) higher	(1) unskilled, semi-skilled	0.5625
		(2) others	0.8165
(3), (4) 1965 – 1974, 1975 – 1989,	(1) lower secondary or lower	(1) unskilled, semi-skilled	0.1906
		(2) others	0.2762
	(2) higher	(1) unskilled, semi-skilled	0.4594
		(2) others	0.6662
(5) 1990 – 1999	(1) lower secondary or lower	(1) unskilled, semi-skilled	0.1065
		(2) others	0.4659
	(2) higher	(1) unskilled, semi-skilled	0.2569
		(2) others	1.1233

Model fit: $L^2 = 12.8$, $df = 14$, $p=0.543$.

Alternative to Table 6.

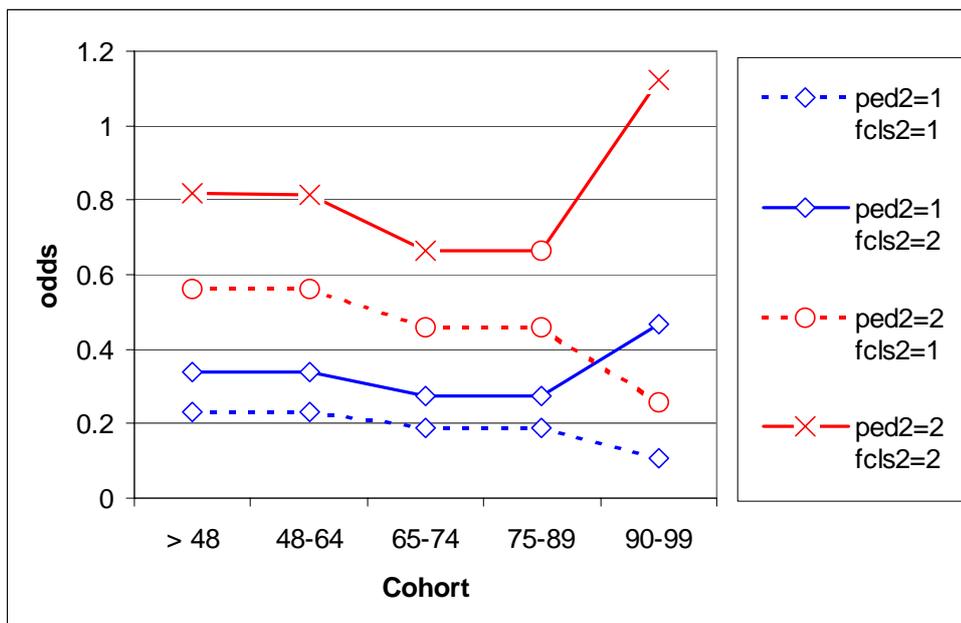


Figure 11: Odds ratios for the second transition between groups defined by parents' education and father's class, for both men and women, predicted by Model III.

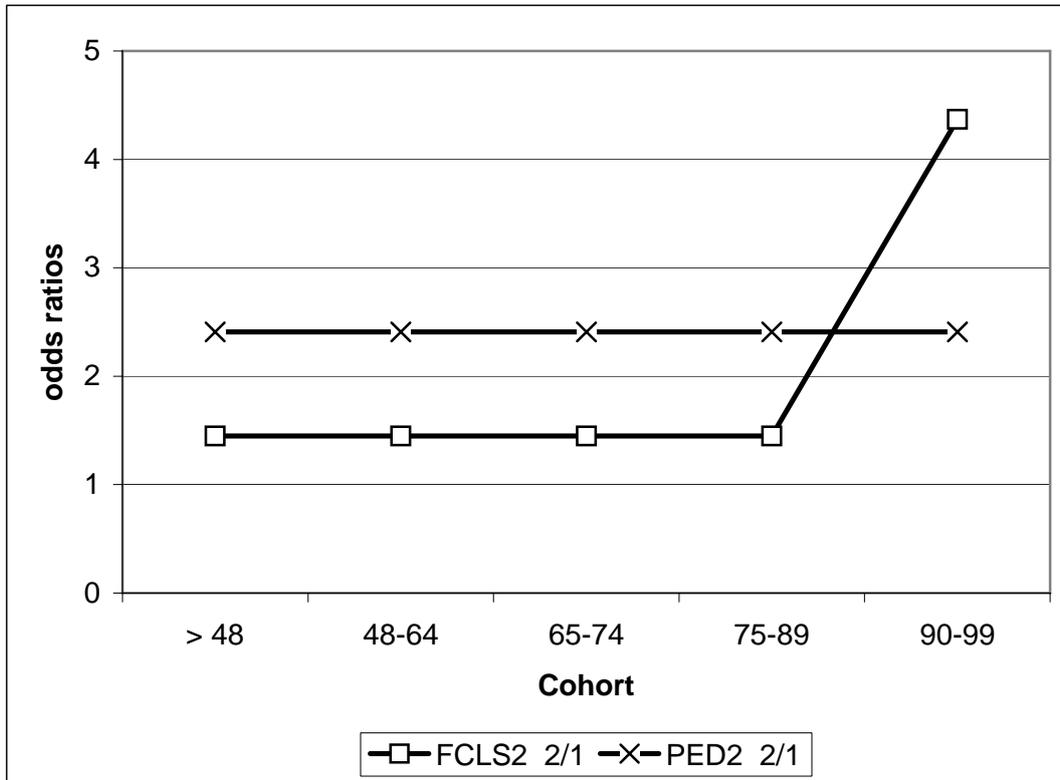


Table 7. Odds of achieving tertiary education: effects of parents' education and gender (Model IV).

COHORT	PARENTS' EDUCATION	GENDER	odds
(1) before 1948	(1) lower secondary or lower	(1) male	0.1143
		(2) female	0.0169
	(2) higher secondary	(1) male	0.4886
		(2) female	0.0721
	(3) tertiary	(1) male	1.4648
		(2) female	0.2167
(2) 1948 – 1964	(1) lower secondary or lower	(1) male	0.1249
		(2) female	0.0528
	(2) higher secondary	(1) male	0.5334
		(2) female	0.2253
	(3) tertiary	(1) male	1.6018
		(2) female	0.6762
(3), (4), (5) 1965 – 1974, 1975 – 1989, 1990 – 1999	(1) lower secondary or lower	(1) male	0.0677
		(2) female	0.0603
	(2) higher secondary	(1) male	0.2890
		(2) female	0.2573
	(3) tertiary	(1) male	0.8668
		(2) female	0.7720

Model fit: $L^2 = 16.2$, $df = 22$, $p=0.807$.

Alternative to Table 7.

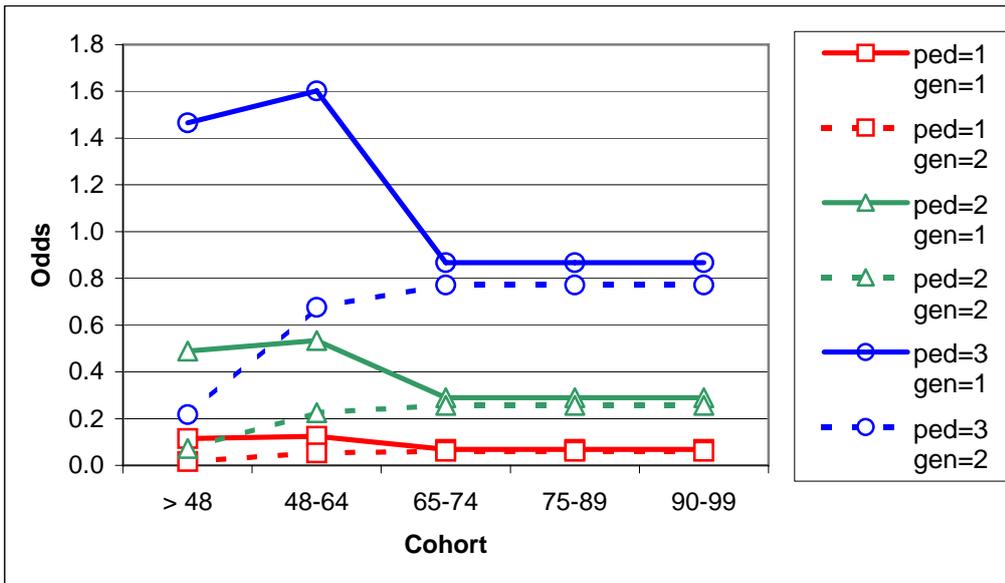


Figure 12: Odds ratios for achieving tertiary education between groups defined by parents' education, for both men and women, predicted by Model IV.

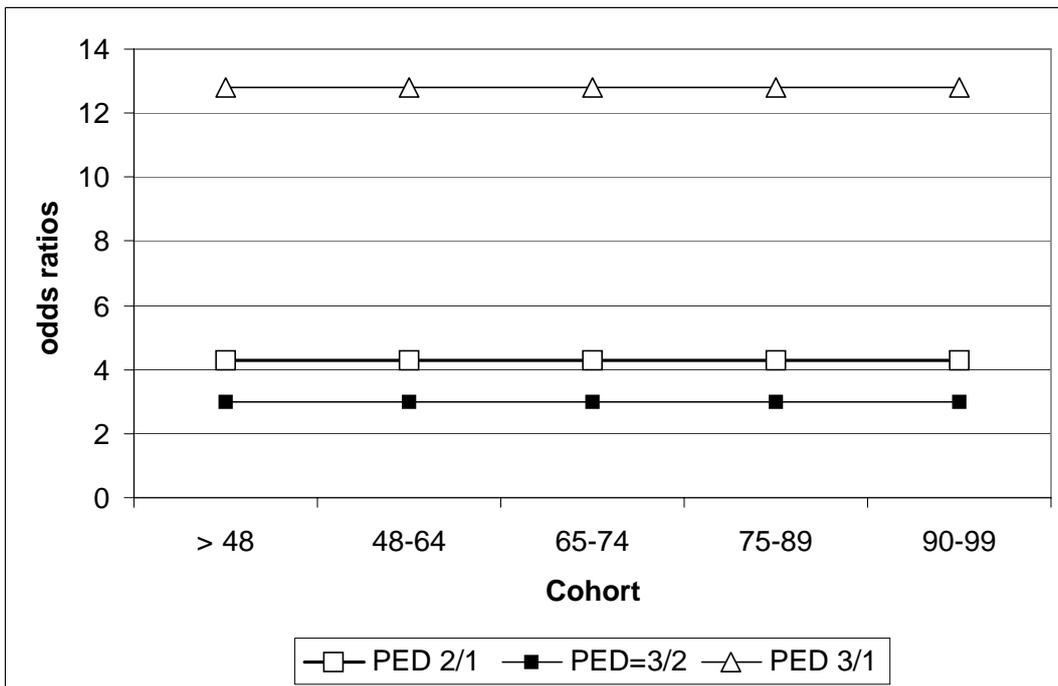


Table 8. Odds of achieving tertiary education: effects of father's class and gender (Model V).

COHORT	FATHER'S CLASS4	GENDER	odds
(1) before 1948	(1) unskilled, semi-skilled	(1) male	0.0734
		(2) female	0.0083
	(2) skilled workers	(1) male	0.1298
		(2) female	0.0147
	(3) routine non-manual	(1) male	0.2402
		(2) female	0.0272
	(4) professionals, self-employed	(1) male	1.0110
		(2) female	0.1147
(2) 1948 – 1964	(1) unskilled, semi-skilled	(1) male	0.1005
		(2) female	0.0440
	(2) skilled workers	(1) male	0.1777
		(2) female	0.0779
	(3) routine non-manual	(1) male	0.3288
		(2) female	0.1441
	(4) professionals, self-employed	(1) male	0.5238
		(2) female	0.2295
(3) 1965 – 1974	(1) unskilled, semi-skilled	(1) male	0.0541
		(2) female	0.0490
	(2) skilled workers	(1) male	0.0957
		(2) female	0.0867
	(3) routine non-manual	(1) male	0.2944
		(2) female	0.2667
	(4) professionals, self-employed	(1) male	0.4690
		(2) female	0.4249
(4), (5) 1975 – 1989 1990 – 1999	(1) unskilled, semi-skilled	(1) male	0.0729
		(2) female	0.0660
	(2) skilled workers	(1) male	0.1289
		(2) female	0.1168
	(3) routine non-manual	(1) male	0.3966
		(2) female	0.3592
	(4) professionals, self-employed	(1) male	0.6317
		(2) female	0.5721

Model fit: $L^2 = 25.5$, $df = 28$, $p=0.601$.

Alternative to Table 8

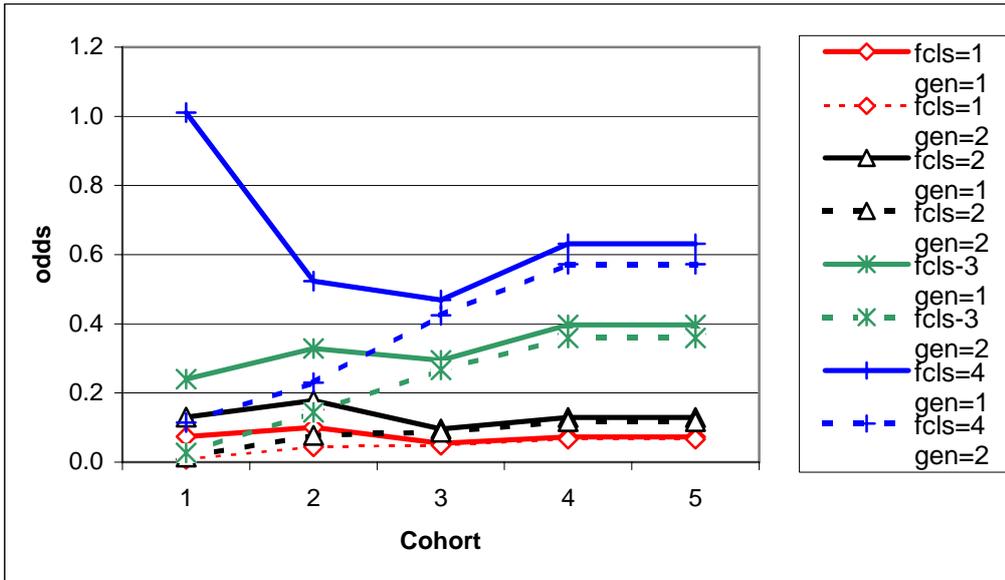


Figure 13: Odds ratios for achieving tertiary education between groups defined by father's class, for both men and women, predicted by Model V.

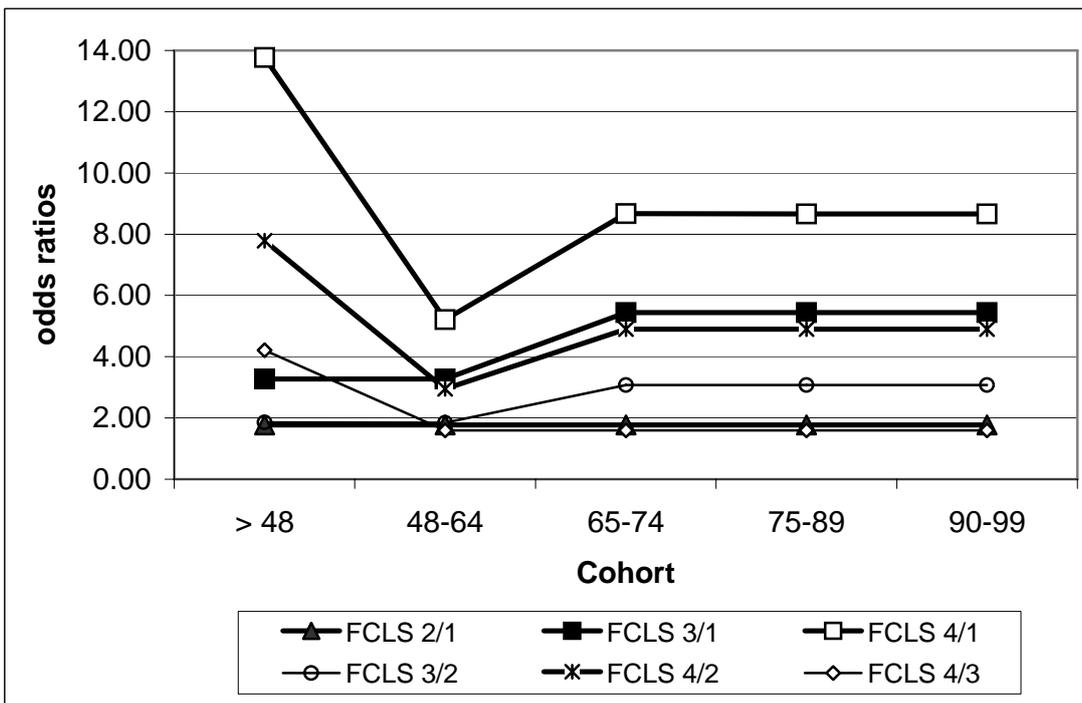


Table 9. Odds of achieving tertiary education: effects of parents' education and father's class (Model IV).

COHORT	PARENTS' EDUCATION	FATHER'S CLASS	odds
(1) before 1948	(1) lower secondary or lower	(1) unskilled, semi-skilled	0.0347
		(2) others	0.0652
	(2) higher secondary, tertiary	(1) unskilled, semi-skilled	0.1628
		(2) others	0.3042
(2), (3), (4) 1948 – 1964, 1965 – 1974, 1975 – 1989	(1) lower secondary	(1) unskilled, semi-skilled	0.0487
		(2) others	0.0915
	(2) higher secondary, tertiary	(1) unskilled, semi-skilled	0.2269
		(2) others	0.4268
(5) 1990 – 1999	(1) lower secondary or lower	(1) unskilled, semi-skilled	0.0222
		(2) others	0.1025
	(2) higher secondary, tertiary	(1) unskilled, semi-skilled	0.1037
		(2) others	0.4779

Model fit: $L^2 = 15.3$, $df = 14$, $p = 0.355$.

Alternative to Table 9.

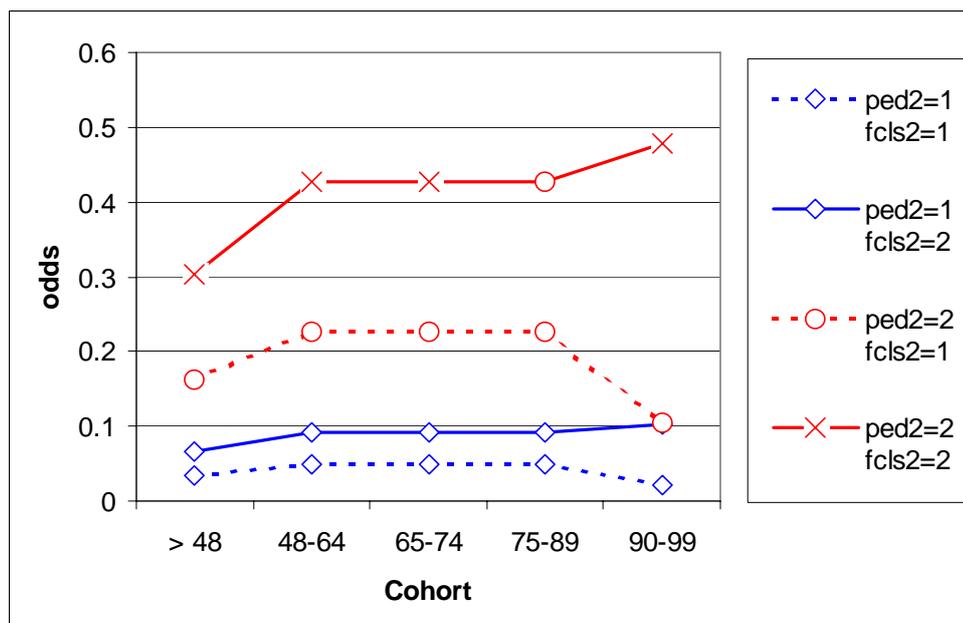
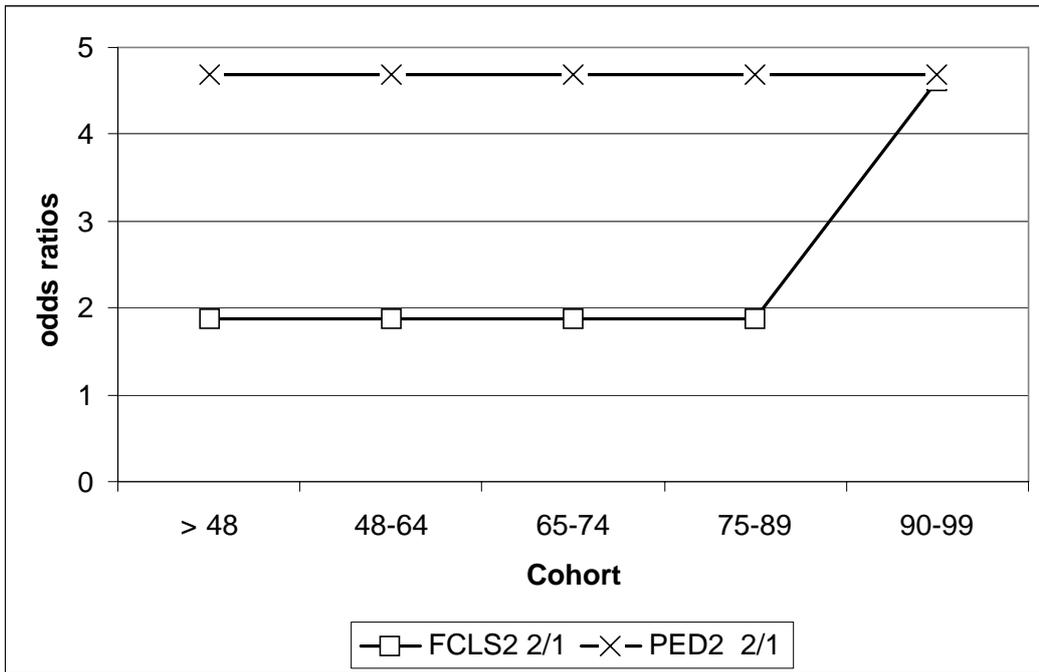


Figure 14: Odds ratios for the second transition between groups defined by parents' education and father's class, for both men and women, predicted by Model VI.



Appendix

Distributions of variables used in the analysis.

Variable	COH						
		→1948	1948-64	1965-74	1975-89	1990-99	Total
RED	LSEC	76.3	63.8	59.6	48.9	54.5	59.3%
	HSEC	17.4	24.9	28.5	36.8	38.5	29.7%
	TERT	6.3	11.3	11.9	14.3	7.0	11.0%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
SUCCES	0 – no	73.5	68.3	70.2	70.5	58.6	68.3%
	1 – yes	26.5	31.7	29.8	29.5	41.4	31.7%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
PED	LSEC	91.4%	81.1%	68.3%	56.6%	37.7%	66.8%
	HSEC	5.4%	15.5%	23.9%	30.8%	42.7%	24.1%
	TERT	3.2%	3.4%	7.9%	12.6%	19.6%	9.1%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
FCLS	UW	38.2	40.8	38.4	32.8	31.7	36.6%
	SW	24.5	29.8	31.1	33.1	29.4	30.3%
	NM	32.2	22.2	16.5	19.0	21.4	20.9%
	PROF	5.1	7.2	14.1	15.1	17.5	12.2%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
GEN	MEN	38.5	45.6	47.0	46.5	51.0	46.1%
	WOMEN	61.5	54.4	53.0	53.5	49.0	53.9%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Specification of logit models in SPSS

Model I

```

LOGLINEAR SUCCESS(0,1) BY COHORT(1,5) PED(1,3) GEN(1,2)
  /CONTRAST(SUCCESS)=SIMPLE(1)
  /CONTRAST(COHORT)=REPEATED
  /CONTRAST(PED)=POLYNOMIAL
  /CONTRAST(GEN)=REPEATED
  /PRINT=DEFAULT ESTIM
  /DESIGN=SUCCESS SUCCESS BY COHORT(2) SUCCESS BY COHORT(4)
    SUCCESS BY PED(1) SUCCESS BY GEN
    SUCCESS BY COHORT(2) BY GEN.

```

Model II

```

LOGLINEAR SUCCESS(0,1) BY COHORT(1,5) FCLS(1,4) GEN(1,2)
  /CONTRAST(COHORT)=REPEATED
  /CONTRAST(FCLS)=REPEATED
  /CONTRAST(GEN)=REPEATED

```

```

/PRINT=DEFAULT ESTIM
/DESIGN=SUCCESS SUCCESS BY COHORT(2) SUCCESS BY COHORT(4)
      SUCCESS BY FCLS SUCCESS BY GEN
      SUCCESS BY COHORT(4) BY FCLS(1)
      SUCCESS BY COHORT(2) BY GEN.

```

Model III

```

LOGLINEAR SUCCESS(0,1) BY COHORT(1,5) PED2(1,2) FCLS2(1,2)
/CONTRAST(SUCCESS)=SIMPLE(1)
/CONTRAST(COHORT)=REPEATED
/PRINT=DEFAULT ESTIM
/DESIGN=SUCCESS SUCCESS BY COHORT(2) SUCCESS BY COHORT(4)
      SUCCESS BY PED2 SUCCESS BY FCLS2
      SUCCESS BY COHORT(4) BY FCLS2.

```

Model IV

```

LOGLINEAR TERC(0,1) BY COHORT(1,5) PED(1,3) GEN(1,2)
/CONTRAST(TEEC)=SIMPLE(1)
/CONTRAST(COHORT)=REPEATED
/CONTRAST(PED)=REPEATED
/PRINT=DEFAULT ESTIM
/DESIGN=TEEC TERC BY COHORT(1) TERC BY COHORT(2)
      TERC BY PED TERC BY GEN
      TERC BY COHORT(1) BY GEN
      TERC BY COHORT(2) BY GEN.

```

Model V

```

FCLS2(1,2)
/CONTRAST(TEEC)=SIMPLE(1)
/CONTRAST(COHORT)=REPEATED
/CONTRAST(PED2)=REPEATED
/CONTRAST(FCLS2)=REPEATED
/PRINT=DEFAULT ESTIM
      FCLS2.

```

Model VI

```

LOGLINEAR TERC(0,1) BY COHORT(1,5) FCLS(1,4) GEN(1,2)
/CONTRAST(TEEC)=SIMPLE(1)
/CONTRAST(COHORT)=REPEATED
/CONTRAST(FCLS)=REPEATED
/CONTRAST(GEN)=REPEATED
/PRINT=DEFAULT ESTIM
/DESIGN=TEEC TERC BY COHORT(1) TERC BY COHORT(2) TERC BY COHORT(3)
      TERC BY FCLS TERC BY GEN
      TERC BY COHORT(1) BY FCLS(3)
      TERC BY COHORT(2) BY FCLS(2)
      TERC BY COHORT(1) BY GEN
      TERC BY COHORT(2) BY GEN.

```

Model VI

```

LOGLINEAR TERC(0,1) BY COHORT(1,5) PED2 FCLS2(1,2)
/CONTRAST(TEEC)=SIMPLE(1)
/CONTRAST(COHORT)=REPEATED
/CONTRAST(PED2)=REPEATED
/CONTRAST(FCLS2)=REPEATED
/PRINT=DEFAULT ESTIM
/DESIGN=TEEC TERC BY COHORT(1) TERC BY COHORT(4)
      TERC BY PED2 TERC BY FCLS2
      TERC BY COHORT(4) BY FCLS2.

```