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From University to Employment:

Higher Education Provision and Labour Market Needs in Serbia

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From University to Employment:

Higher Education Provision and Labour Market Needs in Serbia

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Foreword

Higher education systems in the Western Balkans are facing serious challenges. Growing levels of student enrolment throughout the region are straining the limited resources of public universities. At the same time, the number of private institutions has been increasing rapidly.

Importantly, more needs to be done to ensure that higher education qualifications match labour market needs. Many young people in the region are unemployed – and a number of them have higher education diplomas. This suggests that employers do not hold university degrees in very high esteem.

Whatever the field of study, third-level education is a means of sharpening our intellect and therefore valuable in its own right. However, it should also prepare us for the world of work, and enable us to lead independent lives as confident, engaged citizens. Universities and other higher education institutions need to adapt and modernise to deliver. In rapidly changing job markets, higher education systems should provide graduates with relevant skills and competences. This is not only about finding employment after graduation, but also about being able to adapt to future labour market needs and adjust to career changes.

We all know that a country's human resources are an integral part of its wealth. We say so on many occasions, especially when addressing young people in graduation ceremonies, or in political speeches. Unfortunately, when it comes to following these words with action and giving education the relevance and funding it deserves, we all too often fall short. This is something we have to change.

The skills and qualifications gained in university should help us build our lives and secure our societies' prosperity, competitiveness and progress. This study examines the link between higher education provision and labour market opportunities in the Western Balkans. It also looks at the obstacles facing graduates looking for work and the relevance of their skills for employers. The study is part of the on-going regional policy dialogue under the *Western Balkans Platform on Education and Training.* I am pleased to see that Ministers for Education have been supporting and engaging in this dialogue since the European Commission launched it in 2012.

I hope that the findings of the country reports in this study will contribute to more evidence-based policy-making in each country's higher education and labour sectors. The region's young people deserve nothing less.

Tibor Navracsics
European Commissioner for Education, Culture, Youth and Sport

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List of abbreviations

BA	Bachelor degree
CAQA	Commission for Accreditation and Quality Assurance
Cedefop	European Centre for the Development of Vocational Training
CV	Curricula Vitae
ENQA	European Association for Quality Assurance in Higher Education
ECTS	European Credit Transfer System
EHEA	European Higher Education Area
EQF	European Qualifications Framework
EU	European Union
GDP	Gross Domestic Product
GoRS	Government of the Republic Srpska
HE	Higher education
HEI	Higher education institution
HELM	combined HE and labour market systems
HRM	Human resource management
HSS	Humanities and Social Sciences
ICT	Information and Communication Technologies
IMF	International Monetary Fund
IPA	Instrument for Pre-Accession Assistance
ISCED	International Standard Classification of Education
LFS	Labour Force Survey
MA	Master degree
MESTD	Serbian Ministry of Education, Science and Technological Development
NCHE	National Council for Higher Education
NES	National Employment Service
NQF	National Qualifications Framework
OECD	Organisation for Economic Co-operation and Development
PES	Public Employment Services
PhD	Doctor of Philosophy
RSD	Serbian Dinar
SORS	Statistical Office of the Republic of Serbia
STEM	Science, Technology, Engineering and Mathematics
UNESCO	United Nations Educational, Scientific and Cultural Organization
VET	Vocational education and training

Executive summary

This report analyses higher education (HE) provision and labour market opportunities in Serbia by looking into four inter-related issues: the provision of HE, the current situation of the graduate labour market, the challenges facing graduates and employers on the labour market, and the skill gaps and skill mismatches that hinder graduate labour market integration. The report concludes with a set of recommendations on measures needed to ease graduates' transition to the labour market.

The data used in the study was collected from March to August 2015. It includes two large-scale surveys: one among recent HE graduates (1,438 respondents) and one among organisations that employ HE graduates (177 respondents). Semi-structured interviews were carried out with management staff of higher education institutions (HEIs), ministries, employers' associations, and trade unions. A focus group was also carried out with Erasmus Mundus alumni. The project has assembled a unique database that covers details of most study programmes offered by HEIs in the country in recent years[1].

Main findings

The number of HEIs has increased over the last two decades in response to an increase in student demand. Our database shows that there are now 85 HEIs in Serbia, of which 16 are universities and 69 are professional or vocational colleges. About a quarter of a million students are registered to study, mostly at public HEIs although each year 15% of students enroll at private HEIs. The most frequently followed fields of study are *Business, Administration & Law* and *Engineering, Construction & Manufacturing*. The graduate survey shows that students are fairly satisfied with the quality of education they receive at their HEI, although many graduates consider that their job prospects would have been improved by better teaching methods, a more relevant curriculum and by having better qualified professors. Serbia has an effective system of accreditation of HEIs in place, and along with Montenegro, is the only country in the region in which all HEIs and their study programmes have been accredited.

Graduates face a difficult transition to the labour market. Many experience periods of unemployment before they find a permanent job. While the overall unemployment rate of HE graduates in 2015 was 15.9%, the graduate survey shows that the unemployment rate of recent graduates is 41.5%, similar to the rate of youth unemployment as a whole. The institutional framework that supports graduates' job search is weak, and many graduates rely on their personal connections of family and friends to find a job, an inefficient way to allocate graduate labour. A major barrier facing graduates in their transition to the labour market is a lack of work experience; graduates without any work experience are less likely to find a job that is well matched to their HE qualifications than those who have some work experience. The government supports some graduates to gain work experience through an internship programme, and several large international companies operating in Serbia provide internships to HE graduates, and this approach should be further developed. Employers' cooperation with HEIs is important in supporting improved curricula and in easing graduates' transition to the labour market. Yet, such cooperation is rare, even though many employers consider that it would enable them to recruit graduates with appropriate skills more easily. More than half of graduates are employed in four sectors of the economy: *Education, Public Administration, Wholesale & Retail Trade,* and *Manufacturing*. The fastest increase in graduate employment in recent

[1] Further details about the methodologies and data used in this study can be found in the Annex.

years has been in the *ICT* sector. Graduate employment has also grown relatively fast in a small number of high-growth enterprises known as "gazelles" which tend to be small and medium sized enterprises (SMEs). Economic growth is expected to accelerate over the next three years as economic reforms begin to bear fruit, and the annual oversupply of new graduates is expected to fall from about 33,000 in 2015 to about 14,000 in 2018.

Among the graduates who find a job, their skills and competences gained in the HE system are not always suitable for the workplace. The employer survey shows that employers are only moderately satisfied with the skills of their graduate recruits, and more than half of employers believe that their graduate recruits do not bring much value added in comparison with non-graduates. Employers report that graduates lack interactive skills such as team working, decision-making, adaptability, and analytical and problem solving skills. Such skills are often neglected at HEIs where traditional teaching methods are more often used than student-centred approaches. Employers consider that HEIs could support the development of graduates' interactive skills by modernising teaching methods, by delivering teaching in small class groups rather than in large anonymous lecture rooms, and by adopting practical problem-solving approaches to teaching. In response to the weak skill-sets of graduates, many employers provide additional training to their graduate recruits. However, human resource management (HRM) practices are under-developed, and few employers follow up on training programmes with employee development plans that would maximise the benefits of the training provided.

Efficient matching of graduates to the requirements of the job is important for making the best use of the human capital created by the HE system, and is reflected in improved job retention and higher pay for well-matched graduates. Yet, more than one third of graduates experience "horizontal" mismatch by field of study. Graduates are more likely to be well matched horizontally if they had good academic performance at HEI, if they had a high level of support from their HEI to find a job, and if they have strong interactive skills. However, having help from friends in finding a job (i.e. making use of informal networks and social connections) is not conducive to good matching and is more likely to lead to a mismatched job and a lower level of pay. Measures to improve horizontal matching should include improved career guidance services and better collaboration between HEIs and employers.

The study also confirmed a substantial amount of "vertical" skill mismatch. Overall, fewer than half of graduates are well matched to a job by their level of education; almost two fifths are over-qualified for the job they hold. Being well matched by level of qualification assists graduates to retain their job and avoid unemployment. Factors that assist graduates in finding a vertically well-matched job include the help received from the HEI in job search, having studied an appropriate subject at HEI, studying in an HEI with a good reputation, having some work experience, and the overall economic situation. Vertically well-matched graduates have higher pay than mismatched graduates, although differences in initial salary diminish as graduates sort themselves into jobs more appropriate to their qualification level.

Policy recommendations

As the conclusions set out above demonstrate, action is needed both on the part of HEIs and on the part of employers, government, and public employment services to produce a more effective outcome for graduate job seekers. The research findings reported above suggest several key policy measures that should be implemented to improve the prospects for graduates when they enter the labour market. The recommendations are presented in order of priority.

Higher education

1. HEIs should **modernise curricula** to enable students to develop better interactive skills (such as adaptability, analytical and problem-solving skills, and team working skills). They should also introduce more practical work into their courses to ensure that graduates have a range of skills that can be used in the workplace.
2. HEIs should improve their **teaching methods** in order to increase the quality of education provided, by promoting a student-centred approach to learning based on small discussion classes, student presentations, teamwork assignments, and analytical and practical problem solving exercises.
3. The **quality assurance system** should be improved based on student evaluations and a strengthened Commission for Accreditation and Quality Assurance (CAQA). Publishing of student assessment scores could create incentives for better results in teaching (as happens at many HEIs throughout the EU). External peer-reviews should assess institutions according to the quality of their teaching.
4. The Government should promote the **internationalisation of HEIs** by attracting professors educated abroad into Serbian HEIs, and promoting greater involvement of HEIs in international exchange programmes such as Erasmus+.
5. HEIs should deliver **entrepreneurship learning courses** to all interested students, based on strong links with the local business community. Such courses should aim to support students with the relevant abilities in establishing their own business after graduation.
6. HEIs should provide prospective students with **information on labour market prospects** associated with different study programmes. To support this, HEIs should carry out tracer studies to identify the final destinations of HE graduates. Enhanced career guidance is also needed at secondary school level to support better informed decisions for entry to HE.
7. **The quality of data collected about the HE sector should be improved**. HEIs should provide better information about their study programmes to the Serbian Ministry of Education, Science and Technological Development, and the Statistical Office of the Republic of Serbia (SORS) should revise its classification of study programmes by degree level. More accurate information is needed on student enrolments, completion rates, and duration of study programmes. It would be desirable to develop a unique database on HE provision based on a common methodology of data collection, which would include the most important internationally recognised indicators as defined by Eurostat, UNESCO and OECD. The database developed in this study could serve as a basis.
8. **The National Qualifications Framework (NQF) should be finalised** and carefully explained to employers. A precondition for achieving a better alignment of HEI policies with labour market needs would be to complete the NQF with the involvement of all social partners.

Labour market

1. Policy makers should **support better cooperation between employers and HEIs** through active programmes to organise meetings, round-tables, discussions, and sharing of information. The recently created sectoral councils can provide a step in that direction.
2. **More effective institutional support should be offered to graduates during their transition to the labour market.** Formal career guidance services within HEIs should provide more support graduates in their search for a job. The National Employment Service should be encouraged to improve its services for graduate job seekers, and should exchange information with HEIs about the supply and demand for graduates in specific fields of study and specific sectors of the economy.
3. HEIs and employers should be encouraged to negotiate **more work experience placements with local businesses**, so that graduates enter the labour market with some prior work experience, which should be counted towards the completion of a study programme. To maximise learning outcomes, work placements should be closely supervised by HEIs, and specialised staff of employers should be supported to offer structured learning opportunities in the workplace. The Government should expand its existing internship programmes following graduation.
4. Policy makers should **support employers' continuing training of graduates.** Although many employers provide supplementary training, this is often not supported by effective human resource management (HRM) practices such as career development plans. HEIs could support employers by assisting them in drafting career development plans for graduate employees, by providing training to employers in HRM techniques, and by providing continuing education opportunities for graduate employees at HEIs throughout their career.

1 Introduction

Even during the period of rapid economic growth from 2001 to 2008, the Serbian labour market was characterised by relatively high unemployment, low employment rates, a large informal sector, and a continuous brain drain, with young people being among the most affected (Uvalić, 2010). Since 2009, six years of stalled GDP growth have revealed a number of structural problems, including a dysfunctional labour market. Living standards are still relatively low, with per capita GDP of €4, 635 in 2014 (similar to the average of €4, 596 for the Western Balkan region, and equivalent to 37% of real GDP per capita in the EU-28).[2] Reversing such trends will require an upskilling of the labour force to raise labour productivity and industrial competitiveness. In pursuing such a strategy, the higher education (HE) system will have a crucial role to play in supplying highly qualified graduate workers to the economy. Research studies have shown that the skills and competences of new graduates are often not well aligned to labour market needs (Ristić and Pavlović, 2012; Arandarenko, 2013). The HE system often provides graduates with theoretical knowledge rather than with the practical skills needed by employers (Radović-Marković, 2011). Since only 27.2% of the population of 30-34 year olds hold a tertiary degree, compared to 38% in the EU28, there is room to further expand the HE system, as long as there are a sufficient number of job opportunities for HE graduates.[3] Along with economic recovery, achieving a better alignment of HE study programmes with labour market needs could improve graduates' employability and contribute to a better use of human capital.

This report aims to understand the extent and type of qualifications and skills that are produced by the HE system, the difficulties and opportunities that graduates face in the labour market, and the skill gaps and skill mismatches experienced by employers. It also provides a forecast of the demand for graduates in the near future and concludes with recommendations on measures needed to ensure improved performance of the HE system and the graduate labour market. The report is divided into six sections. Section 2 identifies the structure of HE provision; Section 3 reviews the graduates labour market and provides a forecast of the expected future demand for graduates by field of study; Section 4 identifies the obstacles graduates face in their transition to the labour market, and the difficulties employers face with their new graduate recruits; Section 5 analyses the extent and nature of graduate skill mismatches. Section 6 concludes with a summary of research findings and a set of related policy recommendations. A special database recording basic data on HE provision was created for this study. In addition, two online surveys of recent graduates and of the organisations that employ graduates were carried out. Details about the methodologies and data used in the study can be found in the Annex.

[2] Gross Domestic Product per capita for 2014 taken from Eurostat, variable code [cpc_ecnagdp]. The authors have calculated an unweighted average for the Western Balkans, including an estimate for Kosovo*. The relative real expenditure on GDP in purchasing power parity terms compared to the EU-28 is taken from Eurostat [prc_ppp_ind].

[3] Data on tertiary participation in Serbia are for 2014, and are taken from Eurostat [cpc_pseduc], for the EU28 data are from Eurostat [edat_lfse_03].

2 Mapping the provision of higher education

In recent years, public expenditure on HE in Serbia has declined from 0.96% of GDP in 2009 to 0.86% of GDP in 2014.[4] Public expenditure on HE is above the level achieved in Bulgaria (0.66% of GDP) and Romania (0.78% of GDP), but below the level in Slovenia (1.23% of GDP) and Austria (1.88% of GDP).[5] The strategic goal established by the "Strategy for the Development of Education until 2020" is to reach the EU average by gradually increasing public expenditure on HE to 1.25% by 2020. However, this may be difficult to achieve given that the macroeconomic policy set out in the Economic Reform Programme for 2015-17 envisages an expenditure-based fiscal consolidation aimed at stabilising government debt (European Commission, 2015b). Over the period between 2014 and 2017 the government aims to reduce primary expenditure by 7.9% of GDP, in order to achieve a reduction in the budget deficit to 3.8% of GDP. As part of the fiscal consolidation, salaries of public employees in excess of 25, 000 RSD were cut by 10% in 2015 (including public employees in the HE sector), although there has been a pay increase in 2016 amounting to 2% for public employees in the HE sector (GoRS, 2016).

2.1 Profile of higher education institutions

After Serbia signed the Bologna Declaration in 2003, a new Law on Higher Education was adopted in 2005 distinguishing between academic and vocational studies (Vujačić et al, 2013). The main types of HEIs are universities (*univerzitet*), colleges of academic studies (*visoka škola akademskih studija*) and colleges of vocational studies (*visoka škola strukovnih studija*). There are also faculties (*fakultet*) and art academies (*umetnička akademija*) within a university.[6] Faculties within public universities are independent legal entities. They have substantial autonomy in taking decisions regarding professional, managerial and financial matters (Vujačić et al., 2013).[7] Universities have a dual governance structure consisting of an administrative body, the Council, and an academic body, the Senate. Serbia is one of the few countries in the region to have a substantial post-secondary vocational system provided by a large number of specialised colleges, which provide degree-level qualifications.[8] The largest HEI is the University of Belgrade, a public university with 31 faculties and more than 82, 000 registered students in the 2014-2015 academic year (over a third of the total in all HEIs).[9] Some private HEIs have been established in response to increased demand for higher education (Branković, 2014). The project has compiled a HE provision database covering all HEIs in Serbia (see Table 1). The relative number of private HEIs is below the average in the region in relation to population size.

[4] Data on public expenditure on higher education are available in the laws on the government budget for each respective year ("Zakon o budzetu" and "Zakon o rebalansu budzeta").
[5] Eurostat online data for 2012, variable code [educ_uoe_fine06].
[6] European Commission (2011) *Higher Education in Serbia*, Brussels: TEMPUS Programme
[7] A Law on Higher Education was passed in 2002 that reinstated the autonomy of HEIs that had been eroded under the authoritarian regime.
[8] These organisations were developed in former Yugoslavia as high Colleges (*visoka škola*). These were specialised post-secondary non-tertiary institutions providing four- or five-year study programmes, similar to a *Fachhochschule* in Germany. Since 2005 they belong to HE but only offer study programmes of 180 and 240 ECTS. Similar colleges are also found in Kosovo.
[9] Data from University of Belgrade website and project HE provision database.

Table 1: Accredited HEIs by ownership and type of organisation, 2016

	HEIs	Faculties	Number of HEIs per 100, 000 inhabitants (regional average)	Number of faculties per 100, 000 inhabitants (regional average)
Total number of HEIs	85	128	1.2 (1.3)	1.8 (3.2)
By type of HEI				
Universities	16		0.2 (0.5)	
Colleges of vocational studies	65		1.1 (0.9)	
Colleges of academic studies	4			
By ownership of HEI				
Public	51	67	0.7 (0.5)	0.94 (1.7)
Private	34	61	0.5 (0.8)	0.86 (1.5)

Source: CAQA (2014) and HEI provision database created for this study.

The 2005 Law on Higher Education introduced three cycles of studies in accordance with the Bologna principles and the corresponding European Credit Transfer System (ECTS). Bachelor studies provide either 180 ECTS (three-year programme) or 240 ECTS (four-year programme), and Master studies provide either 60 ECTS (one year programme) or 120 ECTS (two-year programme). After completing Master studies, a student ought to have a total of 300 ECTS (180+120 in the case of 3+2 years, or 240+60 in the case of 4+1 years).

Table 2: Study programmes by type of ownership and degree level, 2014-2015

	Number of study programmes	Proportion of study programmes
Ownership of HEI		
Public	1, 108	73.7%
Private	410	26.3%
Total	1, 518	100.0%
Level of qualification		
Bachelor	664	43.7%
Master	605	39.9%
Doctoral	249	16.4%
Total	1, 518	100.0%

Source: HE provision database.

Typically, Bachelor studies last four years, Master studies last one year and PhD studies three years. In practice, however, both models of organising HE studies (3+2 and 4+1) have been adopted. Most HEIs have opted for the 4+1 model (GoRS, 2012: 103).[10] Of 664 Bachelor level study programmes identified in the HEI provision database, 37% are three-year programmes, while of 605 Master level programmes only 8% are two-year programmes (aligned with three-year bachelor programmes). Almost all doctoral study programmes (with two exceptions) last for three years. This variety of solutions complicates the HE system. Students who complete a 3-year Bachelor degree (obtaining 180 ECTS) but wish to continue studying at a HEI that offers a 1-year Master degree (60

[10] After the adoption of the Law on HE in 2005, there was uncertainty about the financial resources that would be available for the new MA study programmes at public HEIs. This led many HEIs to adopt the 4+1 model to be on the safe side (Interview, public HEI).

ECTS) have to pass additional exams to obtain a full set of ECTS credits.[11] The different ways of organising studies also create difficulties in having reliable statistics on student enrolments and completion rates at different levels of HE (as discussed further below).

Table 3: Study programmes by broad field of study, 2014-2015

Field of study	Number of study programmes	Proportion of study programmes
01 Education	154	10.1%
02 Arts & Humanities	148	9.7%
03 Social Sciences, Journalism & Information	145	9.6%
04 Business, Administration & Law	294	19.4%
05 Natural Sciences, Mathematics & Statistics	114	7.5%
06 Information & Communication Technologies	129	8.5%
07 Engineering, Manufacturing & Construction	308	20.3%
08 Agriculture, Forestry, Fisheries & Veterinary	42	2.8%
09 Health & Welfare	78	5.1%
10 Services	106	7.0%
Total	**1,518**	**100%**
HSS subjects (02+03+04)	*587*	*38.7%*
STEM subjects (05+06 +07)	*551*	*36.3%*

Source: HE provision database. Note: Fields of study are presented according to the International Standard Classification of Education (ISCED), the statistical framework for organising information on education maintained by the United Nations Educational, Scientific and Cultural Organization (UNESCO).

Almost two-fifths (39%) of study programmes are in the Humanities and Social Sciences (HSS) fields,[12] while 36% are in STEM subjects (*Science, Technology, Engineering & Mathematics*) (see Table 3).[13] Public HEIs tend to focus on STEM subjects (which account for 43% of their study programmes[14]). Private HEIs focus more on HSS study fields (which account for 65% of their study programmes[15]). The Serbian HE system is notable for its strong focus on the broad fields of *Engineering, Manufacturing & Construction* in comparison to elsewhere in the region, where only 14% of study programmes are devoted to this field of study.[16] This is a cause for concern, since there is an oversupply of graduates from these study fields on the labour market (see Figure 8 below).

2.2 Students

One of the main aims of the Law on Higher Education of 2005 was to increase the proportion of adults with a HE degree. The "Strategy for the Development of Education until 2020" aims to increase the proportion of 30-34 year olds with HE from 23% in 2012 to 38.5% by 2020 (GoRS, 2012: 130). It is also envisaged that 70% of students entering

[11] This problem is recognised in the *Strategy for the Development of Education in Serbia until 2020* (2012, p. 103): "Having various possibilities for organising studies hampers the continuation of studies at the Master's level when students move from the 3+2 model to 4+1 and vice versa".

[12] HSS is here defined as ISCED 02+03+04, i.e. *Arts & Humanities*, *Social Science, Journalism & Information* and *Business, Administration & Law.*

[13] Within these broad categories, *Business, Administration & Law* account for 19.4% of all study programmes, as does *Engineering, Manufacturing & Construction*.

[14] At public HEIs, the main concentration of study programmes is in the broad field of *Engineering, Manufacturing & Construction*, (which accounts for 26% of all study programmes).

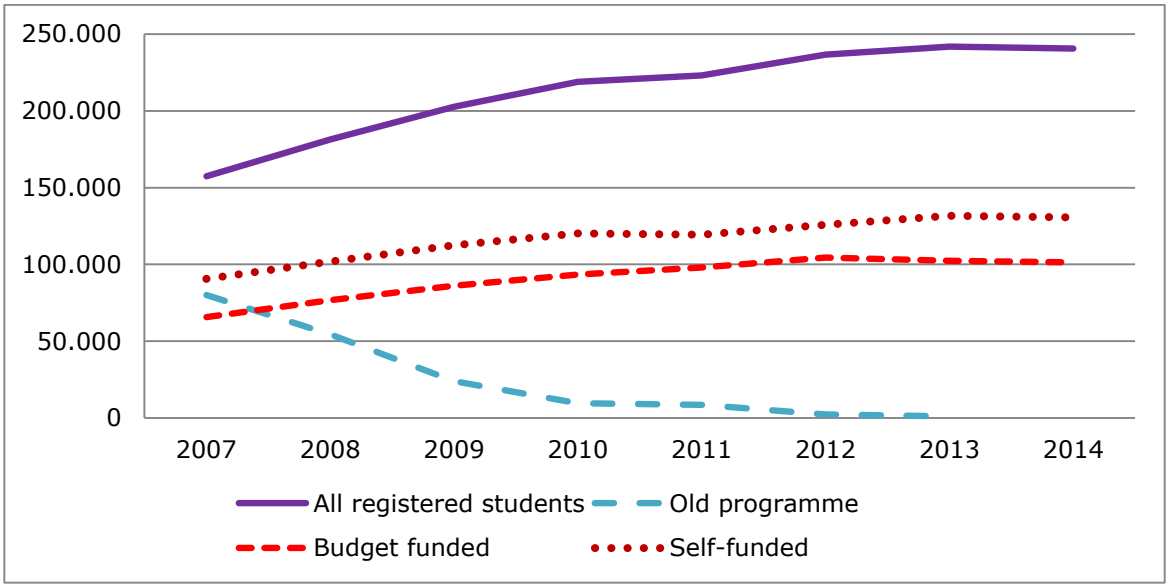
[15] Including *Business, Administration & Law* subjects, which account for 38% of study programmes at private HEIs.

[16] This is reported in the accompanying synthesis report.

the first year of studies opt for academic rather than vocational studies, and that 50% of students who complete academic studies should enrol in Master studies.

Tuition fees for about two fifths of students at public HEIs are covered by the state (*budget-funded students*),[17] while others finance their own studies (*self-financed students*).[18] Students in receipt of budget funding are selected on a competitive merit-based process through a combination of entrance examination and school performance. Unfortunately, the procedures used are not always transparent (OECD, 2012), which enables fraudulent practices in gaining budget-funded places at public HEIs.[19] Tuition fees differ at public and private HEIs. For Bachelor studies, the median annual fee is €600 at public HEIs and €1,500 at private HEIs, and at Master level the respective fees are €740 and €1,550.[20] Students in receipt of a state scholarship are exempted from the fees at public HEIs. The graduate survey shows that the ratio between the tuition fee that graduates would be willing to pay and the actual fee paid (what we might call the "value for money ratio") is highest for Bachelor degrees at 70% (66% at public HEIs and 81% at private HEIs) and lowest for Master degrees at 67% (65% at a public HEI and 85% at private HEIs). This suggests that public HEIs provide lower value for money at both Bachelor level and Master level compared to private HEIs.[21] Overall, the value for money provided by HEIs is just above the average observed elsewhere in the region.[22]

Figure 1: Total number of students registered in all levels of study, 2007-2014



Source: Statistical Office of the Republic of Serbia database.

[17] These students have additional privileges for housing, extra allowances and other facilities.
[18] In the academic year 2014-15, from 242,848 tertiary level students, 104,433 were budget financed (43% of the total) and 138,415 were self-financed. See SORS (2015a) Table 5-12).
[19] The formal entrance competition is bypassed by various means including the addition of a student to the ranked list after it is finalised; fraudulent changes to the quotas of budget financed students; advance receipt of entrance exam questions or purchase of entrance exams; fraudulent changes of test scores; and cheating during the entrance exam (OECD, 2012).
[20] These data are derived from the project's HEI provision database.
[21] The difference in the mean value for money between public and private HEIs is statistically significant at the 1% level at Bachelor level (t-statistic = 4.05, p=0.000, N=428) and at Master level (t-statistic = 3.95, p=0.000, N=400).
[22] For the Western Balkan region as a whole, value for money at HEIs is 68% for Bachelor degrees, and 65% for Master degrees. Low value for money is found in EU countries too. In the UK, for example, three out of ten students think the academic experience in HE is poor value (Department for Business Information and Skills, 2016).

Following the adoption of the 2005 Law on Higher Education the number of registered students increased by 50% between the 2007-08 and the 2012-13 academic years, but has since levelled off to 240,500 in 2014 (see Figure 1).[23] Most students (86%)[24] are registered at public HEIs; in the 2014-15 academic year, over 100,000 students were budget-financed and over 130,000 were self-financed.[25] Until 2007, student enrolment at Bachelor level was carried out according to the old curriculum of the former Law on Higher Education.[26] Over time, the number of students studying under the pre-Bologna "old programmes" has diminished, almost vanishing by the 2013-14 academic year. Some study programmes enrol a large number of students. For example, the Faculty of Law at the University of Belgrade enrols more than 1,500 students each year for its BA in Law, the Faculty of Economics enrols more than 1,400 students each year for its BA in Economics, and the Faculty of Philology enrols more than 1,000 students in its BA in Language Acquisition.[27]

Table 4: Students enrolling and completing studies each year, 2012-15

	Enrolment			Completion		
	2011-12	2012-13	2013-14	2011-12	2012-13	2013-14
Bachelor	50, 474	51, 195	51, 098	15, 621	16, 596	18, 363
Master	4, 715	6, 077	6, 303	30, 955	30, 231	31, 422
Doctoral	1, 882	2, 053	2, 096	580	759	750
Total number of students	57, 071	59, 325	59, 497	47, 156	47, 586	50, 535
Proportion of students in public HEIs						
% Public HEIs	85.5%	83.8%	84.6%	80.8%	81.3%	80.9%
% Private HEIs	14.5%	16.2%	15.4%	19.2%	18.7%	19.1%

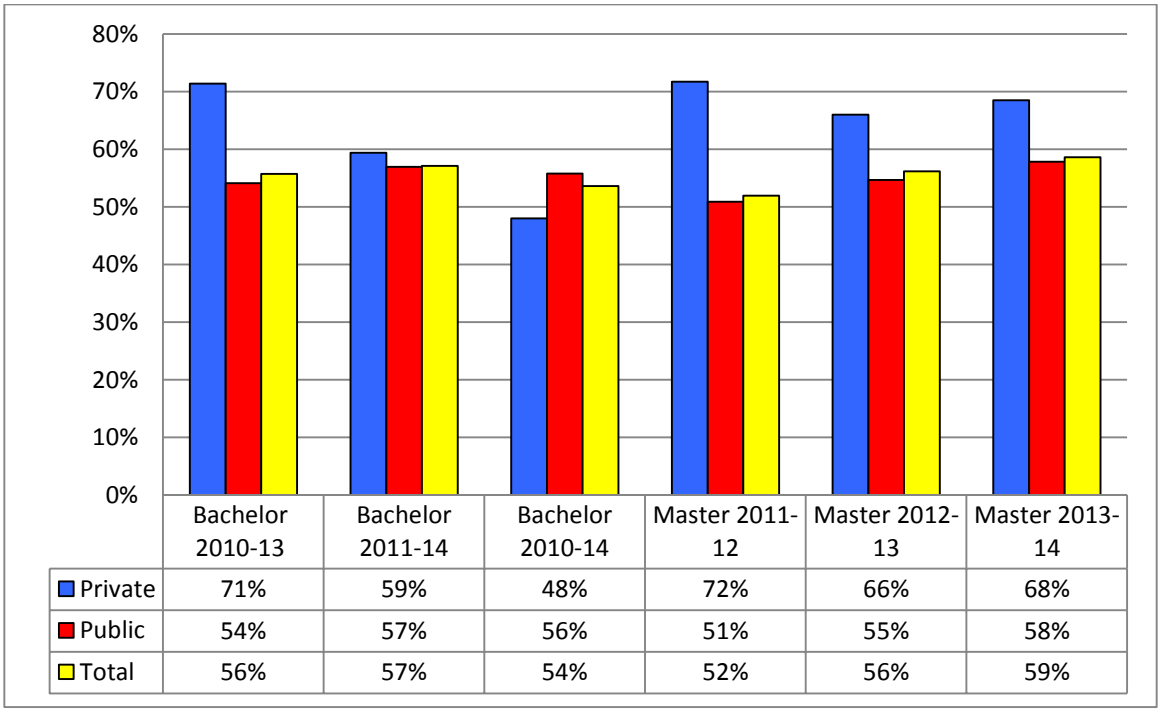
Source: HEI provision database.

Table 4 presents data on the number of students who enrol each year in HEIs and the number of students who complete their studies, at each level of degree. In the academic year 2013-14, the ratio of completions to enrolments was 85%.[28] This is a very high completion ratio compared to other countries of the region.[29] At Bachelor level however, the completion ratio was only 36%, while at Master level the completion ratio was over 100%.[30] An explanation for this apparent anomaly can be found by inspecting the

[23] By "registered" students we mean the number of students who are currently registered to study at all HEIs at all levels of study, i.e. the stock of students. Further on we analyse the enrolment of students, i.e. the annual inflow of students.
[24] Statistical Yearbook of the Republic of Serbia 2015, Belgrade: SORS.
[25] The proportion of students self-financed at Bachelor level fell from 59% in 2007/08 academic year to 57% in the 2013/14 academic year, while the proportion that were self-financed at Master level increased from 47% to 52% over the same period.
[26] In 2013, 1,044 students were registered under the old curriculum (SORS online data base).
[27] The "Strategy for the Development of Education in Serbia until 2020" notes that "[t]he current funding system encourages all HEIs to enroll as many students as possible, and, implicitly, to let them pass as many exams as possible" (MESTD, 2012: 218).
[28] These data are calculated from the Project HEI provision database.
[29] The completion ratio is the ratio of the number of students who complete studies in a given year divided by the number of students who complete studies in the same year. It should not be confused with the completion rate, which is analysed below.
[30] The phenomenon seems to be associated with a few HEIs, including Megatrend University, which had a completion ratio for second cycle studies of 1,378% in the academic year 2011/12, Union University (858% in 2011/12), University of Arts (1, 921% in 2013/14), University of Belgrade (456% in 2013/14) and University of Kragujevac (811% in 2013/14).

Statistical Office of the Republic of Serbia (SORS) statistical release "AS20", which lists the number of graduating students by type of degree. In 2013, within the second cycle of studies alongside the Master degree certificates, we find a group of "Bachelor with Honours" certificates. Altogether 18,467 such degrees were awarded, among which 4,736 were "Bachelors with Honours in Economics" and 2,474 "Bachelor with Honours in Law".[31] These "Bachelor with Honours" certificates are awarded to students from four-year Bachelor programmes, which have been classified as second-cycle graduates (because of the higher number of ECTS they earn).[32] However, such students have only completed 4 years of study, not 4+1 or 3+2, which should not really justify their classification among the group of second cycle studies.[33] Reclassifying these degrees as first cycle Bachelor programmes indicates that about 30,000 graduates completed their studies with a Bachelor degree in 2013. The Statistical Office ought to review the classification protocol in order to provide a more accurate picture of the completions at different levels of study in the HE system in Serbia.

Figure 2: Completion rates on Bachelor and Master study programmes



	Bachelor 2010-13	Bachelor 2011-14	Bachelor 2010-14	Master 2011-12	Master 2012-13	Master 2013-14
Private	71%	59%	48%	72%	66%	68%
Public	54%	57%	56%	51%	55%	58%
Total	56%	57%	54%	52%	56%	59%

Source: HE provision database. Note: Only study programmes with completion rates equal to or less than 100% are included. The cross-section method is used to calculate completion rates.

The completion rate (rather than the ratio) is a standard indicator of the effectiveness of a HE system (Eurydice, 2015). It provides a more accurate picture of the effectiveness of

[31] In addition to the certificates of "Bachelor with Honours in Economics", there were 568 first cycle "Bachelors in Economics" and 957 "Masters In Economics", giving a total of 6, 288 graduates at both first and second cycles of study with certificates in Economics in 2013/14.

[32] According to the undergraduate prospectus of the University of Belgrade, students who follow a four-year study programme are awarded Bachelor with Honours degree, which carries 240 ECTS, and is clearly identified as belonging to the first cycle of studies, not to the second cycle as reported in the SORS AS20 Statistical Release (see "Undergraduate and Integrated Studies", Belgrade: University of Belgrade).

[33] If the SORS AS20 data are recalculated for the academic year 2013-14 by placing "Bachelor with Honours" graduates among the group of first cycle graduates we find a total of 29, 823 graduates from first cycle studies, and 18, 496 graduates from second cycle studies. This is still only a partial correction, as it does not fully adjust for misclassification of the data.

individual HEIs and study programmes than the broad-brush completion ratio discussed above. It is calculated by the so-called "cross-section" method from the project's HEI provision database.[34] Ignoring study programmes with completion rates in excess of 100% for which data is unreliable, we find that the overall completion rate for first-cycle Bachelor programmes is between 56% and 57% for three-year programmes, and is 54% for the (majority) four-year study programmes.[35] Completion rates are higher at private HEIs than public HEIs for three-year programmes, but lower than at public HEIs for four-year programmes. The better performance of private HEIs on Bologna-compliant three-year programmes may suggest that these HEIs have adapted better to the Bologna reforms. However the performance of both types of HEI seems to be converging as indicated by the similarity of the completion rates for the 2011-14 programmes compared to programmes that began in 2010. Completion rates on Master programmes vary from 52% to 59%. These completion rates are among the highest in the region, and are above the lowest completion rates in the EHEA, which are found in Hungary at 48% (Eurydice, 2015), although below the average completion rate in the OECD countries of 68% in 2013.[36]

Figure 3 shows the proportion of students who enrolled in and completed studies by broad field of study in the 2013-14 academic year. Taking broad groups of study fields into account, 40% of students enrolled and 45% completed their studies in HSS study fields (ISCED 02+03+04).[37] At the same time, 30% of students enrolled and 28% completed their studies in STEM subjects (ISCED 05+06+07).[38] These data can be compared to the situation in the EU-28 where 23% of all graduates hold STEM qualifications (Cedefop, 2015). In this perspective, Serbia appears to be doing rather well in the proportion of STEM graduates that are being produced by its HE system, especially in the large number of graduates produced in the fields of *Engineering, Manufacturing & Construction*. Yet, as in the EU, shortages of such graduates are likely to emerge in the future, especially in the fields of *Natural Sciences, Mathematics & Statistics* (see Figure 8 below) unless more students can be persuaded to take up these fields of study. It is notable that only 5% of students completed studies in this study field in the 2013-2014 academic year.

[34] The data available from the HE provision database permit the computation of completion rates for two cohorts following two-year programmes. The completion rates are calculated as the ratio of the number of graduates completing studies in year "t" divided by the number of students who enrolled in year "t-x", where "x" is the duration of the study programme. This method of calculating completion rates, known as the "cross section" method, is clearly more robust than taking the ratio of completions and enrolments in a single year, as it seeks to track the performance of a given cohort through time, although it is less accurate than the so-called "true cohort" method based upon individual level administrative registers or surveys.

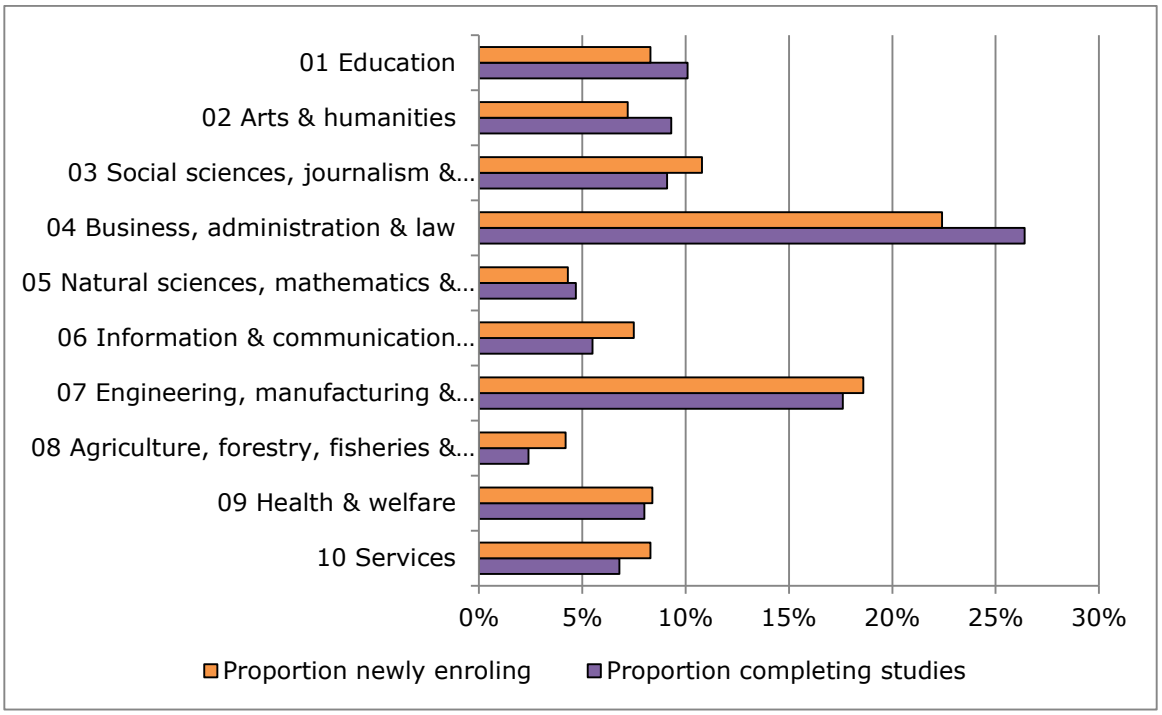
[35] Inclusion of study programmes with completion rates over 100% gives rise to anomalous results. In addition to the issue of misclassification noted in the text, some students who enrolled many years ago under the pre-Bologna programme may have rushed to complete their studies after the MESTD declared their right to a degree would be revoked if they did not complete their studies by a set date. This explanation fits with the swings in completion rates that have taken place on Master programmes, which increased at public HEIs from 286% in the 2011-12 academic year to 573% in 2013-14, while completion rates on Master programmes at private HEIs fell from 666% in the 2011-12 academic year to 71% in 2013-14.

[36] See OECD (2013) Education at a Glance, and the data appendix available at: http://dx.doi.org/10.1787/888932848495.

[37] Within this total, 83% of students completed HSS study fields at private HEIs, compared to 36% at public HEIs.

[38] Within this total, 6% of students completed STEM study fields at private HEIs, compared to 33% at public HEIs.

Figure 3: Students newly enrolling and completing studies by field of study (2013-14) (%)



Source: HE provision database.

2.3 Quality

Expansion of the HE system has raised concerns about the quality of the education provided. In this section we first analyse the accreditation system designed to ensure quality before moving to the issue of programme evaluation and student satisfaction with the quality of HE provision and the role of teaching methods in supporting quality, before turning to a discussion of recent policy developments and gaps.

2.3.1 Accreditation

The Commission for Accreditation and Quality Assurance (CAQA) was established in 2005 under the Law on Higher Education. It is composed of fifteen university professors from all scientific fields and is in charge of accreditation and external evaluation of HEIs as institutions and individual study programmes. CAQA has been subject to international evaluation by ENQA, and became a member of ENQA in 2013. Having accreditation is a condition for a HEI to receive an operating licence from the Ministry of Education, Science and Technological Development (MESTD) and for issuing HE degrees. Both public and private HEIs are obliged to implement an internal evaluation of their teaching staff and teaching methods (which are assessed by students). The external evaluation function of the CAQA relies on both quantitative (e.g. number of teachers and support staff) and qualitative indicators (e.g. existence of a quality assurance system). It reports to the National Council for Higher Education (NCHE). Following reports from reviewers' on-site visits, the CAQA can propose to the NCHE to withdraw accreditation from an HEI or study programme (Vujačić et al., 2013).

The first round of the accreditation process, implemented by CAQA, began in 2007 and the eighth cycle of accreditation was completed in 2011. By law, accreditation must be repeated every five years, and so a second round of accreditation was begun in 2012. By

2014, 88 HEIs and 807 study programmes had been accredited for the second time (CAQA, 2014). The accreditation process has been broadly effective in monitoring quality within the HE system and several HEIs have lost their license as a result of the accreditation process. Currently, all HEIs and study programmes are accredited.

Despite this success, some concerns have been raised regarding the implementation of the accreditation process. According to recent research, while some HEIs have fully accepted and implemented accreditation standards required by CAQA, others have implemented only modified versions of the standards, some have only partially or symbolically implemented them, and a few have simply rejected them (Janičijević, 2015).[39] Consequently, none of the accreditation standards have been implemented by all the HEIs while none of the HEIs has implemented all the accreditation standards (Janičijević, 2015). However, Serbia, along with Montenegro, are the only countries in the region to have had all HEIs and their programmes undergo accreditation, and another round will be repeated in 2017.

2.3.2 Programme evaluation

According to the 2005 Law on Higher Education, HEIs are free to determine the contents of their study programmes and teaching methods. Since the HE system treats public and private HEIs equally, they are expected to respect the same quality standards. However, private HEIs have received a bad press. In the words of one recent study "public institutions are actively involved in campaigning against the legitimacy of private higher education…[and] …private HEIs are often perceived to be motivated primarily by profit, which is considered outside the norms of legitimate practice in education provision" (Branković, 2014: 128).[40] However, private providers may play a crucial role, because they are motivated by a financial incentive to increase their quality in order to attract students. They may be less constrained by a top-heavy bureaucracy and may respond more rapidly to changing labour markets (Sondergaard and Murthi et al., 2012: 151).

A widespread public perception is that private HEIs provide a lower quality education than public HEIs. This perception is partly supported by international university rankings, one of which shows that among the top ten HEIs in Serbia, eight are public HEIs and only two are private HEIs.[41] The public University of Belgrade is the top ranked HEI in Serbia with a global ranking of 536th position (ranked in 17th position in Central and Eastern Europe – CEE), while the public University of Novi Sad is second ranked, with a global ranking of 886th position (ranked 38th in CEE). The top private university is Singidunum University with a global ranking of 3,222nd (ranked 220th in CEE). However, these rankings are only indirectly connected to teaching quality, as the metrics are mainly research-based. Private HEIs often perceived to have fewer high performing students

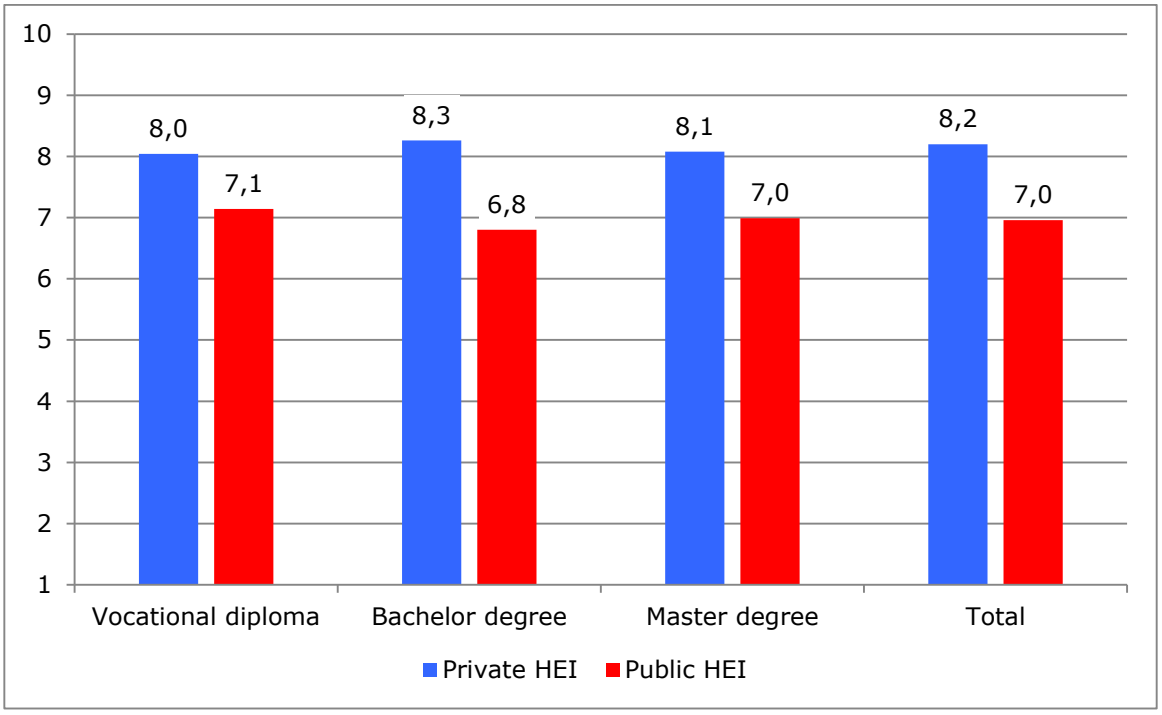
[39] Some HEIs have implemented the accreditation standards only symbolically e.g. "by performing the ritual of preparing and publishing self-evaluation reports with no actual consequences or results of any kind. Some Faculties conducted the process of self-evaluation reporting only in the year of their application for accreditation, and ceased to do so since" while "rejection…is only possible in the case when the university has gained the greatest autonomy with respect to institutional environment...[and] … uses this autonomy in order to block the changes that are being imposed on them" (Janičijević, 2015: 1557).

[40] The "Strategy for the Development of Education in Serbia until 2020" states "The emergence of private education institutions, publicly explained as a contribution to improving the quality of education by strengthening the mechanisms of competition, is … managed in many cases by the interests of profit and lack of public and other demands regarding the quality of education. In the education system, a significant opposition emerged between the short-term economic interests on one hand and the development mission of education on the other" (MESTD, 2012: 12).

[41] This data is taken from the Spain-based "Webometrics Ranking of World Universities", a publication of the Cybermetrics Lab, a research group of the Consejo Superior de Investigaciones Científicas (CSIC), the largest public research body in Spain. It should be noted that the methodology includes only publicly available web links data and does not rank specifically on teaching quality. See "Webometrics Ranking of World Universities", http://www.webometrics.info/en.

compared to the leading public HEIs, since the best students apply to public HEIs with the support of scholarships that are awarded on merit. A main difference between private and public HEIs is managerial flexibility. Having a smaller number of students and a clear hierarchy in decision-making may enable private HEIs to better respond to the demands of the labour market, whereas decision-making in public HEIs may be more complex due to their larger size and more complex administrative procedures (Branković, 2014). Curricula at some private HEIs tend to be more in line with international trends and local needs than those in public HEIs, where academic staff often resist reforms to established teaching methods. Being relatively young institutions, private HEIs do not suffer from such a "path dependency" effect and may be institutionally more flexible in adopting changes in their curricula.

Figure 4: Satisfaction with quality of education at public and private HEIs



Source: Graduate survey. Note: Satisfaction with quality is assessed in response to the question "How satisfied are you with the quality of the education you received?" on a scale of 1-10 with 1= "very dissatisfied" to 10= "very satisfied".

The graduate survey shows that students rate their satisfaction with the quality of education they received at HEI quite highly, with an average score of 7.2 out of 10.[42] Graduates are more satisfied with the quality of education they received at private HEIs than at public HEIs, with a score of 8.2 at the former and 7.0 at the latter (see Figure 4). This does not necessarily imply that the quality of education is actually higher at private HEIs than at public HEIs (for example, students may be more satisfied with the education they receive if it is easier to pass exams at a private HEI).[43] The difference in satisfaction

[42] This is slightly above the average for the Western Balkans as a whole (7.05) but only statistically significantly above satisfaction with quality in Albania ($p<0.01$) and Bosnia ($p<0.05$). It is also slightly higher than the average level of satisfaction of 6.6 found in the CONGRAD study of 2013 (TEMPUS, 2014), two years before the present study, which may indicate some improvement since then.

[43] The "Strategy for the Development of Education in Serbia until 2020" provides a clue about the problems facing public HEIs due to budgetary restrictions when it comments that "For several years now, the state has not been paying material costs at the level defined by the formula in the Decree. This creates major

with quality is around 12 percentage points, with a difference of 15 percentage points for Bachelor studies. The results are surprising, as private HEIs tend to have a worse reputation than public HEIs. It may be that students who attended private HEIs have different characteristics than those who attend public HEIs. In order to explore this hypothesis a regression model has been developed to identify whether such additional possible determinants of graduate satisfaction with their HEI studies have an effect, and if so whether it is these alternative factors that are responsible for the observed differences.

Table 5: Regression model for graduate satisfaction with quality of education

	Coefficient	t-statistic
Public HEI	-1.160	-7.78***
Whether internship was used	1.086	9.67***
Above average performance	0.668	6.20***
Classes in small groups	0.737	7.01***
Education	0.501	2.86***
Natural Sciences, Mathematics & Statistics	0.325	2.52**
Specialist degree	0.571	1.92*
Doctoral degree	0.875	2.20**
Constant	6.535	37.38***
Adj. R-Squared= 0.209; F=40.1; p=0.000; N=1, 187		

*Source: Graduate survey. Note: Significance level ***=1%, **=5%, *=10%. Model estimated using SPSS.*

The regression analysis shows that several factors in addition to ownership status of the HEI determine graduate satisfaction (see Table 5).[44] Several factors have a positive impact on satisfaction including whether the graduate had experienced internship or other form of work experience during studies, whether study performance was above average, whether teaching methods involved classes in small groups. Graduates who studied *Education* or *Natural Sciences, Mathematics & Statistics* have a higher level of satisfaction with quality of their education (compared to those who studied *Social Sciences, Journalism & Information* – the baseline study field for this analysis). Even when these factors are taken into account, the ownership status of the HEI still has a significant influence on perceived satisfaction with HE quality. The results indicate that graduates who studied at public HEIs have a level of satisfaction with their education that is 11.6 percentage points lower than those who studied at private HEIs, slightly less than the 12.0 percentage point gap identified in Figure 4 which does not control for other relevant factors identified in this study.

It should be emphasised that this difference between public and private HEIs could be offset by public HEIs offering internship or work experience to their students or by more frequent use of teaching in small class groups. The former increases student satisfaction with quality by 10.9 percentage points and the latter by 7.4 percentage points. It is important to note also that graduates from *Natural Sciences, Mathematics & Statistics* fields of study have a higher level of satisfaction with the quality of studies compared to other fields of study by 3.3 percentage points, irrespective of whether they studied at

problems to the state HEIs when they need to provide funds for covering the heating and other operating costs, and the consequence is the violation of the delivery and the quality of teaching." (MESTD, 2012: 216).

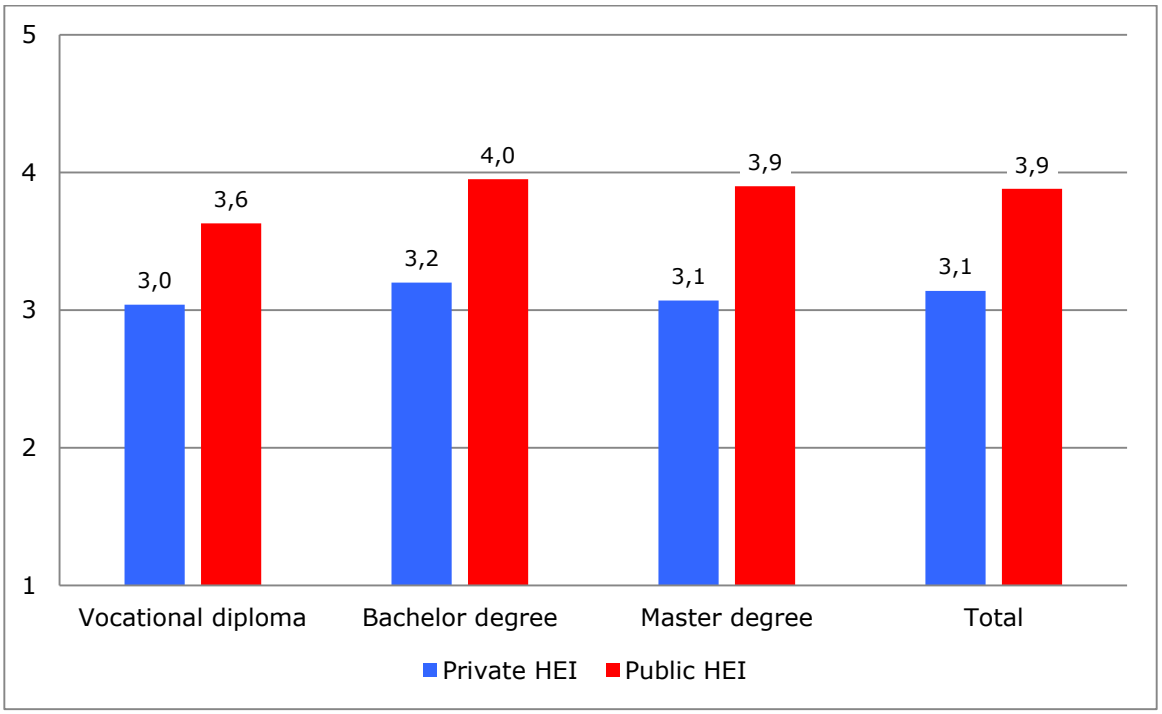
[44] Other factors such as age, gender, and level of degree were taken into account but were not found to be significant influences on perceptions of quality of education at HEIs in the regression analysis, and so are not reported in Table 5.

public or private HEIs. This is an encouraging finding since these fields of study are likely to be increasingly important in supporting future competitiveness of the Serbian economy in the future.

2.3.3 Teaching methods

It is often stated that HEIs in post-socialist countries are insufficiently flexible in responding to labour market changes through curricula reform and the adoption of new teaching methods (Sondergaard and Murthi, 2012). Despite the changes triggered by the Bologna Process, studying in Serbian HEIs is still based on a pre-determined curriculum with most subjects being mandatory (Smirnov, 2008). Some examinations are still taken orally, and most have a strong focus on memorising definitions, theories, concepts, and less on an analytical approach to knowledge. Most university staff were educated in the previous century with few acquiring experience or obtaining PhD degrees abroad. These observations are supported by the graduate survey from which we find that 64% of respondents consider that better teaching methods would have improved their job prospects after graduation either "a lot" or "very much". Two fifths (40%) also thought that better qualified professors would have contributed to their job prospects, while 66% thought that a more relevant curriculum would achieve this goal.

Figure 5: Whether better teaching methods would have improved job prospects



Source: Graduate survey. Note: Differences between public and private HEIs are statistically significant at the 1% level (N=1, 213). The question asked was "Regarding the study programme for your LAST degree obtained, to what extent would better teaching methods at your higher education institution have improved your job prospects after graduation?" (1=not at all, 2= a little, 3= some; 4=much, 5= very much).

According to the graduate survey, graduates consider that while all HEIs need to make improvements, public HEIs have a greater need to improve their teaching methods and curricula to make them more relevant to the labour market than do private HEIs (see

Figure 5). The differences are observable at all levels of study ($p<0.01$).[45] Having better curriculum and better-qualified professors would also make a substantial improvement to graduates' job prospects, especially at public HEIs.

Although many HEIs have made efforts to change teaching practices and curricula by translating textbooks used internationally, teaching methods frequently use rote-learning methods. From the graduate survey we find that 52% of respondents report that rote learning methods were used "somewhat", "a lot" or "very much". While 72% of graduates who report that rote learning was used consider that "very much" improvement is needed in teaching methods, only 23% who report that their professors did *not* use these teaching methods consider that "very much" improvement is needed in teaching methods ($p<0.01$).[46]

Box 1: HE experience in Serbia and the EU: findings from a focus group

Erasmus Mundus alumni from Serbia found the main difference between the HE experience in Serbia and that in EU HEIs to be the relationship between students and lecturers. In EU countries, students feel closer to lecturers, which results in a system that is perceived as more supportive to students. The delivery of lectures in smaller groups was also found as an important feature for most Erasmus Mundus alumni. Furthermore, assessment methods in European HEIs were less reliant on single exams but rather based on a variety of methods throughout the year. A final point regarding the teaching and learning environment in EU HEIs was more emphasis on solving practical problems, which also contributed to students taking a more active role.

Source: Focus group report, Serbia.

2.4 Policy developments and gaps

Over the last decade, while several HE reforms have been introduced many remain to be fully implemented.[47] Some key challenges are set out in the "Strategy for the Development of Education 2020" (hereafter the 2020 Strategy).[48] The objectives are to increase the proportion of 30-34 year olds in HE as mentioned above, increase the quality of HE, raise the efficiency of studies, and improve completion rates and mobility of students. Other objectives are to increase enrolments in technical and natural sciences, and to ensure access to HE for socially disadvantaged groups.

A related issue is HE financing. The 2020 Strategy argues that some HEIs, driven by short-term financial interests, have enrolled too many students and opened departments in an uncontrolled way, endangering quality and efficiency. The Strategy proposes that HEIs should identify the cost of each field of study, in order to rationalise the system of student fees. A new model of financing HE would eliminate some of the negative consequences for the private HE sector of the existing system of financing public HEIs and would require an increase in HE expenditure to 1.25% of GDP by 2020. Although the 2005 Law proposed new arrangements for HE funding based on financial agreements between the Serbian Ministry of Education, Science and Technological Development and each HEI, this has not been implemented. Public HEIs continue to rely on direct funding

[45] Differences between public and private HEIs are significant at 1% level (t-statistic= 8.14, p=0.000, N=1, 238).
[46] The test of statistical significance used is the Pearson Chi-square, with F=172.8, p=0.000 and F=149.7 and p=0.000 for the two examples reported.
[47] "Even though higher education in Serbia is being aligned to the Bologna process, many reforms are still to be fully or properly implemented" (Indicative Strategy Paper for Serbia 2014-2020, Brussels: European Commission, 2014, p. 33).
[48] The accompanying Action Plans were prepared in early 2015.

from the state budget, which encourages maximising the number of students. Public HEIs are also allowed to generate additional funds from tuition fees, donations, teaching, consultancy, administrative services or other sources (Vujačić et al., 2013).

Another set of problems relates to the fragmentation of public universities into autonomous faculties. The 2005 Law on Higher Education restricted the role of universities to a few overall co-ordination functions, such as strategic planning, creating enrolment policies, selecting teachers, upholding quality assurance and control, issuing diplomas, and managing investment planning. This fragmentation has delayed the implementation of reforms and has hindered cooperation between universities and the business sector (Zgaga et al., 2013). It has made it difficult to introduce enrolment policies based on priority study programmes to ensure better correspondence between the supply of HE graduates and labour market demand. It has also hindered uniformity in the degree structure and organisation of studies that could promote student mobility. In recognition of these problems, the 2005 Law envisages the gradual integration of universities, which however has still not been fully implemented despite positive steps in this direction. The *2020 Strategy* also advocates integrating university faculties, and establishing national and regional centres for Doctoral studies. The autonomy of faculties however makes it difficult to collect reliable data to form a comprehensive picture of how the sector functions. Also, the diversity of criteria used to regulate student admissions from one faculty to another may distort the selection process (OECD, 2012).[49]

Serbia still lacks a National Qualification Framework (NQF), a fundamental tool of the Bologna process. The current qualification classification is out-dated and no longer provides adequate information about graduate skills and competences (Arandarenko and Ognjanov, 2012; Gradjanske Inicijative, 2010; Ubović, 2014). Although separate NQFs have been developed covering the European Qualifications Framework (EQF) levels 6-8, and for Lifelong Learning covering levels 1-5, they have not yet been implemented. In 2015, a national NQF working group began to prepare a unified NQF that would take into account existing qualifications in vocational Colleges and HEIs. A major issue is that employers lack an understanding of the new HE qualifications system brought about by the Bologna process. Some employers do not recognise the new terminology and degree levels, or understand why a BA can now be completed in three years instead of four years under the old system.[50] This suggests that the NQF should be completed as soon as possible and adapted to new occupations and current HE qualifications. At the time of writing the NQF has not been completed.[51]

Weak statistical information on HE is also a major challenge. The methods of collection and analysis of HE statistics of the two main institutions in charge, SORS and the Serbian Ministry of Education, Science and Technological Development, are not coordinated, so the two sources give different information (in this study we use data from the SORS).[52] This is a general obstacle to policy making, which affects data in other sectors as well as the HE sector (Uvalić–Trumbić, 2016).

A new Law on Higher Education has been prepared that aims to reform HEI enrolment policy (including funding arrangements), bring study programmes more in line with labour market needs, raise teaching quality, and encourage the mobility of teachers and students. However, the law had not been adopted at the time of writing.

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[49] For example, as part of ongoing reforms of the HE system in Italy aimed at rationalising human and financial resources, faculties were abolished in early 2013 at all state universities, which were transformed into departments as integral components of the universities.

[50] Interviews public HEIs and MESTD.

[51] Various working groups have been established, but due to the complexity of the methodology that has been adopted, the process is unlikely to be completed in the foreseeable future.

[52] The problem of lack of uniformity in reporting HE statistics is recognised and addressed in Appendix 2 of the 2012 *Strategy for the Development of Education in Serbia until 2020* (p. 204).

3 Mapping graduate labour markets

This section maps the graduate labour market on the basis of official data, the findings from our survey of HE graduates who graduated since 2010, and our survey of employers who employ HE graduates. Section 3.1 identifies the difficulties faced by graduates in finding a job, the distribution of graduates by sector, and by the size of the enterprise or organisation in which they are employed. Section 3.2 analyses emerging opportunities for graduate employment and provides a forecast of the demand for graduates in 2018 in relation to current levels of supply by field of study. Section 3.3 identifies policy developments and gaps in relation to the graduate labour market.

3.1 Difficulties facing graduates in finding a job

The economy has experienced a turbulent period since the 2009 recession, with repeated downturns in 2009, 2012 and 2014 (Prica, 2013). Over the period from 2008 to 2012, as a consequence of the economic crisis, total employment fell by 60,000 (SORS, 2016). This masked a fall in formal employment of 325,000, compensated by a (smaller) increase in informal employment. By 2014, there were 2, 544, 188 employed persons in Serbia, of which 451, 850 (17.8%) had a HE degree.[53] Due to a modest recovery of economic growth, by the fourth quarter of 2015 total employment had increased to 2, 558, 347 (SORS, 2016).[54]

Table 6: Unemployment rate and employment rate, 2013-15 (%)

	Total			HE graduates			Western Balkans	EU-28 total	EU-28 graduates
	2013	2014	2015	2013	2014	2015	2014	2015	2015
Unemployment rate	22.1	18.9 (19.4)	17.7	18.3	15.0	15.9	24.2	9.4	5.6
Employment rate	37.7	39.7 (41.7)	42.5	51.8	55.0	58.5	48.6	58.1	76.9

Source: Statistical Office of the Republic of Serbia (SORS) Labour Force Survey and Eurostat online data. Note: The Labour Force Survey methodology was changed in 2015 and SORS revised the data for 2014 (shown in brackets). The new data are not directly comparable to the old data, but are more accurate. Total unemployment and employment rates are for the 15+ age group.

The SORS has recently revised the methodology for carrying out the Labour Force Survey to harmonise with EU standards, making comparisons with previous years unreliable. However, the data for 2014 have been reworked by the SORS (as shown in Table 6) and have resulted in an upward revision of the unemployment rate in 2014 to 19.4%. In 2015, the unemployment rate, on the basis of the revised methodology, fell to 17.7%, reflecting an improvement in the economic situation. Yet, this was only about two percentage points below the overall unemployment rate, and almost three times as high as the EU average.[55] The situation is worse for recent graduates. According to the data from the graduate survey, the unemployment rate of recent graduates (since 2010) is 41.5%, rather similar to the 43.1% overall youth unemployment rate, [56] while the employment rate of recent graduates is just 49%.

[53] Statistical Yearbook of the Republic of Serbia, 2014, Table 3.7.
[54] Of these, it was estimated that about 500,000 work in the informal sector (SORS. 2016).
[55] Similar conclusions can be drawn regarding employment rates, which are below the EU average.
[56] See Statistical Office of the Republic of Serbia, Labour Force Survey (SORS 2015b). Data refer to the age group 15-24. The latest EU Progress Report on Serbia comments that "[t]he ongoing reform of higher education needs to put particular emphasis on the relevance of its study programmes, as the unemployment rate for graduates with tertiary education (aged 19-24) stands at 40% and emigration of young and skilled people is high" (European Commission, 2015a: 65).

3.1.1 Graduate employment by size of employer

The employer survey conducted in this project covered a total of 177 employers.[57] The sample included both public and private enterprises and includes all firm sizes, from micro (employing fewer than 10 workers) to large firms (employing 250 or more). While the majority of employers in Serbia are small or micro-sized, only a relatively few employ graduates, and so the size distribution of employers that do employ graduates is different from the overall population distribution. In the sample, two fifths of the employers that employ graduates are micro sized, and a similar proportion are small sized. Table 7 shows the average number of graduate employees in each size group. The ratio of the number of graduate employees to the number of all employees for each employer (the density of graduate employment) is shown in the final column.

Table 7: Graduate employment by employer size groups

	Distribution of employers in sample	Distribution of graduate employees	Average number of graduate employees	Median number of graduate employees	Density of graduate employment per employer
Micro	23.1%	0.3%	2.6	2.5	72%
Small	21.2%	3.5%	12.5	12.0	53%
Medium	30.8%	20.9%	52.3	33.5	42%
Large	25.0%	75.2%	297.0	237.0	35%
Total	**100%**	**100%**	**82.4**	**21.5**	**47%**

Source: Employer survey. Note: Micro employers are those with fewer than 10 employees; small employers from 10 to 49; medium sized employers from 50 to 249; large employers with 250 or more. This is in accordance with the Eurostat definition of employer size groups.

Table 7 shows that the density of graduate employment per employer is inversely related to the size of employers that employ graduates. Thus, among micro employers, almost three quarters of their employees are graduates. Conversely, among large employers that employ graduates, only 33% of their employees are graduates. Thus, although micro and small firms employ a relatively small share of graduate employees overall, those that do tend to have a large demand for such employees. Most of the growth in employment has taken place in a relatively small proportion of employers. The employer survey[58] reveals that 80% of all jobs created in the past three years have been created by just 10% of employers, and that 82% of graduate jobs created have been created by just 16% of employers. Such employment dynamics are typical in most market economies, where fast-growth employers involved are sometimes called "gazelles" (Acs and Mueller, 2008; OECD 2009).[59] In Serbia, 12.5% of employers are gazelles (according to the Eurostat definition), growing at 20% per annum in terms of employment, while 21% of employers are growing at 10% or more per annum in terms of employment. The latter type of employer could be called "divokoza", a type of Balkan gazelle.[60] Both gazelles and "divokoza" tend to be smaller sized than other employers, typically being

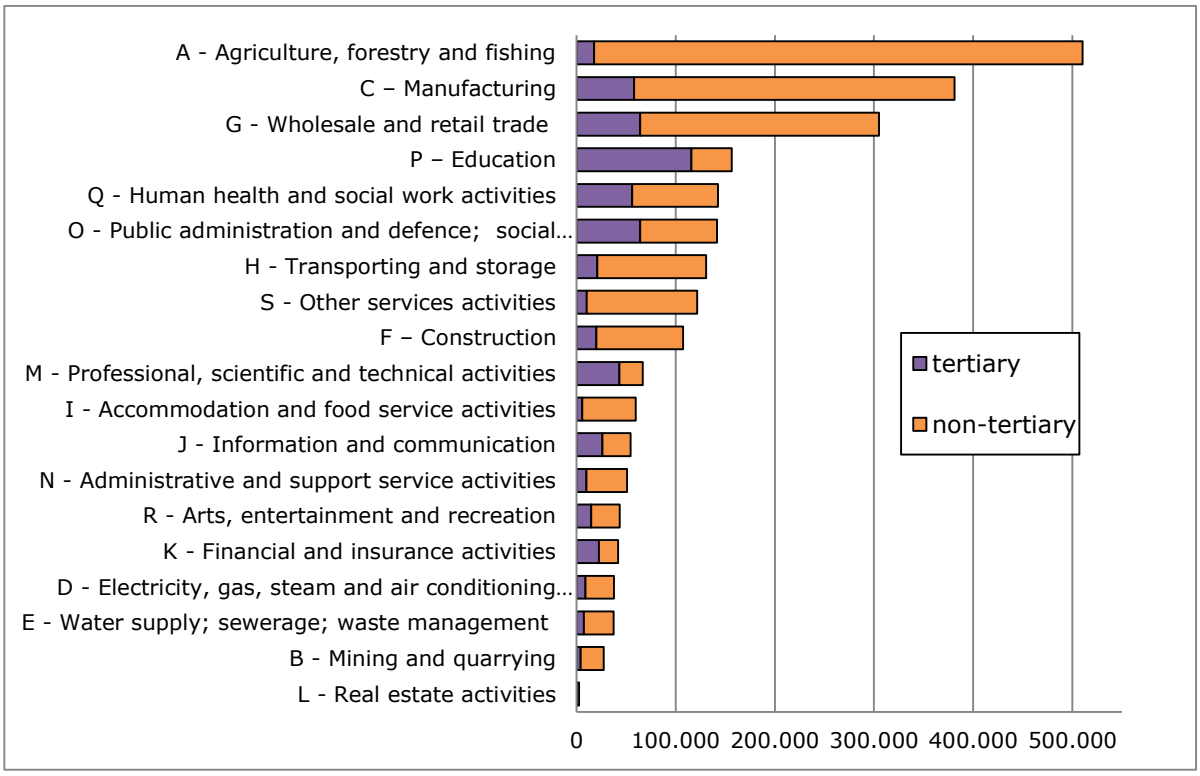
[57] For comparison, the latest EBRD BEEPS survey in Serbia had a sample size of 360 enterprises (EBRD 2015).
[58] Further details about the employer survey methodology can be found in the Annex.
[59] The definition of a gazelle, given by Eurostat, is a company that has been formed within the past three years and is expanding employment by at least 20% per annum over those three years. In Hungary, for example, about 1% businesses in the industrial sector that employ between 5 and 9 employees fall into this category as do 0.45% of businesses with 10 or more employees (Eurostat, variable [eip_pop3]).
[60] "Divokoza", or Balkan Chamois, is speedy, but not as fast as a gazelle. The top speed of a chamois is about 50 kilometres per hour that of a gazelle is about 100 kilometres per hour.

medium sized rather than large employers.[61] The growth rate of graduate employees is much higher among such fast-growth employer organisations ($p<0.01$).[62]

3.1.2 Graduate employment by sector

The opportunity for graduates to find a job differs across sectors and across employers of different size. Most graduates are employed in relatively few sectors (see Figure 6).

Figure 6: Graduate (tertiary) and non-graduate employment by sector of activity, 2014



Source: SORS, Labour Force Survey.

Serbia stands out among Western Balkan countries in having a large agricultural sector, which accounts for about one fifth of all employees.[63] Not surprisingly however, relatively few graduates work in this sector. More than half (53%) of all graduates are employed in *Education*, *Public Administration, Defence & Compulsory Social Security*, *Wholesale & Retail Trade*, and *Manufacturing*.[64] About one quarter (24%) of all employed persons are HE graduates. Some sectors have a larger share of graduate employees than others. Thus, the share of graduates is especially high in *Education* (74% of all employees in the sector are graduates), *Professional, Scientific & Technical Activities* (65% are graduates),

[61] A t-test of the difference in current size of divokoza versus other firms gave a t-statistic of 2.2, p=0.29, N=80. For gazelles the t-test was only statistically significant for the size difference three years ago, not for the current size difference, suggesting that the recent economic recovery is spread across all size groups.

[62] The average annual growth rate of graduates at gazelle employers is 47% compared to just 3% at other employers (t=4.27, p=0.003, N=69), while for divokoza the average annual growth rate of graduates is 34% per annum compared to just 1% per annum in other employer organisations (t=7.38, p=0.000, N=69).

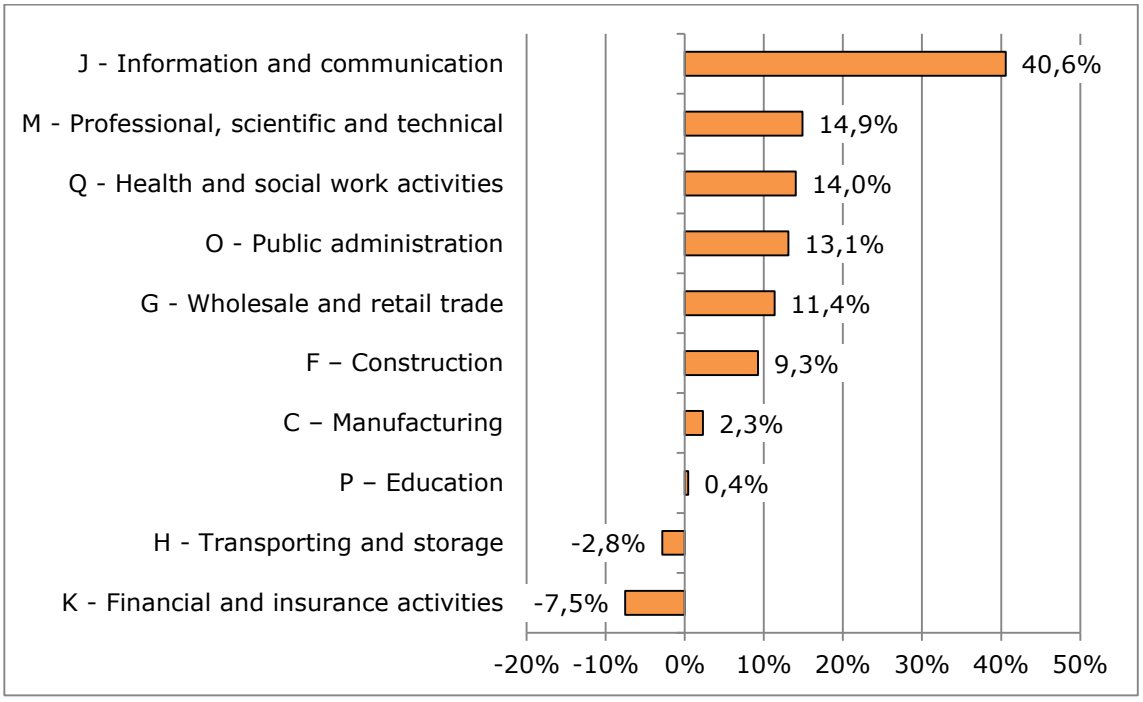
[63] According to one study, Serbia has the highest share of employment in agriculture among all countries in Europe, apart from Romania (Arandarenko, 2011: 25).

[64] Based on Labour Force Survey data provided by SORS.

Financial & Insurance Activities (54% are graduates) and *Information & Communication Technologies* (ICT) (48% are graduates).

The employer survey shows that 47% of the employees of foreign owned companies are HE graduates. About 20% of all persons employed in the Business (private) sector are employed by foreign investor companies, [65] accounting for 80% of the value added in manufacturing. In 2014, there were 2, 624 foreign affiliate companies in Serbia (foreign investors), 78% of which originate from EU countries.[66] About four fifths of their employees were employed in *Manufacturing* (48.1%), *Wholesale & Retail Trade* (25.4%) and *Administrative & Support Service Activities* (7.7%).

Figure 7: Annual % change in graduate employment in major sectors of activity, 2012-14



Source: SORS, Labour Force Survey.

Over the past decade many HE graduates have found employment in the public sector, frequently in the public administration given that administrative reforms have required the restructuring of the government ministries with many openings for young educated people. Despite the new wave of privatisations since 2001, the private sector has expanded slowly, offering limited employment opportunities. Consequently, finding a more secure and better-paid job in one of the government agencies (and the state sector in general) has been a good option for many graduates (Arandarenko, 2015).

Figure 7 shows the ten sectors that account for 85% of total graduate employment. Over the period from 2012-14, the fastest growing sector for graduate employment was *Information & Communication Technologies*, which employs 5% of all graduate employees. Indeed, according to a recent study by the World Bank, Serbia has a strong comparative advantage in communication services, which comprise about half of all

[65] For comparison, 14% of employees in the Business sector in the EU-28 are employed in foreign affiliates ("Foreign affiliate statistics – FATS, Brussels: Eurostat, 2015).
[66] See "Foreign affiliates in the Republic of Serbia in 2014 (inward FATS)", Belgrade: Statistical Office of the Republic of Serbia.

services exports (World Bank, 2014). This puts Serbia in a leadership position in this sector in the whole South East European region. The World Bank study estimated that in total the ICT industry employs 50,000 IT specialists (more than the actual recorded number). About 40% are employed at micro-companies, 28% in small companies, 23% in medium-sized companies and 10% in large companies (World Bank, 2014).

Four other sectors have grown at a rate above 10% per annum, including *Professional, Scientific & Technical Activities* (employing 8% of all graduate employees), *Health & Social Work* (employing 10% of all graduate employees), *Public Administration* (employing 11% of all graduate employees), *Wholesale & Retail Trade* (employing 11% of all graduate employees). If past trends continue, it can be expected that these will also be sectors that will experience fast growth of graduate employment in the future.

3.2 Forecast of future demand for graduates

In order to identify likely future demand and supply for HE graduates, forecasts are needed to predict future changes in labour market needs. Policy makers can use such forecasts to adjust education strategies, or as an early warning of impending change.[67] In this section we set out our own forecasts of the likely demand for HE graduates by field of study in the period up to 2018. The analysis is carried out on the demand side, projecting forward the annual change in demand for graduate labour on the basis of existing information on graduate employment by sector of economic activity taken from national labour force surveys. The methodology of the forecast follows that of Cedefop (2010), which involves identifying "expansion demand" and "replacement demand". Expansion demand is the extra demand arising from economic growth, while replacement demand is that arising from retirement and migration. Expansion demand is estimated on the basis of Labour Force Survey data of SORS revised estimates of graduate employment for 2014 and 2015, projected forward to 2018 on the basis of GDP forecasts derived from the IMF World Economic Outlook database.[68] The replacement demand is calculated using a standard estimate of the retirement rate based on the assumption of a 40-year working life, giving a baseline 2.5% retirement rate and an estimation of net migration.[69] Expansion demand and replacement demand are summed to give an overall estimate of the annual change in demand for graduates by sector. Contrasting the forecast increase in demand for graduates with current levels of supply of graduates (as a benchmark) gives the projected levels of oversupply of graduates by field of study in 2018, assuming current levels of supply are held constant.[70] It should be emphasised that these forecasts are only estimates and should be used only as a general guide to likely direction of change vis à vis current levels of provision, rather than accurate figures for planning purposes.

[67] It should be noted that all forecasts are by their nature imprecise and subject to both error and revision as circumstances change. Nevertheless a forecast provides a framework for policy makers to use as a benchmark against which to make their own judgements and decisions.

[68] The same rate of expansion demand is applied to each sector. Labour Force Survey data are not sufficiently robust to identify differential growth rates per sector, as these are too sensitive to the base year used for calculation.

[69] According to Eurostat data, the net migration rate from Serbia is 0.0% per annum, see Eurostat online data variable code [demo_gind].

[70] Oversupply is defined here as the difference between the projected demand for graduates in a future year (e.g. 2018) and the supply of graduates that completed their studies in 2014, which is taken as a benchmark. For policy purposes, it is appropriate to measure oversupply in this way so that policy makers may see the consequences of holding the HE output constant at current levels, and can identify changes that might be needed to achieve future demand-supply balance.

Table 8: Annual growth of real GDP, total and tertiary employment, 2015-18

	GDP growth (%)	Employment growth (%)	Tertiary employment growth (%)
2015	0.5	0.6	0.5
2016	1.5	0.7	1.5
2017	2.0	1.2	2.0
2018	3.5	2.7	3.5

Source: Projections for GDP growth from IMF World Economic Outlook database; projections for employment are from European Commission EU Candidate and Potential Candidate Countries' Economic Quarterly, Q1 2016, projected forward to 2018 on the basis of the GDP growth rate.

The IMF expects that economic growth will improve over the next few years on the basis of the structural reforms that are currently being implemented (see Table 8). Growth in total employment is forecast to be below this trend due to expected productivity growth, but tertiary employment growth (i.e. growth in demand for HE graduates) is expected to be given a boost due to skill-biased technical progress, and so is expected to match the overall rate of economic growth.[71]

Table 9: Forecast for expansion, replacement and total demand for new graduates by sector of activity, 2015-18

Sector	Expansion				Replacement				Total demand			
	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018
A	90	270	366	653	450	457	466	483	540	727	832	1, 136
B	21	64	86	154	106	108	110	114	127	171	196	267
C	291	878	1,188	2,121	1,464	1,486	1,515	1,568	1,755	2,364	2,704	3,690
D	46	140	190	339	234	237	242	250	280	377	432	589
E	38	116	157	279	193	196	200	207	231	311	356	486
F	100	302	408	729	503	510	520	539	603	812	929	1,267
G	321	969	1,311	2,340	1,614	1,638	1,671	1,730	1,936	2,607	2,982	4,069
H	106	319	432	772	532	540	551	570	638	860	983	1,342
I	30	92	124	222	153	155	158	164	183	247	283	386
J	132	397	537	959	661	671	685	709	793	1,068	1,222	1,667
K	114	343	465	830	572	581	593	613	686	924	1,057	1,443
L	2	6	8	14	10	10	10	11	12	16	18	25
M	217	655	886	1,582	1,091	1,108	1,130	1,169	1,309	1,763	2,016	2,751
N	51	154	208	372	256	260	266	275	308	414	474	647
O	322	970	1,313	2,344	1,617	1,642	1,674	1,733	1,939	2,612	2,988	4,077
P	580	1,749	2,366	4,224	2,914	2,958	3,017	3,123	3,494	4,707	5,384	7,347
Q	282	850	1,150	2,053	1,416	1,438	1,466	1,518	1,698	2,287	2,617	3,571
R	74	224	303	541	373	379	386	400	447	603	689	941
S	53	160	216	386	267	271	276	286	320	430	492	672
Total	**2,871**	**8,657**	**11,716**	**20,912**	**14,428**	**14,644**	**14,937**	**15,460**	**17,299**	**23,301**	**26,653**	**36,372**

[71] Moreover, due to the proposed privatisation of state-owned enterprises, it is expected that there will be large-scale layoffs, and "it is most likely that the number of employees going into 2018 will be equal to that from the end of 2015" (Petrović et al., 2016: 19). SORS responded to the critique from the Fiscal Council with a vigorous defense of the Labour Force Survey data (SORS, 2016).

Source: Table 8 and estimates of replacement demand. Note: A=Agriculture, forestry & fisheries; B=Mining & quarrying; C=Manufacturing; D=Electricity, gas, steam & air conditioning supply; E=Water supply; F=Construction; G=Wholesale & retail trade; H=Transportation & storage; I=Accommodation & food service activities; J=Information & communication; K=Financial & insurance activities; L=Real estate; M=Professional, scientific & technical activities; N=Administrative & support service activities; O=Public administration & defence, P=Education; Q=Health & social work activities; R=Arts, entertainment & recreation; S=Other services.

On the basis of the GDP growth forecasts of the IMF, the forecast of total graduate employment is expected to be around 618,000 by 2018, an increase of about 41,000 from 2015. This is the expansion demand due to the expected net increase in job openings for graduates. To obtain a forecast for the actual numbers of graduates that will be demanded from the HE system, we add the "replacement demand" arising from the retirement of currently employed persons with a HE degree. Applying this to our estimates of graduate employment, we derive an overall forecast of the annual increase in demand for graduates, which is the sum of expansion demand and replacement demand. Taking account of both expansion and replacement demand, the total annual demand for new graduates is expected to increase from about 17,000 in 2015 to about 36,000 in 2018 (see Table 9).

Change in the demand for graduates at sector level has implications for the pattern of recruitment that the HE system should anticipate. In order to address this issue we use the data from the graduate survey to estimate a transformation matrix that connects the sector in which graduates are employed to their field of study.[72] This provides forecasts of the demand for graduates by field of study. This is contrasted with the supply of graduates, which we derive from the HE provision database.

Table 10: Annual new demand and supply of graduates by field of study

Field of study	New demand				New supply	Surplus & shortage
	2015	2016	2017	2018	2014	2018
01 Education	1,325	1,785	2,041	2,786	5,319	2,533
02 Arts & Humanities	1,245	1,677	1,918	2,617	4,707	2,090
03 Social Sciences, Journalism & Information	2,867	3,862	4,417	6,028	4,619	-1,409
04 Business, Administration & Law	4,438	5,978	6,838	9,332	13,328	3,996
05 Natural Sciences, Mathematics & Statistics	1,657	2,232	2,553	3,484	2,372	-1,112
06 Information & Communication Technologies	1,163	1,567	1,792	2,446	2,774	328
07 Engineering,0Manufacturing & Construction	1,953	2,631	3,009	4,107	8,905	4,798
08 Agriculture, Forestry, Fisheries & Veterinary	416	560	641	874	1,206	332
09 Health & Welfare	1,571	2,116	2,420	3,303	4,049	746
10 Services	664	895	1,023	1,397	3,449	2,052
Total	**17,299**	**23,301**	**26,653**	**36,372**	**50,728**	**14,356**

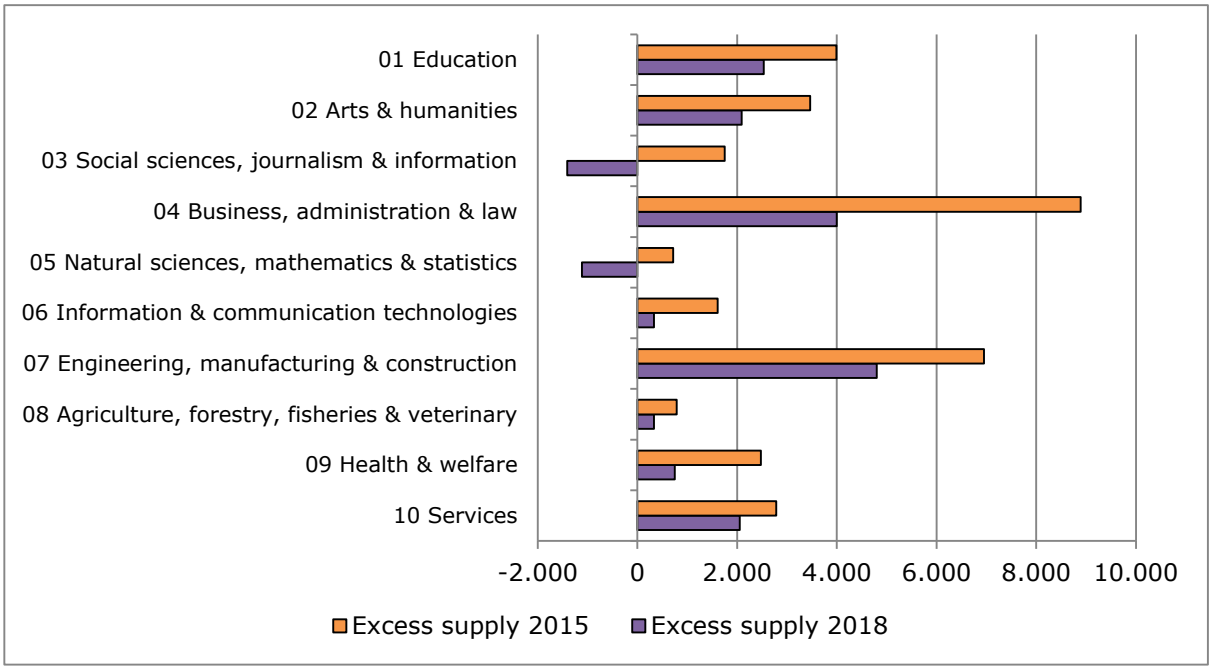
Source: Graduate survey and project HEI database: Demand is the employer demand for graduate workers; Supply is the number of students graduating from HEIs at all degree levels.

[72] In order to obtain reliable estimates the entire graduate survey for the Western Balkan countries is used to create the transition matrix. This is justified on the grounds that the technological level in each country is rather similar and so it can be expected that an average measure of inputs of graduates per unit of output can be a good approximation to the country coefficients.

Table 10 shows the projected demand for graduates by field of study from 2015 to 2018 against the actual supply of graduates by field of study in 2014 derived from the HEI provision database. On the assumption of unchanged supply of new graduates, the oversupply (surplus) is expected to fall from about 33, 000 in 2015 to about 14, 000 in 2018. On this basis, the supply of graduates will still be more than adequate to meet projected demand in 2018, and there will still not be enough jobs available to absorb the whole supply of graduates emerging from the HE system.

Figure 8 below shows the gap between supply and demand for graduates from the labour market for 2015 and 2018, identifying the broad fields of study from which there is expected to be shortages or surpluses of HE graduates in relation to expected demand. The projection by field of study for 2018 is intended to give a picture of what the pattern of shortages and surpluses would look like if there were no change in supply patterns from current levels. In doing this, the analysis provides a guide as to where the HEI system should look to make adjustments, which in doing so will change the pattern of supply, hopefully in the direction of achieving a greater balance between supply and demand. Surpluses are found in most fields of study, especially in *Business, Administration & Law* and *Engineering, Manufacturing & Construction*. Due to expected economic growth, these annual surpluses are expected to diminish over time. Shortages are expected to emerge most strongly in *Social Science, Journalism & Information*[73] and *Natural Sciences, Mathematics & Statistics*. In the absence of further expansion in the number of students graduating in these fields of study, these skill shortages are likely to increase over time. This suggests that it will be important to expand the supply of graduates from these fields of study in the future.

Figure 8: Surpluses and shortages of graduates by field of study, 2015 and 2018



Source: Table 10.

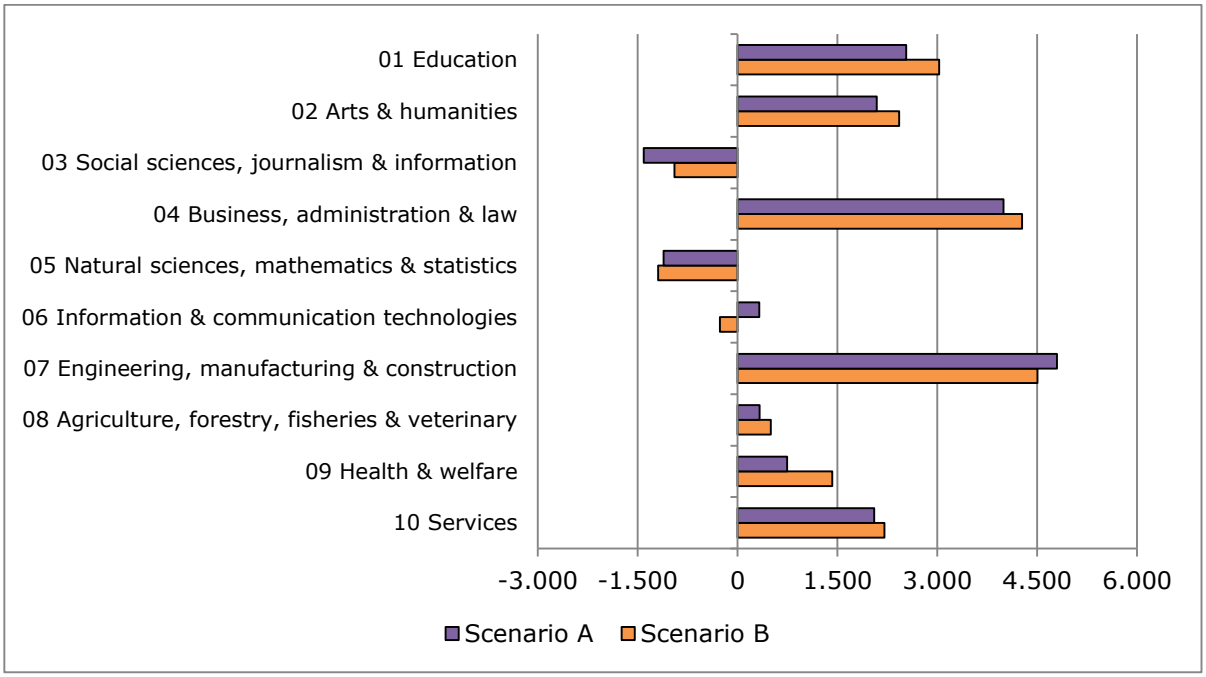
The above analysis is based upon the assumption of an absence of structural change in the economy. If instead of the status quo, the government were to initiate an industrial

[73] Social Sciences include Economics, Political Science, Psychology and Sociology.

policy that supported a more rapid development of the knowledge intensive manufacturing sectors, the forecast would be different. In order to gauge the magnitude of possible changes, we develop a scenario in which the *Manufacturing* sector, the *Construction* sector, the *Information & Communication* sector, and the *Professional, Scientific & Technical* sectors are supported by a range of measures that lead to the growth of graduate employment at a rate of 8% per annum over the period up to 2018, while other sectors are assumed to grow 2% per annum (to maintain the same overall demand for graduates in 2018 as would have occurred without the change in policy). The resulting change in our forecast for excess demand for graduates by field of study is presented in Figure 9.

Under Scenario B with an industrial policy that supports faster growth of some technology-intensive sectors, there is an increased shortage of graduates with qualifications in *Natural Sciences, Mathematics & Statistics,* and a shortage emerges for *Information & Communication Technology (ICT)* graduates compared to the status quo. There is also a reduced oversupply of graduates from *Engineering, Manufacturing & Construction* fields of study. This is not surprising, since the hypothetical industrial policy should be expected to lead to a greater demand for these graduates. Overall, the changes are not huge, illustrating that the overall pace of growth is a more important determinant of the demand for graduate labour than inter-sectoral shifts in the structure of demand. This scenario-building exercise illustrates how the forecast methodology can be used to enable policy makers to reflect upon the consequences of industrial policy decisions for the consequent changes in requirements for qualified graduates. Of course, such scenarios rely upon a number of restrictive assumptions that may not hold up in practice and so can only be a rough guide to policy makers who should also apply their own judgements about the significance of any outcomes, bearing in mind the full range of policy goals.

Figure 9: Difference in oversupply of graduates in 2018 under scenario B with industrial policy relative to scenario A without industrial policy



Source: Table 10 and authors' calculations. Note: Scenario A represents the status quo; scenario B assumes rapid growth in manufacturing, ICT and professional and scientific sectors, and slower growth in other sectors.

3.3 Policy developments and gaps

Over the past decade, the government has prepared several employment strategies and undertaken various measures to influence labour market trends. The "National Economic Programme" prepared in April 2015 includes measures regarding human capital. One of the priority areas is to improve the effectiveness of active labour market policies with special emphasis on youth, redundant workers and the long-term unemployed. Although youth are targeted, the main focus is on young people in general rather than the specific needs of HE graduates. In addition, the "National Employment Strategy 2011-2020" and the "National Employment Action Plan for 2016" (adopted in 2015) envisage a set of measures aimed at helping young people find employment. These include services for young people who have registered with the Public Employment Service, such as the assessment of employability, preparation of individual employment plans, mediation in finding a job, and active labour market policies that can contribute to finding a job. However, these programmes are insufficient in scope and are not specially focused on HE graduates. An "Employment and Social Reform Programme", adopted in May 2016, will guide employment policy during the process of EU accession. While it offers one of the best overall analyses of the situation on the labour market, it lists too many priority objectives, the recommended measures are often too general, there are few indications on how they are to be implemented, and the suggested reforms are insufficiently linked to other policies, such as the Strategy for the Development of Education until 2020. A "Strategy for support of SMEs, entrepreneurial skills and competitiveness 2015-2020" has also been adopted together with an Action Plan. Its main goal is to support entry of SMEs and promote the business results of entrepreneurs, the development of human resources and better connections between education programmes and the economy. In addition, the 2014 Labour Law provisions were partly designed to facilitate the employment of young graduates. The law extends the period of fixed-term employment contracts, which can now last for 24 months based on one or more consecutive fixed-term contracts (instead of 12 months, as was previously the case) or even longer in exceptional cases. This change is designed to ease the hiring of young graduates.

Box 2: Best practice example: sector skills councils

In 2012 four sector councils were established to identify labour market needs in specific sectors: Information and Communication Technologies, Agriculture, Food Industry and Tourism.[74] These sector councils were established on a pilot basis for nine months. The government has recently announced their continuation and the creation of two more sector councils by the end of 2015.[75] These could provide a suitable institutional structure for more intense cooperation and dialogue between representatives from HEIs and employers. However, at the time of writing little further progress seems to have taken place.

An important gap is lack of coordination between labour market policies and HE policies. Some progress has been made in this area, but not enough to address the main problems facing graduates on the labour market.[76] The "Strategy for the Development of Education until 2020" (2020 Strategy) (MESTD, 2012) recognises the problem from the education side, and aims to promote cooperation between HEIs and employers to ensure

[74] The setting up of these four Councils was supported through two IPA projects: "Support to Quality Assurance, Examination system in primary and secondary education" (IPA 08); and "Modernisation of vocational education and training" (IPA 7).
[75] Action plan for the implementation of the Strategy for the Development of Education of Serbia until 2020.
[76] Interview, Employers Union Association.

that the planning of HE enrolment policy will be more in line with the priorities of economic and social development.

Another policy gap includes the lack of well-organised support to assist HE graduates to find a job when they enter the labour market so that they do not have to rely on personal and family connections. In addition, there is an absence of measures to support graduates in obtaining relevant work experience during their period of HE studies, or immediately afterwards, through appropriate work placement and internship programmes. On the side of employers, the main policy gap includes the lack of support for employers in providing additional training to HE graduates to make up for the gaps in graduates' skills, especially practical and interactive skills which, as demonstrated below, the HE system is not well placed to provide.

4 Transition from HE to the labour market

The transition from HEI to the labour market is an important stage in a graduate's career. A smooth transition ensures that the investment made in education at HEI is put to good use and not wasted. An initial period of unemployment or inactivity after leaving HEI can lead to a depreciation of the human capital that has been built up over several years (Mroz and Savage, 2006; Bell and Blanchflower, 2011). An inability to find a job that is well matched to the field of study followed at HEI or the level of studies undertaken can reduce the return on investment (Robert, 2014). We return to this issue in section 5 below.

HE graduates in Serbia face a precarious transition to stable employment.[77] There is a general agreement among interviewees that limited job opportunities represent the major obstacle to the employment of higher education graduates, at least into well-matched jobs.[78] This is not an absolute barrier, as employers will often prefer an overqualified recruit to a less qualified one, even if the qualification is above the requirement of the job. The graduate survey shows that employed graduates on average spent nine months to find their first job after graduating from HEI, and three months to find their current job. Although they have been employed for an average of two years and two months, 58% have experienced at least one spell of unemployment. Currently unemployed graduates have also had a precarious entry to the labour market, having spent on average 17 months in unemployment. On average, they have also spent ten months as an employee, having taken eight months to find their first job (similar to the employed graduates mentioned above). This is suggestive of a pattern of unstable attachment to the labour market and that the transition from HE to the labour market is far from being a smooth process for many graduates.

In this section we explore the challenges facing both graduates and employers in the labour market. We begin by exploring the relations between HEIs and employers and emphasising the need for improved cooperation between them. In subsection 4.2 we examine the challenges facing graduates in the labour market including the lack of formal job-search assistance available and lack of work experience during studies. In subsection 4.3 we address the problem that employers face in taking on new graduate recruits, including employers' dissatisfaction with the skills of new graduate recruits, the skill gaps they face and their need to provide additional training to fill these gaps.

[77] This is even more so for those with only primary or secondary education compared to those with tertiary education (Mujanović, 2016).

[78] Interview, MESTD; interview, Ministry of Economy; interview, Ministry of Labour, Employment, Veteran and Social Affairs; interview, NGO.

4.1 Limited cooperation between HEIs and employers

A major challenge facing HEIs is to develop cooperative relations with employers. Such cooperation is needed for the development of curricula, for placing students in companies for internships, for finding jobs for graduates, and for improving HEI career guidance. In the EU, the most common forms of such cooperation are over curriculum design, development of courses, exchange and mobility programmes, continuing education and lifelong learning, and entrepreneurial education (Healy, 2012: 21). In the EU, cooperation between employers and HEIs is fairly common and is often facilitated through government support for university-business cooperation projects. Employers participate in decision-making or consultative bodies within HEIs in 22 countries, are actively involved in curriculum development in 19 countries, and frequently participate in teaching in 15 countries (Eurydice, 2014: 67). Such cooperation projects could be a useful means for HEIs in Serbia to contribute to the labour market success of their graduates.

In order to gauge the level of cooperation between HEIs and employers in Serbia, the employer survey asked respondents to indicate how frequently they discussed changes in study programmes with HEI representatives. The survey responses indicate that few companies discuss these issues with HEIs: almost one half of employers (47%) responded "never", over one third (36%) responded "rarely", while less than one sixth (17%) responded "often". When asked how frequently they cooperate with a HEI in the recruitment of graduates, two thirds (60%) responded "not at all", or "a little". These answers suggest that there is little cooperation between enterprises and HEIs. However, when asked how much effect cooperation over study programmes has on increasing the matching of HE graduates with their jobs, 71% responded "very much", "a lot" or "somewhat", while in relation to cooperation over recruitment, 80% answered in the same way. This suggests that while employers believe that such cooperation would improve the outcome of the recruitment process, there are obstacles on both sides to taking cooperative action. There is therefore a strong case for the government to support the development of cooperative relations to benefit both HEIs and employers. These findings are backed up by interviews with stakeholders, who argued that insufficient cooperation and communication between the HEIs and employers is one of the main reasons why HEIs do not know which skills employers require from their graduates.[79]

The National Council for Higher Education's initiative to include employers' representatives in the CAQA and the development of sectoral councils may assist stronger cooperation between HEIs and employers. Closer cooperation of HEIs and employers has been promoted by some EU-funded projects through the development of centres for technology transfer and business incubators.

Box 3: Best practice example of University-Business Cooperation

For example, the University of Belgrade has developed a Centre for Technology Transfer, (CTT) which was founded by the decision of the University Council on October 26th 2010, to identify, protect and commercialise the results of scientific research work and the protection of intellectual property of the University of Belgrade. It aims to encourage knowledge transfer between the University and the economy. In doing so it aims to create educational opportunities for students, and link students with future job opportunities. The benefits to industry in addition to the transfer of technology include the opportunity to find suitable highly skilled staff. Business incubators have also been

[79] Interview, MESTD.

developed by the University of Novi Sad and by some faculties of the University of Belgrade. However, these are the exceptions and not the rule.

4.2 Challenges facing graduates on entering the labour market

A major challenge facing graduates on entry into the labour market is the relative lack of assistance from formal institutions such as the career guidance services within HEIs and the public employment services outside HEIs. Due to this, graduates rely mainly on friends and family to find a suitable job, giving rise to charges of nepotism and corruption in the graduate labour market. Another key challenge is the lack of work experience that many graduates have when they enter the labour market, as well as the problem that the HE system does not equip them with sufficient and relevant skills, which limits their job prospects. In this section we address these issues in turn.

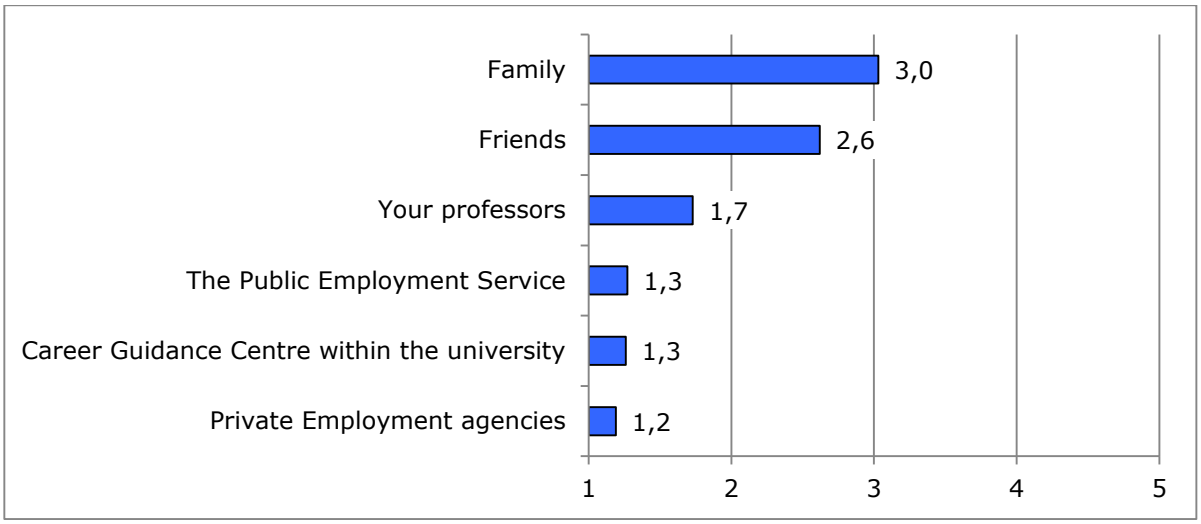
4.2.1 Lack of assistance in finding a job

Unlike other HEIs in the region, most public universities in Serbia have had career centres for almost a decade, such as the Centre for Career Development at the University of Belgrade which was established in 2006, the Centre for Career Development and Student Counselling that was established at the University of Kragujevac in 2007, while a career centre with the same name was established at the University of Novi Sad also in 2007.[80] The practice of career centres at Serbian HEIs is the most advanced and developed in the region. Alumni associations are also becoming more important in assisting students find connections to the labour market (Babić and Kordić, 2012). After completing their studies, graduates can also approach the National Employment Service (NES) for assistance in finding employment and other types of services. The NES provides information on available positions and offers training and guidance to the unemployed, although it does not have a specific programme for graduates.[81]

Despite these institutional developments, the graduate survey shows that the NES and HEI career centres play only a limited role in helping graduates find a job after graduation (see Figure 10). Family and friends are the most important source of assistance, much more so than the NES or HEI career centres or even private employment agencies. In this situation, nepotism can play a role in job search, and graduates who are less well connected on a personal basis may have lower chances of finding a job. This is supported by evidence from the graduate survey, which shows that graduates who held a job had received significantly more assistance from their family than those that were out of work ($p<0.05$).[82] Assistance from friends and professors is even more strongly associated with a graduate having a job rather than being unemployed.[83] Assistance from professors seems to be especially important for those graduates who studied STEM subjects ($p<0.01$).[84] It can also be observed that graduates from private HEIs receive more support from career guidance services within their HEI than do graduates from public HEIs ($p<0.01$).[85]

[80] Careers centres can also be found at many other HEIs throughout Serbia.
[81] Interview, National Employment Service.
[82] Graduates in employment score 3.1 (on a 1-5 scale) on the extent of assistance received from their family compared to 3.0 for unemployed graduates ($F=3.05$, $p=0.048$).
[83] Graduates in employment score 2.7 (on a 1-5 scale) on the extent of assistance received from their friends compared to 2.5 for unemployed graduates ($F=3.81$, $p=0.022$), and 1.9 versus 1.4 on the extent of assistance from professors ($F=29.7$, $p=0.000$).
[84] Graduates who studied STEM subjects score 2.0 (on a 1-5 scale) on the extent of assistance received from their professors compared to 1.5 for other graduates ($F=43.08$, $p=0.000$).
[85] Graduates who studied at private HEIs score 1.5 (on a 1-5 scale) on the extent of assistance received from a career centre at their HEI compared to 1.2 for graduates who studied at public HEI ($F=17.97$, $p=0.000$).

Figure 10: Help to find a job after graduation from alternative sources



Source: Graduate survey. Note: Responses are scored on a scale of 1-5, where 1="no assistance" and 5="very much assistance".

In view of these findings, more efforts should be made at public HEIs and through the NES to ensure that all graduates have full information about available jobs, and receive support in finding a job on an equal basis irrespective of the extent of their connections or family ties, as this would improve the prospects for graduates to find a job.[86] On a more general level, career guidance and counselling services should be strengthened at earlier stages of education and not limited to the period of transition to the labour market. Secondary school leavers should be informed about a wide range of professions in order to improve their choices of study programmes at HEI.

4.2.2 Lack of prior work experience

Most HE students have limited opportunities to engage in internships or relevant work experience during their studies, a factor that may limit their chance of finding a job.[87] As a representative from the Serbian Association of Employers put it:

> *"Employers… are not satisfied with practical skills and competences. There are many young people that have never visited any company or have never seen how business operations function in reality."*[88]

The employer survey shows that almost three quarters (72%) of employers attach at least some importance to previous work experience when making a decision to recruit a new graduate.[89] Graduates that have had at least some work experience while studying are therefore likely to be more successful in their job search. Some evidence in support of this proposition is found from the graduate survey, which shows that 57% of those who had "very much" work experience held a job, compared to just 42% of those who

[86] Assistance from the family can have a negative effect on earnings of graduates, if it channels a graduate into a mismatched job with lower pay. Professional networks are more effective at channelling graduates into appropriate jobs (Tatsiramos (2015).

[87] Several European comparative studies have shown that students who participated in practical training before graduation are more likely to find jobs than those without relevant work experience (Eurydice, 2014: 69). Motivation may be a common underlying factor, but it is generally thought that there is a direct link between work experience and the likelihood of gaining a job, since these studies show that employers pace a value on work experience as such.

[88] Interview, Association of Employers.

[89] On a scale of 1-5 72% of employers give a score of 3 "somewhat", 4 "a lot" or 5 "very much" to the importance of previous work experience.

had had no work experience ($p<0.01$).[90] Work experience also supports the efficient matching of graduate qualifications to their job requirements. While 48% of those who had had at least a little work experience or an internship held a job that was well matched to their field of study at the time of the graduate survey, only 39% of those who had no work experience held a well-matched job ($p<0.01$).[91]

Erasmus Mundus alumni in our focus group observed that enhancing 'practical' learning could improve teaching at Serbian HEIs. Based on their EU experience, they believe that this could be achieved by introducing internships as part of a study programme, through project-work carried out in a company, or by carrying out a research project related to the final dissertation within a company. However, from the graduate survey we find that although 63% of students had experienced some form of work experience or internship during their studies at HEI, only 36% of students found such experience to be "a lot" or "very much" use for their learning outcomes. This suggests that where internships are used as part of a study programme, more effort should be made to ensure that they are well supervised and are connected to an organised learning experience.

Since 2011 a programme of internships has been aimed at graduates designed to assist them to acquire their first work experience. In 2015, about 5, 000 graduates were involved in this programme, which is designed to enable the acquisition of practical knowledge and skills for independent work in the occupation for which the graduates have an appropriate qualification. The programme lasts 6-12 months and is also available for unemployed persons without professional experience and with at least secondary education.[92] Various large international companies operating in Serbia offer internships to university graduates, including NIS, HTEC, Adidas, Proctor and Gamble, Coca Cola and others. Studies of the experience of internships in Serbia suggest that they are more successful where there is close collaboration between the HEI and the employer on the educational and learning content of the internship, accompanied by supervision, which should be regulated by a formal agreement between the parties (Radišić et al., 2011).

4.3 Employers' challenges in taking on new graduates

Employers face many challenges in taking on new graduate recruits. In this section we first consider the extent of employers' dissatisfaction with graduate skills, then analyse the nature of the skill gaps that employers face, before turning to a discussion of the extent of training that employers feel they must provide to make up the deficiencies of the HE system in providing graduates with the required skills.

4.3.1 Dissatisfaction with skills of new graduates

Employers on average score their satisfaction with the skills of their graduate employees at just 5.9 (on a scale of 1= "not at all satisfied" to 10 = "very satisfied"), indicating only a moderate degree of satisfaction with the skills of their graduate employees. Encouragingly, foreign employers are more satisfied with the skills of their graduate employees, scoring 7.0 compared to 5.5 for other (domestic) employers ($p<0.01$).[93] This is the opposite trend to other countries in the region where foreign employers are less or equally satisfied with the skills of graduates than domestic employers. This suggests that, in Serbia, foreign employers are able to attract the most skilled graduates, perhaps by paying them higher salaries. Perhaps also this is a reflection of the high level of skills of

[90] Chi-square =28.8, p=0.000, N=1, 191.
[91] Chi-square =18.3, p=0.001, N=394.
[92] Interview, Ministry of Labour, Employment, Veteran and Social Affairs.
[93] A t-test of difference in mean scores gives t=3.48, p=0.001.

the best Serbian graduates, since foreign employers rank the satisfaction with skills of their graduate employees higher than almost all other countries in the region, with the exception of Albania where the foreign employers' scores are similar to Serbia.

However, the employer survey also shows many graduates do not have such a high level of skills as the best graduates since 55% of employers consider that graduate recruits bring only "some" or "a little" or "no" value added in comparison with their non-graduate employees.[94] This highlights the importance of improving the quality of the HE system in Serbia, as it is a costly exercise to spend scarce resources on a HE system that fails to deliver improved value added among more than half of HE graduates in relation to secondary school leavers. Many employers take the view that graduates especially lack interactive skills: they are poor in decision making skills, scoring just 3.2 (on a scale of 1 to 5, where 1 = "no skill", and 5 = "very much skill" in the relevant dimension), and in planning and organisational skills (3.3) and ability to adapt and act in new situations (3.2).

Worryingly, employers in high technology sectors are significantly less satisfied with their graduate employees' interactive skills than other employers.[95] Since these are sectors where interactive skills are likely to be especially important for competitiveness, this points to a strong need to improve the interactive skills taught at HEIs in Serbia. Perhaps not surprisingly, foreign employers' perceptions of graduates' language skills are significantly higher than the perceptions of domestic employers ($p<0.1$), suggesting that graduates with good language skills are more likely to be recruited by foreign employers. There is also some evidence that employers that cooperate with HEIs over recruitment have a better perception of their graduate employees' interactive skills.[96] This emphasises the importance of such cooperation for employers, as such cooperation enables them to select graduates with interactive skills that they consider important to their business success.

While there is generally no difference in graduate skills by the size of the employer organisation, both micro and small employers perceive their graduate employees' analytical and problem solving skills to be significantly higher than employers in medium and large organisations ($p<0.05$). This suggests that graduates with these skills are attracted to work in smaller companies perhaps because of their greater flexibility, lesser bureaucracy, and more welcoming attitude to graduates with such skills. In addition, interactive skills appear to be important for the growth of graduate employment, as fast-growth "gazelle" employers regard good reading and writing skills more highly than other employers, and "divokoza" employers regard both these and also good numerical skills more highly than other employers ($p<0.05$).[97]

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[94] On average, graduate employees in Serbia earned 99, 554 dinars per month in 2015, while graduates from vocational secondary schools earned 65,076 dinars per month (SORS, 2015: Table 7), which suggest that HE graduates *do* provide value added compared to secondary school leavers. However, this data refers to all employers, not just those who employ graduates, and so is not conclusive evidence on the matter.

[95] Just to give one example, employers in high technology sectors give a score of just 2.7 for their graduate employees communication skills compared to 3.7 for other employers ($F=11.07$, $p=0.002$). Similar differences in mean scores are found in other dimensions of interactive skills (decision making skills, problem solving skills and so on).

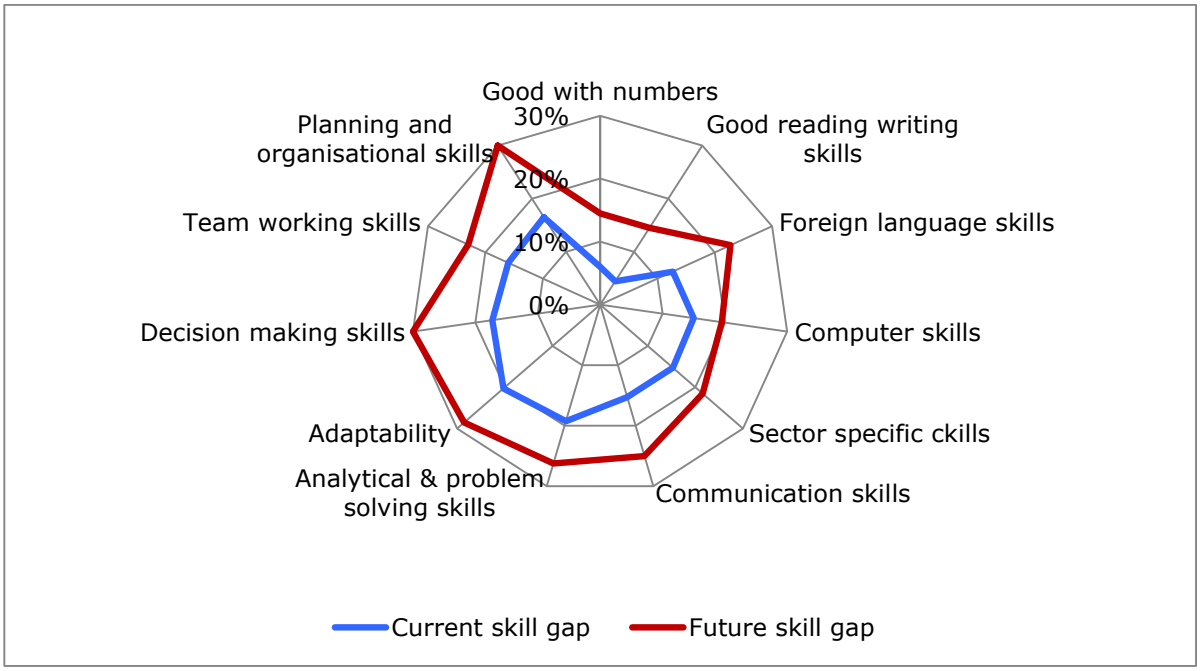
[96] Employers that cooperate with HEIs score 3.6 on the 1-5 scale that measures extent to which graduate employees have planning and organisational skills compared to 3.1 for other employers ($F=3.33$, $p=0.073$); they score 3.5 on the extent to which graduate employees have decision making skills compared to 2.9 for other employers ($F=4.4$, $p=0.039$); and 3.7 on adaptability skills compared to 3.2 for other employers ($F=4.0$. $p=0.05$).

[97] "Gazelle" employers score the degree of importance of good reading and writing skills at 3.9 (on a 1-5 scale from less to more important) compared to an average score of 3.0 for other employers (t-statistic = 2.82, $p=0.024$.

4.3.2 Graduate skill gaps

Employers' dissatisfaction with graduate skills reflects gaps in the skills that graduates bring with them to the labour market. Students are poorly prepared for a rapidly changing labour market. We analyse these skill gaps through the employer survey, which asks employers about (i) the actual skills of their graduate employees along various dimensions and (ii) the level of skills they consider necessary to carry out the job. The difference between these two measures is the estimated skill gap. Reducing the skill gaps of graduates would potentially improve their employability and productivity.

Figure 11: Graduate skill gaps – current and future (%)



Source: Employer survey. Note: skill gaps are measured as the difference between actual and desired skills reported by employers, with the underlying scale of skill measurement set at 1 where the respective skill is not important and 5 where it is very important for the performance of the business.

Graduate skill gaps as reported by employers are shown in Figure 11. The data show relatively high current skill gaps in interactive skills such as adaptability, analytical and problem solving skills, decision-making skills, and planning and organisational skills. Skill gaps are lower among cognitive skills such as computer skills and sector specific skills. Numeracy, reading, and writing skills exhibit relatively low skill gaps. All types of skill gaps are expected to increase in the future (i.e. over the three years following the survey up to 2018) with prominent future skill gaps expected for interactive skills, especially in the area of decision making skills and planning and organisational skills. Gaps in foreign language skills are also expected to emerge. The interviews confirm that graduates lack interactive skills; while employers perceive that graduates are relatively well equipped with theoretical knowledge, they are generally not satisfied with their communication skills, team work, foreign language skills, [98] corporate culture and other interactive skills that are not emphasised in the HE system.

A major reason for interactive skill gaps is the neglect of critical-thinking and problem-solving skills in the HE system. Curricula are still too theoretical and focused more on

[98] Studying abroad was considered to give a valuable advantage in terms of employability because of better language skills, according to the focus group with Erasmus Mundus alumni.

memorising facts than in developing interactive skills, regardless of the field of study. The graduate survey asked employers about which forms of teaching and learning experience at HEI contributed most to the skills that are needed by their businesses. The answers are revealing: employers identify the most important teaching and learning methods to be classes in small groups, problem-solving and creative-thinking teaching methods, and internships or work placements. In contrast, lectures in large groups and rote learning of facts are thought to contribute little to the skills that employers need.[99] Perceptions from the focus group with Erasmus Mundus alumni suggest that in comparison with EU countries, HE lecturers in Serbia put less emphasis on problem solving and student interaction in the classroom. All this provides some evidence that teaching methods ought to be modernised to develop interactive skills such as planning and organisational skills, decision-making skills and analytical and problem solving skills.

However, despite the high gaps in interactive skills among graduate employees, policy makers should not neglect basic cognitive skills, as these are essential building blocks of business productivity and competitiveness. In evidence of this, the employer survey shows that neither "gazelles" nor the "divokoza" type of fast-growth employer experience gaps in respect of graduates' reading and writing skills, while other employers do report having skill gaps in these dimensions. "Divokoza" employers additionally do not have gaps in relation to graduates' numeracy skills.[100] This suggests that employers that recruit graduates with sufficient competencies in these cognitive skills tend to grow significantly faster in terms of both total and graduate employment than other employers.

Reforms to teaching methods are difficult to introduce because HEIs lack incentives to promote innovation in teaching methods. In public HEIs, there is little rotation of teaching staff, and some staff teach the same course material for years until they retire. In addition, foreign staff cannot be hired to teach at public HEIs, which may limit opportunities for importing good practices although they may be appointed as visiting professors.[101] Reforms to teaching methods could start by better linking staff promotion of to course evaluations by students. Smaller classrooms emphasising interaction between students and teachers, and the use of more practice-based teaching should also be promoted.

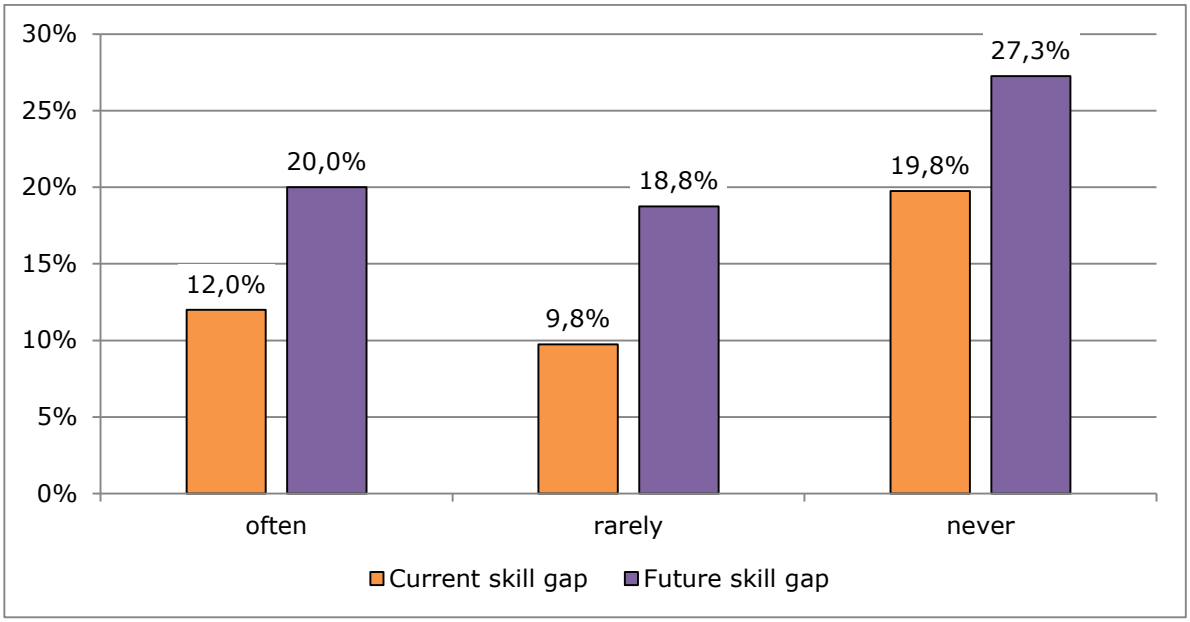
Cooperation between employers and HEIs can increase the likelihood that graduate recruits will have the skills needed to do the job for which they have been recruited. Figure 12 shows that employers who often cooperate with the HEIs over curricula tend to have lower current and future expected skill gaps than other employers who rarely or never cooperate with HEIs. This is due to the exchange of information about employers' skill needs that accompanies such cooperation, and the associated adjustments to curricula that this enables HEIs to undertake. It also enables employers to improve their selection of the graduates who have skills that are most suited to their requirements.

[99] Small groups, problem solving and creative thinking teaching methods score between 4.0 and 4.5 on a 1-5 scale where 1 = "not at all" and 5 = "very much", while lectures in large groups and rote learning of facts score between 1.7 and 2.4 on a 1-5 scale where 1 = "not at all" and 5 = "very much".

[100] Graduate employees of fast growth employers ("divokoza" i.e. with employment growth > 10% per annum) have significantly lower gaps (-9%) for reading and writing skills than other employers (+6%) on a t-test of difference of mean interactive skill gaps, with t=1.90, p=0.063. N=56; and for numeracy (-4% for divokoza versus +8% for other employers) (t=1.74, p=0.088, N=56).

[101] Interview, public HEI.

Figure 12: Skill gaps by cooperation with HEI over curricula, current and future skill gaps

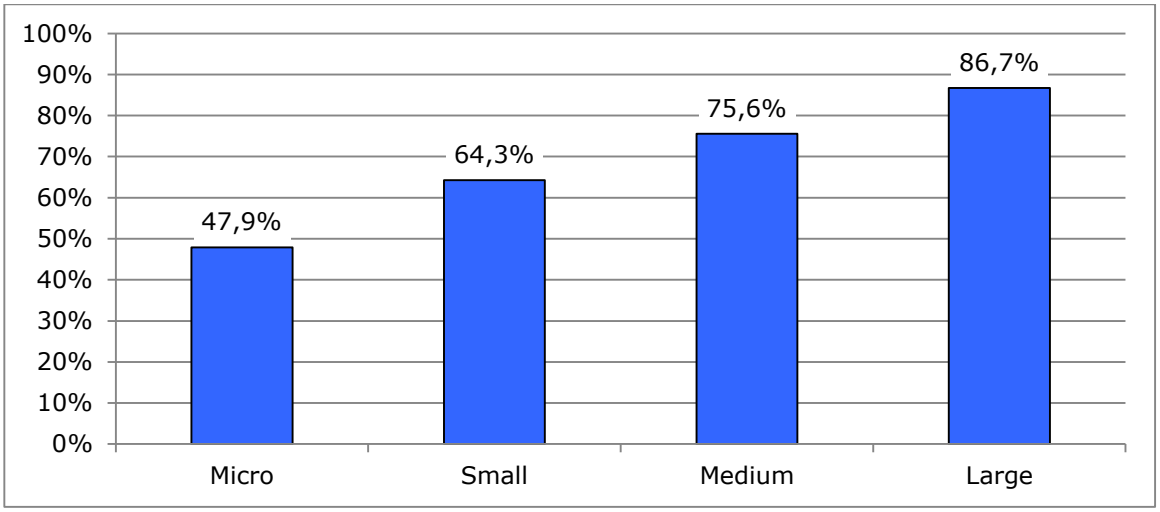


Source: Employer survey. Note: skill gaps are measured as the difference between actual and desired skills reported by employers, with the underlying scale of skill measurement set at 1 where the respective skill is not important and 5 where it is very important for the performance of the business.

4.3.3 Training of new graduate employees

Due to the inadequacies of the practical skills provided to students at HEIs in Serbia, many employers find it necessary to provide additional training to their graduate recruits. More than four fifths (82%) of employers provide formal training to their graduate employees, while almost all (89%) provide informal on-the-job training. Large and medium sized employers are more likely to provide formal training than small and micro employers (see Figure 13).

Figure 13: Formal training provided by employers by employment size group



Source: Employer survey.

As shown above, employers in high technology sectors are significantly less satisfied with their graduate employees' interactive skills than other employers. It is not surprising, therefore, that employers in high technology sectors provide significantly more formal training to their new graduate employees than do other employers. While on average two thirds of employers provide formal training to their new graduate recruits, among high technology employers almost all (93%) provide formal training. This is further evidence that HEIs are failing to provide an appropriate level or type of skills that are required by employers, especially in high technology industries.

Employers also need to make improvements in the training they deliver to graduate recruits. Several studies have found that the practices of human resources management are weakly developed in Serbian businesses and rely mainly on traditional rather than modern methods of organisation (Bogičević Milikić et al., 2012). Consequently, few employers carry out a systematic skills need assessment, and many fail to monitor the effectiveness of the training that is provided (Bogičević Milikić et al., 2008). Moreover, few employers follow up the training that is provided with an employee development plan that would include career plans for progression and promotion based on formal appraisal schemes. Thus, although many employers provide training, the quality of the training and its effectiveness for progression of graduate employees is not always sufficient to fill the perceived gaps in graduate skills.

4.4 Summary

The research reported above shows that both graduates and their employers have a difficult time in managing the transition from HE to work. The main reasons for this are the lack of available jobs, but also a higher education system that does not equip graduates with appropriate skills. Few employers actively cooperate with HEIs over curricula development and recruitment, even though they report that this would improve the matching of graduates to the jobs that are available. The government could provide additional support to promote collaboration between HEIs and employers. Graduates lack effective formal career guidance and counselling services to support effective job search. Instead, they turn to family and friends, or their professors, to provide informal routes to the labour market based on contacts and connections. This increases the likelihood that nepotism can play an important role in a graduate's success in searching for a job. In addition, most graduates lack work experience, which reduces their chances of success on the labour market. While many larger companies offer internships and there is a government programme to support them, such internships need to be carefully supervised to ensure that they provide an even more useful learning experience to the graduates who participate in them.

Employers believe that graduates lack interactive skills, a perception held especially strongly by employers in high technology sectors. Employers that cooperate with HEIs over curricula and recruitment have less of a problem with graduate skill gaps. Employers also believe that all forms of skill gaps are likely to increase in the future, presumably because technology is advancing while the skills taught at HEIs seem to be standing still. In addition to interactive skill gaps, basic cognitive skills, especially reading and writing skills remain key to strong company performance; companies with low cognitive skill gaps are more likely to be fast growth "gazelles" than companies with high skill gaps in these areas. In the context of such skill gaps among their graduate recruits, most employers find the need to provide additional training for their new graduates. However, most employers use traditional human resource management procedures that have not been modernised. Consequently, graduate training should be supplemented by effective employee development programmes and efficient methods of promotion appraisal.

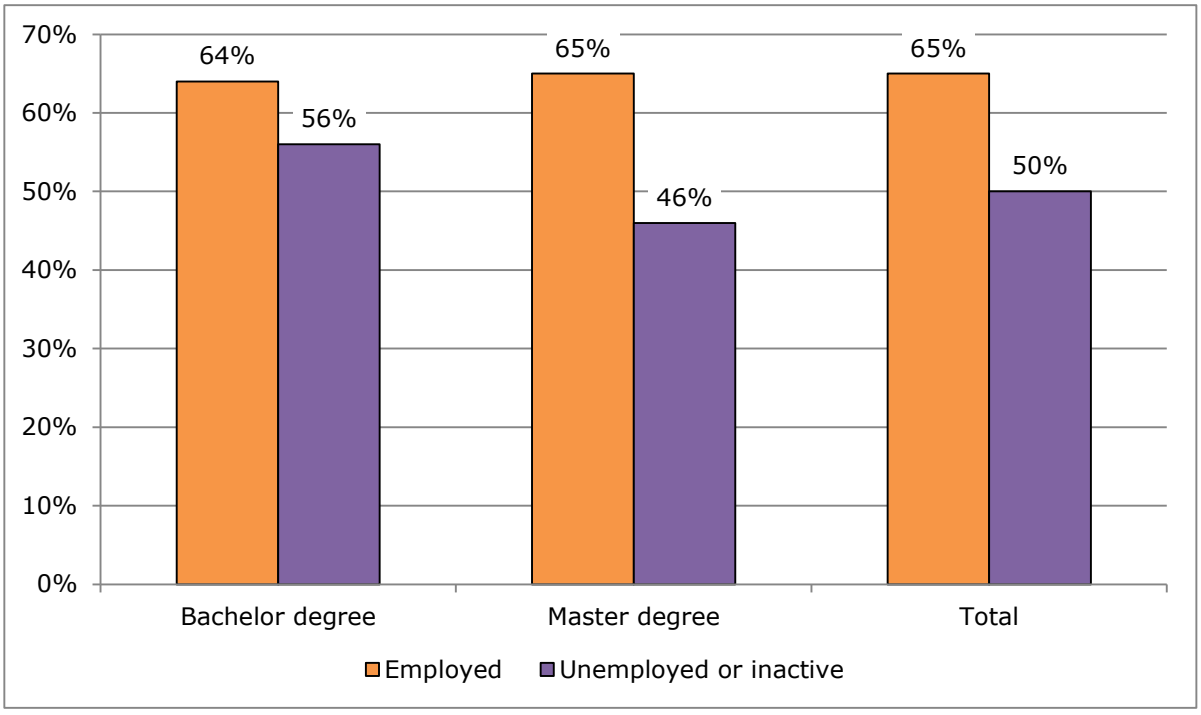
5 Skill mismatch

Skill mismatch is widespread in market economies (McGuiness, 2006). It has two dimensions. The first is *horizontal* skill mismatch, which refers to a situation in which the employee has a qualification in a field of study that is not required by the job held. The second is *vertical* skill mismatch, which refers to a situation in which an employee has a qualification either above or below the level of skill necessary to carry out the job. There is strong evidence that there is an inverse relationship between skill mismatch and productivity levels (Adalet McGowan and Andrews, 2015a). Thus, countries with a higher level of skill mismatch are expected to have a lower level of productivity and growth than countries with a lower level of skill mismatch, other factors being equal.

5.1 Horizontal mismatch

More than one third (34%) of employed graduates who responded to the survey say that they are in a job that is not well matched to their field of study, a little higher than the average for the region (32%). However, the proportion of such horizontal mismatch varies according to labour force status. The graduate survey shows that employed graduates are more likely to be well matched than those that are unemployed or inactive in the last job that they held (See Figure 14). While two thirds of graduates in employment are well matched, only half of those currently unemployed or inactive are well matched in their previous job. Therefore, being well matched seems to be a positive factor in assisting graduates to keep hold of the job that they have, and avoid falling into unemployment. The graduate survey shows that good horizontal matching is also associated with higher pay with an average difference of €50 per month (a gap of about 14% in relation to current salaries at the time of the survey).

Figure 14: Graduates with a horizontally well-matched job by degree level and labour force status (% within degree level)



Source: Graduate survey. Note: for unemployed and inactive respondents, matching refers to last job held.

Various factors influence the degree of horizontal mismatch among graduates. Graduates who performed better at their HEI are less likely to experience this type of mismatch than others, since they have more human capital to offer employers and therefore are more likely to be able to choose a job that matches their field of study at HEI ($p<0.01$).[102] Graduates who learned better skills, especially numeracy skills, computer skills ($p<0.05$), subject-specific skills ($p<0.01$), communication skills ($p<0.01$), analytical and problem solving skills ($p<0.01$), adaptability skills ($p<0.01$), decision making skills ($p<0.01$), team working skills ($p<0.01$), planning and organisational skills ($p<0.01$), at their HEI are more likely to find a well-matched job ($p<0.01$).[103] This is also the consequence of a greater level of human capital being attractive to employers. It confirms that the form of human capital based around interactive skills, in addition to sector specific (vocational) skills and numeracy/computer skills are the most important type of skills to employers. The form of support received is also an important determinant of matching success, with 60% of well-matched graduates having received at least some support from their HEI, compared to just 38% of mismatched graduates ($p<0.01$).[104] However, support from friends does not lead to better matching, rather to a worse match, as 66% of those who have a well matched job received at least some support from friends in finding it compared to 74% of those with a mismatched job ($p<0.1$).[105] This points to the inefficiency of nepotistic practices in job search which may lead graduates into mismatched jobs that tend to pay less and create vulnerabilities to job retention.

5.2 Vertical mismatch

Graduates are vertically mismatched if their level of qualification provides a set of skills that is either above or below the skills needed to carry out the job. If the graduate's degree level is above the level of required skills, this situation is often referred to as over-education. This problem seems to be significant in Serbia. Overall, less than one half of graduates are vertically well matched to the level of their qualification.

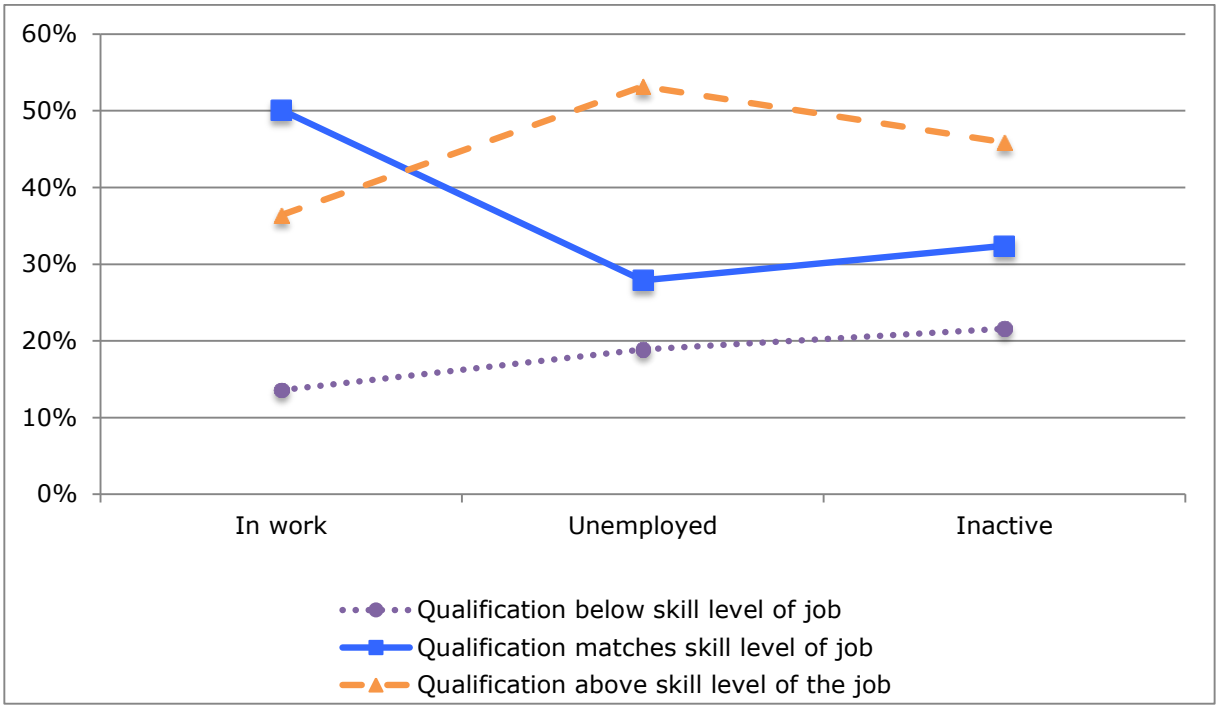
The graduate survey shows that there is a high degree of vertical mismatch, as 54% of recent HE graduates report that their level of qualification is not well matched to the skill requirements of the job they hold (or held in the past if unemployed or inactive). This is far higher than the level of skill mismatch observed in the EU where, according to the OECD Survey of Adult Skills, the highest level of mismatch is in Italy at around 34% (Adalet McGowan and Andrews, 2015b). Within this total, 39% of graduates in Serbia are over-qualified for the job they hold (or did hold if currently inactive or unemployed) and 15% are under-qualified for the job they hold (possibly due to the effects of nepotism as it is difficult to see why an employer would otherwise hire an underqualified graduate). Correspondingly, only 46% of all recent graduates hold (or have held) a vertically well-matched job (a proportion which rises to 50% of currently employed recent graduates – see Figure 15).

Having a well-matched job has some implications for earnings. The graduate survey shows that graduates who are well matched have higher initial earnings than those who are mismatched, with median monthly earnings of €250, compared to €200 for those

[102] From the graduate survey, 59% of Bachelor level graduates who have a horizontally well matched job performed above or far above average compared to just 37% of those who were not in a well-matched job (Chi-square=13.5; p=0.009, N=264).
[103] Almost half (45%) of those who have a well matched job had learnt "a lot" or "very much" numeracy skill at their HEI compared to just 35% with a mismatched job (Chi-square=14.9; p=0.005; N=721). Similar results are obtained for the other skills mentioned in the text.
[104] From the graduate survey, Chi-square=41.6; p=0.000, N=709.
[105] From the graduate survey, Chi-square=9.2, p=0.057, N=705.

who are over-qualified or under-qualified.[106] The differences persist as graduates progress in their careers. For the current job, the graduate survey shows that both well-matched graduates and underqualified graduates have median monthly earnings of €400, compared to €360 for graduates who are over-qualified.[107] The differences in earnings is a measure of the productivity gap between well-matched and poorly matched graduates, and therefore of the potential gain from ensuring that the matching process works more efficiently for recent HE graduates.

Figure 15: Vertical matching by labour force status (% within labour force status)



Source: Graduate survey.

Figure 15 shows that graduates that are in work (employed or self-employed) are more likely to be in a well-matched job by level of qualification than unemployed or inactive graduates (in their previous job). Graduates who are unemployed are more likely to have been overqualified in their previous job than are employed graduates. As with horizontal matching, this implies that matching is important for job retention.

Various other factors seem to predispose graduates to have a well-matched job compared to either being under-qualified or over-qualified. The graduate survey shows that graduates who are well matched received more help from their HEI ($p<0.01$) or from their professors ($p<0.01$).[108] This identifies the important role that HEIs can play in assisting their graduates in having a successful transition to the labour market. A range of specific difficulties in finding a job, including the subject studied ($p<0.1$) and the

[106] Other studies of skill mismatch in transition countries also find a wage penalty associated with over-qualification, see e.g. Lamo and Messina (2010).

[107] It should be noted that these data refer to the median salaries. Mean salaries of university graduates reported by SORS were RSD 94,944 in 2015, equivalent to €771, and RSD 65,781 for college graduates, equivalent to €535 (Statistical Yearbook of the Republic of Serbia, 2016, Table 3.14). Mean salaries are higher than median salaries due to the highly skewed income distribution.

[108] While 27% of those who have a well matched job had "a lot" or "very much" assistance from their HEI to find a job, only 16% of those who were in a job where the skills needed were below their level of qualification had such assistance (Chi-square=22.7, p=0.004; N=709).

reputation of the HEI attended ($p<0.01$) and the economic situation ($p<0.01$) are all associated with a higher probability of being in a job that is not well matched to the level of qualification. That the subject studied may prevent a graduate from attaining a well-matched job reinforces the general finding of the importance of early career guidance to steer graduates into fields of study that are more likely to provide a successful transition to the labour market. The influence of the reputation of the HEI is also an important finding that suggests that HEIs that have poor reputations should make further efforts to improve their standing in the community. Finally, having some work experience ($p<0.05$) or an internship ($p<0.05$) during the period of studies improves the chance of finding a well-matched job.[109] This confirms the importance or work experience during studies in easing the graduates' paths to the labour market.

6 Conclusions and policy recommendations

The research reported above shows that the HE system in Serbia produces too many graduates relative to the needs of the labour market, leading to a high graduate unemployment rate.[110] On the labour market side there is an oversupply of graduates from most study fields but especially from *Business, Administration & Law,* and *Engineering, Manufacturing & Construction*. Many students drop out of studies leading to a low completion rate. Of those students who do graduate many face the prospect of unemployment. Of those who do find a job, many are in jobs that are not matched to their field of study or their level of qualification, reducing their wages and job prospects in relation to graduates in well-matched jobs. With an overall completion rate at 4-year Bachelor level of 54%, an employment rate of 49% and a rate of (vertically) well-matched graduates at 46%, it could be said that the internal efficiency of the combined HE and labour market systems (the HE-LM system) is just 12%.[111] In other words, of every hundred new students entering the system in any one year, it can be expected that only twelve of every hundred entrants to the HE system will eventually graduate and find a well-matched job. In order for the HE system to make a better contribution to building human capital and to the competitiveness and growth of the economy, significant reforms of the HE system and the graduate labour market are needed, and better cooperation between employers and HEIs should be encouraged.

6.1 The provision of higher education

The number of HEIs has increased over the last two decades in response to an increase in student demand especially in the 2000s as the economy recovered and new graduate level jobs were being created. There are now 85 HEIs in Serbia, of which 16 are universities and 69 are professional or vocational colleges. The country has 1.2 HEIs per 100,000 of the population, about the same as the regional average of 1.3. Substantial reforms have been introduced into the HE system, principally following the 2005 Law on Higher Education which introduced the Bologna principles, introducing three cycle studies and the European Credit Transfer System (ECTS). However, while many further HE reforms have been introduced, many remain to be fully implemented. For example, public HEIs remain fragmented into numerous independent faculties, which inhibits the restructuring of the sector, with each faculty having a financial incentive to admit as

[109] While 49% of those who had used an internship during studies had a well-matched job, only 38% of those who were overqualified had such an experience (Chi-square=5.5; p=0.063; N=722); similar results were found for graduates who had some prior work experience during their studies.

[110] The "difficult employment situation" of HE graduates in Serbia has also been identified in the CONGRAD survey of HE graduates in Serbia (TEMPUS, 2014: 103).

[111] The efficiency of the HE-LM system can be assessed as the product of these three ratios: 0.54 x 0.49 x 0.46 = 0.12.

many students as possible. This has led to an excessive entry of new students with little regard for the ability of the labour market to absorb them. In particular, study fields such as *Business, Administration & Law* and *Engineering, Manufacturing & Construction* produce more graduates than the labour market can absorb. The excessive enrolment of students into the HE system is combined with a low teaching quality and low completion rates. Students are dissatisfied with the quality of teaching, especially at public HEIs, due to overcrowded lecture theatres, a lack of attention to teaching in small classes, and a lack of practical course content and work experience.

6.2 The graduate labour market

Holding a higher education degree confers some protection against unemployment since the unemployment rate of HE graduates is lower than for the working population as a whole; the graduate unemployment rate is 15.9% compared to 17.7% for the working population. However, the graduate survey shows that the unemployment rate of recent graduates is much higher at 41.5%, similar to the overall rate of youth unemployment. More than half of graduates are employed in four sectors: *Education*, *Public Administration*, *Wholesale & Retail Trade*, and *Manufacturing*, while the fastest increase in graduate employment in recent years has been in the ICT sector. Graduate employment has also grown relatively fast in a small number of high-growth enterprises known as "gazelles" which tend to be SMEs. Economic growth is expected to accelerate over the next three years as economic reforms begin to bear fruit and the oversupply of new graduates is expected to fall from about 33,000 in 2015 to about 14,000 in 2018. On this basis, there will still not be enough jobs available to absorb the whole supply of graduates emerging from the HE system. This forecast is based on the assumption that current levels of graduate supply do not change (as appears likely as the growth in graduate numbers has come to a halt in recent years, and the number of graduate completions is fairly stable). The oversupply of graduates in 2015 is estimated to have been largest in *Business, Administration & Law* and in *Engineering, Manufacturing & Construction*. By 2018, shortages are expected to emerge in *Social Sciences, Journalism & Information* and in *Natural Sciences, Mathematics & Statistics*. This suggests that there enrolment policies should be adjusted to encourage more students to enrol in study fields where shortages are likely to emerge on the labour market in the future, and correspondingly to limit enrolment in study fields where there is an oversupply that is expected to be persistent without some offsetting policy action. More importantly there is a need to support the creation of additional high-skilled high-wage jobs in certain sectors. Combined action is needed on both sides of the graduate labour market – on the supply of graduates through appropriate HE reforms and on the demand for graduates through appropriate labour market reforms. These policies need to be coordinated in order to maximise their effectiveness.

6.3 Transition from higher education to the labour market

Many graduates experience periods of unemployment before they find a stable employment position. The formal institutional framework that supports graduates' job search is relatively weak so many graduates rely on personal connections of family and friends. This opens opportunities for nepotism, which is an inefficient way to allocate graduate labour. A major barrier facing students in their transition to the labour market beyond the lack of graduate jobs is their lack of work experience. Graduates with some work experience are more likely to find employment, and work experience supports the efficient matching of graduates to appropriate jobs by field of study. The government supports graduates to gain work experience through an internship programme, and many large international companies operating in Serbia provide internships. An expanded internship programme to improve the skills of graduates and provide them with work

experience would depend on the willingness of employers to increase the number of internships they offer. Employer cooperation with HEIs can support improved curricula and ease graduates' transition to the labour market. Yet, such cooperation is rare, even though many employers consider that it would enable them to recruit graduates with appropriate skills more easily. Graduate employment opportunities are also affected by the lack of a finalised National Qualifications Framework, as the list of qualifications is not up-to-date.

Employers are only moderately satisfied with the skills of their graduate recruits; domestic employers are less satisfied than foreign employers, while employers in high technology sectors are less satisfied than other employers. More than half of employers believe that their graduate recruits do not bring much value added in comparison with their non-graduate employees. Employers report that graduates lack interactive skills such as team working, decision-making, adaptability and analytical and problem solving skills. These skills are neglected at HEIs where traditional teaching methods emphasise rote learning rather than student-centred approaches. The employer survey shows that HEIs can support the development of interactive skills among graduates by modernising teaching methods, delivering teaching in small interactive class groups rather than in large anonymous lecture rooms, and adopting practical problem solving approaches rather than theoretical and rote learning. Due to the weak skills sets that many graduates bring to the job, most employers provide additional training. However, human resources management practices are under-developed, and few employers follow up their training programmes with an employee development plan to maximise the benefits of the training provided.

6.4 Skill mismatches

Efficient matching of graduates to the requirements of the job is important for making the best use of the human capital created through studying at HEI, and its benefits are reflected in higher levels of job retention and in higher pay for well-matched graduates. Yet, more than one third of graduates experience horizontal mismatch by field of study. Graduates are more likely to be well matched by field of study if they had good academic performance at HEI, if they have strong interactive skills, and if they had a high level of support from their HEI in finding a job. However, having help from friends in finding a job (i.e. making use of informal networks and social connections) is not conducive to good matching and is more likely to lead to a mismatched job and a lower level of pay. Measures to improve horizontal matching should include improved career guidance services and better collaboration between HEIs and employers.

The study also confirmed substantial vertical skill mismatch. Overall, less than one half of graduates are well matched to their level of education; almost two fifths are over-qualified for the job they hold and surprisingly, despite the relatively low offer for graduate jobs, 15% are under-qualified. Being well matched by level of qualification assists graduates to keep hold of their job and avoid unemployment. Factors that assist graduates find a vertically well-matched job include the help received from the HEI in finding a job, having studied an appropriate subject at HEI, studying in an HEI with a good reputation, having some work experience, and the overall economic situation. Well-matched graduates have higher pay than mismatched graduates, although differences in initial salary diminish as graduates sort themselves into jobs more appropriate to their qualification level.

6.5 Policy recommendations

As the conclusions set out above demonstrate, action is needed both on the part of HEIs and on the part of employers, the government, and public employment services to

produce a more effective outcome for graduate job seekers. This is in line with the OECD skills strategy, which proposes that policy should not only focus on improving the supply of skills through education and training systems, but also on stimulating the demand for high level skills in the market and their utilisation in the workplace (OECD, 2012; Valiente, 2015). The research findings reported above suggest several key policy measures that should be implemented to improve the prospects for graduates when they enter the labour market. The recommendations are presented in order of priority.

Higher education

1. The study provides evidence of large skill gaps among HE graduates that are expected to increase in the future, especially in the area of interactive skills. HEIs should therefore take steps to **modernise the curricula** to enable students to develop improved interactive skills (such as adaptability, analytical and problem-solving skills, and team working skills). HEIs should also introduce more practical work into their courses to ensure that graduates have a range of skills that can be used in the workplace.
2. **Teaching methods should be modernised** in order to increase the quality of education provided, by promoting a student-centred approach to learning based on small discussion classes, student presentations, teamwork assignments, and analytical and practical problem solving exercises.
3. The **quality assurance system** should be improved to enable the scrutiny of various aspects of professors' work, based on student evaluations and a strengthened CAQA. Professors whose quality of teaching is judged unsatisfactory through student and peer assessment should be requested to attend refresher courses on teaching methods. Publishing of student assessment scores could create incentives for better results in teaching, working with students, and in research and publications (as happens at many HEIs throughout the EU). External peer-reviews should be conducted for both public and private HEIs, and institutions should be assessed according to the quality of their teaching and the ranked scores should be published.
4. The Government should promote the **internationalisation of HEIs**. Greater effort should be made to attract professors educated abroad into Serbian HEIs, and to continue to take advantage of participation in in international exchange programmes and in particular to establish a National Agency for full participation in Erasmus+.
5. **HEIs should deliver entrepreneurship learning courses** to all interested students. Such courses should be based on strong links with the local business community and could involve invited lectures from business practitioners. Such courses should aim to support a proportion of students with the relevant abilities and an interest in establishing their own business after graduation.
6. HEIs should provide prospective students with **information on labour market prospects** associated with different study programmes should be a responsibility of HEIs. To support this, HEIs should carry out tracer studies to identify the final destinations of HE graduates. Enhanced career guidance is also needed at secondary College level to support better decisions at entry to HE.
7. **The quality of data collected about the HE sector should be improved**. HEIs should provide better information about their study programmes to the Serbian Ministry of Education, Science and Technological Development, and the Statistical Office of the Republic of Serbia (SORS) should revise its classification of study programmes by degree level. More accurate information is needed on student enrolments, completion rates, and duration of study programmes. It

would be desirable to develop a unique database on HE provision based on a common methodology of data collection, which would include the most important internationally recognised indicators as defined by Eurostat, UNESCO and OECD. The database developed in this study could serve as a basis.

8. Independent faculties in the public sector are formally grouped into universities and the 2020 Strategy advocates deeper integration at all levels. However, faculties retain substantial autonomy in many important financial, organisational and professional areas. **HEIs should be further integrated and centralised** and the funding model of public faculties should be revised to focus on learning outcomes, completion rates, and graduate employment rates rather than student enrolments. This should improve the focus of HEIs more on supporting successful transitions to the labour market.
9. **The National Qualifications Framework (NQF) should be finalised** and explained to employers. An essential precondition for achieving some of the most important objectives of the on-going HE reforms, including better alignment of HEI policies with labour market needs is to finalise the new NQF with the involvement of all social partners.

Labour market

1. Many graduates experience a precarious entry to the labour market and require more support in finding their first job. Matching of graduates to appropriate jobs by field of study and by level of qualification provides substantial benefits in terms of improved productivity, improved pay, and improved attachment to the labour market. Yet, graduates receive most support in their job search from family and friends, which diminishes the chances of finding a well-matched job. **More effective institutional support should be offered to graduates during their transition to the labour market.** Formal career guidance services within HEIs should gather more information on labour market opportunities to support graduates in their search for a job. HEIs that do not have such centres should establish them. The National Employment Service should be supported to improve its services for graduate job seekers, both financially and institutionally, and should exchange information with HEIs about the supply and demand for graduates in specific fields of study and specific sectors of the economy.
2. Relatively few employers cooperate with HEIs over the development of curricula or the recruitment of graduates. Yet such cooperation improves the prospects that employers will find suitably qualified and skilled graduates to fill their vacancies. Policy makers should support **better cooperation between employers and HEIs** through active programmes to organise meetings, round-tables, discussions, and sharing of information. The recently created sectoral councils can provide a step in that direction.
3. Graduates with some work experience are more likely than those without work experience to be employed in a well-matched job. An optional period of practical work experience should therefore be counted towards the completion of a study programme. HEIs and employers should be encouraged to negotiate more **work experience placements with local businesses** so that graduates enter the labour market with some prior work experience. HEIs should integrate such practical work experience placements into the study programmes. Employers should be provided with support to take on students for work placement experience with the support of HEIs. To maximise the learning outcomes, work placements should be closely supervised by HEIs, and specialised staff of employers should be supported to offer structured learning opportunities in the

workplace. The Government should expand its existing internship programmes following graduation.

4. Many employers provide training to their graduate recruits to compensate for the skill gaps that graduates bring with them from the HE sector. Policy makers should support **employers' continuing training of graduates.** Although many employers provide supplementary training, this is often not supported by effective human resource management (HRM) practices such as career development plans. HEIs could support employers by assisting them in developing career development plans for graduate employees, by providing training to employers in HRM techniques, and by providing continuing education opportunities for graduate employees at HEIs throughout their career.

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Annex – Methodological note

1. Higher education provision database

We collected data on existing study programmes in Serbia offered by both public and private HEIs. The database covers 13 HEIs and 255 study programmes, based on data provided directly mainly from the Statistical Office of the Republic of Serbia (SORS). The database provides for *each study programme* several categories of data, e.g. name of HEI, name of faculty, name of qualification, level of qualification (Diploma level, Bachelor level, Master level, field of study (ISCED classification), the number of students beginning studies per year (since the academic year 2012-2013), the number of students completing studies per year (since academic year 2012-2013) and the total number of students registered to study in 2014-2015. Data on accreditation was collected from the Commission for Accreditation and Quality Assurance (CAQA). Data on the number of years to obtain a qualification and the number of ECTS credits associated with each qualification was based on information gained from stakeholders (i.e. HEIs). Data on annual tuition fees was derived from HEI websites. When information was not available for a particular study programme, the information for a similar study programme and the same HEI for which data was available was used. The SORS uses an older ISCED classification, and in some cases this had to be updated to the newer classification used in this study (ISCED 2013). The list of HEIs included in the project's HE provisions database is as follows.

Table A1: HEIs included in the HE provision database

Name of HEI	Ownership status
Agricultural College of Vocational Studies, Sabac	Public
Agriculture and Food Business College of Vocational Studies, Prokuplje	Public
Belgrade Business College, Belgrade	Public
Business and Technical College of Vocational Studies, Uzice	Public
Business College of Vocational Studies, Leskovac	Public
Business College of Vocational Studies, Novi Sad	Public
Business College of Vocational Studies, Blace	Public
Business College of Vocational Studies, Valjevo	Public
Civil Engineering and Geodesy College of Vocational Studies, Belgrade	Public
Electrical Engineering and Computers College of Vocational Studies, Belgrade	Public
Engineering College of Vocational Studies, Belgrade	Public
Fine and Applied Arts College of Vocational Studies, Belgrade	Public
Hotel Management College of Vocational Studies, Belgrade	Public
Information and Communication Technologies College of Vocational Studies, Belgrade	Public
Medical College of Vocational Studies, Cuprija	Public
Nursing College of Vocational Studies, Belgrade	Public
Police Academy, Belgrade	Public
Railway College of Vocational Studies, Belgrade	Public
College of Applied Vocational Studies, Vranje	Public
College of Vocational Studies, Belgrade Polytechnic	Public
College of Vocational Studies for Teacher Education, Pirot	Public

College of Vocational Studies for Teacher Education, Sabac	Public
College of Vocational Studies for Teacher Education, Aleksinac	Public
College of Vocational Studies for Teacher Education, Kikinda	Public
College of Vocational Studies for Teacher Education, Krusevac	Public
College of Vocational Studies for Teacher Education, Novi Sad	Public
College of Vocational Studies for Teacher Education, Sremska Mitrovica	Public
College of Vocational Studies for Teacher Education, Subotica	Public
College of Vocational Studies for Teacher Education, Vrsac	Public
State University of Novi Pazar	Public
Technology and Chemistry College of Vocational Studies, Krusevac	Public
Technology and Mechanical Engineering College of Vocational Studies, Trstenik	Public
Technology College of Vocational Studies, Arandjelovac	Public
Technology College of Vocational Studies, Belgrade	Public
Technology College of Vocational Studies, Cacak	Public
Technology College of Vocational Studies, Kragujevac	Public
Technology College of Vocational Studies, Nis	Public
Technology College of Vocational Studies, Novi Sad	Public
Technology College of Vocational Studies, Pozarevac	Public
Technology College of Vocational Studies, Sabac	Public
Technology College of Vocational Studies, Subotica	Public
Technology College of Vocational Studies, Zrenjanin	Public
Textile College of Vocational Studies, Leskovac	Public
Textile Design, Technology and Management College of Vocational Studies, Belgrade	Public
Touristic College of Vocational Studies, Belgrade	Public
University of Arts, Belgrade	Public
University of Belgrade	Public
University of Kragujevac	Public
University of Nis	Public
University of Novi Sad	Public
Basketball College, Belgrade	Private
Business College of Vocational Studies, Zemun	Private
Information Technology College of Vocational Studies, Belgrade	Private
Management and Business Communication College of Vocational Studies, Sremski Karlovac	Private
Management and Business College of Vocational Studies, Zajecar	Private
Sports Academy, Belgrade	Private
Sports and Health College of Vocational Studies, Belgrade	Private
Academy of Diplomacy and Security, Belgrade	Private
Academy of Football College of Vocational Studies, Belgrade	Private
Accounting College of Vocational Studies, Belgrade	Private
Advertising and Public Relations College of Vocational Studies, Belgrade	Private

Business College of Vocational Studies, Cacak	Private
Modern Business College of Vocational Studies, Belgrade	Private
Project Management College of Vocational Studies, Belgrade	Private
Traffic Management College of Vocational Studies, Nis	Private
Business Economics and Entrepreneurship College of Vocational Studies, Belgrade	Private
Medical College of Vocational Studies, Belgrade	Private
Sports College of Vocational Studies, Belgrade	Private
Business and Industrial Management College of Vocational Studies, Krusevac	Private
Business College, Belgrade	Private
Entrepreneurship College of Vocational Studies, Belgrade	Private
Academy of Fine Arts, Belgrade	Private
Health and Sanitary College of Vocational Studies VISAN, Belgrade	Private
Union University, Nikola Tesla, Belgrade	Private
European University, Belgrade	Private
International University Novi Pazar	Private
Educons University	Private
Metropolitan University	Private
Union University	Private
Economics Academy, Novi Sad	Private
Alpha University, Belgrade	Private
Megatrend University of Applied Sciences, Belgrade	Private
Singidunum University, Belgrade	Private

Source: HE provision database

2. Surveys

Two surveys were carried out in the framework of this study: one that was administered to recent graduates from higher education institutions (HEIs) and one that surveyed employers located in Serbia who employ recent higher education graduates among their workforce. These surveys were carried out from May to August 2015.

2.1. Graduate survey

The sample frame consisted of recent graduates from HEIs, i.e. having graduated from higher education since 2010. We designed an online survey questionnaire and managed it through the Qualtrics software platform. An online survey link was sent by a number of HEIs (see list below) directly to their alumni contact lists, as well as by the LSE Qualtrics account where contacts of alumni could be provided outside of the institutions. Due to the *Law on Personal Data* only HEIs themselves were able to directly contact their graduates via their personal email addresses, hence the implementation of the graduate survey had to rely on the cooperation of HEIs. A letter explaining the project was sent to all HEIs in Serbia, signed by the Minister of Education, Science and Technological Development, dr. Srđan Verbić. It requested HEIs to take part by inviting their recent graduates to complete the online survey. With the assistance of the ERASMUS+ office, 456 emails were sent to all HEIs in Serbia targeting rectors, vice-rectors, and deans and vice deans. Graduates were, in most cases, sent personalised emails by the respective HEIs that invited them to complete the survey, and to pass it on to friends and

colleagues from their HEI. HEIs that were not able to directly contact their graduates published an invitation letter on their institutional websites, Facebook pages and elsewhere. Graduates were also contacted through the ERASMUS Mundus alumni group. A list of institutions that formally confirmed that they would send the survey invitation to their graduates is provided in Table A2. None of the institutions that confirmed their participation reported any obstacles in inviting graduates to take part in the survey.

Table A2: HEIs included in the survey

Name of HEI	Ownership status
College of Vocational Studies for Teacher Education, Aleksinac	Public
College of Applied Vocational Studies, Vranje	Public
College of Professional Studies Cacak	Public
College of Professional Studies for Educators and Business, Sirmium	Public
College of Vocational Studies for Teacher Education, Pirot	Public
College of Professional Studies MPK Srmska Karlovci	Public
College of Professional Studies, Novi Sad	Public
College of Sports and Health	Public
College of Textile Design, Technology and Management	Public
EDUCONS University	Private
High Medical College of Professional Studies Cuprija	Public
Technology College of Vocational Studies, Nis	Public
Entrepreneurship College of Vocational Studies, Belgrade	Private
College of Dental Medicine in Pancevo	Private
Singidunum University, Belgrade	Private
State University of Novi Pazar	Public
The Conference of Vocational Academies Serbia	Public
Union University, Belgrade	Private
Economics Academy, Novi Sad	Private
University of Arts, Belgrade	Public
University of Belgrade	Public
University of Kragujevac	Public
University of Nis	Public
University of Novi Sad	Public

The required sample size was assessed on the basis of the desired level of precision. Among other issues, we were interested in the experience of graduates from different types of HEI, public and private, and across three categories of labour force status: in work, unemployed, or inactive. We collected a total of **1,438** complete questionnaires from recent graduates of Serbian HEIs who graduated in or after 2010. This gave the desired degree of precision to the estimates. Most respondents (92%) graduated in 2012 or later. Of these, 17.1% graduated in 2012, 23.9% graduated in 2013, 40.9% graduated in 2014 and 10.1% graduated in 2015.

The representativeness of the sample can be checked by comparing the distribution of the sample of graduates by field of study to the distribution of the underlying population of students by field of study as reported in the HE provision database. In Table A3 the distribution of graduates by field of study in the graduate survey is compared to the

distribution of students who completed their degree in the academic years 2011-2012 to 2013-2014 taken from the HEI database. We take the average over the three years, since the graduates in the graduate survey have completed their degrees at different points of time in the past. It can be seen that the representation of the sample is not close to that of the distribution from the HEI database due to an over-representation of graduates from study programmes in *Natural Sciences, Mathematics & Statistics* and an under-representation of graduates from *Business, Administration & Law* and *Health & Welfare* giving a Pearson correlation coefficient of just +0.17. The correlation coefficient between sample and population data for other fields of study is very high at +0.94. This should be taken into account when interpreting the results of the survey.[112]

Table A3: Sample distribution (graduate survey) and population distribution of graduates (completions) by broad field of study

	Graduate survey (number)	Graduate survey (%)	HE Provision database (%)
01 Education	156	11.1%	9.9%
02 Arts & Humanities	137	9.8%	9.1%
03 Social Sciences, Journalism & Information	158	11.2%	8.7%
04 Business, Administration & Law	162	11.5%	26.9%
05 Natural Sciences, Mathematics & Statistics	352	25.1%	4.1%
06 Information & Communication Technologies	88	6.3%	5.6%
07 Engineering, Manufacturing & Construction	213	15.2%	17.4%
08 Agriculture, Forestry, Fisheries & Veterinary	13	0.9%	2.4%
09 Health & Welfare	16	1.1%	8.8%
10 Services	110	7.8%	7.3%
Total	1,405	100.0%	100.0%
Missing values	33		
Total including missing values	1,438		

Source: Graduate survey and HE provision database.

2.2. Employer survey

We designed a questionnaire that was implemented through a mix of online surveys and phone interviews. The sample frame consisted of public and private organisations of all sizes located in Serbia and employing HE graduates. We used several channels to distribute the survey (see Table A4). The Chamber of Commerce and Industry of Serbia invited employers to take part in the survey by circulating the invitation letter provided by the Project core team through their sectorial branches. The American Chamber of Commerce also invited their members to participate in the survey. The Serbian Association of Employers invited employers via their website. In addition around 1,500 email addresses of employers in Serbia were collected from different websites[113] and forwarded to LSE to be invited to complete the online survey.

[112] In practice the application of weights makes little difference to the results. For example the weighted score for the variable "satisfaction with quality of education" is 7.18 using unweighted data and 7.07 using weighted data. Similar small differences are found in other variables of interest.

[113] Mainly from the following websites:
The National market of goods and services in Serbia http://trzistesrbije.com/
Serbian Association of Employers http://www.poslodavci.org.rs/

Table A4: Organisations that distributed the employer survey

Chamber of Commerce and Industry of Serbia
American Chamber of Commerce (AmCham)
Serbian Association of Employers
Ministry of Economy
Ministry of Labour, Employment, Veteran and Social Affairs

Altogether, we collected a total of **177** completed questionnaires. Since the survey sample was taken from the population of employers who employ graduates, there is no available population distribution, and so the representativeness of the sample cannot be validated; nor can the sample be adjusted by any relevant weighting technique. Also, the sample was by design adjusted (using additional telephone interviews) to ensure that we had a similar distribution of employers across all enterprise size groups according to the Eurostat definition. The sample was balanced: in terms of the number of employees most of the employers surveyed were either micro sized (23%), small sized (21%) or medium sized (31%) and large employers (25%). This design was chosen to ensure that we had enough medium and large sized employers in the sample to make comparisons across size groups. The survey covered the various sectors of the economy, with the largest concentrations in *Manufacturing* (19%). Since the population distribution is not known we are unable to claim that the survey is representative of the population of employers who employ graduates. The results should be read bearing this caveat in mind. However, this does not preclude us from drawing inferences from within the sample about statistically significant differences between employer size categories for variables of interest (such as extent of employer-provided training).

3. Interviews with key stakeholders

We conducted semi-structured interviews with **15** key stakeholders, with the aim to develop a comprehensive view on the causes of challenges for employers and HE graduates in the labour market. We identified stakeholders at three levels.

- **Policy-making stakeholders** (4 ministries, EU Delegation office)
- **Higher education stakeholders** (5 HEIs, Erasmus alumni focus group)
- **Labour market stakeholders** (the Serbian Chamber of Commerce, 1 trade union, 1 public employment service representative, and 1 NGO)

We developed an interview guideline containing a set of questions for these semi-structured interviews. One group of questions were of a general nature and were posed to all stakeholders, to better confront their views on key issues. The second group of questions were specifically tailored to the various stakeholders, designed to explore further primarily issues within their specific competences. Local experts conducted the interviews and translated them into English.

We also carried out a focus group discussion with Erasmus Mundus alumni who had studied abroad, to gather their impressions of the contrasts between teaching methods used in their home and host countries.

4. Labour market data

We obtained Labour Force Survey (LFS) data for the period 2011-2014 from the SORS. This provided information about the sectoral structure of tertiary level employees for the years 2013 and 2014, which were used as a base for the forecast for graduate

employment by sector. The sectoral forecast was then converted into a forecast of demand for graduates by field of study using coefficients derived from the graduate survey. The LFS was also used to identify the relevant labour market key statistics for HE graduates (employment rate, unemployment rate), which could be compared to the statistics derived from the graduate survey relating to the employment rate and the unemployment rate of recent graduates.

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