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IMPROVING EDUCATIONAL OUTCOMES IN SLOVENIA

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ABSTRACT/RÉSUMÉ

Improving educational outcomes in Slovenia

Overall, the education system fares well by international comparison. Slovenia has one of the highest shares of the population aged 25 to 64 to have completed at least upper secondary education, and ranks high in international educational achievement tests. Nevertheless, in some areas, reforms could significantly improve performance and equip the labour force with the skills most in demand in a rapidly changing economy. In particular, low student-teacher ratios, small class sizes, and a high share of non-teaching staff suggest that there is room for improving spending efficiency. Rationalising teaching and non-teaching staff would also free up valuable public resources that could be redirected towards underfunded aspects of the education system. Low enrolment rates in short vocational education programmes and in certain higher education fields, such as science and engineering, contribute to a skill deficit in some occupations, underlining the need to make such programmes more attractive. At the tertiary level, completion rates and spending per student are low by international standards, and students take too long to complete their studies. The combination of low student fees and access to generous financial support, coupled with the preferential treatment of student work until recently, creates "fake students"; it also provides genuine students with an incentive to remain in the tertiary education system too long. Introducing universal tuition fees along with loans with income-contingent repayment would help to address such issues. This Working Paper relates to the 2011 Economic Survey of Slovenia (www.oecd.org/eco/surveys/Slovenia).

JEL classification codes: I20; I21; I22; I23; I24; I28.
Keywords: vocational and technical education; tuition fees; tertiary education; income-contingent loans; PISA; early childhood education; student work

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Améliorer les résultats du système éducatif en Slovénie

Dans l'ensemble, le système éducatif donne des résultats satisfaisants par rapport aux autres pays. La proportion de la population slovène âgée de 25 à 64 ans ayant achevé au moins le deuxième cycle de l'enseignement secondaire est parmi les plus élevées de la zone OCDE et le pays est très bien placé dans les évaluations internationales du niveau des élèves. Néanmoins, dans certains domaines, des réformes pourraient largement contribuer à améliorer les performances et à doter les travailleurs des qualifications les plus recherchées dans une économie en pleine mutation. Ainsi, le faible nombre d'élèves par enseignant, la taille réduite des classes et la proportion élevée de personnel non enseignant donnent à penser qu'il serait possible d'accroître l'efficacité des dépenses. La rationalisation des effectifs enseignants et non enseignants serait un autre moyen de dégager des ressources publiques précieuses qui pourraient être réaffectées à des secteurs du système éducatif dont le financement est insuffisant. Le faible nombre d'inscrits dans les filières courtes de l'enseignement professionnel et dans certaines branches de l'enseignement supérieur comme les sciences et les études d'ingénieur se traduit par un déficit de compétences dans certains métiers, d'où la nécessité de rendre ces formations plus attrayantes. Dans l'enseignement supérieur, les taux de réussite et les dépenses par étudiant sont faibles par rapport aux moyennes internationales et les études durent trop longtemps. De plus, la modicité des droits de scolarité et l'accès à des aides financières généreuses, conjugués au traitement préférentiel dont bénéficiait jusqu'à une date récente le travail des étudiants, ont pour effet de créer des « faux étudiants », tout en incitant ceux qui font vraiment des études à rester trop longtemps dans l'enseignement supérieur. L'instauration de droits de scolarité universels, parallèlement à des prêts remboursables en fonction des ressources, pourrait apporter une solution à ces problèmes. Ce Document de travail se rapporte à l'*Étude économique de l'OCDE de la Slovénie 2011* (www.oecd.org/eco/etudes/Slovénie).

Classification: I20; I21; I22; I23; I24; I28.
Mots-clés: éducation technique et professionnelle; frais de scolarité, éducation tertiaire; en fonction du revenu des prêts; PISA, éducation préscolaire; travail des élèves

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Improving educational outcomes in Slovenia

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Slovenia has a broad-based education system that has equipped its labour force with good skills (see Annex 2.A1 for the main features of the Slovenian education system). However, the system faces important challenges. Renewed pressures on public finances require a greater focus on efficient use of public money, especially in the primary and secondary schooling system, while growth in funding of the higher education system has not kept pace with the increasing importance of higher education to the economy. This is a liability as Slovenia moves closer to the world technology frontier and fostering innovation becomes more important than implementing existing technologies (Vandenbussche, *et al.*, 2006). In the aftermath of the global financial crisis, which has reduced potential growth and raised the equilibrium unemployment rate in Slovenia, a transformation of the skills of the labour force would help foster innovation, attract greater foreign investment, and give new impetus to Slovenia's convergence to euro area living standards. The first section of this chapter assesses the performance of the education system while the second section discusses policy options to improve both the performance and efficiency of the system.

Educational outcomes

Educational performance at the primary and secondary school level is good, though less so for disadvantaged pupils

Slovenian pupils achieve relatively high scores in international achievement tests. Their average scores in all three key subject areas in the 2006 Programme for International Student Assessment (PISA) fare relatively well compared with other OECD countries (Figure 1). The Progress in International Reading Literacy Study (PIRLS) and the Trends in International Mathematics and Science Study (TIMSS)[2] confirm that Slovenian pupils compare favourably against their peers in the participating countries, with slightly higher achievement in science than in reading and mathematics. Trends in average science, mathematics and literacy scores of fourth and eighth-grade students have been rather favourable as well, with scores on TIMSS and PIRLS assessments, particularly in science and mathematics, improving substantially.

2.	The Progress in International Reading Literacy Study (PIRLS) collects reading comprehension achievement results for pupils in their fourth year of formal schooling for 40 countries. The Trends in International Mathematics and Science Study (TIMSS) gathers information on the mathematics and science achievement of fourth and eight grade pupils. For further information on TIMSS see *http://timss.bc.edu*.

Figure 1. **Slovenian pupils compare well in PISA score comparisons across OECD countries**[1]

Mean scores, 2009
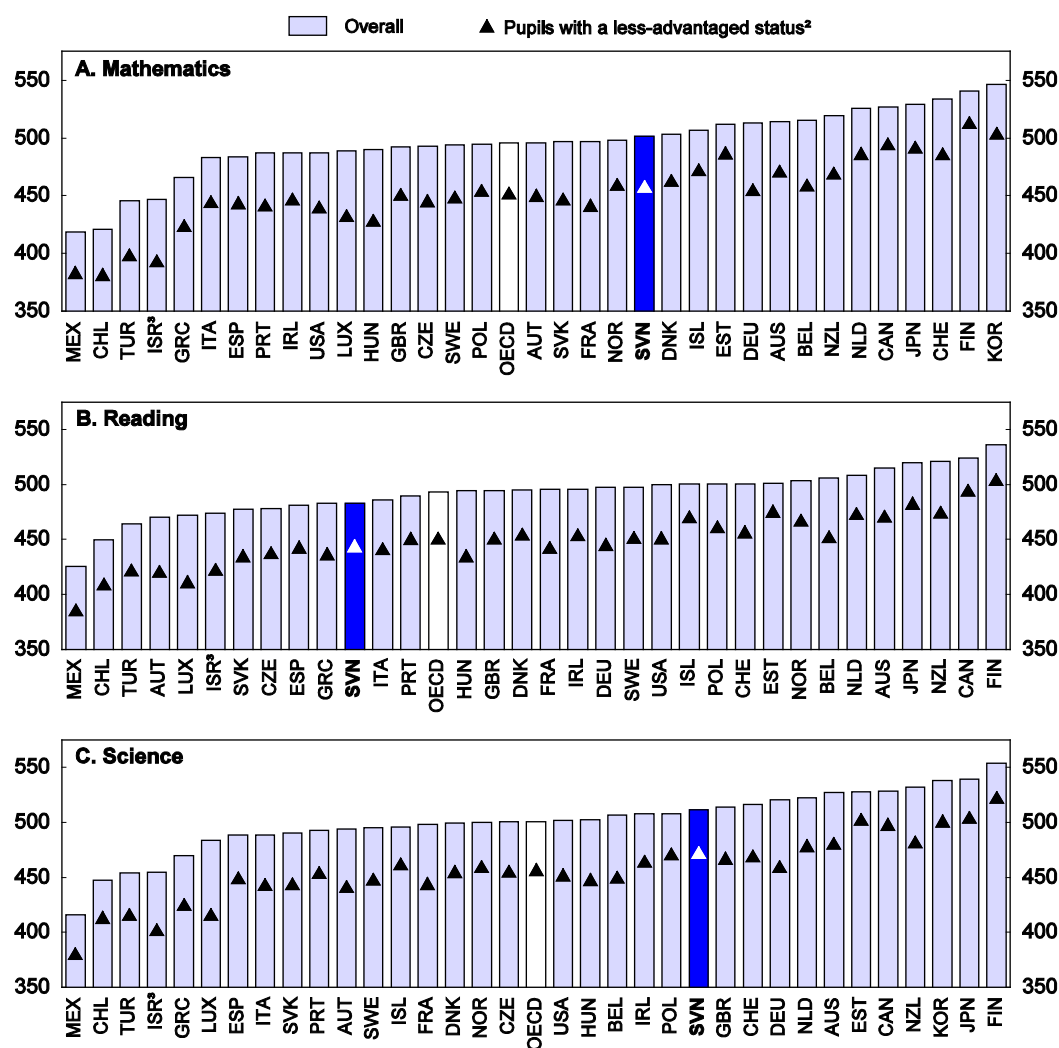
1. PISA: Programme for International Student Assessment.
2. Bottom quarter of the PISA index of economic, social and cultural status.
3. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD (2010), *PISA 2009 Results: What Students Know and Can Do - Student Performance in Reading, Mathematics and Science* and *PISA 2009 database*.

…

but performance of pupils with an immigrant background is weaker

Although average achievement scores are relatively high in Slovenia, they remain strongly influenced by the socio-economic backgrounds of pupils, as in most other OECD countries. In particular, pupils with an immigrant background, who constitute around 10% of the pupils at the relevant age cohort, perform significantly worse than native students, even after accounting for the socio-economic status of the parents (OECD, 2007). While the difference between the average PISA scores of pupils with and without an immigrant background does not differ significantly from the OECD average (57 points in Slovenia versus the OECD average of 55 on the 2006 PISA science scale), the gap in the share of top performers[3] between the two groups is large in Slovenia, being second only to Germany across the OECD (Figure 2). A similar picture emerges when the share of top and strong[4] (and not only the top) performers is considered (OECD, 2009a).

Figure 2. **The share of top performers with an immigrant background is low[1]**

Age 15, percentage difference of top performers in science between native students and students with an immigrant background[2]
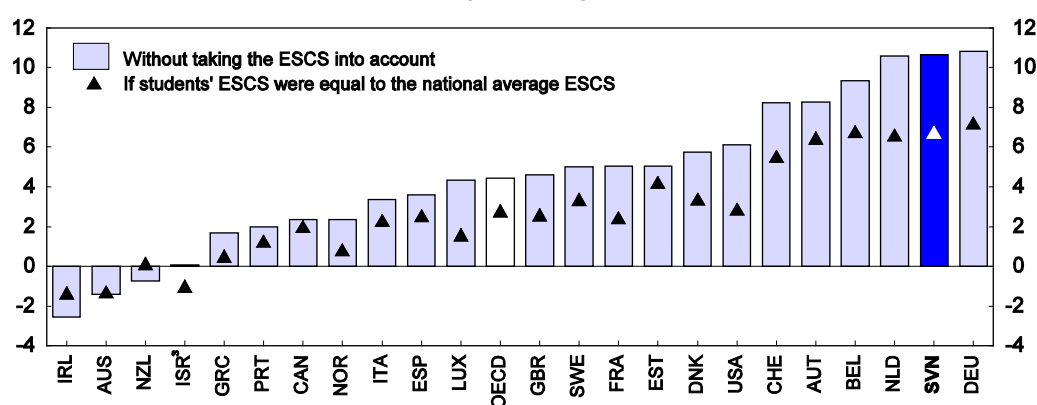
1. Socio-economic background measured by the index for economic, socio and cultural status (ESCS).
2. Native students are those who were born in the country of assessment and have at least one parent who was also born in the country of assessment. Students with an immigrant background are those whose parents were born in a foreign country.
3. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD (2009), *Education at a Glance 2009* and OECD (2007), *PISA 2006: Science Competencies for Tomorrow's World.*

Higher education attainment rates are rising but are still below the OECD average

Tertiary attainment rates in Slovenia are below the OECD average, although the attainment rates of young workers are significantly higher than those of older workers (Figure 3). The situation should eventually improve as overall entry rates into tertiary programmes are rather high in Slovenia, reflecting wide access to higher education. In 2007, 88% of the relevant age cohort was expected to attend a vocational or academic tertiary programme at some point in their lives, substantially exceeding the OECD average of 71%.

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3.   Top performers refer to pupils proficient at levels 5 and 6 in the PISA 2006 science assessment, that is, pupils scoring higher than 633.33 points.

4.   Strong performers refer to pupils proficient at level 4 of the PISA 2006 science assessment.

Figure 3. **The share of tertiary graduates is growing but fails to keep up with the OECD average**
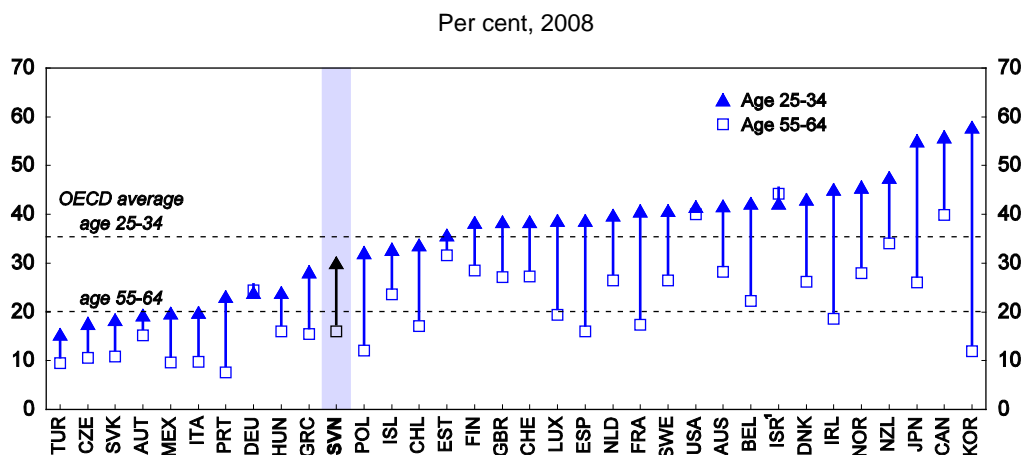
Per cent, 2008

Source: OECD (2010), *Education at a Glance 2010*.

Nonetheless, with current graduation rates still being below the OECD average, the gap in tertiary attainment rates of the working-age population *vis-à-vis* the OECD average will remain for a while (see Figure 4, Panel A). Graduation rates that fail to match the high entry rates are primarily explained by low completion rates in academic tertiary programmes, as completion rates in vocational education programmes are around the OECD average (see Figure 4, Panel B).

Slovenian tertiary education graduates enjoy high returns to their human capital investment. Using net annual wage premia derived from Mincerian wage equations, Ahčan *et al.* (2008) estimated that returns to a four-year undergraduate programme in Slovenia (average for men and women) were about 10½ per cent in 1994, 12% in 1999 and 12½ per cent in 2004. When gross hourly wages are used as the dependent variable, gross wage premia were 86% in 2008 for tertiary education graduates over upper secondary graduates, with no statistically significant differences across genders (see Annex A2). Nevertheless, given the excessively long study durations (6.9 years on average), internal rates of return to tertiary education are as low as 9.4%. When combined with the generous public subsidies they receive, students in Slovenia have had significant financial incentives to go into higher education.

Higher education has a strong vocational focus in Slovenia (tertiary-type B), where study programmes are generally shorter and focus on the development of practical, technical or occupational skills. Slovenia is the only OECD country where the share of vocational higher education graduates is higher than that of academic programmes (Figure 4, Panel A). The structure of the secondary education system largely explains this pattern. In 2008, while roughly 40% of upper secondary graduates came from general academic programmes, the rest were from technical and vocational ones (Table 1).[5]

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5.   While Slovenia does not necessarily have to follow larger countries in having a large share of science and technology graduates and can specialise in more service–oriented sectors such as tourism, manufacturing still has a large share of GDP and being able absorb new technologies is essential.

Figure 4. **Access to tertiary education is wide but graduation rates are not correspondingly high**[1]

2008[2]
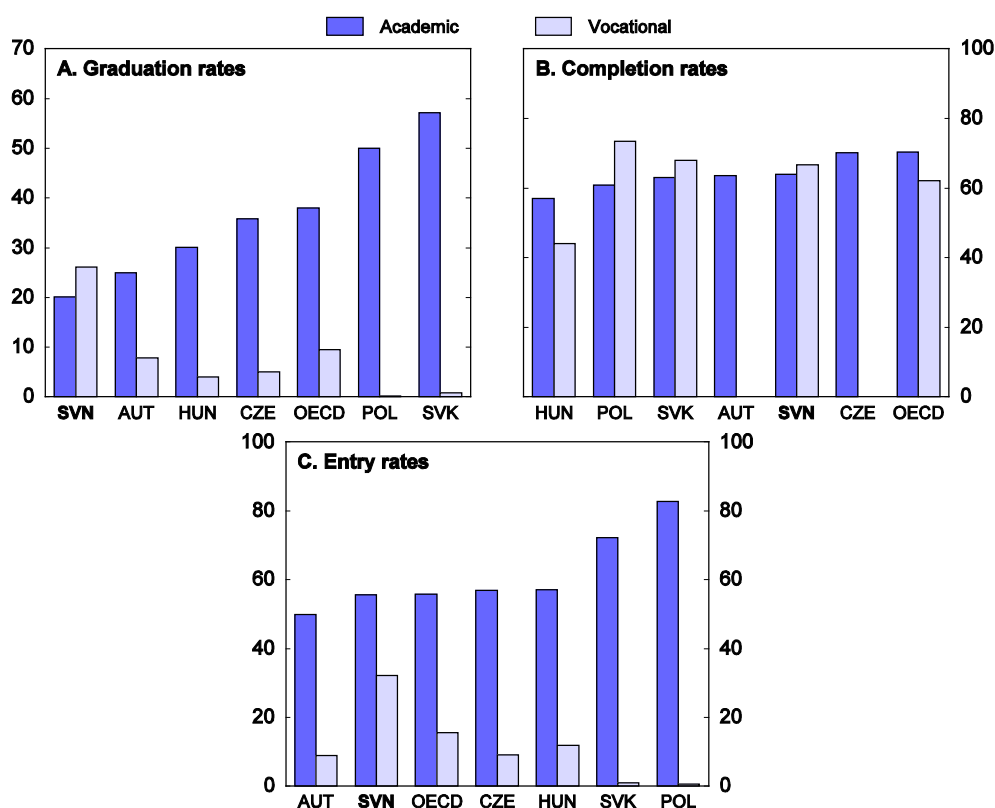
1.   Graduation rates refer to the estimated percentage of an age cohort that will complete tertiary education, based on current patterns of graduation (the age cohorts of 25-26 for tertiary type–A and 23–26 for tertiary type–B programmes). Entry rates are the estimated percentage of an age cohort that will enter tertiary education for the first time (19–year–olds in Slovenia). Completion rates correspond to the proportion of new entrants who graduate with at least one degree at the level entered into. Completion rates are calculated as the ratio of the number of students who graduate from an initial degree to the number of new entrants into this degree *n* years before, with *n* being the number of years of full-time study required to complete the degree. See Tables A3.1, A2.3 and A4.1 in the source publication for information on the calculation methods and coverage.
2.   Completion rates for 2005 for Hungary.

Source: OECD (2010), *Education at a Glance 2010*.

Table 1. **The Slovenian education system has a vocational focus**[1]

Upper secondary education, end of school year 2008/09

	Enrolled		Graduates	
	Number	%	Number	%
Total	**83 300**	**100.0**	**21 003**	**100.0**
Programmes				
Lower vocational	1 017	1.2	370	1.8
Middle vocational	12 248	14.7	3 630	17.3
Technical and professional/vocational	34 956	42.0	8 344	39.7
Gymnasium	33 882	40.7	8 290	39.5
Courses				
Vocational	340	0.4	140	0.7
Matura	857	1.0	229	1.1

1.   Data cover youth only.

Source: SORS (2010), "Upper Secondary Education for Youth and Adults, Slovenia, the End of the School Year 2008/2009 and the Beginning of the School Year 2009/2010", *First Release*, Statistical Office of the Republic of Slovenia, April.

Education is generally attuned to market needs but some mismatches are mounting

Employability at the vocational level is reasonably high but pupil interest is diminishing

While there has been little change in upper secondary graduation rates over the past few years, the structure of upper secondary enrolments has been shifting towards programmes that provide direct access to higher education at the expense of vocationally-oriented programmes. The share of pupils who enrolled in programmes that lead directly to tertiary education was around 84% in 2008, up from 82% in 2000 (IMAD, 2009a).

The change in the structure of upper secondary enrolments in Slovenia reflects diminishing interest in vocational upper secondary programmes (short, two-year, and middle, three-year, vocational programmes), creating a skill deficit in the labour market. In particular, the significant drop in the number of students enrolled in short vocational programmes causes shortages of certain occupations. This number dropped by over 50% (from about 2 000 students to about 1 000) between 2007 and 2009. Middle vocational programmes also saw large declines in enrolment from over 18 000 students in 2007 to around 12 000 students in 2009. The expanding economy over the same period exacerbated the skill deficit even further. Shortages have been primarily in low-skilled manual jobs in the fields of construction, mining and public utilities, and are generally taken by immigrants (Svetlik, 2004).[6]

The picture regarding the employability of vocational and technical education of upper-secondary graduates in Slovenia is mixed. On the one hand, the unemployment rate of vocational and technical upper secondary education graduates has been rather low at 3.7% and compares favourably against the OECD average of 5.3% in 2008. On the other hand, their employment rate at 74.4% (in 2008) has not been high by international comparison and remains slightly below the OECD average of 75.4%. The gap *vis-à-vis* the EU19 average (74.6% in 2008) is smaller and had narrowed until the crisis broke out (OECD, 2010). The employment performance of vocational and technical upper secondary graduates is generally better than those in other Central and Eastern European countries (with the exception of the Czech Republic) that had broadly similar institutional arrangements and had undergone a transition process. Employment rates of vocational and technical upper-secondary graduates in former socialist countries have remained lower than

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6.   Immigrant workers had been granted an increasing number of permits to meet the shortfall until the global financial crisis hit Slovenia.

those of the graduates of upper-secondary programmes that provide direct access to academic tertiary programmes as general skills tend to be more in demand, especially in economically turbulent times (Kézdi, 2006).

Mismatches seem to be on the rise at the tertiary level

There is a great variation in unemployment rates and employability of graduates from different fields. This is partly explained by the slow rate at which enrolment trends respond to changes in the relative demand for labour and leads to mismatches between the output of the higher education system and the needs of the labour market. It also naturally translates into a growing number of unemployed workers with tertiary qualifications (IMAD, 2010). A study finds that the lowest unemployment rates amongst graduates in 2008 were in the fields of health and welfare, engineering, manufacturing and construction, science, mathematics and computing (HEGESCO, 2009). Farčnik and Domadenik (2009) find that graduates in health, computing, engineering, manufacturing and construction fields have the highest likelihood of getting employed in the six months following their graduation.

Despite favourable employment prospects and high private returns to studies, the share of science and engineering graduates in Slovenia is low by international comparison. The number of science and technology graduates per 1 000 inhabitants aged 20-29 is significantly lower in Slovenia than the EU average (10.7 compared to 13.9, in 2008) and there are few signs of this gap closing (IMAD, 2010). Arts, humanities and social sciences graduates make up the majority of tertiary graduates. Although some incentives, such as greater availability of scholarships and grants for students going into these fields, have been introduced, the impact has been limited so far. Considering that a greater share of engineering and science graduates is associated not only with a greater innovative and technology absorption capacity of the economy but also with human capital spillovers and economy-wide productivity gains, boosting the number of graduates from these fields is a priority. The specialisation of Slovenian industry on low and medium-technology goods is partly a consequence of Slovenia's pattern of human capital investment.[7]

Reforms to improve educational performance

Spending on tertiary education should rise…

Resources devoted to higher education, as measured by per student spending, are low by international comparison (Figure 5). On a per student basis and evaluated at purchasing power parities, Slovenia spent roughly USD 7 000 on tertiary education in 2007, excluding R&D related spending, as compared to the OECD average of USD 8 970 (OECD, 2010). The ratio of students to teaching staff also reflects the stronger emphasis on non-tertiary education in Slovenia (Figure 6). Although total spending in higher education has slightly increased over the past few years, this increase was mainly attributable to the expansion of higher education, implying fewer resources on a per-student basis. For instance, the higher education system expanded markedly in the 1990s, with the number of students nearly tripling, but public spending on higher education as a share of GDP remained constant, resulting in a 20% annual decrease in real public expenditures per student over 1995–2000 (Mramor, 2001).

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7.   Further analysis is required to firmly establish the direction of causality as to whether the structure of the economy determines this pattern of investment in human capital or the observed pattern of educational attainment leads to specialisation in certain industries.

Figure 5. **Slovenia appears to spend too much on basic education and too little on tertiary education**

In thousand US dollars, 2007[1]

Expenditure per student[2]

A. Primary education[3]

y = 0.21x + -0.15
R² = 0.77

B. Secondary education

y = 0.27x + -0.67
R² = 0.84

C. Tertiary education

y = 0.44x + -1.48
R² = 0.69
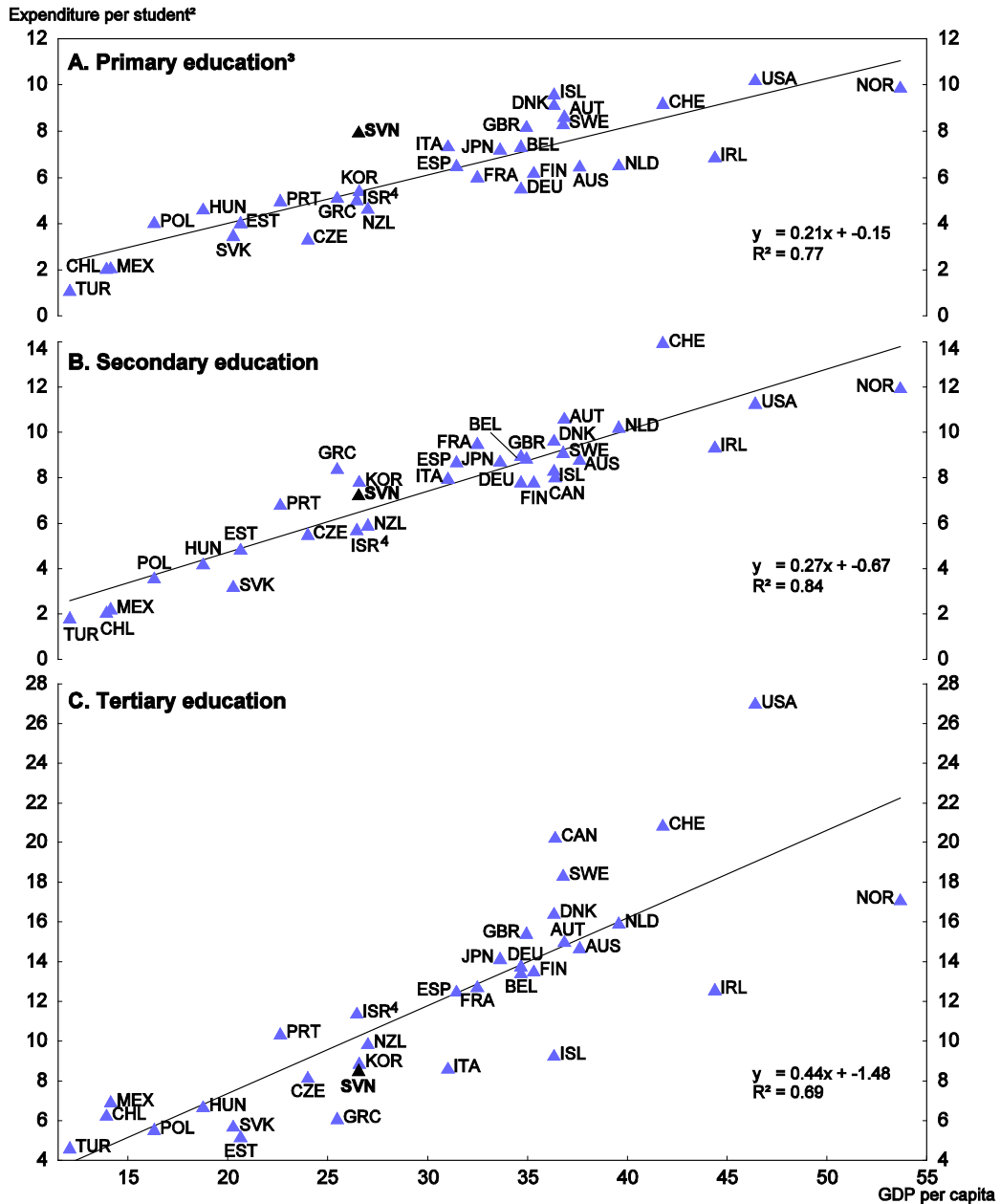
GDP per capita

1. Expenditure and GDP per capita in equivalent US dollars converted using purchasing power parities. 2005 data for Greece, 2006 for Turkey.
2. Annual expenditure on educational institutions. Public institutions only for Canada (tertiary), Hungary, Italy, Poland, Portugal, Switzerland and Turkey. Secondary education also includes primary education for Canada. For tertiary education Estonia and Turkey exclude research and development activities.
3. In Slovenia there is no distinction between primary and lower secondary levels of education.
4. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD (2010), *Education at a Glance 2010.*

Figure 6. **Low pupil-teacher ratios prevail in the Slovenian education system below the upper secondary level**

By level of education, 2008[1]
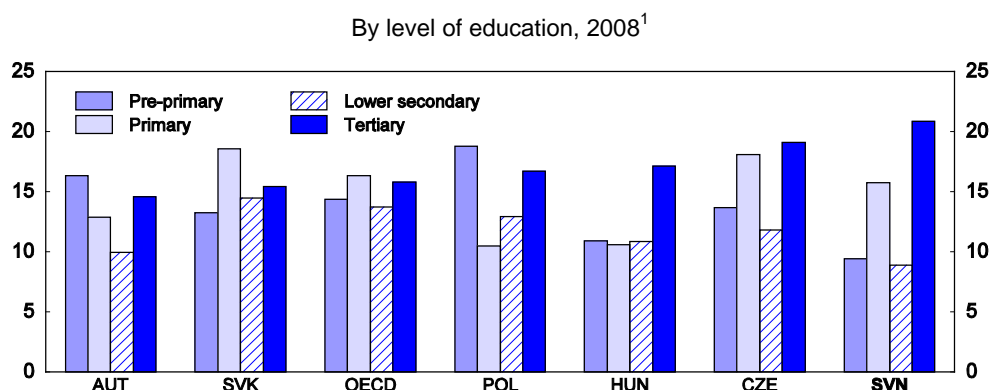
1.   Calculations based on full-time equivalents.

Source: OECD (2010), *Education at a Glance 2010*.

Owing to the importance of tertiary education to boost innovation and growth, the authorities should consider directing more funds to tertiary education and, in particular, to more efficient higher education institutions. Given the need for fiscal consolidation, the government could achieve this by developing new sources of financing for tertiary education, notably in the form of universal tuition fees, which would also help to improve the efficiency of the higher education system. More generally, eliminating inefficiencies in higher education would boost available resources on a per-student basis.

… and higher education funding mechanisms should be improved

Public higher education institutions (HEI) in Slovenia enjoy relatively high institutional autonomy, including with regards to entering partnerships with industry or other higher education institutions, staffing decisions, student selection, and quality assurance. Autonomy is also comparatively high for funding and financing, although there are some constraints in raising student fees. In 2004, Slovenia moved to lump-sum funding of higher education institutions for teaching-related activities, which covers around half of total funds (25% raised from tuition fees and the rest from third parties) and made them autonomous in allocating public and private funds internally.[8] The funding mechanism involves two main parts: a fixed part representing the grandfathered element of public funding; and a flexible part relating public funding to inputs and outputs of HEIs.[9] For 2009, the fixed part was set at 60% of the annual funds for study activities of the HEIs adjusted for inflation in 2008. The fixed part is included with a view to allowing HEIs to adjust to the new funding system and its share is being reduced gradually. The flexible part is determined as a function of the number of graduates and the total number of enrolled students who belong to six different tariff groups depending on the field of studies.[10]

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8.   The figure can be found in the report "Study on Progress in Higher Education Reform across Europe: Funding Reform" (available at: *http://ec.europa.eu/education/news/news2259_en.htm*), which was prepared by a CHEPS-led consortium for the European Commission.

9.   Public funds are allocated to higher education institutions in two steps. In the first step, total annual available funds are determined. In the second step, allocations to individual institutions are decided. Public funds for study activities to educational institutions are increased in real terms by at least the growth in GDP but not less than 2.5% over the previous fiscal year.

10.   The number of graduates refers to the graduates of full–time undergraduate study programmes at the HEI in the previous calendar year and the total number of students is defined as the number of full–time students in undergraduate study programmes in the current academic year. The total number of student

While the funding mechanism adopted in Slovenia has the potential to lead to efficient outcomes in higher education, it needs to be fine-tuned and supported by additional measures to yield the desired objectives. In particular, the fixed element of public funding should be removed. It favours large, historically well-established institutions, rather than efficiency considerations, and may therefore perpetuate inefficient provision of higher education services. It also handicaps recently established institutions to challenge the incumbents. Finally, it takes funds away from the expansion of the flexible part, which will be increasingly needed as tertiary education expands further. It is difficult to achieve adequate funding per student when the expansion of tertiary education is rapid enough to outpace the large grandfathered element. Given that the higher education system in Slovenia appears to be already underfunded in terms of per-student expenditure, the grandfathered part of funding might exacerbate the situation.

Public funding based solely on enrolments might give institutions the incentive to favour quantity of enrolments over quality of courses. This could be particularly relevant if HEIs have no discretion in setting their fees and student mobility is not sufficiently high to boost competition among universities (see below). Giving HEIs the autonomy to set their own fees could help to eliminate distortions in demand due to fixed prices across HEIs. This could in turn help to improve efficiency and make the system more responsive to student and employer preferences through greater competition (Barr, 2004). While the current funding mechanism based on the number of graduates has the potential to lead to improvement in efficiency, for example through improved completion rates, it may give institutions the incentive to lower their standards. It might also lead to more emphasis on outputs that are easily attainable and measurable at the expense of relatively hard-to-measure activities, such as development of creativity and problem-solving skills (OECD, 2008).

Some steps have been taken to improve the quality assurance system.[11] The Senate for Evaluation became operational in 2008 to implement an external quality assurance system, including the creation of the National Agency for Quality in Higher Education (*Nacionalna agencija Republike Slovenije za kakovost v visokem šolstvu*) which took over accreditation and external evaluation responsibilities from the Council for Higher Education the following year.[12] This agency will be responsible for procedures and evaluation criteria and for carrying out the evaluations. The authorities should swiftly proceed to implement the quality assurance system to counteract potential adverse effects of relying on enrolments and the number of graduates to determine public funding.

Although public higher education institutions have full autonomy in recruiting their own staff, they are constrained by the Public Sector Act in determining salaries. This constraint adversely affects the position of public HEIs to compete for hiring and retaining most talented staff. Considering that salaries are included in the lump-sum public funding and HEIs are autonomous in the allocation of those funds, HEIs should be given more freedom to determine the salaries of their academic staff. This would promote quality among academics, leading to improvements in the quality and efficiency of the higher education system (OECD, 2008).

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excludes "absolvent" students who have completed the course work and are working on their finishing theses. The study field is one of the 22 fields defined in the ISCED classification of UNESCO.

11. Several higher education institutions underwent international accreditation on their own initiative in the past few years.

12. It is envisaged to become a member of the European Association for Quality Assurance in Higher Education (ENQA).

Spending efficiency in compulsory education could be improved

Slovenia has achieved relatively good performance at the primary and lower secondary levels, but at a relatively high cost: it spends considerably more on basic education on a per-pupil basis than other countries with similar income levels (Figure 5). However, the average PISA scores are not significantly different than those achieved in these countries.

Revise the geographical distribution

In the face of recent urbanisation trends and changing demographics, the geographical distribution of pupils in Slovenia has changed markedly (IMAD, 2009a). Data on average class size in compulsory education suggest that there is a huge disparity across schools and regions. Average class size ranges from 4.5 to 24.2 pupils, below the legal limit of 28, with around 40% of schools having less than 15 pupils in a class. School sizes also vary greatly and some 56% of schools have less than 200 pupils (Figure 7). The geographical distribution of schools, driven by socio-economic considerations to provide basic education to all children in the towns they reside in, accounts for the variation in school sizes. Local governments are responsible for basic public schools, either in the form of single institutions or as an organisational unit of other schools. Smaller branch units with as few as 30 students provide education from first to third or first to sixth grade students in geographically remote regions. In bigger cities, school sizes reach over 1 000 pupils.

Figure 7. **Schools and classes are mostly small at the basic education level**[1]
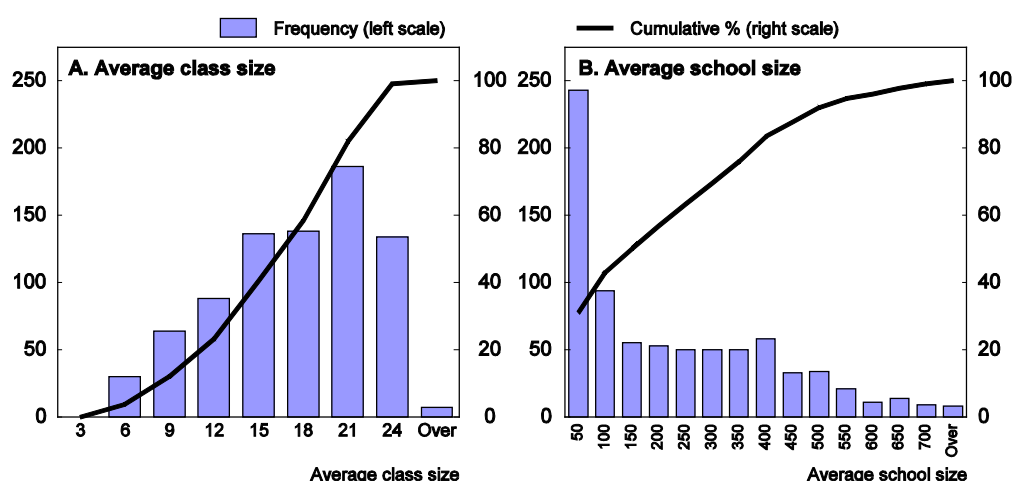
1. Compulsory education for pupils between 6 and 15 years old is offered in so-called basic schools and is organised as a single structure (without distinction between primary and lower secondary levels).

Source: Ministry of Education and Sport.

Increase class sizes…

Adjustments in the size and distribution of physical facilities, and teaching capacity of schools would improve efficiency. Currently, Slovenian schools must employ a large number of professional support staff, as a share of total staff, and retain them regardless of the size of the school, making the system very costly. Maintaining large numbers of teaching and support staff in schools where only few pupils are enrolled wastes valuable public resources. In this regard, restructuring compulsory education schools is necessary. Merging and closing some of the schools, and extending catchment areas would reduce operating costs substantially, as would rationalising the number of teaching and professional support staff,

and introducing mechanisms to share these across schools when their workload is not sufficient to justify their full-time employment.[13]

The average class size in primary and lower secondary education appears too low. In primary education, the OECD average class size is three pupils more than Slovenia's 21.6. There is a similar sized gap for public lower-secondary schools, although class sizes in private schools are around the OECD average (OECD, 2010). With smaller class sizes than most other OECD countries, pupil-teacher ratios in Slovenia are unsurprisingly also lower than the OECD average, particularly in lower-secondary education (Figure 6).

Slovenia could increase average class sizes and pupil-teacher ratios without sacrificing either the quality or the quantity of the compulsory education. OECD evidence finds no systematic relationship between performance in international assessment tests, as measured by the results of the PISA study, and pupil-teacher ratios (Sutherland and Price, 2007).[14] Woessmann (2003) and West and Woessmann (2002) show only modest gains from reducing class sizes or increasing teaching staff. Other Central and Eastern European countries spend significantly less than Slovenia but are able to achieve largely comparable results in international tests. In addition, improvements were recorded in TIMSS and PIRLS assessments over a period when spending levels were virtually unchanged.

… and reduce the number of professional support staff

The operating costs of Slovenian primary and lower-secondary institutions are high due also to the relatively large number of non-teaching professional staff who provide support services to pupils, such as guidance counsellors, librarians, doctors, nurses, psychiatrists, and psychologists. Slovenian schools employ 9.4 professional support staff on average per 1 000 pupils, substantially higher than the OECD average of five (OECD, 2009a). The authorities should displace the redundant teaching and professional support staff in schools to improve the cost efficiency of the basic education system. School mergers and closures and expansion of catchment areas would be the key ingredients of any policy initiatives in this area.

Rationalising the number of staff, on the other hand, could be done in a number of different ways. For instance, not replacing retiring staff in full until more appropriate pupil-teacher ratios and average class sizes are reached could be one option to follow but it would not yield immediate results, as currently over 80% of primary school teachers in Slovenia are below the age of 50 (OECD, 2010). Another option could be to allow voluntary departures with sufficiently generous redundancy packages, which might involve training opportunities and job search assistance as well as short-term income support. The main downside of this line of approach would be adverse selection problems, as relatively gifted staff, with better options elsewhere, could be the ones choosing to leave. A final option could be to terminate the contracts of the redundant staff with adequate payout packages, accompanied by active labour market policies. One important issue in the implementation of this approach is the selection of the redundant staff. As Slovenia practices school-level rather than teacher-level evaluation, it is important to develop objective criteria to select lower performing staff.

In view of various socio-economic considerations that shape the design of the education system and the complexity of issues surrounding a relatively large scale restructuring, assembling a commission of experts would be very useful. Issues such as determining surplus staff, deciding how to extend catchment areas, the retraining or cross training needs of remaining staff, increasing the efficiency of the existing structure and assessing demographic trends require substantial amount of expertise.

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13.   The current legislation allows government employees to be dismissed for restructuring reasons.

14.   Krueger (2003) finds that class size is systematically related to achievement.

Improve education support to vulnerable groups, notably immigrants

Enhancing childcare could improve the education outcomes of pupils from disadvantaged backgrounds...

Access to early childhood education and care (ECEC or childcare) is increasingly recognised as a means to enhance educational outcomes for all (Gaber and Marjanovič Umek [2009], in the Slovenian context). It also helps to improve the labour market participation of females and to boost fertility rates (Lohmann *et al.*, 2009). In particular, pupils from disadvantaged backgrounds benefit from early childcare, which compensates for lower parental resources, thereby reducing the risk of late educational development (Hanushek and Woessmann, 2007). High quality ECEC improves educational outcomes and the behaviour of young children much more effectively than policy interventions that take place later (Magnuson and Waldfogel, 2005). Since, in Slovenia, children from an immigrant background often lack the motivation to become successful in their educational endeavours (OECD, 2007), encouraging the participation of pupils from such backgrounds in ECEC is essential.

Children from disadvantaged socio-economic backgrounds are more likely to be cared for at home by their mothers because the opportunity cost of staying at home is lower due to both lower potential earnings and a lower likelihood of finding employment (OECD, 2001). In addition, low-income parents often have to set aside a large proportion of their incomes if they want their children to attend ECEC. Although the inclusion of immigrant children in the education system two years prior to starting compulsory basic education is already recommended in Slovenia, the authorities should ensure greater participation of children from disadvantaged socio-economic backgrounds from an early age by providing means-tested subsidies for additional expenses, such as meals and out-of-school-hours care. Such subsidies could be paid for by rationalising ECEC as discussed below.

The authorities recognise the need to introduce mechanisms to better integrate children with an immigrant background in the education system. The 2007 Strategy on the inclusion of children with an immigrant background[15] notably encourages developing materials and techniques to teach Slovenian as a second language more efficiently and better informing parents about the school system, their rights and their duties. In view of the increasing net flow of immigrants and a relatively large population of immigrants currently residing in Slovenia, all the measures introduced by the Strategy should be maintained and adequately funded.

... provided that efforts to achieve efficiency gains are made

The authorities in Slovenia recognize the importance of ECEC and have made it more affordable through the 2008 amendment to the Pre-School Institutions Act.[16] The share of children enrolled in early childhood education has increased steadily, reaching 85% for children aged between three and five, and 50% for children under three years of age in the 2008–09 school year (IMAD, 2010), which is in line with the Barcelona objectives.

But the costs of providing ECEC services in Slovenia are rather high. In 2007, annual expenditure on pre-primary education per child (for children three years and older) was amongst the highest in the OECD, with only Iceland and the United States being higher. Spending on ECEC services relative to GDP per

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15. In 2009, guidelines for education of immigrant children in kindergartens and schools, which were based on the 2007 Strategy, were further improved.

16. The Act Amending the Pre–School Institutions Act provides that in cases where more than one child in a family attends kindergarten, the fee for the oldest child is one bracket lower than the fee assigned, and the fees for younger children are waived altogether.

capita, on the other hand, was the highest in the OECD at 32% and substantially exceeded the OECD average of 18% (OECD, 2010).

Financial incentives for putting children into childcare is likely to raise the demand further, making necessary a rapid expansion of the supply and associated costs (IMAD, 2010). Some appropriate steps have been taken recently to boost the supply of child-care places but the authorities should also aim at creating additional such places in a cost efficient way. For example, the government could grant concessions where it is deemed possible and appropriate. More importantly, it could allow the child-teacher ratios to rise. Currently, the ratio is low by international comparison, which in large part explains the high costs of ECEC services. Greater reliance on teacher aides would also reduce the costs of ECEC services. Another measure to boost supply of ECEC places and streamline inputs is to rationalise supply and demand mismatches across Slovenia. There is scope to transfer excess capacity to locations that face particularly strong demand. In some cities and towns, notably in Ljubljana, demand seems to be already very strong. For instance, the number of children who could not be placed in a pre-school was high in Ljubljana in 2009, reaching 18% of the total enrolment in the city; almost half of the children who could not be admitted into a pre-school programme in Slovenia were in Ljubljana. However, there are no signs of excess demand in smaller towns and average class sizes also tend to be lower.

The rapid expansion of childcare places may raise concerns over the quality of ECEC. Considering the disparate financial conditions of municipalities due to the economic downturn and rising enrolments in kindergartens, many local governments lack the resources to provide high quality services. This in turn means that the standard of ECEC services varies considerably across geographic areas. The Ministry of Education and Sport is preparing an amendment to make financial remuneration to kindergarten staff a part of the national budget, shielding the provision of ECEC services from fluctuations in the financial health of local governments, simplifying kindergarten enrolment procedures, and regulating appropriate monitoring systems for the safety of playground equipment. The government should proceed with this amendment and introduce further quality assurance guidelines and mechanisms to conduct evaluations of the pre-school institutions, while ensuring that the body that conducts evaluations is properly resourced.

Boost the participation of vulnerable groups in adult education programmes

Adult education programmes can provide an important vehicle to meet labour market demands in a flexible and swift manner, helping to improve the adaptability of the economy, to reduce unemployment and to boost social inclusion. Higher participation in such programmes can help mitigate the adverse impacts of the crisis by increasing the employability, particularly of low-skilled workers who are relatively weakly attached to the labour market. Moreover, skill shortages may arise during the transformation of transition economies into more advanced economies (Rutkowski, 2007). In such economies, adult education programmes can be heavily employed to upgrade the skills of adults who have limited possibilities to access formal education institutions.

Participation in adult education programmes is comparatively high in Slovenia, though it falls well short of the levels observed in Scandinavian countries. Adult participation in lifelong learning strongly depends on educational attainment and age. Despite a slight increase in recent years, the participation of older workers in adult programmes is modest, inhibiting their employment prospects (OECD, 2009b). Adults with low educational attainment (individuals whose highest attained degree is primary or below) show considerably less interest in adult learning activities; the difference between highly educated individuals and individuals with low educational attainment in adult education participation is the highest in the EU (IMAD, 2010). According to the Adult Education Survey (AES), the most frequently cited barriers to participation in adult learning in Slovenia are schedule conflicts with work (52.4%), high costs of adult education (45.9%) and family responsibilities (35.6%). Individuals with low educational attainment most frequently mentioned costs (63.2%), followed by conflicts with work schedules, and

problems related to health or old age (41.3% and 34.2%, respectively) (Eurostat, 2007). More affordable adult education is necessary to boost participation in lifelong learning and to bridge the gap in participation tendencies between individuals with low and high educational attainment. Currently, adult education is financed by public and private funds, with equal contributions from the state, employers and participants. Local communities sometimes also co-finance non-formal programmes. Targeted subsidies should be put in place to reduce or eliminate the cost of adult education paid by individuals with low educational attainment levels.

### *Enhancing job matching by better equipping students in vocational education…*

One of the major challenges for Slovenia is to transform the vocational and technical education (VET) systems that have played a major role in the education system. While vocational and technical education systems equip individuals with skills that give them direct access to the labour market, those skills can quickly become obsolete. Consequently, more general, advanced skills that allow individuals to adapt to the changing needs of industry and new technologies are now in greater demand in developed economies. Considering the pace of technological innovation, the value of narrow vocational qualifications has been disappearing fast. Therefore, while vocational skills are still crucial, it is important that workers have good general skills as well, helping them adapt easily to structural changes in the economy. Similar trends have been observed in other transition economies experiencing a shift in production from manufacturing to services. Workers with general skills and more education experienced better labour market outcomes, including shorter unemployment spells (Rutkowski, 2007).

Slovenia appears caught in a dilemma. On the one hand it needs to make short vocational programmes more attractive to prospective students. On the other hand, the education system has to become more focused on providing students with easily transferrable general skills. However, both challenges can be tackled together. One of the reasons for diminishing interest in short vocational secondary education programmes is the lack of direct access to tertiary education for those graduating from these programmes. One way of addressing this issue is therefore to align the core elements of different upper secondary tracks. This would allow more flexible transition from one track to another. Such a measure would more effectively allow capable pupils access to higher education. Although the 2006 reforms of vocational and technical education facilitated vertical and horizontal transition between study programmes and institutions, some vocational programmes, notably short ones, do not provide sufficient flexibility to those who would like to continue their studies at a higher level.

Another way would be greater involvement of the social partners, particularly employers, in the curricula of the programmes. In international comparison, the involvement of stakeholders in the VET system is limited, as is the current influence of business and industry on school curricula (Figure 8). The Slovenian education system has a combined school and work-based apprenticeship programmes, but only 1.6% of upper secondary education pupils participate in such programmes, although around 60% of them are enrolled in vocationally-oriented programmes. The 2002 reform of VET allowed 20% of the curriculum to be flexible, based on local needs and conditions. The authorities should introduce sufficient incentives to ensure greater involvement in the determination of curriculum and work-based study programmes. International evidence suggests that the employment performance of vocational upper secondary education graduates tends to be correspondingly favourable where participation in apprenticeship programmes is particularly high. Austria, the Czech Republic, Denmark, Germany and Switzerland are good examples in the prevalence and successful outcomes of greater employer involvement in VET (OECD, 2009a).

Figure 8. **Business and industry have little influence on school curricula**

Level of influence, percentage of students in reporting schools
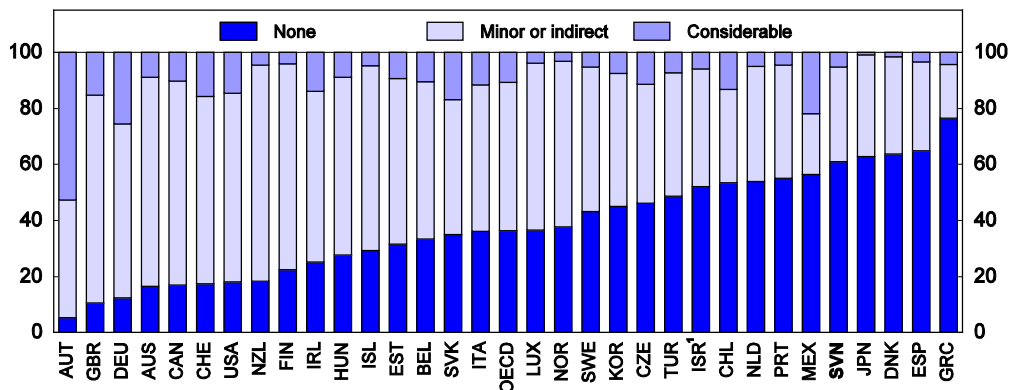
1. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD (2007), *PISA 2006: Science Competencies for Tomorrow's World.*

Another issue that is likely to exacerbate the problem is the wage-setting framework in Slovenia. In this regard, the recent steep hike in the minimum wage may further dampen the supply of vocational education graduates from short and medium-length programmes, as workers with specific vocational skills enjoyed only a slight premium over their non-educated counterparts even before the hike. The steep increase in the minimum wage might have an adverse impact on human capital acquisition by further compressing wage bands and thereby returns to education (see Box 1).

Box 1. **Impact of minimum wage hikes on human capital acquisition**

Economic research typically focuses on the effects of the minimum wage on employment rather than human capital acquisition and schooling. Nevertheless, the impact of minimum wage increases on human capital and schooling tends to be much longer-lasting than the employment effects as they set back human capital formation and employment prospects even later in life.

There are several theoretical channels through which minimum wage hikes distort schooling decisions and human capital accumulation. *First*, a higher minimum wage might meet the reservation wages of some students and induce them to drop out.* *Second*, increases in the minimum wage often result in the compression of wage differentials rather than all wages growing by the same rate. This is particularly relevant for specialised low-skilled workers with earnings close to the minimum wage. An obvious consequence of wage compression is to greatly diminish incentives to specialise through formal schooling or other means to develop new skills. In this regard, the minimum wage hikes might hurt enrolment in short vocational and technical programmes that help low-skilled individuals specialise in certain occupations.

There is mounting empirical evidence that increases in the minimum wage have perverse effects on the participation of young adults in education, although it is still a somewhat contentious issue empirically. Using Current Population Survey data in the United States, Neumark and Wascher (2003) find significant adverse effects of minimum wages on the enrolment of 16–19 year olds, with an estimated elasticity of around –0.3. Chaplin *et al.* (2003) confirm these results, using an alternative dataset covering the entire population of public school students in the United States. They established that a USD 1 increase in the minimum wage lowers continuation rates by around one percentage point. Pacheco and Cruickshank (2007) find that minimum wage increases have a statistically and economically significant impact on enrolment in New Zealand: a 10% increase in minimum wage lowers the enrolment of 16-19 year olds by 1.5 percentage points.

*   Although the composition of employment possibly changes in terms of new and old dropouts, as some new dropouts are likely to take jobs from the less-skilled and lower-educated teens who had already left school.

… and improving incentives in higher education

Tighten eligibility to in-study benefits beyond normal study length

As mentioned previously, completion rates are somewhat low at the tertiary level (except for vocational higher education) by international comparison (see Figure 4, Panel B). Only around 65% of those who enter a tertiary programme go on to graduate, while the OECD and EU19 averages are 69% and 71%, respectively. Besides, tertiary education students take almost seven years on average to complete their studies at the undergraduate level, among the longest in the OECD (Figure 9). The length of pre-Bologna degree programmes only partially accounts for the excessively long duration of studies. The repetition rates of students at the undergraduate level are very high, though declining slowly (IMAD, 2009b). This rate is the highest for the first year, reaching 13% in the 2009–10 academic year, but it drops to 9.4% and 4.3% in the second and third years, before going up to 6.3% in the fourth year.

Figure 9. **Slovenian higher education students take too long to complete their studies**
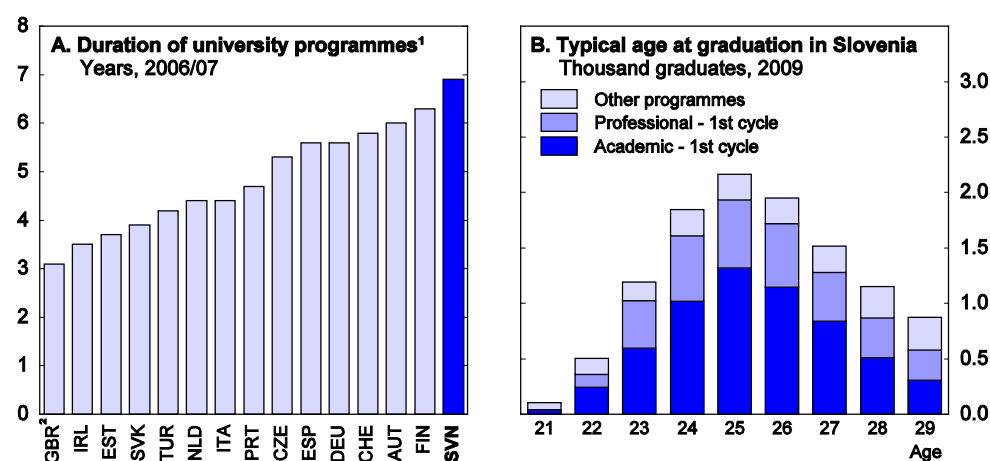
1. The survey covers all students who are national or permanent residents enrolled at higher education institutions and studying at ISCED level 5A.
2. England and Wales only. The average duration in Scotland is 4.4 years.

Source: Eurostudent (2008), *Social and Economic Conditions of Student Life in Europe, Final report, Eurostudent III 2005–2008* and SORS (2010), "Tertiary Education Graduates – General Overview", *SI-STAT data portal*, Statistical Office of the Republic of Slovenia, September.

Students enjoy generous subsidies and benefits, including subsidies for living expenses (meals, accommodation, transportation and cultural activities) and state scholarships (Figure 10). Student benefits went even further with the preferential treatment of student work until October 2010, when Parliament adopted a new bill that abolishes student work and introduces mini jobs.[17] Student work was an extremely flexible form of employment in terms of hiring and firing as opposed to regular employment, which is still heavily regulated in Slovenia. Employers also benefited from lower social contributions when they hired students, as students did not pay social security contributions (see Box 2 for more details).

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17. It still remains a contentious issue and has been strongly opposed by students and social partners, who can repeal the legislation in a referendum.

Figure 10. **Public subsidies for tertiary education come exclusively in the form of scholarships and grants**[1]

In per cent of total public expenditure on education, 2007[2]
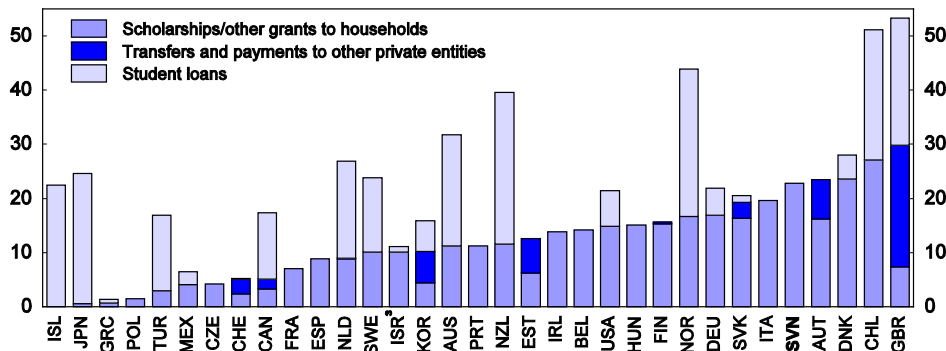
1. Public subsidies for education to households and other private entities.
2. 2006 for Turkey, 2005 for Greece.
3. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD (2010), *Education at a Glance 2010*.

Box 2. **Student work in Slovenia**

Student workers received preferential regulatory and tax treatment in Slovenia with the objective to prevent student poverty until the mini jobs legislation was introduced in 2010. Student workers enjoyed major benefits. *First*, student work was administratively very flexible. Employers did not have to go through the lengthy procedures to hire or fire student workers that were required for other workers. To qualify, students only needed a proof of student status (called a "student referral"). *Second*, neither students nor their employers had to contribute to the public pension fund or pay for social and health services, making student workers much cheaper than regular full-time employees. The main burden for employers was a special 14% concession fee, which was distributed to student employment agencies, the Student Organisation, and the public funds for scholarships and improvement of study facilities.

There were relatively few restrictions on student work, allowing both students and employers to use it extensively. There was no limit on the number of hours worked for students, though there was a limit on total monthly earnings, which was rather high (in excess of the median wage in the economy). More than one million student referrals were issued in 2008 and students performed 75 million hours of work (4.3% of total hours worked in the economy) (Šušteršič *et al.*, 2010).*

In addition to propping up student incomes, student work served the purpose of preparing students for the labour market and allowing them to gain experience in their prospective careers. Šušteršič *et al.* (2010) found that around one-third of student workers performed high-skilled jobs and they were more likely to perform demanding tasks if they were more advanced in their studies. There was also some correspondence between their field of study and the nature of work performed.

The attractiveness of student work gave students incentives to abuse the scheme and put young graduates competing with low-cost student workers at a disadvantage in the labour market (Šušteršič *et al.,* 2010). Many students chose to prolong their studies and continue working using the student status. In addition, many young people enrolled in higher education institutions only to obtain the student status and to be able to take advantage of the privileges of student work.

* Based on J. Šušteršič, B. Nastav and T. Kosi (2010), "Ekonomski vidiki študentskega dela" (Economic Aspects of Student Work), Faculty of Management Koper, University of Primorska.

Not surprisingly, the in-study benefits that are not tied to the progress of studies attract "fake students", who would not normally go into tertiary education in the absence of these benefits. The Student Organisation in Slovenia estimated that the share of "fake students" could be as high as one third. The apparent lack of conditionality between access to student benefits and progress of studies does not provide students, irrespective of whether a student is genuine or fake, with financial incentives for the rapid completion of their studies. The situation is exacerbated by lenient limits on the number of times repeat students can take the exam to continue their studies, making expelling an unsuccessful student very difficult and in turn helping individuals who exploit the system.[18]

Under the new legislation, the flexible contracts previously available only to students have been made available also to unemployed and older workers, and the number of hours someone can work will be capped at 60 hours a month.[19] Also, the holders of mini jobs are to pay social security contributions.[20] Conceivably, this is a step in the right direction, removing the incentives for "fake students" to go into higher education. On the other hand, the mini jobs legislation will likely lead to greater competition for temporary jobs which could only be claimed by students in the past. Considering the prevalence of student work and the support student work provides to their incomes, in the absence of additional measures, there is a risk of greater student poverty. This requires appropriate funding options (see following section).

Reforming the student fee system could help students finish their studies faster and reduce labour mismatch

Although the abolition of the preferential treatment of student work reduces the financial incentives for students to maintain their student status longer, reforming the current tuition fee system with universal subsidies would likely have an even larger and more direct impact on study durations and completion rates. This would go along with several other benefits, such as greater availability of funds for HEIs from private sources and encouraging students to make better informed decisions regarding what to study. The low share of private resources allocated to higher education in Slovenia and relatively high private returns suggest that there is room for introducing cost-sharing in funding higher education without undermining access and equity (Figure 11). Increasing the share of private expenditure on tertiary education would clearly reduce the duration of studies beyond what is necessary (Brunello and Winter-Ebmer, 2003).

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18. HEIs have discretion regarding the number of times a student can take the exam that determines whether they can continue in the study programme but current limits are relatively lax. For instance, a repeat student can take the exam up to six times to stay in the study programme at the University of Ljubljana.

19. The minimum hourly wage will be EUR 3.5 and the maximum EUR 8.

20. The tax rate will be set at 29.5%, with 15.5% earmarked for social security contributions, 6% for a special scholarship fund, 2% for construction of student dormitories and the rest for administrative costs and activities by student and pensioners' organisations.

Figure 11. **Slovenia relies on public spending to fund tertiary education**

Expenditure on educational institutions, 2007[1]
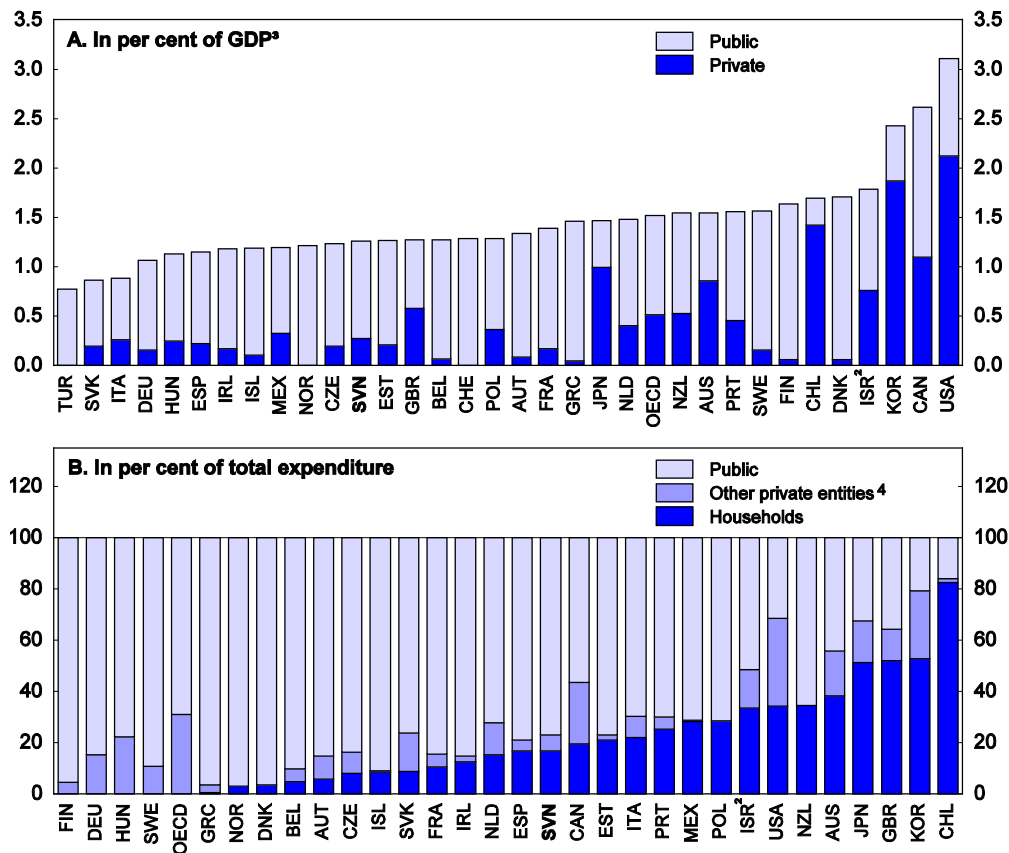
1. 2005 data for Greece, 2006 for Canada and Hungary.
2. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.
3. No data for private expenditure is available for Norway, Switzerland and Turkey.
4. Where no breakdown for household expenditure is available, this shows expenditure from all private sources.

Source: OECD (2010), *Education at a Glance 2010*.

One implication of these large public subsidies, however, is regressive outcomes, since workers as a whole fund education for individuals whose future earnings are likely to be high. The extent of redistribution of public resources is not only from the poor to the individuals who are likely to earn high returns to their educational investment in the future, but also to individuals from a privileged background, who have sufficient parental resources to undertake tertiary education investments. Therefore, universal public subsidies to higher education redistribute away from the lifetime poor, further reinforcing rather than reducing inequalities (Barr, 2001). Another element of the current higher education funding arrangements that goes against the equity principle of the higher education system in Slovenia is the dual system of charging tuition fees. Part-time students and students in non-subsidised places at private HEIs pay substantial tuition fees ranging from EUR 2 000 to 10 000 a year, depending on the study programme while their full-time counterparts do not.[21] As students from less privileged backgrounds are more likely to have greater difficulties to finance their studies, this system is regressive.

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21. They pay small administrative fees covering registration and certification costs. The fees were around EUR 25 in the 2009/10 academic year.

Considering the challenges facing the Slovenian higher education system, including the need to raise funds from private sources, to reduce skill mismatches in the labour market, and for timely progression of tertiary studies, one policy option is to introduce universal tuition fees for full-time students along with income-contingent loans (ICL) with repayments linked to post-graduate income to ensure equity in access. These arrangements can reflect the true costs of study programmes and economy-wide externalities to give students further financial incentives to go into fields where social benefits of tertiary education exceeds private benefits (see Box 3). In the absence of tuition fees, the authorities generally have to rely exclusively on grants to align social and private benefits. In cases where grants do not provide sufficient incentives, subsidies to tuition fees could be a flexible alternative to introduce adequately large financial incentives. In addition to the benefit of making students repay the costs of their tertiary education, students would be more attuned to labour market signals. If tuition fees vary across institutions and fields of study with different curricula, costs and returns, students are more likely to go into the fields and institutions that will give them better chances of success in the labour market (Oliveira Martins *et al.*, 2007).

Box 3. Social returns to tertiary education

For governments considering subsidising higher education it is important to estimate the magnitude of social returns in excess of private returns to education. While private returns largely reflect wage and employability *premia* stemming from additional years of schooling for an individual, social returns focus on productivity gains at the aggregate level. In this respect, social and private returns differ markedly, if there is a purely "signalling" role of education and/or there are substantial human capital spillovers.

Individuals may benefit from high private returns to their educational investments, even if these investments do not augment their human capital. Spence (1973) shows that, if education is sufficiently costly for low-ability individuals, only high-ability individuals will invest in education, thereby signalling their higher productivity to potential employers. While the signalling role of education might help improve matching in the labour market and returns to education are positive from an individual's point of view, at the aggregate level, costs of education might outweigh these benefits, making social returns significantly lower than private returns.

In the presence of positive human capital externalities, these spillovers drive a wedge between social and private returns to education. As the full benefits of investment in human capital do not accrue to individuals who participate in education, socially suboptimal levels of investment can prevail. State subsidies for education could be utilised to reduce the gap between private and social returns, internalising some of the externalities.

Two different approaches are predominantly adopted to determine the size of social returns to education in the literature. The first one is a macro approach, drawing on the empirical growth literature. The role of human capital accumulation in explaining income differences across countries and over time is explored extensively (Mankiw *et al.*, 1992). The second approach involves including the average human capital stock in the region where the individual lives into the Mincerian wage equations along with other standard controls, based on the idea that human capital has the characteristics of a local public good in addition to the individual benefits. Accounting for average educational attainment in the area where the individual is located may provide some evidence regarding the quantitative importance of human capital externalities (Rauch, 1993; Ciccone and Peri, 2006).

The balance of overall evidence points to private returns to tertiary education significantly exceeding social returns. Psacharopoulos (2009) provides a compilation of some estimates of social and private returns to tertiary education for 33 EU member and candidate countries. Consistent with demanding data requirements for estimating social returns, there are more private than social return estimates. Private internal rates of return, which average 10.2%, exceed social returns by 2.3 percentage points. In three out of the 16 cases for which social return estimates are available, social returns are higher than private returns (by 2 percentage points in Germany and 0.3 percentage point in Ireland). Although there are no available social returns estimates for Slovenia, it is unlikely that they are anywhere near the levels that justify current funding arrangements.

There are clearly important decisions to be made regarding the repayment parameters (see Box 2.4). These parameters include the income threshold above which borrowers make payments, how progressively repayment rates rise with income and what interest rates apply to debt. The determination of the parameters of a prospective ICL scheme obviously depends on country-specific factors and anticipated labour market outcomes and must be supported by micro simulation analysis. Nevertheless, there is evidence that ICLs would be workable in Slovenia. Vodopivec (2004) explores the financial performance of an ICL scheme based on a simulation study, benefiting from rich longitudinal data on all labour force participants in

Slovenia. He finds that, with the target cost recovery rate of 20% and contribution rate of 2%, 55% of individuals would have repaid their entire debt within 20 years; 19% of individuals still would not have repaid any of their debt after 20 years. The "leakage" of the scheme due to uncollected debt would have been 13.5% of total lending. He also notes that implementation costs would be minimal, amounting to less than 0.5% of collected debt.

Box 4. **Loans with income-contingent repayments**

A critical issue in providing finances for higher education is the presence of credit constraints due to difficulties in borrowing against future human capital to invest in further education. Potential lenders would refrain from providing students with financial resources to invest in higher education in the absence of government intervention. This market failure is addressed by extending government-guaranteed bank loans to students so that potential lenders are protected against the risk of default. This approach, however, has some shortcomings. *First*, making such arrangements universally available would be prohibitively expensive as the default risk is assumed by the public sector. Rationing such loans on the basis of means-tested parental resources is a solution but it raises difficulties for students that do not have access to either these loans or the resources of their well-off families. *Second*, as the repayment of such loans does not take into account the future capacity of borrowers, some risk-averse students would be unwilling to undertake these loans, especially if defaulting is costly. *Third*, graduates facing high loan repayment obligations would be more likely to choose careers with high earnings rather than low-paying but socially productive ones.

Income-contingent loans (ICL) offer a potential solution to the shortcomings of government-guaranteed loans, while still dealing with capital market imperfections. The defining characteristic of ICL schemes is that the collection of debt is tied to the borrowers' future capacity to pay. Repayments are not required in periods of low income, ensuring that borrowers are able to meet their repayment obligations and to smooth their consumption across periods of high and low income. In other words, ICLs provide a mixture of consumption-smoothing benefits and insurance against the uncertain outcomes of risky educational investments.

There are several income-contingent financing instruments: risk-sharing, risk-pooling, graduate taxes and human capital contracts. As the name suggests, in risk-pooling ICLs, default risk is assumed by the cohort of borrowers *ex post*, while the public sector takes on the default risk in risk-sharing ICLs. Graduate taxes involve paying a certain fraction of future incomes for an agreed period of time regardless of the amount borrowed, making it a very progressive debt collection mechanism. Human capital contracts are private contracts in a form very similar to graduate taxes. These income-contingent financing instruments have theoretically distinctive features to reach different social and economic outcomes, but only ICLs with risk sharing have been implemented in practice. Most notable examples that have successfully implemented ICLs are Australia, which instituted the world's first broadly based income-contingent charging system for higher education in 1989, New Zealand, and the United Kingdom.*

Countries differ in their implementation of ICL schemes. While the Australian and UK systems cover only tuition fees, the New Zealand system is designed to cover both tuition fees and living expenses. The approach towards the interest rates charged for ICLs varies across countries, as well. New Zealand and the United Kingdom subsidise interest charges on loans, with New Zealand tying the extent of subsidies to the financial situation of borrowers. Australia, on the other hand, indexes debt to the consumer price index, effectively charging zero real interest rate. Higher Education Institutions (HEIs) in New Zealand and the United Kingdom are free to set their own tuition fees but they are capped to contain costs. In Australia, on the other hand, there is no price discretion for HEIs, but there are three bands of costs for different study programmes. In New Zealand and the United Kingdom, the proceeds go directly to HEIs, allowing resource allocation effects within the higher education system. In addition, the United Kingdom and New Zealand opt to offer means-tested grants to students from disadvantaged backgrounds along with the loan component with a view to improving their access, but there seems to be little direct evidence that these grants have been successful in boosting such students' participation in higher education.

International experience suggests that a successful implementation of ICLs impinges on having a comprehensive tax system that could be used to efficiently track borrowers and their incomes, and collect loan repayments, making the scheme viable and reducing the operational costs of running it. Operating an ICL scheme outside the public sector is likely to be very costly, as uniquely identifying borrowers, and keeping track of their repayment obligations and their true future incomes would require substantial resources. The administration of ICLs through the tax system reveals a potential problem. If emigration is high, tracking borrowers would be rather difficult and sustainability of ICLs would be difficult due to defaults. Slovenia, with its relatively advanced tax system, is well placed to administer and operate an ICL.

*   Some short-lived and restricted implementations of ICLs took place in the United States, as well.

If introducing universal tuition fees with ICLs does not prove possible,[22] the authorities could alternatively consider introducing stricter eligibility criteria for tuition waivers, notably in the form of waiving tuition fees only during a period that is considered the normal study duration. The new National Higher Education Master Plan 2011-20, which is expected to be adopted by Parliament in 2011, has proposals along these lines. It stipulates that students will have to pay tuition fees beyond the normal length of study programmes (4 in the first cycle, 2 in the second, 3 or 4 in the third, for Bologna-compliant programmes). In the second and third cycles, if students fail to complete their programmes, they have to return the costs of their studies. While these measures may shorten study durations, they will not be able to address the broader set of problems of the Slovenian higher education system. They may also deter students who are risk-averse and/or are from a disadvantaged background from participating in higher education in the first place, as they may face financing difficulties later in their studies.

Bolster mobility in higher education

In Slovenia, the structure of enrolment in higher education by regions reflects a bias towards local institutions. The pattern of enrolments in the first grade of undergraduate professional and university education by regions reveals that most students attend higher education institutions in the regions of their residence. For instance, the greatest share of the students of the University of Ljubljana comes from the central region of Slovenia (*Osrednjeslovenska regija*), where Ljubljana is located. The same holds for the Universities of Maribor and Primorska. Overall, around 65% of students come from the same region as their higher education institutions.

To the extent that HEIs have a captive market, they are less likely to strive to create quality study programmes that meet the demands of the students and the labour market, as student mobility acts as a mechanism to stimulate quality and responsiveness of the education system. In the absence of differential tuition fees, the driving factor behind the low inter-regional student mobility is the economic conditions of students and their parents. State cash support represents less than 10% of the total income of students living away from home, whereas this share is over 60% in Sweden and exceeds 40% in Finland, the Netherlands and the United Kingdom (Eurostat, 2009).[23] In this respect, Slovenia should introduce more targeted scholarship and loan schemes for students studying away from their region of residence.[24]

International student mobility is also low in Slovenia (Figure 12). The share of foreign students in Slovenia (0.9% of total enrolment) and the proportion of Slovenian students studying abroad (2.1% of total enrolment) in 2007 were among the lowest in both the OECD and EU (IMAD, 2010). Even with the advent of the Bologna Process, which introduced measures to facilitate student mobility, there has been little change in the share of international students who choose Slovenian higher education institutions to continue their studies, or of Slovenian students who choose to study abroad.

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22.   High marginal personal income taxes are put forward as the reason behind the lack of tuition fees in Slovenia. Financing higher education this way is potentially associated with a considerable deadweight loss. High marginal taxes pose a significant barrier to entrepreneurship and inflows of high–skilled immigrants.

23.   Direct non-cash support, such as subsidised accommodation, tuition fees and health insurance, is not taken into account and support to parents is also excluded.

24.   There are some minor financial incentives for students studying outside of their home towns. For instance, the income threshold for the means–tested National scholarship is slightly higher for those studying away from home. Also, the merit–based Zois scholarship amounts are determined based on, among other factors, the distance between the city of studies and permanent residence. The adjustment, however, is somewhat minor.

Figure 12. **Internationalisation of Slovenian tertiary education is very low**
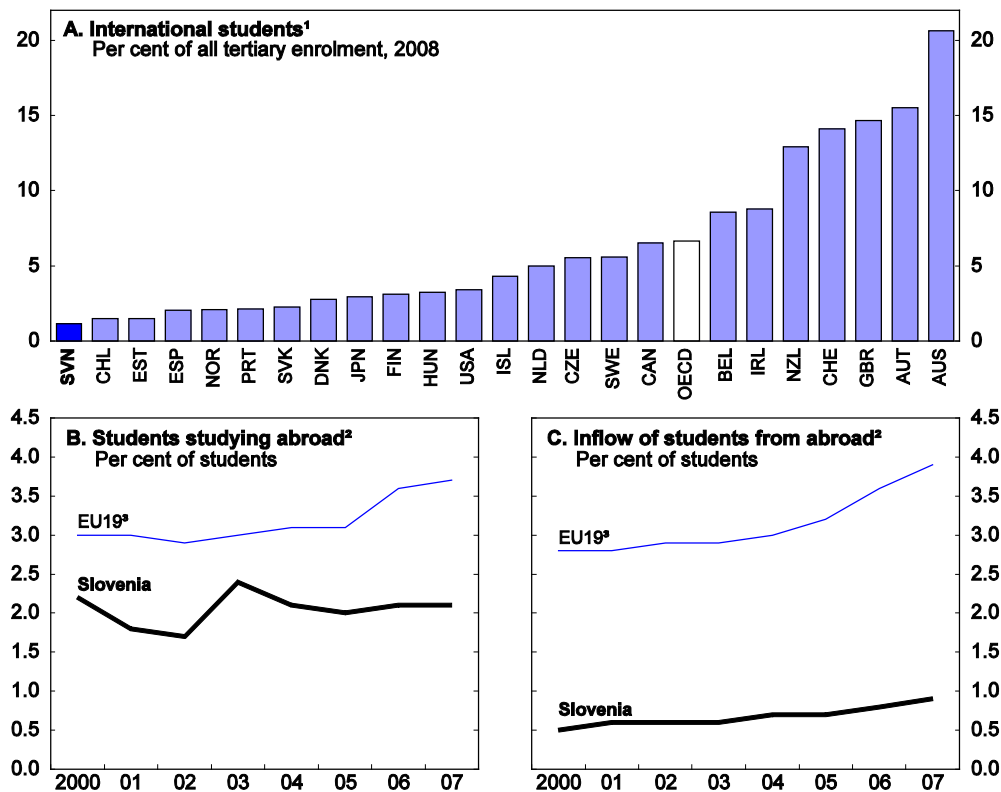
1. Defined on the basis of students' country of residence or the country where students received their prior education depending on data availability.
2. Based on data from Eurostat covering the European Union, the European Economic Area and EU candidate countries.
3. Unweighted average of EU member countries that are also members of the OECD, excluding Luxembourg.

Source: OECD (2010), *Education at a Glance 2010* and Eurostat (2010), "Education and Training", *Eurostat database*, September.

One reason for the lack of outbound mobility is the generous subsidies higher education students receive in Slovenia and most of these subsidies are not portable. Although, there is some portability of financial support, it is unlikely to provide sufficient means to study abroad without additional private resources. For example, students studying abroad for a limited period, primarily through the ERASMUS programme, can continue to receive scholarships (merit-based, Zois, and means-tested, national scholarship) under the same conditions as the students remaining in Slovenia (for further details on the scholarships, see Box 3.4 of OECD, 2009b). If students go abroad to study in programmes that are not available in Slovenia or they can prove that studying abroad will substantially enhance their expertise and employability, they also can claim the national scholarships for the entire duration of studies. However, considering that the average amounts of Zois and national scholarships were EUR 225 and 175 a month in 2008, respectively, financial barriers still exist in the absence of access to loans or parental help. As students studying abroad do not take advantage of subsidies to cover living expenses such as public transportation and free healthcare, additional grants or loans should be introduced to make outbound student mobility less financially unappealing. These grants or loans should be specifically earmarked for outbound mobility of students.[25]

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25. *Ad Futura* scholarships are specifically targeted at the mobility of researchers and post–graduate students but their scope remains limited.

The very low share of inbound international students could be caused by a number of different factors, including the lack of internationally outstanding institutions and accredited programmes, but the restriction on the language of the classes that can be offered is straightforward to link with the lacklustre performance. By law, HEIs that offer a course in a foreign language must offer the same course in Slovenian. This evidently discourages HEIs from offering courses and study programmes in international languages, given scarce teaching resources. The dominance of Slovenian as the language of most courses makes it a potentially appealing destination only for students from neighbouring former Yugoslav Republics, with which the language barrier is not a big issue and who benefit from regional cooperation initiatives in the higher education area. The authorities should abolish the requirement that HEIs offer any course in a non-Slovenian language must teach the same course in Slovenian in order not to overburden HEIs, as well as swiftly proceeding with Bologna reforms.

Overall, the Slovenian education system has performed relatively well to date but faces new challenges with the changing structure and needs of the labour market. *First*, there is scope for improving spending efficiency in compulsory education and early childhood education and care, which would free up some resources to be diverted to underfunded areas of the education system. *Second*, the vocational education system fails to meet labour market demands, creating a skill shortage in certain occupations. Higher education is primarily financed from public resources with limited private spending and available funding falls short of adequate levels, while study durations are excessively long. The Slovenian education system has the institutional features to meet these challenges by following the recommendations presented in Box 5.

Box 5. Recommendations on improving educational outcomes

Ensuring the availability and quality of child-care places

- Improve spending efficiency in early childhood education and care provision and boost supply by allowing pupil-teacher ratios to increase.

- Reduce the geographical mismatch of child-care places.

- Introduce quality assurance guidelines and mechanisms to conduct evaluations of the pre-school institutions and ensure that the body that conducts the evaluations is properly resourced.

Improving spending efficiency in basic compulsory education

- Restructure the compulsory education system by merging and closing the schools that serve too few students, and extend catchment areas to reduce operating costs.

- Rationalise surplus teaching and non-teaching staff.

Making vocational secondary school education more attractive to students and relevant to labour-market conditions

- Better inform potential candidates for vocational and technical training about career opportunities.

- Further increase employer involvement in vocational education to better adapt curricula to labour-market requirements.

- Facilitate more flexible transition from vocational to academic tracks to make it easier for vocational students to access higher education.

Improving the funding and efficiency of the higher education system

- Introduce universal tuition fees, determined by higher education institutions, in tandem with loans with income-contingent repayment.

- Make adequate levels of public funding available to higher education institutions, particularly if raising funds from private sources through introducing fees is not possible.

- Tie in-study benefits, such as access to free health care, subsidies for living expenses and state scholarships, to adequate progress of studies.

- Take into account student progress when allocating funding to higher education institutions.

- Phase out the grandfathered element in the funding mechanism for higher education and give more weight to performance to better meet institutions' financing needs.

- Provide better information and financial incentives to ensure that students are encouraged to undertake study programmes with high social returns.

Bolstering student mobility

- Ensure adequate financial support is available to students seeking to study abroad.

- Ensure that official accreditation is available to programmes meeting quality standards.

- Develop study programmes that are more attractive to prospective foreign students and relax restrictions on offering courses in non-Slovenian languages.

Improving accessibility of adult education

- Put in place targeted subsidies to reduce adult education costs paid by individuals with low educational attainment levels, who are also most likely to benefit from these programmes.

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Annex A1

The education system in Slovenia

Slovenia developed its own comprehensive education system after gaining independence in 1992. Major reforms were undertaken to create a broad-based, inclusive and modern education system, including changes to the organisation and financing of education. For instance, the Higher Education Act was adopted in 1993 to provide the legislative basis for modernising tertiary education and some important amendments to the Act followed in 1999, 2004 and 2005.

Administrative control is shared by national and local authorities as well as schools. Since 2005, there have been two separate ministries responsible for the education system at different levels. The Ministry of Education and Sport is responsible for developing and implementing education policies, inspection procedures, and the allocation of funds related to pre-primary, basic compulsory and upper secondary institutions. The Ministry of Higher Education, Science and Technology, on the other hand, performs similar tasks for higher education and research. Post-secondary vocational education falls within the competence of the Ministry of Education and Sport.

Education in Slovenia starts with non-compulsory pre-school education. It is carried out predominantly by public kindergartens that accept pupils between the ages of one and six (the compulsory schooling age). Providing pre-school education is a responsibility of municipalities which establish, fund and staff pre-school institutions. Public pre-school institutions are financed jointly by local communities from parental contributions, the state budget for some specific purposes and private donations. Private pre-school institutions are also eligible for state funding if they are granted a concession.

Almost all pupils attend public schools at basic and upper secondary levels. Public schools are established and funded entirely by central and local governments.[26] Compulsory basic education lasts for nine years and is structured as three triads.[27] Teachers work together with kindergarten teachers in the first year of the first triad, with a single class teacher working with children during the rest of the triad. In the second triad, specialist subject teachers are gradually introduced. Classes are taught exclusively by specialised subject teachers in the third triad.[28] Since 2006, some subjects have been taught by two teachers and it is possible to group pupils within a class and to stream them into different subjects. Pupils that successfully complete basic compulsory education may continue their education in any general or vocational secondary school with some restrictions on the location of the school. Pupils that attend but fail to complete compulsory education successfully are given a certificate to allow them to enrol into short vocational education programmes.

The upper-secondary education system features general as well as vocational and technical tracks, making it a rather diversified part of the education system in Slovenia. General upper secondary education is performed in gymnasia *(gimnazije),* which are further divided into general gymnasia with no specific field of study and specialist gymnasia that concentrate on technical subjects, economics or art.[29] They are

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26. In the school year 2008/09, there were 849 compulsory schools, of which only three were private. There were also six private and 136 public upper secondary education institutions.

27. The implementation of the new nine–year basic compulsory education began in the 1999/2000 school year and it has been adopted in all schools in the country since the 2003/04 school year.

28. In small schools, there is a possibility to form multi–grade classes to teach pupils of different ages together.

29. They also include the classical variant that features Latin in compulsory and Ancient Greek in optional subjects.

all four–year programmes that culminate in the General Matura examination, which is an externally assessed exam in five subjects, three of which are compulsory and two are elective, and is required for enrolment in post-secondary and higher education.

Vocational and technical upper secondary education covers a broad range of programmes. Pupils can enrol in: *i)* short vocational programmes (*poklicno izobraževanje*) that typically last two and a half years; *ii)* secondary vocational programmes (also classified under *poklicno izobraževanje*) that last three years in school or, in the dual system, in school and at the place of employment; and *iii)* secondary technical education programmes (s*rednje tehniško in strokovno izobraževanje*) that last four years. Secondary technical qualifications can also be acquired through completing a two-year vocational-technical upper secondary programme (s*rednje poclicno-tehniško izobraževanje)* after a three–year secondary vocational programme, or passing the master craftsman, foreman or shop manager exam at the Chamber of Craft or Chamber of Commerce. Technical and professional schools as well as vocational schools end with the Vocational Matura exam, which is a nationwide exam covering four subjects. There is also a possibility for general upper-secondary graduates to attend special one–year courses *(Poklicni tečaji)* organised to prepare them for taking the Vocational Matura, if they would like to earn a vocational qualification and enter the labour market. Conversely, vocational and technical upper-secondary graduates can attend one–year courses (*Maturitetni tečaj*) to take the Matura exam and become qualified to enrol in a higher education institution. Social partners play a role in planning, programming and implementation of vocational and technical upper secondary education programmes.

Tertiary education covers higher education and post-secondary vocational education (two–year vocationally-oriented study programmes) which was separated from higher education after the Higher Education Act was introduced in 1993. Tertiary education is provided both by public and private institutions that include universities, faculties, art academies and professional colleges.[30] Public higher education institutions follow a dual system in charging tuition fees. While full-time students with state-sponsored places do not pay any tuition fees, part-time students do. Upper secondary graduates that pass the Matura exam have access to higher education. Students can directly enrol in the study programme of their choice, if there are enough places. In case the number of applicants exceeds the number of places, higher education institutions have the autonomy to select students. Selection is generally based on upper-secondary grades, Matura scores and/or an aptitude test.

Higher education consists of three cycles. The first cycle includes undergraduate professional and academic programmes, and the second and third cycles involve master's and doctoral programmes, respectively. Before the 2004 amendment to the Higher Education Act, which introduced the Bologna Process[31] compliant study programmes (to better integrate the Slovenian higher education system with the European system), higher education programmes were binary in terms of their levels: undergraduate and post-graduate. All higher education institutions are to fully implement the Bologna compliant study

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30. In the 2009/10 academic year, there were three public universities with 53 member institutions, two private universities with seven member institutions, and 26 single higher education institutions (of which 12 were eligible for state subsidies).

31. The Bologna Process is an initiative launched in 1999 with the Bologna declaration by ministers in charge of higher education from 29 European countries to create a European Higher Education Area in which students, graduates and higher education staff move relatively easily. Currently, 47 countries, which are also party to the European Cultural Convention, participate in the process. It stipulates: *i)* developing an overarching framework of qualifications for the European Higher Education Area, notably comparable degrees organised in a three–cycle structure and a common definition of learning outcomes in this three–cycle structure; *ii)* a common quality assurance system; *iii)* the recognition of foreign degrees and other higher education qualifications.

programmes from the 2009/10 academic year.[32] Undergraduate higher education programmes are provided at universities as well as at other higher education institutions and last for three or four years (a maximum of six years in the pre-Bologna system academic programmes; three to four years in the new Bologna-compliant academic and professionally-oriented programmes) and lead to a *Diploma* degree. Graduate studies lead to a *Specializacija* (one to two years after earning an undergraduate degree in the Pre-Bologna system and does not exist in the new system), *Magisterij* (equivalent to the Master of Science degree in the pre-Bologna system and earned after one to two years in the new system) and *Doktorat* degrees (Doctor of Science).

Adult education in Slovenia covers a wide range of formal and non-formal education and training activities. There are three main ways for continuing education and training. *First*, for adults who failed to or did not complete their upper secondary education, it is possible to continue vocational and Matura preparation courses, allowing them to obtain upper secondary school certificates. They can also take the master craftsmen examination to obtain the title of Master, if they have completed vocational education in the past and have three or more years of work experience. The Master title allows the holder of title to continue studies at a higher vocational level. The same rules and regulations apply both to adults and youth. *Second*, the system of Certification of National Vocational Qualifications is developed to provide an option alongside the traditional vocational education and training (VET). Numerous stakeholders, including the Ministry of Labour, Family and Social Affairs, the Centre for Vocational Education and Training, the Adult Education Centre, the National Examination Centre, the Employment Office, and chambers and trade unions, take part in certifying vocational qualifications. These bodies are primarily financed from the state budget. *Third*, non-formal education and training that does not lead to a higher qualification is provided by adult education institutions that include in-company training centres, formal education institutions that provide supplementary courses and commercial schools that specialise in certain fields such as foreign languages.

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32.   Students who are enrolled in pre–Bologna programmes prior to the 2009/10 academic year can continue their studies under the conditions prevailing at the time of their entry into the programme. They must, however, graduate by the 2015/16 academic year.

Figure A1.1. **Structure of the education system**[1]
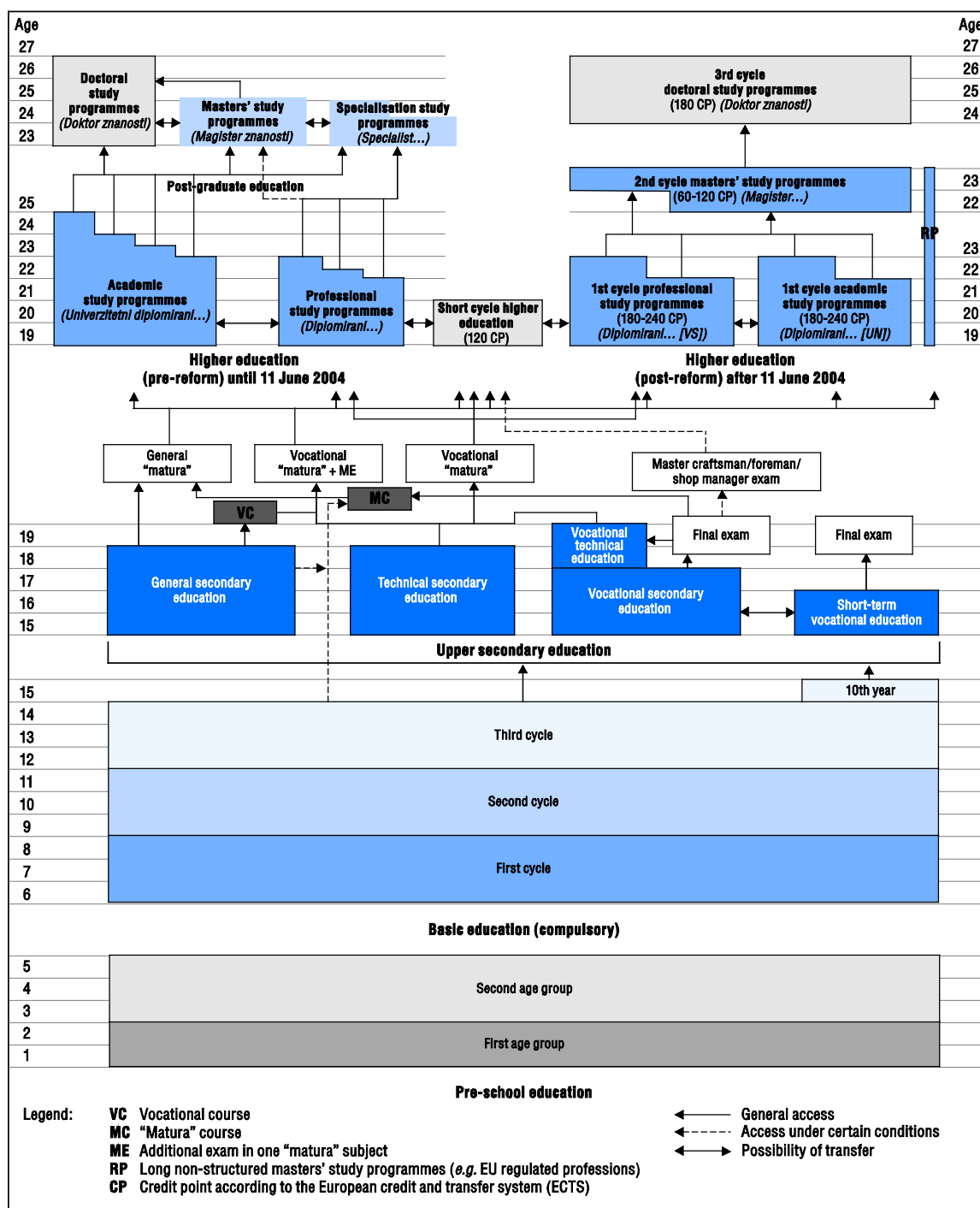
1. Italics indicate the diploma awarded.

Source: Ministry of Education.

Annex A2

Private returns to education in Slovenia

The optimality of educational investment depends on returns, similarly to other types of investment. Internal Rates of Return (IRR) to education are a standard measure in the literature of the profitability of undertaking additional years of schooling and are used to summarise financial incentives, both costs and benefits, associated with studying. IRR depend on several factors, including labour market outcomes, average and marginal tax rates, the share of students' time worked, study duration, tuition fees and social benefits received over the life span.

There are a number of approaches for estimating IRR (see, for instance, Heckman *et al.* [2006] for a review) and they have become more and more sophisticated, with recent estimates relying on frameworks that account for different kinds of lifetime economic benefits and costs of schooling (Boarini and Strauss, 2007; de la Fuente and Jimeno, 2005). The most common methods are the discount method and the Mincerian approach. The discount method is an application of cost-benefit analysis to the decision making process regarding further educational investment. In the discount method, the optimality of the investment is assessed at the margin and the resulting rates of returns are compared with that of alternative investments. For instance, Blöndal *et al.* (2002) used the discount method to compute private and social rates of return for ten OECD countries in 1999–2000. While the discount method has the advantage of summarising various benefits and costs associated with further education, it often relies on more broad-brush average earnings across educational groups, failing to control for other relevant individual characteristics.

The Mincerian approach which is adopted in this study relies on the estimation of earning equations using individual-level data (Mincer, 1974). In its simplest form, the log of gross earnings is regressed on educational attainment, linear (and quadratic) terms capturing labour market experience, tenure and other relevant individual characteristics. The coefficient of educational attainment is interpreted as the percentage wage differential due to an additional educational investment. The major advantage of this approach lies in its simplicity. However, it fails to account for the costs of education, taxes and social benefits that workers pay/receive over their life span.

Clearly, the rates of returns estimated by the two approaches differ insofar as the costs of education, taxes and social benefits are substantial. Different underlying assumptions on the age-earnings profile also lead to differences between the two. In order to have the wage premium estimated through Mincerian approach to be equal to an IRR, the assumption that experience-earnings profiles are parallel across schooling levels is required (Heckman *et al.*, 2006).

Data

The Mincerian approach by its nature requires cross-sectional data on educational attainment, wages and other individual characteristics. European Union Statistics on Income and Living Conditions (EU-SILC) provides internationally comparable, cross-sectional and longitudinal data on labour, education and health information at the individual and household level in the European Union. More specifically, they cover employment, unemployment, job search and history, income, education and training, health, migration, life satisfaction and social relations at the individual level. In EU-SILC the highest educational attainment is recorded along a simplified version of the ISCED-97 classification, which distinguishes six

levels of education.[1] It, however, does not contain any information on distinctions within levels of education in terms of programme orientation (general or academic versus vocational or technical courses), making it unsuitable for estimating returns to different types of tertiary programmes. Given the relative prominence of vocational and technical courses in Slovenia, the data availability issue prevents us from looking into deeper issues. Moreover, in order to focus on returns to tertiary education, the existing classification was further reduced to three levels of highest educational attainment: below upper secondary, upper secondary and tertiary graduates.

Specification

The econometric specification follows Strauss and de la Maisonneuve (2007) as far as possible to ensure comparability with the larger set of estimates that they provide. In particular, the following equation is estimated using OLS (indices for individuals are suppressed for expositional simplicity):

$$\log(hrw) = \alpha_0 + \alpha_1 * edu1 + \alpha_2 * edu3 + \alpha_3 * edu1 * female + \alpha_4 * edu3 * female$$
$$+ \beta_1 * exper + \beta_2 * exper * female + \beta_3 * married + \beta_4 * part\_time$$
$$+ \beta_6 * healthy + \beta_7 * indefinite + \varepsilon$$

where:

female	dummy for female workers
hrw	gross hourly wages
edu1, edu3	dummies for less-than-upper-secondary and tertiary educational attainment, respectively
exper	number of years of experience in the labour market
married	dummy for married individuals
part_time	dummy for part-time worker
healthy	dummy for persons with serious health issues
indefinite	dummy for persons with a permanent contract

This specification misses some of the characteristics that are controlled for in Strauss and de la Maisonneuve (2007). Most notably, job tenure, the over or under-qualification dummy, and the number of workers in the individual's production unit and the dummy for public sector jobs are excluded due to data availability issues. As an additional control, a dummy variable for individuals with serious health issues is included in the empirical specification. Overall, the estimated wage *premia* are likely to be higher than those that would have obtained with the full set of controls as additional job and individual characteristics tend to decrease the coefficient of interest in the regression equation.

The estimation strategy we adopted here fails to account for possible endogeneity and selection bias issues. Educational attainment is correlated with unobserved intrinsic abilities that are also determinants of earnings, leading to biased wage *premia* estimates. The approach adopted here overlooks possible selection bias issues as only employed individuals are included in the sample. Strauss and de la Maisonneuve (2007) show both these problems have only limited impact on the estimates.

Results

The estimation of Mincerian wage equations reveals that the hourly gross wage premium on completed tertiary education in Slovenia reached 95% in 2005 and 86% in 2008, which were rather high by

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1.   They include: less than primary education, primary education, lower secondary education, upper secondary education, post–secondary non–tertiary education, first stage of tertiary education and second stage of tertiary education (corresponding to ISCED levels 5 and 6).

international comparison (Table A2.1).[2] In view of long study durations, these large *premia* do not translate into correspondingly high per annum wage *premia* of tertiary education. Using the average duration of tertiary studies in Slovenia, which was 6.9 years in 2007, per annum wage *premia* were 10.2% in 2005 and 9.4% in 2008.

Table A2.1. **Results of the Mincerian wage regressions**[1]

	2005			2008		
edu1	−0.286	**	(0.041)	−0.271	**	(0.033)
edu3	0.676	**	(0.05)	0.617	**	(0.034)
female	−0.212	**	(0.052)	−0.193	**	(0.042)
edu1*female	−0.072		(0.052)	−0.032		(0.044)
edu3*female	−0.052		(0.067)	−0.046		(0.042)
experience	0.011	**	(0.002)	0.009	**	(0.001)
female*experience	0.008	**	(0.002)	0.005	**	(0.002)
married	0.005		(0.022)	0.047	*	(0.018)
indefinite	0.449	**	(0.04)	0.424	**	(0.037)
healthy	0.175	**	(0.036)	0.165	**	(0.024)
part_time	−0.095		(0.082)	−0.261	**	(0.058)
constant	0.986	**	(0.092)	1.367	**	(0.076)
Observations	3409			3814		
R-squared	0.260			0.349		

1. The dependent variable is the log of hourly gross wages. Robust standard errors are shown in parentheses. The asterisks indicate p-values as follows: **<0.01, *<0.05.

2. Through a simple algebraic manipulation, it can be shown that the wage premium for tertiary graduates is exactly equal to $e^{\alpha_1 + \alpha_4 * female} - 1$.

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