



OECD Reviews of Tertiary Education

Estonia

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Per Högselius, Maria José Lemaitre
and William Thorn**

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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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This report is based on a study visit to Estonia in September-October 2006, and on background documents prepared to support the visit. As a result, the report reflects the situation up to that point.

1. Introduction

1.1 Purposes of the OECD Review

This Country Note on Estonia forms part of the OECD Thematic Review of Tertiary Education. This is a collaborative project to assist the design and implementation of tertiary education policies which contribute to the realisation of social and economic objectives of countries.

The tertiary education systems of many OECD countries have experienced rapid growth over the last decade, and are experiencing new pressures as the result of a globalising economy and labour market. In this context, the OECD Education Committee agreed, in late 2003, to carry out a major thematic review of tertiary education. The principal objective of the review is to assist countries to understand how the organisation, management and delivery of tertiary education can help them to achieve their economic and social objectives. The focus of the review is upon tertiary education policies and systems, rather than upon the detailed management and operation of institutions, although clearly the effectiveness of the latter is influenced by the former.

The project's purposes, methodology and guidelines are detailed in OECD (2004a).¹ The purposes of the review are:

- To synthesise research-based evidence on the impact of tertiary education policies and disseminate this knowledge among participating countries;
- To identify innovative and successful policy initiatives and practices;
- To facilitate exchanges of lessons and experiences among countries; and
- To identify policy options.

¹ Reports and updates are available from www.oecd.org/edu/tertiary/review

The review encompasses the full range of tertiary programmes and institutions. International statistical conventions define tertiary education in terms of programme levels: those programmes at ISCED² levels 5B, 5A and 6 are treated as tertiary education, and programmes below ISCED level 5B are not.³ In some countries the term higher education is used more commonly than tertiary education, at times to refer to all programmes at levels 5B, 5A and 6, at times to refer only to those programmes at levels 5A and 6.⁴ An additional complication is presented by the practice, in some countries, of defining higher education or tertiary education in terms of the institution, rather than the programme. For example it is common to use higher education to refer to programmes offered by universities, and tertiary education to refer to programmes offered by institutions that extend beyond universities. The OECD thematic review follows standard international conventions in using tertiary education to refer to all programmes at ISCED levels 5B, 5A and 6, regardless of the institutions in which they are offered.

The project involves two complementary approaches: an *Analytical Review strand*; and a *Country Review strand*. The Analytical Review strand is using several means – country background reports, literature reviews, data analyses and commissioned papers – to analyse the factors that shape the outcomes in tertiary education systems, and possible policy responses. All of the 24 countries involved in the Review are taking part in this strand. In addition, 14 of the tertiary education systems have chosen to participate in a Country Review, which involves external review teams analysing tertiary education policies in those countries.

² The International Standard Classification of Education (ISCED) provides the foundation for internationally comparative education statistics and sets out the definitions and classifications that apply to educational programmes within it.

³ Programmes at level 5 must have a cumulative theoretical duration of at least 2 years from the beginning of level 5 and do not lead directly to the award of an advanced research qualification (those programmes are at level 6). Programmes are subdivided into 5A, programmes that are largely theoretically based and are intended to provide sufficient qualifications for gaining entry into advanced research programmes and professions with high skills requirements, and into 5B, programmes that are generally more practical/technical/occupationally specific than ISCED 5A programmes. Programmes at level 6 lead directly to the award of an advanced research qualification. The theoretical duration of these programmes is 3 years full-time in most countries (e.g. Doctoral programme), although the actual enrolment time is typically longer. These programmes are devoted to advanced study and original research. For further details see OECD (2004b).

⁴ Throughout the text the expressions “tertiary education” and “higher education” are used interchangeably.

Estonia was one of the countries which opted to participate in the Country Reviews and hosted a review visit in September/October 2006. The reviewers comprised an OECD Secretariat member, and academics and policy-makers from Australia, Chile, the Netherlands and Sweden. The team is listed in Appendix 1.

1.2 The Participation of Estonia

Estonia's participation in the OECD Review is being co-ordinated by Heli Aru, Advisor, Education and Labour Market, Ministry of Education and Research. Estonia's Country Background Report (CBR) for the OECD Review was prepared by the Ministry of Education and Research under the editorship of Heli Aru, and was supported by the National Advisory Committee (details provided in Appendix 2).

The Review Team is grateful to the authors of the CBR, and to all those who assisted them for providing an informative and policy-oriented document. The CBR covered themes such as the background and content of tertiary education reforms; the structure of the tertiary education system; the role of tertiary education in regional development, the research effort of the country, and the shaping of labour markets; the challenges faced in resourcing, governing, achieving equity in and assuring the quality of the tertiary education system. Some of the main issues identified by Estonia's CBR, and which are taken up in this Country Note, include:

- The pursuit of a better alignment between the tertiary system and the nation's economic and social development goals;
- Introducing a new relationship between government and tertiary education institutions, so institutions are accountable for their performance, but keep sufficient autonomy to direct their own affairs so that they can be dynamic and creative;
- Improving equity of access and outcomes among all socio-economic groups;
- Diversifying the funding and expanding private financing to meet demand for study places and to increase funding per student for quality improvements;
- Better define the role of professional tertiary education in a system moving from a largely undifferentiated and markedly academic tertiary education system to one in which there are varied institutions to respond to a range of societal and labour market needs.

The Estonian CBR forms a valuable input to the overall OECD project and the Review Team found it to be very useful in relation to its work. The analysis and points raised in the CBR are cited frequently in this Country Note.⁵ In this sense, the documents complement each other and, for a more comprehensive view of tertiary education policy in Estonia, are best read in conjunction.

The review visit took place from 25 September to 3 October, 2006. The detailed itinerary is provided in Appendix 3. The Review Team held discussions with a wide range of educational authorities and relevant agencies and visited several institutions of tertiary education in the country. Discussions were held with representatives of Ministries such as education and research, finance, economic affairs and communication, and social affairs; tertiary education institutions and their representatives; student organisations; representatives of academic staff; employers; the business and industry community; and agencies responsible for research and quality assurance. This allowed the team to obtain a wide cross-section of perspectives from key stakeholders in the system on the strengths, weaknesses, and policy priorities regarding tertiary education in contemporary Estonian society.

This Country Note draws together the Review Team's observations and background materials. The present report on Estonia will be an input into the final OECD report from the overall project. We trust that the Country Note will also contribute to discussions within Estonia, and inform the international education community about developments in Estonia that may hold lessons on their own systems.

The Review Team is very appreciative of the informative and frank meetings that were held during the visit, and the helpful documentation that each group provided. The tertiary education community clearly attached great importance to the purpose of the visit and the fact that the Review Team brought an external perspective. The meetings were open and provided a wealth of information and analysis. A special word of appreciation is due to the National Co-ordinator, Heli Aru, for going to great lengths to respond to the questions and needs of the Review Team. We were impressed by her efficiency and expertise and enjoyed her kindness and very pleasant company. The courtesy and hospitality extended to us throughout our stay in Estonia made our task as a Review Team as pleasant and enjoyable as it was stimulating and challenging.

⁵ Unless indicated otherwise, the data in this Country Note are taken from Estonia's Country Background Report (Ministry of Education and Research, 2006).

Of course, this Country Note is the responsibility of the Review Team. While we benefited greatly from the Estonian CBR and other documents, as well as the many discussions with a wide range of Estonian personnel, any errors or misinterpretations in this Country Note are our responsibility.

1.3 Structure of the Country Note

The remainder of the report is organised into five main chapters. Chapter 2 provides the national context. Chapter 3 outlines the key contextual factors shaping tertiary education in Estonia and tries to assist international readers by identifying what is distinctive about tertiary education policy in Estonia. Chapter 4 then identifies the main strengths of Estonian tertiary education policies together with the challenges and problems faced by the system.

Chapter 5 uses the analysis in the previous sections to discuss policy priorities for future development. The suggestions draw on promising initiatives that the team learned about during the visit. Chapter 6 has some concluding remarks.

The policy suggestions attempt to build on and strengthen reforms that are already underway in Estonia, and the strong commitment to further improvement that was evident among those we met. The suggestions should take into account the difficulties that face any visiting group, no matter how well briefed, in grasping the complexity of Estonia and fully understanding all the issues.

2. National Context

2.1 Geography

Located in the top-right corner of Europe, Estonia is one of the smallest countries of the continent with a territory of 45 227 square kilometres and 1.35 million inhabitants (as of 2004). About 50% of the country is covered by forests and the nearly 1 200 lakes constitute 5% of the surface. In the Baltic Sea there are more than 1 500 islands which belong to Estonia.

The country is divided into 15 counties. Tallinn is the capital and also the largest city with 371 000 inhabitants. The second largest city is Tartu with 105 000 inhabitants. Narva, Kohtla-Järve and Pärnu are other cities of (relatively) considerable size: 50 000 to 80 000 inhabitants. The urban population constitutes around 70% of the total population.

2.2 History and culture

The first Republic of Estonia was in place between 1918 and 1940. In the fifty years between 1940 and 1991, Estonia was part of the Soviet Union. Through the so-called “Singing Revolution” independence was regained in August 1991. In 2004, Estonia became a NATO member state and member of the European Union.

The official language is Estonian, a language (like Finnish and Hungarian) which belongs to the Finno-Ugric language family. The major minority language is Russian spoken by about 30% of the population. Russian language education is provided at all levels of education. English and German are also widely spoken and understood.

The largest ethnic groups are Estonians (68%) and Russians (26%), while Ukrainians, Belarussians and Finns each constitute 1-2% of the population.

2.3 Demography

Estonia is one of the least densely populated countries in Europe. With about 1.35 million inhabitants, the density is about 30 people per square kilometre. The size of the population has sharply decreased over the past fifteen years (from 1.57 million in 1989 to 1.35 million in 2004), partly because of emigration – particularly in the 1990s – and also as a result of low birth rates. A further decrease of 17-18% of the Estonian population is currently predicted in 50 years. At the same time, the population is ageing at an increasing rate. Projections of the number of 16-18 year olds for the period up to 2016 show a sharp decline. Whereas there were almost 65 000 16-18 year olds in 2005, there will be approximately 27 000 persons in the same age range in 2016 (estimate by the Centre for Policy Studies Praxis, 2006). Not only will this affect higher education, but also the economy and the social security system. Whereas there were two working people per pensioner in 1992, according to forecasts this will decrease to 1.27 working people per pensioner in 2050. Such changes will have a dramatic impact on balancing investments in education, health and social security.

2.4 Economy

The economy underwent considerable change during and since the independence. Having experienced a dramatic economic collapse in the early 1990s (real GDP dropped by almost 40% in the period 1989-1994), Estonia is now one of the fastest growing economies in Europe (GDP growth of 9.8% in 2005). Since 1995, the average growth of the economy has been almost 6%, compared to an average of 2.3% for the EU25 during that period. It is estimated that by 2010, the country will be at about 62-63% of the EU average GDP.

The tax system is based on flat rate taxes (23% income tax). Companies are exempted from corporate income tax if profits are reinvested. The system of VAT is set at 18%. Employers pay a social and health insurance tax amounting to 33% of the gross wage.

Most trade takes place with other EU member states, for the year 2004, the percentage amounted to 80% of the total trade. The main trade partners are Finland, Sweden and Germany. Major exports are machinery and equipment, wood and wood products, textiles, agricultural and food products. Major imports are machinery and appliances, transport equipment, metals and agricultural and food products.

The currency is the Estonian kroon (EEK), EUR 1 = EEK 15.65 (as of 17 February, 2007). The target date to introduce the Euro has been postponed to 2010.

The unemployment rate is low compared to the rates in many OECD countries, in 2005 it decreased to 7.9%. Long-term unemployment, however, constitutes 53% of all unemployed (as of 2006), with particular incidence in non-Estonians.

Estonia has caught up with advanced countries in terms of ICT infrastructure and the use of ICT in society. Surveys show that more than half (54%) of the 6-74 year olds in Estonia are using the Internet.

2.5 Government

Estonia is a parliamentary democracy with a President as Head of State. The Parliament (*Riigikogu*) is elected by proportional representation. Its 101 members are elected for a period of four years. The government at the time of the review visit, a coalition of the Estonian Reform Party, the Estonian Centre Party and the People's Union, was in office since April 2005. In the past fifteen years, the average duration of coalition governments has been approximately two years.

The current and past government coalitions have based economic policies on a balanced state budget and liberal trade and investment laws. In 2005, the government budget surplus was about 1.8% of the GDP.

3. Context and Main Features of Tertiary Education

3.1 Introduction

In the period since the restoration of independence remarkable changes took place in the system of higher education. This is not only visible in the rise in the number of higher education institutions, but also in the developments in the areas of funding, human resources management, quality assurance, research and innovation, equity, links to the labour market and internationalisation. These are discussed in more detail below. This chapter provides the key contextual factors shaping tertiary education in Estonia and tries to assist readers by identifying what is distinctive about tertiary education policy in Estonia. First, we address – under the general heading of governance, steering and planning – the main features of the tertiary education sector, the degree structures, the main players in the field of higher education policy and the major policy documents and regulations.

3.2 Governance, steering and planning

There are three types of educational institutions that provide higher education: universities (*ülikool*), professional higher education institutions (*rakenduskõrgkool*) and vocational education schools (*kutseõppeasutus*). Both public (or state) and private higher education institutions are authorised to operate. In total there were 39 institutions providing higher education in 2005, ten less than in the academic year 2001/02. In the course of the academic year 2006-2007, this number further decreased to 35.

There are six public universities: Tallinn University (with 7 350 students in 2005), the University of Tartu (18 536) – the oldest in the country (created in 1632), Tallinn University of Technology (10 700), the Estonian University of Life Sciences (4 752), the Estonian Academy of Music and Theatre (567) and the Estonian Academy of Art (962). Although these institutions existed already in 1991, significant changes to their operation occurred since then. First, a number of institutes formerly part of the Academy of Sciences were integrated into the universities. Second, two

universities underwent considerable change in the last year. The current Tallinn University (founded as the Tallinn Pedagogical University in 1919), results of a 2005 merger of the Academic Library of Estonia, the Estonian Institute of Humanities, the Institute of History of the Estonian Academy of Sciences and the Tallinn Pedagogical University. The Estonian Academy of Art (established in 1914) was involved in the merger operation, but stepped out of the merger process. The University of Life Sciences was also established in 2005, largely built on the former Estonian Agricultural University (dating from 1951). Also, several of these universities have in the past ten years established a number of semi-independent (regional) colleges. The public universities together catered for about two-thirds of the 68 287 students enrolled in Estonian higher education in 2005.

There are five, relatively small private universities, most of which offer programmes in just a few disciplines. The most important fields offered are business administration, law, media, arts and humanities and information technology. Their number of students in 2005 ranged from 116 to 2 547, in total they had 6 467 students.

Eight professional higher education institutions constitute the public part of this sector catering for 7 142 students in 2005. Their size ranges from 166 to 2 111 students. Additionally, there are thirteen private professional higher education institutions (with a total of 7 452 students), all of very small size, although the largest of the privates is bigger than the largest public professional higher education institution (i.e. 2 538 students). Like private universities, private professional higher education institutions focus mostly on business administration, information technology, arts and humanities, but also on theology.

The third sector, vocational education schools, consists of six public institutions and one private institution. The total number of students in this sector is 4 359. They range in size from 30 to 1 322 students. These institutions offer not only tertiary education but also secondary-level education.

Degree structures have been changed regularly in the past decade, so formally a number of different qualifications structures coexist. It seems most relevant, however, to focus on the latest qualifications structure, introduced in 2002. Universities offer Bachelor (three years, 180 ECTS⁶ credits – or exceptionally 240 ECTS credits, *bakalaureusekraad*), Master (one-two years, 60-120 ECTS credits, *magistrikraad*) and PhD programmes (three to four years, *doktorikraad*). Medicine, pharmacy, dentistry,

⁶ ECTS stands for European Credit Transfer System. It structures studies according to a system of credit points (60 points for an academic year on a full-time basis).

veterinary medicine, architecture and civil engineering are exempted from the Bachelor-Master structure. These programmes (still) have integrated tiers, leading directly to the Master degree (300-360 ECTS credits). State professional higher education institutions offer mostly four-year Bachelor programmes (*rakendus kõrgharidus*), but some programmes are three years, some others four-and-a-half. Students can continue their studies at universities but often need bridging courses. The state institutions are allowed to offer Master programmes (under some conditions) but, as of 2006/2007, there were only six master programmes registered by three state professional higher education institutions (Tartu Aviation College, the Estonian Maritime Academic and the Estonian National Defence College). Private professional higher education institutions offer mostly three-year programmes, some offer Master programmes as well. Vocational education schools offer professional higher education programmes. The recent *Estonian Higher Education Strategy 2006-2015* envisages to close down most of these programmes or to have the schools upgraded to professional higher education institutions.

Access to higher education is regulated by the *Universities Act* and the *Institutions of Professional Higher Education Act*. Students having either a general secondary school-leaving certificate (12 years of schooling) or a secondary vocational school-leaving certificate (based on qualifications of different length) and the State Examination Certificate have access to higher education. In addition, those having a corresponding foreign qualification can gain access. But access for all students is subject to discretion of higher education institutions. Merit plays the dominant role in the access to the specific programmes.

Higher education institutions are under the auspices of the Ministry of Education and Research, except for the National Defence College and the Public Service Academy – both professional higher education institutions – which are under the supervision of the Ministry of Defence and Interior Affairs, respectively.

Before describing the main players in higher education policy, it is helpful to outline the major policy developments in three phases. The first phase (1989 – 1995) implied separating from the Soviet system and building up a new legal framework. Much effort was put in realising the 1995 *University Act*, paving the way for the 1996 *Standard of Higher Education*. The second phase (1996 – 1999) saw the expansion of the higher education system in combination with the development of legal frameworks and quality assurance mechanisms for the different sectors. The third phase (2000 – 2004) indicated the next wave of reforms, hallmarked by the higher education reform plan 2002. The growth of the system was considered too fast, competition within the system was deemed fierce and the system was

not fully geared towards the expectations set out in the Bologna Declaration. The most recent strategy document (2006 – 2015) was approved by the Government in June 2006.⁷

This 2006 *Estonian Higher Education Strategy 2006-2015* addresses three main challenges for the sector in the coming years. First, the number of students entering higher education is expected to diminish by about 60% by 2016. Second, there is a clear need to strengthen the international dimension of higher education institutions. Third, additional funding – both for infrastructure and human resources – is of vital importance for the sustainability of the system.

The following specific measures are planned: clarification of the profiles of higher education institutions; a focus on quality issues; changing the recognition of diplomas (independent of accreditation results); advance the Bologna process; a new scheme for steering higher education by means of three-year contracts with individual higher education institutions; and more attention to career services and guidance to better inform young people about professional prospects.

The Ministry of Education and Research plays a key role in Estonian higher education policy. Its main responsibilities are: distributing the state-commissioned study places across institutions, allocating funds to professional higher education institutions, approving development plans for professional higher education institutions and carrying out state supervisory activities. Government and parliament eventually determine the overall direction of the higher education system, including the available funds for higher education and research.

The Ministry is assisted by a number of semi-independent organisations and advisory councils. The Estonian Research and Development Council (ERDC) advises on strategic issues in the field of research and development. The Higher Education Quality Assessment Council (HEQAC), with members appointed by the government, has responsibilities in the accreditation of higher education institutions and their programmes. The Research Competency Council, established by the government, makes recommendations to the Minister of Education and Research about targeted research funding and proposes the approval of evaluation results of research and development. The Estonian Science Foundation (ESF), a research-funding organisation composed of experts, provides financial support in basic and, to a limited extent, applied research. The Archimedes Foundation, set up by the Ministry of Education and Research, manages a range of

⁷ A month after the visit of the Review Team, the Estonian Parliament approved the strategy document (November 8, 2006).

activities in relation to aid and cooperation with the European Union. It also incorporates the Higher Education Quality Assessment Centre responsible for providing administrative support to HEQAC in institutional and programme accreditation processes.

Although practices differ by institution and by institutional type, the governance of institutions follows the following pattern. A rector, the highest authority, is elected for a given period (typically five years) by an Electoral Body (a small body with representatives of academics and students). The rector may appoint vice-rectors with specific task areas, *e.g.* research, teaching and learning, and development. Academic councils (also termed government boards), typically consist of the rector, vice-rectors, directors, deans and representatives from the staff and students. The council is the highest decision-making body of the institution. In addition, there is an advisory body, the *kuratoorium*, which consists of persons external to the institutions.

Other important stakeholders in higher education are: the Rectors' Conferences (there are separate conferences for public universities, private universities and professional higher education institutions), the Federation of Estonian Student Unions (FESU), the Estonian Employers' Confederation, the Estonian Chamber of Commerce, and the Federation of the Employees of Estonian Universities, Institutions of Science, Research and Development (UNIVERSITAS).

The regulations will be addressed in more detail in the following sections and chapters. Suffice to simply list the main regulatory frameworks and indicate their main function.

The Universities Act (1995), Institutions of Professional Higher Education Act (1998), Private Education Institutions Act (1998), Vocational Education Schools Act (1998), University of Tartu Act (1995), and the Standard of Higher Education (1996) detailing the regulations regarding the higher education institutions.

Standards for Accreditation of Universities and Institutions of Professional Higher Education in Estonia (2003) and The List of the Names of Academic Degrees awarded by Educational Institutions (1991), relating to quality assurance and the qualification frameworks.

Statute and Form of Diploma and Academic Transcript (2003) and Signation of Degrees awarded by Universities (2004), regulations that deal with the Bologna process and internationalisation in general.

The Basic Cost of a Student Place created on the Basis of State-commissioned Education (2005) and The Factors for broad Groups of Study (2002, 2004), dealing with funding issues.

3.3 Funding

Public expenditure on tertiary education in Estonia has remained relatively stable over the last ten years fluctuating between 0.9 and 1.1% of GDP (0.9% in 2005). Data on private expenditure are available for 2004 and 2005 only. In 2005, private expenditure amounted to 0.47% of GDP. Due to the rapid growth in the numbers of full-fee students in Estonia, private expenditure can be expected to have risen sharply in recent years. In 2005, total expenditure on tertiary education is estimated to represent some 1.4% of GDP (by comparison the OECD average in 2003 was 1.5%). In 2002, annual expenditure on tertiary education institutions per student relative to GDP *per capita* was 24.9, below the lowest value among the 26 OECD countries for which data are available (OECD average of 42.6, see Appendix 4).

3.3.1 Institutional funding

Estonian higher education institutions receive funding from the public budget for the provision of graduates (so-called state-commissioned places), for capital investment and for other expenditure (foreign aid projects, education allowances for students, library expenditure, etc.).⁸ Finance from the public budget is provided primarily in the form of the state commission: approximately 80% of public funding over the period 1995-2004. Both public and private institutions receive funding through the state commission. However, private institutions are allocated a very small number of state commissioned places, in a restricted range of disciplines. In some cases this allocation occurs in areas where supply by public institutions is deemed lacking while in other cases it is intended to reflect public recognition of the quality of the programmes.

The system of the state commission has been in place since 1995. The state commission represents a contract between the Estonian government and a higher education institution for the purchase of a certain number of graduates. As it currently operates, the government commission defines the number of Masters' graduates in particular disciplines an institution is paid to produce. As possession of a Bachelor degree is a condition for gaining a Master degree, the commission also requires a particular output of graduates with Bachelor degrees. Accordingly, institutions are expected to provide at least 1.5 places in Bachelor programmes for each place in a Master programme.

⁸ Research funding is discussed in section 3.6.

The actual content of the commission is determined through a negotiating process, which has regard to a range of considerations (specified in the *Universities Act, 1995*): the foreseeable need for specialists with higher education degrees in the labour market; demonstrated capacity of institutions to provide graduates; on the proposals of ministries, local government associations, registered professional and occupational associations (unions) and universities; and on the funds designated for state-commissioned education in the state budget.

In deciding on the content of the state commission, two considerations have been paramount. First, ensuring access to higher education for approximately 50% of high school graduates and, second, the view that state funding should balance student study preferences for so-called ‘soft’ disciplines such as business studies and humanities. The process for determining the state commission involves discussions between a number of players including the Ministry of Education and Research, other ministries such as economy, labour and finance, social partners and institutions.

Institutions receive funding for state-commissioned places in the form of a block grant. The quantum of the grant is determined by the number and distribution of state-commissioned places by funding categories. The rate of funding for different categories of students is determined by the multiplication of a base funding rate by the funding factor applying to the category of student. Some 34 funding factors exist (see *The Factors for broad Groups of Study*, August 2002 of the Government of Estonia). Funding factors exist at the level of the broad domain of education (e.g. humanities), field of study (e.g. education) and at curricular level in some cases (e.g. courses for teachers of music). There is no system for the automatic adjustment of grants to reflect changes in the prices faced by higher education institutions. All nominal increases have to be argued for in the budgeting process. Funding for capital infrastructure is provided as a separate funding stream. Institutions have to bid for investment funding for particular projects.

Both public and private institutions gain income for their teaching activities from student tuition fees. Public institutions may charge tuition fees to students who do not gain access to state-commissioned places and are free to set the level of fees. The one restriction on public universities is that they may not increase fees by more than 10% each year (see *Universities Act, 1995*).

3.3.2 Student finance

Students in Estonia fall into one of two distinct groups. Either they occupy state-commissioned places and pay nothing for their tuition or they

do not and pay the full costs of their tuition. A third group is emerging: students admitted free of charge at the expense of tertiary institutions. This trend is especially visible at the PhD level.

State-commissioned places are allocated by higher education institutions to students studying full-time on the basis of academic performance. Places are allocated to commencing students on the basis of their performance in relevant entrance exams (essentially the state exams at the end of secondary school). Should a student in a state-commissioned place fail to meet the requirements of full-time study he or she loses the right to occupy such a place and may be replaced by a better performing student undertaking study at the same level.

The tuition fees paid by students in fee-paying places vary by type of course and institution. Comprehensive information on fees is not collected by the Ministry of Education. However, information provided to the Review Team indicates that fees may reach up to EEK 60 000 per annum (*e.g.* for courses in medicine at the University of Tartu delivered in English) and are often of the order of EEK 35 000 for legal studies and EEK 18 000 for humanities. Fees for courses at professional higher education institutions can be lower (*e.g.* EEK 14 000).

Support for students is also provided in the form of grants for living costs and a student loan scheme. Grant support for student living costs is provided in the form of a basic allowance and a supplementary allowance (see *Study Allowances and Study Loans Act*). The basic allowance is an untargeted allowance, intended to cover expenses related to the acquisition of education. The supplementary allowance is a targeted allowance. It is provided to students who meet the requirements for obtaining the basic allowance and whose place of residence is outside the local government area in which the educational institution at which they study is located to help with expenses related to housing and transport.

Eligibility for these grants is restricted to students in state-commissioned places. Allowances are distributed by institutions. With the exception of a small proportion (5%) intended to be distributed on the basis of financial need, they are allocated on the basis of academic performance. The budget available for student allowances is extremely tight. In 2006, some 15% of students received the basic allowance and some 17% received the supplementary allowance.

A student loan scheme is available for students at public and private universities (whether in state commissioned places or not) who are studying full-time or who are working as teachers and undertaking a teacher training programme on a part-time basis. Eligible students can access a loan for a period equivalent to the nominal study time for a course and can borrow up

to a maximum amount in a year (the upper limit was EEK 17 500 in 2004/05). Loans are repayable after a student has completed (or otherwise terminated) his or her studies. The proportion of eligible students taking up loans is not known.

Student loans are provided by private financial institutions. The government guarantees a minimum interest rate to the lending institutions and also guarantees lending institutions against default by the student. To gain a loan a student must provide security in the form of two guarantors, a mortgage on property or a call on other assets. The interest rate applying on loans is a commercial rate determined by legislation but cannot fall below 5%. However, the rate of interest paid by students is set at 5%. If the interest rate is in excess of this percentage, the government pays the difference.

Repayment of loans commences 12 months after the completion (or termination) of study. Repayment is based on a mortgage style schedule and is not related to income. Repayments are suspended in certain circumstances – *e.g.* for a parent with children under three years of age and during compulsory military service. During these periods, the government pays the interest accruing on borrowers' loan accounts. The government also assumes all or part of outstanding loan commitments in certain cases – *e.g.* on entry into government employment, in the case of a parent raising children under five and in the event of a borrower's death or permanent incapacity.

As noted above, the government guarantees the lending institution against default by the student. However, no guarantees are provided to students against default. If in the event of non-payment of debt, the lending institution cannot recover outstanding amount from the student or his or her guarantors, the government will reimburse the institution for the unrecovered debt. In its turn, the government can seek to recover the outstanding amount from the student and his or her guarantors.

3.4 Quality assurance

3.4.1 Current arrangements

The growth of the system has led Estonian society to the realisation that the quality of higher education varies both by the type of institution and by field of study. Estonia started to build its national quality assurance system in the mid 1990s, in answer to the rapid expansion of the higher education sector. Its goals were to increase the information on higher education offerings and to provide the academic community with support for self-improvement.

Since 1996, by governmental decree, the *Standard of Higher Education* regulates the establishment of higher education institutions and determines the requirements they and their programmes must meet in order to obtain an education license. This licensing process is carried out by the Ministry of Education and Research.

Quality assurance arrangements are based on an accreditation scheme, which is voluntary but essential both for having the right to issue officially recognised higher education credentials and to have access to state funding. Evaluation is the responsibility of the Higher Education Quality Assessment Council (HEQAC), established in 1995 and composed of twelve members, appointed by the government on the recommendation of the Ministry of Education and Research (which takes into account the proposal of higher education institutions, academic unions and employers). HEQAC determines the quality standards, organises external reviews and makes a recommendation to the Ministry regarding universities, professionally- or vocationally-oriented higher education institutions and their operation. The accreditation decision belongs to the Ministry, which normally approves the recommendation of the HEQAC; however, it can reject it, in which case a new review must be carried out.

HEQAC is supported in its work by the Estonian Higher Education Accreditation Centre (HEAC), which operates within the Archimedes Foundation. HEAC prepares all relevant documentation for the HEQAC, including self-analysis reports and reports by expert committees, as well as the main documents for accreditation of study programmes. In practice, HEAC operates as the secretariat for HEQAC.

Accreditation is both at the institution and programme level. Institutional level accreditation looks at the overall organisation and management of the institution, the effective use of resources and the creation of a favourable environment of studies. Programme level accreditation assesses conformity to the *Standard of Higher Education* and the quality of education received by the students.

In terms of outcomes, institutions or programmes may achieve an accredited status, indicating that they meet the set of requirements; they may receive conditional accreditation, meaning that there are major shortcomings which must be addressed within three years, or they may be rejected, receiving a ‘not accredited’ decision which means that the problems found jeopardize the quality of graduates’ knowledge and skills. Not accredited programmes cannot continue in operation. Admission is terminated, and the students must be reallocated to other programmes, either in the same university or in another one. If a university is not accredited, its dissolution

is initiated and places for the students must be found in other higher education institutions.

Quality is indirectly steered through legislation (see also section 3.2 for an overview). As explained earlier, a significant legal document is the *Standard of Higher Education* (1996, and amended in 2003 and 2004). It sets out the requirements that must be met by higher education institutions and their programmes. The Ministry of Education and Research is responsible for determining whether institutions meet the requirements of the *Standard of Higher Education*. Specific quality assurance requirements are set out in the *Standards for Accreditation of Universities and Institutions of Professional Higher Education in Estonia*, and *Standards for Accreditation of Curricula of Institutions of Professional Higher Education in Estonia*, both from 2003.

In addition to the national regulations, the Rectors of six universities and one private institution have signed a *Quality Agreement*, which specifies the basic principles that apply to the hiring and promotion of faculty. While this is still a private agreement, it is proposed that some points in it are to be included in the law. At least in part this was the result of a feeling that current regulations were confusing, and that the standards being applied were either too general or not demanding enough. Its main purpose was to establish requirements that are more specific and more relevant to society; the end result would then be to increase trust among higher education institutions.

Thus, there are a number of regulations that impose quality restrictions on the operation of higher education institutions, particularly in the case of professional higher education institutions and vocational education schools. New private institutions must show, to the satisfaction of the Ministry of Education and Research that they meet the requirements of the *Standard of Higher Education*, and offering programmes in new fields of study, or opening new curricula by professional higher education institutions and vocational education institutions is subject to feasibility decisions by the Ministry.

3.4.2 Quality assurance: the strategy for higher education 2006-2015

The Ministry of Education and Research's *Strategy for Higher Education 2006-2015* places a strong emphasis on quality and the means to assure it. Its objectives focus on the competitive quality of Estonian higher education and the need for it to serve the country's development interests and innovation. Consistent with these objectives, the actions highlight the

need to strengthen quality assurance by promoting internal assessment and improvement strategies within educational institutions and establishing quality requirements and supervision of quality by the state.

Regulations define the different types of higher education institutions: universities must have positively accredited research teams and doctoral study programmes in at least two fields of study. Higher education may also be provided by regionally-based university campuses and professional higher education institutions. General requirements shall be contained in the *Standard of Higher Education*, duly updated, and in the *Universities Act*, which will stipulate requirements for candidates to faculty positions, curricula and procedural issues for the defence of theses, as well as the arrangement of quality supervision by the Ministry of Education and Research.

Changes envisaged in the quality assurance arrangements are: (a) a new licensing arrangement is to be implemented and all existing higher education institutions must apply for the new license before September 2008. Licensing for existing institutions will be issued by the government on proposal of quality assessment by the Ministry of Education and Research. New licenses are issued on the basis of compliance with the requirements set out in the *Standard of Higher Education* and the assessment by the Ministry on the justification and purposefulness of the license; (b) new fields of study or study on a new level must be separately licensed; (c) accreditation will be improvement-oriented, based on international assessment on the basis of a comparison with other similar recognised higher education institutions; (d) all higher education institutions and fields of study must be accredited every seven years. In the case of serious deficiencies, accreditation may result in a proposal to withdraw the license; (e) accreditation will be the responsibility of the Higher Education Quality Assessment Council, but higher education institutions are entitled to use the services of any accrediting agency included in the European Higher Education Quality Assurance Register.

Developments in this line of action will be evaluated on the basis of the following indicators: number of higher education institutions which have passed the procedures of external quality assurance and acquired the license; assessments of Estonian higher education institutions by internationally recognised accrediting agencies; proportion of higher education institutions and fields of study where internal quality assurance has been started in compliance with international practice.

3.5 Equity

Equity does not feature among the priorities in tertiary education policy in Estonia. As regards access to tertiary education, the policy emphasis in Estonia has relied considerably on the expansion of overall enrolment rather than the question of equity of access which relates more to the question of differences in participation rates among groups of students – by socioeconomic background, region of residence, cultural background or disability. Serious concerns persist as regards equity of access but there has been considerable progress regarding the expansion of participation. Enrolment levels in tertiary education grew 168% between 1994-95 and 2005-06, which is at the level of the largest growth rates among OECD countries (OECD, 2006a). The number of tertiary students relative to the population of individuals in the five-year age group following secondary school-leaving age reached 64% in 2003 (above the mean of 57.9% in the OECD countries for which comparable data are available) from 51% in 1999 (see Appendix 4). In the past decade, the number of secondary school graduates remained stable which indicates that this growth reflects the rise in enrolment rates.

The growth of tertiary education in Estonia has been accomplished through two mechanisms. First, through expansion in the public sector: mostly by increasing the number of places in tertiary-level professional programmes offered by state vocational education schools (the number of tertiary students admitted in these institutions grew 19 times between 1995 and 2004) and introducing a discriminatory fee policy whereby a proportion of students pay full tuition while the others pay no tuition fees (in the entire system, the proportion of fee-paying students grew from 7.4% in 1994 to 54% in 2006⁹). Second, through expansion in the fee-paying private universities sector: the number of admissions in private universities increased almost fivefold from 1995 to 2004. The proportion of new admissions accounted for by private universities grew from 5% in 1995 to 9.1% in 2004.

The rapid expansion might lead to different equity outcomes. On the one hand, the expansion opens up more places in tertiary education institutions, and these should enhance the ability of disadvantaged students to attend. On the other hand, given the pattern for the expansion, disadvantaged students

⁹ To put this figure in perspective, it should be added that the private sector accounts for about 20% of overall enrolments. In 2004/05, 47% of students attending the four largest public universities (University of Tartu, Tallinn University of Technology, Tallinn University, and the Estonian University of Life Sciences) paid tuition fees.

might have gained access to lower-status institutions, including those in smaller towns, and to fee-paying places either in the public or the private sector.

The governmental strategy to make tertiary education more equitable relies on four main approaches. First, the provision of a number of non-fee-paying state-commissioned places, to be distributed exclusively on a merit-basis. The *Estonian Higher Education Strategy 2006-2015* states that “In 2006-08, the state-commissioned education provides student places to at least 50% of the students who have acquired general secondary education and 10% of the students who have acquired secondary vocational education”. Second, a student support system with few elements related to the financial circumstances of students. This includes the State-guaranteed loan scheme for full-time students and the basic and supplementary allowances distributed mostly on the basis of merit to students in state-commissioned places. Only an insignificant proportion of the basic allowances are targeted at the financially neediest students while the supplementary allowance is targeted at students originally from a remote area relative to the institution attended (see section 3.3). Third, the expansion of the supply of tertiary programmes, with the creation of institutions in smaller cities (in particular non-university institutions). Finally, a range of initiatives to assist the participation of the Russian-language minority in tertiary education.

3.6 Research and innovation

In the Soviet period, the core of the Estonian system for research and innovation was the powerful Academy of Sciences with its often very prestigious research institutes. Higher education institutions, in contrast, participated only to a very limited extent in research and innovation activities. To the extent that they actually did carry out R&D, it was mostly a matter of small-scale contract research for enterprises or for applied R&D organizations, which was used as an extra stream of income to support teaching and related activities.

Following Estonia’s re-independence in 1991 and the introduction of a market economy and a strongly *laissez-faire*-oriented economic policy, the vast majority of production enterprises and applied (notably military-related) R&D organisations experienced a dramatic collapse. Many enterprises and most applied R&D organisations disappeared, while some enterprises managed to survive after privatisation and radical employment reductions (75-90% reductions were not uncommon).

The new, private owners of enterprises have so far usually come from Sweden and Finland and they have hardly shown any interest in Estonia's R&D potential (including research activities at higher education institutions), but rather in its low-cost production environment.

The former applied R&D organisations, in contrast to production enterprises, had therefore hardly any chance of attracting foreign investments, and given the lack of government attention and support during the first years of the new Republic, they were therefore usually shut down. To the extent that the applied institutes had functioned as a link between research and production, this link was, as a consequence, severely weakened. From a systemic perspective, this meant an increasing isolation between different sub-systems for research and innovation.

The positive aspect of the overall collapse of the Soviet-era research and innovation system was that it freed a considerable number of highly qualified R&D workers. These individuals, as a matter of fact, came to form the core of a number of future-oriented Estonian business firms, particularly in the IT sector, whereas other individuals became an important source of human capital in the government sector.

Compared to the severe weakening of enterprises and applied R&D organisations, the transition for higher education institutions was smoother. The differential evolution of different types of organizations gave rise to far-reaching mismatches in the overall system of innovation, with higher education institutions and surviving academy institutes providing education and research in a way that did not correspond to the actual needs of the Estonian economy and society.

Today, these mismatches are still reflected in a considerable imbalance between a relatively well-developed system for education and research, and a much more poorly developed innovation system. Hence, the expenditure on R&D by the business sector in Estonia measured as a share of GDP (0.28% in 2003) is almost negligible compared to the OECD average (1.51%), while the corresponding expenditures on R&D by Estonian higher education institutions (0.36%) is more comparable to the OECD average (0.42% of GDP).

Internationally, Estonia has aroused some attention in recent years due to its innovative advancements particularly in the field of IT. For example, the country has been a front-runner in the field of Internet banking, mobile communications services and e-government (Högselius, 2005). In e-government, Estonia was in 2001 ranked 5th in the world in the Global Information Technology Report (GITR, 2002).

The country has proved capable of producing a number of highly innovative companies, although these have usually been small. Economic growth as a whole has so far been much more investment-driven than innovation-driven. Moreover, the most innovative companies have usually had only very weak links to higher education institutions, although exceptions such as Regio and Skype occur, which can be described as spin-offs from the University of Tartu and Tallinn University of Technology, respectively. All in all, research activities at higher education institutions have had minimal impact on economic development in Estonia (Högselius, 2005). However, as further outlined in the next chapter, there are currently many positive developments under way, which seem to open up for considerable long-term improvements.

Following a reformation of the Academy of Sciences in 1997, most of the Soviet-era academy institutes were merged with higher education institutions. The last independent institutes became university units as late as in 2005, when a number of institutes in the fields of humanities and social sciences joined Tallinn University. Hence, most research is nowadays carried out in universities, while the Academy of Sciences has been transformed into an honorary membership organisation.

Research is strongly concentrated in the University of Tartu and Tallinn University of Technology, which together stand for around 70% of all R&D output in Estonian higher education institutions (including publications, patents, defended PhDs and income from contract research). Smaller higher education institutions, including most professional higher education institutions, vocational education schools and private institutions contribute only to a very minor extent to carrying out research.

Some of the smaller institutions, however, notably Tallinn College of Engineering, report that they have a long-term interest in strengthening their position in research, and there is a strong persuasion also in smaller higher education institutions that they have something to offer in this respect, using their close relations to enterprises and other organisations for shaping demand. This should also be seen in relation to their ambition to offer 'research-based' teaching.¹⁰

The system for research funding is dominated by the recently introduced base-line funding for research universities and in particular by the much larger long-term grants awarded by the Research Competence Council (RCC, soon to be renamed the Research Council), which *de facto* form the

¹⁰ The ambitions of higher education institutions to offer research-based teaching was emphasised by practically all institutions that were visited by the Review Team.

basis for sustaining existing Estonian research strengths. In addition, the Estonian Science Foundation (ESF) plays a role in providing individual researchers with smaller grants.

Industry contributes only to a very minor extent in funding R&D activities at higher education institutions. An important new source of research funds, however, arises from the participation of Estonian researchers in EU projects. The funding mechanisms have been further diversified through the creation of Centres of Excellence in 2001 and Centres of Competence in 2004. The Centres for Excellence were selected in two rounds in 2001 and 2002, with the aim to support a number of particularly strong and internationally competitive Estonian research groups through targeted funding. The Centres of Competence, which were created in 2004, are more innovation-oriented and are formed by higher education institutions in collaboration with business firms. The goal is to strengthen the strategic links between research and innovation in Estonia.

The responsibility for policy-making in the field of research and innovation is shared by several entities, the most important of which is the R&D Council at the government level. Strategy documents, however, are in practice being worked out by the Ministry of Education and Research and the Ministry of Economic Affairs, to which two specialised commissions – the Research Policy Commission and the Innovation Policy Commission, respectively – are attached. In addition organisations such as the Research Competency Council and Foundation Enterprise Estonia (a large government agency dealing with science and technology-related issues from an entrepreneurship perspective) contribute to shaping policy.

Research and innovation policy started to gain attention in the late 1990s, notably in connection to the IT boom and the installation of the (2nd) Laar government in 1999. The Estonian parliament adopted a first major R&D strategy in December 2001, in the form of a five-year plan for the period 2002-2006. The strategy formulated, among other things, the goal to achieve 1.5% of GDP on total R&D expenditure by 2006, and it prioritised three specific areas of science and technology: user-friendly IT, biomedicine and materials technologies (MEC, 2001). A new strategy (covering the period 2007-2013) is currently being launched.

3.7 Human resource management

The staff of public higher education institutions in Estonia are employees of individual establishments and do not possess civil servant status. Institutions are responsible for the hiring and firing of academic

personnel and the setting of salaries and conditions of service within the framework of relevant labour law and other relevant legislation.

The *Universities Act* (§34-§40) defines the general framework for the employment of academic staff, including the qualifications required at different levels in the academic hierarchy, the process of hiring and the terms of employment. Academic positions are required to be filled through public competition. Staff are employed on fixed term contracts for a period up to five years (in the case of a position filled through a competitive process) or three years (in the case of a position which, for one reason or another, has not been filled competitively). Since 2003, indefinite employment contracts may be offered to full professors who have been employed at the same university for at least eleven years and who have been successful in three consecutive competitive selection processes. All academic and research staff have the right to a semester's sabbatical leave once every five years.

Professors are elected (appointed) by the council of the university, and other members of the teaching staff and research are elected by the collegial decision-making body of the structural unit. As noted above, the required qualifications for academic personnel are described in the law and, therefore do not vary between universities and professional higher education institutions. However, in reality, institutions establish additional specific requirements reflecting differences in the sectors and fields in which they are operating.

Given the decentralised wage setting arrangements, salaries for academic staff in Estonia vary between institutions. The average salary for academic and research staff at public universities was 1.5 times the average wage in 2003. Salaries for staff in professional higher education institutions were lower, being on average some 1.2 times higher than the average wage.

Overall, academic staff appear reasonably well paid *in relative terms*, with salary relativities comparable to those in a number of English speaking countries. For example, the monthly salary for a professor in Estonia was 2.5 times the average monthly wage in 2003. In Australia, where academic salaries are relatively generous in international terms (Kuber and Roberts, 2005, p. 8), a professor was paid 2.4 time average weekly earnings in 2002 (Horsley and Woodburne, 2005, p. 8). In the United States, the salary for a professor was 2.3 times the average wage in 2003.¹¹

¹¹ Calculation of the Review Team based on National Centre for Education Statistics (2005) (table 235) and data from the Bureau of Labour Statistics.

3.8 Links to the labour market

Today, the Estonian labour market, when set against those in OECD countries, is characterised as follows (Ministry of Education, 2006, and OECD, 2006b):

- Average employment rates (in 2004, 64.4% of individuals aged between 15 and 64 were in employment, a figure close to the average of 65.1% for OECD countries).
- Relatively high labour force participation of females (in 2004, 60% of women aged between 15 and 64 were in employment, compared to an average of 55.6% for the OECD area).
- Average unemployment rates (7.9% in 2005, compared to a 2004 average of 6.9% in the OECD area) but with a high share of long-term employment (53% of all unemployed in 2005).

The period following the restoration of independence led to dramatic changes in the Estonian labour market. The size of the labour force declined in 30% in the period 1990–2005 (from 825 800 to 586 300 individuals). The primary sector shrank fivefold, the industrial sector contracted 1.5 times (with significant cutbacks in manufacturing, mining and fishing) while the service sector remained relatively stable throughout this period. Most of the recent growth has occurred in service areas such as financial intermediation and real estate. Following a peak of 14.2% in 2000, unemployment rates have steadily fallen to reach 7.9% in 2005. These are higher for the Russian-speaking population (12.9%) and males (8.8% against 7.1% for females).

The Estonian labour market has relatively few large employers. The dominant feature of the pattern of enterprise structure is the large number of small and medium-sized businesses, which shapes both the nature of the labour market for graduates and the ways in which much research and development takes place and is funded (see also section 3.6). The labour market is heated. There is a strong and continuing demand for skilled labour, unemployment is at a six-year low, and concerns have been expressed regarding skill and labour shortages.

In relation to the tertiary education sector, despite the fact that through massification of the system increasing numbers of graduates leave institutions, demand remains strong. Unemployment rates are lowest for individuals with tertiary qualifications (3.8% in 2005, twice and four times as low as for those with secondary and basic education, respectively) and have remained relatively stable between 3.5% and 6% in the period 1997–2005. Some studies have also shown that there is a significant positive correlation between educational attainment and annual income. The three

areas of study with the best salary prospects are the social sciences; science and technology; and business and law. The proportion of tertiary education graduates in the labour force was 35.9% in 2005.

Estonia has a relatively small proportion of students in the areas of engineering, manufacturing and construction. In 2002-03, 9% of graduates originated from these study areas compared to an average of 14.2% for the OECD countries for which comparable data are available. By contrast, 39% of graduates were in the social sciences, business and law, considerably above the average of 30.6% for the OECD area (see Appendix 4).

As to the international dimension of the labour market and its apparent tensions, there are no data to provide evidence of brain drain in Estonia. Anecdotal evidence suggests that this threat is real in relation to scientists and engineers. Exchanges during the Review Visit suggest that most of those who take a job abroad do return to Estonia a few years later.

The articulation between the tertiary education system and the labour market is made essentially at three levels. First, there are efforts to diversify the supply of tertiary programmes, in particular through the expansion of the professionally- and vocationally-oriented sectors (professional higher education institutions and vocational education schools). Second, there is the intention of influencing students' choice of area of study by allocating state-commissioned places across study areas according to some assessment of labour market needs undertaken by the state commission (see section 3.3). The current approach favours science and technology, services and health/welfare in detriment of the social sciences, arts and humanities (in 2005-06, 40% of state-commissioned places were in the area of science and technology). Finally, partnerships between institutions and employers are established, especially in non-universities. These include the contribution of professionals from industry to the delivery of programmes in institutions, the participation of professional organisations in curriculum development, and the presence of employers in the *kuratorium* (advisory body) of institutions.

3.9 Internationalisation

Estonian higher education institutions considerably increased their international linkages after the restoration of independence. At present the main channels for international relationships in Estonia relate to student and teacher mobility and to Estonia's participation in the construction of the European Higher Education Area, especially through the Bologna process.

In relation to the Bologna process, the government has adjusted the regulations and adopted a two-cycle structure at a relatively early stage and

set procedures for issuing the Diploma Supplement in English to all students free of charge and automatically. The government's 2005 strategic paper for the internationalisation of higher education emphasises the importance of being active in international networking and embarking upon international careers: "... the Estonian academic community should promote active participation in international networking, because the pursuit of a scientific career in only one university is exceptional. It should become commonplace to pursue post-doctoral studies in another university after the conferral of the doctorate and to assess the work experience in a foreign university upon election to an academic position".

The interest in and enthusiasm for internationalisation is both supported by a survey carried out by the Ministry of Education and Research (referred to in the *Country Background Report*) and the perceptions collected by the Review Team during the visit. Major components of internationalisation, according to the survey respondents, should be international cooperation in teaching and research, participation in international networking, greater mobility of Estonian staff and students, and increasing the number of foreign students coming to Estonia.

Several mobility initiatives have been launched. Some date from the beginning of the 1990s (the kindred peoples programme for students from Finno-Ugric ethnic backgrounds coming to Estonia, research mobility through the Estonian Academy of Science), but most of these were established from 2002 on. In 2004, the fellow nationals programme was initiated, aiming to support the repatriation of young Estonians. Also the Kristjan Jaak national initiative, supporting short stays abroad, has been recently established. In 2005/06, 207 students and scholars benefited from this programme. Another recent initiative is the support for doctoral students to study at foreign universities. In 2005/06, 47 candidates participated in this programme. Estonia also participates, since 1999/2000, in the ERASMUS/SOCRATES programme. There have always been more outgoing than incoming students (e.g. 444 outgoing versus 266 incoming in 2004/05). The pattern is different for academic staff, in the starting years the incoming numbers were almost equal or higher than the outgoing numbers, but in 2004/05 the pattern was reversed (243 outgoing versus 158 incoming). Two Estonian universities participate in three ERASMUS Mundus consortia: "Economy, State and Society", "Security and Mobile Computing" (both University of Tartu), and "Digital Library Learning" (Tallinn University). At the individual higher education institution there are additional initiatives to foster mobility.

4. Strengths and Challenges of Tertiary Education Policy

4.1 Introduction

Having provided a basic description of the main features of the tertiary education system and the national policy context in the previous chapter, in this chapter these aspects are further analysed and discussed. While Chapter 3 was predominantly based on the background information provided to the visiting team by our hosts, Chapter 4 identifies the main strengths of Estonian tertiary education policies together with the challenges and problems faced by the system.

4.2 Governance, steering and planning

Much has been achieved in the recent years, even though the Estonian higher education system has not always been under favourable conditions. It had to cope with a communist heritage, political instability (many coalition governments that not always completed their terms), an impressive growth of the system in terms of student numbers and limited resources. Despite this, all concerned with higher education – governments, institutions and other stakeholders – are positive about the future and are eager to contribute to the improvements that are deemed necessary.

The consultative nature of policy-making – certainly eased by the size of the system –, allowing the government to think through its objectives, to discuss crucial issues with stakeholders and to adjust policy strategies is well appreciated. Where needed, the government and institutions rely upon international experts, particularly when it comes to quality assurance and peer review for granting research projects, or follow international best practice. The involvement of employers and their organisations in policy-making is however somewhat underdeveloped (see also section 4.8), which is also likely to reflect the still incipient interest of employers' organisations in higher education issues.

In the eyes of the Review Team, the increase in manpower at the ministerial level has improved the Ministry's capacity to develop and implement policies, although overall the size of the Ministry seems still limited. The increased capacity has been reached not only through broadening the capacity at the Ministry itself, but also through linkages with other ministries and through semi-independent organisations (e.g. Archimedes Foundation, for activities related to the European Union; the Foundation includes the Higher Education Quality Assessment Centre, administering accreditation, see section 3.4.1). Nevertheless, there seems to be a relatively weak information base to guide higher education policy development. The *Eesti Teadusinfosüsteemi* (Estonian Research Portal, ETIS) contains much information on research, but in the domain of education, background information on important issues seems to be missing. Examples of data lacking identified in this report include: data evidencing brain drain (see section 3.8), number of students taking loans by socio-economic background (see section 3.3.2), data on characteristics of staff in Estonian higher education institutions (see section 4.7), data giving insight into equity issues and student retention and progress (see section 4.5), and labour market outcomes at the system level (see section 4.8). Furthermore, policy evaluation studies seem to be sporadic, although at the institutional level there are some, but inevitably small-scale, surveys. It is understood, however, that the small size of the system leaves some room for an informal understanding of policy effects.

Higher education institutions in Estonia have considerable substantial and procedural autonomy, although there are some differences between the universities and the professional higher education institutions. The 2001 OECD review (OECD, 2001, p. 171) noticed that the professional higher education institutions were under more direct financial control of the Ministry of Education and Research than the universities. This aspect was hardly raised in the interviews by representatives of these institutions, so the Review Team assumes that this difference in the level of financial control has gradually disappeared. However, representatives of the professionally- and vocationally-oriented institutions stressed that the room for development (particularly in terms of setting up new programmes, including Master level degrees) was rather limited.

For both universities and professional higher education institutions the autonomy seems to be focused particularly on the financial and the legal status of the institutions. During the Visit, some concerns were expressed regarding the (relatively) lower autonomy regarding the provision of programmes and human resource management. Regarding the former, accreditation was mentioned as limiting curricular innovation and regarding

the latter, specifically the rather strict tenure procedures for staff at the institutions were mentioned.

Overall, the institutions appreciate their level of autonomy, which gives them considerable leeway to adapt their processes and structures and to respond adequately to specific local, national and international demands. However, there were some concerns about the burden current regulation processes place on the institutions. Institutions had to spend considerable energy and time to translate the requirements in relevant and helpful regulations and mechanisms at the institutional level. More recently, this situation is improved, the governmental *Estonian Higher Education Strategy 2006-2015* being welcomed as a beacon for institutional planning and development.

There is general satisfaction with the internal governance structures of the institutions, where elected students and staff members take part – as members of the council – in institutional decision-making and a rector is elected by a selection of the members of the institution. The Review Team noticed minor differences in procedures and composition of councils and committees across the institutions. Overall, there seems to be a fair balance between executive steering and control and consensus-driven decision-making, in which both staff and students play an important and satisfactory role in councils and committees. Also, through course evaluations, but also in informal ways, students think they can affect the quality of the provision. But, there were unanimous concerns about the advisory role of the *Kuratoorium*. Many expressed the view that this body is either not very committed to advising the institution in important matters and/or does not or cannot properly reflect a role on behalf of society. Partly because of the problems noted around the *Kuratoorium* and its non decision-making role, the Review Team formed the impression that societal interests might not be sufficiently represented in the formal decision-making procedures at higher education institutions.

The Review Team appreciates how the system has developed. The increasing diversity of the system, particularly the expansion of professional higher education and the growth of the private sector, is a positive development. At the same time, the Review Team has concerns about the present fabric of the system. This relates, first, to the lack of societal appreciation for the activities and achievements of the professional higher education sector; it seems that employers and students might prefer university graduates, possibly due to a lack of familiarity with and understanding of the nature of professional higher education. The Review Team learned from the interviews that the institutions and their programmes are insufficiently known by students, which calls for initiatives to raise the social prestige and standing of professional education. Employers, however,

seem to be satisfied with the skills and knowledge that graduates acquire in these institutions.¹² A second concern related to the system's fabric is the fragility of the private higher education sector. Since 1995, seven private institutions emerged and disappeared again (OECD, 2001), and currently the share of the private sector in terms of student numbers (about 20%) is still limited and the typical size of a private institution is fairly small.¹³ A third concern is the fragmented and dispersed nature of the system notably in terms of a lack of cooperation between the institutions. It appeared to the Review Team that rather strong barriers exist between universities, professional higher education institutions and the vocational schools and likewise between public and private institutions within the same sector. These barriers are visible in research (*e.g.* lack of networking between universities and professional higher education institutions) and in teaching (*e.g.* lack of effective recognition of learning across institutions).

4.3 Funding

4.3.1 Institutional funding

Overall, the speed at which the Estonian higher education system has evolved from the pre-independence system to a system which embodies many features which represent 'good practice' in funding is remarkable.

The funding of institutions has evolved in the direction of greater autonomy for institutions and increased simplicity in granting arrangements. Institutions now have considerable autonomy in terms of managing their finances, staff and assets such as land and buildings. The provision of operating funding in the form of a block grant allows institutions to deploy funds to deliver state-commissioned education with few restrictions. The provision of funding to institutions under an explicit contract means that governmental expectations are clear. Overall, the government's role in the system has developed as one of steering rather than direction or control. At

¹² There are however some positive signs that professional higher education is gaining popularity among students. The professional higher education sector grew faster in the period 1998 – 2005 than the university sector. In this period, student numbers at universities increased by a factor of 1.7, students in professional higher education institutions almost doubled and the factor for the vocational sector was 2.4.

¹³ The size of the 19 private higher education institutions (as of 2005) ranges from 18 to 2 538. Eight out of the 19 institutions have less than 250 students.

the same time, private institutions are a feature of the Estonian system and receive some limited public funding.

The policy of allowing institutions to offer places on a full-fee paying basis in addition to state-commissioned places has operated as something of a safety valve in terms of balancing public expenditure and societal expectations. It has enabled institutions to meet a level of demand for higher education far in excess of the numbers of places funded through the state commission without overburdening the public budget.

While reforms to the Estonia system of student loans are proposed, the positive features of the current system need to be acknowledged. Firstly, loans are widely available. Secondly, the loan arrangements allow students to defer repayment until after the completion of study and repayment arrangements take into account debtors' circumstances to a degree.

It is important also to acknowledge that higher education policy in Estonia continues to evolve. Importantly, the proposals for further reform in Estonia articulated in the recently developed *Estonian Higher Education Strategy 2006-2015* continue in the positive direction pursued to date, particularly in terms of reinforcing institutional autonomy and increasing funding certainty. One of the four action lines included in the 2006 strategy paper is the modernisation of the funding system for Estonian higher education. Proposals include:

- the introduction of three year performance based contracts for state-commissioned education;
- expenditure of approximately EEK 400 million per annum on capital investment, with this funding being included as part of institutions operating grants;
- exploration of the possibilities of public/private partnerships in funding higher education; and
- the review of measures to ensure equal access to higher education for socio-economically disadvantaged students.

One of the most striking features of the evolution of Estonian higher education since independence is the rapid growth in the numbers of full-fee paying students both in terms of absolute numbers and as a share of all students. From a clear preponderance of publicly funded students in the early 1990s, the situation has evolved to the point that fee-paying students now represent more than half of all students. This development raises some fundamental issues for funding policies, particularly regarding the appropriateness and impact of a funding model which results in just over half of all students receiving no public support. In this context, three main

issues need further elaboration: the relevance and effect of the state commission; the financing of student tuition costs; and income support for students.

The Review Team's concerns regarding the state commission relate to the content (what is purchased) of the commission rather than its form. The existence of an explicit contract between the government and higher education institutions which defines what the government is buying and under what conditions is seen as a positive feature of the Estonian funding system. The problems with the commission lie rather with the relevance of the commission to the labour market and its impact on student choice and the supply of skills.

The Review Team sees three sets of problems with the current operation of the state commission. Firstly, the Review Team questions the extent to which it reflects the needs of the Estonian labour market. As expressed in legislation and in documents such as the *Country Background Report* and the *Estonian Higher Education Strategy 2006-2015*, the intent of the commission is one of ensuring an adequate supply of qualified personnel for the labour market. Two comments can be made here. In the first place, the numbers of graduates specified by the commission is inadequate to meet current demand. The Estonian labour market is currently absorbing an output of graduates far in excess of the numbers commissioned without apparent difficulty. Second, the focus of the commission on the supply of graduates in 'hard' disciplines (*e.g.* sciences and engineering) does not give adequate recognition to the importance of the service sector (particularly financial and business services) in a modern 'knowledge' economy.

Secondly, it is not certain that the concentration of state-commissioned places in certain fields will help solve the problem of shortages of qualified applicants for particular targeted occupations – for example, for jobs in teaching or engineering. There can be no guarantee that graduates in supported fields will take up employment in related occupations. It is probable that many will seek better remunerated employment in occupations not directly related to their studies, particularly in tight labour market conditions such as those that exist currently in Estonia. A more effective approach to the problem of lack of supply for certain occupations may be to consider demand-side measures such as bonus payments, bonded scholarships or loan waivers for students who enter such occupations.

Thirdly, the current arrangements are likely to have a potentially distorting effect on student choice. Ideally, one wants students to undertake those programmes which best utilise their talents. However, given the limited number and skewed distribution of state-commissioned places, a bright student with limited means may be encouraged to enter a course of

study for which he or she has limited interest simply in order to gain a free education. This is particularly the case regarding the humanities, social sciences and business studies where the proportion of state commissioned places is low. For example, only 15% of students undertaking business studies occupied state-funded places compared to approximately 75% in the case of students undertaking engineering, teaching and health-related studies.

There are areas in which the funding arrangements for institutions could be both simplified and rendered more transparent in their operation. The system of funding coefficients for example is unnecessarily complicated with some 34 different factors relating to broad discipline areas, programme and to particular types of courses (individual curriculum) in some cases. Simpler funding formulae exist in many other countries. For example, the funding formula used in the Czech Republic consists of seven coefficients (Šebková, 2006, see particularly table 7.8) covering different discipline groupings. The one used in Australia involves 12 funding clusters (DEST, 2006) and in New Zealand it involves 15 categories (TEC, 2006).

In addition, the failure to adjust the funding rates for the effects of inflation on an automatic basis (*i.e.* maintain their real value) creates considerable budgetary uncertainty for institutions, particularly in times of relatively high inflation.

4.3.2 Student finance

Turning now to student funding, it became clear that current arrangements involve a sharing of the costs of higher education between students (and their families) and the public budget. While supporting the principle of cost sharing, the Review Team questions the efficiency and equity (see also section 4.5) of the manner in which this is currently achieved. In the current system, cost sharing is achieved by arrangements which see some students having their studies fully subsidised by the public budget and remainder paying the full costs of their tuition. In other words, the burden of private contributions is borne by a subsection of the student population rather than shared by all. The Review Team considers that more equitable and efficient arrangement would involve all students contributing towards the costs of their tuition and most (if not all) students receiving some public subsidy.

The case for tuition fees for all has two elements.¹⁴ Firstly, graduates receive a considerable private benefit from their education in the form of

¹⁴ For a good discussion of the issues see Chapman and Ryan, 2002, p. 2-3 and Chapman, 1997.

higher lifetime earnings and lower chances of unemployment. Secondly, the effects of full subsidisation are regressive in that public resources are redistributed to those who have better life chances and earnings potential. The case for a broader distribution of public tuition subsidies is the corollary of the above. The rationale for the provision of public support is that there is some societal or external benefit attached to higher education which is not captured by the individual graduate. The scale and distribution of such benefits is notoriously difficult to estimate. However, it is hard to argue that there are no externalities accruing from the education of the 50% of students who currently receive no public support for their tuition.

In addition, the current distribution of state-commissioned places creates both distortions to choice (see above) and inequities. This is particularly the case in that these students are concentrated in certain disciplines (*e.g.* the social sciences and humanities), certain modes of study (part-time and distance education) and/or have certain characteristics (*e.g.* they are often older students).

The other major element of the current financing arrangements which could benefit from reform is the student loans scheme. In particular, the existing loan scheme does not fully remove the risk that some students with the ability to successfully undertake higher education will be prevented from doing so through lack of financial means.

Firstly, loans are not accessible to all students. Currently only full-time students are eligible to take out a government supported loan. Secondly, access to loans is conditional on a student's credit worthiness and the provision of sureties (*e.g.* assets such as property) by the student or by two guarantors. This condition immediately poses problems for students from families unable (due to limited means) or unwilling to provide securities. It was impossible for the Review Team to quantify the extent to which students were unable to take out a loan for this reason. However, it was clear from the team's discussions with students that the need for guarantors did prevent some students from taking out loans. Thirdly, students taking out loans run the risk of default. The government guarantees the lending institution against the risk of default, not the student. The consequence is that students with limited means or from families with limited means may be discouraged from taking out a loan due to an unwillingness to risk default. Lastly, the amount which students can borrow is not sufficient to cover tuition costs let alone living expenses.

The student support system in Estonia is extremely limited in its coverage with most students receiving no assistance with living expenses. The grant support that is available is allocated on the basis of academic performance rather than the financial circumstances of the student or his/her

family. Loans are available to full-time students (see above) to cover tuition and living costs. However, the amounts available do not cover tuition fees for most students in fee-paying places and the need for security and the risk of default mean that taking out a loan is not an option for students from poor backgrounds.

The outcome is that many students in Estonia have to meet the full cost of tuition as well as their living expenses without any public support. These students can be expected to come disproportionately from poorer backgrounds. Under these circumstances, the only option left for such students is to work on something approaching a full-time basis. In the course of its visit, the Review Team was struck by the extremely high proportion of the students with whom they spoke who were working full-time or close to full-time while at the same time undertaking full-time study loads. The burden that this places on students and the effects that it is likely to have students' capacity to learn effectively is likely to be considerable.

4.4 Quality assurance

One of the main aspects that is immediately apparent when reviewing the Estonian higher education system is the general acceptance and legitimacy of its quality assurance arrangements. Both quality and the need to provide public assurance about it are central issues in higher education policy of the Estonian government and policies at most higher education institutions. Close attention is being paid to the developments in other parts of the world, and quality assurance mechanisms are developing with close regard to the needs of the higher education system. Proof of this is the continuing need to amend the laws, standards and procedures, and the system's ability to analyse the way in which quality assurance is being carried out.

Also, current mechanisms are well established and institutionalised. Higher education institutions know what to expect, and their opinions systematically recognise that the need to face external quality assurance processes has helped them develop their own internal assessment procedures. External review is also generally accepted, and the observations of the external review teams are seen as useful inputs for the development of the institutions and their programmes.

At the same time the Review Team noticed tensions between the licensing and accreditation procedures. The first tension relates to the balance of control. A form of licensing – albeit restricted at present – is in place to control the quality of many new higher education institutions through the approval of their programmes. Some of them are private, but

there are also some public ones that need to be controlled. The mechanism established for this is the application of the *Standard of Higher Education*, which sets out the basic requirements for the curricula. The *Estonian Higher Education Strategy 2006 – 2015* carries this licensing mechanism forward, and makes it compulsory for all institutions to apply for the new license before September 2008. Accreditation is in place to promote the quality of higher education, and it means to do so by encouraging higher education institutions to develop internal quality assurance procedures, and to voluntarily submit themselves to accreditation.

Licensing, in this arrangement, is a once-only assessment, carried out when the programme is in its initial stages. Once the programmes of a new institution are licensed, it can continue developing, and if it wants to have its degrees recognised, or have access to public funds, it must submit these and itself to accreditation. In international terms, licensing is the mechanism used to provide a measure of quality control, based on threshold standards. It is usually cyclical, and it may either be permanent (as is the case in the US) or it may occur during a fixed period of time during which the programme or the institution are periodically assessed to determine its ability to comply with the threshold standards being applied. It is a mechanism that is increasingly being applied in those countries where higher education is diversifying, either because there are new types of higher education institutions (university and non-university types) or because new providers are coming into the field. Licensing is usually compulsory, and it can end in the denial or withdrawal of the license. Therefore, it is a high stakes assessment exercise, where self-evaluation plays a much less significant role than in accreditation, mainly because it is not very realistic to expect an institution clearly to identify its weaknesses if the end result may be its closure.

Accreditation, on the other hand, is a mechanism designed to provide public assurance of compliance with pre-determined standards. It has a much larger component of quality improvement, it is usually voluntary, and it ends in a statement about the level of compliance, but it does not necessarily lead to the withdrawal of a license to operate. In this case, self-assessment plays a role which is as important as the external review, which has as one of its main objectives the validation of the self-assessment outcomes. It is a good way to help higher education institutions learn to develop and apply internal quality mechanisms, and to promote self-improvement.

In this sense, what the Estonian quality assurance system entails is a fair amount of sticks (both in licensing and accreditation), downplaying the carrots that can be put in place to support self-assessment and creating an intrinsically motivated evaluation culture.

In a similar way, a voluntary accreditation scheme linked to the possibility of sanctions for the institutions failing the evaluation has problematic aspects, which brings us to the second tension, namely between voluntary versus compulsory procedures. Being voluntary, it does not provide for the most critical higher education institutions to be evaluated. While the Ministry of Education and Research can initiate evaluations on its own, in many cases doubtful programmes or institutions can survive without accreditation, and continue to offer low quality services. This is where compulsory licensing (as envisioned in the 2006 strategy document) is much more effective. On the other hand, if accreditation is to promote and support a quality assurance culture, and help develop honest, in-depth self assessment capabilities, it should be voluntary and without the risk for sanctions. This is particularly important, since international experience shows that self-assessment is the most effective tool for the promotion of quality.

The Higher Education Accreditation Centre (HEAC), acting for HEQAC, has provided well-specified criteria and procedures, which enable the system to operate in a clear and transparent way. It provides training and technical assistance to higher education institutions, in order to help them prepare for self-assessment, and has developed supporting materials for this process.

Accreditation results are published, thus making it possible to fulfil one of the system's goals, which is to provide useful information to stakeholders.

The system is based on the work of international evaluators. Only seldom will Estonian nationals be part of the external peer review team. The reason for this is quite obvious: the size of the country and of its academic community makes it very difficult to achieve objective, comprehensive assessments without the strong participation of foreign experts. But the work of international experts is also a very good way to continually measure Estonian academic and professional teaching against international standards, something that the country needs and is eager to pursue.

In the current system of quality assurance, there is a risk of developing formal, more quantitative processes and indicators, rather than the qualitative analysis which can lead to better self-regulatory practices. There are some indications of this already. Several of the higher education institutions visited mentioned that accreditation tended to be focused on formal criteria, but that quality could rarely be explained merely by meeting formal requirements. A review of the standards applied for curricula and institutions shows that they emphasise qualitative aspects, but the provisions of the *Quality Agreement*, the *University or Professional Higher Education*

Acts and the Standard of Higher Education tend to focus on formal and quantitative measures.

On the other hand, the standards for programme evaluation are general, that is, they do not refer to the requirements associated to specific programmes. The judgment about the quality of a given programme depends on the views of the external review team, which is composed entirely by foreign experts. As an illustration, they must judge whether the “curriculum complies with requirements of the Standard of Higher Education, a professional standard and international legislation taking into account industrial and economic development in Estonia and Europe”, without any indication on what would be desirable from the point of view of the Estonian government, higher education institutions, the labour market or the professional field. They are also expected to tell whether the “curriculum for continuing education reflects requirements of the labour market”. Thus, the quality criteria applied to programmes fail to take into account the views of Estonian stakeholders or any specific national requirements, which could be spelled out in order to provide guidelines both to the programmes and to the external reviewers.

The quality standards that are applied have been developed in relation to regular, face-to-face programmes. But there have been important developments in the field of online or e-education, which require that quality criteria and procedures are adapted to address the specific issues more closely related to distance and online provision. While many of the quality criteria for face-to-face programmes also apply to distance education, there are special aspects dealing with this type of provision which should be adequately taken into account.

Finally, the decision making processes on quality assurance are complex and may be subject to a charge of insufficient independence, both from the government and the higher education institutions. In fact, the accreditation decisions are taken by the Ministry of Education and Research, on the recommendation of the HEQAC, which bases this recommendation on the advice of the peer review team.

The Ministry of Education and Research may not agree with the HEQAC, in which case it can ask the Council to make a revision of the process. This makes the Council dependent on the Ministry, which is not acceptable under European quality assurance standards (ENQA). At the same time, the Council may reject the recommendations of the review team. This possibility was criticised a number of times during the interviews held with the Review Team on the grounds that decisions become less transparent and potentially favour the most prestigious institutions.

4.5 Equity

There has been an improvement of the geographical accessibility to tertiary education. First, the expansion of tertiary education in Estonia has led to the establishment of tertiary education institutions outside the two main cities – Tallinn and Tartu. In 2005/06, 10% of all students were studying in these institutions. These institutions are of two types. Most of them (17) are organisational units of the public universities based in either Tallinn or Tartu. Examples include the Virumaa College of Tallinn University of Technology (dedicated to technology-oriented programmes of interest to local industries), the Pärnu College of the University of Tartu (focused on tourism-related programmes), and the Rakvere College of Tallinn University (specialised in the training of teachers and nurses). There are also five independent institutions which are either a professional higher education institution or a vocational training school providing programmes at tertiary level. The development of institutions of tertiary education in regions has been mostly the result of both individual institutions' strategies to expand at regional level and regional initiatives to upgrade some secondary-level institutions to tertiary level. It does not result from a strategy devised by the government in collaboration with local authorities. The role of the Ministry of Education and Research has been limited to supporting selected initiatives such as the Narva College of the University of Tartu in light of its aim to prepare teachers for schools with Russian instruction in the Ida-Virumaa region.

However, institutions located in non-urban areas present a number of limitations. They offer programmes in a restricted number of areas and rely often on academic staff whose primary employment is with an institution located in an urban area (typically the “parent” institution). Their curricula tends to concentrate on public employment areas (e.g. teaching, nursing, social workers) while options in study areas more related to industry are limited. They are also often fairly small institutions.

Second, the access to tertiary education programmes in regions has been favoured by the development of opportunities for open/distance learning. The main institutions of tertiary education now provide courses using distance or e-learning delivery. A particularly relevant initiative is the creation, in 2002, of the Estonian e-University Programme, bringing together the State, the business community, the University of Tartu, Tallinn University of Technology and partly publicly funded under the Estonian IT Foundation. This consortium seeks to facilitate e-learning opportunities for Estonians, including those in more remote areas. A complementary initiative to be applauded is the opening of 10 regional learning centres across the country, typically based at university campuses, vocational schools or public

libraries. The e-University Programme and the regional centres have engaged in collaboration to facilitate access to quality education in remote areas. These initiatives are at an early stage of development. The Review Team formed the impression that the regional learning centres are still not being used to their potential and overall distance provision is still underdeveloped.

The Review Team also felt that there is an overall lack of clarity about the regional dimension in tertiary education provision. However, this does not come as a surprise as Estonia is a small country with a high proportion of its population living in urban areas (69% in 2004). The approach of leaving the initiative to the better established institutions to develop regional campuses and complementing that with the development of distance learning and the establishment of regional learning centres seems appropriate. The emphasis on distance learning is certainly to benefit from the high degree of computer literacy of Estonians and the extensive computer and Internet resources across the country. An appropriate complement is the provision of financial assistance to facilitate the access of students from regions to institutions located in the main urban areas as is currently done through the supplementary allowance (see also section 4.3).

Female participation has steadily increased in recent years. In 2003, females represented about 62% of tertiary enrolments (greater than the highest proportion among the OECD countries for which comparable data are available, see Appendix 4), compared to about 51% in 1993. However, women are underrepresented in some areas such as technology and engineering and overrepresented in some others such as teaching or nursing. Similarly, the gender gap in postgraduate programmes also favours women: in 2003, the percentage of females in these programmes was 55%, greater than the top figure for the OECD countries for which comparable data are available (see Appendix 4).

Another positive development has been the expansion of the participation of more mature students, which seems to indicate opportunities for these students. The proportion of students aged 26 and older increased from 15.3% in 1995 to 34.1% in 2005. The main reason seems to be that many individuals postponed their enrolment in tertiary education as a result of the poorer conditions and available business opportunities in the period which immediately followed the restoration of independence. Despite this high level of participation, strategies for promoting lifelong learning are incipient and there are no provisions to allow entry into higher education on the basis of a person's assessed competencies instead of formal qualifications.

An area in which there have been serious efforts is the development of initiatives to facilitate the participation of the Russian-speaking minority in tertiary education. Russian is the major minority language in Estonia, being spoken by about 30% of the population. Russian-language education is provided in public and private schools at all levels from pre-schools to tertiary institutions. Given that the main tertiary institutions do provide instruction mainly in Estonian, Russian-speaking school leavers find themselves at a disadvantage to access these. In 2005, while 39% of Estonian-speaking school-leavers accessed a state-commissioned place in tertiary education, 31% of Russian-speaking school-leavers did so. For this reason, the Ministry of Education offers a one-year advanced Estonian language course (with the provision of extra funding) to those students who have limited proficiency in Estonian and are granted a state-commissioned place. Institutions of tertiary education also play an active role in this area. Their supply of Russian courses often goes beyond the provision required by the Ministry. Some institutions offer full degrees in Russian – overall about 10% of students in tertiary education study in Russian. Some smaller private institutions were established to cater for the needs of the Russian-speaking community. Other initiatives at institutional level also include the possibility of writing exams in Russian and the formation of groups of Russian students. The Review Team formed the view that there is strong awareness in the system of the need to cater for the needs of Russian-speaking students.

Another important development has been the introduction in 1997 of a uniform state secondary school-leaving examination across the country which is the most important criterion for admission to institutions of tertiary education and access to state-commissioned places (the institution may use additional entrance criteria). This might be instrumental in making the basis for access more uniform across the system and providing clear expectations about standards to enter tertiary education.

Despite these positive developments, a number of concerns about the equitable provision of tertiary education remain. There is a general lack of knowledge about the extent to which equity in tertiary education is a problem as a result of the lack of critical data such as the socio-economic background of students in tertiary education, that of those accessing non-fee-paying places or that of those who benefit from student support programmes. The interviews during the Review Visit provided indications that access to tertiary education is strongly related to the socio-economic background of students and their families, namely income levels and the educational levels of parents. The Review Team formed the impression that, despite the lack of firm evidence, there is a clear sense in the system that tertiary education in Estonia is inequitable in that overall entry and access to the state-commissioned places (in particular in the best institutions) are

disproportionally granted to students from families with the highest educational attainments.

It can also be said that there is an overall lack of commitment to improving equity in Estonian tertiary education. Equity is not among the priorities of tertiary education policy, few initiatives are targeted at improving equity, little information is collected to assess the extent of the problem, and an insignificant share of public funds is set aside for need-based financial aid. Similarly, the institutional commitment to improving equity also appears to be low by international standards. Institutions provide relatively little in the form of need-based student support. In discussions with institutional officials during the Review Visit, the issue of improving equity was rarely raised.

As noted in detail in section 4.3, the student financial support system is still underdeveloped and does not assist adequately those students with financial need. The allowances currently offered are not sufficient to cover realistic costs of living and the supply of loans is limited. The granting of student support on the basis of merit only is also questionable, as no social objective seems to be achieved. In fact, it is unlikely that academically gifted students not financially needy would choose not to attend tertiary education if no merit-based allowance was made available to them. These public funds would accomplish a better social goal if they were used to facilitate the access to tertiary education of those financially needy but academically talented students. In this respect, it is significant that the proposal for introducing a means-tested student allowance system in the context of the *Study Allowances and Loans Act* of 2004 was abandoned as a result of acute political disagreements.

The Review Team also formed the view that not enough support structures are in place to facilitate the access to tertiary education of disabled students. Some provisions exist in the Law, such as the physical accessibility of facilities, funds to subsidise the cost of sign language interpretation, or some small educational allowances (EEK 100 to EEK 400 per month) for disabled students who undertake tertiary studies. However, in practice, accessibility problems persist and few study materials exist for students with special needs. In 2004, only 13 persons with a visual disability, 5 persons with a hearing impairment and 6 persons with reduced mobility enrolled in tertiary education.

At present, there is also little focus on equity of outcomes. The Review Team formed the impression that little emphasis is placed on student progression throughout tertiary studies with little special support and follow-up measures to assist those students which reveal more difficulties. In the institutions we visited, we saw little evidence that students' progress is

closely followed by a teacher and that students whose disadvantaged background has been identified receive any particular attention. This is important in light of the evidence that the proportion of students graduating within the nominal duration of the degree has been falling in recent years in all types of institutions (*e.g.* from 60% in 1996 to 48% in 2004 for academic programmes in public universities, see Ministry of Education and Research, 2006) and that the proportion of students withdrawing from tertiary studies has been rising over the same period. A survey conducted by the University of Tartu in 2005 suggests, as possible reasons for student withdrawal, poorly informed career choices (often distorted by the allocation of state-commissioned places) and poor preparation (not compensated by tutoring services at the institutions) (Must, 2006). The extent to which Estonian tertiary students work (often full-time) while studying on a full-time basis is also likely to negatively impact on study outcomes.

4.6 Research and innovation

In general, several positive and encouraging trends can be discerned with regard to research- and innovation-related issues in Estonia. At the same time, however, a number of problematic issues remain that need to be addressed. The following issues are considered: overall vision and strategy, research funding, human resources, university-industry relations, the regional dimension and integration with foreign research and innovation systems.

An important positive trend is the revived awareness of the importance of science and innovation for the development of the economy and society. This awareness was strong in the Soviet period, but it largely disappeared in connection to the neo-liberal shock therapy of the early 1990s.

Innovation is now being widely discussed and debated in Estonian media as well as in political circles and at higher education institutions. There is an increasing understanding that the current low-cost-oriented Estonian economy cannot be sustained on the long term, and that there is therefore an acute need to create a more knowledge-based and innovation-oriented economy. There is nowadays a broad consensus about this interpretation among a wide array of actors.

A challenge in this connection, however, is that the increasingly recognized importance of research and innovation has so far not been reflected in corresponding financial commitments. In other words, although the goals have become more clearly formulated, the means for achieving these remain diffuse. The contradiction between intentions and concrete actions as experienced in the implementation of the first R&D strategy

(2002-2006), for example, with regard to the national strategic programmes, has also contributed to lowering the level of trust between policy-makers and other actors.

A related weakness is that frequent changes in political constellations have tended to make previous decisions obsolete and thereby forced actors to readjust their long-term planning. This has created an obvious tension within the research and innovation community. Research and innovation policies need very long-term perspectives if they are to be planned and implemented effectively, and this long-term commitment has so far been missing in Estonia.

Another traditional problem in the Estonian system of innovation has for many years been the lack of actual priorities or a clear ‘strategic thrust’ when it comes to the implementation of R&D policy. This remains an issue, but there are at least two examples of policy initiatives that have recently tried to counteract this, namely the formation of targeted funding through Centres of Excellence and Centres of Competence.

Concerning organisational arrangements for research and innovation policy, a problem is that too many organisations are involved in policy-making. Neither the division of responsibilities and above all the coordination between the two relevant ministries (Ministry of Education and Research and Ministry of Economic Affairs) is clear, nor are the relations between and effectiveness of the R&D Council, the Research Policy Commission, the Innovation Policy Commission and the Research Competency Council as policy-making actors. The rapidly shifting agendas of different governments and responsible ministers have also made it difficult to interconnect economic and research strategies.

A success regarding the structural reforms launched in the 1990s is clearly the transformation of the Academy of Sciences, whose research institutes have now in most cases joined universities. This has strengthened the research capacity of universities in a radical way, thereby also creating opportunities for a better integration of teaching and research.

At the same time, the reform does not automatically mean that research that was previously carried out at academy institutes is now organically integrated with teaching activities at higher education institutions. To a certain extent there is still an obvious separation, at the level of individuals, between teachers and researchers, and this problem seems not to have been satisfactorily addressed in policies and strategies.

Moving to the second issue of concern, research funding, the general observation is that it functions better now as compared to a few years ago, when there was a number of complaints and uncertainties, as created by, for

example, one instance of ministerial intervention in the selection of research grants. A stable, competitive-based and fairly transparent system has since then been established, which seems to function smoothly, while minimising conflict. In general, the portfolio of instruments for research funding can be said to be in reasonable balance, while the portfolio has also been diversified in recent years.

The Research Competency Council, which is the most important funding agency, filed only seven complaints out of 240 granted projects in 2004. A positive feature is also the recent introduction of base-line funding in 2005, although it covers only around 15% of total research funds. The Estonian Science Foundation contributes another 15-20%, orienting itself to individual grants.

In addition, Estonian researchers and research groups have become very active with respect to EU-related funding opportunities, where they have also proved successful and internationally competitive in several areas. A drawback, however, is that the European Union structural resources, the purpose of which was to complement national R&D investments, have in reality been used to substitute for the latter (Ministry of Education and Research, 2006; Technopolis, 2006).

A positive aspect is the increasing emphasis on competitive-based research funding and in particular the internationally oriented evaluation process. A strength is in particular that both the Research Competency Council and the Science Foundation to a surprisingly great extent use reviewers from abroad in their assessment processes.

Given the problems of securing the human resource basis in the Estonian research system (see also section 4.7), a positive trend is the increased attention in both policy formulation and implementation to funding young researchers. A EEK 6 000 per month stipend for state-commissioned PhD students has been introduced, while also the Research Competency Council and the Science Foundation focus increasingly on young researchers, both PhD students and post-docs. Additionally, the Centres of Competence programme has proved a way for young researchers to be involved with the university while retaining a link to private business.

An important issue in Estonian higher education institutions has for many years been the problems concerning investments in scientific instruments and equipment. Nowadays the situation has improved, and the equipment and infrastructure problems have, if not been solved, at least aroused attention and understanding.

All in all, higher education institutions spend only slightly less on R&D than their counterparts in Western countries do, as a percentage of GDP

(0.36% as compared to the OECD average of 0.42%) – despite failure in recent years to meet financial targets for government-funded R&D (cf. Technopolis, 2006, p. 24). This means that teaching has a real opportunity to be research-based, although there is a need for more time for teachers to actually be involved in research.

The most pressing problem in the Estonian system for R&D funding, however, is the continued reluctance of private business to invest in R&D. As mentioned in the previous chapter (section 3.6), the expenditure on R&D by the business sector in Estonia, measured as a share of GDP (0.28% in 2003), is almost negligible compared to the OECD average (1.51%). At the same time, there is a positive trend in this respect, as the private sector in 2004 already contributed 40% of total Estonian R&D expenditures, whereas the corresponding figure in 1999 was only 20%. This is still low, however, in international comparison, and it is even lower if seen in relation to the low aggregate R&D expenditures in Estonia.

The availability of qualified human resources is one of Estonia's major strengths in research and innovation, although the negative demographic development along with a number of other factors (as discussed below) at the same time poses serious threats to the future in this respect.

The overall absorptive and adaptive capacity in the Estonian research and innovation community is impressively high for a country of Estonia's size and GDP level. This capacity was the most valuable asset inherited from the Soviet period, paving the way for a number of internationally successful research groups in the post-Soviet era and, to a lesser extent, innovative business firms.

Despite being a very small country, Estonia hosts highly qualified research groups over a very wide spectrum of scientific disciplines and interdisciplinary fields. This means that the Estonian research community has strong 'background competencies', which enable the country to follow international developments in practically all major fields of science and thereby also make Estonian research prepared for and less vulnerable to new radical scientific developments globally.

Estonian research groups are internationally recognised, at least in some particular fields. The internationally most competitive disciplines include materials science, pharmacology-toxicology, botany, zoology and environmental sciences (Ministry of Education and Research 2006). This is also reflected in, for example, a high success rate in EU applications and a good overall integration with the global research community. Within the EU 5th framework programme, Estonian applications had a success rate of 24.2%.

A major challenge for the future of Estonian research is the fostering of a new generation of researchers. Most of today's leading researchers are above 60 years of age. There is a problematic lack of researchers aged 40-55 years (ESF, 2006), making the effective fostering of younger researchers even more pressing and acute.

Higher education institutions report that it is much more difficult than before to attract qualified young people to science and to keep them there, especially PhD students. In 2005, only 118 PhD degrees were awarded in Estonia, which is considered to be below the critical threshold for sustaining existing research strengths on the long-term. Innovative companies, too, usually have great problems to attract qualified young people – although a number of encouraging exceptions can be identified.

Policy-makers and higher education institutions are nowadays clearly aware of the tremendous challenge regarding the ongoing generation shift and have developed a number of initiatives for counteracting the negative trend, several of which have already proven effective. For example, the possibility to offer internationally competitive researcher salaries has created a returnee trend of emigrant researchers, including recent PhDs and post-docs. A monthly stipend for state-commissioned PhD students has also been introduced, as mentioned above, while funding agencies have started to focus more on young researchers. A further initiative that has proved able to bring young talents into research is the Centres of Competence programme.

An issue that has been widely discussed in Estonia is the loss of human resources through emigration ('brain-drain'). With their excellent language skills, it is hardly surprising that young, talented Estonians with research ambitions are attracted by generous offerings from foreign universities and innovative companies.

However, there are also positive effects arising from international movement and there is no clear evidence that the net effect of emigration is negative. The flow of emigrant researchers is, of course, a prerequisite for being able to bring them back at a later stage. People who return back home after having completed their masters or doctoral degrees abroad, or enjoyed a post-doc experience in a foreign country, provide an invaluable opportunity for domestic development both in terms of their competencies and their personal networks. This is obvious at higher education institutions, but also in the private sector, where the value of returnees is reflected in the fact that many of the most successful innovative Estonian companies are in fact based on people with far-reaching foreign experience (Högselius, 2006).

A major problem in the Estonian innovation system is the wide gap between activities in higher education institutions and in business. Although

the situation has improved somewhat in recent years, there are still only very few direct links, compared to typical OECD countries.

Most higher education institutions can easily list a number of important links to domestic business, but projects are usually very small and the extent of links is not at all at the same level as in Western countries. The sectoral differences are substantial, though, and the links with industry are stronger in some sectors, such as mechanical engineering and energetics (Tallinn University of Technology, 2006). All in all, the private sector in Estonia contributed only 6.5% of R&D expenditures at higher education institutions in 2004.

The mismatch between the two sectors is illustrated by the frequently made argument by universities that Estonian companies are not strong enough to be able to use the valuable research results generated in higher education institutions, while companies themselves view universities as overly rigid and unable to adapt themselves to the rapidly changing demands of local industry, and that they are not actively promoting what they have to offer.

This situation reflects, on the one hand, the heritage from the Soviet-style system of innovation, in which university-industry links were notoriously weak, and on the other hand, the currently investment- rather than innovation-oriented Estonian economy. The latter circumstance is reflected in a significant mismatch in Estonia between the extent of university research and business R&D activities.

Relatively well-developed links do exist, however, between industry and professional higher education institutions, such as Tallinn College of Engineering and the IT College. The amount of contract research at professional higher education institutions has increased in recent years, and the dominance of the University of Tartu and Tallinn University of Technology is not as obvious in contract research as in other measures of R&D activity.

Businesses are also fairly active in their contribution to developing curricula at professional higher education institutions, as firms feel that professional higher education institution courses have the potential of being more directly related to activities in the private sector than courses at universities. This reflects, again, the character of the domestic industry, with its far-reaching lack of innovation-driven and science-based companies of the type that in more advanced knowledge-based economies find it more natural to collaborate closely with universities.

The risk with professional higher education institutions' adaptations to local business is that they might get trapped in the current low-cost-oriented

economy, which might contradict Estonia's official ambition to become a high-tech country.

A positive trend, however, is the recently increasing expenditures on R&D by private businesses, and a corresponding growth in the number of privately employed researchers and engineers (from almost zero in 1997 to around 700 in 2004, measured as full-time equivalents). The lack of R&D in business has perhaps been the most striking problem in the Estonian system of innovation since 1991. The recently positive trend is also reflected in an increased demand for contract research at higher education institutions, for example at Tallinn University of Technology: its contract research volume during the past five years increased 2.5 times (Tallinn University of Technology, 2006).

An important actor in supporting university-industry links for innovation is Foundation Enterprise Estonia (FEE), which is a large organisation for Estonian measures, with a staff of around 200. FEE has been successful in raising the awareness among companies regarding their role in the innovation system, while also supporting universities in their attempts to develop links with business. The most important concrete initiative so far is the Centres of Competence programme, in which 7-10 companies and one to two higher education institutions collaborate on a long-term basis.

The Centres of Competence programme was launched only two years ago, and in that sense it may be premature to determine its degree of success. Initially there were problems with the programme in terms of bureaucracy and ownership conflicts between higher education institutions and firms, but after these start-up problems the programme has proved an encouraging experience. The Centres have not only brought higher education institutions and firms together in a very concrete way, but they have also turned out to be a way to integrate young people in research who would otherwise have been more reluctant to embark on a research career. In addition, the Centres of Competence programme has brought people back from abroad.

Estonia is a small country and may in some respects be regarded as a single region, with its national system of innovation also forming a single regional system of innovation. While the small size of the country creates some problems when it comes to large-scale R&D, it is also a strength, as it makes collaboration and interaction within the country easier than in geographically more dispersed countries. The value of the small-size flexibility in Estonia, when compared to larger countries, can hardly be exaggerated.

There is an omnipresent 'everybody-knows-everybody' mentality in research and innovation. This is strength as it makes it easy to identify

potential partners for new R&D projects, etc. It is also a weakness, as illustrated, for example, by the reported difficulties for funding agencies to find independent evaluators for research proposals. This problem, however, has been solved in a satisfactory way by making use of foreign evaluators.

The problems resulting from the distance between the most important R&D locations Tartu and Tallinn (200 km) should not be exaggerated. Researchers often have multiple assignments and even employment in different locations within the country and travel on a daily basis between different regions in connection to their R&D activities.

This is also the case at the numerous regionally-based campuses of universities, such as Narva College, whose teachers often travel on a weekly or at least regular basis to Tartu. The integration between regions outside of Tartu and Tallinn, however, is generally weak, with the most important channel of interaction being teachers at regional colleges who also pursue Master's or doctoral study in Tartu or Tallinn. Regional colleges, however, are usually so small that they rarely have any opportunity to gain the critical mass needed to establish internationally competitive research groups. Their prospects for being involved in R&D are, instead, dependent upon their networking within projects led by larger higher education institutions.

In a similar way, the major domestic higher education institution partners for R&D in local industry in regions such as Ida-Virumaa and Lääne-Virumaa are rarely located in those regions, but rather in Tallinn or Tartu, to which the distance, after all, is short. The University of Tartu, for its part, emphasises that its main industrial partners are not located within Estonia, but abroad.

Estonia's far-reaching re-integration with Western systems of research and innovation since the collapse of the Soviet Union has had both negative and creative effects. There were fields or at least niches of innovative potential inherited from the Soviet era which could obviously have been far better exploited in the new independent era, if the governments of the early 1990s would have paid more attention to protecting existing strengths in the face of the sudden opening-up of the domestic economy for foreign investment. On the other hand, Estonia has profited enormously from its international openness that was established in 1991. In particular, Estonia has been able to exploit in a fruitful way its close geographical and cultural proximity to the advanced knowledge-based economies of Finland and Sweden. Finland, in particular, constitutes a ubiquitous point of reference at all levels when it comes to formulating visions, policies, strategies and preparing various initiatives and reforms.

In cultural terms, Estonia already tends to regard itself as a 'Nordic' country, and it aims at a 'Nordification' also in economic terms. Although it

can be discussed to what extent it is realistic to try to build a Nordic-style knowledge society in Estonia (given its much smaller population and radically different historical point of departure), the Review Team stresses the generally positive role of the Nordic inspiration.

Estonian research is well integrated with the global community. As discussed above, Estonian research groups are internationally recognised, at least in some particular fields. Moreover, half of publications of Estonian researchers are written in collaboration with foreign partners, while foreign researchers also are very active as evaluators of Estonian research proposals. The extent of the country's international integration is statistically reflected in the fact that 15.2% of total Estonian R&D expenditures came from abroad in 2003, compared to the EU average of 7%. For higher education institutions, the figure is even higher.

A particular challenge for Estonian research and innovation is to strengthen its image and visibility abroad. Although the country does have a good reputation in some fields, Estonia is in the eyes of foreign observers often viewed as a former Soviet republic, encompassing a wide array of overly negative attributes, rather than as a modern science- and innovation-oriented 'Nordic' country.

4.7 Human resource management

The Estonian higher education system has achieved a remarkable transformation from a system in which research and teaching were separated and in which there was little focus on performance to a system in which the role of an academic is to both teach and to conduct research (although not yet fully integrated across the system, see section 4.6) and in which there is an emerging culture of performance.

In addition to the early decision to integrate the former research institutes under the Academy of Sciences and universities, one of the factors which have facilitated this transformation is the fact that Estonian higher education institutions have enjoyed a considerable degree of autonomy in managing their human resources since the early 1990s. In particular, institutions have operated as the employing authority rather than the state.

Also important is the outward orientation of Estonian policy makers, institutional leaders and academic staff. International linkages covering both research and teaching activities were strong. In addition to Estonian academics teaching and researching abroad, European Social Funds were being used to bring highly qualified specialists on professor level (under long-term contracts) to Estonia. The Review Team was impressed with the

range of professional learning opportunities available to academic staff in Estonian higher education institutions.

The Estonian *Country Background Report* cites the “limited supply of the number of qualified candidates for academic positions” as “being one of the most strategic issues for higher education institutions in Estonia”. The extent of competition for professorial positions is argued to be low. In 2004, there were 0.7-1.7 applicants per position in universities. In addition, the number of students completing doctorates is considered inadequate. In recent years there have been just over 100 PhD completions annually. This is well below the number of 300 doctoral graduates per year considered necessary by the Estonian authorities to meet the needs of the higher education sector and the economy more broadly (see also section 4.6).

Data regarding staff in Estonian higher education institutions are not readily available. The absence of such data also limits the extent to which Estonian authorities and institutions can effectively plan and develop for the renewal of their teaching and research staff. Without such data, it was difficult for the Review Team to assess the extent to which there was an emerging problem in terms of the supply of potential candidates for academic and research positions or the extent to which the target for the output of 300 completed doctorates per annum was appropriate to achieve reproduction of the Estonian academic labour force.

To the extent that there are shortages of potential academic staff, the impact of the level of academic salaries in Estonia relative to salaries in other occupations is not clear-cut. Data concerning changes in relative salaries over time was not available to the Review Team. However, as mentioned in Section 3.7, the relativities between academic and wages in the rest of the economy in Estonia appear comparable to those in a number of English speaking countries. To some extent, tightness in the academic labour market may simply reflect a generally very tight labour market flowing from an extremely buoyant economy.

One area in which action could be taken to improve the attractiveness of academic careers is that of the flexibility of employment contracts. With the exception of staff members employed continuously for a period of at least 11 years in the same position, institutions are required by legislation to employ staff on fixed term contracts of no more than five years duration. The Review Team considers that such requirements unnecessarily restrict the capacity of institutions to offer different employment contracts tailored to the particular needs and circumstances of institutions and employees. This is particularly the case if institutions are engaged in international competition for staff.

4.8 Links to the labour market

There are a number of positive developments regarding the links between the tertiary education system and the labour market. First, the Estonian tertiary system is increasingly able to accommodate the needs of a diverse set of learners. On the one hand, considerable expansion has taken place, which has permitted to better accommodate overall demand for tertiary education. An expanded private sector and the possibility of attending a public institution on a fee-paying basis have been instrumental in better matching supply to demand. On the other hand, the emphasis placed on the development of the vocational sector has made the supply of programmes more diversified and more aligned with the needs of industry. The proportion of students enrolled in shorter programmes (Tertiary-type 5B programmes) has grown from 17% in 1998 to 38% in 2003 (considerably above the average of 17.4% for the OECD countries for which comparable data are available, see Appendix 4). More varied training opportunities at the tertiary level are now available to the population. However, as is the case in many other countries, vocationally-oriented tertiary studies still suffer from a lack of parity of esteem relative to university studies. In addition, an obstacle that remains in terms of the equitable and efficient development of the nation's skills is the inability of the student support system to alleviate the substantial problems of credit constraints and debt aversion faced by potential students at the time of their enrolment decision.

Second, there are good examples of partnerships between institutions and industry. These can take the form of consulting services, joint research projects, periods of time spent by professionals of industry in institutions, employers as external members of *kuratoorium*s, or input of businesses and industry to curriculum development as members of institutions' curriculum councils. However, the Review Team formed the impression that strong, systematic co-operative arrangements with industry do not seem to be a generalised practice in institutions (see also section 4.6). Such arrangements seem to be considerably more developed in the professional and vocational sector (professional higher education institutions and vocational education schools) where ties between faculties and communities of professional practice are stronger. In these institutions, programmes are practice-oriented, and programme content is informed by advisory groups which include employers. A general problem across the system seems to be the limited opportunities for practical training experience through internships in the productive sector. There is a broad lack of interest of companies in taking students for short periods and acting as their mentors. This practice might also be hindered by the high proportion of students who work in parallel to their studies (mostly in areas not linked to their area of study). This limits the opportunities for students to develop skills closely attuned to the

demands of the labour market, and a clear understanding of employment prospects and compensation in their intended field of employment.

Third, tertiary education institutions seem to have a good sense of the labour market outcomes of their graduates. Most institutions conduct surveys of graduates which provide useful information about career paths and the views of graduates on their preparation. This information is also collected as a requirement for programme accreditation. The surveys have the potential to inform the design of institutions' programmes and put them in better relation with labour market needs. However, the extent to which such surveys are developed and used varies considerably across institutions. Also, little attention has been devoted to the analysis of graduates' labour market outcomes at the system level. For example, no systematic analyses of the returns to tertiary qualifications have been conducted.

A number of other initiatives are to be supported. An important step to provide transparency of qualifications to the labour market was the regulation developed in 2005 by the Government which permits the comparison of the qualifications granted by the four degree structures which have been sequentially in place since 1991. Another positive development has been the growing engagement of representatives from employers, businesses, and professional communities in the evaluation exercises conducted by the Higher Education Quality Assessment Council. Finally, an excellent example of a partnership between academia, domestic business and, to some extent, the government, is the Estonian IT Foundation. It brings together the State, the business community, the University of Tartu, and Tallinn University of Technology and is funded by businesses, the state and the European Union. It seeks to contribute to the development of capacities in the ICT area. This is achieved through a range of diverse activities such as the establishment of the IT College (a professional higher education institution), the e-University Consortium (see also section 4.5), support in curriculum development in the ICT area, and schemes to encourage the mobility and training of teaching staff.

Despite these strengths, there are still considerable challenges in linking the tertiary education system to the labour market. First, it is not clear whether the current offerings do respond to actual labour market needs. The labour market seems to be mostly absorbing tertiary education graduates as suggested by the low unemployment rates among tertiary graduates and the general message conveyed in the interviews that it is relatively easy for a graduate to find a job. However, some evidence indicates that a significant proportion of graduates appear not to find employment in an area matching the competencies and skills acquired in tertiary education. For instance, only 54% of 1999/2000 and 57% of 2002/03 graduates from teacher education and health care programmes were employed in teaching and health services

in 2005 (Ministry of Education, 2006). This might indicate that, in some instances, the supply of jobs requiring tertiary level skills and competencies does not match the number of graduates with such skills (an alternative explanation is that salary levels in the public sector are not responsive enough to reflect real demand). Another concern expressed in the interviews was that too few students are enrolled in engineering and natural sciences programmes. Recent growth in tertiary enrolments has been concentrated in the social sciences (in areas such as business, law, and public administration).

Second, the input by employers/industry to tertiary education policy appears to be somewhat limited. There seems to be no forum at national level where representatives of business and industry could systematically contribute to the development of tertiary education policy. An encouraging development was the recent formal involvement of representatives of employers' organisations in a taskforce which contributed to the preparation of the recently approved Higher Education Strategy. We also formed the view that there is little tradition of the active involvement of industry in the daily activities of institutions, especially in universities. The formal participation of employers and representatives of industry as external members of *kuratooriumis* seems to have little impact on institutions' practices as the *kuratooriumis* play a modest role in institutions' decision-making (see also section 4.2). The executive bodies of institutions (councils) do not provide for the participation of members external to the institutions. At the same time, the Review Team formed the view that employers and the business community do not seem prepared to contribute at the level of institutions' and the system's expectations. A study by foreign experts (Laasberg, 2005) identified, among the main problems of Estonian institutions, the following aspects: (a) in developing curricula, institutions usually base their work on traditions and existing lecturers rather than the competencies needed in a certain specialty and study level; and (b) there are limited contacts with potential employers and professional associations.

Third, it was clear for the Review Team that lifelong offerings of tertiary institutions are underdeveloped and the needs of adult learners do not seem to be a focus of tertiary institutions. According to data from the 2004 EU Labour Force Survey, only 6.7% of the population aged 25–64 participated in some type of training in the previous four weeks, considerably below the 9.9% EU average. Strategies for promoting lifelong learning are incipient which is, for instance, reflected in the limited supply of training for company employees. The cooperation between institutions of tertiary education and companies for developing tailor-made programmes is still in the initial phase. The opportunities for adults to undertake tertiary education after an experience in the labour market are also hindered by the

absence of policy provisions to allow entry into higher education on the basis of a person's assessed competencies instead of formal qualifications.

Fourth, career placement and advising services appear not to be widely provided to students by Estonia's tertiary institutions. In light of its population, Estonia has a labour market smaller and more closely knit than that of the average OECD country. As a consequence, it is possible that informal social networks based upon personal acquaintance and professional communities may work to effectively link students to labour market information and opportunities. Nonetheless, Estonia's institutions may wish to review the efficacy of their informal arrangements and the desirability of more formal and systematic career and advising services (see also section 4.5). Also, career guidance does not seem to be widely available at the system level. No central organisation seems to provide information, advice and guidance services that are designed to help people make informed career choices. This gap in the system has been exposed as one of the main reasons to explain tertiary drop-outs by a study conducted by the University of Tartu (Must, 2006). Career guidance is an area in which the potential for development is large.

Fifth, as explained in detail in section 4.3, funding institutions by way of the state-commissioned places distorts the extent to which students respond to labour market signals. As a result, the extent to which enrolments across areas of study are driven by student demand is restricted. A demand-led system would allow students to respond to labour market signals and to adapt to the market's changing characteristics, therefore favouring an efficient allocation of human resources. Attempts to optimise education provision with labour market requirements are wrought with difficulties and complexities. The basis for the allocation of state-commissioned places across fields of study remains an issue. Labour markets are volatile – and that certainly is the case for the Estonian open economy – and unpredictable. Future labour market demands are fairly difficult to predict, in particular when the appropriate databases do not seem to be available and the focus is on the knowledge economy where today's cutting edge skills and capacities can be outdated tomorrow.

Sixth, despite the substantive increase in tertiary education participation and completion rates, skill shortages seem to be a lasting issue. There are no data to provide evidence of skill shortages in Estonia. Anecdotal evidence, however, indicates the existence of shortages in engineering and in some particular professional and trade occupations (e.g. metal work, electronics, optics, construction). Causes for these shortages are deemed to be the demographic trends (acute population decline) in combination with insufficient student demand for the sciences and technology. In light of the fact that the number of students engaging in tertiary education studies is

likely to drop by 60% between 2004 and 2016, there is the risk that the skill shortage challenge will exacerbate in the coming years.

Seventh, a final issue of concern is the mobility of students within the system. In particular, the transition to the Bologna-type undergraduate/graduate degree structure fell short of expectations in improving the mobility of students across institutions. Each institution which offers Master's programmes does retain its own admission criteria, which makes it more difficult for Bachelors graduates from professional higher education institutions, vocational education schools, and private institutions to access them. There might even be some questionable discrimination in the access to Master's programmes in some specialities with few state-commissioned places in favour of graduates who have completed bachelor studies in the institutions offering those programmes. By contrast the movement of students between public universities is facilitated by the protocol of good intentions signed by the Rectors of six universities in 1995.

4.9 Internationalisation

There are extensive international activities and certainly international exchange is on the rise, both for staff and students. Leading research groups are generally well linked internationally. Furthermore, the institutions and individuals show a considerable openness to international experiences, whether this relates to such experiences at the individual level or to the openness to foreign approaches and models. Regarding the latter, developments in Sweden and Finland are particularly referred to, with considerable sensitivity that these models should appropriately be adjusted to the Estonian context. This openness also relates to the involvement of international experts in evaluation and accreditation activities in both research and teaching, allowing the higher education institutions and disciplines to benchmark their experiences against those from foreign experts. During the visits, it also appeared to the Review Team that the foreign language skills (English) of many teachers, but particularly students were well developed.

Another positive development has been the formal acknowledgment of internationalisation as a strategic area of interest in tertiary education, through its prominence in the 2006 *Estonian Higher Education Strategy 2006-2015*. The strengthening of the international dimension of higher education institutions is identified in the *Strategy* as one of the three main challenges for the sector in the coming years. In this context, a “Strategy for the internationalisation of Estonian higher education over the years 2006-2015” was prepared with the objective of guiding policy development in this

area by the Ministry of Education and Research. This strategic document offers the potential for the internationalisation portfolio to be considerably broadened. It includes provisions for: (i) the creation of a supporting legal environment (quality assurance instruments, recognition of qualifications, regulation of joint degrees with foreign institutions and transnational higher education, links to immigration policy); (ii) the internationalisation of teaching (student exchanges, full-degree international students, mobility of doctoral students, international academic staff, foreign language curricula, international joint programmes, internationalisation of curricula); and (iii) the support system for internationalisation (supportive international study environment, integration of international students and academic staff, marketing and information). This is an important step in recognising internationalisation as a matter of strategic importance for tertiary education. The challenge will now be the implementation of policies to bring the objectives of the strategy into fruition. At present, internationalisation is still limited in scope. Forms of internationalisation such as ‘internationalisation at home’, for example in the development of joint degrees with foreign partners and the development of a European dimension in curricula, are still underdeveloped.

Student and academic staff mobility constitute the core of internationalisation and in this respect the diversified portfolio of actions to increase mobility for staff and students planned in the *2006-2015 Higher Education Strategy* is well appreciated by the Review Team. At the same time, the level of mobility, particularly foreign students coming to Estonia (in 2004/2005 amounting to 1.3% of total enrolments in Estonian higher education), is still low. The barriers discouraging foreign students from studying in Estonia appear to be: (i) language difficulties; (ii) the absence of incentives to undertake an academic career in Estonia; and (iii) the perception of poor prospects in the wider Estonian labour market.

A serious concern in Estonian higher education is brain drain, although this could not be supported by concrete evidence (see also section 4.2). But given that the issue was raised by all types of stakeholders in the interviews, we take it for granted that this is a real issue. Many talented young graduates leave to country to find employment elsewhere, but some return after a number of years of gaining international experience. Although motivations to go to a foreign institution differ, quite a few interviewees conveyed that the attractiveness of the foreign salaries play a role, even if the costs of living abroad are generally higher.

The brain drain – despite efforts to repatriate scholars – in combination with the greying of academic staff poses serious challenges for recruitment of adequate staff. Data on, for example, Tallinn University of Technology revealed that in 2006 about 45% of staff were 50 years or older. It also

appeared that a good proportion of projects awarded by the research councils were given to very senior staff, which raises the question of whether the current allocation mechanisms contain sufficient incentives to keep Estonian higher education and research sufficiently attractive for young scholars. Although data on brain drain were not sufficiently available to thoroughly analyse the problem, the issue was raised as a serious concern during most of the interviews. The issue of finding sufficient candidates for the next generation of Estonian researchers and teachers therefore looms largely (see also section 4.6). Estonian salary scales and remuneration packages are uncompetitive relative to other European and non-European countries. These factors inevitably inhibit the entry of foreign doctoral students, post-doctoral faculty and more senior faculty, and so retard Estonia's capacity to compete for globally mobile intellectual labour.

The Estonian higher education system has adopted many of the elements (*e.g.* three cycles, ECTS, Diploma Supplements) of the Bologna process and has done this in a fairly short period of time. There are, however, a number of issues that need further attention. In the previous section 4.8, the Review Team addressed the limited mobility between Estonian institutions and that programmes retain their own admission criteria. This not only limits national mobility, but also raises concerns about the potential for international mobility. A second issue is that the dependency status of the HEQAC should be solved, to allow the HEQAC to be internationally recognised (see further section 5.4).

A final issue is the actual number of students and staff involved in mobility. With due respect for limited budgets, the level of mobility is relatively low, particularly the number of foreign students studying (temporarily or for a full programme) at Estonian higher education institutions. The Review Team acknowledges the paradox that may be inherent to stimulate mobility: an increase in outward mobility may seriously increase the pattern of brain drain.

5. Pointers for Future Policy Development

5.1 Introduction

Within the broad context of overall appreciation of the developments in Estonian higher education, including the Ministry's and institutional policies and strategies, there are a number of concerns that need to be addressed. This chapter sets out the Review Team's recommendations for future policy development.

5.2 Governance, steering and planning

As stressed in section 4.2, the Review Team deems appropriate the level of autonomy of higher education institutions. However, efforts need to be undertaken to provide professional higher education institutions levels of autonomy similar to those granted to universities. The Team's concern is not solely related to creating a level-playing field *per se*, but reflects the need to boost the development of the professional higher education sector. The Ministry may consider granting more freedom to professional higher education institutions to innovate in their programme provision (including the development of Master programmes) and in setting entrance requirements. Quality assurance and formal licensing should be the guiding approaches to determining whether a programme should be offered. But by allocating the financial risk of failure or a lack of quality to the institution, the Review Team is of the opinion that higher education institutions will experience a fair balance of sticks and carrots, allowing them to bring about the necessary changes in programme provision while at the same time preventing them to develop a host of new programmes that may not be sustainable in the long term. A second concern regarding excessive central steering, affecting the entire system, are the tenure procedures for academic staff (see also sections 4.7 and 5.7). Detailed national regulation should be eliminated, leaving tenure procedures to be arranged by institutions. Higher education sectors may want to develop guidelines or exchange good or best practices for the respective sectors.

The concern about the *Kuratoorium* should prompt the Ministry and institutions to reflect on how to improve society's role in institutional decision-making. Whether it is a lack of time or commitment of its members, or whether the institutionalisation (meeting about twice a year) is insufficient, or whether the *Kuratoorium* is simply unable to represent society was difficult to distil from the interviews. In this sense, the pattern in Estonia is not that different from experiences in other higher education systems. Throughout Europe, we see that governments and individual institutions have chosen particular solutions that are deemed to fit their particular circumstances, but are not necessarily optimal solutions (see *e.g.* Amaral *et al.*, 2002). The Review Team recommends formalising the necessary linkages to society in the governance arrangements. In particular, public authorities should seek to widen participation of external stakeholders in the bodies responsible for the strategic governance of higher education institutions, namely institutions' councils. Formal regulation would also be needed at the level of the programmes or disciplines. This could either be in the form of introducing departmental or programme level (advisory) committees that secure employers' and other stakeholders influence on the curricula. Another way to formalise this would be to include in the accreditation mechanisms that programmes are required to explain and provide evidence of how they secure that their programmes meet the demands from society (in particular employers).

The Review Team suggests improving the information base needed for policy development, particularly in the areas of education and policy evaluation. The Team has identified a number of important gaps in the data base that should be available for evidence-based policy-making (see section 4.2). A key step is to systematically collect data at the system and institutional level in areas relevant for policy. The Ministry should also commission research on a number of key issues such as equity or labour market outcomes of students. This could draw on Estonian research groups with an interest in educational policy.

Policy-making takes place informally and formally within a small network of higher education stakeholders. Consultative mechanisms involving the full range of stakeholders are in place and there is a well-established culture of dialogue in the development of tertiary education policies. In this context, however, efforts by the Ministry to encourage the participation of employers and their organisations on discussions at national level need to be sustained to match the involvement at the institutional and programme levels (particularly at professional higher education institutions).

The system's integration and cooperation should be on the agenda of all involved. The fragmentation is worrying in itself, but the envisaged demographic developments make it an issue of great concern. The Ministry

addresses the issue in the *Estonian Higher Education Strategy 2006-2015*, but the concern is – according to the Review Team – not sufficiently instrumentalised. The document states: “The number of higher education institutions is unnecessarily large, the studies available do not sufficiently take into account the needs of the labour market”. Some actions are suggested to strengthen the links with the labour market, but it appears that the Ministry – as it has not been involved in recent restructuring of the field, mergers and other organisational changes were initiated and carried out by the institutions themselves – would like to rely mostly on the instrument of quality assurance (licensing and accreditation) to bring about changes in the higher education landscape.

Moreover, given the limited development of the professional higher education sector (21% of student enrolment), the Ministry might want to set up supportive instruments to increase its importance. Compared to many other European systems, the share of professional higher education students is still relatively small. In some systems the professional higher education sector is larger than the university sector (see Huisman and Kaiser, 2001). Building a professional sector of tertiary education is not easy, and there are plenty of other countries which have struggled with the difficulties. But there are useful positive examples, notably the fairly recent and very successful establishment of the AMK sector in Finland, broadly on the lines of the (former) British polytechnics and the German *Fachhochschulen*. The aim should be to create and promote a distinct professional/vocational sector, dedicated to providing the highest quality of professional and vocational education and training: a sector which is strongly employer-oriented and closely integrated with the specific labour market needs of each locality and region. The institutions in this sector need to develop, and take collective ownership of, their own distinctive mission, in which they can take pride. For this reason quality assurance arrangements need to be specifically designed to be fit for professional/vocational purposes: of course academic quality and rigour are essential, but it is not appropriate for vocational courses to be assessed against purely academic standards. A strong sector can generate its own high status so professional/vocational programmes and qualifications are not seen as second-best. In addition, opportunities can and should be created for students to move across the vocational-academic divide (in both directions) with appropriate support, at the end of the bachelor’s and master’s cycles.

It is essential to increase the cooperation between higher education institutions. An element of such a strategy – which would be in line with European developments – would be to stimulate more vigorously flexible learning paths and the validation of previous learning experiences for students throughout the system. This concerns both the transfer across

sectors (universities and professional higher education sector, vocational schools sector; public and private) and within and between institutions in a particular sector (see also section 4.8 on within-sector mobility). At the operational level, it is suggested to use the instrument of contracts with the higher education institutions to formalise agreements in this area.

5.3 Funding

Estonia has managed to significantly expand access to higher education without at the same time overburdening the public budget by allowing public universities to enrol students on a full-fee basis in additions to those for which they receive public support. However, the cost has been to create a degree of unfairness and to distort student choice.

The Review Team is strongly of the view that the principle of “cost sharing” between the public budget and individuals should be maintained. However, this should be achieved at the level of each individual student rather than by having some students pay nothing for their tuition while others pay the full cost. Accordingly, the Review Team recommends that Estonia introduces arrangements under which all students make a contribution towards the costs of their studies and, as far as is possible, receive some public subsidy. The existing level of public funding would, if redistributed, allow all students to receive a public subsidy equivalent to approximately 50% of current course costs on average.

Acceptance of this recommendation will necessitate the redesign of some aspects of the existing funding system. Rather than make recommendations regarding the details of a reformed funding system, the Review Team has chosen to provide an outline of preferred directions. Examples of systems based on individual students paying tuition fees and receiving public subsidies are provided, among others, by the Australian, English and New Zealand higher education systems as well as most of the American public state systems. This experience can and should be drawn on by Estonian authorities in designing a system which meets Estonia’s needs.

The Review Team is of the view that Estonia should ensure that any new financing arrangements continue to allow student demand to have a significant influence both on the overall size and shape of the higher education system in Estonia and provision at the institution level. This would entail the state financing institutions on the basis of actual enrolments or graduations rather than purchasing, in advance, places in particular fields and levels of study. Following this line of thinking, we believe that the Estonian government should reflect on extending public subsidies to all students in properly accredited courses at private institutions (once the

quality assurance arrangements planned by the *2006-2015 Higher Education Strategy* are fully operational) as well as allowing the total number of students receiving public support to be driven by demand rather than rationed.¹⁵

An important consideration for governments – in general – regarding the introduction of demand-driven funding arrangements is budgetary risk and uncertainty related to fluctuations in outlays flowing from changes in demand. It is important to note that, the demographic situation in Estonia and reasonably high participation rates in higher education mean that risks of upward budgetary pressures arising from increases in student numbers are low.

Moving to a system in which student demand is the main driver behind the distribution of students between and within institutions would also necessitate the reconceptualisation of the contract between the government and institutions. In a sense the state would move from being a purchaser of a defined set of services to that of a funding partner with students. The Review Team believes that this role remains compatible with a broadly contractual relationship with institutions in which institutions are expected to meet certain requirements particularly regarding quality and orientation to the labour market. In this context, the focus of the contract should move from the specifics of the places purchased to the broad objectives which the government would like institutions to achieve. The negotiation of the contract could become a process whereby the government as a funding partner engages in a strategic discussion with institutions of higher education about directions and means.

Moves to simplify the structure of grants to higher education institutions should continue. The proposed inclusion of investment funding in institutions' operating grants is supported. Simplification should also include a review of the funding coefficients and base funding rates with the aim of reducing the number of funding categories and equalising base rates between universities and professional higher education institutions.

The proposal to move from annual funding to the use of three-year rolling agreements is supported as a means of providing higher education institutions with greater funding certainty and capacity to plan the development of provision. In this context, consideration should also be given to the implementation of arrangements which maintain the real (*i.e.* after inflation) value of the per-student funding rates over the life of the contracts. Efforts to stimulate the supply of graduates in particular fields

¹⁵ The example of New Zealand is relevant here, see New Zealand Ministry of Education (2006).

should focus on the use of demand-side incentives rather than supply side measures.

Another important area in which the current arrangements could be improved is that of the student loan scheme. Consideration should be given to the replacement of the current student loans scheme with an income-contingent loan scheme along the lines of those that exist in *e.g.* England, New Zealand and Australia. The advantages of such arrangements over mortgage style loans (as exist in Estonia) in terms of removing the financial barriers to access to higher education due to low individual or family income, lack of collateral and aversion to the risk of default are widely acknowledged (see, for example, Chapman and Ryan, 2002). The objective of such a scheme would be to ensure that no potential student was prevented from undertaking higher education due to an inability to pay the costs of tuition at enrolment.

During the course of the Review Team's visit, questions were raised regarding the feasibility of implementation of an income-contingent loan scheme in Estonia, particularly in terms of costs, administrative burden and its relation to the taxation system. It is important to ensure that any possible misconceptions are removed to ensure that the policy debate can take place on the basis of fact. In terms of costs to the public budget, income-contingent loan arrangements can be designed to produce any particular outcome – all depends on the interest rate charged on student debt. The administrative burden of such a scheme would be no greater than that associated with the current loan scheme in Estonia. The role of the taxation system in arrangements could be reduced to the provision of data on borrowers' annual incomes to an administering agency for the purposes of calculating repayments. Finally, the use of the tax system to collect repayments as is done in Australia is a matter of administrative efficiency rather than an essential design feature of income-contingent loan schemes.

Of course, a system of income-contingent loans based on a public fund entails a substantial initial investment (only recovered when students start their repayments), not easily supported by the public budget. This cost could be limited, for example, by phase in arrangements which offered access to the new scheme only to newly enrolling students or to the neediest students only.¹⁶ However, as the system matures, it should become universal.

The arrangements for student income support in Estonia are inadequate from the point of view of their design and their coverage of students and the level of support they provide to students, especially those from poorer

¹⁶ It should be recognised that the costs to the public budget of offering a loan to students are offset by the fact that student debt is in fact an asset.

backgrounds. Revision of these arrangements is considered a priority. However, it is acknowledged that additional public investment in student income support would need to be undertaken over several years.

Initial priorities should be to provide grants for living costs on a means-tested basis rather than on the basis of academic merit and to introduce income contingent loans as suggested above with borrowing limits sufficient to allow students to cover a component of their living costs. In the longer run, the objective should be to increase the funding available for student income support to provide greater coverage of students and a higher level of grant. Consideration should also be given to extending eligibility for grants and loans to part-time as well as full-time students.

5.4 Quality assurance

Estonia has already made significant advances by the development of the *Higher Education Strategy*. In this strategy, the main issues have been addressed, and the basis for a combined licensing and accreditation scheme has already been set up.

It would be recommended however to make some adjustments, spelling out the following main purposes for the quality assurance system to be developed: (a) to promote quality and the development of self-regulation abilities in the more consolidated and developed higher education institutions through a cyclical, rigorous but not threatening accreditation scheme. By non-threatening the Review Team means that no sanctions would be applied through the accreditation mechanism, although in special cases, it might lead to the need to renew the license granted; (b) to establish strong, clear requirements for new institutions and new programmes, which must obtain a license. A provisional or initial license would enable the institution to begin operations; after a number of years, during which the institution is supervised by the Ministry of Education and Research, it would be fully licensed and entitled to submit itself or its programmes for accreditation. If during this licensing period the institution or its programmes are found to be deficient, and there is no adequate and effective improvement plan, the institution or the programme may be closed down, and the students relocated to other programmes or institutions (in the same way as it is done today with accreditation). In this scheme, accreditation would be voluntary, but licensing would be compulsory – not just necessary, or desirable, but indispensable to operate as a higher education institution in Estonia.

The decision made to carry out almost all external reviews through the work of international reviewers is sound and has many advantages.

Nevertheless, it makes it difficult to take account systematically of any national priorities, be they at the institutional or the programme level. Therefore, it is strongly recommended that, at least for programmes leading to regulated degrees (e.g. for professional fields like nursing, teaching and accountancy), a statement of expected learning outcomes is developed, taking into account the views of the most significant stakeholders. This would provide useful guidelines for international reviewers help institutions in the design of their curricula and provide students and employers with valid and effective information to support their decisions. The current standards then would be applied within the framework of the predetermined and explicit expected learning outcomes. The learning outcomes would thus provide the core of contents, abilities and attitudes that should be developed during the teaching and learning process.

An adaptation of the current standards to take into account the requirements of on-line or distance education is also recommended. There are international examples of these, which could provide a basic starting point. Applying the same standards for face-to-face programmes may result in not paying attention to significant aspects dealing with unbundling of curricula and materials, organisational issues, assessment and other important elements for distance or on-line education.

Currently, the accreditation decisions are taken by the Ministry of Education and Research. This, besides making it impossible for the Estonian quality assurance body to adjust to the European guidelines for quality assurance, means that there are several steps between the actual assessment and the decision-making, and in each step, there is an opportunity for discretion. It is therefore recommended that the HEQAC or its functional equivalent is the actual accrediting agency, with the responsibility to make accreditation decisions. The Council should be supported by a secretariat, with the resources needed for its effective operation. If there is a decision to establish a licensing scheme for institutions – and it is strongly recommended that this be so – the Minister of Education and Research should either delegate this function to the HEQAC, or it must allocate the department in charge of licensing the necessary resources, both human and financial. A licensing process that is carried out in a merely formal manner discourages those institutions that are trying to do a sound job, and ends up discouraging quality within the system.

In many countries, licensing is a self-funding operation, funded through the fees paid by the institutions that apply for a license. An effective cost sharing arrangement could be set up through the establishment of institutional fees, which could at least pay for the external evaluation process, and ensure a sound and reliable licensing process.

5.5 Equity

Clearly, issues of equity in tertiary education in Estonia need to become more prominent in national debates and policy-making. A more coherent and systematic approach to equity would in the first instance assess where equity problems arise: whether they are related to income constraints faced by families and insufficient student support; whether they are related to inequity of opportunities at the school level; whether they are linked to admissions issues; or whether they are related to other barriers such as the lack of knowledge about the benefits of tertiary education. This requires the systematic collection of data such as the socioeconomic background of the tertiary student population, or completion rates by family background. This would allow the development of appropriate strategies to reduce inequalities in tertiary education.

It is unfortunate that the recently approved *Estonian Higher Education Strategy 2006-2015* puts so little emphasis on the equity dimension and does not enunciate any clear goals in this area. Only one of the articulated six objectives for the Estonian higher education sector (“To promote the social dimension of higher education”) mentions equity in very general terms: “The system of social guarantees for students must afford fair access to higher education and devotion to studying.” Only one of the four lines of action vaguely mentions the need to account for the socio-economic situation of students in ensuring equal access to tertiary education (Activity 10 under Line of Action 4).

The response to reduce inequities in the access to and completion of tertiary education should include initiatives in four areas: (i) schooling policies; (ii) financial assistance to needy students; (iii) incentives for tertiary education institutions to widen participation and provide extra support for students from disadvantaged backgrounds; and (iv) policies targeted at particular populations.

Students whose parents have lower levels of education underestimate more often the net benefits of tertiary education. To offset this gap, career guidance and counselling services in Estonian schools should strengthen their role in making poorly-informed school children aware of the benefits of tertiary education and in raising their attendance aspirations. In this respect it is important to put in place a network of career guidance school services that is adequately staffed and undertaken by individuals with the appropriate training. It is suggested that career guidance place more emphasis in the transition from upper secondary to tertiary education for students from disadvantaged backgrounds. The models suggested by a recent OECD review of career guidance can be useful in this respect (OECD, 2004c). In addition, an expansion of tracks from vocational upper

secondary education to tertiary education is also likely to enlarge the participation rates of the currently underrepresented groups.

Another crucial element for ensuring the equitable provision of tertiary education is the financial assistance provided to needy students. The student support system should be expanded and diversified. Suggestions to respond to the equity issues raised by the financing of the system were proposed earlier (section 5.2). It was stressed that the resources going to grants on the basis of merit only should be diverted to grant schemes conferred on the basis of need. Also, if tuition fees are introduced for all students at public institutions, the government should require institutions to waive all or a portion of fees for the neediest students. To help ensure that sufficient discounts are provided, the government should set aside funds to pay institutions for the amount of fees waived for designated students.

Tertiary education institutions also need to be provided with incentives to widen participation by less represented groups and assist those groups with extra support. A possibility worth considering is the creation of a special financial incentive for institutions to attract less represented groups. This could be achieved, for instance, by assigning a greater weight in the student-related component of the funding formula to particular groups of students such as Russian-speaking students or disabled students. Institutions could also establish, from their own funds, schemes of grants to be conferred on the basis of the socio-economic status of students. Institutions should put in place mechanisms to support students from disadvantaged backgrounds in their study progress. As noted earlier, Estonian institutions need to expand the supply of tutoring services to their students.

Finally, some particular groups call for targeted policies. More effective support needs to be developed for disabled students. This should include improvements in the accessibility to the buildings, more resources for institutions to provide special support for this group of students, and allowances to assist disabled students to face the costs of attendance. It is significant that the *2006-2015 Higher Education Strategy* paper identifies an activity to respond to this need.

The initiatives to facilitate the participation in tertiary education of the Russian-speaking minority should be sustained to equalise participation rates across language communities. It is important to ensure that a minimum provision of support for Russian-speaking students is harmonised across institutions. Improvements in this area depend greatly on school-level language policies so a great deal of consistency across educational levels is required.

The development of policies to allow attendance on the basis of acquired competencies (rather than academic qualifications) should be

envisaged to support the lifelong learning role of tertiary institutions. However, the assessment of acquired competencies should be developed in such a way that entrance standards are not lowered. It is also important to provide support for young people who work and study simultaneously. In this regard, the supply of programmes could be more flexible to take into account the needs of this group.

The strategy to improve the coverage of tertiary education in remote regions should continue to be drawn upon distance education in combination with the establishment of regional campuses of urban-based institutions and the development of vocationally-oriented institutions to respond to the needs of local markets. The regional learning centres are an important point of physical linkage between tertiary education and local communities. They serve as study centres and provide teleconferencing facilities. The role of the e-University consortium is also instrumental in bringing together the key elements to provide tertiary programmes to students located in remote areas. The government might want to assess whether, compared to more traditional methods of delivery, the centres and the e-University programme are appropriately supported. In the view of the Review Team the provision of distance learning needs to be further strengthened.

5.6 Research and innovation

Estonia is a country which has in recent years undergone radical societal changes in all possible dimensions, and which continues to be in a permanent state of flux in a way that is very different from traditional OECD member countries. In this situation, it is all the more important to point out the need for a stable, long-term thinking about the evolution of the national system for research and innovation. Such systems take long time to build up and to change, and Estonia needs a stronger overall consensus and commitment to the main strategies and policies for research and innovation – in a way that can transcend short-term political trends and government shifts.

Related to this, Estonia needs stronger implementation of strategies, and there has to be a much more far-sighted, visionary commitment in terms of financial resources allocated to the build-up of a sustainable system of innovation. Failure in this respect would risk to undermining the overall trust of actors in the system.

But there is also a need for measures to counteract, at the policy level, the systemic problems in the research and innovation system. The artificial separation of policies for education, research, innovation and economic development needs to be overcome, and organisations responsible for

different sub-policies must coordinate their efforts more effectively. The shut-down or merger of some organisational units appear to be unavoidable in order to enable this.

There is an obvious need for implementing priorities in research and innovation policy-making, especially when it comes to prioritising certain fields of science and technology at the expense of other fields. This will be a painful process, but Estonia is one of the world's smallest countries and cannot keep a leading edge in everything. In the prioritisation process, two main dimensions should be taken into account: the prospects for international competitiveness in the field in question, and the relevance in relation to concrete (future) needs in Estonian society.

Regarding the first of these two dimensions, mechanisms must be developed that enable prioritization of new and emerging, radical fields of science and technology, in addition to already existing competitive strengths. Regarding the second dimension, obvious examples of fields include energy and environment-related research and innovation, health care-related R&D, the challenge of building an information society, and research within the humanities relating to Estonian history and culture. These fields overlap in part with already formulated points of emphasis in earlier strategy documents, but by emphasising the close links to actual demands of Estonian society, the so far missing strategic and financial commitment to the corresponding policies may be easier to facilitate in practice.

At the same time, although the need for priorities is obvious, it is extremely important that Estonia sustains its current research competencies in a wide spectrum of scientific fields. This is necessary if the country is to be able to respond rapidly to internationally emerging trends in research and innovation, to exploit foreign R&D advancements and more generally to retain its integration with the international community (Cohen & Levinthal, 1989). However, this argument should not be misinterpreted as a proposal to sustain Estonian research in all fields.

Support for young researchers is a key issue for Estonian research to be sustainable on the long term. The awareness of this exists and several appropriate measures have been taken. This has to continue.

The important Academy of Sciences reform has made good sense, but the integration of research institutes into higher education institutions has to proceed and it is a process that needs active support. Higher education institutions need to devote efforts to exploiting teaching capabilities of institute researchers, in order for university teaching to actually be research-based in a fruitful sense. This seems to have been a neglected issue so far.

Professional higher education institutions must be better integrated into the overall strategic thinking. These form a vital link between higher education institutions and industry in today's Estonia, but it is not clear how their future development fits into the overall R&D and innovation strategies.

In improving university-industry links for innovation, businesses and other employers need to be actively involved to a much greater extent in the development of higher education institution strategies and curricula. It is particularly important that not only employers in general are involved, but that innovative companies, including SMEs, are involved. The number of small science-based firms in Estonia is admittedly very limited, but those that do exist might provide highly useful input to the activities of higher education institutions. Given the considerable time dimension in the build-up of strong systems for research and innovation, it is extremely important to listen not only to the needs of dominant players on today's labour market, but also and above all to try to gain insight in and anticipate the labour market of tomorrow.

5.7 Human resource management

The major areas for improvement in the management of human resources identified by the Review Team were the following: the need for better data; employment contracts; and less legislative prescription.

Good data concerning staff are essential if good policy human resource policies are to be developed. From this point of view, the Review Team encourages the Estonian authorities to give priority to the launch of the new EHIS data base (see *Country Background Report*).

In terms of employment contracts, consideration should be given to allowing institutions greater flexibility concerning the types of employment contract which can be offered to academic and research staff. These could include contracts which provide for renewal subject to satisfactory performance after an initial period or ongoing contracts with explicit performance expectations.

More broadly, in the area of human resource management as in many other areas, Estonian higher education institutions possess considerable autonomy regarding some facets of their activities but are subject to quite detailed legislative prescription regarding others. For example, they are free to set wages but the processes for hiring and the duration of employment contracts are defined by the *Universities Act*.

To enable institutions to respond more flexibly and rapidly to changing circumstances and institutional needs, the Review Team considers that there

should be a focus on principles rather than specific processes in legislation. In the case of human resource management, this would entail the requirement for institutions to observe (and demonstrate that they have observed) the principles of open competition for positions, selection on the basis of merit and transparency of process in recruitment without specifying exactly how this were to be achieved. Similarly, the principle that continued employment in a public institution is based on the meeting of performance criteria could be enshrined in legislation without specifying how it was to be implemented in any particular case.

5.8 Links to the labour market

In our view, initiatives to strengthen the connections between tertiary institutions and the labour market can be grouped into a number of categories. A first generic way of ensuring that the provision of educational programmes match labour market requirements is to create a policy framework that permits student enrolment choices to respond to labour market signals. The principal means by which educational offerings can be aligned to labour markets is through the decisions of students themselves, about what to study and where. Study choices are sensitive to labour market prospects, among other things such as peer influence and the intrinsic factors associated with given occupations/professions. A demand-driven system requires system policies (e.g. funding of study places) and institutional policies (internal resource allocation) that permit the number and type of tertiary study opportunities to respond to the preferences of students. This calls for the adjustment of the current institutional funding approach along the lines suggested in section 5.2. An approach that takes into account the diversity in the system and avoids the danger of micro-management (*i.e.* through the state-commissioned places) appears best suited to deal with the current and future challenges of the labour market. A focus on planning and regulation rests uneasily with a student demand-driven approach.

For a demand-driven system of labour market alignment to work, information about available programmes, labour market outcomes and employment requirements must be made available to students, institutions and employers. Students need to be informed about the labour market, the kinds of jobs available, and the types of educational preparation needed for those jobs. This helps students make well-informed decisions about their fields of tertiary study. Thus, the government must develop data systems that permit prospective and current students to understand the labour market outcomes of different study choices. For a given occupation/profession, indicators could include graduates by gender, proportion of graduates in employment, proportion in employment in area of graduate competence,

average salary at different stages of career, level of position, status of employment (e.g. part-time or not, whether in self-employment), or employment growth rates. The adoption of a unified student-level data system would make it possible, in principle, for public authorities to link student records to information about employment and wages, whether through unemployment insurance or tax records, and provide the foundation for analysis of labour market outcomes. The system could partly draw on the current experience of institutions with graduate surveys. Evidence obtained from a systematic analysis of labour market outcomes could also provide a crucial input to key decisions about the approval of new programmes, or quality assurance reviews.

In this respect it is also important to ensure that career guidance in secondary schools and career placement services in tertiary institutions make good use of such detailed data on labour market outcomes. The system could greatly benefit from the strengthening of career services at all educational levels. It is also important to make transfers among fields of study, and among institutions, more flexible. This would allow students who realise they are in the wrong field of study to change, both reducing these kinds of mismatches and potentially allow greater responsiveness to changing labour market patterns.

A second generic way in which the national policy framework can assist in the alignment of tertiary education practice and labour markets is through steering and governance systems. The Ministry of Education and Research should sustain its efforts to involve labour market actors (businesses, professions, labour unions) in the formulation of national tertiary education policies through their inclusion in bodies that provide advice and analysis to the government, as was the case with the taskforce which contributed to the preparation of the recently approved Higher Education Strategy. For this dialogue to be effective, it needs to be ensured that businesses and employers develop an interest in participating in this dialogue, and that the views of the latter are valued and taken into account in the formulation of policies. The Ministry of Education and Research should also include in deliberative and advisory bodies those within government who bear responsibility for employment and skills policies, since they bring different perspectives and competencies to tertiary policy choices. Additionally, public authorities should seek to widen participation of labour market actors in the bodies responsible for the strategic governance of higher education institutions, namely institutions' councils. We do believe that the direct involvement of the business community in the daily running of institutions has the potential to improve the responsiveness of institutions to labour market needs and more institutions should consider such arrangement.

A third approach is to create a policy framework that permits institutions to learn about and adapt to graduate labour market outcomes. Tertiary education institutions will often want to focus on responding to the labour markets experiences of their graduates – either because this responsibility is part of their institutional mission, or because they recognise that it is in their interest to do so as a means of attracting students. While there are many ways that institutions may be encouraged to learn about and respond to the labour market experiences of graduates, two deserve special consideration. First, public authorities should ensure that public data systems permit the development of long-term graduate labour market experiences, so that institutions can develop an understanding not only of unemployment spells or wages immediately after the completion of studies, but also understand the longer-term career paths of graduates. Institutions that discover, for example, occupational change and career mobility are better equipped to reassess how students are trained, and what it means to provide so-called employability skills to their students. Second, public authorities can use the policy instruments available to them to encourage tertiary institutions to engage employers, both public and private, in identifying graduate skills and competencies – in the design of programmes and assessment of students, e.g. through the approval of new study programmes, or the re-accreditation of existing programmes.

In this context, it is important to strengthen partnerships between institutions and the business sector. Practices to be reinforced include internships for students and teachers in industry, offices in institutions to liaise with the business sector, and the participation of employers in institutional governance. The system should partly draw on the current good practices in the professional and vocational sector, where links with industry are more developed. There is a need to make the partnerships more sustained and systematic across the entire tertiary education system. There is also a need to evaluate the variety of partnerships more carefully, to determine which of them are likely to be more effective.

Fourth, it needs to be ensured that the tertiary system offers sufficient opportunities for flexible, work-oriented study. Universities have long experience and often considerable competencies in transmitting discipline-based knowledge and training young people in the development of academic and professional capabilities. However, they are much less familiar with – and adapted to – the use of work-based learning to develop professional skills. Likewise, they are typically less skilled in the education of mature students, of whom many may work and have other obligations that prevent them from following a continuous and full-time mode of study (a circumstance which, in Estonia, actually applies to most tertiary education students given the extent to which they take part-time employment).

National policy-makers should support the diversification of study opportunities so that Bachelor degree education oriented toward working life and short-cycle practice-oriented programmes are sufficiently available, and strengthen the capacities of institutions charged with their provision (e.g. professional higher education institutions and vocational education schools) so that the quality is widely recognised by students and employers alike. In this respect, the current reforms in the vocational education system (at both secondary and tertiary levels, with the expansion of provision, the multiplication of pathways between educational tracks, and the provision for attendance on the basis of competencies) are to be supported. They do have the potential to raise the profile of vocational education, improve the transition between secondary and tertiary education, expand choice in practice-oriented programmes, and better respond to the needs of industry and businesses. The success of these reforms will also greatly depend on policies to prevent the potential academic drift of some tertiary vocationally-oriented institutions.

Along the same lines, institutions should widen opportunities for lifelong learning by increasing the flexibility of provision (e.g. part-time and distance provision), by providing financial support to address the difficulties facing low-income workers, and by reviewing the suitability of education and training alternatives. Further, they should ensure that assessment and recognition of prior learning is widely accessible and attractive to use, both on the part of students and institutions, and that a national qualifications framework provides clear signals to students, institutions and employers.

Finally, a better assessment needs to be made of the extent of shortages in some labour market areas and the potential for brain drain in the areas of science and technology. Policy in these areas needs to be more based on firm evidence. Interest of students for science and technology needs to be stimulated from an early age, making school-level policies more relevant in this area. As set out in section 5.3, the problem of shortages in some occupations can also be more adequately addressed through some active employment policies (e.g. bonus payments, loan waivers upon entering such employment). The development of incentives to attract high achieving international students could also be envisaged (e.g. the provision of fellowships, scholarships and more liberal immigration policies).

5.9 Internationalisation

The key role for national policy is to ensure that there is a framework conducive to internationalisation: this should include appropriate quality assurance systems, a supporting legal environment, an appropriate support system, funding arrangements which allow institutions to raise revenues

from internationalisation, salaries that strengthen the ability of institutions to compete for foreign researchers and national programmes of doctoral scholarships for promising foreign students. The “Strategy for the Internationalisation of Estonian Higher Education over the years 2006-2015” is a sound basis on which to develop such national framework as it provides a comprehensive list of the elements a suitable framework should include (see section 4.9). The priority is therefore to develop and implement policies to put into practice the objectives laid out in the *Strategy*.

However, internationalisation should not be over-regulated by the Ministry. Much international engagement can only be pursued at the institutional level, or indeed within institutions at the basic-unit level. Accordingly, it is recommended that the Ministry of Education and Research take steps to encourage tertiary education institutions to take on a more proactive internationalisation role. This could be achieved in various ways, but experience in other OECD countries shows that an effective procedure would be to require institutions to develop their own internationalisation strategy, as part of funding arrangements which could include a dedicated funding stream. The latter could be used to strengthen institutions’ administrative and organisational structures for the various elements of internationalisation. A useful example can be found in the Czech Republic, where internationalisation has been identified in the 2006-2010 Long-Term Plan as one of the three main priorities in the development of tertiary education. International activities in the annual plans of higher education institutions that are in accordance with the priorities stipulated by the Czech Ministry will be eligible for additional state funding (File *et al.*, 2006).

There is room to expand student and teacher mobility. A number of initiatives could prove useful in this respect. These include more flexible curricula and internationally recognised credits to facilitate two way student mobility; the encouragement of bilateral and multilateral inter-institutional agreements; professional/administrative capacities to manage broader exchange programmes; and better infrastructure for foreign students who study in Estonia, including the creation of supporting offices and opportunities to learn Estonian. Also, recognising that supporting a “small” language like Estonian is a major issue, a key strategy to improve internationalisation remains the provision of more programmes and courses in a language more accessible to foreigners. The Review Team understands the concerns for preserving a national language and identity, but this can be reconciled with policies which seek to foster internationalisation of Estonian higher education. It is not very likely that many foreign students will invest a considerable amount of time and energy in learning the Estonian language, if there are plenty of opportunities to study at high-quality and cost-friendly

institutions either in the same region or elsewhere in Europe. It is therefore suggested to support more vigorously the development of programmes in English and to support – where necessary – teachers to teach effectively in English. A rather successful strategy employed in other “small language” countries (e.g. the Netherlands) has been to develop programmes in English at the Master’s level and offer most of the Bachelor programmes in the domestic language.

As articulated in the “Strategy for the Internationalisation of Estonian Higher Education over the years 2006-2015”, internationalisation should go beyond student and teacher mobility, however. A broader internationalisation strategy should include: ‘internationalisation at home’ (international curricula, extra-curricular activities, foreign visiting academics, a requirement that Estonian students take a minimum number of courses in a language other than Estonian); the development of joint degrees with foreign partners; the authorisation for foreign institutions to operate campuses in Estonia; a framework to recognise study credits obtained by Estonian students in foreign institutions through e-learning and distance education; a greater commitment to using international materials within courses and programmes; the development of a European dimension in curricula; and the development of international research co-operation.

Greater efforts are also needed to promote Estonian tertiary education abroad. The Ministry and the rectors’ conferences may wish to give further detailed consideration to the branding image of Estonian tertiary education for an international market. Some marketing could be nationally collaborative, via the above agencies, and some could be undertaken on a regional basis via partnerships between institutions, local and regional governments and employers’ associations. International student marketing should be particularly targeted at those critical areas of the economy where skilled graduate employees are in short supply.

Given the lack of full insight into the issue of brain drain, it is first suggested to investigate in-depth the magnitude of the problem, its causes and impacts. Such insights will assist the development of appropriate policies and strategies to counter or limit the brain drain. Acknowledging that the differential economic situations across countries cannot be changed easily, fiscal measures may be helpful as well as attempts to strengthen sustainable ties with international partners in research and education (in an attempt to change brain drain into brain gain and turn brain drain into temporary mobility).

6. Concluding Remarks

In the fifteen years which followed the “Singing Revolution” of 1991, Estonia has built a tertiary education system that has responded to the major problems inherited from the Soviet period. There can be few tertiary education systems that have accommodated as much change in such a short period of time as Estonia did in the period following the restoration of independence. This historical epoch witnessed significant achievements in the tertiary education system: a remarkable expansion, the increasing diversity of institutions and offerings within the system, the successful integration of the research units of the Academy of Sciences into the universities and the sound progress made with the implementation of the Bologna process. This is even more remarkable in light of the limited resources available to higher education during this period. Currently the tertiary system is characterised by high levels of institutional autonomy, academic self-governance, competition between institutions as the prime instrument to bring convergence between institutional initiative and national objectives, and a facilitatory relationship with the Ministry of Education and Research.

The expansion has led to a number of challenges which are calling for a priority shift from growth to quality improvement and consolidation. The environment within which the Estonian tertiary education system finds itself has changed fundamentally when compared to that of 1991. The priorities today are to ensure that Estonia has a tertiary education system that is able to function effectively in an increasingly competitive European and international higher education area, and that contributes to the development of Estonia in the context of the knowledge economy. Estonia is now ready to make a transition from a focus on quantity to a greater emphasis on the quality, coherence, and equity of tertiary education. This is a favourable time to materialise such changes given the demographic trends mean that there will be fewer individuals in the system and resources will be freed to enhance quality, expand lifelong learning, improve equity mechanisms, and develop the innovation potential of tertiary education institutions.

This report has reviewed the development of tertiary education policy in Estonia, its considerable strengths and the challenges that it still faces. The report makes a number of suggestions in which policy directions in Estonia

could be strengthened and hopefully made even more effective. The Review Team believes that what is needed now is a period of adjustment, in which the range of stakeholders in the system engages with a new set of challenges. The focus in the years ahead is to be on making tertiary education better, more competitive, highly diversified and more relevant -- to Estonian society, to wider social needs and to working life. The key challenge is how to reconcile the priorities of individual institutions and the broader social and economic objectives of the tertiary education system. The many dimensions of the complex problems call for a package of measures, not only one or two selective interventions. Some of the problems require taking a long term perspective, while others require immediate attention.

It is not the role of this Review Team to provide a detailed prescription of the sequence of steps tertiary education policy is to follow in light of the broad policy directions given in this report. Setting up priorities for policy implementation is a consensus building exercise to be conducted among Estonian stakeholders. We note that Estonians are moving, in thoughtful ways, towards agreement about how to address some of the challenges identified in this report, for example, through the extensive discussions among a wide range of stakeholders which led to the development of the *2006-2015 Higher Education Strategy*. It is our view, however, that the immediate policy focus should be the establishment of a solid and widely accepted governance framework, one in which institutions appreciate their contribution to the system and have a clear understanding of their responsibilities *vis-à-vis* other institutions and educational authorities, quality assurance arrangements provide agreed levels of accountability, and funding mechanisms are consistent with the goals of the tertiary system.

We note a number of common issues that have emerged in this report: the enhancement of the outward focus of institutions; more integration in the system and further collaboration between institutions within and across sectors; the strengthening of the information base to develop policy; the reassessment of priorities in the allocation of public resources; and the reinforcement of the steering capacity of the Ministry.

An imperative is to enhance the outward focus of institutions. This entails stronger educational links to employers, regions and labour markets; the strengthening of university-industry links for research and innovation; a greater role for external stakeholders in system and institutional governance and in quality assurance; an increased share of external funds in institutional budgets; and the broadening of the internationalisation policy portfolio to foster more openness to Europe and the world. In pursuing this objective, it might prove helpful to better define the roles and missions of institutions, or sectors, so each provides a distinct contribution within the system.

Another pressing need is the improvement of the co-operation among tertiary education institutions between and across sectors. It should be encouraged for rational reasons (e.g. creation of critical masses, regional services), and of course, in terms of stability and survival (in sometimes unfavourable regional settings). Communication should be facilitated by the relatively small network of higher education stakeholders but we note the often limited opportunities that higher education in Estonia has to take advantage of economies of scale.

Better information is one of the persistent suggestions throughout this report. Tertiary education requires far better information in terms of its operations and planning than is currently available for educational authorities, institutions, staff and students. This is not an appeal for extra bureaucracy but the basis to build a common information platform as the foundation for overall policy making. The availability of further data about the performance of the system can also support the suggested reinforcement of the self-regulation abilities of institutions in the area of quality improvement, in a system where there is a need for more stringent requirements for institutional and programme licensing.

There also needs to be a reassessment of how public resources for tertiary education are distributed. It is necessary that the principle of cost-sharing between the State and students becomes fairer by having all students provide an individual contribution. It also became clear to the Review Team that the system needs to give more emphasis to the equity dimension and allocate extra funds to face inequities in the system. Estonia might also want to consider devoting more resources to the research and innovation potential of institutions. This is to be achieved in line with a stable, long-term strategy for the development of the national system for research and innovation, including a far-reaching prioritisation exercise.

Another priority is the reinforcement of the steering capacity of the Ministry of Education and Research in the effort to build a coherent system. Taking on responsibilities such as policy steering and performance evaluation should entail changes in its competencies and organisation. In particular, it needs to strengthen its capacities with respect to data collection and analysis, policy experimentation, and policy analysis. This requires the ability to judge whether higher education is meeting expectations and the improvement of the formal processes of informing, reporting and follow-up. Of course, it is important that the ‘informal social networks’ characteristic of small systems such as Estonia’s be used as channels of communication and ways of reaching informal understanding, consensus and accommodation between stakeholders. However, faced with rapid expansion, informal networks are not sufficient to guide the further development of the system and some level of formalisation of procedures is needed at the central level.

This includes better co-ordination of policies among different Ministries as is the case in the development of innovation policy.

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Authors of the Country Background Report

The report was prepared by the Ministry of Education and Research under the editorship of Heli Aru, Advisor, Education and Labour Market, Ministry of Education and Research.

Appendix 3. Programme of the Review Visit

Monday 25 September, Tartu

- 10:30 – 11:00 Ministry of Education and Research
Higher Education Department
Universities Unit
Professional Higher Education Institutions (PHEI) Unit
Planning Department
- 11:00 – 12:30 Ministry of Education and Research
Research Department
- 12:30 – 14:00 Higher Education Quality Assessment Council (HEQAC)
Chair of HEQAC
Head of the Accreditation Centre
- 14:00 – 15:00 Ministry of Education and Research
Monitoring Department
Academic Mobility Centre, Foundation Archimedes
- 15:00 – 16:00 Ministry of Education and Research (Pre-tertiary education),
Video Conference
General Education Department
Vocational Education and Training Department
- 16:30 – 19:30 Institutional Visit 1: Estonian University of Life Sciences
Rector and Management Group
Academic Staff Representatives
Students Representatives
- 19:30 – 21:00 Dinner with Representatives from Ministry of Education and
Research (Deputy-Secretary General for Higher Education and
Research, Head of Higher Education Department) and
representatives from institutions based in Tartu.

Tuesday 26 September, Tartu

- 08:30 – 09:30 Research Competency Council, including its Secretariat (within Foundation Archimedes)
- 10:00 – 13:00 Institutional Visit 2: Tartu School of Health Care (PHEI)
Rector and Management Group
Academic Staff Representatives
Students Representatives
- 13:45 – 15:00 Local stakeholders and University leaders
Representatives of Tartu City (Mayor, Deputy-Mayor)
Representatives of Tartu County Government (Head of Economic Development Department)
Representatives of University of Tartu (Rector, Vice-Rector for Research, Vice-Rector for Academic Affairs)
- 15:00 – 18:00 Institutional Visit 3: University of Tartu
Rector and Management Group
Academic Staff Representatives
Students Representatives

Wednesday 27 September, Tallinn

- 09:00 – 12:00 Institutional Visit 4: University NORD (private university)
Management Group
Academic Staff Representatives
Students Representatives
- 12:15 – 13:30 Mrs. Tiina Annus, Advisor to Ministry of Education and Research, former Education Programme Director at the Center of Policy Studies PRAXIS
- 13:30 – 15:00 Public Universities Rectors' Conference
- 15:00 – 16:30 Professional Higher Education Institutions Rectors' Conference
- 16:30 – 17:30 Association for the Support of Estonian Vocational Education and Training
- 17:30 – 18:30 Private Universities Rectors' Conference

Thursday 28 September, Narva, Mõdriku, Rakvere

- 10:00 – 13:00 Institutional Visit 5: Narva College of the University of Tartu
Director and Management Group
Academic Staff Representatives
Students Representatives
- 13:00 – 14:30 Mayor of Narva
- 16:00 – 18:15 Institutional Visit 6: Lääne-Virumaa Kutsekõrgkool (Higher Vocational School)

Director and Management Group
Academic Staff Representatives
Students Representatives
- 18:30 – 19:30 Rakvere County Governor

Friday 29 September, Tallinn

- 09:00 – 12:00 Institutional Visit 7: Tallinn University of Technology
Management Group
Academic Staff Representatives
Students Representatives
- 12:30 – 14:00 Foundation *Enterprise Estonia*
- 14:00 – 17:00 Institutional Visit 8: Tallinn College of Engineering (PHEI)
Rector and Management Group
Academic Staff Representatives
Students Representatives
- 17:30 – 18:30 Foundation for ICT Development
- 18:30 – 19:30 Estonian Science Foundation

Sunday 1 October, Tallinn

Review Team meetings

Monday 2 October, Tallinn

- 09:00 – 12:00 Institutional Visit 9: Tallinn University
Rector and Management Group
Academic Staff Representatives
Students Representatives
- 12:00 – 13:30 UNIVERSITAS (Representatives of Academic Staff)
Federation of the Employees of Estonian Universities,
Institutions of Science, Research and Development
- 14:00 – 15:30 Prof. Jüri Engelbrecht, Vice President of the Estonian Academy
of Sciences
- 16:00 – 17:30 Dr. Olav Aarna, Chair of the Cultural Affairs Committee of the
Parliament (*Riigikogu*)
- 17:30 – 18:30 Head of Audit Department, National Audit Office
- 18:30 – 19:30 Mrs. Mailis Reps, Minister for Education and Research
- 20:00 – 22:00 Dinner with Representatives from Ministry of Education and
Research (Deputy-Secretary General for Higher Education and
Research and other officials) and representatives from
institutions based in Tallinn.

Tuesday 3 October, Tallinn

- 08:30 – 09:30 Employers' Associations
Estonian Chamber of Commerce
Estonian Employers' Confederation
- 09:30 – 10:30 Ministry of Finance, Ministry of Economic Affairs and
Communication, Ministry of Social Affairs
- 10:30 – 11:30 Federation of Estonian Students' Unions (FESU)
- 11:30 – 13:00 Oral Report by Review Team with preliminary conclusions
Deputy Secretary General for Higher Education and Research
Head of Higher Education Department
Deputy-Head of Higher Education Department
National Co-ordinator to the OECD Review

Appendix 4. Comparative Indicators on Tertiary Education

	Estonia	OECD mean ¹	Estonia's rank ²	Estonia as % of OECD mean ³
PARTICIPATION				
Gross enrolment ratio into tertiary education, total tertiary programmes⁴				
2003				
Male +Female	64	57.9	-	111
Male	49	52.5	-	93
Female	65	63.5	-	102
1999				
Male +Female	51	49.1	-	104
Male	42	45.6	-	92
Female	60	52.7	-	11
Distribution of students, by type of programmes				
2003				
Tertiary-type 5A programmes	59	80.1	-	74
Tertiary-type 5B programmes	38	17.4	-	240
Tertiary type 6 programmes	2	3.3	-	61
1998/1999				
Tertiary-type 5A programmes	81	77.7	-	104
Tertiary-type 5B programmes	17	20.2	-	84
Tertiary type 6 programmes	2	3.2	-	63
Gender distribution of students (2003)				
Females as a per cent of students in total tertiary programmes	62	53.2	1/29	117
Females as a per cent of students in tertiary type-5A programmes	60	53.2	4/29	113

	Estonia	OECD mean ¹	Estonia's rank ²	Estonia as % of OECD mean ³
Females as a per cent of students in tertiary type-5B programmes	65	55.0	5/29	118
Females as a per cent of students in tertiary type-6 programmes	55	44.0	1/28	125
School life expectancy⁵ (2003)				
ISCED 1 – 6	15.7	17.1	24/28	92
ISCED 5 and 6	3.3	2.8	9/28	118
Tertiary graduates by field of study⁶ (2002/2003)				
Education	12	12.6	-	95
Humanities and arts	10	10.2	-	98
Social sciences, business and law	39	30.6	-	130
Science	8	9.2	-	87
Engineering, manufacturing and construction	9	14.2	-	63
Agriculture	2	2.2	-	91
Health and welfare	13	14.4	-	90
Services	7	4.5	-	156
Not known or unspecified	-	-	-	-
Unemployment ratio and educational attainmentⁱ (2003)				
Number of 25 to 59 year-olds who are unemployed as a percentage of the population aged 25 to 59				
Lower secondary education				
Total	12.6	-	-	-
Males	-	9.8	-	-
Females	-	11.0	-	-
Upper secondary education (ISCED 3A)				
Total	-	-	-	-
Males	-	7.1	-	-
Females	-	10.6	-	-
Post-secondary non-tertiary education				
Total	11.0	-	-	-
Males	-	5.9	-	-
Females	-	6.9	-	-

	Estonia	OECD mean ¹	Estonia's rank ²	Estonia as % of OECD mean ³
Tertiary education, type B				
Total	-	-	-	-
Males	-	3.9	-	-
Females	-	4.4	-	-
Tertiary education, type A and advanced research programmes				
Total	5.5	-	-	-
Males	-	3.6	-	-
Females	-	4.1	-	-
Admission to tertiary education ⁷ Source: Eurydice (2005)				
Limitation of the number of places available in most branches of public and grant-aided private tertiary education (2002/03)				
Limitation at national level with direct control of selection		1/35	-	-
Selection by institutions (In accordance with their capacity or national criteria)	√	23/35	-	-
Free access to most branches		11/35	-	-
EXPENDITURE				
Annual expenditure on tertiary education institutions per student relative to GDP per capita, public and private institutions (2002)	24.9	42.6	26/26	58
Expenditure on educational institutions and educational administrations as a % of GDP, public sources (2002)				
All levels of education	5.2	5.3	-	98
Tertiary education	0.9	1.1	-	82
Educational expenditure in tertiary as a percentage of total educational expenditure (2002)	19.7	24.1	20/23	82

	Estonia	OECD mean ¹	Estonia's rank ²	Estonia as % of OECD mean ³
Expenditure on tertiary education institutions by nature of spending (2002/2003)				
Distribution of total and current expenditure				
Current	95.7	88.4	3/26	109
Capital	4.3	11.6	24/26	34
Current expenditure as a percentage of total expenditure				
Salaries	47.5	66.1	27/27	72
Other Current	48.1	33.9	3/27	142
Registration and tuition fees (2002/03)⁸				
Source: Eurydice (2005)				
Registration and tuition fees and other payments made by students of full-time undergraduate courses, public sector				
Neither fees nor compulsory contributions		9/35	-	-
Solely contributions to student organisations		3/35	-	-
Registration and/or tuition fees (and possible contributions to student organisations)	√	23/35	-	-
PATTERNS of PROVISION				
Ratio of students to teaching staff in tertiary education (2002/2003)				
Based on full-time equivalents, Public and private institutions.				
Type B	-	14.4	-	-
Type A and advanced research programmes	-	15.7	-	-
Tertiary education all	-	14.9	-	-
Foreign students as a percent of tertiary enrolment (2002)	2	6.6	27/27	30
RESEARCH AND DEVELOPMENT				
Gross domestic expenditure on Research and Development (R&D) as a percentage of GDP Source: Eurostat (2005)				
2003	0.82	2.24	21/24	37
1998	0.58	1.61	2.15	27

	Estonia	OECD mean ¹	Estonia's rank ²	Estonia as % of OECD mean ³
Higher education expenditure on R&D as a percentage of GDP				
Source: Eurostat (2005)				
2003	0.36	0.42	13/19	86
1998	0.19	0.37	-	51
Percentage of gross domestic expenditure on R&D by sector of performance (2003)				
higher education	47.3	18.7	1/18	253
(higher education in 1998)	56.0	17.2	-	326
business enterprise	33.9	67.3	17/18	50
government	15.8	10.9	8/18	145
private non-profit sector	3.1	3.1	3/14	100
Researchers as a percentage of national total (full time equivalent) (2003) Source: Eurostat (2005)				
higher education	65.4	37.0	1/11	177
(higher education in 1998)	68.6	40.0	-	172
business enterprise	16.7	45.4	10/11	58
Government	15.8	17.1	6/11	92
Researchers per million inhabitants, Full time equivalent				
2002	1950	2683	-	73
1998	2142	2410	-	89

Notes for the Tables

Sources:

All data are from the UNESCO “Global Education Digest 2005” and “Statistics on research and development”, UNESCO Institute for Statistics, <http://www.uis.unesco.org>, unless indicated otherwise in the table.

Notes:

1. “OECD mean” is calculated as the unweighted mean of the data values of all OECD countries for which data are available from the UNESCO Global Education Digest 2005 and UNESCO Statistics on research and development. Estonia is not included in the calculation. Calculation is done by the OECD Secretariat.
2. In the case of OECD member countries, “country’s rank” indicates the position of indicated country among OECD countries when countries are ranked in descending order from the highest to lowest value on the indicator concerned. But, in case of non OECD countries like Estonia, Estonia’s rank means the same rank of OECD country whose data is closest to Estonia’s data.
3. “% to OECD mean” indicates Estonia's value as a per cent of the OECD value. For example, on the first indicator “*Gross enrolment ratio into tertiary education, total tertiary programmes, 2002/2003, Male+Female*”, the percentage “111” indicates that Estonia’s value is equivalent to 111% of the OECD mean.
4. Gross enrolment ratio means number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the population in the theoretical age group for the same level of education. For tertiary level, the population used is the five-year age group following on from the secondary school leaving age.
5. School life expectancy is the number of years a person of school entrance age can expect to spend within the specified levels. To compensate the lack of reliable data by age for tertiary the gross enrolment ratio for tertiary is multiplied by 5 and used as a proxy for the age-specific enrolment rates. At all other ISCED levels enrolment that is not distributed by age is divided by the school-age population and multiplied by the duration of the given level before being added to the sum of the age-specific enrolments rates.
6. This indicator shows the ratio of graduates as a proportion to all fields of studies. The fields of education used follow the revised ISCED classification by field of education.
7. In this indicator, the column “OECD mean” indicates the number of Eurydice member countries/areas, in which limitation on admission to tertiary education is adopted, out of 35 countries/areas whose data is available. For example, in the column “Limitation at national level with

direct control of selection”, 1/35 indicates that limitation at national level with direct control of selection is adopted in 1 county.

8. “Registration fees” refers to payments related to registration itself or the certified assessment of each student. By “tuition fees” is meant contributions to the cost of education supported by individual tertiary education institutions. These fees also include any certification fees. Payments for entrance examinations are excluded. In this indicator, the column “OECD mean” indicates the number of Eurydice member countries/areas, in which registration and tuition fees are adopted, out of 35 countries/areas whose data is available. For example, in the row “Solely contributions to student organisations”, 3/35 indicates that contributions to student organisations are adopted in 3 countries/areas.

Country specific notes:

- i. Age range is different; OECD mean is based on 25 to 65 year olds; Indicators by Gender are not available; Post secondary non-tertiary education is included in upper secondary education; Tertiary education type B included in Tertiary education type A and advanced research programmes.

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OECD Reviews of Tertiary Education

Estonia

In many OECD countries, tertiary education systems have experienced rapid growth over the last decade. With tertiary education increasingly seen as a fundamental pillar for economic growth, these systems must now address the pressures of a globalising economy and labour market. Within governance frameworks that encourage institutions, individually and collectively, to fulfil multiple missions, tertiary education systems must aim for the broad objectives of growth, full employment and social cohesion.

In this context, the OECD launched a major review of tertiary education with the participation of 24 nations. The principal objective of the review is to assist countries in understanding how the organisation, management and delivery of tertiary education can help them achieve their economic and social goals. Estonia is one of 14 countries which opted to host a Country Review, in which a team of external reviewers carried out an in-depth analysis of tertiary education policies. This report includes:

- an overview of Estonia's tertiary education system;
- an account of trends and developments in tertiary education in Estonia;
- an analysis of the strengths and challenges in tertiary education in Estonia; and
- recommendations for future policy development.

This *Review of Tertiary Education* in Estonia forms part of the *OECD Thematic Review of Tertiary Education*, a project conducted between 2004 and 2008 (www.oecd.org/edu/tertiary/review).

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