Universidade de Aveiro
2006
Secção Autónoma de Ciências Sociais, Jurídicas e Políticas (Social, Juridical and Political Sciences)

Martina Vukasović

Ensino Superior e Estratificação Social na Sérvia 1990-2005

Higher Education and Social Stratification in Serbia 1990-2005

Universidade de Aveiro
2006
Secção Autónoma de Ciências Sociais, Jurídicas e Políticas (Social, Juridical and Political Sciences)

Martina Vukasović

Ensino Superior e Estratificação Social na Sérvia 1990-2005

Higher Education and Social Stratification in Serbia 1990-2005

Thesis presented to the University of Aveiro to fulfil the formalities essential to obtaining the degree of European Master in Higher Education (Erasmus Mundus), done under the scientific supervision of Dr. Cláudia S. Sarrico, Assistant Professor at the Department of Social, Juridical and Political Sciences of the University of Aveiro

Dedicated to Mirjana, Marina and William

the juri

president	Doutor Artur da Rosa Pires, Professor Catedrático Secção Autónoma de Ciências Sociais, Jurídicas e Políticas da Universidade de Aveiro
vogais	Doutora Maria Margarida da Fonseca e Castro Cardoso, Professora Auxiliar da Instituto de Ciências Biomédicas de Abel Salazar da Universidade do Porto
	Doutora Cláudia Sofia Sarrico Ferreira da Silva, Professora Auxiliar da Secção Autónoma de Ciências Sociais, Jurídicas e Políticas da Universidade de Aveiro (orientadora)

thanks

- to Cláudia S. Sarrico, for supervision, guidance and counselling,, but most of all for her dedication;
- to Margarida Cardoso, for crucial assistance with logistic regression models;
- to Lisbet Berg, Timo Keski-Petaja and Peter Maassen, for their comments and suggestions while this study was still in the proposal phase;
- to Vuk Tošić, for help with translation, amongst other;
- to Margareta Andrejić, Aleksandar Baucal and Desanka Radunović, for providing ideas and relevant information about Serbian education system;
- to the staff of the Centre for Education Policy, and especially to Zoran Grac and Bojan Komnenović; for their support and assistance in gathering relevant documents and information from Serbia, a task that was often close to “mission impossible”;
- to Kjersti&family&friends, Terhi&parents, Carla&Helena&Paulo, Lucia&Marina&Luis and Olesya for making Norway, Finland and Portugal homes away from home;
- to Roberta, for friendship;
- to Sjur Bergan, Jochen Fried, Gordana Nikolić and Samir Salim, for the support in “switching teams”;
- to Srbijanka Turajlić, for more than mentorship.

palavras-chave

base sócio-econômica, conclusão, desigualdade, desvantagem, educação superior, estratificação, exclusão, matrícula, progresso, Sérvia

resumo

O presente estudo focaliza questões sobre desvantagem e exclusão em educação superior na Sérvia no período entre 1990-2005. O estudo analisa como matrícula, progresso e conclusão em educação superior dependem de elementos como as bases sócio-econômicas dos alunos, baseando-se nos bancos de dados nacionais. A estrutura teórica foi construída com base nas idéias sobre formas de capital e reprodução em educação de Bourdieu, a teoria da perspectiva do curso da vida e as hipóteses da desigualdade mantida maximamente e da desigualdade mantida efetivamente. O estudo mostra que existe exclusão tanto interna quanto externa de alunos das classes menos privilegiadas e que progresso e conclusão em educação superior dependem também de elementos das bases sócio-econômicas dos alunos.

keywords

Completion, disadvantage, enrolment, exclusion, higher education, inequality, progress, Serbia, socio-economic background, stratification

abstract

The present study focuses on issues of disadvantage and exclusion in higher education in Serbia in the period 1990-2005. The study analyses how enrolment, progress and completion in higher education depends on elements of students´ socio-economic background on the basis of national statistical databases. The theoretical framework is built upon Bourdieu´s ideas on forms of capital and reproduction in education, the life course perspective, as well as the hypotheses of maximally maintained and effectively maintained inequality. The study shows that there is both external and internal exclusion of students from less privileged socio-economic backgrounds and that progress and completion of higher education also depends on elements of students´ socio-economic background.

Table of contents

1. INTRODUCTION 5

2. THE SERBIAN CONTEXT 8

2.1. Massification of education and educational attainment 8

2.2. The Serbian education system 16

2.3. Enrolment, progress and completion in higher education 18
2.3.1 Enrolment 19
2.3.2 Progress and completion 20

2.4. Social, political and economic context for 1990-2004 period 23

3. HIGHER EDUCATION AND SOCIAL STRATIFICATION 26

3.1. Educational and social stratification 26

3.2. Conceptualising and operationalising socio-economic background 29

3.3. Dynamics of reproduction of social stratification through education 31

3.4. Inequality, disadvantage, exclusion and under-representation in higher education 32

3.5. Theoretical considerations and the Serbian context 34

3.6. Theoretical framework for this study 35

4. METHODOLOGICAL CONSIDERATIONS 37

4.1 Research design and method 37

4.2 Sources of data and reliability issues 37

4.3 Concepts, indicators and variables 41
4.3.1 Concepts 41
4.3.2 Indicators of students´ socio-economic background 42
4.3.3 Variables 43

4.4 Data analysis 47
4.4.1 Preliminary exploratory analysis of cumulative statistics 47
4.4.2 Univariate and bivariate analysis of SV20 and SV50 databases 48
4.4.3 Multivariate analysis – logistic regression 49

5. HIGHER EDUCATION AND SOCIAL STRATIFICATION IN SERBIA 51

5.1 Patterns of enrolment, progress and completion 51

5.1.1 Enrolment 51
5.1.2 Progress 60
5.1.3 Completion 63

5.2 External and internal exclusion 70
5.2.1 External exclusion 70
5.2.2 Internal exclusion 72
5.2.3 Accumulated disadvantage from previous stages of education 78

5.3 Results of logistic regression modelling 79

6. CONCLUSION 84

REFERENCES 90

ANNEX 1 – DEFINITIONS OF KEY TERMS AND CONCEPTS ..... **ERRO! MARCADOR NÃO DEFINIDO.**

ANNEX 2 – CHANGES IN THE AVERAGE DURATION OF STUDIES IN PUBLIC UNIVERSITIES FOR DIFFERENT FIELDS OF STUDY ..... **ERRO! MARCADOR NÃO DEFINIDO.**

Tables

Table 1 Size of cohorts related to specific type and expected duration of higher education, according to the Census 2002. 15
Table 2 Gross enrolment ratio for different stages of education. 15
Table 3 Proportion of students in different types of HEI in two parts of period under research. 53
Table 4 Ethnicity of students and population for central Serbia and Vojvodina 56
Table 5 Distribution of students between the fields, for university and vocational higher education 60
Table 6 Progress of students expressed by categorical variable *progress_cat* 61
Table 7 Progress of students in different fields of study 61
Table 8 Measures of association between *new_or_repeat* and *year_of_study* 62
Table 9 Progress and repetitions with respect to year of study 63
Table 10 Average duration of studies, for different expected durations 65
Table 11 Average duration of studies, absolute and relative prolongation (1994-2004) .. 67
Table 12 Under-representation or over-representation in terms of enrolment and completion 71
Table 13 Correlation coefficients and related significance levels for initial enrolments. 72
Table 14 Measures of association and test of statistical independence between new enrolment or repetition and education of parents. 75
Table 15 Means and standard deviations for progress, for different levels of education of parents. 76
Table 16 Association between education of mother and progress of student through university HE, with respect to year of study. 77
Table 17 Association between education of parents and type of higher or secondary education 79
Table 18 Results of logistic regression 80

Figures

Figure 1 Educational attainment according to the 2002 census. 9
Figure 2 Number of pupils or students enrolled in specific level of education (primary, secondary and higher). 10
Figure 3 Total population of Serbia. 11
Figure 4 Live births per 1000 inhabitants. 12
Figure 5 Number of students in higher education (selected years). 13
Figure 6 The inequality cycle 35
Figure 7 Number of students in higher education from 1990-2005. 52
Figure 8 Initial enrolments in higher education. 53
Figure 9 Students from Bosnia and Herzegovina and Croatia studying in Serbia. 54
Figure 10 Declared ethnicity of students in the period 1990-2005, in central Serbia. 57
Figure 11 Declared ethnicity of students in the period 1990-2005, in Vojvodina. 58
Figure 12 Number of graduate students. 64
Figure 13 Age of initial enrolment and age of graduation of students who completed higher education. 66
Figure 14 Average duration of studies in public universities in the 1994-2004 period. 68
Figure 15 Average duration of studies in vocational higher education. 69
Figure 16 Average progress with respect to education of parents. 76
Figure 17 Ratio between number of students at initial enrolment and in the final year of study. 78
Figure 18 Average duration of studies at public universities, for different fields . **Erro! Marcador não definido.**

1. Introduction

The present study focuses on enrolment, progress and completion in higher education in Serbia in the period 1990-2004 and the influence the socio-economic background of students has on these three processes.

The relevance of the research is twofold: in terms of the development of the higher education system in Serbia and in terms of its contribution to higher education research. First of all, the research presented here should be seen in the light of heated debates about the reform of the study system in higher education in Serbia, reasons for high drop-out rates, prolonged duration of studies and discussion on the new funding system for higher education. So far, most of the actors have been focusing on the rigid study system as the key reason for the inefficiency of higher education, failing to acknowledge the possible influence of factors outside of the higher education institution (such as students´ socio-economic background) on enrolment, progress and completion. Furthermore, the research will attempt to establish links between changes in enrolment, progress and completion, on the one side, and changes in the system of (higher) education, demographic and wider social and economic changes, on the other side. In this respect, it may also be able to serve as an interesting case study of this process in the region of Western Balkans, which is potentially one of the contributions to higher education research as such. The relationship between social stratification and education in a former socialist system (such as Serbia) has not been the focus of much research, especially not when analysing social stratification with respect to higher education. This makes any comparison between Serbia and essentially capitalist societies in Western Europe or the USA impossible due to lack of data. Therefore, this study essentially seeks to explore the issue at hand and provide necessary information and guidance for further studies. Some of these future studies may decide to use additional data and more robust statistical analysis; they may also take the form of longitudinal studies or may take a more qualitative perspective on the matter.

The research is thus guided by the following research questions:

1. What are the main patterns of enrolment, progress and completion of higher education in the period 1990-2004 in terms of students´ socio-economic background?
2. What is the impact of changes in the systems of primary, secondary and higher education and overall social and demographic changes on these patterns?
3. Is there external exclusion in higher education - which social groups could be seen as disadvantaged in terms of enrolment, progress and completion of higher education in general (i.e. all types of higher education provision) and what could be the reasons for this disadvantage?
4. Is there internal exclusion in higher education – which social groups could be seen as disadvantaged in terms of enrolment, progress and completion of more prestigious forms of higher education (university higher education, more prestigious programmes) and what could be the reasons for this disadvantage?
5. How does this disadvantage relate to previous stages in education; i.e. how much of the disadvantage is accumulated through stages of education prior to higher education and how much it is the product of the higher education system?

The research is thus focused on the following concepts: enrolment, progress and completion of higher education, as well as the concepts of exclusion, disadvantage and socio-economic background. Chapter 3 "Higher education and social stratification" provides an extensive discussion about these concepts and Annex 1 provides a full list of terms and concepts used in this study. Here are the definitions for the six main concepts in use:

1. *enrolment* - refers to obtaining a status of a registered student of a specific year of studies at a higher education institution. When referring to registering as a student of the first year of studies for the first time the term used is *initial enrolment*;
2. *progress* - refers to the time it takes to enrol in the next year of study after initial enrolment in the current year of study (e.g. a first-year student becomes a second-year student);
3. *completion* - refers to obtaining a higher education qualification. Within this research, this term is limited only to undergraduate qualifications;
4. exclusion –
    a. *external exclusion* – refers to the process through which certain social groups are prevented from enrolling into any form of higher education whatsoever,
    b. *internal exclusion* – refers to the process through which certain social groups are prevented from enrolling into more prestigious types of higher education and more prestigious programmes/disciplines (e.g. law, medicine);
5. *disadvantage* - refers to the smaller likelihood of an event (initial enrolment, progress, completion) for a student with certain characteristics. E.g. a student of type A is considered to be disadvantaged in terms of initial enrolment in university higher education to the student of type B if A is less likely to enrol than B;
6. *socio-economic background (SEB)* - relates to diverse student characteristics such as: gender, age, education of parents, employment of parents, student's employment, and citizenship (Serbian, from countries of former Yugoslavia, other foreign), ethnic/national identity.

For reasons of better operationalisation, this research uses the concept of enrolment instead of access. While access relates to the opportunity of being a student (and this is theoretically possible for any person who has completed 4-year secondary education), enrolment relates to obtaining the status of student, i.e. being registered as a student in a specific higher education institution, in a given year of study. In that respect, the research distinguishes between initial enrolment (enrolling into the first year of study for the first time in a given institution) and enrolment in general (enrolling into any year of study, with information if it is for the first time or if it is a repeated enrolment).

This study is adopting an essentially quantitative modernist approach. It understands elements of SEB as objective categories (except perhaps for ethnicity), quantifiable and fixed in time. It seeks to make preliminary inferences about the scope and nature of external and internal exclusion with respect to student's SEB, in order to analyse to what extent the hypothesis of *maximally maintained inequality – MMI* (Raftery and Hout, 1993), *effectively maintained inequality – EMI* (Lucas, 2001), *life*

course perspective – LCP (Lucas, 2001; Archer et al., 2003) and the postulated inequality cycle (see Chapter 3 "Higher education a and social stratification") can be applied to the Serbian higher education context.

The core data used in the study consist of official statistics regarding enrolment and completion of higher education as well statistical data related to general demography or education as a whole. The research also relied on analysis of changes in legislative framework and/or organisation of various stages of education in Serbia, as well as wider social, political and economic circumstances relevant for the period under study. The methods of data analysis were quantitative in nature, including various univariate and bivariate analysis as well as logistic regression modelling.

The next chapter will provide relevant information about the education system of Serbia, as well as an overview of important social, economic and political changes during the period under research. Chapter 3 describes the most important theoretical perspectives on the relationship between social stratification and education, as well as important guidelines for operationalising the concept of socio-economic background. It also includes a discussion as to what extent these theoretical considerations are applicable to Serbia and concludes with a description of a theoretical framework used in this study. Chapter 4 is dedicated to methodology. The chapter contains a discussion on the validity and reliability of the data, followed by a description of the statistical tools used to analyse the data. Chapter 5 presents the main findings of the study, organised around the research questions. By way of conclusion, Chapter 6 presents the mains conclusions of the study, relating them to the conceptual framework analysed in Chapter 3. It also discusses the strengths and weaknesses of the present study, and gives some recommendations with respect to data collection at the national level. Finally, it points to possible further developments of the issue of the relationship between education and social stratification in future studies.

2. The Serbian context

This chapter provides information about the Serbian education system, as well as relevant social, economic and political changes which took place during the period under research. It begins with an analysis of the massification of education and educational attainment in Serbia, and continues with descriptions of the whole Serbian education system. Enrolment, progress and completion in higher education are described in more detail. The chapter concludes with an overview of the period under research in terms of economic, social and political situation.

2.1. Massification of education and educational attainment

According to the census 2002, educational attainment in Serbia (population of 15 and older) in 2002 was as presented in Figure 1. In percentages:

- more than 5% has no education,
- around 16% completed some grades of primary education but did not graduate,
- almost 24% completed only primary education,
- 41% obtained a secondary education qualification,
- a bit more than 4% has a vocational higher education degree, and
- only a bit more than 6% completed university higher education.

It is also evident that, in terms of the entire population, women have lower educational attainment – they are more represented in lower education levels than men. Since this presents the overall population, it is useful for comparing the education of parents of the student population with overall education of population, to see the scope of external exclusion.

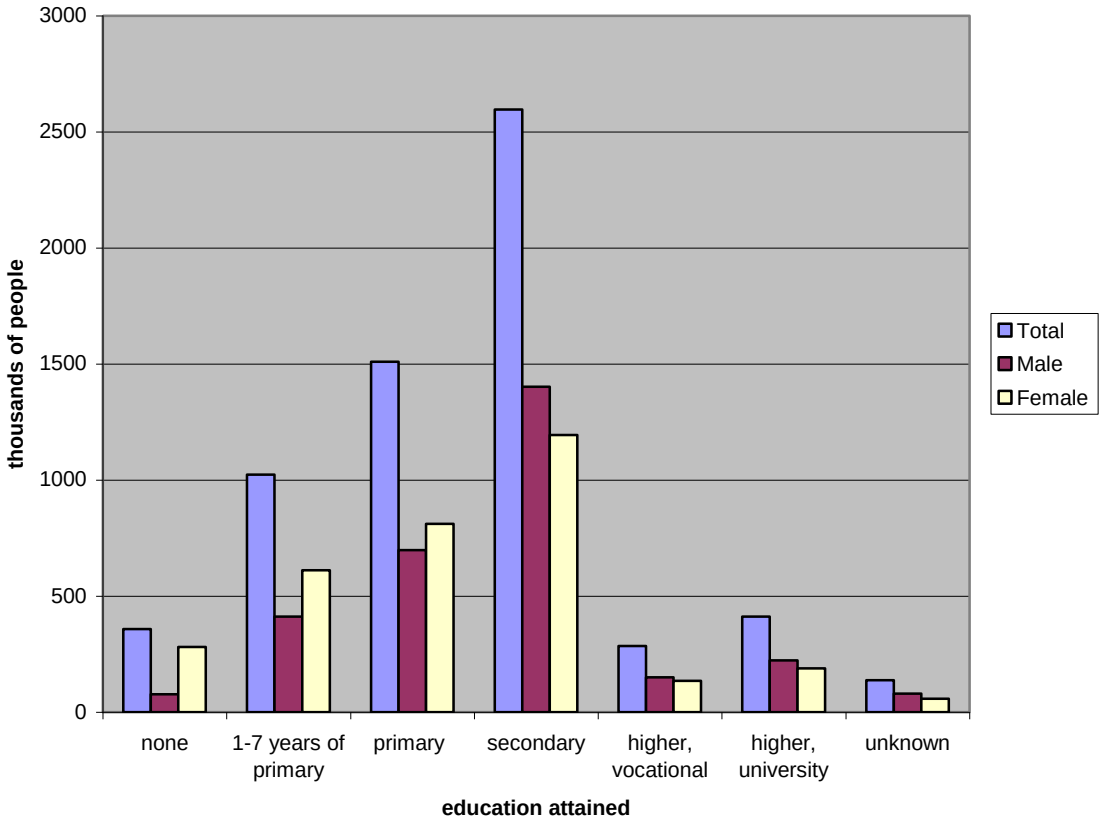

Figure 1 Educational attainment according to the 2002 census.

Source: Statistical Office of Serbia (2003).

The reasons for such low educational attainment are many. Serbia has been historically a rural country. Massification of primary, and subsequently of secondary and higher education, took place after WWII. Demographic and education statistics available for this research do not include a history of the population's educational attainment so it is not possible to analyse the changes in educational attainment levels over time. On the other hand, available data do show how the number of pupils (or students) enrolled into the specific level of education (primary, secondary, higher) developed over time. These data are presented on Figure 2.

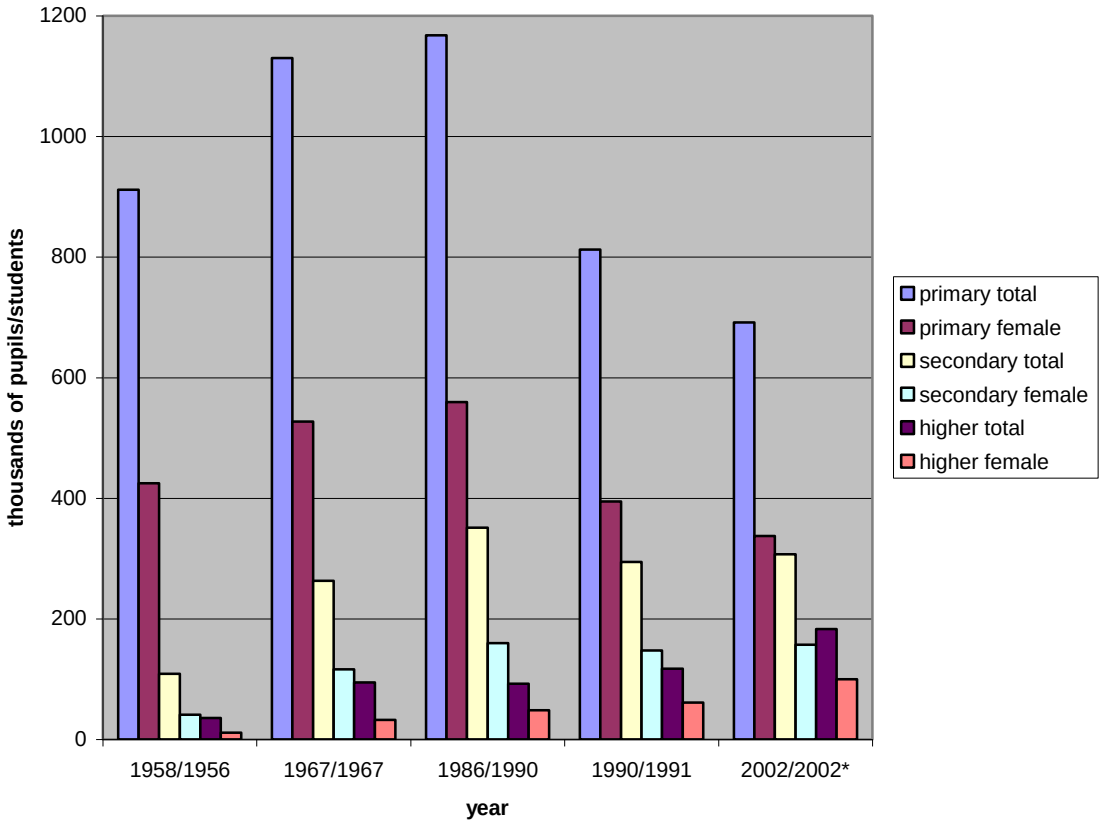

Figure 2 Number of pupils or students enrolled in specific level of education (primary, secondary and higher).

Source: Statistical Office of Serbia (2005b, chapter 22; 2006, chapter 21)[1].

For comparison, Figure 3 shows the total population of Serbia. The census data were taken for the years which are closest to the years related to data in Figure 2. Figure 4 presents the number of live births per 1,000 inhabitants in the period after WWII until 2002. It should be noted that in all figures, data after 1991 do not include Kosovo.

The increasing trend in the number of pupils or students enrolled in secondary or higher education could be attributed to the planned expansion of these two stages in education. Furthermore, as can be seen from Figure 3, the total population of Serbia has been increasing from 1961 to 1991, so it could be argued that the increase in number of pupils and students is to an extent following the trends in the population. However, the number of pupils enrolled in primary education does not follow this trend – it is first increasing (1958-1967) and then decreasing (see Figure 2).

[1] The first year in the time axis refers to the data about primary and secondary education and the second refers to higher education data, since the related sets of data do not have the same timeline. The data were paired on the basis of minimum time distance between the related sets. The data for 2002 do not include Kosovo, while all previous years presumably do.

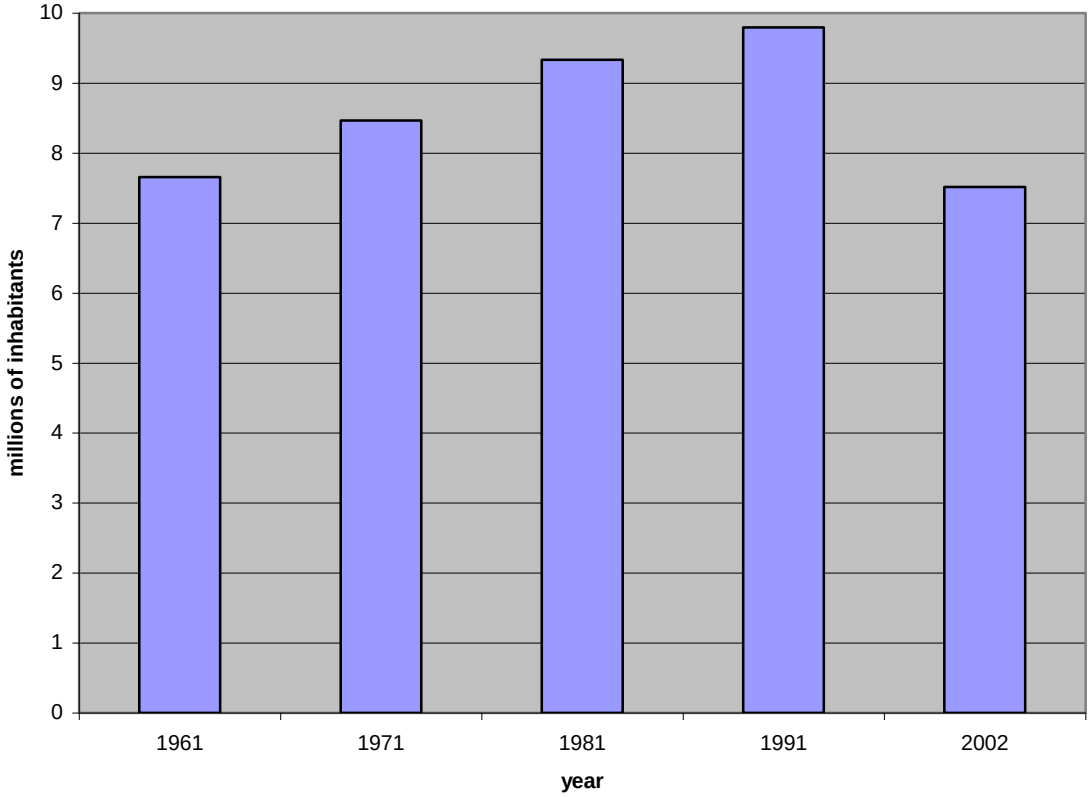

Figure 3 Total population of Serbia.

Source: Statistical Office of Serbia (2003).

This can be potentially attributed to the changes in the number of births. As can be seen from Figure 4, from 1948 to 1953 the number of live births per 1,000 inhabitants was around 27. Since 1953, it has been decreasing, only to become a bit more than 10 live births per 1,000 inhabitants in 2002. Changes in the number of live births influences sizes of cohorts related to specific stages in education (in the case of primary education, the offset is 6-7 years for Serbia).

Therefore, the increase in the number of primary school pupils from 1957 to 1961 could be a consequence of two factors:

1. relatively high number of live births in the 1948-1953 period, compared to the rest of 20th century, and
2. planned expansion of primary education with the idea of achieving universal primary education.

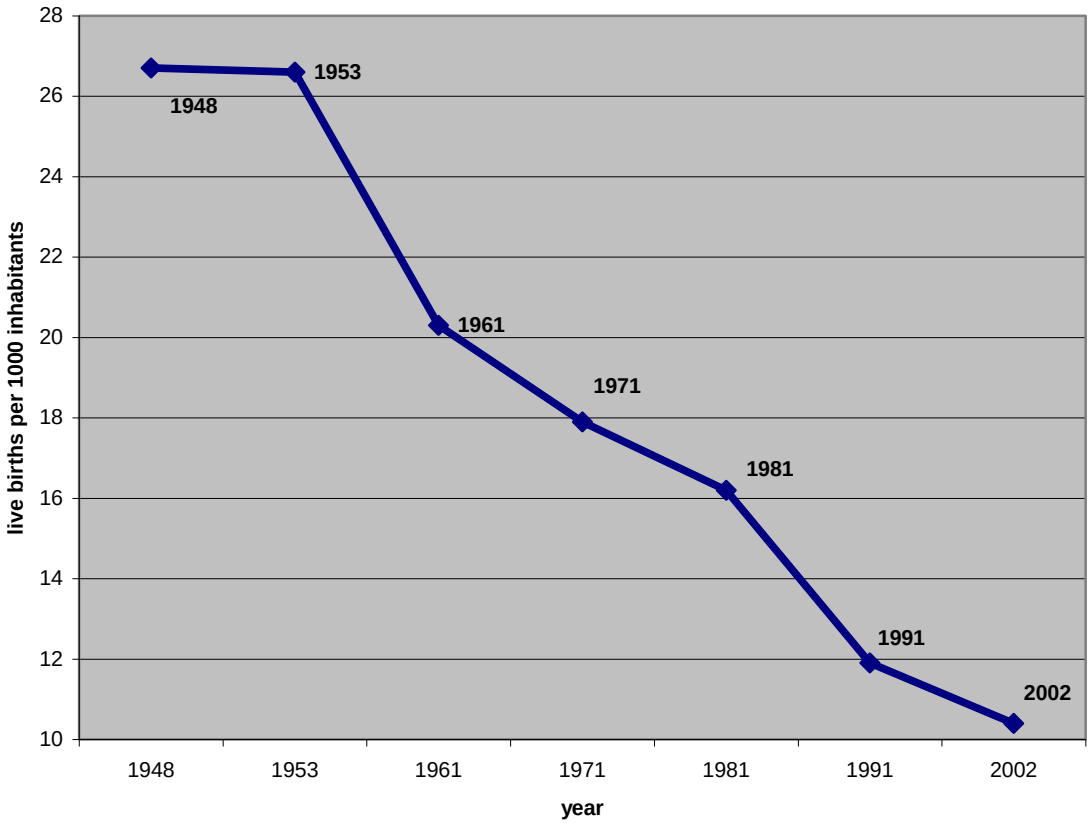

Figure 4 Live births per 1000 inhabitants.

Source: Statistical Office of Serbia (2005b, chapter 4).

Once universal primary education was achieved, the number of primary school pupils began to directly reflect the number of live births, which may be one of the possible explanations for the decrease from 1967 to 2002, coupled with exclusion of the ethnic Albanians in Kosovo (least developed region in former Yugoslavia or Serbia, with the fastest growing population) from the Serbian public education system by not allowing primary education in the Albanian language.[2] This eventually led to the emergence of a complete parallel system of education on all levels – primary, secondary and higher.

With respect to massification of secondary and higher education, it is interesting to notice that the number of secondary school pupils is relatively stable from the 60s onwards, despite the fact that the number of those completing primary education (and thus qualifying for secondary education) was increasing as well. Data after 1990 do not include Kosovo, but nevertheless the number of secondary school pupils is not changing significantly from the 60s till 1991, possibly suggesting that Kosovo was underdeveloped in terms of expansion of secondary education.

[2] The data about adult education, i.e. primary and/or secondary education of adults is collected separately. Therefore, the number of pupils presented here does not include adult education.

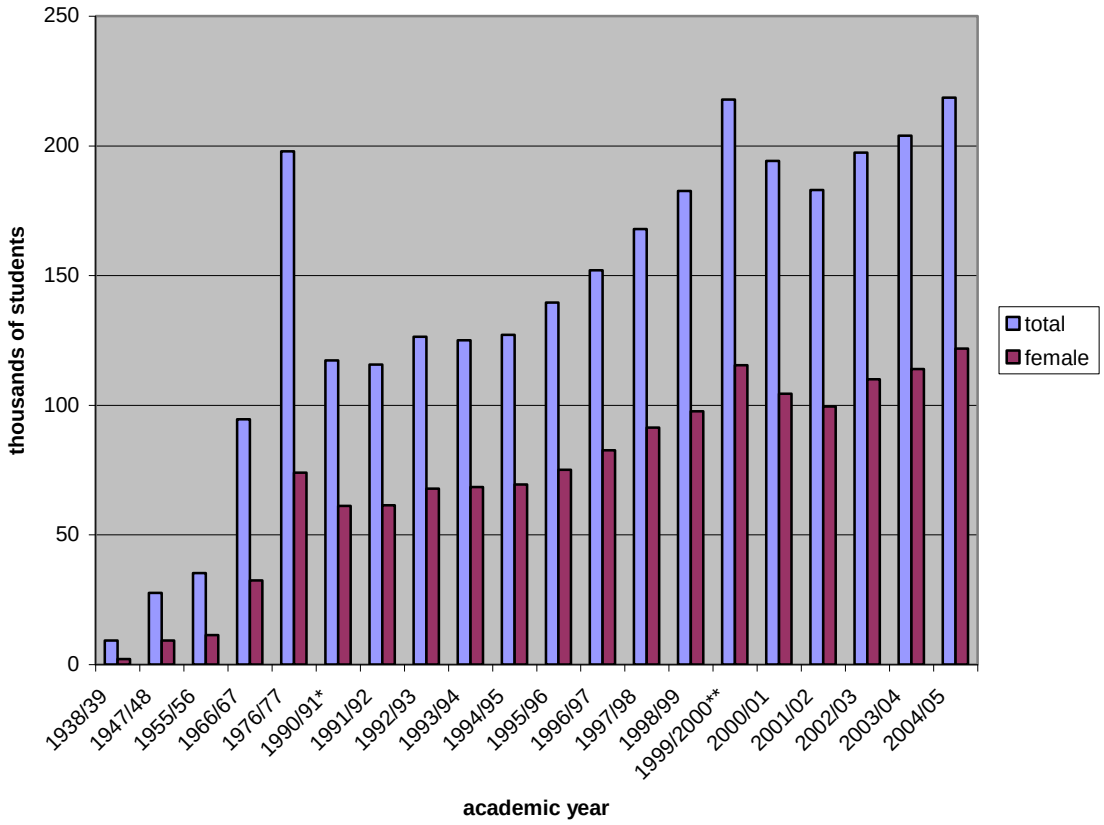

Figure 5 Number of students in higher education (selected years).

Sources: for data until 1990 – Statistical Office of Serbia (2005a), for 1990-2005 data – Author.
*** 1990/91 – data collection was not automated so these data are aggregated data, i.e. for this academic year it is not possible to distinguish between different categories of students except on the basis of gender**
**** 1999/2000 – there were no entrance exams or *numeri clausi* this year because of the NATO bombing**

As for higher education, available data presented in Figure 5 shows a significant increase in the period 1955/56 to 1976/77, with student numbers doubling every ten years. According to the Statistical Yearbook (2005, chapter 22) the number of higher education institutions also increased in this period: from 31 to 97 in the period 1955-1966 and then to 127 in the period 1966-1976[3]. This increase both in capacity and demand could be the consequence of the higher fertility rates after WWII and intentional expansion of the higher education system directed by the socialist regime. When it comes to the sharp decrease from 1976 to 1990, there are several difficulties with interpretation. First of all, it is possible that the data for 1990 do not include data for Kosovo, especially higher education in Albanian (while previous data should have included this as well). However, having in mind the low educational attainment in all stages of education in Kosovo, it is unlikely that the omission of Kosovo from official statistics could have caused such a steep decrease. The number of higher education institutions did not change from 1976 to 2001 (Statistical Office of Serbia, 2005b),

[3] It is worth mentioning that prior to 1958; there were no higher education institutions of any kind in Kosovo.

although this only refers to the total number of institutions and not to the capacity of each institution. Furthermore, as new institutions were formed in the 90s (notably private institutions) the fact that there were as many institutions in 1976 and in 2001 may also hide the information that some institutions were closed and some opened. However, it could also be that the coverage and methodology of data gathering changed, rendering data incomparable. During this research, it was not possible to obtain clear information about these issues from the Statistical Office of Serbia. Therefore, these interpretations should serve only as initial guidelines for understanding the process of expansion, since available data do not offer opportunities for deeper analysis (e.g. there is no information on the number of students in different types of higher education institutions or in different fields). Furthermore, no data was found about years "in between" the years presented in Figure 5.

When it comes to the period 1990-2005, the total number of students was continuously increasing and almost doubled during these 15 years, to reach approximately 220,000 students in 2004, the total number of institutions being 223. As is stated in the Figure 5, 1999 is an odd year, since all requirements for enrolment into higher education were lifted, i.e. freshmen enrolling into higher education 1999 did not have to take any entrance exams and there was no *numeri clausi*. The minor decrease from 2000 to 2001 is also present in the analysis of initial enrolments (freshmen only, see Chapter 5 "Higher education and social stratification in Serbia").

In terms of gross enrolment ratios (GER) for the three stages of education, the Statistical Office of Serbia systematically reports GER for primary and secondary education. Since GER for higher education is not readily available, it was calculated specifically for the purposes of this study – using census 2002 and data on student numbers[4]. GER refers to the ratio between the total number of students and the number of people in the related age cohorts. However, determining related age cohorts for higher education needs to take into account that for the period under research higher education programmes lasted from 2 to 6 years (see Table 1). Therefore, GER for higher education was calculated using (weighted) GERs for each higher education programme, i.e.:

$$GER^{HE} = GER^{vocational,\ 2\ years} + GER^{vocational,\ 3\ years} + GER^{university,\ 4\ years} + GER^{university,\ 5\ years} + + GER^{university,\ 6\ years}$$

Most students enrol at the age of 19 (44%, on the basis of data on completion), then at the age of 20 (16%), while those who enrol at the age of 18 or 21 are 8%. Thus, 19 is used for the initial age in the relevant cohort. Upper limit of the cohort was calculated on the basis of expected duration of studies, taking into account the so-called "graduation time" – foreseen additional 6-12 months for finishing the final thesis. According to enrolment data (see Chapter 4 "Methodological considerations" on the description of the source of data), total number of students in 2002/2003 was *F=197,322*. On the same basis, of the total number of students:

- *G=2%=0.02* is in 2-year vocational programmes,
- *H=20.4%=0.204* in 3-year vocational programmes,
- *I=48.4%=0.484* in 4-year university HE,

[4] Both GER and completion rate (thus also drop out rate) were calculated for 2002 due to the fact that census 2002 provided the exact data on the size of the related cohort.

- *J=16.3%=0.163* in 5-year university HE and
- *K=9.9%=0.099* in 6-year university HE.

Therefore, GER for e.g. 4-year university HE was calculated as follows:

$$GER^{university,\ 4\ years} = I*F/C$$

Table 1 Size of cohorts related to specific type and expected duration of higher education, according to the Census 2002.

Type of higher education	Size of cohort
Vocational HE, 2 year programme, 19-21	A = 305,057
Vocational HE, 3 year programme, 19-22	B = 407,552
University HE, 4 year programme, 19-23	C = 510,535
University HE, 5 year programme, 19-24	D = 614,192
University HE, 6 year programme, 19-25	E = 717,707

Source: Statistical Office of Serbia (2003)

Table 2 Gross enrolment ratio for different stages of education.

Stage of education	GER (2002) in %
Primary education	96.1
Secondary eduction	62.1
2-year vocational higher education	1.3
3-year vocational higher education	9.9
4-year university higher education	18.7
5-year university higher education	5.2
6-year university higher education	2.7

Sources: for primary and secondary education - Statistical Office of Serbia (2005b, Chapter 22), for higher education – Author

As can be seen from Table 2, the GER for higher education as a whole is 37.8%, and for university higher education it is 26.6%. The GER is decreasing as the stage of education increases.

As will be discussed in Chapter 3 “Higher education and social stratification“, even though GER puts Serbia inside Trow's (1970) mass higher education classification, educational stratification on the basis of student's socio-economic background is likely to take place, both in terms of external exclusion due to the fact that higher education is far from universal (Raftery and Hout, 1993) as well as in terms of internal exclusion through tracking (Lucas, 2001). To be able to analyse and understand the process of educational stratification, it is necessary to know the structure of the education system in Serbia and how the process of transition from one to the next stage of education (primary to secondary or secondary to higher education) works.

2.2. The Serbian education system

There are three main stages in the Serbian education system: primary, secondary and higher education, the latter including both undergraduate and postgraduate (master, doctoral) studies.

Primary education is compulsory for all children age 6 or 7 to 14 or 15. During the period in question, the duration of primary education was 8 years (8 grades):

- the first 4 years: pupils spend those learning basic skills and subjects (literacy, Serbian language, mathematics, nature, society, arts, physical education, and sometimes a foreign language as of the third grade[5]). Classes are taught by one head teacher complemented by special teachers for foreign language;
- the last 4 years: pupils continue to learn the basic subjects (maths, Serbian language, arts, physical education) and (another) foreign language (typically English) as well as a larger number of discipline oriented subjects (e.g. physics, chemistry, biology, history, geography, etc.). Separate teachers are allocated to each of the subjects, with one of them acting as the head teacher in charge of the particular class.

The rate of completion of primary education was 91.8% in 2002 (Statistical Office of Serbia, 2005b), although this refers to those who have completed primary education on time, i.e. without repeating any of the grades, suggesting that the actual completion rate is somewhat higher.

After completing primary education, pupils can choose whether or not to continue their education in one of the following types of secondary education:

1. the so-called *gymnasium*[6] – 4-year secondary education which serves as preparation for higher education, usually university type higher education. The certificate obtained after completion of a gymnasium does not have its related qualification level (see below). The subject division resembles the division in the last 4 years of primary education with additional subjects such as sociology, psychology, philosophy, logic, constitution and citizen rights, Latin, etc. There are three possible "streams" within a gymnasium – comprehensive (with equal focus on natural sciences/mathematics and social sciences/languages), socio-linguistics (more attention is put on social sciences and languages) and natural-mathematical (more attention is put on natural sciences and mathematics)[7]. There are 118 gymnasiums throughout Serbia, at least one in each big city (Statistical Office of Serbia, 2005b). Approx. 24% of all secondary school pupils attended gymnasiums in 2006 (Ministarstvo prosvete i sporta, 2006). Data about pupils in gymnasiums related to the period of study (1990-2004) were not available;
2. the 4-year secondary vocational schools – education and training with subjects reflecting the specific vocation, but also including some general subjects. The qualification obtained after this type of secondary education is related to the

[5] The learning of a foreign language depended on the availability of teachers, meaning that remote schools or schools in small towns had less possibility to organise the learning of a foreign language.

[6] This is the direct translation from Serbian. The term has a German origin. This type of secondary education corresponds to the "grammar school" in the UK or to the "lycée" in France.

[7] There are also several special gymnasiums for talented pupils, which have programmes focusing even more on mathematics and natural sciences, or on languages and literature. The number of these schools is very small and they do not affect significantly this study.

4th qualification level in the national qualifications system (see below for explanations of different qualification levels). Some of the subjects are more practical in nature and in some schools certain provision for work placements are available. These schools are roughly classified as being oriented to either technical or social subjects, although there are also some other schools which are more difficult to put in either of the categories, such as schools for art (including music and ballet), agriculture, nursing schools, etc. Approx. 50% of all secondary school pupils attend these schools (Ministarstvo prosvete i sporta, 2006);

3. the 3-year secondary vocational schools, which provide training necessary to obtain the 3rd level in the national qualification system. Sometimes they are referred to as apprenticeship colleges and may provide training for jobs such as: public transport drivers, various types of mechanics, etc. Approx. 26% of all secondary school pupils attend these schools (Ministarstvo prosvete i sporta, 2006).

There were 373 secondary vocational schools of both types (3-year and 4-year) in 2003 (Statistical Office of Serbia, 2005b). The data for each type separately or for earlier periods were not available.

It should be noted that from 1987 up to 1990 pupils were enrolled in the so-called *streamed education* which provided education and training to very narrowly defined occupations, as of the first year. This practice was abandoned and gymnasiums and secondary vocational schools were re-introduced in 1990.

In this respect, it could be said that there are 3 different tracks to follow after the completion of primary education (age 14 or 15), plus the option of not continuing with education and training. Available data suggests that around 97% of pupils continue with some form of secondary education (Statistical Office of Serbia, 2006). In 2002 the abandon rate[8] from secondary education was 1.47% (Statistical Office of Serbia, 2005b). The transfer from primary to 4-year secondary education (both vocational and gymnasium) is determined on the basis of grade average and two entrance exams: one in maths and one in Serbian language and literature. 3-year secondary education does not require an entrance exam. The gymnasium is generally considered to be the most prestigious type of secondary education, in terms of the grade average and entrance exam results necessary to enrol into this type of education. Theoretically, it is possible to move from one type of 4-year secondary education to another. However, no research so far has focused on this issue, although it could be expected that the actual practice is far more difficult due to bureaucracy and/or social stigma.

Both primary and secondary education are free of charge in terms of tuition, although parents are expected to pay for books, notebooks, stationery and other things required for learning. Wealthier parents are also often paying additional fees to private tutors in various subjects, usually in mathematics, natural sciences and foreign languages, and especially when it comes to preparations for entrance exams for secondary schools. Very few schools provide meals for their pupils, although meals are served in pupil homes, which are available to some of the children who wish to attend a secondary school away from their place of residence. The exact number of

[8] The abandon rate represents the difference between pupil number at the beginning and pupil number at the end of the school year, in relation to the pupil number at the beginning of the school year.

places available for pupils studying away from home is difficult to determine because the available statistics does not distinguish between homes for pupils and homes/dormitories for students.

As was already implied, a specific stage of education has its related qualification level:

- completed primary education corresponds to the 1st qualification level – unqualified worker;
- completed primary education and qualification in terms of low level apprenticeship corresponds to the 2nd qualification level – semi-qualified worker;
- completed 3-year secondary education relates to the 3rd qualification level – qualified worker;
- 4th qualification level is obtained after completing 4-year secondary vocational education;
- 5th qualification level corresponds to a completed 4-year secondary vocational education and specialisation on the basis of the acquired vocation;
- vocational higher education corresponds to the 6th qualification level;
- there are two types of the 7th qualification level:
    - 7th-A qualification level corresponds to the undergraduate university higher education (4-6 years of study in the period in question),
    - 7th-B corresponds to graduate university higher education, the so-called "magisterium" (term having German origin) which lasts[9] 2 to 3 years;
- the highest, 8th qualification level relates to the Doctorate.

2.3. Enrolment, progress and completion in higher education

Higher education in Serbia dates back to mid 19th century, but the first institution bearing the name of "university" was established in 1905 in Belgrade. All other public universities in Serbia were established after the WWII, while private higher education appeared only in the mid 90s.

Universities consist of faculties, which are considered to be separate legal entities (the number of institutions therefore includes individual faculties, not universities). The university of Belgrade is the biggest university with 31 faculties and 8 research institutes, and approximately 71,000 students and 4,700 of teaching staff with different status (from teaching assistant to full professorship). All other public universities (in Kragujevac, Niš and Novi Sad) are smaller than the University of Belgrade and with a similar teacher/student ratio, except for the University of Arts in Belgrade, which has a more favourable teacher/student ratio, reflecting the nature of its programmes[10]. University higher education is concentrated in major cities in Serbia (like Belgrade, Kragujevac, Novi Sad and Niš), although some faculties or branch

[9] The "magisterium" should not be confused with a Bologna master degree. The possible confusion was precisely the reason why this stage of higher education is labelled with a specific (Germanic) word.
[10] After 2000, one additional public university was founded in the city of Novi Pazar, but this university is not a part of this study since it was recently established.

campuses belonging to one of these universities may be in other cities. The extent of governmental control over universities has changed several times during the 90s, through several legislative changes initiated by the government intention to prevent universities from initiating or taking part in any form of social unrest.

Vocational higher education institutions were established after WWII, to provide 2 or 3-year vocational higher education. They were under a stricter control from the government and have a different structure, e.g. they do not have rectors but directors and their programmes had to be approved by the Ministry. Each institution of vocational HE was a separate legal entity and they were not part of a bigger structure (as opposed to faculties being part of universities). There were around 45 public vocational higher education institutions in the 2000-2004 period.

When it comes to private higher education, it was emerging at a slower pace than elsewhere in the region, probably because of the economic and political crisis. In 2006 there were 6 private universities and around 30 private vocational higher education institutions. The private sector is relatively small (approximately 6% of students were enrolled in private higher education in 2002). Due to the fact that private institutions emerged relatively late, and that certain data necessary for analysis (e.g. education of parents, or previous education) was not available for these students: private institutions were not included in this research.

In terms of legislative treatment, during the period under research vocational and university higher education were regulated by separate legislation and it could be said that vocational higher education was not considered to be a "fully fledged" higher education. One argument put forward by these claims (mostly in public discussions) was that the legislation regulating the two kinds of higher education was separate. Furthermore, during the discussions about the new Law on higher education, which was adopted in 2005 (see below) it could be heard that "higher education takes place only at universities" and that it "has to be closely linked with research". Another possible reason for such an attitude towards vocational higher education could be that some of the programmes lasted only 2-years. Within this thesis, however, vocational higher education is considered to be a form of higher education, primarily due to the fact that both vocational and university higher education followed secondary education and provided education and training of similar qualification levels. Furthermore, in 2005 the Parliament of Serbia adopted the Law on higher education through which these two types of higher education were effectively merged.

2.3.1 Enrolment

Access to higher education in Serbia is determined by two main criteria:

- completion of 4-year secondary education, and
- entrance exam (administered by individual faculties or vocational HEI).

Overall grade average, as well as grades in specific subjects from secondary education of relevance to higher education institution one is applying to carries 40% of the total score, while the entrance exam carries 60% of the total score. These requirements can be wavered for certain art programmes. Furthermore, additional tests of abilities can also serve as entrance exams. On the basis of grade averages and exam results, students are ranked separately by each individual institution (in the case

of universities, these are individual faculties). Since there are *numeri clausi* in Serbia, to enrol into the first year of study in a specific institution, a student needs to be ranked higher than the total number allocated for that institution. In addition, in order to be financed by the State, a student needs to be within the state-funded quota (usually 1/3 to ½ of the total allocated number). The State decides on the total number and the state-funded quota, on the basis of proposals from individual faculties or vocational schools. The status of state-funded student can be revoked if progress is not satisfactory (see the following subsection on progress and completion). Such a student will then become co-funded or self-funded (depending how unsatisfactory the progress is). Also, a student will be self funded from the beginning if s/he is not ranked high enough to be within the state-funded quota.

This procedure consequentially limits the number of institutions a student can apply to (in a single enrolment period) because entrance exams usually coincide with each other. Therefore, within a single enrolment period it is not possible to apply for enrolment to the same field of studies in several universities[11]. In addition, there seems to be a discrepancy between secondary education curriculum and entrance exam requirements, which is reflected in an expansion of preparatory courses for entrance exams, offered by private organisations or higher education institutions themselves. These preparatory courses last from 1 month to 1 year and on a fee paying basis. These are usually concentrated in university centres (cities or towns which have at least one university) which makes them inaccessible for students living outside university centres, essentially destroying the principle of meritocracy.

2.3.2 Progress and completion

When it comes to progress and completion of higher education, this has been very closely regulated by legislation until 2005. All three legislative texts on university higher education which cover the period under study – Law on University from 1992, 1998 and 2002 states that, to enrol into the next year of studies, a student does not need to pass exams in all subjects – s/he can pass only a portion of exams, and only from specific subjects (decision on specific subjects is left to individual institutions). Therefore, it is possible to enrol, e.g. into the second year of study with two subjects not passed if the total number of subjects in the first year is a maximum of 7. When it comes to enrolment into final years of university higher education, legislation gave freedom to universities to allow enrolment with half of the subjects passed. In vocational higher education, related legislation (valid throughout the period under research) postulated that a student needs to pass all subjects to enrol into the next year of study, although higher education institutions are free to allow students to enrol into the next year of study with two subjects not passed. Although it was not officially possible to enrol e.g. in the third year of study without passing all subjects from the first year (i.e. transferring subjects for two years is not possible) certain institutions were allowing this to happen as well, especially in connection to exceptional external circumstances such as strikes, bombings etc. Therefore, a student has to repeat a year of study if s/he did not pass the required amount of subjects. In that respect, it could

[11] There is a proposal to change the system so high school students would pass a high school graduation exam which would serve as the sole criterion for entrance and which would allow students to apply to several institutions. However, this is just a proposal and implies significant changes in the system of secondary education as well.

be said that the expected progress to the next year of study would last one year, although it is possible that it takes more (two, three years or more – in case of repetition). Financing mode is also determined on the basis of repetition – if a state funded student does not perform as expected s/he can loose state funding and pay either the costs invoked by his/her repetition of the year of study (thus falling into the co-funded status) or the entire tuition fee (thus becoming a self-funded student). The opposite was also possible: if s/he passes all subjects, a self funded student starts to be financed by the State as of next academic year, even if the total number of state-funded students thus exceeds the state-funded quota set for initial enrolments. Despite appearances, this practice may not have been a major incentive for good progress, since during the period under research tuition fees were not as high as they are at present and a large number of students was repeating nevertheless.

It is said that a student has graduated, i.e. completed his/her higher education, when s/he has passed all subjects prescribed in the programme and, in most cases, wrote and defended a thesis. This does not necessarily happen immediately after finishing with all lectures in the final year of study. Legislation (both for university and vocational higher education) foresees an extension of the study time for another 6 months or 12 months (the latter only in cases where a student has to write a thesis). If a student does not graduate within that extended time, s/he has to pay for all exams s/he takes and looses most of the social benefits connected with the student status.

Both the process of progress and requirements for completion of higher education may contribute to the decrease in the completion rate and prolongation of studies in terms of duration. The Serbian Ministry of Education and Sports claimed (Turajlić et al., 2004) that 2/3 of students never complete higher education and referred to this as the "dropout rate". This result was obtained by using the number of graduates and the number of freshmen for the same academic year, thus assuming that the total number of students or the number of freshmen is not increasing over time, which is not the case (as will be presented in Chapter 5 "Higher education and social stratification in Serbia").

Completion rate refers to the ratio between the number of those who have completed higher education and the number of those who enrolled in the appropriate academic year (e.g. 4 years prior to the year for which completion data are used if programmes are expected to last 4 years). This is relatively easy to calculate in systems which do not allow for prolongation of studies or which closely follow the progress of each student. Neither is the case in Serbia. Furthermore, since the number of repetitions of a year of study is not limited, there may be persons still registered as students but who are not active in their studying (e.g. passing exams) and they are "treated" the same way when it comes to higher education statistics. Finally, because the expected duration of studies can be from 2 to 6 years for the first degree and all of these studies may be prolonged for a virtually indefinite period of time – it is impossible to accurately determine the completion rate in higher education in Serbia, unless each institution is taken separately (which means around 150 individual institutions). For these reasons, it is impossible to determine the actual completion rate although certain approximations are possible.

Therefore, for the purposes of this study, the completion rate was estimated for 2002 on the basis of the number of graduated students in 2002 and the number of

freshmen enrolled into higher education in a specific year in the past, which was determined on the basis of the average duration of studies. For example, in the case of 4-year programmes, analysis shows that the average duration of studies is 6.76 years (rounded to 7 years, see Chapter 5 "Higher education and social stratification in Serbia"). Therefore, the number of freshmen used to calculate completion rate was taken from 1995 in the case of 4-year programmes and even earlier years in the case of 5 and 6-year programmes. This way, the estimated completion rate is around 55%, meaning that the dropout rate is around 45%. This is a rather simplistic understanding of dropout, since it is not sensitive to the situations in which students change institutions during the programme and eventually graduate from the other institution. This issue is discussed in detail in Yorke (1999).

What is commonly presented as the possible causes of dropout and prolongation of studies are: the study system that allows the "transfer" of exams to the next year of study, inappropriate workload, frequent disruptions of the academic year by various external forces (strikes, demonstrations, war, etc.), low student motivation due to poor job prospects and/or bad economic and political situation, the motivation to retain the status of a student so one can use student benefits or evade military drafts. None of these possible causes or the possible impact of students´ SEB on the efficiency of higher education have been studied so far.

In terms of changes to legislation on higher education in the period under research, vocational higher education was regulated by one legislative text from 1992 to 2005. Some amendments to the text were introduced in 1993 and 1996 but these do not affect any of the issues related to this research. When it comes to university higher education, three different legislative texts regulated this area: one adopted in 1992, the next in 1998 and another adopted in 2002[12]. The 1998 Law was adopted to prevent further involvement of the academic community in protests and demonstrations against the regime (see next section). The Law diminished university autonomy by, amongst other, prescribing that heads of all institutions (deans and rectors) are appointed by the State, even though before they were elected by the members of the institutional senate (part of whom were representatives of the State). The period from 1998 until the revolution in October 2000 was marked by expulsions of both students and staff. In 2002, the new government introduced the new legislation, primarily in order to reinstate university autonomy (the text largely resembled the Law adopted in 1992), while the new proposal for the Law on higher education, introducing Bologna degree structure, and was being prepared.

Apart from the changes regarding the relationship between state and higher education, other changes of relevance to this research included changes in the funding scheme. In 2002, the category of co-funded students was abolished. This meant that no new students could be enrolled as freshmen in this status as of 2002.

[12] In August 2005 the Serbian Parliament adopted the Law on Higher Education, which regulated both vocational and university higher education and is largely in line with the Bologna action lines in terms of degree structure, quality assurance, ECTS etc. This Law, however, is not relevant for the period under research.

2.4. Social, political and economic context for the 1990-2004 period

The following section gives a very brief and somewhat superficial overview of major social, political and economic changes, which may have affected patterns of enrolment, progress and completion in higher education in Serbia, during the period under research.

During the 1980s the former Yugoslavia (official name: Socialist Federative Republic of Yugoslavia) began to experience an economic crisis. In the late 1980s, Slobodan Milošević rose to power in Serbia, through the structures of the Communist Party. In 1989, the Serbian Parliament amended the Serbian constitution, greatly reducing the autonomy of two provinces which were part of Serbia – Vojvodina and Kosovo. With respect to Kosovo, this was a continuation of the oppression of the Albanian majority living in Kosovo. Education in the Albanian language was forbidden (as was stated before, this led to the formation of a parallel "underground" education system for Albanians in Kosovo), and students and staff of the Albanian ethnic origin were expelled from the public university in Priština (capital of Kosovo). In 1990, in the first elections, Milošević won the position of the president and his Socialist Party of Serbia (transformed from the Communist Party) won a parliamentary majority of over 80%.

The beginning of the 90s was marked by the break up of former Yugoslavia and wars in Slovenia, Croatia and Bosnia. Macedonia seceded without armed conflict and Serbia and Montenegro remained together in the newly established Federal Republic of Yugoslavia. Few competences were at the federal level: defence and international affairs were amongst the few, while education was under the jurisdiction of the constitutive republics. Although Serbia officially did not take part in the wars in Bosnia and Croatia, armed forces (both military and paramilitary) received ample support from the Serbian regime. This also meant that in the first half of the 90s, military drafts were very frequent (at this time, military service was still obligatory for all men over the age of 18). Since having a status of student sometimes "saved" men from being drafted, an undetermined (and possibly undeterminable) number of men were enrolling into higher education to avoid military service. An undetermined number of men also fled the country or were avoiding the drafts in other ways.

1995 was marked by several events relevant for this study – primarily two operations by the Croatian army: "Bljesak" in May 1995 and "Oluja" in August 1995, which led to the recapturing of parts of Croatian territory which were under control of Croatian Serbs. The two operations, especially "Oluja" initiated an influx of refugees to Serbia. According to the United Nations, there were 200,000 refugees which fled to Serbia in that period. Since higher education was generally not taking place in territories affected by war, in the period prior to 1995, and especially after "Bljesak" and "Oluja" a number of young people of higher education age from Croatia and Bosnia moved to Serbia and started or continued their studies in Serbia. It is not possible to accurately determine the number of these students, although data on citizenship may give a rough estimate (see Chapter 5 "Higher education and social stratification in Serbia"). Soon after the Dayton agreement in 1995, which ended the war in Bosnia and Herzegovina, special relations between one of the entities in Bosnia and Herzegovina – Republic of Srpska with a Serbian majority and Serbia were

established, including the right for students from the Republic of Srpska to study in Serbia on the same basis as domestic students (all other foreign nationals would have to pay a tuition fee).

The rule of Milošević was also marked by economic crisis. Galloping inflation, international trade sanctions, shortages of gas, food and other supplies also lead to the rise of the so-called "grey economy". Official unemployment rates were more or less stable, although the real situation was far from good since many of those who were employed, especially in big state-owned companies, were not receiving salaries for extended periods of time and/or the inflation would completely diminish the value of their remuneration. Due to this situation, a number of young people, some with higher education qualifications or in the midst of their higher education, left Serbia. The exact number of these cases is not available.

The 90s were marked by several student and academic protests in Serbia, in 1991, 1992, 1996/97, 1998 and 2000. These protests disrupted the academic year and enrolment procedures. For example in 1996/97, due to a 3-month-long student protest, there was either none or very limited academic activity in most of the faculties in Belgrade, which meant that lectures and exams were postponed for 2 months (e.g. June exam period actually took place in August). Due to this, requirements to enrol into the next year of study (see section on enrolment, progress and completion) were in many places loosened. 1998 saw another wave of student and academic protest against the repressive Law on higher education. Smaller disruptions of the academic year by student protests took place from 1998 till the democratic revolution in October 2000, although not all institutions were equally affected by this.

In March 1999, NATO started the military operation against Serbia, over the issue of Kosovo and oppression against the Albanians in Kosovo. The bombing lasted 78 days and disrupted both the academic year and the enrolment procedure. The exam periods were postponed and requirements to enrol into the next year of study were again loosened. Furthermore, the government decided not to organise entrance exams and not to have *numeri clausi* when it comes to initial enrolments in public universities (see Figure 5). In addition, due to the fact that after the bombing Kosovo came under the control of UNMIK (and consequently elected structures), Serbian forces retreated. They were followed by another influx of refugees. The University of Priština, from which Albanian students and staff were expelled in late 80s, became entirely controlled by the Albanians. The Serbian community founded their own university in the divided city of Kosovska Mitrovica[13] (town in the north of Kosovo, the major town in the region where Serbs are not a minority). This university for a while operated in smaller cities in central Serbia but was afterwards moved entirely to Kosovska Mitrovica, mainly for political reasons. It was never fully considered as a part of the Serbian higher education system (e.g. the official statistics do not include this university) nor is it an integral part of the Kosovo education system (UNMIK revoked its licence several times). Some students previously enrolled at this university, or the University of Priština before the NATO bombing, enrolled in other universities in Serbia which are a part of this study. The exact number of these students is hard to determine as the available data do not record this information.

[13] The official claim is that the university established in Kosovska Mitrovica is the successor of the University in Priština, while the Albanians claim the same for the university that is now operating in Priština.

Following the presidential elections in September 2000, in which the opposition candidate won (although the victory was first denied by Milošević), a revolution took place in October 2000, forcing Milošević to acknowledge the victory of Vojislav Koštunica as the president of the Federal Republic of Yugoslavia. The first democratic government of Serbia was elected in January 2001 with Zoran Đinđić as the Prime Minister. The government started a set of economic and political reforms, including reforms of higher education. These reforms resulted in, amongst other, the accession of Serbia to the Bologna Process and adoption of a new piece of legislation in 2005. Furthermore, the government began to make stricter decisions when it comes to the number of students admitted to public universities, to prevent overcrowding.

In February 2003, the Federal Republic of Yugoslavia was transformed into the State Union of Serbia and Montenegro (essentially a loose confederation of Serbia and Montenegro) and higher education remained under the jurisdiction of the constitutive states. In March 2003, Zoran Đinđić was assassinated. The government introduced a state of emergency following his assassination in order to fight organised crime (members of which were designated as assassins). The state of emergency did not affect academic life to a great extent.

In May 2006 Montenegro chose independence from Serbia through a referendum.

3. Higher education and social stratification

There is a vast literature on the issue of how students´ socio-economic background affects their educational careers (including higher education). This issue is addressed in various ways, depending on:

- the disciplinary background or the predominance of a certain disciplinary perspective (sociology, psychology, economics etc.);
- the focus on the student or the higher education system or the interaction between the two;
- the underlying assumption of the effects (higher) education has on social stratification – higher education as a tool for social mobility or for social reproduction.

The disciplinary background to a certain extent affects the choice of data and methodology used, ranging from mainly sociological and economic broad quantitative studies including large samples and statistical modelling, sometimes for comparative purposes (for example Müller and Karle, 1993; HEFCE, 2005; Wong, 1998), to qualitative studies using interviews or surveys, which also tend to stress the importance of the specific context and are sometimes more psychological or ethnographical in nature (for example Ball, 2002; Bowl, 2003; Fuller, 2004). Some of the studies tend to be longitudinal and follow a specific cohort from end of primary or beginning of secondary education till higher education or even the labour market (HEFCE, 2005; Cosser et al., 2004). There are also the so-called "studies in retrospect", which use various statistical data covering large periods of time to analyse the issue at hand (Raftery and Hout, 1993).

This chapter will provide an overview of the literature on the issue, focusing on:

- educational and social stratification and the relationship between the two;
- dynamics of reproduction of social stratification through education, especially higher education and
- issues of inequality, disadvantage and exclusion in higher education.

The final section of this chapter will outline the theoretical framework used for this research.

3.1. Educational and social stratification

Research on the effect of SEB on access, progress and completion of any stage of education, including higher education, is primarily motivated by the understanding that not all social groups or social classes are equal in this respect, i.e. that there is stratification in education which is, more or less, reflecting the stratification in society. The characteristics of pupils/students upon which this stratification is taking place is a complex issue and will be briefly discussed later, but before that, it is important to see what forms of educational stratification there are.

Educational stratification can be understood in quantitative and qualitative terms. When it comes to quantitative terms, it relates to the situation in which completion of

primary education (assuming that access to primary education is universal[14]), access and completion of secondary education and access and completion of higher education depend upon some background characteristics, like belonging to or identifying as a member of a specific social class. This form of educational stratification could be connected to the fact that the supply of later stages of education may not be sufficient to cater for the existing demand of all social strata but also that the demand for later stages of education may not be equally present in all social strata, for various reasons. In terms of qualitative educational stratification, it relates to the situation in which access or completion of education of higher quality or prestige (e.g. gymnasium vs. secondary vocational education, primary education with 2 foreign languages instead of primary education with only one foreign language, differences in quality of learning outcomes etc.) is dependent on socio-economic background.

Although with the process of massification of education (including higher education) the overall level of educational attainment is slowly, yet steadily increasing, it is still evident that there are differences in educational attainment and that these differences are often connected with the SEB. It should also be understood that:

- the "creation" of stratification is encompassing the entire education system, from preschool to higher education and beyond (e.g. transfer to the world of work),
- that stratification is most easily visible in the transitions from one stage of education to the other since there it can be more easily quantified (see Lucas, 2001 and Raftery and Hout, 1993), although
- one should not forget that educational stratification can and does take place within one stage of education, primarily being qualitative in nature.

The next issue is connected to the analysis of the possible causes of educational stratification and the relationship between educational and social stratification. One part of research on this issue actually does not have educational stratification as the primary focus of the analysis; it is rather the results of such research which may testify to the existence of educational stratification. Such research includes, amongst other, studies of student-choice behaviour.

Student-choice behaviour research focuses on the student as the main actor in the process and his/her aspirations and expectations (Ball, 2002; Zietz and Joshi, 2005). The student, thus, is seen as the one making a choice with regards to, somewhat simplified, two main questions: 1) whether or not to continue with higher education and 2) which institution and which programme to choose. Such studies thus focus on analysing what are the factors affecting student answers to these two questions. These factors may include various elements of the student socio-economic background, influence of peers, parents, media, higher education institutions, labour market etc. As can be seen, SEB is only one of the factors taken into account. Some studies perceive these choices to be conscious (and to a certain extent rational) and thus investigate the topic through the use of surveys and interviews, in some cases following a certain group of students throughout the various stages in education (including higher education) and possibly into the labour market (Cosser et al., 2004). The importance attached to the consciousness of choice is somewhat lesser in the longitudinal studies

[14] This statement implicitly assumes that primary education is compulsory education, which is the case in Serbia.

that try to analyse student-choice behaviour on the basis of its effects, i.e. which students (from an initial group chosen usually in the end of primary or sometime during secondary education) have "ended up" in a) higher education (type, programme), b) in the labour market, c) unemployed and not studying etc. (Cosser et al., 2004). It could be argued that student choice behaviour studies are more economic in terms of the underlying disciplinary perspective because they focus much more on individual behaviour (rather than the interaction of the individual with the education system or the system as such), often presuppose that students make rational choices with the goal of satisfying their needs and that there are certain market-like mechanisms in higher education which could facilitate the match between the demand (student side) and the supply (institution/system side) (Zietz and Joshi, 2005).

Different from (but not necessarily contrary to) student-choice behaviour studies is the approach that tries to see higher education in terms of its effects to social stratification. Here, the focus is not on the student as the one making the choice but rather on the interaction between students making choices with respect to higher education and the (higher) education system.

There are two main "schools" of thought with respect to the effect education has on social stratification. One sees education as the tool for social mobility, which can enable or facilitate individual advancement on the social ladder, thus improving their socio-economic status (and hence the quality of life) and shifting them from the less privileged social class origin to the more privileged social class destination[15]. This is especially present in the governmental policies and strategies for poverty reduction, economic development, increasing social cohesion etc. (Serbian Government, 2005). Such perspective also has some resonance in both the human capital theory and the signalling hypothesis (Weiss, 1995). Both of them attach an important role to education and training in terms of attaining more privileged occupational status, although they differ in the understanding of why this happens: while the human capital theory claims that a better/more educated person indeed gains additional knowledge and skills relevant for work, the signalling hypothesis claims that educational qualification does not signify a significant qualitative difference in knowledge and skills, but rather acts as a signal of "favourable employee characteristics" (Weiss, 1995). In terms of the role attached to higher education specifically, it is claimed that, since primary education is (in many countries, including Serbia) universal and secondary education is almost universal – it is the higher education stage that is decisive in facilitating or enabling social mobility, especially since the professions connected to higher occupation status almost always require a higher education qualification.

Opposing to that is the understanding of education as the tool for social reproduction. Numerous studies show that throughout the educational system, student's socio-economic background plays a strong role in determining whether or not s/he will advance through the educational system or will drop-out (HEFCE, 2005; Lucas, 2001; Marks, 2005; Power, 2000; Wong, 1998). As was explained in Chapter 2 "The Serbian context", this research is trying to assess to what extent differences in enrolment, progress and completion in higher education (and partly secondary

[15] It is important here to stress that the majority of studies related to social classes define them in terms of the occupational status (Archer et al., 2003; HEFCE, 2005; Müller and Karle, 1993, Wong, 1998).

education) are marked by differences in elements of the student's SEB. To do that, it is necessary to first discuss the concepts of social class and SEB elements.

3.2. Conceptualising and operationalising socio-economic background

Two main approaches to conceptualising socio-economic background in the discussions of educational stratification can be visible in the literature (Archer et al., 2003). The first approach is predominantly a quantitative approach, necessarily linked to modernist, categorical conceptualisations of *social class.* This approach has the underlying understanding that it is possible to objectively define social class, most often on the basis of occupational status or on the basis of wealth. Furthermore, belonging to a particular social class is fixed. The classification in a particular social class therefore takes e.g. the form of (Archer et al., 2003:10):

1. higher managerial and professional occupations;
2. lower managerial and professional occupations;
3. intermediate occupations;
4. small employers and own-account workers;
5. lower supervisory, craft and related;
6. semi-routine occupations and
7. routine occupations.

Therefore, educational stratification on the basis of the social class is objective and fixed and can be quantified.

On the other hand, another school of thought, claims that class should be understood as a process, that it is necessary to include a "complex combination of social, structural, economic and cultural factors" (Archer et al.. 2003:11) and to contextualise the analysis. Furthermore, one must be aware that the belonging to a social class is connected to the construction of a particular identity and that this construction is an open-ended activity, resulting in the fluidity of such identity, since the external factors on the basis of which this identity is formed are fluid as well. A number of researchers (Marks, 2005; Morrow and Torres, 1994; Peck, 2001) thus claim that educational stratification should not be seen only in connection to one's (social) class or status, since other characteristics, including gender, race, ethnic origin, education of parents, participation in cultural events, possession or access to high culture at home, participation of both student and parents in social networks may also play a significant role. In that respect, they tend to advocate an analysis of the direct effects various student characteristics have on their (higher) education career as well as an analysis of possible interaction between these characteristics and their joint influence on the career in (higher) education. This implies that it would be better to approach the issue of stratification in more complex terms than just occupation status of parents, i.e. to include other student characteristics in defining disadvantaged social groups.

Regardless of the choice between these two main approaches, an important question relates to how one chooses which student characteristics to take into account. In other terms, the question is whether these characteristics are the characteristics of the student or are characteristics of his/her parents. In most cases which belong to the quantitative approach, students´ background is analysed through their parents´

occupation and education. In that way, it is understood that the parents´ social class is equal to the social class of the student. While this may be considered completely correct in the analysis of enrolment, progress and completion of earlier stages in the education system (primary and secondary), it is more complicated in the case of higher education. The issue is not a simple question of legal age of maturity since family influence may remain strong well beyond age of 18 or 21, thus bearing significant cultural as well as political and economic implications and complicating research. The fact that, in legislative terms, a young person of a certain age is considered as an independent adult does not mean that his/her attitudes, aspirations, expectations, abilities etc. are no longer affected by his/her family. Most of the studies focusing on students of traditional age do not make any considerations about this question and treat social class of all students being equal to the social class of their parents. Archer et al. (2003), however, provide an interesting example from the UK on the use of parents´ occupation in defining students´ social class until the age of 21. After 21, students´ reported occupation is used. This approach reflects the so-called *life course perspective (LCP),* according to which (Lucas, 2001; quoting Müller and Karle, 1993) the relationship between parents and children changes, essentially diminishing the influence parents have over the choices their children make as these children get older. The LCP therefore predicts that the effect of students´ SEB defined through parents´ SEB will diminish with each educational transition, i.e. with the age of the child, potentially disappearing in the case of transition from secondary to higher education, or from one to the other year of study within higher education.

In addition to this, some studies claim that the nature of the influence depends on the socio-economic background as such (Green et al., 2003), i.e. that the students´ SEB does affect their educational experience, but in different ways for different SEB. For example, the effects are not of the same nature in the case of students from working families and from the middle-class families. Along these lines, Power (2000) advocates the division of the middle class, which is often understood as one homogenous group, into several middle classes to allow for more sensitive analysis. Similarly, students from the same ethnic background but of different gender may have completely different higher education careers (e.g. in some cases racial minority boys are more disadvantaged than racial minority girls; HEFCE, 2005). All this seems to further strengthen the recommendation that research into the topic, even the one adopting a quantitative modernist approach, should avoid using crude social class definitions and should fine tune the classification of social groups based on analysis of data, with due attention paid to elements of the student socio-economic background other then parents´ education or parents´ (or students´) occupation.

For these reasons, the present study will not adopt a priori any classification of social class, but will rather focus on various elements of the student's socio-economic background, such as gender, ethnicity, education of parents, work status of parents etc. This is closer to the first, categorical approach to the issue, since all the aforementioned elements of the students´ SEB are essentially categorical in nature and understood as being objectively defined (except for ethnicity which is discussed in detail in Chapter 4 "Methodological considerations" and Chapter 5 "Higher education and social stratification in Serbia").

3.3. Dynamics of reproduction of social stratification through education

The next issue of interest is why there is educational stratification, or, to put it in another way, why the social stratification is reproduced in education or even by education.

One of the key figures in theorising this problem, French sociologist Pierre Bourdieu sees the whole education (system) to be actively contributing to social reproduction (Bourdieu and Passeron, 1990): since the education system is formed and organised by the (social) group that is in the possession of power, it also seeks to reproduce the same distribution of power in the society and hence, reproduce social inequality[16]. Bourdieu goes on to define various forms of capital (Bourdieu, 1986) which are instrumental in the process of reproduction: social capital, cultural capital and economic capital. What is new in Bourdieu´s considerations, compared to common considerations of inequality based on economic inequality, is the focus on less obvious forms of capital such as cultural capital and social capital. The conversion of social and cultural capital into economic capital, and vice versa, is less tangible, making it more difficult to organise a system of education which will be immune to these forms of capital. This in turn prevents the education system to become truly socially neutral, if this possible at all. While the economic capital is relatively easy to operationalise through wealth or earnings, the other two forms of capital are more difficult to render tangible. In most studies, the cultural capital is operationalised through education of parents or access to (high) culture (sometimes very technically represented with the number of books available to the pupil/student, or by the number of visits to the theatre or art exhibitions per month). The social capital is usually represented through active participation, or official and unofficial membership in different social networks, including the church.

The concept of socio-economic background, at least how it is used in this research, is closely related to the afore-mentioned social, cultural and economic capital. In simple terms, one can state that the various elements of the socio-economic background can be attributed to one of the given forms of capital. For example, education of parents corresponds to cultural capital, earning of parents (and possibly of student) corresponds to economic capital, while belonging to a specific ethnicity could be linked to social capital. Nevertheless, it should be noted that, while the SEB is considered in this research to be a quantifiable, objective, explicit concept fixed in time, Bourdieu's ideas about different forms of capital and the potential transformation from one to the other form of capital do not exhibit such quantifiability, objectiveness, explicitness or fixedness in time.

Another issue that needs to be stressed is that Bourdieu and Passeron (1990) claim that not only the education system is not immune to social stratification and thus is not contributing to social mobility; it is also a tool of social stratification, i.e. it is actively contributing to social stratification. For example, those who dropout from higher education dropout not only because of their socio-economic background, but also

[16] Some authors (Morrow and Torres, 1994) use stronger concepts than "inequality" – they claim that the education system is reproducing various forms of domination and subjection.

because the academic setting as such, through what Bourdieu refers to as "symbolic violence", "forced" them to dropout. In that sense, it could be argued that higher education at present (the present being marked by massification in terms of numbers and diversity of students) still reflects the aspirations, expectations and needs of the students from the past, when HE was still reserved for the elite. Similarly, one could claim that the institutional academic habitus (Thomas, 2002) seldom corresponds to the individual habitus (Bourdieu and Passeron, 1990) of the average student, negatively affecting his/her success in higher education (success in this research being operationalised through the concepts of progress and completion, see Chapter 4 "Methodological considerations").

With respect to higher education, some authors claim that the aspirations towards higher education are rather low in lower social classes and that the risk aversion or debt aversion are higher than elsewhere (Archer et al., 2003). Furthermore, it is also stated that not only would it be necessary to raise aspirations and awareness of rates of return from higher education, but that the institutional habitus, including "ethos, organisation and pedagogy" (Archer et al., 2003:15) should also be challenged in order to change the scope of social stratification in higher education.

To summarise the previous sections, various elements of the students´ socio-economic background will influence their (higher) education careers: inequalities in SEB will be reflected as inequalities in education, which brings us to the issues of inequality, disadvantage, exclusion and under-representation.

3.4. Inequality, disadvantage, exclusion and under-representation in higher education

Inequality can be understood as the absence of equality of opportunities to access, progress and complete higher education. A more tangible concept could be the concept of *disadvantage.* In this respect, disadvantage refers to the smaller likelihood of an event (initial enrolment, progress, completion) for a student with certain characteristics. For example, a student of type A is considered to be disadvantaged in terms of initial enrolment in university higher education to the student of type B, if A is less likely to enrol than B, given the analysis of the actual student population (as will be done within this research).

The effect of such disadvantage is exclusion. The concept of exclusion is closely connected to the concept of representation. *Exclusion* from higher education is considered to be absolute if a certain social group is not at all represented in higher education, even though such a social group can easily be identified in the society. For example, the Roma population in Serbia is almost absolutely excluded (not just) from higher education. Exclusion can also take the form of under-representation and thus can be labelled as "relative exclusion". This situation occurs if the proportion of the social group in higher education with respect to the total number of students is less than the proportion of that social group with respect to the overall population. Another dimension of classification is the crude division between institutional exclusion, that which is the effect of the specific institutional structure and organisation of higher education; and self exclusion, that in which, due to the clash between the identity of

the individual and the habitus of the institution of higher education, the individual "decides" not to start or continue with higher education.

The previous considerations about exclusion are primarily quantitative in nature, in the sense that they consider only the quantity of the members of a certain social group in higher education in general. In this respect, such understanding of exclusion is closely related to the hypothesis of *maximally maintained inequality (MMI):*

> *"… transition rates and odds ratios between social origin and educational transitions remain the same from cohort to cohort unless they are forced to change by increasing enrolments"* (Raftery and Hout, 1993: 56)

According to Wong (1998) this means that once the earlier stages of education become accessible to all regardless of their social status or background, as is the case in industrialised countries, it is the higher education stage that acts as a sieve in terms of limiting access to students from poorer socio-economic backgrounds; and remains the sieve until it becomes universal itself. Therefore, since HE in Serbia is not universal (and neither is 4–year secondary education for that matter), the MMI hypothesis implies that those of less privileged SEB will be under-represented or not at all represented in higher education, i.e. they will be *externally excluded*.

However, higher education can not be considered as homogenous. As was explained in Chapter 2 "The Serbian context", there are two types of higher education, the quality of learning outcomes may also vary from institution to institution and there are explicit and implicit differences between different fields of study in terms of assigned prestige and expected earnings upon graduation. Therefore, there are substantial qualitative differences within higher education. The MMI hypothesis therefore is not sufficient to account for these qualitative differences. The hypothesis of *effectively maintained inequality (EMI)* (Lucas, 2001) may be better suited to account for the situation in which certain social groups are disadvantaged in terms of access to more prestigious fields or institutions or programmes offering learning of higher quality. This situation can be labelled as *internal exclusion:* the social group in question may be well represented in higher education in general, but the problem arises if the distribution of students belonging to this social group is not balanced between different types of higher education or different fields. The EMI hypothesis is useful to analyse tracking in education systems; both explicit tracking, in which the completion of a specific type of secondary is a rigid explicit requirement for access to a specific type of higher education, and implicit tracking, in which these requirements may not be explicitly stated but the transition from one stage to the next essentially results in tracking. This stresses the importance of analysing different tracks that may exist in earlier education stages (such as comprehensive, vocational or apprenticeship track in the case of secondary education in Serbia – see Chapter 2 "The Serbian context"), as well as tracks within higher education (such as university and vocational higher education institutions – see Chapter 2), which may further influence transfer to postgraduate education or the labour market.

The MMI and EMI hypotheses are not necessarily contradicting each other. EMI shares the MMI prediction that there will be some inequality caused by differences in the socio-economic background, regardless of the stage of education in question. However, it goes beyond MMI to claim the following:

"...MMI suggests competition will be nil for any level of education that is universal. In contrast, EMI implies that for levels of education that are universal, competition will occur around the type of education attained." (Lucas, 2001:1653, emphasis in original).

If compared to the afore-mentioned life course perspective (LCP), the EMI hypothesis is not necessarily contradicting it, as long as it considers the student's SEB to be equal to his/her parents' SEB.

3.5. Theoretical considerations and the Serbian context

It would be worth to analyse the extent to which the theoretical considerations presented here are relevant in the case of Serbia, both for the reasons of it being a transition society (and thus the education system being formed to serve the previous socialist society) and for the reasons of the deep social, economic and political crisis in the 1990s, which had a profound effect on all walks of life, including education.

With respect to the first issue, Serbia being a country in transition with a relatively long history of socialism (although somewhat different from most of the Eastern and Central European countries), it is important to stress that several countries (or the whole "group" of former socialist/communist countries) have been the focus of studies related to education and social reproduction (for example Müller and Karle, 1993; Wong, 1998). Tomusk (2000), for example, claims that Bourdieu´s theory of social reproduction is, in general, valid for socialist systems. The caveat Tomusk offers relates to the fact that some of the socialist education system were explicitly structured to eliminate any effects cultural capital may have had on enrolment, progress and completion in higher education. It was precisely the lack of cultural capital (in the most common understanding of cultural capital) that rendered a more privileged status, coupled with active membership in the Party, which corresponds to the concept of social capital. The end result, in effect, was not that there was no stratification, but that stratification was indeed taking place, albeit on the basis of a new understanding of cultural capital and the traditional understanding of social capital.

With respect to the issue of whether or not the effects of the crisis in the 1990s were so profound as to prevent any analysis of social reproduction formulated to address more stable societies, two considerations are important:

1. The changes in the environment may have had a delayed effect on education, since most of the cohorts which are part of the study received their primary and secondary education in less dramatic circumstances (prior to the 1990s).
2. One could also argue that change in higher education is slow and incremental (Clark, 1983), and it takes some time for the effects of the changing environment to substantially influence higher education.

This issue, however, is of special importance and will be discussed further in Chapter 6 "Conclusion".

3.6. Theoretical framework for this study

Taking into account the previous theoretical considerations, as well as the concept of "cumulative pattern of disadvantage" (Cheng and Heath, 1993; quoted in Shiner and Modood, 2002) what could be postulated is the existence of an *inequality cycle*, for each of the stages in the education system (see Figure 6).

The inequality cycle essentially implies that a person´s initial socio-economic inequality (which could be seen through the possession, or lack of Bourdieu´s three types of capital) contributes to the emergence of educational inequality (in terms of enrolment or progress in a specific stage of education or quality of learning outcomes, quality and prestige of institution, track destination, socialisation in the school environment or academia, etc.). Thus accumulated educational inequality contributes to further socio-economic inequality, affecting enrolment into the following stage of education or contributing to inequality in terms of the labour market outcomes, primarily in the attained (occupational) status.

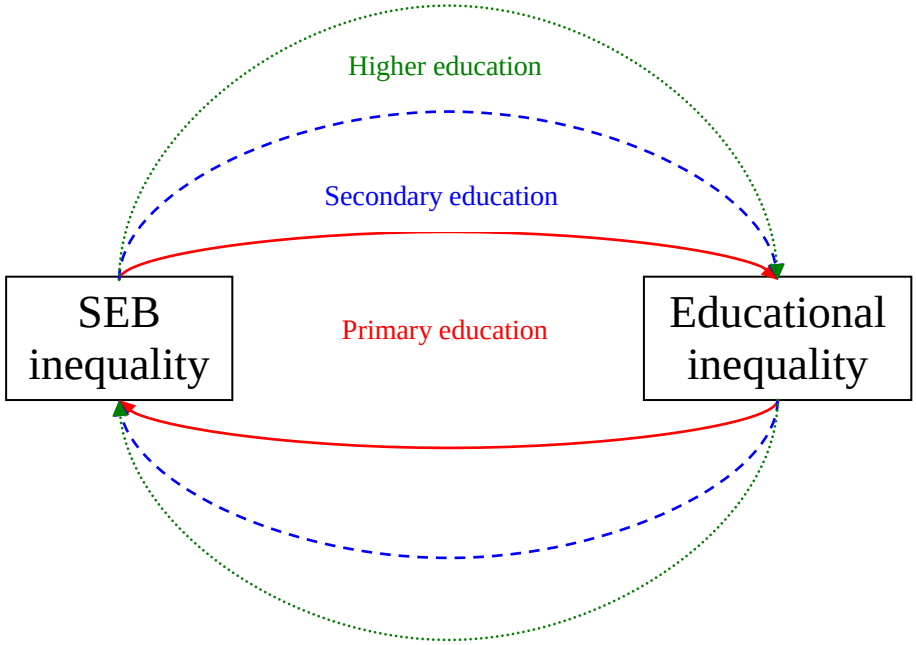

Figure 6 The inequality cycle

Therefore, going through the education system consisting of three stages (primary, secondary and higher education), a person would "go through" the inequality cycle three times as presented in Figure 6, and would maintain or even increase his/her disadvantage, compared to the peers of more privileged socio-economic background. This disadvantage (or the increase thereof) would be easiest to identify in quantitative terms in transfer points, i.e. in points where differentiation and selection takes place (such as moving from primary to secondary education, or secondary to higher education, or higher education to the labour market). To assess the extent of disadvantage one would need data for at least two connected "passages" through the inequality cycle. Furthermore, in these transfer points, one would be in the position to

test to what extent the MMI or EMI hypothesis or the life course perspective (LCP) are capable of describing and/or predicting the resulting educational stratification. However, it should be remember that the disadvantage will also exist in terms of pupil/student success, reflected in the quality of learning outcomes or the progression to the next year of schooling.

To conclude, this study is adopting an essentially quantitative modernist approach. Although it is not focused on social class as such, but on elements of the socio-economic background, it is nevertheless categorical in nature and understands elements of SEB as objective categories (except perhaps for ethnicity). The study thus seeks to make preliminary inferences about the scope and nature of external and internal exclusion with respect to students´ SEB, in order to analyse to what extent the hypothesis of MMI, EMI, LCP and the inequality cycle can be applied to the Serbian higher education context. It nevertheless acknowledges that the bulk of the analysis will be primarily exploratory and, to a smaller extent, explanatory (see Chapter 4 "Methodological considerations", Chapter 5 "Higher education and social stratification in Serbia" and Chapter 6 "Conclusion"), especially having in mind that some issues (e.g. education system as an active agent in social reproduction) or some aspects of the issues (why students dropout and not just what is the SEB of students who dropout) are not possible due to limitations with respect to data availability. Further limitations exist due to the choice of methods of data analysis, which does not address qualitative, more contextualised factors.

4. Methodological considerations

This chapter will address several issues related to the research methodology. The first section offers a description of the research design and method. The following section describes the data used in the research, along with the analysis of reliability of such data. The third section is dedicated to the concepts used in the research, indicators of the socio-economic background and variables used in statistical analysis. The details of the statistical analysis are given in the final section of the chapter.

4.1 Research design and method

The present study entails the analysis of enrolment, progress and completion of students in higher education, on the basis of a secondary analysis of official statistical data. All data was obtained from the Statistical Office of Serbia in 2006 (see further in this chapter for the detailed description of the sources of data) and it includes the number of students either enrolling in each year of study at each higher education institution or completing their studies, as well as some of the characteristics of these students, which can be connected to their socio-economic background. Furthermore, official statistical data on demography and other stages of education (primary and secondary education) were used in this research.

As was already stated, the primary goal of the research was to identify patterns of enrolment, progress and completion with respect to some elements of the socio-economic background, with the further goal of assessing the extent to which higher education in Serbia exhibits external and internal exclusion. Therefore, the research adopted a quantitative research method, including univariate and bivariate analysis, as well as logistic regression modelling (all methods will be explained in detail further in the chapter).

4.2 Sources of data and reliability issues

Data used in this study can be classified in two main groups:
1. education and demographic statistics, and
2. higher education statistics.

Education and demographic statistics include:
- numbers of pupils enrolled in primary and secondary education for selected years,
- census 2002 data including:
    - educational levels of the population in 2002 (with information for a selection of previous years),
    - ethnicity/nationality and citizenship of the population,
    - occupational structure,
    - gender and age structure;

- census data from years prior to 2002 (primarily the total number of inhabitants and the number of live births per 1,000 inhabitants);
- data on refugees, and unemployment in certain fields, etc.

Higher education statistics include data obtained through two standardised forms: SV20 and SV50. SV20 form is used to record enrolment in higher education (each year of study, not just initial enrolments). SV50 is used to record graduation. These forms are completed for each student in all higher education institutions on the territory of Serbia: public and private, university and vocational higher education. The Statistical Office of Serbia collects forms from higher education institutions and digitalises the data.

The fact that these two forms are collected in all HEI and are standardised enables comparability in time and type (i.e. specific higher education institution or type of higher education). Furthermore, the forms consist of information which are objective in nature (e.g. education of parents, place of birth, place of residence, occupation of parents etc.) which implies high level of stability of measures – it is highly unlikely that a student completing the form will make a mistake regarding, for example, the level of education of his/her mother. Nevertheless, some measures of certain characteristics (e.g. ethnicity) have reliability problem, which are discussed in detail further in this section.

The data obtained from SV20 and SV50 forms used for this study include: cumulative statistics from SV20 for the period 1990-2004, SV20 database for the period 2000-2004 and SV50 database for the period 1990-2004.

Cumulative statistics from SV20 for the period 1990-2004 includes total number of students falling into different categories with respect to several elements of the socio-economic background or personal information:

- gender and age;
- place of birth and place of residence;
- education of both parents;
- previous (usually secondary) education;
- ethnicity;
- citizenship;
- who is supporting the student – parent, another guardian or student himself/herself;
- the work status in case the parent is supporting the student: employed, self-employed, owner of SME, retired, supported by other means – e.g. rent;
- occupation of parent (or student in case the student is self supported).

They also include relevant information on the higher education experience of the student, such as:

- which institution and which programme the student is enrolled into and in which year of study;
- whether s/he is enrolled into that year of study for the first time or s/he is repeating it and
- what is the financing mode (state funded, co-funded or self funded).

SV20 database recorded information about each student enrolling in each HEI from the 2000/01 academic year to 2004/05.

When it comes to data on completion, databases of information gathered through SV50 form were available for all students who completed higher education from (calendar) year 1994 to 2004. SV50 form, however, includes only a few of the SEB elements or personal information: gender, citizenship, ethnicity, place of birth and residence, who is supporting the student and occupation of the person supporting him/her as well as the work status of the parent in case a parent is supporting the student.

It is important to stress that the identities of the students were not disclosed and some information which is not digitalised (e.g. exact date of graduation, grade average) was not included in the databases. Cumulative statistics was primarily used for exploratory purposes while databases allowed for more complex analysis (calculating correlations and means, independence chi-square tests, logistic regression etc).

For analysis of completion, it should be noted that SV20 and SV50 have different time scales. As was stated, SV20 is completed each year during enrolment into a year of study and thus it is related to academic year (in Serbia, this covers the period from October until the following September). SV50 is completed for each graduating student and data are aggregated for calendar year, which means that the date of graduation is designated by calendar year. SV50 form does have a section about the actual date of graduation (day/month/year) but this data is not digitalised, i.e. it was not available in the database. SV50 also records the year of initial enrolment in the programme the student graduated from and this actually refers to October of that year. This discrepancy in time scales poses a problem in analysis of duration of studies, since the duration of studies was calculated (see further in this chapter) as the difference between the year of graduation and the year of initial enrolment. In this way, for students who graduated between January and September of a given year, the duration of studies was overestimated by a maximum of 9 months, while for the students who graduated between October and December of a given year; the duration was underestimated by a maximum of 3 months. This issue is further addressed in Chapter 5 "Higher education and social stratification in Serbia" as well as in Chapter 6 "Conclusion".

In terms of reliability, it was already stated that some information collected through SV20 and SV50 have diminished reliability. This includes information about student's ethnic background, student's employment and work status of parent/student. When it comes to ethnic background, due to the fact that the period in question (and especially the 90s) is marked by civil wars in the region, which led to a rise in the visibility of ethnic intolerance, it is possible that this data is not accurate – either because students themselves felt reluctant to declare their ethnic status (if different from the Serbian majority) or because some of the declarations were subsequently recorded otherwise by the administrative staff. Media reports from the time of the census 2002[17] also show that there were cases that census takers either did not record ethnic background or did record false data (by mistake or on purpose). This problem has also been addressed by some academic papers[18] which analyse problems in

[17] Source in Serbian: http://www.mail-archive.com/sim@antic.org/msg04397.html (accessed on March 15, 2007),

[18] Raduški, N. (2003) Etnička slika Srbije – popis 2002. godine (The ethnic make up of the population of Serbia – census 2002), Migracijske i etničke teme, 19, pp. 253-267. Available (in Croatian) from:

recording data on ethnicity through self-declaration. There is no way of knowing if something similar occurred when completing SV20 or SV50 forms, but these events raise suspicion about the accuracy, and thus reliability, of the data. In addition, due to a complex structure of the former Yugoslavia, there is an interaction between the data on citizenship and ethnicity: one could hold citizenship of one of the republics, but live in another. Therefore, the influx of refugees into Serbia and consequential increase in the number of students coming from outside of Serbia can not be measured through the data on citizenship. Available data did not record whether a student was a refugee from war affected regions or not, and since it is possible that someone is declared Serbian in terms of citizenship but Croatian in terms of ethnicity (and vice versa) it could be that students, especially younger ones were confusing these two terms when completing the SV20[19] form. Furthermore, as will be presented in Chapter 5 "Higher education and social stratification in Serbia", some students declared themselves to be Yugoslav in terms of ethnic origin, possibly suggesting that there parents belong to different ethnic group or suggesting their intention to declare themselves in terms of geographical/political terms or to avoid explicit declaring their ethnicity. This is also decreasing the reliability of data regarding ethnicity.

When it comes to data regarding employment, it should be noted that the exact wording of the question in the SV20 form implies registered paid work. However, the Ministry of Labour, Employment and Social Policy stated[20] that around 50,000 workers were discovered on unregistered, i.e. illegal, jobs in 2005. Certain employers avoid registering their workers to avoid taxation and still be able to offer competitive wages. This phenomenon was more prominent during the 90s, primarily due to a grave economic crisis, unprecedented inflation rates and deterioration of big state companies. Therefore, the data on employment recorded from SV20 may underestimate the amount of students who are supporting themselves through some form of paid work.

Finally, the data related to work status of parents or students also pose several problems for analysis. Usually, such data should be an indicator of the so-called occupational status of parents – a way to distinguish between e.g. managerial, white-collar and blue-collar jobs. However, the data recorded in this way cannot serve as an indicator of the occupational status of parents since the main distinguishing characteristic is mode of employment (employed, employer, self employed, not employed, retired, working abroad) and not the level or status of the position or the remuneration associated with the job (thus also indicating wealth). The "grey" economy mentioned in the previous paragraph relating to student employment and the economic crisis (leading to the situation in which e.g. parents may have been officially employed in a big state owned company but not receiving any remuneration for months on end), may also be distorting information regarding work status. This problem is further discussed in the Chapter 6 "Conclusion".

---

http://hrcak.srce.hr/index.php?show=clanak_download&id_clanak_jezik=11922 (accessed on March 15, 2007)

[19] SV50 form is usually completed by members of the administrative staff.

[20] In Serbian: http://www.dnevnik.co.yu/arhiva/01-03-05-2004/Strane/spec.htm (accessed on March 15, 2007)

4.3 Concepts, indicators and variables

4.3.1 Concepts

The main concepts in this research are: initial enrolment, progress, completion in higher education and exclusion from higher education.

Initial enrolment refers to enrolment for the first time in the first year of study of a higher education programme offered by a particular institution. It is essentially measured by the number of students enrolling, with information of their background and personal data, as well as the type of higher education programme available.

The concept of progress through higher education is essentially analysed through two dimensions. The first dimension is related to repetition, i.e. whether or not the student is repeating the year of study in question. As SV20 records only if there is repetition or not, it is not possible to know if the student is repeating for the first time, or for the second, third etc. This is the reason why another dimension was added to the concept of progress through higher education and that is how long it takes to enrol into the next year of study, i.e. how long it takes to pass all the exams required to enrol into the next year of study.

When it comes to completion, i.e. the graduation (fulfilment of all requirements set by the programme to obtain the degree in question), it is analysed through the analysis of the duration of studies and, when compared to the expected duration of studies, through absolute and relative prolongation (the exact definitions of absolute and relative prolongation are given in Chapter 4 "Methodological considerations"). It should be borne in mind that the duration of studies is a biased measurement, because of the aforementioned difference between the time scales of the initial enrolment and completion data (see Chapter 4 "Methodological considerations").

As was stated in Chapter 1 "Introduction" and Chapter 3 "Higher education and social stratification in Serbia", exclusion of a certain social group from higher education refers to the situation in which that social group is either under-represented in higher education or type of HE (compared to the general population) or not represented at all in higher education. It can have two forms:

- external exclusion – the social group which is considered to be "externally excluded" is not adequately represented in higher education in general, i.e. the total proportion of all students in higher education belonging to that social group is smaller than the total proportion of the entire population belonging to that social group;
- internal exclusion – the social group which is considered to be "internally excluded" is not adequately represented in all forms of higher education (with respect to type of higher education and field), i.e. the total proportion of all students in the specific form of higher education belonging to that social groups is smaller than the total proportion of a) the total proportion of all students in higher education belonging to that social group and/or b) the total proportion of the entire population belonging to that social group.

This means that external and internal exclusion may exist independently of each other and basically constitute qualitatively two different forms of exclusion, which could be roughly connected to the two hypothesis related to maintaining inequality (see

Chapter 3 "Higher education and social stratification") – the MMI hypothesis in the case of external exclusion and the EMI hypothesis in the case of internal exclusion.

4.3.2 Indicators of students´ socio-economic background

As was stated in Chapter 1 "Introduction", the goal of this research is to analyse the influence of various elements of the student's socio-economic background on enrolment, progress and completion in higher education. In Chapter 3 "Higher education and social stratification", it was stated that such studies usually classify students on the basis of education of parents and/or their parents (or their own) occupation status (e.g. managerial, white-collar, blue-collar workers, etc). These measures are used to indicate student's socio-economic background or the cultural, economic and sometimes social capital (Bourdieu, 1986). Having in mind the aforementioned problems regarding parents' work status and employment of students – the sole information available from the data used in the research, which does not share these validity and reliability problems is the education of parents. Therefore, it was used as the main indicator of students´ socio-economic background.

The previous section already stated that for each student, SV20 records education of each parent and one of the following categories can be chosen:

- parent has no education whatsoever,
- parent has incomplete primary education (1-7 years),
- parent completed primary education,
- parent completed secondary education (although there is no reference to the type of secondary education),
- parent completed vocational higher education and
- parent completed university higher education, although no distinction is made between undergraduate level, and higher levels such as "magisterium" or doctorate.

Education of parents may be used as a proxy for cultural capital and economic capital. The cultural capital is often operationalised in the literature by the education of parents and research found that there is a strong correlation between education of parents, and other operationalisations of the cultural capital, for example number of books in the household, number of visits to cultural events per month, etc (Wong, 1998). Within this research endeavour, it is not claimed that the cultural capital can be fully operationalised by education of parents, although the research will treat education of parents as a potential indicator of the cultural capital as well.

When it comes to economic capital, the situation is more problematic. While the official statistics do state that persons with qualifications from higher education earn on average more than those who do not have higher education (in September 2006 the average salary of a person with university degree was 1.7 times bigger than the average salary in Serbia[21]), it is not clear how much this information, related to the time of economic transition and reform (i.e. outside of the period under research) is relevant for the years marked with severe inflation, economic crisis and a strong

[21] Statistical Office of Serbia, Statement ZP12, available from (in Serbian only, document accessed on February 16, 2007) http://webrzs.statserb.sr.gov.yu/axd/dokumenti/zp12092006.pdf.

"grey" economy. One could claim that people who had better education were less vulnerable to the consequences of the economic crisis, since some research shows (Blöndal, Field and Girouard, 2002:13) that possession of higher education lowers the risk of (prolonged) unemployment. Nevertheless, the situation in Serbia in the period under research was so extreme and "abnormal" that it is difficult to assess to what extent such assumptions really hold. Therefore, one should not assume that the education of parents is also an indicator of the economic capital.

Since one of the goals of the research is to study how completion depends on elements of the socio-economic background (recall that the dropout rate was estimated to be 45%), but having in mind that the data on completion (i.e. SV50 data) do not include education of parents, another way of estimating the influence of education of parents in completion had to be found. SV20 data, since it corresponds to all years of study, thus including the final years of study was used for this purpose. Thus, the comparison of the elements of SEB of graduates and SEB elements of freshmen (in this case, this would include only education of parents) which would yield a reliable analysis of SEB of those who dropped out was not possible. Instead, education of parents of freshmen (those initially enrolling) was compared to the education of parents in the final year of study. The assumption is that the majority of those who reached the final year of study would eventually complete their studies. This assumption can be substantiated with the analysis of progress through higher education, which shows that the most problematic year in terms of progress is the second year of study: it has the highest repetition rate and longest value of progress (Chapter 5 "Higher education and social stratification in Serbia"). However, the students in the final year of study cannot be considered as representative of the students who graduate, but only as the best possible proxy for graduates, given the data constraints.

4.3.3 Variables

Given the concepts of interest, as well as the discussion outlined above on indicators of socio-economic background and composition of the population of those who dropped out, several variables were either taken directly from the data or were constructed. They are classified here as independent and dependent, and corresponding levels of measurement are given. Certain variables will be considered as both dependent and independent, depending on the method and goal of analysis.

Independent variables

Independent variables:

- age – interval, this enables calculation of age of initial enrolment and age of graduation where necessary;
- gender – dichotomous (nominal);
- citizenship – nominal;
- ethnicity – nominal;
- previous education of student – ordinal. Refers to the highest education qualification obtained prior to enrolling into a given higher education institution and may include:

    - 4-year secondary education (gymnasium or vocational secondary education),
    - vocational higher education,
    - university higher education.

  Previous education of student was treated as an ordinal variable, since e.g. gymnasium is considered to be more prestigious than vocational secondary education, but lower in level than any form of higher education.;
- education of each parent – ordinal;
- work status of parents (or student – in case the student is self supported) – nominal. May have the following values:
    - parent is employed,
    - parent is owner of an enterprise,
    - parent is self-employed,
    - parent is active (able to work) but not employed,
    - parent is retired or has other personal income not related to work,
    - parent is temporarily working abroad,
    - student is not supported by parents but by other persons or an institution,
    - student is self supported through personal income not related to work, and
    - student is self supported through work related income;
- employment of student – dichotomous (nominal, although sometimes treated as ordinal). Employment of student was usually treated as a nominal variable since possible values are not employed or employed. In some cases it was treated as an ordinal variable, to allow for certain correlation analysis.

Dependent variables

Dependent variables relate to various aspects of student's higher education experience and include:

- new enrolment or repetition – dichotomous, refers to information whether the student is enrolling for the first time in the specific year of study or s/he is repeating the year;
- progress – interval, refers to the time it takes to enrol into the next year of study. Progress was calculated as follows (since this was the only way allowed by the structure of the data):

  progress = (academic_year – year_initial_enrolment + 1)/year_study[22]

  Thus, this variable is related to cumulative progress up to the year of study in question. On the basis of progress as an interval variable, a categorical variable was constructed. An average was calculated for the entire sample under research (see Chapter 5 "Higher education and social stratification in Serbia") and students were categorised into the following categories: accelerated progress (progress<1), expected progress (progress=1), expected to average progress (1<progress<average progress), average to twice the expected

[22] The *academic_year* refers to the academic year for which the data are related, *year_initial_enrolment* refers to the academic year in which the student enrolled for the first time in the first year of study in the given institution and *year_study* designates the year of study the student is enrolled into (1st, 2nd … 6th).

progress (average progress<progress<2), longer than twice the expected progress (progress>2);

- duration – interval, refers to the total duration of studies – from the year of initial enrolment until the year of graduation. Calculated as follows:

  duration = year of graduation – year of initial enrolment

  Note again that this variable was biased due to discrepancy between the time scales of enrolment and completion data;
- absolute prolongation – interval, refers to the total prolongation of studies and was calculated on the basis of duration and expected duration of studies (2, 3, 4, 5 or 6 years depending on the type of HEI and field – see Chapter 2 "The Serbian context"):

  prolongation_abs = duration – duration_expected[23]
- relative prolongation – interval, determines the amount of prolongation for each year of study

  prolongation_rel = prolongation_abs/duration_expected

  This variable is somewhat similar to progress variable. However, populations covered by SV20 and SV50 are different and the existence of these two variables allowed for some comparison between the two populations, especially having in mind the high dropout rate (see Chapter 5 "Higher education and social stratification in Serbia" for further discussion).

Two of the main concepts described in Chapter 1 "Introduction", initial enrolment and enrolment do not appear in the list of dependent variables. The reason for this is that both concepts have been analysed through the analysis of the student population in terms of various elements of the socio-economic background for:

a. students who are for the first time enrolling into the first year of study at a given institution – in the case of initial enrolments,
b. students who are enrolling into any year of study (for the first time or repeating) – in the case of enrolments as such.

Therefore, the analysis of initial enrolments and enrolments is primarily descriptive and gave some information on external and internal exclusion. However, certain exploratory and explanatory analysis was done using the type of higher education, field of studies and mode of financing as dependent variables (see further below).

Variables treated as dependent or independent

Certain variables were treated as both dependent and independent, depending on the focus of analysis. These were:

- year of study – ordinal;
- financing mode – ordinal (three rank ordered categories – state-funded, co-funded, self-funded student). State funded and co-funded exist only in public higher education;
- type of higher education institution – nominal – three possible categories: public universities, public vocational higher education institutions (see Chapter 2 "The Serbian context") and private higher education institutions (both universities and vocational HEI). Sometimes treated as ordinal in

[23] The label *duration_expected* refers to the expected duration of studies (as foreseen by the regulations of HEI and specific programme). See Chapter 2 "The Serbian context" for detailed information.

analysis limited to public higher education institutions, with public universities as the first rank and vocational HEI as the second rank;

- field – nominal. The programmes were classified in 7 different categories:
    1. teacher training (including elementary and preschool teacher training),
    2. business and economy,
    3. social sciences, arts and humanities,
    4. natural sciences and mathematics,
    5. law,
    6. engineering and technical sciences and
    7. health sciences (dentistry, medicine, veterinary medicine, pharmaceutical studies and physical education).

  The field classification is as presented in order to:
    a. take into account a large number of HEI offering programmes in education, both as branch campuses of education faculties (university type) or as individual vocational HEI offering courses for preschool teachers,
    b. take into account the fact that a large proportion of students is enrolled in business and economy or law (25.2% in economy – both university and vocational and 9.4% in law – only university) and
    c. take into account the fact that in some cases programmes in social sciences, arts and humanities are organised within the same institution, thus making it impossible to distinguish the exact programme for all students (e.g. in Belgrade these studies are organised in separate faculties, i.e. separate HEI, while in the case of Novi Sad, Nis and Kragujevac this is not the case);
- expected duration, determined on the basis of type of higher education institution and the field of studies. Possible values are 2, 3, 4, 5 and 6 years of study. Expected duration was not determined for 7 institutions belonging to public universities (5% of the total student population for enrolments). The reason for this is that these institutions offer both 4 and 5 year (or 5 and 6 year) programmes and it was impossible on the basis of data available to distinguish which students belonged to which programme. These institutions offer programmes in engineering or health sciences. Therefore, in the analysis of the data related to these two fields, only institutions for which expected duration was determined were used. See Chapter 5 "Higher education and social stratification in Serbia" for further discussion of this matter.

These variables were used as dependent variables in the descriptive analysis of initial enrolments or enrolments, or in logistic regression (see related section in this chapter or Chapter 5 "Higher education and social stratification in Serbia"). Furthermore, in theoretical terms, variables such as *financing* and *employment* have a complicated relationship with each other and with the variables *progress*, *new enrolment or repetition* or *duration.* It could be argued that whether or not a student is state or self funded may affect student's employment since, in the case of state financing the student is less likely to need an additional source of income, and may not be employed. However, the opposite may be true as well because, hypothetically, a student who is employed (to gain additional funding for living costs or for other reasons) and started his/her studies in the status of state financed student may "fall" into the self funded category because s/he can not cope with the academic workload coupled with employment. In addition, even though financing status depends on

success during studies (see Chapter 2 "The Serbian context") and thus it could be argued that *progress* or *new enrolment or repetition* affects *financing*, it is also possible that, due to the coupling between *financing* and *employment*, the opposite effect is present as well (especially having in mind the aforementioned problems with the *employment* variable). For these reasons, any correlations or similar analysis involving these variables was done using directional measures of correlations (for further details see below or Chapter 5 "Higher education and social stratification in Serbia").

4.4 Data analysis

Data analysis basically consisted of four phases:

1. preliminary exploratory analysis of the cumulative statistics on enrolment for the period 1990-2004, as well as other education or demographic statistics;
2. univariate analysis of databases on enrolment (SV20, 2000-2004) and completion (SV50, 1994-2004);
3. bivariate analysis of SV20 and SV50 databases and
4. logistic regression modelling for a set of dependent variables connected to enrolment.

Since the actual databases included the entire population (for the related periods) of students and graduates (total number of entries is over one million), the databases used for analysis were constructed by taking a 10% random sample (using SPSS) for each academic year or year of graduation and then merging the files from different years into one for SV20 data and one for SV50 data, retaining the information about the academic or calendar year in question.

Due to the fact that data for private higher education institutions was sometimes found to be incomplete (e.g. data about previous education of student was not properly recorded) as well as that only around 6-7% of the total student population is enrolled in private higher education institutions, which, in a majority of cases, have been founded very recently, private higher education was dropped from further analysis. Furthermore, for the reasons explained above, more complex analysis of data did not include the *employment*, *occupation*¸ *citizenship* and *ethnicity* variable.

4.4.1 Preliminary exploratory analysis of cumulative statistics

Cumulative statistics about enrolment was used to obtain relative frequencies for different elements, or a combination of elements of SEB or, to a lesser extent, relative frequencies for different aspects of student's experience (see above the discussion on dependent variables). This was done with the intention to analyse major patterns in terms of enrolment and to make initial inferences about internal and external exclusion. In addition, this data was also used in the attempt to assess the possible influence of changes in higher education system (e.g. legislative changes) or external changes in the society (e.g. major political events which caused disruption of academic work or influx of refugees). In this way, analysis of cumulative statistics was primarily used to address certain issues related to the first two research questions,

i.e. patterns of enrolment and impact of changes in higher education or society at large on these patterns.

4.4.2 Univariate and bivariate analysis of SV20 and SV50 databases

All univariate and bivariate analysis was done using SPSS versions 12 and 14.

Univariate analysis consisted of calculations of frequencies, tables of categorical data and diagrams for variables of measurement level below interval. In the case of interval variables, SPSS was used to calculate various measures of central tendency, particularly means, 95% confidence interval of means, statistical significance of these means, their standard deviations to assess the level of dispersion and skewness of the distributions.

Bivariate analysis included analysis of independence of two variables through chi-square tests of independence, as well as investigations of patterns of change and possible associations (correlations) between the two variables in question. In cases where one variable was interval (e.g. progress) and the other was nominal or ordinal in nature (e.g. gender or education of parents) – analysis of patterns and associations included comparison of means through a one-way ANOVA procedure and calculation of Eta correlation coefficient, used to measure correlations between ordinal and nominal variables. The ANOVA procedure basically calculates means of the interval variable for each value of the ordinal or nominal variable and analyses variance between groups, i.e. different values of the nominal/ordinal variable (through differences between the mean for that group and the overall mean) and within groups (through standard deviation of the mean for the group in question). This variance is tested by an F statistic, which is, simplified, the ratio between the variation within groups and between groups, taking into account the corresponding degrees of freedom. The Eta coefficient is the percentage of variance of the dependent variable which is accounted for by the variance between the categories of the independent variable.

To investigate the association between nominal or ordinal variables, the study relied on calculation of various correlation coefficients, primarily the symmetric measures of correlation – in cases in which it was clear which variable should be treated as independent and which as dependent (e.g. type of HEI of destination can not influence the education of parents, so clearly HEI type is the dependent variable, and education of parents the independent variable in that case). These measures were Kendall's tau-b, Kendall's tau-c or Spearman's rho. All three measures give information to the proportional reduction of error – i.e. what is the reduction in error of predicting a rank (or category) of an observation on one variable when information about the rank (or category) of the other variable is know, compared to when this rank is not used. The larger the coefficient of correlation, the larger is the proportional reduction in error. Most of the results reporting includes Kendall's tau-b or tau-c, since Spearman's rho assumes that the data are fully ranked (Agresti and Finlay, 1986), i.e. that there is no tied pairs, which is not the case. In cases where the two variables whose association is measured do not have the same number of possible categories, Kendall's tau-c was used, since, unlike Kendall's tau-b, it does not assume

that the related cross-classification tables are square. It should be noted that the Kendall's tau and the Spearman's rho coefficients of correlation between two variables give information about the proportional reduction of error in predicting the value of one variable given the value of the other variable (Agresti and Finlay, 1986). However, the interpretations in this study are formulated in a simpler way, in terms of which event seems to be more or less likely.

4.4.3 Multivariate analysis – logistic regression

Bivariate analysis as well as theoretical considerations indicated that there could be joint effects of several independent variables, as well as interaction between them (Agresti and Finlay, 1986: 307). That is:

- a relationship between two variables could be a spurious relationship (diminishing or disappearing when controlled for the third variable),
- there could be an intervening third variable between the independent and dependent variable,
- association between two variables could be dependent on the level of the third variable or
- a dependent variable could have more than one independent variable influencing it.

Since the majority of variables (particularly those treated as independent variables) are either nominal or ordinal in nature, calculations of partial correlations was not possible, since these procedures treat all variables as interval level variables. Therefore, logistic regression was used to model the occurrence of the following events and calculate corresponding odds ratios:

1. a student is initially enrolled into a university, vs. a student is not initially enrolled into a university (i.e. s/he is enrolled in a vocational HEI),
2. a student is enrolled as a state funded student, vs. a student is not enrolled as a state funded student (i.e. s/he is either enrolled as co-funded or self-funded) and
3. a student is repeating a year of study vs. a student is not repeating a year of study.

Logistic regression allows for the calculation of the odds ratio, i.e. what is the probability of an event taking place vs. of an event not taking place. The model actually assumes that the logarithm of the odds ratio is linear with respect to independent variables (see Agresti and Finlay, 1986) and calculates the parameters of the model using maximum likelihood (see Hosmer and Lemeshow, 2000 for details), i.e. the values of parameters maximise the probability of obtaining the observed set of data, given the values of the presumed independent variables.

Logistic regression assumes that the dependent variable is dichotomous, i.e. an event can either happen or not happen, hence the modelling of *university/no university*; *state funded/not state funded* and *repeating/not repeating.* The independent variables used were: education of each parent, previous (secondary) education of student and gender. The independent variables were chosen on the basis of previous bivariate analysis. Their measurement level was also reduced from ordinal to dichotomous to facilitate interpretation:

- education of parent was reduced to create two dichotomous variables:
    1. parent has higher education/ parent does not have higher education and
    2. parent has secondary education or more/ parent has less than secondary education;
- previous (secondary) education was recoded in such a way as to take the value of “1” in case the student attended a gymnasium and the value of “0” in case the student attended a secondary vocational school;
- in terms of gender – females were coded “1” and males “0”.

In terms of education of parent, essentially two models were used for each of the response variables, one using "has HE/does not have HE" variable and the other using "has SE/does not have SE" variable. Therefore, there were 6 models in total.

Logistic modelling was also done using SPSS, (binary logistic regression procedure), using a backward procedure – all independent variables are first in the model and then are deleted from the model, depending on their significance. The procedure provides estimates of parameters (including the significance as well as 95% confidence intervals), goodness-of-fit tests (e.g. Hosmer–Lemeshow test which has as the null hypothesis that the model fits the data) and the estimate of the prediction value of the model, i.e. the percentage of cases in which the model will be correct. All these results are duly reported in Chapter 5 “Higher education and social stratification in Serbia”, in the section dedicated to logistic regression models.

5. Higher education and social stratification in Serbia

5.1 Patterns of enrolment, progress and completion

5.1.1 Enrolment

During the period under research (1990-2005), the total number of students almost doubled, from approximately 120,000 to around 220,000 (see Figure 7). This includes students in both types of higher education, in public and private institutions alike.

The beginning of the 90s exhibits a rather stable number of students, with a steady increase from 1995 till 1999, the start of the increase coinciding with the largest influx of refugees from war affected regions (primarily Croatia). When it comes to the number of institutions, the data available from the Statistical Office of Serbia show no change in the number of higher education institutions from 1976 to 2001: the number of higher education institutions remained 127 (Statistical Office of Serbia, 2005b). However, in 2004 there were around 150 individual public institutions (note that individual faculties within the same university as well as branch campuses are counted as separate institutions, Chapter 2 "The Serbian context") as well as around 80 private institutions (Statistical Office of Serbia, 2005b). No new public universities were founded in the period under research, although new faculties were opened in some of the universities. Furthermore, private universities were beginning to emerge as early as 1993 and private vocational higher education institutions in 1994. This all means that, in spite of the fact that the number of institutions was 127 from 1976 to 2001, some institutions were opened and some closed down. Therefore, there were changes in the supply of higher education, although it is not possible to analyse this in quantitative or qualitative terms due to the constraints imposed by the structure of available data.

Therefore, the steady increase in the total number of students could be interpreted as a consequence of:

- the increased demand (partly connected to the influx of refugees enrolling for the first time or continuing their higher education),
- the expanded offer in private institutions,
- the increase of the *numeri clausi* at public institutions (even though the actual capacity of these institutions did not change), and
- new faculties in public universities (the last two potentially being more related to the initial enrolments, see Figure 8).

In addition, it is often mentioned in public discussions that there might be a connection between increased enrolment in higher education and the fact that an undeterminable amount of male students enrolled in higher education primarily to avoid military service or being sent to the front in Croatia and Bosnia (although the latter could be valid only for the period prior to the Dayton agreement in 1995). However, as was stated previously, it was not possible to assess to what extent the military service and drafts affected increased enrolments. Furthermore, as was stated in Chapter 2 "The Serbian context", the 1999/2000 academic year was extraordinary since the government decided to lift the requirement to pass an entrance exam in order

to enrol into higher education and the number of places available for freshmen was not limited. After 2001, the new government started with a stricter policy in terms of number of students in public institutions to prevent overcrowding (which is potentially damaging the quality of higher education). The bulk of the increasing number of students from 2001 onwards is likely caused by the establishment of new higher education institutions.

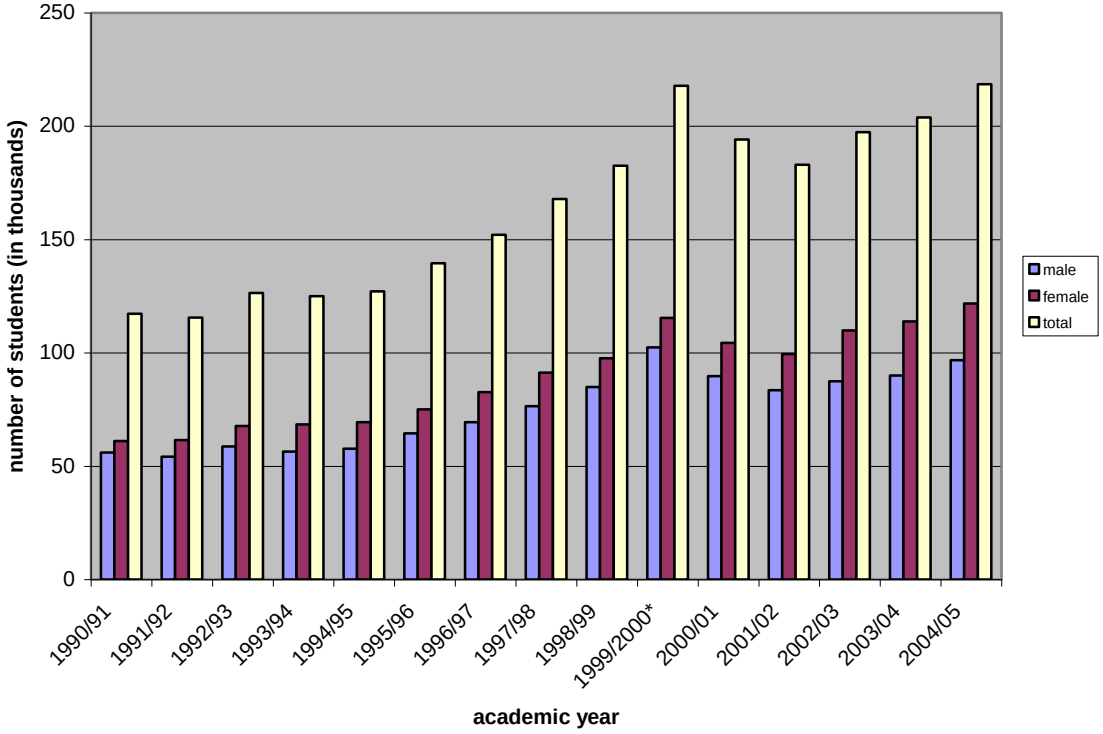

Figure 7 Number of students in higher education from 1990-2005.

*** 1999/2000 – there were no entrance exams or *numeri clausi* this year because of the NATO bombing**

The female students are more numerous than male and the proportion of female students increased from around 52% in 1990 to almost 56% in 2004. This is larger than the proportion of females in the entire population (51% according to the 2002 census), which may suggest women outperforming men in terms of higher education enrolment (and completion, see below). There distribution of male and female students according to the field of study is discussed later in this section. In terms of initial enrolments (Figure 8), the odd nature of enrolments in 1999/2000 due to the NATO bombing is even more prominent. The government policy of stable or even decreasing initial enrolments from 2000 onwards in public institutions is visible, especially having in mind that the period after 2001 was also marked by an increasing number of institutions (see above).

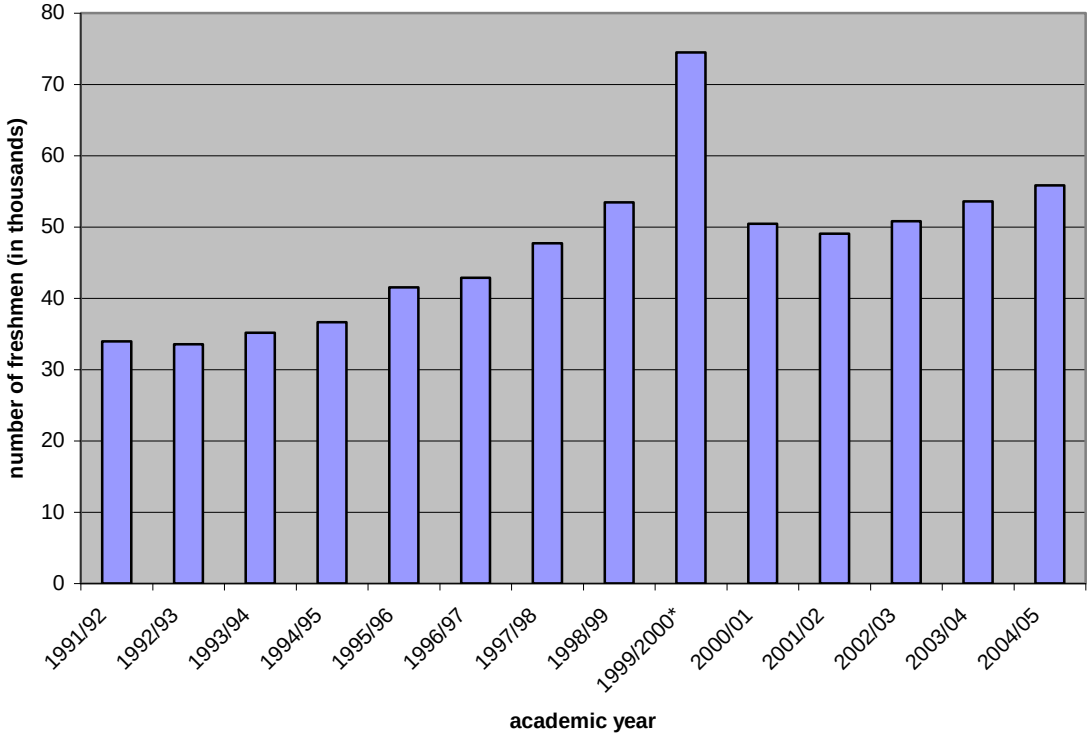

Figure 8 Initial enrolments in higher education.

***1999/2000 – see Figure 7.**

When it comes to the type of higher education institution, Table 3 provides an overview of the proportion of students in public universities, public vocational higher education institutions and private institutions (both types) in two parts of the period under research. The year 2000 was chosen as the divide between the two parts for reasons of changed external circumstances (see Chapter 2 "The Serbian context").

Table 3 Proportion of students in different types of HEI in two parts of period under research.

Type of HEI	1990-2000	2000-2005
Public universities	78%	71%
Public vocational HEI	21%	22%
Private HEI (both types)	1%	7%

The increase in the proportion of students enrolled in private higher education from 1% to 7% coincides with the rapid increase in the number of institutions from 2001 onwards, suggesting that the bulk of the new institutions were private (few new faculties within public universities were formed since 2001). One may speculate that the situation in the 2000-2005 period in which initial enrolments were more or less stable, while the proportion of students in private institutions was increasing, was an indicator that a number of students transferred from public to private institutions after studying for a certain period of time in a public institution, motivated by the perception that it would be easier to complete higher education at a private institution.

However, as there is no data on transfer of students between different types of institutions, it is impossible to confirm this using the available sets of data.

In terms of citizenship and ethnic background, the analysis shows that, as of 1993 the majority of students, almost 96% are of "domestic" citizenship – citizenship of Serbia or of Montenegro (in the period under study, Serbia and Montenegro constituted Federal Republic of Yugoslavia or the State Union of Serbia and Montenegro). Prior to 1993, all students from former Yugoslavia (SFRJ) were registered as domestic. However, after 1993, students who were citizens of Bosnia and Herzegovina, Croatia, Macedonia or Slovenia constituted almost 4% of the total student body. Here, one should recall the discussion with respect to the relationship between ethnicity and citizenship in former Yugoslavia given in Chapter 4 "Methodological considerations". As was stated there, the data used in this study did not record if students were refugees. Nevertheless, it is interesting to note that, of the 4% of students who were holders of citizenship of one of the former Yugoslav republics, almost 76% were from Bosnia and Herzegovina, followed by 21% from Croatia and a bit more than 2% from Macedonia.

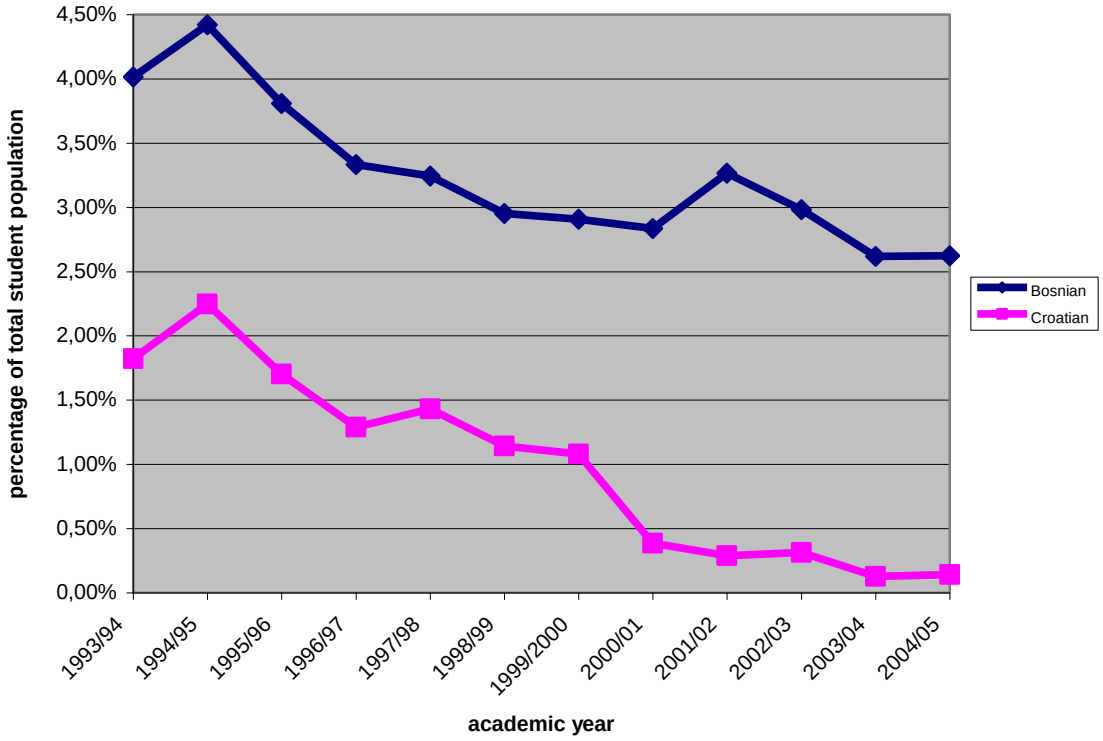

Figure 9 Students from Bosnia and Herzegovina and Croatia studying in Serbia.

As can be seen in Figure 9, in terms of temporal developments, the number of students with Bosnian citizenship remains above 2.5% of the total number of students throughout the period under research. The number is higher (4-4.5%) in the war period, suggesting that some students from Bosnia (possibly of Serbian ethnic origin) came to Serbia to study, since there was almost no higher education at that time in Bosnia. After 1995 and the Dayton agreement, students from Republika Srpska (one of the two parts of Bosnia with a Serbian majority) could study in Serbia under the

same conditions as students from Serbia or Montenegro, which may explain why the number of students from Bosnia did not decrease to the same extent as the number of students from Croatia after the end of the war. Furthermore, some refugee students may have obtained Serbian citizenship after coming to Serbia and thus not be recorded as coming from Bosnia or Croatia any longer.

The issue of the ethnic origin of students was already touched upon in Chapter 4 "Methodological considerations", suggesting diminished reliability of data on ethnicity. One of the reasons, as is explained in Chapter 4 "Methodological considerations" could be that people felt reluctant to state their true ethnic origin and chose "Serbian" instead. Furthermore, it is possible that due to the interaction between the concept of citizenship and of ethnicity, especially in relation to the states and ethnic groups of former Yugoslavia, that students mix these two concepts, thus giving incorrect information. Therefore, any inferences regarding patterns of enrolment, progress or completion with respect to ethnicity have to be made with significant caveats. The following text provides an overview of the composition of the student population in terms of ethnicity as well as some temporal developments in the period under research, which may be of interest for further research using more reliable data on ethnicity.

The issue of ethnicity is particularly interesting if seen for Vojvodina (northern province in Serbia) and central Serbia separately, since historically Vojvodina is more ethnically diverse. As is presented in Table 4, in Serbia 90% of students declare themselves, in terms of ethnic origin, as Serbian (3% as Yugoslav, 2% as Montenegrin, 1% as Bosniak and 4% other ethnic groups). On the other hand, in Vojvodina 75% of students declare to be Serbian, 7% Hungarian, 6% Yugoslav, 4% Montenegrin, 1% Croatian, 1% Ruthenian[24], 1% Slovak and 5% other ethnic groups). When it comes to the overall population, according to the 2002 census the situation is as follows:

- 90% declared as Serbian in central Serbia, compared to 65% in Vojvodina;
- 0.5% declared as Montenegrin in central Serbia, compared to 1.7% in Vojvodina;
- 0.5% declared to be Yugoslav in central Serbia, compared to 2.5% in Vojvodina;
- there are 14% declared as Hungarians, and almost 3% as Croatians and Slovaks each in Vojvodina, while in central Serbia less then 1% declared as such;
- negligible percentage declared to be Albanian in Vojvodina and 1% in central Serbia. The situation is the same for declared Bosniaks (2.5% in central Serbia and negligible in Vojvodina),
- Ruthenians live entirely in Vojvodina (almost 1%) and
- the people who declared as Roma[25] are 1.5% both in central Serbia and in Vojvodina.

[24] An ethnic group of western Slavic origin.

[25] The data about Roma in the 2002 census are misleading since many of them live in unregistered addresses and thus were not "covered" by the census.

Table 4 Ethnicity of students and population for central Serbia and Vojvodina

in %	central Serbia total	central Serbia student	Vojvodina total	Vojvodina student
Serbian	90	90	65	75
Montenegrin	0.5	2	1.7	4
Yugoslav	0.5	3	2.5	6
Albanian	1	<1	<1	<1
Bosniak	2.5	1	<1	<1
Croatian	<1	<1	3	1
Hungarian	<1	<1	14	7
Ruthenian	<1	<1	1	1
Roma	1.5	<1	1.5	<1
Slovak	<1	<1	3	1

This comparison may indicate that some of the ethnic groups are under-represented in the student population (compared to the entire population): Croats, Slovaks and Hungarians (in ethnic terms) in Vojvodina and Bosniaks in central Serbia, while Roma are under-represented in both parts of Serbia (but they are also under-represented in all stages of education). Nevertheless, to accurately assess the level of under-representation in terms of ethnicity, more reliable data on both the entire population and the student population is necessary. It should also be mentioned that Hungarians may also study in Hungary, under the same conditions as those holding Hungarian citizenship.

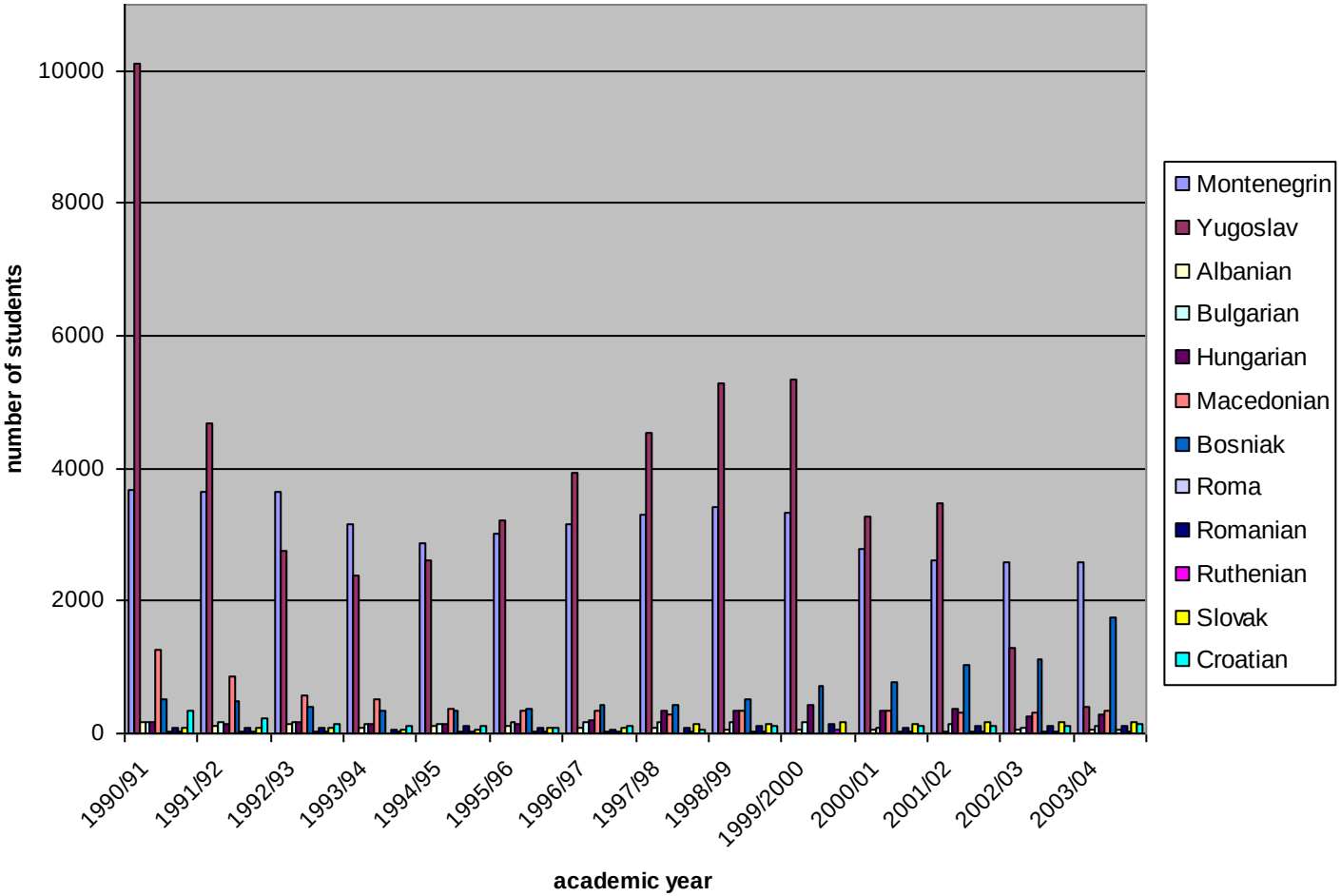

Figure 10 Declared ethnicity of students in the period 1990-2005, in central Serbia.

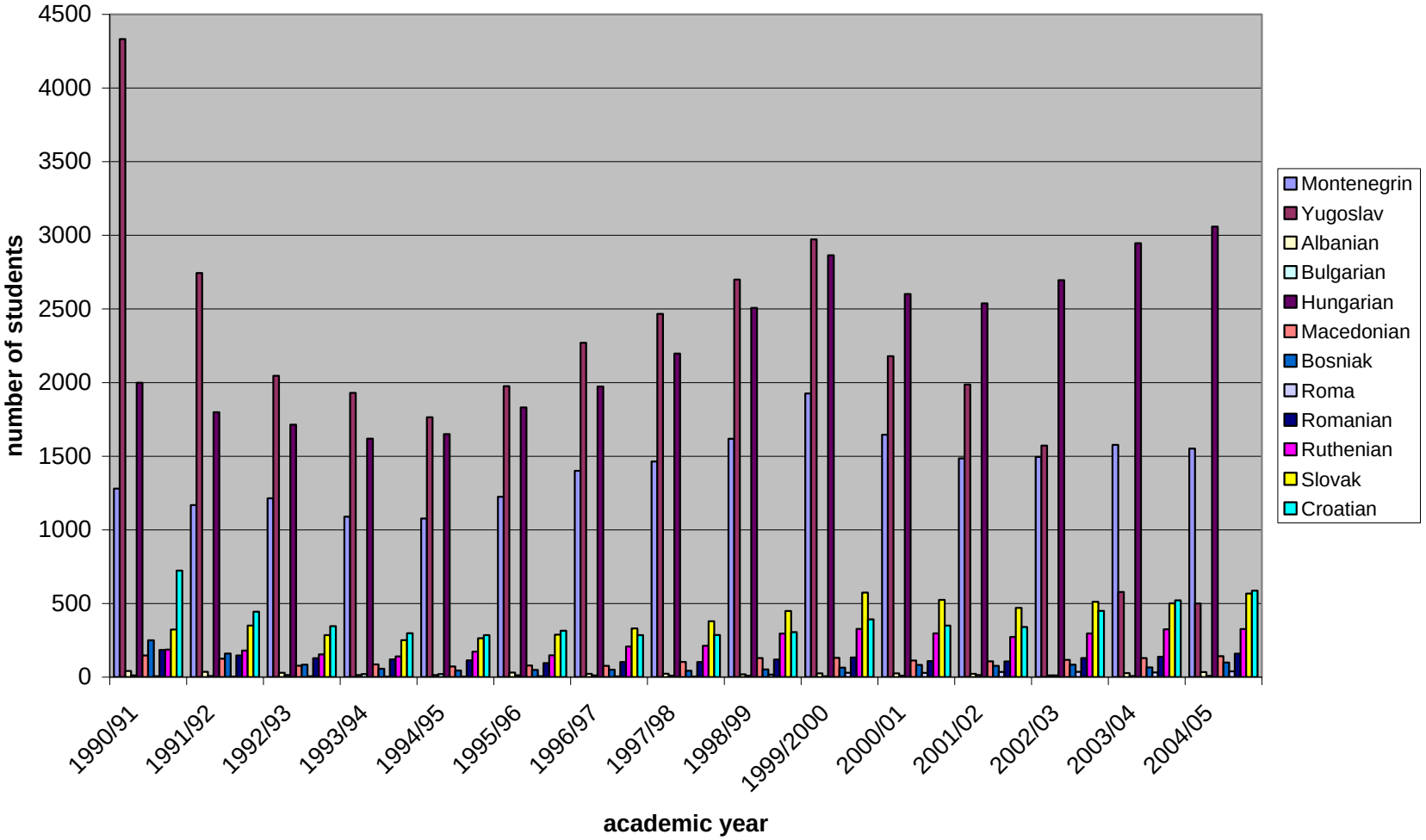

Figure 11 Declared ethnicity of students in the period 1990-2005, in Vojvodina.

When it comes to temporal developments in terms of ethnic origin of students (see Figures 10 and 11), several interesting observations can be made:

- the number of students who declare themselves as Yugoslav (see Chapter 4 "Methodological considerations" on the concept of "Yugoslav" in terms of ethnicity) changes significantly. These changes are most likely reflecting the political situation, in terms of the rising of the nationalism and the negative feeling towards Yugoslavia in general. It may also be due to the fact that at some point it was possible not to declare the ethnic origin (and be registered as "not declared" instead of "Yugoslav" as was previously the case):
    - there is a sharp decrease from 1990 to 1991 – the percentage of "Yugoslav" students halved, followed by a steady decrease until 1993,
    - from 1993 to 1998 the number of "Yugoslav" students is increasing again and then again decreasing after 1999,
    - in 1990 the "Yugoslav" students represented 12.3% of the total student population, while in 2004 they represented 0.35% - 35 times less;
- the number of "Bosniak" declared students in central Serbia is increasing after 2000, most probably due to the more positive attitude of the authorities and part of the society towards this ethnic group, as well as the fact that the census 2002 allowed the possibility to declare oneself as "Bosniak";
- the number of students declaring to be Albanian in central Serbia is negligible throughout the period under research, reflecting the problematic situation with Kosovo – although the data do not include Kosovo (where Albanians constructed their parallel educational system) there were Albanians living in central Serbia as well but they either did not enrol into institutions in Serbia or did not want to declare themselves as Albanian (although one could make inferences about ethnicity on the basis of first and last name).

In terms of the age of initial enrolment, the average age is 19.86, which is slightly higher than expected; since it is expected that students will continue with higher education immediately after graduation from secondary education, which is usually at the age of 18 or early 19. Standard deviation for average age of enrolment is 2.58, suggesting rather high dispersion. The distribution is skewed to the left, and the mode and the median are both 19. There are very few entrants of non traditional age. It should be stressed that this average age of enrolment was calculated on the basis of SV20 database, covering the entire student population in 2000-2004 period. The analysis of SV50 database (graduates) will show a different average age of enrolment, which will be discussed further in the text (see below, section on completion).

As far as employment while studying, the proportion of employed students is relatively small – only 6.5% of students are employed while studying. However, caveats regarding the variable employment (see Chapter 4 "Methodological considerations") should be kept in mind.

The students (both in terms of enrolment and in terms of completion) were classified in 7 distinctive fields, listed in Chapter 4 "Methodological considerations" (where also the rationale for such division was given). The distribution of students between the fields, regardless of the type of higher education (in terms of enrolment) is given in Table 5.

Table 5 Distribution of students between the fields, for university and vocational higher education

Field	Percentage of students	Percentage of female students (of all students in the field)
Teacher training	4.6	>90
Business or economy	25.5	60
Arts, humanities and (other) social sciences	12.2	>70
Natural sciences and mathematics	7.4	60
Law	9.4	around 55
Engineering and technical fields	26.2	<40
Health sciences	14.1	60

Table 5 shows that a large proportion of students are in two fields: business and economy, or engineering and technical fields. It should be stressed that in the field of education and economy and business the ratio of university students to students in vocational institutions is approx. 1:2, engineering is almost 1:1, and in medicine it is 3:1. There are no programmes in vocational institutions in the field of natural sciences and mathematics and only 2% of students of arts, humanities and other social sciences are enrolled in vocational institutions (all some form of art schools). In the field of law 10% are in vocational institutions (i.e. policy academy). As can be seen from Table 5, some of the fields also exhibit gender bias:

- more than 90% of students in teacher training are female;
- more than 70% in social sciences, arts and humanities are female;
- more than 60% in business and economy, natural sciences and mathematics and medicine are female; while
- more than 60% are male in engineering; and
- law is more or less balanced (having in mind the proportion of women in higher education in general) a bit less than 55% are women.

5.1.2 Progress

As was explained in the Chapter 4 "Methodological considerations", progress through higher education was analysed using three variables: *progress* (interval), *progress_cat* (ordinal) and *new_or_repeat* (dichotomous). Average progress was calculated on the basis of SV20 database thus referring to the 2000-2004 period only. Average progress is 1.45 years with a 0.77 standard deviation, and median and mode both equal 1. Therefore, while more than 50% of students actually have expected progress, there is a substantial proportion of students whose progress is worse than expected, i.e. it takes them more than a year to enrol into the next year of study. This is particularly visible in the analysis of *progress_cat*, presented in Table 6[26]:

- 1.4% of students have progress less than 1 suggesting better progress than expected. This is possible after the first year of study – students who show exceptional grade average may apply for the so-called accelerated studies, allowing them to take exams without actually attending all the lectures;

[26] Sum of percentages exceeds 100 because of rounding.

- 52.4% of students have expected progress and an additional 9.7% have progress between the expected value (1) and the average value), but
- 36.6% students have progress worse than average (10.4% needing 2 years or more to enrol into the next year of study).

Table 6 Progress of students expressed by categorical variable *progress_cat*

Progress, categorical	Percentage of students
Better than expected, *progress<1*	1.4
Expected, *progress=1*	52.4
Between expected and average, *1<progress<1.45*	9.7
Average to twice the expected, *1.45<progress<2*	26.2
More than twice the expected progress, *progress>2*	10.4

Progress is somewhat better in universities – 1.44 (compared to 1.47 in vocational HEI) and with smaller dispersion. Female students have better progress than male: 1.41 to 1.50, around one month of difference. When it comes to differences between different fields with respect to progress: teacher training has the best progress – it takes 1.14 years to enrol into the next year of study, while in law it takes the most – 1.67 years to enrol into the next year of study (see Table 7). The dependence of progress with respect to year of study will be discussed later in this section (see below).

Table 7 Progress of students in different fields of study

Field	Progress
Teacher training	1.14
Business and economy	1.52
Arts, humanities and social sciences	1.37
Natural sciences and mathematics	1.44
Law	1.67
Engineering	1.45
Health sciences	1.36

One can further analyse progress by analysing the ratio of new enrolments into a year of study to the repetitions of that year of study, using the *new_or_repeat* variable (see Chapter 4 "Methodological considerations"). Around 30% of students enrolling into any of the years of study is repeating. 48% of students who repeat are female and, considering that they make up more than a half of the total student population and less than a half of those who repeat: the conclusion could be that female students are more successful. Students in vocational HEI tend to repeat less: 26% of students enrolled into vocational HEI repeat, compared to more than 32% of students enrolled into universities.

Analysis of progress and of new enrolments vs. repetitions are both useful to investigate the efficiency of higher education and the possible dependence of this efficiency on various elements of the students´ socio-economic background. For example, a student who has longer than expected progress has repeated at least one year up to the point in which the progress was measured. *Progress*, together with the derived variables *progress_cat* and *new_or_repeat* were used in this study because of

the different levels of measurement (*progress* is interval, *progress_cat* is ordinal and *new_or_repeat* is dichotomous) that allow the usage of different statistical tools. Another reason is that progress, due to the way it was calculated, represents accumulated progress. Since it is calculated as follows:

$$progress = (academic\_year - year\_initial\_enrolment + 1)/year\_study$$

it means that, for example, if a student enrolled in the third year of study has progress 1.5, it means that it took him/her 1.5 years to enrol from the first to the second year and another 1.5 years to go from the second to the third year of study. It is not possible to enrol into any year of study in the middle of the academic year; this means that the student in the example either repeated the first or the second year of study once. If progress was 2, that would mean that s/he repeated both the first and the second year once or repeated only the first year but twice or only the second year but twice. This would be reflected in the new_or_repeat values for that student for the specific year of study.

The previous discussion is relevant for looking into the dependence of *progress* and *new_or_repeat* values for different years of study. Dependence of *new_or_repeat* on the year of study is presented in Table 8. The Pearson's chi-square indicates that the *new_or_repeat* variable is not statistically independent from the year of study. In addition, various correlation coefficients, for example Phi, which treats both variables as nominal, or Spearman, which treats both variables as ordinal, are significant. Phi coefficient is more useful because Table 9 suggests that the repetitions are most frequent for the second and third year of study, and also because *new_or_repeat* is essentially a dichotomous variable.

Table 8 Measures of association between *new_or_repeat* and *year_of_study*

	Value	**Significance**
Pearson chi-square	5894.684, df =5	0.000, df =5
Phi correlation coefficient	0.290	0.000
Spearman correlation coefficient	0.087	0.000, T-test value 23.237

(number of entries 70,150)

Values of average progress follow the same pattern as repetitions (Table 9):

- it takes most time to complete the second year of study (1.55 years) and this is also the most repeated year (45.8% of student repeat that year of study);
- this is followed by the third year of study for which progress is 1.48 and repetition rate is 40.5%;
- the first year of study is next in both respects, with 1.43 years to complete it and 26.7% of students repeating it;
- the fourth and the fifth year of study follow the same pattern while the sixth year of study does not fit into it. The average progress for the sixth year of study is 1.44 and only 12.1% of students repeat it (compared to the first year which has almost the same progress and more than double the repetition rate). However, it should be noted that only 1.2% of the total number of students is enrolled into the 6^{th} year of study and it could be that the pattern is "destroyed" in this case, because it includes students of one particular field,

which has also peculiarities in terms of the structure, organisation and content of the study programme.

Table 9 Progress and repetitions with respect to year of study

Year of study	Average progress	Repetitions (in %)
1	1.43	26.7
2	1.55	45.8
3	1.48	40.5
4	1.26	10.8
5	1.17	2.5
6	1.44	12.1[27]

5.1.3 Completion

Figure 12 shows the number of graduates for each year of the period 1994-2004. The drop in 1997 is most probably due to the fact that in 1996/97 there was a student and academic staff strike against fraud in local elections. The protest lasted 3 months (winter 96/97), during which time most of the activities at many HEI were stopped and consequently postponed. This postponing could have contributed to the increase in the number of graduates in 1998. It is interesting to notice that the drop in 1999 is not particularly large, despite the NATO bombing (compare this to initial enrolments in 1999 – see subsection on enrolment in this chapter), especially having in mind what was just stated about the number of graduates in the previous year, 1998. The number of graduates is slowly increasing from 2001 onwards. These graduates have enrolled into studies approx. 6-7 years before (see below the calculations of the average duration of studies), i.e. from 1994 to 1998, the period in which the number of initial enrolments also increased slightly (see Figure 8).

[27] The sixth year of study is the final year for studies of medicine. One can repeat the final year of study in any of the fields if one did not meet all of the pre-exam requirements in all of the subjects (usually attendance of classes, lab work, sometimes essays etc.).

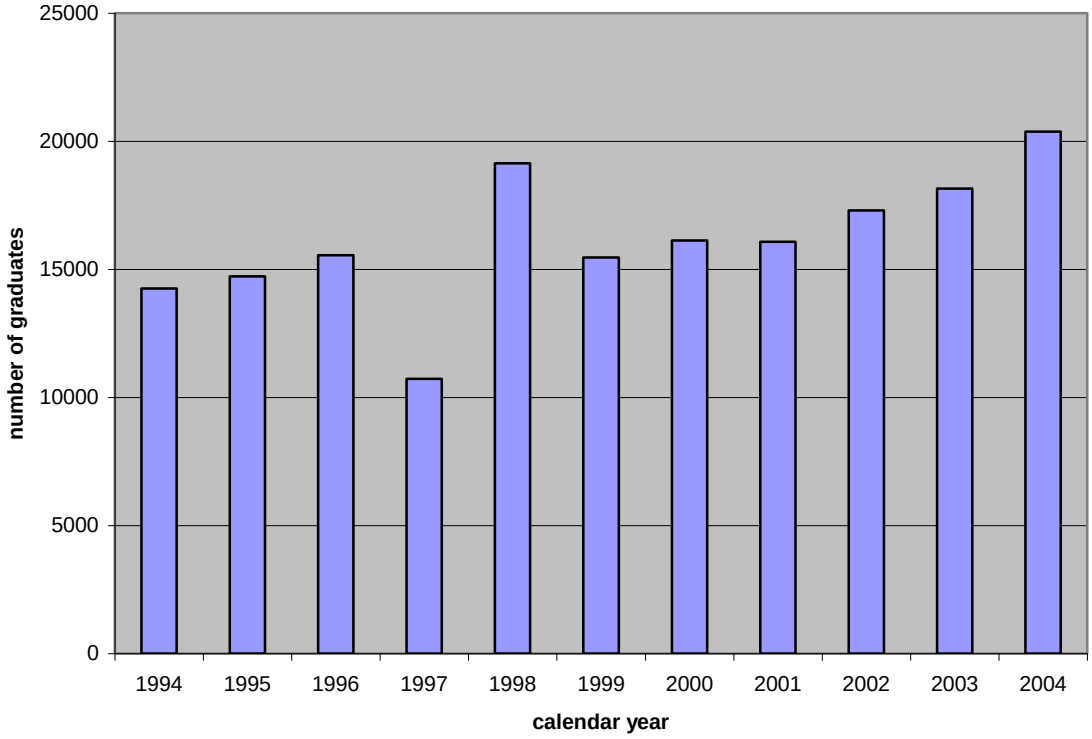

Figure 12 Number of graduate students.

As was stated in Chapter 4 "Methodological considerations" – SV50 form does not include data about elements of the students´ socio-economic background. Furthermore, the completion data are aggregated for each calendar year, while higher education academic year (and thus the studies) begins in October, meaning that calculations of average duration of studies are biased (see Chapter 4 "Methodological considerations"). Since there is no nationally aggregated data on how many students graduate in the January-October period and how many in October-December period[28], there is no possibility to assess the amount of bias introduced in this way. However, underestimates will cancel overestimates to a certain extent. Nevertheless, this caveat should be borne in mind in all analysis of average durations.

For all higher education, average duration of studies is: 6.27 years. However, this should be analysed with respect to expected duration of studies. Table 10 shows average duration of studies for different expected durations. One should recall that the estimated completion rate is 55% (see Chapter 2 "The Serbian context"), i.e. that 45% of students dropout.

[28] SV50 form does include a line in which the exact date of graduation is written. However, this data is not digitalized and therefore, not aggregated on the national level.

Table 10 Average duration of studies, for different expected durations

Expected duration	Average duration (1994-2004)
2	4.20
3	4.67
4	6.76
5	7.51
6	7.62

Of all the graduates, 59% are females and 41% are male. Recalling that, at initial enrolment, the ratio was – 44:56 in favour of females and knowing that analysis showed a significant correlation between gender and duration of studies (Kendall's tau-b=-0.093 and Spearman's rho=–0.106, both at less than 0.01 level of significance, based on 12,503 entries), one can see that women outperforming men in higher education is visible also in terms of duration of studies (not just in enrolment and progress). Fields which are heavily dominated by women (teacher training) have the least prolongation of studies (expected duration is 4 years and average duration is 4.98), which might suggest that better performance of women may be due to the fact that they choose fields in which performance as such is better (because of better organisation of studies, adequate workload and well developed curricula) not due to the fact that they are women. This is further supported by the fact that the most prolongation is present in more or less balanced fields (in terms of gender) and not in male dominated fields (such as engineering). For example in law the average duration is 7.45, which is 3.45 more than expected duration.

Analysis of SV50 database showed that, in terms of age at initial enrolment, the SV50 population (graduates) is older than the SV20 population (all freshmen; recall the 45% dropout), i.e. the graduate students, on average, enrolled into the institution they graduated from later then freshmen students. Average age of initial enrolment of freshmen (on the basis of SV20 data) was 19.86 while average age of initial enrolment of graduates (on the basis of SV50 data) is 21.20 – 1.35 years later. This discrepancy will be discussed further ahead. However, as was said before, these two populations are different – in crude terms the graduates represent the 55% of the total student population, i.e. of those who completed their studies.

The two populations are different in one more respect: they correspond to different periods of time. Graduate population covers the period 1994-2004, while freshmen population corresponds to 2000-2004 period (due to the structure of the data available). This means that graduate population is younger than the freshmen population, which should not be the case if one wants to "isolate" the process from any external temporal changes. Therefore, the difference in average age of initial enrolments between the two groups could be due to some factors external to the higher education system – changes in the earlier stages of education or some wider social, political or economic circumstances influencing students in early 90s to enrol later in higher education than students in early 21st century. Another possibility, if one assumes that these external factors are not of significant influence (i.e. despite of the different corresponding period, one assumes that the freshmen population in early 90s was more or less the same as the freshmen population in early 21st century) is that some of the graduates first enrol into one institution (one programme) and complete 1 year or more there (and thus constitute a part of the freshmen population there), and

then leave that institution without completing and enrol into another institution which they eventually graduate from (and thus constitute a part of the graduate population of that institution). Thus, the difference in ages of initial enrolment may be due to the "second choice" or "second chance" effect: students for various reasons (including lack of motivation or unrealistic workload) change programmes after a period of study and graduate from the second institution and programme they chose. If this is truly the case one needs to make extensive research into this question in specific by comparing relevant time periods. So far, SV50 does record all previous education, but only if it is completed (i.e. a student has a certificate). Therefore, incomplete higher education undertaken prior to the programme a student graduated from is not recorded as such, making analysis of possible "second chance" or "second choice" effect impossible using the available data. Furthermore, as the calculation of duration of studies includes only the programme the student graduated from, the possible "second chance" or "second choice" effect effectively increases the total time students are staying in higher education, thus increasing inefficiency.

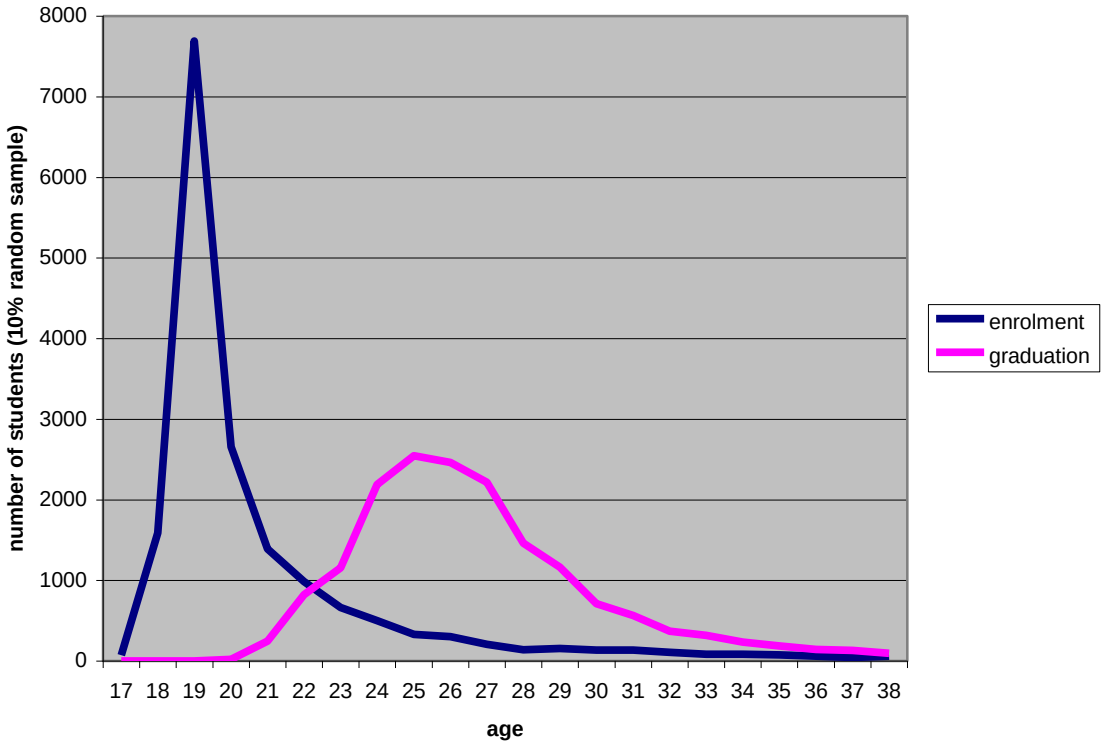

Figure 13 Age of initial enrolment and age of graduation of students who completed higher education.

In terms of age of graduation, see Figure 13, the distribution of students on the basis of age of initial enrolment has somewhat smaller dispersion (standard deviation is 5.01) than age of graduation (standard deviation being approximately 5.36). The increase in dispersion from enrolment to completion corresponds to the prolongation of studies characteristic for the whole higher education. This would be even more evident if using the standard deviation for average age of initial enrolment of freshmen from SV20 database (it is 2.85, almost two times less than standard

deviation for age of graduation), although, as was said earlier, the problem with this approach is that it is comparing two different periods of time thus reversing the natural order of the two populations (graduate population should be older than freshmen population, which here is not the case).

Table 11 gives data on average duration of studies with respect to type of HEI and the field. As can be seen, the smallest relative prolongation is for teacher training and health sciences B in universities, while the largest relative prolongation is in law and engineering A. The reasons for such differences in average duration may be due to better organisation and curriculum in teacher training institutions ("practice what you teach") or in the higher motivation in medical students: if one decides to dedicate at least 6 years of life to obtain a degree in medicine than any further prolongation is costly in terms of time and money. When it comes to law studies, one possibility for large average duration, and thus large relative prolongation could be due to the overcrowding of institutions (e.g. Faculty of Law in Belgrade enrols 1,500 to 2,000 students every year) affecting quality and efficiency of studies, but also a reverse effect of students´ socio-economic background, law students tend to have better educated (and probably wealthier) parents than others, except for engineering and medicine (see next section for further discussion on this issue).

Table 11 Average duration of studies, absolute and relative prolongation (1994-2004)

Duration vs. HEI type and field	Expected	Average	Absolute prolongation	Relative prolongation
Vocational A[29]	2	4.20	2.20	1.10
Vocational B	3	4.67	1.67	0.56
Teacher training, university	4	4.98	0.98	0.24
Economy, university	4	6.76	2.76	0.69
Social sciences, arts and humanities, university	4	6.62	2.62	0.66
Natural sciences and mathematics, university	4	7.05	3.05	0.76
Law, university	4	7.32	3.32	0.83
Engineering A, university[30]	4	7.62	3.62	0.90
Engineering B, university	5	7.51	2.51	0.50
Health sciences A, university	5	7.52	2.52	0.50
Health sciences B, university	6	7.62	1.62	0.27

However, since the data presented here are rather crude and quantitative, further detailed and more qualitative studies are necessary to understand the reasons for differences in average duration and relative prolongation between different fields of study.

[29] Vocational A type refers to 2-year vocational studies. Vocational B refers to 3-year programmes.

[30] Engineering A is 4-year engineering programmes, while engineering B is 5-year engineering programmes (majority). Similarly, health A relates to 5-year programmes of dentistry and pharmaceutical science, while health B refers to 6-year programme in medicine. Some data on expected duration of some programmes in the health sciences field were missing – see Chapter 4 "Methodological considerations".

Temporal developments with respect to average duration of studies in the period 1994-2004 for public universities are presented in Figure 14. There is a significant drop in the average duration of studies (approx. 0.8 years) for those who graduated in 2000 and 2001. On average, these students started their studies in 1993 and 1994, which corresponds to the gravest economic crisis. It is interesting to note that the trends are rather different for individual fields (individual graphs for average duration in public universities in different fields are given in Annex 2):

- teacher training does not exhibit the same drop in the average duration of studies. It is rather increasing in duration throughout the period, possibly due to changes in the programme content and duration of teacher training programmes;
- economics, social sciences etc and natural sciences all have the drop in average duration in 2000 and 2001 but the trend in the beginning of the 90s is more erratic;
- law, engineering and medicine follow, more or less, the general trend presented in Figure 14.

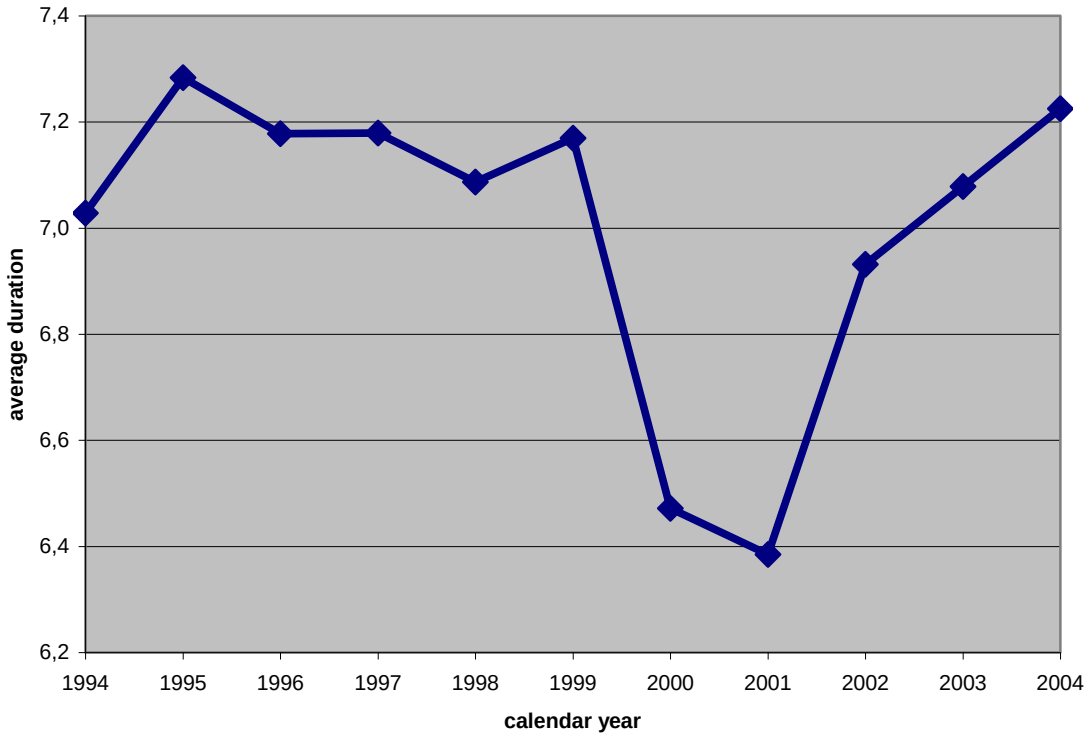

Figure 14 Average duration of studies in public universities in the 1994-2004 period.

It is difficult to assess the reasons for the drop in the average duration of studies in 2000 and 2001, having in mind that these students enrolled on average in 1993 and 1994. One of the possibilities could be that the changes in the system of studying and the introduction of generally higher tuition fees in 1998 motivated students to complete their studies prior to the date when the 1998 Law started being applicable to them. According to the Law on University adopted in 1998, students who started studying "under" the 1992 Law could complete their studies under old regulations within two years of the expiration of the 6 or 12 months of the extended studying time

(see Chapter 2 “The Serbian context”). The increase in the average duration from 2001 onwards could be due to a time lag. These students started studying around 1994–1997 and their final years of secondary education and first years of higher education were marked by political and economic crisis and student strikes, and their studying also included 1999, the year of the NATO bombing. Therefore, it could also be that professors exhibited some leniency as well due to the circumstances under which these students were studying, which influenced the average duration of studies. Nevertheless, all this is initial speculation and in-depth analysis of changes in study programmes in certain fields, as well as qualitative analysis is necessary to understand such changes in average duration of studies.

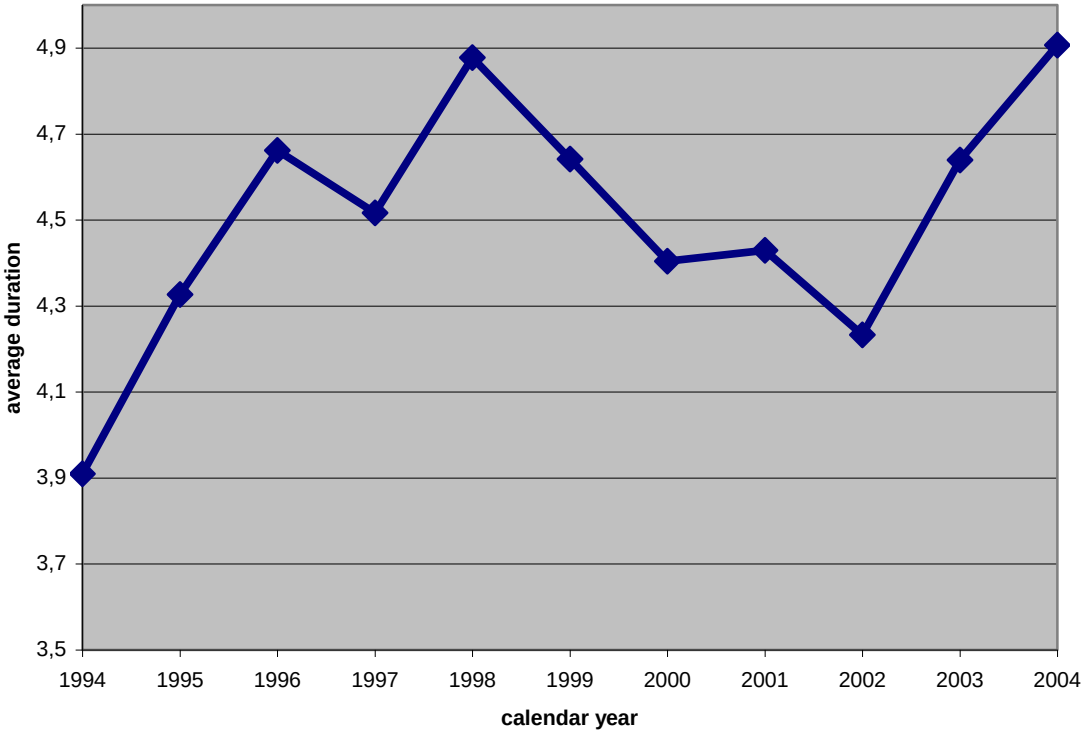

Figure 15 Average duration of studies in vocational higher education.

The temporal changes of the average duration of studies in vocational higher education are given in Figure 15. One can see that the pattern is more erratic than the pattern for average duration in universities. The amplitude of change in the average duration is around one year. The increase in the average duration from 2002 onwards may be due to the introduction of a higher number of 3 year programmes in vocational institutions from 2000 onwards. However, it is difficult to provide any definite conclusions on the basis of available data.

5.2 External and internal exclusion

5.2.1 External exclusion

Analysing the composition of the student population in Serbia, and comparing it to the total population, one is able to assess the scope and nature of external exclusion from higher education. This also means that it suffices to analyse initial enrolments in order to identify groups excluded from or under-represented in higher education.

As was stated in Chapter 1 "Introduction" and Chapter 3 "Higher education and social stratification", external exclusion from higher education refers to the situation in which certain social groups are not represented or under-represented in higher education, compared to their representation in the total population. Table 12 gives an overview of the proportion of people with specific characteristics (gender, ethnic origin, and education of parents) in the total population and in the population of students, indicating possible under-representation, and thus external exclusion.

Table 12 shows that the under-represented categories in terms of enrolment are: men, all non-Serbian ethnic groups (except for Montenegrin and Yugoslav), those whose parents have education lower than secondary and those who attended secondary vocational schools (since those who attended the gymnasium are over-represented). It should be noted that all afore-mentioned caveats regarding ethnicity apply and that the results presented here with respect to this characteristic are indicative at best and should be further investigated (including by qualitative research). With respect to education of parents compared to education levels of the whole population, it could be argued that these two populations are not adequate for comparison since the data about the whole population include persons as young as 15 while the parents of students are certainly older than that. However, one can argue that by including the younger people in the analysis of the educational attainment of the whole population, and given the expansion of educational opportunities, the educational attainment has only been improved by increasing the proportion of those who have completed secondary and higher education but are not yet old enough to be parents of a student. This goes to say that, if data on educational attainment included only the people older than e.g. 35, the proportion of the lower educated would be bigger. Thus, the under-representation of students from lower educated parents would be even more prominent. The under-representation of people coming from secondary vocational schools may be connected to the fact that the gymnasium does not provide a labour market relevant qualification thus "forcing" pupils to continue education, but also that the quality of learning outcomes in secondary vocational education or the motivation the pupils there receive from their teachers to continue with education is not sufficient. It should be noted also that previous education is strongly correlated with education of parents, which will be discussed further in this chapter. With respect to completion: males continue to be under-represented, reinforcing the conclusion that women are outperforming men.

Table 12 Under-representation or over-representation in terms of enrolment and completion

	Categories	% of total (census 2002)	% of enrolments 2000-2004	Under- or over-represented in terms of enrolment	% of completion 1994-2004	Under- or over-represented in terms of completion
Gender	Male	48	44	Under	41	Under
	Female	52	56	Over	59	Over
Ethnicity	Serbian	83	87	Over	66.6	Under
	Montenegrin	1	3	Over	2.1	Over
	Yugoslav	1	3	Over	1.8	Over
	Bosniak	1.8	<1	Under	0.3	Under
	Hungarian	4	2	Under	1.2	Under
	Albanian	0.8	0	Under	0.1	Under
	Croatian	0.8	0	Under	0.3	Under
	Slovak	0.9	0	Under	0.3	Under
	Ruthenian	0.2	<1	Under	0.2	Under
	Roma	1.44	0	Under	0	Under
Education (father/mother)*	No school	5.6	0.1/0.2	Under	n/a**	n/a**
	Incomplete primary	16.2	0.6/1.1	Under	n/a**	n/a**
	Primary	23.9	5/9	Under	n/a**	n/a**
	Secondary	41.2	49.9/57.4	Over	n/a**	n/a**
	Higher, vocational	4.5	18.5/14.6	Over	n/a**	n/a**
	Higher, university	6.5	25.6/17.4	Over	n/a**	n/a**
Previous education***	Gymnasium	24%	43.5%	Over	n/a***	n/a***
	Secondary vocational (4year)	n/a****	56.5%	n/a****	n/a***	n/a***

*** Education of the whole population includes all persons older than 15.**

**** Education of parents is not recorded for graduates; hence this information is not available for completion.**

***** Previous education is available for initial enrolments only; hence this information is not available for completion.**

****** The data on number of pupils in secondary education other than gymnasium does not distinguish between 3-year and 4-year secondary education.**

In terms of completion, under-representation of men is evident both with respect to the total population and with respect to enrolment. With regards to ethnicity of graduates, it is interesting to notice that the proportion of graduates of specific ethnicity is significantly different to the related proportions with regards to enrolment. Apart from the already mentioned problems with recording ethnicity as such, another source of this difference could be the fact that in most HEI the SV50 form for graduation is not completed by the individual students, but by an administrator. It is not certain whether the administrators use information available from SV20 form

(which is completed by the student in question) when completing SV50 form. This and other issues related to data collection will be discussed further ahead.

5.2.2 Internal exclusion

Internal exclusion refers to the situation in which certain social groups are under-represented in a specific type of higher education or a specific field, which are considered to be (for various reasons) more prestigious. In this respect, it would be interesting to see if there is any correlation between type of higher education, field, financing mode and elements of the student's socio-economic background. Furthermore, to analyse the process of implicit tracking, we will look into the previous education of students and to what extent e.g. students from secondary vocational schools are "tracked" into vocational higher education. The analysis will primarily focus on initial enrolments, although correlation between progress, repetition or duration of studies with certain elements of student's socio-economic background will be discussed as well.

Table 13 Correlation coefficients and related significance levels for initial enrolments.

Independent variable	Correlation coefficient	Gender	Education of father	Education of mother	Previous education
HEI type	Kendall's tau	-0.045[31] Sig. 0.000	0.203 Sig. 0.000	0.206 Sig. 0.000	0.334 Sig. 0.000
	Spearman's rho	-0.047 Sig. 0.000	0.202 Sig. 0.000	0.210 Sig. 0.000	0.351 Sig. 0.000
Financing mode	Kendall's tau	0.002 Sig. 0.762	0.028 Sig. 0.000	0.028 Sig. 0.000	0.050 Sig. 0.000
	Spearman's rho	0.002 Sig 0.762	0.034 Sig. 0.000	0.035 Sig. 0.000	0.063 Sig. 0.000

Number of entries: 22,871

Kendall's tau and Spearman's rho correlation coefficients (with related levels of significance) between two independent variables (*HEI_type* and *financing*) and four dependent variables are given in Table 13. Results show that only the correlation between *gender* and *financing* mode is not significant, while all others are significant with significance level lesser than 0.01. The correlation between *gender* and *HEI_type* means that women are more likely to attend universities, which is in line with previous results that the women to men ratio in universities is 58:42 while in all higher education it is 56:44. Education of parents seems significant for both the type of higher education and financing mode (although the correlations are weaker in the latter case). This implies that the better the education of parents the more likely students are to end up in university higher education and to be part of the state funded quota. It is interesting to notice that the correlations with the education of mother are stronger in both cases, suggesting stronger influence of mother on education of

[31] All Kendall´s tau coefficients are Kendall´s tau-c, except for the correlation between gender and type of higher education, where tau-b is used, since this is the only case in which the numbers of categories of both variables are equal, i.e. the cross-classification table is square.

children, a phenomenon noticed in other studies as well (Albert, 2000:158) and also visible in terms of progress (see below). The financing mode correlations basically mean that those who generally may be in a better economic situation (in relative terms, in the Serbian context) due to the fact that their parents are better educated (and consequently may earn more on average), do not pay tuition fee while those who are from a poorer economic background end up enrolling as self-funded students. When it comes to the type of previous (usually secondary) education, it seems of most relevance when it comes to HEI type and financing mode. Students who completed the gymnasium are more likely to end up in universities and within the state funded quota, than students who completed secondary vocational schools.

The previous education variable is also interesting for seeing to what extent the disadvantage in terms of enrolment into a specific kind of secondary education depends on the student's socio-economic background. Analysis shows that girls are slightly more likely to have attended gymnasiums. Also, children of better educated parents are more likely to have attended more prestigious secondary education. Again, education of mother seems to have greater influence on the education of the children. The fact that both the type of secondary and the type of higher education depend on the education of parents suggests that the influence of this element of the student's socio-economic background on educational transitions is strong even for higher education and there is a decrease of influence from the transition to secondary education to the transition to higher education.

Internal exclusion with respect to fields could be seen through the analysis of education of parents of students in different fields:

- medicine has the highest proportion of students whose parents are university educated (31.8% for education of father and 26% for education of mother), followed by engineering, then social sciences, arts and humanities;
- law, economy and natural sciences and mathematics students have the fourth, fifth and sixth proportion of university education parents, respectively, while teacher training has the lowest proportion (10.5% for education of father and 6.8% education of mother).

This goes to say that apart from the effect the education of parents has on the type of HEI, there is also an effect on the field of choice – children with better educated parents are more represented in more prestigious fields. Prestige of a field is here determined on the basis of demand expressed in the number of points from secondary education and entrance exam necessary to enrol into the specific field of study within a state-funded quota[32]. Prestige could have been also determined on the basis of earnings of graduates from different fields. However, the classification of data on earnings by the Statistical Office of Serbia is done according to the areas of work (for example banking and insurance, mining, etc.) and not on the basis of fields of study.

Internal exclusion is not only related to initial enrolments, but to progress and completion as well, especially having in mind that full qualifications rather than parts of study are determining the attained occupational status (Collins, 1979) or possibilities for continuation of education. Therefore, it is not sufficient only to see which social groups are internally excluded at initial enrolment, but also to analyse if

[32] Data on necessary number of points for state funded quota were obtained from (available in Serbian only, page accessed last time on April 4, 2007): http://www.infostud.com/obrazovanje/prijemni/

there is further internal exclusion during studies, and consequently at completion. Repeating a year of study may lead to loosing the state funded status, thus making it even more difficult to continue and complete the studies for a student from a less privileged background who, for example has to work while studying to earn additional money for the tuition fee. This may also drive the student to change HEI to decrease costs of living (e.g. move from the capital, Belgrade, to Kragujevac in central Serbia). Also, a student may decide to move from a university to a vocational HEI to decrease the expected duration of studies and thus decrease the loss due to foregone earnings and/or tuition fee (tuition fees may be lower in vocational HEI). The possible internal exclusion through differences in progress or new enrolments vs. repetitions ratio will be analysed with respect to gender and education of parents. The data on previous education, as is explained in Chapter 4 "Methodological considerations", is available only for initial enrolments and unfortunately cannot be used here.

With respect to new enrolments or repetitions of a specific year of study, analysis shows that:

- female students are repeating less: 45% of those who repeat the year of study are women. Having in mind that women are more numerous than men in general in higher education, the fact that men are the majority of those who repeat gives further evidence to the position that females are outperforming men in terms of progress;
- whether or not a student will repeat a year is not statistically independent from education of parents (see Table 14). Chi-square test for independence between education of father and new enrolment or repetition in public universities yields chi-square value of 71.5 (df=6) at less than 0.01 level of significance, while chi-square for education of mother and new enrolment or repetition is 156.105 (df=6), again at less than 0.01 level of significance. All correlations (treating both categories as nominal – e.g. Phi, or ordinal – e.g. Kendall's tau or Spearman's rho) are significant, and stronger in the case of education of mother than education of father. Correlations reflect the situation in which students with better educated parents repeat less;
- when controlled for field of study, new enrolment or repetitions and education of parents are statistically independent in the field of teacher training and natural sciences and mathematics, while in the field of engineering education of father and new enrolment or repetition are statistically independent, while education of mother and new enrolment or repetition are not (see Table 14). Both teacher training and natural sciences and mathematics are on the bottom of the ranking in terms of education of parents of students (the parents are least educated). At the same time, teacher training has the best progress amongst the fields, which may suggest that students' success in teacher training is not a consequence of their background but of the organisation of studying as such (the already-mentioned "practice what you teach" effect). As for the explanations of results for natural sciences and engineering, further research is necessary.
- the chi-square values for test of independence between education of parents and new enrolment and repetitions are highest in the field of law (30.541 for education of father and 60.798 for education of mother, both at df=6 and less than 0.01 level of significance), followed by medicine, social sciences etc. and economy (see Table 14). In all cases, the chi square test values are higher for education of mother, suggesting stronger dependence. The dependence is

not strictly "linear" although the general trend is that the ratio of repetitions vs. new enrolments is decreasing as the level of education of parents is increasing: e.g. in the case of law, the ratio between repetitions and new enrolments of students whose fathers have no education is twice as much as for those whose father have university education; in the case of mother education, the repetitions/new enrolments ratio for students whose mother have no education is three times as much as for students with university educated mothers.

Table 14 Measures of association and test of statistical independence between new enrolment or repetition and education of parents.

chi-square test values or correlation coefficients	***edu_father* and *new_or_repeat***		***edu_mother* and *new_or_repeat***	
	Value	**Sig.**	**Value**	**Sig.**
All fields	71.5	0.000	156.105	0.000
Teacher training	Not significant			
Business and economy	22.199	0.001	35.908	0.000
Arts, humanities and social sciences	10.575	0.102	41.906	0.000
Natural sciences and mathematics	Not significant			
Law	30.541	0.000	60.798	0.000
Engineering	Not significant		26.578	0.000
Health sciences	20.163	0.003	39.446	0.000
Phi	0.032	0.000	0.047	0.000
Kendall's tau-c	0.019	0.000	0.032	0.000
Spearman's rho	0.019	0.000	0.033	0.000

Number of entries 70,150

It was already mentioned that female students have better progress than male students (average progress for women is 1.41 and for men is 1.50 years). When using progress as the categorical variable (see Chapter 4 "Methodological considerations"), women are more represented in the category of expected progress (progress=1): there is approx. 1.5 more women in that category then men, while in categories of longer than average progress there is approx. 1.2 more women then men (women are generally more numerous in higher education).

Analysis of progress with respect to education of parents yielded the results shown in Figure 16. As can be seen, the higher education of mother is more clearly connected to better progress. The trend is that progress is improving[33] as the education of mother increases, with the exception of mothers having higher vocational education, but the increase seems rather small. The relationship between progress and education of father on the other hand is more erratic, but one needs to bear in mind that the association between education of mother and various elements of the student's experience (enrolment, progress, new enrolments or repetitions) was consistently stronger than in the case of education of father.

[33] Recall the definition of the variable *progress:* the time it takes to enrol into the next year of study. Therefore it is lower if the progress is better, i.e. if the students are more successful.

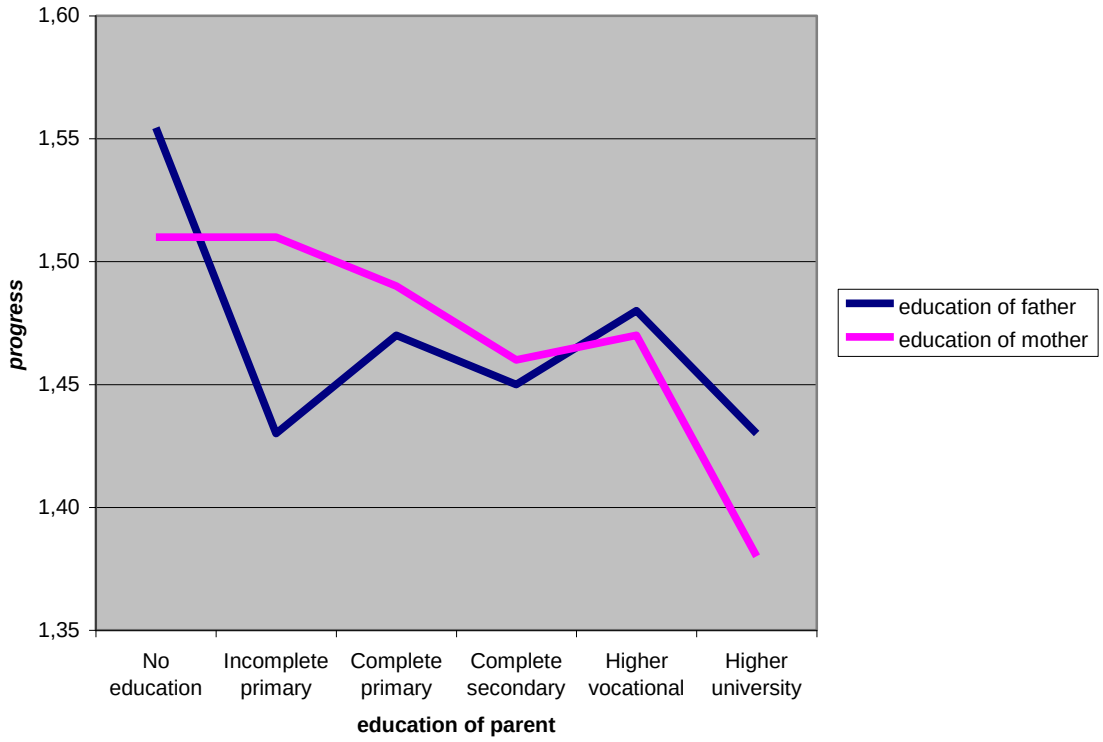

Figure 16 Average progress with respect to education of parents.

Table 15 provides the values of average progress, as well as standard deviations, depending on education of parents. One can see that the dispersion (see values of standard deviations) is also decreasing with the increase of the education of parents. Students with better educated parents seem more "stable" in terms of their progress. It should be noted, however, that the large dispersion for lower education of parents could be due to the fact that on the one hand there are teacher training students who have generally lowest education of parents and best progress (possibly due to increased motivation, coupled with better developed pedagogical competences of teachers in teacher training programmes), and on the other hand the students with not so well educated parents probably come from poorer families and therefore face weaker support from their parents with regards to higher education, may have to work along side studying to contribute to their cost of living and possibly tuition fee, thus dedicating less time to their studies and consequently having worse progress.

Table 15 Means and standard deviations for progress, for different levels of education of parents.

Education level of parent	Average progress (father)	Standard deviation (father)	Average progress (mother)	Standard deviation (mother)
No education	1.55	1.41	1.51	1.10
Incomplete primary	1.43	0.89	1.51	1.02
Complete primary	1.47	0.90	1.49	0.86
Complete secondary	1.45	0.77	1.46	0.78
Higher vocational	1.48	0.78	1.47	0.76
Higher university	1.43	0.74	1.38	0.67

Association between progress and education of parents changes with the year of study. Table 16 shows values of Eta, measure of association between education of mother and progress. It shows that the association is the strongest for the 6th year of study, and then for the 5th and 2nd year of study.

Table 16 Association between education of mother and progress of student through university HE, with respect to year of study.

Year of study	Progress (Eta)
1	0.051
2	0.076
3	0.051
4	0.051
5	0.079
6	0.127

When it comes to analysing internal exclusion related to completion, the data available pose a problem. As was stated in Chapter 4 "Methodological considerations", SV50 form does not include data on the education of parents or any other valid indicator of student's socio-economic background, thus disabling any analysis on how the composition of student population in terms of socio-economic background changes from initial enrolment to completion, also disabling an analysis on what the socio-economic background of those who dropout is. What was done is the comparison, on the basis of SV20 data (i.e. enrolment), of the SEB of students at initial enrolment and for the final year of study.

Figure 17 shows the ratio between the number of students at initial enrolment and the number of students in their final years of study with specific education of parent. Since Serbian HE is characterised by high dropout rates, the ratio between the total number of students at initial enrolment and the number of students in the final year of study is presented by the line labelled "average" (solid triangles). Values lower than average thus indicate over-representation of students of specific education of parents in the final year of study with respect to initial enrolment and vice versa, values higher than average indicate under-representation of students of specific education of parents in the final year of study with respect to initial enrolment.

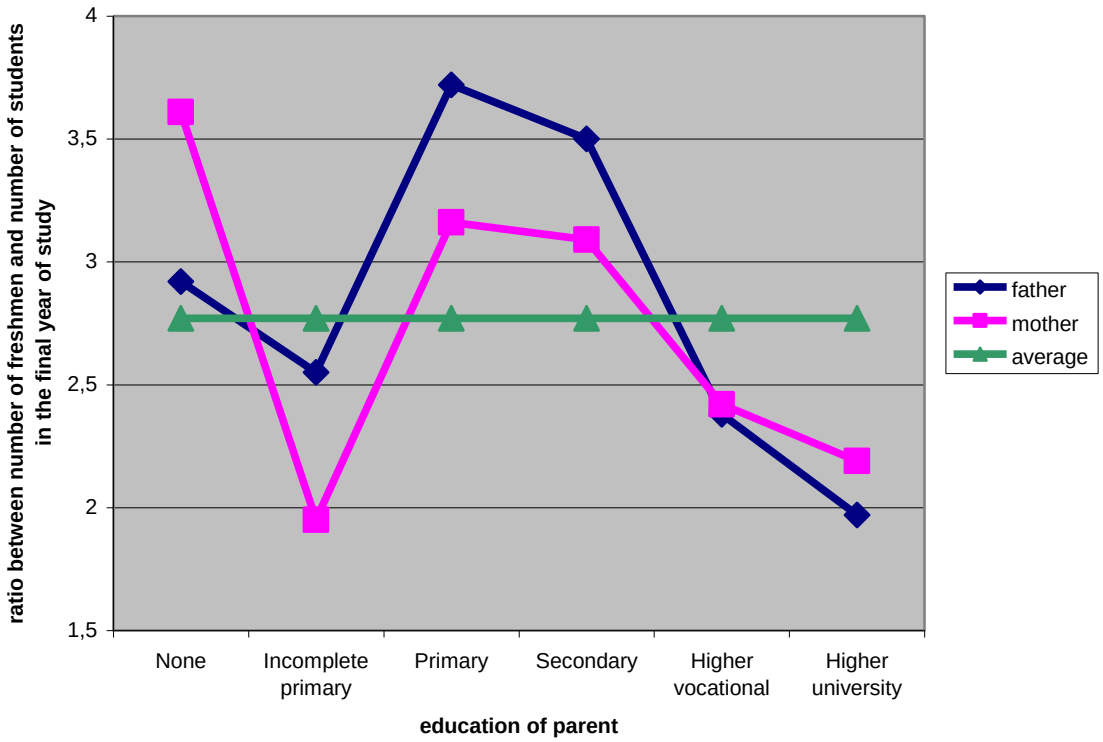

Figure 17 Ratio between number of students at initial enrolment and in the final year of study.

As can be seen from Figure 17, students whose parents have some form of higher education are over-represented in the final year of study while students whose parents have primary or secondary education are under-represented in the final year of study. The results for students with parents who have no education or incomplete primary education are close to average for education of father and far from average for education of mother and they do not correspond to the previous trend of under-representation of students with lower educated parents. However, it should be noted that these students represent around 1% of the total student population in question, while other groups represent 7% (parents with primary education), 54% (secondary education) and 38% (both types of higher education), which means that the weight of the data for parents with no education or with incomplete primary is low in comparison to other data. It would be interesting for further studies on this issue to analyse the data using the corresponding weights. This result serves as an indication that the drop-out is higher for students with lower educated parents, although it should be borne in mind that this comparison of initial enrolment to the final year of study is just a proxy for comparison between enrolment and completion and all results should be taken with reserve.

5.2.3 Accumulated disadvantage from previous stages of education

The data available for initial enrolments regarding the previous education of freshmen allows for a brief analysis of the influence education of parents has on

education prior to higher education, thus also allowing for partial indication whether theories of cumulative disadvantage (Shiner and Modood, 2002), MMI, EMI and LCP are useful in this case (Lucas, 2001; Raftery and Hout. 1993). Table 17 provides values of Kendall's tau–c measure of association between education of parents and type of secondary and higher education for initial enrolments in public higher education. It should be noted that all associations are particularly strong and that they indicate the more prestigious type of education for students with better educated parents. Again, the association with the education of mother is stronger.

Table 17 Association between education of parents and type of higher or secondary education

Kendall's tau – c	Type of higher education	Type or previous (secondary) education
Education of mother	0.206	0.173
Education of father	0.203	0.171

Number of entries: 22,871

It is interesting to see that the associations between education of both parents and type of higher education are stronger than in the case of secondary education. Neither secondary nor higher education is universal: GER for secondary education is around 62% and for higher education is 37.8%. The fact that the association is stronger for later stages of education suggests that the life course perspective (LCP) which, as was explained in Chapter 3 "Higher education and social stratification", postulates waning influence of education of parents for later educational transitions, may not be applicable in this case. The fact that an association with the education of parents and the type of education exists at the transition from secondary to higher education suggests, as well as the results testifying to an association between type of secondary and type of higher education (Kendall's tau-c = 0.334), could also indicate that the inequality is maintained throughout the education system and that disadvantage is accumulated through the processes of external, as well as internal exclusion (to a certain extent resembling implicit tracking). Besides the available data, the testing of LCP, MMI and EMI hypotheses on the Serbian education system requires, at least, data regarding the transition from primary to secondary education with respect to socio-economic background (especially in terms of track placement within secondary education).

5.3 Results of logistic regression modelling

Chapter 4 "Methodological considerations" gives an overview on how the logistic regression modelling was done. As was mentioned there, essentially three dichotomous variables were the focus of modelling:

- initial enrolment into the university HE,
- initial enrolment as a state funded student, and
- repetition of the year of study.

When it comes to independent variables, all models include education of parents and gender. In cases of modelling the type of higher education or financing mode, previous education (see Chapter 4 "Methodological considerations"), and interaction between education of each parent and previous education was used as well. Gender

was used in all models as fixed variable, to allow for the comparisons between males and females, even if these differences were not statistically significant. All models had the first category as reference, which means: male, from secondary vocational education and with parents who do not have HE (alternatively, do not have secondary education). All results present the final step in the model, thus for the variables which were not significant (deleted from the model), this is indicated by "not significant" in the appropriate cell.

Table 18 Results of logistic regression

Response variable	Input variables	Hosmer and Lemeshow test			% of correct predictions	Parameter estimates			
		χ^2	df	Sig.		Sig.	Odds ratio	95% CI	
								Lower	Upper
HEI type: university or no	Gender	0.721	6	0.994	64.2	0.649	0.935	0.699	1.250
	Previous education					0.000	3.081	2.132	4.453
	Father - HE: yes or no					0.010	1.537	1.108	2.133
	Mother – HE: yes or no					Not significant			
	Interaction *previous_edu* with *edu_father*					Not significant			
	Interaction *previous_edu* with *edu_mother*					0.098	1.661	0.910	3.031
HEI type: university or no	Gender	0.594	2	0.743	63.6	0.417	0.887	0.665	1.184
	Previous education					Not significant			
	Father - SE: yes or no					Not significant			
	Mother – SE: yes or no					Not significant			
	Interaction *previous_edu* with *edu_father*					Not significant			
	Interaction *previous_edu* with *edu_mother*					0.000	4.781	3.424	6.677

Results of logistic regression (continued)

Response variable	Input variables	Hosmer and Lemeshow test			% of correct predictions	Parameter estimates			
		χ^2	df	Sig.		Sig.	Odds ratio	95% CI	
								Lower	Upper
Finance mode: state funded or no	Gender	2.384	2	0.304	57.1	0.338	0.878	0.673	1.146
	Previous education					0.007	1.446	1.104	1.893
	Father - HE: yes or no					Not significant			
	Mother – HE: yes or no					Not significant			
	Interaction *previous_edu* with *edu_father*					Not significant			
	Interaction *previous_edu* with *edu_mother*					Not significant			
Finance mode: state funded or no	Gender	3.618	2	0.164	57.4	0.343	0.879	0.674	1.147
	Previous education					Not significant			
	Father - SE: yes or no					Not significant			
	Mother – SE: yes or no					Not significant			
	Interaction *previous_edu* with *edu_father*					0.006	1.460	1.113	1.915
	Interaction *previous_edu* with *edu_mother*					Not significant			
Repeat the year or no	Gender	2.466	2	0.291	69.1	0.008	1.208	1.050	1.391
	Father - HE: yes or no					0.013	0.836	0.727	0.962
	Mother – HE: yes or no					Not significant			
Repeat the year or no	Gender	0.000	0	/	69.1	0.005	1.225	1.065	1.409
	Father - SE: yes or no					Not significant			
	Mother – SE: yes or no					Not significant			

The following can be inferred from results presented in Table 18:

- the values of Hosmer–Lemeshow test suggest good fits for models related to *HEI type*, especially the model using education of parents reduced to "has HE/ does not have HE". On the other hand, models of *financing* and *repetition* are poor, especially those using education of parents reduced to "has secondary education/ does not have secondary education" since in the final step only the default variable of *gender* is included. However, for modelling *repetition* the data on previous education were not available (they are available only for initial enrolments) and other models (as well as bivariate analysis) suggest strong influence of previous education on enrolment in higher education, which may also influence progress through higher education, although this was not possible to analyse due to lack of data;
- modelling university/ no university (i.e. university/ vocational HE) by using education of parents as "has HE/ does not have HE" (the first model in Table 18) suggests that, all other things being equal, those who attended gymnasium prior to higher education have 3 times higher probability to be enrolled into a university than those who attended secondary vocational education. Furthermore, those whose fathers have higher education have approx. 1.5 times more probability to be enrolled in a university than those whose fathers do not have higher education. Both of these odds ratios are significant at 0.01 level of significance. The interaction between mothers having higher education and attending gymnasium is a significant influence on 0.1 level of significance and suggests that, all other thing being equal, those whose mothers have higher education and who attended gymnasium have approx. 1.7 times higher probability of being enrolled into a university than those who do not have highly educated mothers and did not attended a gymnasium. This model correctly predicted 64.2% observations;
- modelling of university/ no university by using education of parents as "has secondary education/ does not have secondary education" (the second model in Table 18) has poorer goodness-of-fit results, possibly suggesting that whether a parent has or does not have higher education is a better predictor of type of higher education a student will enrol to than whether a parent has or does not have secondary education. It is interesting to notice however that the direct influence of previous education and education of father is not significant under this model, but that model suggests that those who have mothers with secondary education and attended gymnasium have almost 5 times higher probability to attend a gymnasium than those whose mothers do not have secondary education and who did not attend a gymnasium;
- for both the first and the second model it is important to stress that:
    - the correlation between previous education and education of parents (particularly education of mother) was noted in bivariate analysis as well,
    - although bivariate analysis suggested somewhat stronger correlations with education of mother, it should be noted that: the education of parents variable was reduced to a dichotomous variable, women are generally less educated than men (this includes parents of students, not just the general population) and there is a strong correlation between education of father and education of mother (Spearman's rho for non-reduced values of education of father and education of mother was

0.548). The reduction to a dichotomous variable, differences in distribution of education of mother and education of fathers and the correlation between the two may have affected the modelling in such a way as to yield the result in which education of father (albeit reduced to a dichotomous variable) has a stronger influence than education of mother;

- the goodness-of-fit models of repetition is poor (actually, the model using education of parents as "has secondary education/ does not have secondary education" excluded all the variables except for gender which was introduced as default). Nevertheless, it is interesting to notice that within both of these models, gender remains as a significant variable but with an odds ratio estimate contradicting the results of bivariate analysis: the Spearman correlation coefficient for gender and new enrolment or repetition variable was 0.039 and significant, while the results of modelling suggest that women have around 1.2 higher probability to repeat the year than men, all other things being equal. Analysis of progress also showed that the average progress of female students is by 0.1 year better than the average progress of male and Spearman's rho and comparison of means of progress gave statistically significant results. All this, coupled with the results presented in Table 18, which show that the goodness-of-fit of the model is low, may suggest that one should be inclined to attach greater validity to the results of bivariate analysis, which give the conclusion that female students are better in terms of progress than men.

In terms of more general conclusions regarding logistic regression modelling it should be noted that the modelling was done by using a limited set of indicators of the socio-economic background (see discussion about validity in Chapter 4 "Methodological considerations") which affected the goodness-of-fits and thus validity. However, the fact that even with a limited set of input variables, it can be inferred that more prestigious secondary education and higher education of parents (father) is (significantly) increasing the probability of a student ending up in a university instead of a vocational HEI, suggest that there is internal exclusion (or implicit tracking) in higher education on the basis of some elements of the socio-economic background.

6. Conclusion

This study focuses on issues of enrolment, progress and completion in higher education in Serbia, and analyses the processes of external and internal exclusion on the basis of students' socio-economic background. In terms of the theoretical framework, the study uses Bourdieu´s ideas about reproduction of social stratification in education and forms of capital to shed light on the reasons for exclusion. Further analysis of exclusion is done using the hypothesis of maximally maintained inequality (MMI) for external exclusion, and the effectively maintained inequality (EMI) for internal exclusion. On the basis of the idea of cumulative disadvantage, the study postulates an inequality cycle, which illustrates how initial socio-economic inequality transforms into educational inequality and then again into socio-economic inequality in each stage of education.

The study identified major patterns of enrolment, progress and completion in higher education, in crude terms for the 1990-2004 period, and finer detail for the period 2000-2004 in terms of enrolment and progress and for the period 1994-2004 in terms of completion.

In short:

- The number of students doubled from 1990-2004 and women are more represented in higher education than men;
- Women seem to be more successful in terms of progress and completion than men: they tend to repeat less, it takes them less time to enrol into the next year of study and they prolong their studies less than men;
- There is some gender bias in terms of distribution in different fields of study: teacher training, social sciences, medicine and natural sciences is predominantly female, while engineering is still predominantly male, law is more or less balanced;
- There is a large concentration of students in the fields of economy and law, which take around 35% of the total enrolments, while all other social sciences, humanities and arts take up around 12% of the total enrolments;
- Patterns of enrolment in terms of citizenship and ethnicity were more difficult to analyse due to problems with respect to validity and usability of such data. Nevertheless, some speculations about the apparent changes in ethnic composition and citizenship of the student population were provided;
- When it comes to progress, the second year of study seems most problematic: it has the highest repetition rate and the highest value of progress. First and third year of studies are also problematic in this respect;
- Rate of completion of higher education in Serbia was estimated to be 55%, suggesting dropout rate of 45%. Nevertheless, these results are just estimates since the data and the structure of the study programmes did not allow exact calculations;
- Average age of enrolment of the entire student population and average age of enrolment of the graduates (enrolment in the programme they graduated from) differ. Possible explanations include the situation in which students may graduate from the programme they choose after initially enrolling into a programme they dropout from. However, there were problems in comparing

these two populations, which are addressed in detail in Chapter 5 "Higher education and social stratification in Serbia";
- The estimated average duration of studies[34] is in all cases longer than expected and the relative prolongation is highest in the case of 2-year vocational higher education, where the average duration is more than double of the expected duration and is lowest for 6-year studies of medicine where the relative prolongation is less than 1/3 of a year;
- The estimated average duration of studies changes significantly in the 1994-2004 period, dropping by almost a year for those who graduated in 2000 and 2001. This phenomenon requires further research.

When it comes to identifying possible impacts of the changes in the system of higher education, or wider social, cultural and political circumstances on patterns of enrolment, progress and completion, the study provides a set of potential explanations. The reason for this is primarily the lack of additional data which could corroborate some of the prospective explanations. However, one should not discard the possibility of potential interaction between a multitude of internal and external factors to higher education, some of which may prove to be difficult to measure or even identify, could make any analysis of the impact of changes in the wider society on enrolment, progress and completion extremely difficult.

In terms of external exclusion from higher education, the following groups can be understood as externally excluded:
- ethnic minorities, such as: Bosniaks, Albanians, Croatians, Slovaks and Ruthenians*;*
- students whose parents have no education whatsoever, have incomplete primary education or just primary education. In this respect, children whose parents have university higher education are substantially over-represented in higher education, compared to the entire population;
- students who completed secondary vocational education, instead of the so-called "gymnasium".

These examples of external exclusion, recalling that higher education in Serbia is not universal (see calculation of the GER in Chapter 2 "The Serbian context") can be relatively easily connected to the maximally maintained inequality hypothesis, which suggests that for all stages of education which are not universal there will be an under-representation of those from poorer socio-economic background.

In terms of internal exclusion, the analysis shows significant correlations between types of higher education on the one hand and gender, education of both parents and previous education on the other. These results suggest that, generally speaking: girls, those with better educated parents and those who attended the so-called gymnasium are more likely to enrol into university, the opposite being more likely for males, those with less educated parents and those who attended secondary vocational schools. It should be noted that education of mother seems more important than education of father. Both the results for correlations of type of higher education with education of parents and previous education suggest the existence of implicit tracking. This is further reinforced with the results of logistic regression modelling of the odds

[34] Recall all caveats with respect to overestimating or underestimating the duration of studies. See Chapter 4 "Methodological considerations" or Chapter 5 "Higher education and social stratification in Serbia".

of attending the university vs. not attending (the model quoted here showed high goodness-of-fit and predicted correctly more than 60% of observations): all other things being equal (gender, education of parents), a student who completed the "gymnasium" is approximately 3 times more likely to be enrolled into a university, and a student whose father has a higher degree has around 1.5 higher probability to be enrolled in a university. These results can be connected to the idea of effectively maintained hypothesis (EMI), which claims that exclusion will exist also in terms of the type of higher education (different types of institutions or different fields), thus effectively tracking those from poorer socio-economic backgrounds to less prestigious institutions or fields.

Both the results on external exclusion and results on internal exclusion provide an indication that MMI and EMI hypotheses may be useful to analyse educational transitions in the Serbian education system. The fact that internal exclusion exists also in secondary education (children of better educated parents are more likely to attend the more prestigious form of secondary education) implies that the inequality cycle may also be a good tool for understanding the dynamics of educational transitions and of social stratification through education. The life course perspective (LCP), which suggests waning influence of parents on educational careers of their children, does not seem to apply well to the Serbian case. Nevertheless, this research cannot claim that it tested any of these hypotheses in a complete way, since the number of valid SEB elements used in this study was rather small, thus not providing a totally adequate operationalisation of SEB.

This brings us to the various facets of validity of this research: measurement validity, internal validity, external validity and ecological validity.

The measurement validity concerns to what extent the data used in this research are good operationalisations of the concepts of interest. As was stated in Chapter 4 "Methodological considerations", the main concepts under investigation are enrolment, progress and completion in higher education and exclusion from higher education. Enrolment, or more specifically, initial enrolment is operationalised through the number of students enrolling into the first year of study for the first time in a given HE programme. As initial enrolment related to the obtaining of a student status – the concept of initial enrolment is therefore closely connected to the way it is measured in this study. The similar situation is for the concept of completion, since it is operationalised through the number of students completing higher education in a given calendar year, from a specific programme and with a specific duration of studies. Neither the concept of enrolment nor the concept of completion go beyond obtaining the status of student or the status of graduate from higher education, i.e. they are not bearing any information with regards to the ability of the student, his/her preparedness for higher education, competences acquired through higher education, etc. Therefore, the results of the analysis cannot serve to infer anything about these characteristics of the students. Progress is, as was stated, operationalised through the variable *progress* relating to the time it takes to enrol into the next year of study and through the dichotomous variable *new_or_repeat*. Again, such operationalisation does not provide any information regarding the quality of learning outcomes of a student, since it is connected only to his/her status, whether s/he enrolled into the next year of study or not and how long it took him/her to do so.

The concept of exclusion was also approached quantitatively. Exclusion and hence inequality does take many forms, many of which are not obvious or visible if using quantitative data. Issues of concordance between the institutional habitus and the habitus of the student, motivation and expectations of the student, more subtle forms of exclusion consequently reflected in variance of the quality of learning outcomes were not a part of this study, since the available data could not testify to these processes. Therefore, it should be recognised that the inferences about exclusion presented in this study are an indication of major forms of exclusion at best. Similarly, due to the structure of the data used (see Chapter 4 "Methodological considerations"), the socio-economic background of the students was approximated with the education of parents, which does not "paint" the full picture of the student's position in terms of social stratification. This is why the research never attempted to classify students in specific social strata or social class, but keeps referring to education of parents as an indicator of socio-economic background.

To secure internal validity of the research, any inferences regarding causal relationships are carefully made, taking into account the natural connection between variables used (for example HEI type cannot affect gender, while the opposite is possible) and the formulations include sufficient caveats regarding causality due to possible interactions between variables as well as above mentioned issues related to measurement validity.

As was stated in Chapter 4 "Methodological considerations", the databases used for the bulk of the analysis are complete, i.e. they refer to the entire student and graduate population in the periods under research (2000-2004 for enrolment and 1994-2004 for graduation). Calculations in SPSS were not done on the entire population, but on approximately 10% random sample (sampling was done automatically by SPSS) and significance tests were done (and provided in results) to assess the usability of this data to make conclusions about the entire population. Generalisations to the situations outside of the specific time period under research were not made, primarily due to the volatility of the external situation. Similarly, while it could be that the patterns of enrolment, progress and completion in Serbia may be similar to the patterns exhibited in, for example, other countries of the Western Balkans, it is not possible to make such generalisations although the results presented here may serve to inform similar studies elsewhere or for comparative purposes.

The question of ecological validity can be rephrased as "how far from the real world is the picture painted in this study?". To reinforce the previous discussion regarding measurement, internal and external validity – the picture painted in this research can be considered to be a sketch of the actual situation with regards to patterns of enrolment, progress and completion in higher education and exclusion from higher education on the basis of socio-economic background. It should be considered primarily as a map to guide further research in specific issues raised here. Some of the suggestions for such future research are given further ahead.

Some of the problems encountered with operationalisation of SEB suggest that it would be necessary to change the contents of the SV20 and SV50 forms in the following manner:

SV20 form

1. The occupational status of parents should be recorded, rather than the work status, which largely reflects the division of labour characteristics for a socialist society. The classification of different occupational status should be clear enough to be understood by students completing the form and should to a certain extent reflect peculiarities of the Serbian context, but not to the extent to prevent comparability with other countries;
2. The possibility not to declare oneself in terms of ethnicity should be made more visible. Further possibilities for improvement regarding this issue do not concern the content of the SV20 form as such, but are rather connected to the change of prevailing social attitude towards minorities in general to enable free self-declaration and thus provide more reliable data;
3. Previous education should be recorded for all enrolments, not just initial enrolment. This will enable the analysis of the impact of previous education of student on progress in higher education, thus providing adequate data to potentially test the idea of cumulative disadvantage and the idea that social inequality is transformed into educational inequality and again back to social inequality in each stage of education;
4. Previous education should include both the completed secondary education, as well as any period of higher education, even if no qualification was obtained. This would make it possible to analyse if students successfully complete the programme of their first choice or not and would be useful for student-choice behaviour studies and the "second choice" or "second chance" effect;
5. Formulation of questions regarding employment of students should include the option of having part-time work or volunteer work;
6. It should be possible to record the number of repetitions of the year in question, not just if it is repeated or not. This would allow a more straightforward analysis of progress for each year of study; since the measure presented here is cumulative in nature (see Chapter 4 "Methodological considerations").

SV50 form

1. The time scale of data on completion should be harmonised with the academic year to allow for precise calculations of average durations of study, i.e. to avoid underestimates and overestimates (see Chapter 4 "Methodological considerations");
2. The SV50 form should include the questions on the same SEB elements as SV20 form (including the suggestions presented above) to ensure comparability between initial enrolment and completion, thus enabling better analysis of the SEB of those who dropout.

The problems encountered with respect to estimation of completion and dropout rates were primarily caused by the specific study system which was in place during the period under research. Bologna inspired reforms of higher education in Serbia, introduced with the law on higher education adopted in August 2005 may change this and thus facilitate the calculation of dropout rates on the national level. Alternatively, individual institutions should consolidate their information systems so they can identify dropout rates for their own institutions as well. It should be however understood that the issue of dropout is more complex than the situation in which a student does not complete the exact programme s/he initially enrolled into. Yorke

(1999) provides a good overview as to what can be considered as dropout from higher education and under what circumstances, charting all the possible outcomes. Such an approach is even more important in a system which is intended to offer more flexibility in terms of study programmes, allow pausing for a year, moving from one type of higher education to the other, etc, all of which the Serbian higher education is intended to provide to students (Ministarstvo prosvete i sporta, 2005).

Finally, the research presented here hopefully opened a field for further in-depth research in the matter. Since the methodological approach here was strongly quantitative and resulted in substantial exploration, albeit limited explanation of the phenomena at hand, possible topics and methods for future research may include: longitudinal studies focusing on all educational transitions, based on richer data, primarily in terms of elements of SEB (see Lucas, 2001), using more robust statistical analysis for testing the applicability of MMI, EMI and LCP, in order to provide a well founded framework for further qualitative studies in the matter. Such studies could be focusing on particular groups here identified as externally or internally excluded and may aim to identify the causes for such exclusion. In addition, attention could be put towards better identification and analysis of those who dropout from higher education and the extent to which the higher education system as such, or the habitus of the institution in particular, contributed to their decision to dropout. Last but not least, this study could potentially serve to inform the development of future student choice behaviour studies, which may be of even greater relevance in the system that is slowly moving towards increased marketisation of higher education, visible in the increasing number of private institutions and increasing number of students opting for private higher education, as well as in the announcement of changes in the funding mechanisms of higher education in Serbia.

References

Agresti, A. and Finlay, B. (1986) *Statistical Methods for the Social Sciences*. San Francisco: Dellen.

Albert, C. (2000) Higher education demand in Spain: The influence of labour market signals and family background. In *Higher Education*, 40 (2), pp. 147-162.

Archer, L., Hutchings, M. and Ross, A. (2003) *Higher Education and Social Class: Issues of exclusion and inclusion.* London: Routledge and Falmer.

Ball, S.J. (2002) "Classification" and "Judgement": social class and the "cognitive structures" of choice in higher education. In *British Journal of Sociology of Education*, 21 (1), pp. 51-72.

Blöndal, S., Field, S. and Girouard, N. (2002) *Investment in Human Capital through Post-compulsory Education and Training: Selected Efficiency and Equity Aspects.* Economics Department working paper 33. Paris: OECD.

Bourdieu P. (1986) The Forms of Capital. In Lauder H., Brown, P., Dillabough, J-A. and Halsey, A.H. (Eds) (2006) *Education, Globalization and Social Change.* Oxford: Oxford University Press.

Bourdieu, P. and Passeron, J.C. (1990) *Reproduction in Education, Society and Culture*, 2nd edition. London: SAGE.

Bowl, M. (2003) *Non-traditional entrants to higher education: "They talk about people like me".* Stoke on Trent: Trentham Books.

Clark, B. (1983) *The higher education system: academic organisation in cross-national perspective*, Berkeley: University of California Press.

Collins, R. (1979) *Credential Society: A Historical Sociology of Education and Stratification.* New York: Academic Press.

Cosser, M., du Toit, J. and Visser, M. (2004) *Settling for Less: Student aspirations and higher education realities.* Cape Town: Human Sciences Research Council.

Fuller, M. et al. (2004) Barriers to learning: a systematic study of the experience of disabled students in one university. In *Studies in Higher Education*, 29 (3), pp. 303 – 318.

Green, A., Preston, J. and Sabates, R. (2003) Education, Equality and Social Cohesion: a distributional approach. In *Compare*, 33 (4), pp. 453-470.

HEFCE (2005) *Young Participation in Higher Education*. Bristol: HEFCE.

Hosmer, D.W. and Lemeshow, S. (2000) *Applied Logistic Regression*. 2nd edition. New York: John Wiley and Sons.

Lucas, S.R. (2001) Effectively Maintained Inequality: Education transitions, Track Mobility and Social Background Effects. In *American Journal of Sociology*, 106 (6), pp. 1642-1690.

Marks, G. N. (2005) Cross-National Differences and Accounting for Social Class Inequalities in Education. In *International Sociology*, 20 (4), pp. 483-505.

Ministarstvo prosvete i sporta (2005) *Strategija Ministarstva prosvete i sporta za period 2005-2010. godine*. Available in Serbian from www.mps.sr.gov.yu (accessed on April 27, 2007) (Ministry of Education and Sports: Strategy for 2005-2010).

Ministarstvo prosvete i sporta (2006) *Srednje obrazovanje 2000-2005: Statistički bilten.* Beograd: Ministarstvo prosvete i sporta (Ministry of Education and Sports: Secondary Education 2000-2005: Statistical Bulletin).

Morrow, R.A. and Torres, C.A. (1994) Education and the Reproduction of Class, Gender and Race: Responding to the Postmodern Challenge. In *Educational Theory*, 44 (1), pp. 43-61.

Müller, W. and Karle, W. (1993) Social Selection in Educational Systems in Europe. In *European Sociological Review*, 9 (1), pp. 1-23.

Peck, B. (2001) The poor stay poor and the rich get rich. In *Issues in Educational Research*, 11 (2), pp. 45-64.

Power, S. (2000) Educational Pathways in the Middle Class(es). In *British Journal of Sociology of Education*, 21 (2), pp. 133-145.

Raftery, A.E. and Hout, M. (1993) Maximally Maintained Inequality: Expansion, Reform and Opportunity in Irish Education, 1921-75. In *Sociology of Education*, 66 (1), pp. 41-62.

Serbian Government (2005) *Poverty Reduction Strategy*. Available from http://www.prsp.sr.gov.yu/download/PRSP.zip (accessed on April 27, 2007).

Shiner, M. and Modood, T. (2002) Help or Hindrance? Higher Education and the Route to Ethnic Equality. In *British Journal of Sociology of Education*, 23 (2), pp. 210-232.

Statistical Office of Serbia (2003). *Census 2002*. Available from http://webrzs.statserb.sr.gov.yu/axd/en/popis.htm (accessed on April 27, 2007).

Statistical Office of Serbia (2005a). *Educational Statistics 1990-2004*. Available from http://webrzs.statserb.sr.gov.yu/axd/en/drugastrana.php?Sifra=0011&izbor=tabela (accessed on April 27, 2007).

Statistical Office of Serbia (2005b). *Statistical Yearbook 2005*. Available from http://webrzs.statserb.sr.gov.yu/axd/en/god.htm (accessed on April 27, 2007).

Statistical Office of Serbia (2006). *Statistical Yearbook 2006*. Available from http://webrzs.statserb.sr.gov.yu/axd/en/god.htm (accessed on April 27, 2007).

Thomas, L. (2002) Student retention in higher education: the role of institutional habitus. In *Journal of Education Policy*, 17 (4), pp. 423-442.

Tomusk, V. (2000) Reproduction of the ´State Nobility´ in Eastern Europe: past patterns and new practices. In *British Journal of Sociology of Education*, 21 (2), pp. 269-282.

Trow, M. (1970). Reflections on the transition from mass to universal higher education. In *Daedalus, Journal of the American Academy of Arts and Sciences*, 99(1), pp. 1-42.

Turajlić, S., Andrejić, M., Rudić, L. and Todorović, Lj. (2004) *Visoko obrazovanje u Srbiji.* Beograd: Ministarstvo prosvete i sporta (Turajlić et al.: Higher education in Serbia).

Weiss, A. (1995) Human Capital vs. Signalling Explanations of Wages. In *Journal of Economic Perspectives*, 9 (4), pp. 133-154.

Wong, R.S.K. (1998) Multidimensional Influences of Family Environment in Education: The Case of Socialist Czechoslovakia. In *Sociology of Education*, 71 (1), pp. 1.22.

Yorke, M. (1999) *Leaving Early: Undergraduate Non-completion in Higher Education.* London: Routledge Falmer.

Zietz, J. and Joshi P. (2005) Academic choice behaviour of high school students: economic rationale and empirical evidence. In *Economics of Education Review*, 24 (3), pp. 297 – 308.

Annex 1 – Definitions of key terms and concepts

- Access – refers to the possibility of obtaining a status of a registered student, i.e. being eligible for higher education (in terms of completed secondary education and passed entrance exams).
- Certificate – refers to an official document (or documents) issued upon completion of primary or secondary education.
- Completion – refers to obtaining a higher education qualification. Within this research, this term is limited only to undergraduate qualifications.
- Disadvantage – refers to the smaller likelihood of an event (initial enrolment, progress, completion) for a student with certain characteristics. E.g. a student of type A is considered to be disadvantaged in terms of initial enrolment in university higher education to the student of type B if A is less likely to enrol than B.
- Duration of studies – refers to the time between the year of initial enrolment and the year of completion. Biased measurement due to the discrepancy between the time scales of enrolment and completion data. Calculated as follows:

  duration = year of graduation – year of initial enrolment
- Dropout – refers to students loosing their registered student status without completion.
- Educational attainment – refers to the percentage of the appropriate age group that is enrolled into the specific type of education.
- Enrolment – refers to obtaining a status of a registered student of a specific year of studies at a higher education institution. Does not equal access. When referring to registering as a student of the first year of studies for the first time the term used is *initial enrolment.*
- Exclusion
  - External exclusion – refers to the process through which certain social groups are prevented from accessing any form of higher education whatsoever.
  - Internal exclusion – refers to the process through which certain social groups are prevented from accessing more prestigious types of higher education and more prestigious programmes/disciplines (e.g. law, medicine).
- Financing of studies
  - State funded – student enrolled in a public higher education institution who does not pay the tuition fee;
  - Co-funded student – student enrolled in a public higher education institution who pays a small amount of the tuition fee, the larger share being covered by the state;
  - Self-funded student – student enrolled in any higher education institution (public and private) who pays the full tuition fee defined by the institution in question.
- Higher education – includes both the university and the post-secondary vocational sector.
- Higher education institutions (HEI) – includes institutions such as public and private universities (and their constituent faculties which are separate legal

entities), independent private faculties, art academies and various institutions of post-secondary vocational education.

- Inequality – absence of equality of opportunities to access, progress and complete higher education.
- Primary education – refers to education which is compulsory for all children between 7-15 years of age. In some literature referred to as "compulsory education". Lasts 8 years and ends with obtaining a certificate of primary education. One of the requirements for entering secondary education (together with entrance exams). There are no tracks within primary education.
- Progress – refers to the time it takes to enrol in the next year of study after initial enrolment in the current year of study (e.g. a first-year student becomes a second-year student). Calculated as follows:

  $$progress = (academic\_year - year\_initial\_enrolment + 1)/year\_study$$

- Prolongation – the difference between the expected and actual duration of studies.
  - Absolute prolongation – total prolongation of studies. Calculated as:

    $$prolongation\_abs = duration - duration\_expected$$

  - Relative prolongation – amount of prolongation for each year of study. Calculated as:

    $$relative\_prolongation = prolongation\_abs/duration\_expected$$

- Secondary education – refers to the stage in education taking place after primary education. There are three tracks in secondary education: *gymnasium*, *secondary vocational education* (various vocational profiles, 4 years) and *apprentice training schools and centres* (various profiles, 3 years). Only gymnasium and secondary vocational education provide certificates necessary for accessing higher education.
- Social class – refers to the hierarchical distinctions between individuals or groups in societies or cultures. Related to the concept of *socio-economic status.*
- Social group – here refers to a group in the society which possesses certain distinctive characteristics. It is related to the concepts of *social class* and *socio-economic status* but goes beyond those, in the sense that includes additional characteristics as well, such as gender, race, ethnicity etc. Closely related to the concept of *socio-economic background.*
- Social mobility - the degree to which, in a given society, an individual's social status can change throughout the course of his or her life, or the degree to which that individual's offspring and subsequent generations move up and down the class system.
- Social reproduction – the process of transferring social stratification from generation to generation. The opposing concept is *social mobility.*
- Social stratification - hierarchical arrangement of social classes, castes, and strata within a society.
- Socio-economic background (SEB) – relates to diverse student characteristics such as: gender, age, education of parents, employment of parents, student's employment, and citizenship (Serbian, from countries of former Yugoslavia, other foreign), ethnic/national identity. Related, but not equal to terms such as *social class* or *socio-economic status.*
- Socio-economic status (SES) – refers to the ascribed or achieved status in society. It is often operationalised with occupational status.

- Tracking – relates to the process of educational differentiation of students in a certain (transfer) stage in the education system (transfer from primary to secondary, or from secondary to higher education). E.g. upon the completion of primary education, in theory, students are differentiated between three different tracks, i.e. types of secondary education on the basis of their educational achievements. Can be explicit and implicit.
- Under-representation – a certain group is said to be under-represented in e.g. higher education if the percentage of individuals belonging to that group with respect to the total number of people in higher education is lesser than the percentage of individuals belonging to that group with respect to the total population.

Annex 2 – Changes in the average duration of studies in public universities for different fields of study

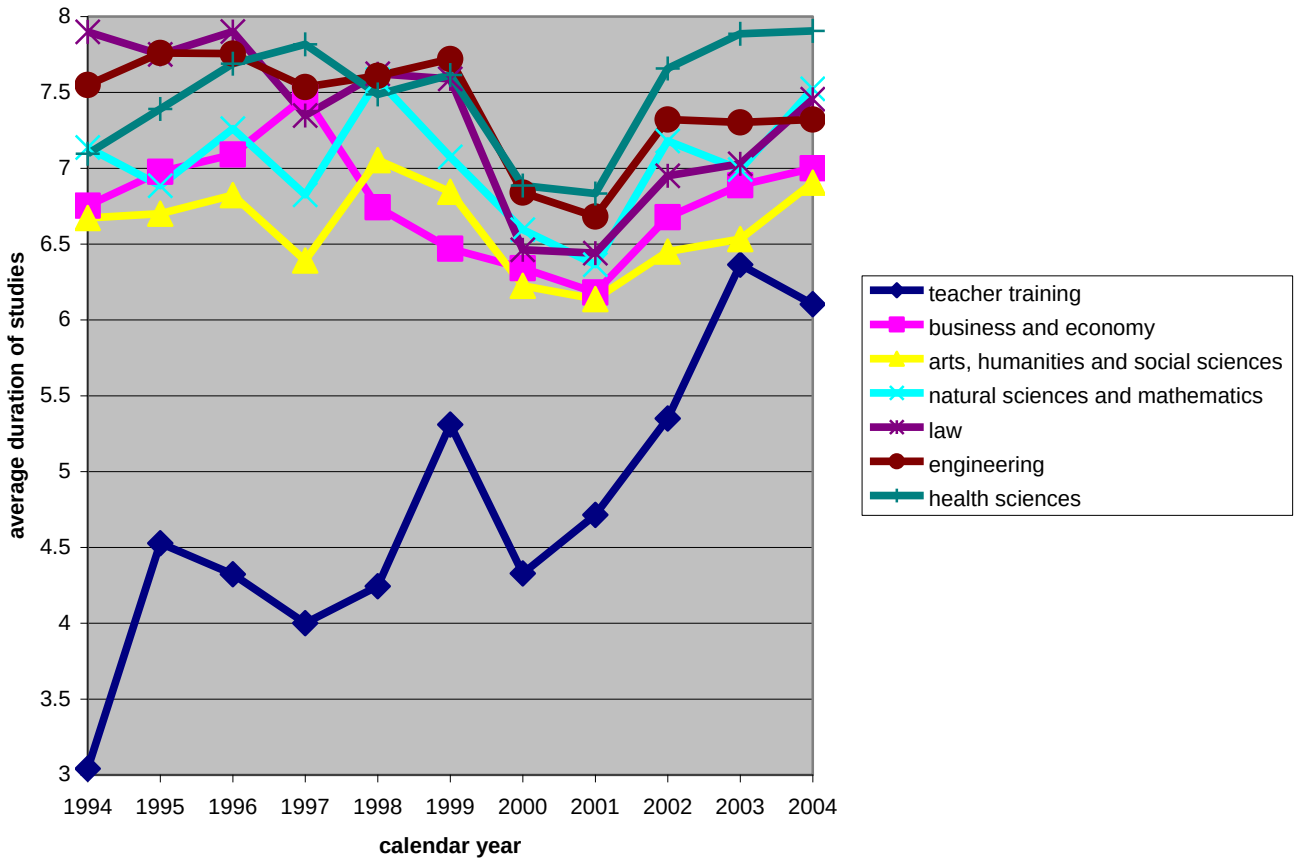

Figure 1 Average duration of studies at public universities, for different fields