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Hungarian Innovation Policy: What's the Best Way Forward?

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by
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ABSTRACT/RÉSUMÉ

HUNGARIAN INNOVATION POLICY: WHAT'S THE BEST WAY FORWARD?

The Hungarian government has recently been focusing on innovation policy as part of a wider campaign to improve the business environment. This paper first underscores the importance of a good general business climate in encouraging both formal and informal R&D activity as well as ensuring Hungary benefits from the international diffusion of innovation. In examining specific innovation policies, the new National Innovation System is described and an assessment is made of the National Innovation Fund and the Innovation Contribution used to fund it. Assessment of changes in R&D tax allowances and in the strategy for giving out grants for research is also made. The paper also looks at regulatory reform to improve industry-science links, including the government's recent legislative changes that make it easier for universities to set up spin-off companies. The final section considers what further reforms are needed to help tertiary and compulsory education become more conducive to innovation and to encourage the deepening of human capital in general.

JEL Classification: I20, O30, P20
Keywords: Hungary, R&D, innovation policy, education policy

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LA POLITIQUE D'INNOVATION EN HONGRIE : LA MEILLURE FACON D'AVANCER ?

Le gouvernement hongrois a récemment mis l'accent sur la politique d'innovation dans le cadre plus vaste d'une campagne destinée à améliorer l'environnement des entreprises. Cet document souligne à quel point il est important que le climat général des affaires soit bon pour encourager les activités formelles de recherche-développement (R-D) et les types plus informels d'innovation, et pour que la Hongrie puisse tirer parti de la diffusion internationale de l'innovation. Dans le cadre de l'examen des dispositifs spécifiques de promotion de l'innovation, nous décrivons le nouveau Système national d'innovation et nous évaluons le Fonds national pour l'innovation, ainsi que la Contribution à l'innovation utilisée pour le financer. Nous examinons également l'évolution des mécanismes de crédits d'impôt et de la stratégie d'attribution des subventions de recherche. Cet document aborde ensuite les mesures de réforme de la réglementation axées sur le resserrement des liens entre entreprises et milieux scientifiques, notamment les dispositions législatives adoptées récemment qui facilitent la création par les universités d'entreprises issues de la recherche. Dans la dernière partie, nous nous demandons quelles sont les réformes complémentaires nécessaires pour que l'enseignement supérieur et l'enseignement obligatoire favorisent davantage l'innovation et le renforcement du capital humain en général.

Classification JEL : I20, O30, P20
Mots-clef : Hongrie, R-D, la politique innovation, la politique enseignement

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HUNGARIAN INNOVATION POLICY: WHAT'S THE BEST WAY FORWARD?

by Philip Hemmings[1]

1. The current Hungarian government is paying considerable attention to innovation with senior politicians strongly involved in reforms through a new structure of policymaking groups, advisory committees and executive bodies (referred to as the National Innovation System).[2] This paper first looks at the fundamental challenges in providing the right environment for innovation. It then looks at the wide range of influences on innovative activity under three headings: general business conditions, targeted R&D policy and education. The policy recommendations are summarised in Box 1.

The biggest challenge is knowing how far policy should go

2. A relatively low level, and apparently weak progress in innovative activity, *prima facie* justifies the government's focus on innovation; a focus which is also encouraged by commitments to increase R&D activity in the EU's Lisbon Agenda and by opportunities to get EU funds to support R&D-based projects.[3] Though total R&D activity has increased in recent years, it is nevertheless equivalent to only about 1% of GDP. Quite a number of OECD countries have at least twice this level of activity (Figure 1). Furthermore, the share of R&D conducted by business enterprises is also very low (Figure 2), suggesting that a lot of the research being carried out is not aimed at developing products and processes that have potential for commercial application. Indeed, there are only about 700 private-sector research units in the whole economy according to data collected by the Central Statistical Office. The low level of innovative activity is confirmed in a wide range of other indicators (Table 1).[4]

3. The agenda for innovation policy is however rather more complicated than the indicators of innovation activity suggest. Hungary's low level of innovation in part reflects the structure of the economy.[5] A lot of high-tech production is by subsidiaries of large international firms who carry out their main R&D activity elsewhere. In addition, many domestic manufacturing firms operate on a relatively small scale, often probably too small to warrant formal R&D activities. Though these firms may indeed be innovative, and may benefit from spillovers in knowledge and know-how from the large high-tech producers, these processes probably do not get fully recorded in statistics on innovative activity. These aspects of the economy not only explain, in part, why domestic R&D activity is low but also imply that the diffusion of technologies coming from outside Hungary is relatively important.

Box 1. **Policy recommendations on innovation policy**

General business conditions and innovation

Healthy framework conditions for business are the precondition for innovation in Hungary to take off and for fast absorption of innovation from outside the country.

- Generating healthy framework conditions underscores the need for sound macroeconomic policy.
- In terms of general-purpose technologies, ICT diffusion has been hampered at least in the past by a rather slow liberalisation of telephony markets which has reduced pressures for price cuts in internet access charges and other communication services. Market players, particularly the incumbent, Matav, need to be closely monitored.

Specific innovation policies

The government's focus on innovation policy has involved changing the decisionmaking and administrative structure of innovation policy and increasing the level of support provided. There is now a need to take stock of the impact of recent measures, bearing in mind the following:

- Assessment of the Innovation Fund system should focus on whether the opportunity for businesses to reduce their innovation contribution levy by increasing R&D activity has successfully widened private-sector innovation. Even if firms' R&D responses to the offset option turn out to be good, the authorities should nevertheless assess whether such strong earmarking of revenues is optimal.
- The strategy of increased targeting in grant allocations implies that it is important the authorities follow up on plans to create a monitoring system of projects supported by grants. This could perhaps usefully be extended to include broader monitoring of the targeted research fields. The authorities should also consider the potential for spillover effects to other sectors in deciding on which areas to target.
- Given that the current tax-allowances are relatively generous in international comparison, and that the conclusions of research on the impact of tax relief are often sceptical, the allowances may be too high and deadweight losses substantial. Bearing this in mind, the authorities' should focus on evaluating the impact of the current level of support before deciding on further changes.
- The lightening of rules on university spin-off companies and the secondment of researchers to the private sector are welcome, but more regulatory reform needs to be done, particularly regarding the Hungarian Academy of Science (HAS). One way of helping HAS reform would be to strengthen the link between performance and budget allocation. Reforms may also require changes to the tenure status of HAS's researchers.

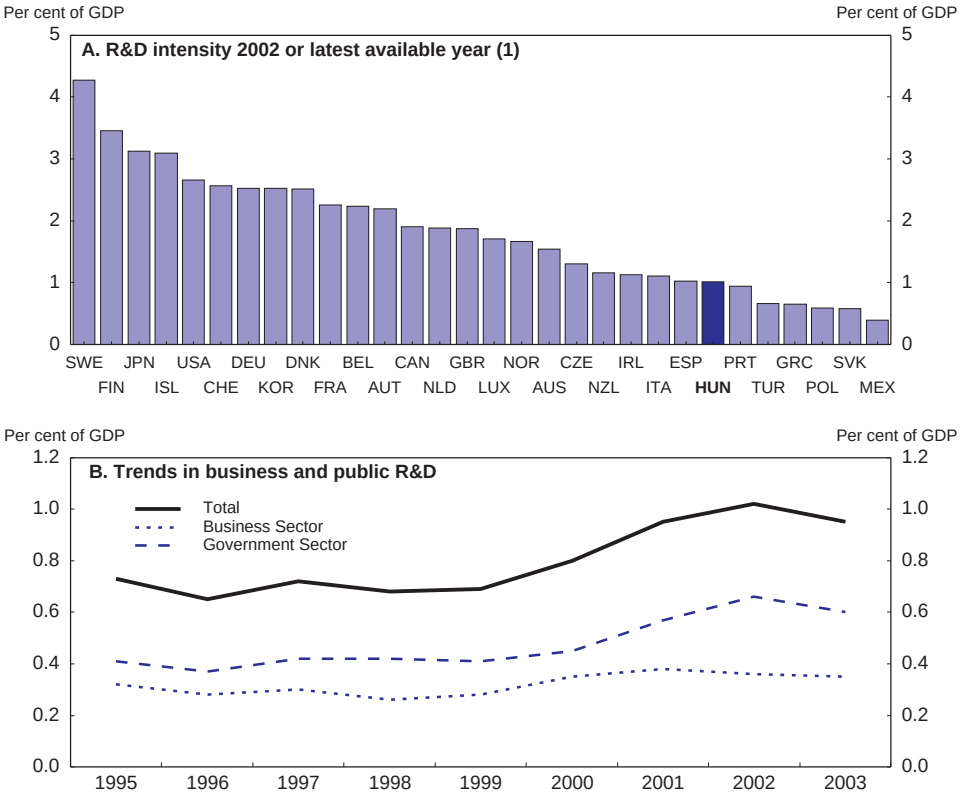
Education policy and innovation

The introduction of shorter more vocational degrees in tertiary education is particularly welcome, nevertheless more work needs to be done on market signals in tertiary education and in raising standards of compulsory education:

- The government should try again to introduce greater consultation between the tertiary sector and business on the content and mix of courses. In addition the government should consider making greater use of incentives in tertiary-education funding to encourage changes in the allocation of teaching resources. The incentive structures for students and universities could also be strengthened if tuition fees extended throughout the system, however there is no political intention to introduce such a general tuition fee system.
- Stronger supply responses are also needed in vocational education; practical training as well as consultation and cooperation with the business sector should be strengthened.
- In compulsory education, the authorities should take stock of the current system of segregating secondary-school students into vocational and academic streams system, given its tendency to misallocate students and that the division into vocational and academic streams is anyway less useful in the context of providing skills for modern labour markets. The challenges faced by the teaching profession need better alignment of teacher education, reward structures, professional development and school needs. In particular, excessive job protection needs to be addressed and pay structures are in need of reform.

4. In addition, there is a more fundamental problem and not one unique to Hungary: it is difficult to establish just how far to go in encouraging innovation. Some level of legal, institutional and financial support for R&D is universally accepted because research generates positive spillovers. However, research activities take diverse forms, spillovers effects are hard to gauge, and policy instruments have uncertain impacts and interact in complex ways. Cross-country comparisons in R&D activity help somewhat but, as the previous paragraph implies, can also be misleading because differences are driven by market forces and differences in the structure of production as well as policies. Furthermore, policies in other countries are not themselves necessarily optimal. In addition, policies affecting the overall business environment influence R&D. Therefore a good balance between targeted and general measures is also important. Given all these complexities, good innovation policy needs to be a careful process of advance through judicious adjustment and careful monitoring.

Figure 1. **Gross domestic expenditure on R&D**

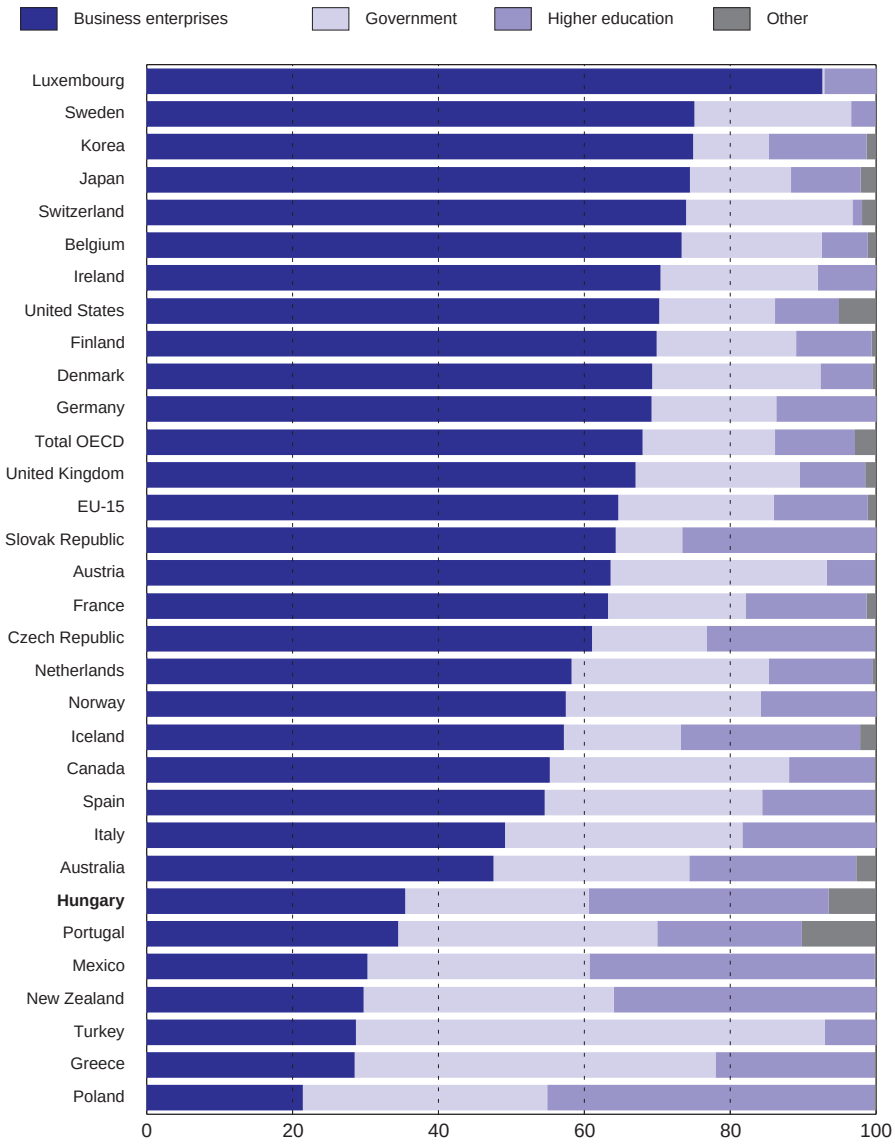


1. 2000 for Australia, Luxembourg and Switzerland; 2001 for Greece, Ireland, Italy, Mexico, Netherlands, Sweden.

Source: OECD, Main Science and Technology indicators.

Figure 2. **R&D expenditures by performing sector**

Percentage share in national total, 2002[1]



1. 1998 for Austria, 1999 for Greece, New Zealand and Sweden, 2000 for Australia and Luxembourg, 2001 for Ireland, Italy, Mexico and Netherlands.

Source: OECD, Main Science and Technology Indicators database.

Table 1. **Broad indicators of innovation activity**

	Hungary	OECD average
Total R&D spending as a % of GDP	0.95	2.28
of which:		
business	0.35	1.53
Government	0.30	0.25
higher education	0.25	0.40
Total researchers per 1 000 total employment	3.8	6.5
Number of patent applications to EPO in the ratio of GDP on PPP (2001)	0.6	3.3
Share of high technology industries in manufacturing exports (2003)	32	25
Scientific publications per million population (1999)	191	402
Investment in venture capital as a % of GDP (1998-2001)		
early stages	0.01	0.04
Expansion	0.04	0.09

1. Latest available year of data.

Source: OECD, Main Science and Technology Indicators database. Hungary's relatively low level of innovative activity is reflected in a wide range of statistics.

Good general business conditions are important

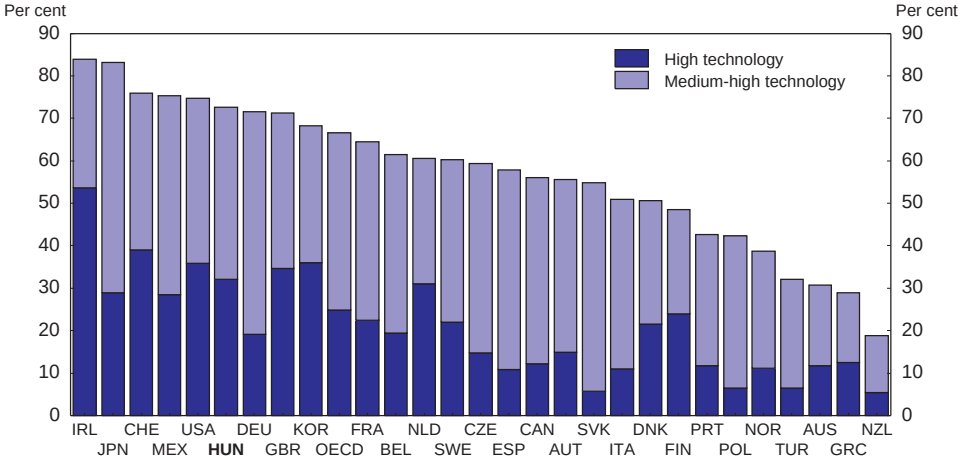
5. Healthy business conditions are the precondition for innovation in Hungary to take off and this should be a key consideration in overall thinking on innovation policy. General business conditions matter for innovation, partly because they can help increase the impact of innovation policy itself but also because they can have direct influence on R&D activity and affect broader and less formalised forms of innovation. The latter is arguably important for Hungary as its large small-and-medium enterprise sector means the creation of new products and processes on an informal basis (*e.g*. research conducted without use of identifiable specialist researchers or research departments) is an important aspect of innovation in a broad sense.

6. The framework conditions for business also matter for Hungary's important inflows of "imported" innovation. As a small open economy, the fruits of innovation have in large part been – and will continue to be – imported in the form of high-tech capital equipment, production processes and foreign business models. This is underscored in OECD indicators of science and technology which show Hungary's share of high-technology in manufacturing exports to be one of the highest in the OECD area (Figure 3). Therefore, although it is important that domestic R&D develops more rapidly, it is also important that the embodied know-how in imported capital equipment and foreign business techniques continue to pull Hungary up the value-added chain.

7. Macroeconomic conditions are an important influence on domestic R&D activity. This has been underscored in recent OECD analysis (OECD, 2005a) examining what drives differences in the growth of R&D activity across countries; robust output growth, stable inflation and low real interest rates are all found to be important drivers of innovation. In many ways this is not surprising; when economies are doing well, businesses can more easily afford research into new products and processes and buoyant demand for consumer and investment products makes for more favourable assessment of the risks and returns of engaging in research. *This underscores the need for sound macroeconomic policy*.

Figure 3. **Share of high- and medium-high-technology in manufacturing exports**

2003[1]



1. Total OECD excludes Luxembourg.

Source: OECD, STAN Indicators databases, March 2005.

8. In addition, the various regulatory frameworks for business as well as general tax and support measures aimed at encouraging business activity contribute to encouraging R&D-based enterprises. Measures to support investment are grouped under the Smart Hungary programme, including notably opportunities for tax holidays for large investments (see Annex A2) and there is wide-ranging general support for SMEs, notably including simplified tax treatment (see Annex A3).

9. The pace of diffusion in ICT among businesses and households is also a relevant framework factor for innovation (and indeed for moving up the value-added chain in general) because of the gains in business efficiency offered by ICT networks as well as the potential for innovative services via the internet. Hungary has some way to go before catching up with the levels of ICT diffusion seen in leading OECD countries and so ensuring fast progress on this front is important.[6] A widening of tax breaks on spending on computer equipment to all households is likely to help boost diffusion.[7] However, as the special chapter on competition issues in the OECD's 2004 *Economic Survey* points out, *ICT diffusion has been hampered at least in the past by a rather slow liberalisation of telephony markets which has reduced pressures for price cuts in internet access charges and other communication services.* Indeed, the latest available OECD international comparisons (OECD, 2005b) suggest that, at least in mid-2004, the cost of a business-based basket of fixed-line and mobile telephone calls was still relatively high (Figure 4).[8] However, because a major step to further strengthen competition was taken just last year (the 2004 Telecommunication Act, see the *2004 OECD Economic Survey* for further details) it is as yet rather early to tell if more measures need to be taken. Nevertheless, it is clear from the price data that the *market players, particularly the incumbent, Matav, need to be closely monitored.*

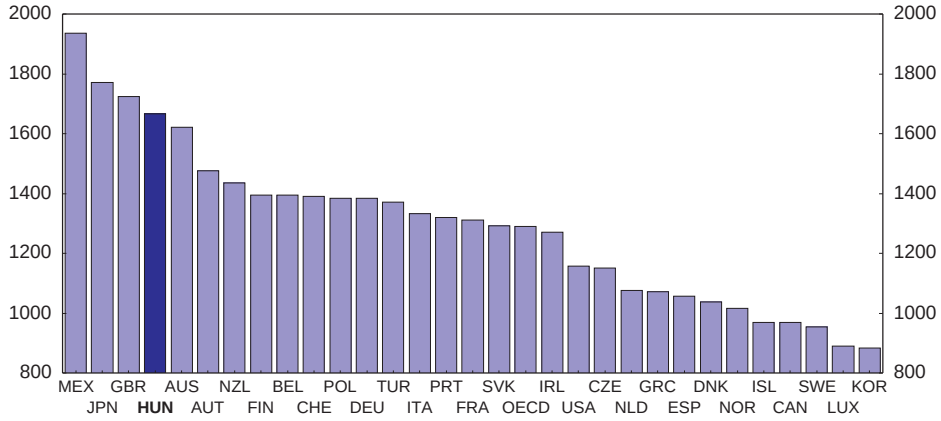
Targeted innovation polices: time to take stock of recent measures

10. The decision-making and administrative framework for innovation policy has changed significantly over the past couple of years.[9] The new National Innovation System is headed up at the political level by the Science and Technology Board which is chaired by the Prime Minister. There is also a new executive body, the National Office for Research and Technology (NKTH), which is notably responsible for running a new fund for financing support for innovation – the Research and Technology Innovation Fund (see Annex A1 for further details on the structure of the National Innovation System). The most welcome aspect of the new framework for innovation policy is that it focuses on encouraging

commercially sustainable innovation. The system also looks set to increase co-ordination across government and bring an across-the-board perspective to R&D policy.

Figure 4. **Telephone charges for business, excluding tax[1]**

August 2004, USD



1. Calculations are based on a basket of telephone charges that includes those for mobile and international calls as well as domestic fixed-line communication.

Source: OECD (2005), *Communications Outlook*.

11. In addition to the new system for funding R&D support, there have been changes in the focus of grant-based support, changes to tax-breaks for R&D and regulatory reforms. The various committees and advisory groups involved in innovation policy are also playing a role in the reform of the tertiary education sector. The key targeted measures are summarised in Box 2.

The Innovation Fund: a novel method of financing R&D grants

12. The Innovation Fund, which began operating in 2004, is a novel way of funding grants for R&D projects and other innovation programmes. Financing of the Fund comprises a new turnover-based levy on businesses (the Innovation Contribution) plus a matching transfer from central government (R&D grants were previously financed entirely from central-government funds). Firms with between 10 and 50 employees were previously required to pay Innovation Contributions but as of this year only firms with more than 50 employees are required to do so (Table 2). The contribution is scheduled to increase to reach 0.3% of firm turnover in 2006. In 2005, the Innovation Contribution in combination with the matching grant is expected to total HUF 40 billion (about 0.2% of GDP, see Table 3).

Box 2 **Key schemes in Hungary's innovation policy**

Grants available to both the public and private sector:

A system of open-tender grants for specific research projects funded by the innovation fund (around 30 projects are currently being funded).[1]

R&D related (co-financed) grants from the EU, including special measures for providing innovation services in industrial parks.[2]

Tax (and similar) incentives

Firms can make the following deductions from corporate income tax base:[3]

- 100% of the value of other R&D spending for outsourced R&D projects and in-house R&D (introduced in 2001, prior to this the tax allowance was 20% and was first introduced in 1997).
- 300% of the value of R&D if it is performed in a higher-education institution or in an institution managed by the Hungarian Academy of Sciences (up to a limit of HUF 50 million) (introduced in 2004).
- 50 to 70% of the value of donations to foundations supporting R&D activities.
- 10% of wage costs related to R&D or software activities (in this case the deduction is on corporate income tax, not its base).

Offset for contributions to the Innovation Fund can be made by the amount spent on R&D.

Special policies for SMEs (firms with less than 250 employees)

Assistance with intellectual property rights (IPRs) and marketing:

- The cost of applying for IPRs (up to HUF 30 million) can be deducted from the income-tax base.
- In December 2004 grants valued at HUF 80 million were awarded for tenders to provide services to SMEs to help international registration of patents and marketing.
- Support services for patenting: In 2004, a programme (VIVACE) was launched that aims for the Hungarian Patent Office to have a new customer service network and to provide training in industrial and intellectual property rights.

Support to overcome liquidity problems in financing research in early stages of innovation:

- Financial support, funded by the Hungarian Development Bank.
- Subsidies for firms getting EU R&D grants to help overcome the problem that the EU funds are only awarded when research projects are completed (part of the 2005 Innovation Act).

Special policies for public-sector institutions and universities

As part of re-focusing of the grant system, universities have been able to apply for grants to set up regional "innovation centres".

New rules on university spin-off companies (part of the 2005 Innovation Act):

- Universities (and similar institutions) can now set up a spin-off company without government approval and a rule that the spin-off had to have at least 50% public ownership has been scrapped. Rules on academics taking leave without pay to work elsewhere have also been lightened.
- New opportunities for grants for setting up a spin-off (one of the conditions being that the spin off is classified as an SME, *i.e.* it has less than 250 employees).

Some reforms to tertiary education are underway, notably with the introduction this year of shorter and more vocationally oriented degree courses.

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1. Details of the projects supported by the open tender grant system can be found on the NKTH's website.
2. Firms or universities which have succeeded in getting a grant of more than HUF 50 million of EU Structural Funds to provide innovation services to companies in industrial parks can get a subsidy equal to 50% of costs up to a value of HUF 100 million.
3. Only the most important tax-incentives for R&D are listed. The deductions are "additional" deductions in the sense that R&D expenditures are counted as a business cost anyway and like other costs can go towards reducing the profit assessed for corporate income tax. The treatment of donations is in fact more complex but effectively means an additional tax deduction of 50% (70% if the donations are classified as "permanent").

Table 2. **Firm contribution rates to the Innovation Fund: percentages of firm turnover**

	2004	2005	2006 and beyond
Self-employed and firms with less than 10 employees	Exempt	Exempt	Exempt
Firms with less than 50 employees	0.05	Exempt	Exempt
Firms with more than 50 employees	0.20	0.25	0.3

Source: National Office for Research and Technology.

Table 3. **The major items of financial support for R&D**

Type of financial support	Annual amount in HUF	Amount as an approximate percentage of GDP
Funding for grants through the Innovation Fund (Innovation Contributions plus matching transfer from central government)	HUF 40 billion (expected in 2005)	0.2 , expected to increase in 2006 and 2007 because of rising Innovation Contribution rates
R&D tax allowances	HUF 5 billion (2003 figure)	0.05
Funding for grants and other R&D-related support from EU – when co-funding is required it is generally be financed with money from the central budget line earmarked for EU integration.	About € 250 million is expected per year in the 2007-13 EU budget	0.25

Source: National Office for Research and Technology, Ministry of Finance.

13. A key feature of the system is that firms can deduct the value of R&D spending from their contribution. This feature aims to induce additional R&D activities. This opportunity to offset contributions may indeed have a wider take up than tax allowances (see below) as firms can benefit even when no profits are made. The mechanism also avoids the problem that tax allowances tend to favour incumbent firms through provisions allowing losses to be carried forward. In addition the Innovation Fund strongly earmarks revenues for R&D support and, because of its visibility, may raise awareness on innovation to businesses and the public at large.

14. However, there are some downsides to this new system. The Innovation Contribution adds to an already complex tax environment for businesses and entails some additional administrative costs for the public sector.[10] Furthermore, as with all earmarking between revenues and spending, the system reduces flexibility in public financing. This suggests close monitoring of the impact of the scheme is needed to gauge whether the downsides are serious and whether the positive impacts are significant:

- *Assessment of the Innovation Fund system should focus on whether the opportunity for businesses to reduce their innovation contribution levy by increasing R&D activity has successfully widened private-sector innovation.* In evaluating the impact of the offset option it will be important to assess how much of any reported increase in R&D activity is through creative accounting as opposed to genuine increases in resources spent on R&D.

- *Even if firms' R&D responses to the offset option turn out to be good, the authorities should nevertheless assess whether such strong earmarking of revenues is optimal.*

15. In addition to the Innovation Fund, resources to support R&D are available from EU-funds. Most innovation-related funding will come through the Economic Competitiveness Development Operational

Programme (ECOP).[11] As in other areas, success in tapping into the EU funds for R&D depends crucially on having good administrative support. Although the authorities have been working hard on this front, it is too early to tell the degree of success in accessing R&D-related funds (see the Annex to Chapter 2 of the 2005 *Economic Survey* of Hungary for further detail on EU funding).

Assessing the shift to more focused grant allocation

16. Changes to the system of grants for R&D projects and other areas of innovation have entailed stronger targeting on specific areas of research and greater support for the development of joint research between the public and private sector:

- As before, general grants are available on an open-tender basis for research projects in both the public and private sector. However, greater consideration is now given to the field of research in assessment of applications. It is also aimed to increase the share of grants allocated to the private sector to 40%.

- A new programme sponsoring regional knowledge centres is underway. As of spring 2005, projects for six university-based research centres had been awarded grants each worth HUF 1-2 billion and there are plans to support up to four more projects. The grant money goes towards the construction of new research facilities as well as research posts.

17. The increased attention to the field of research in deciding on grant proposals is part of a wider strategy of increased targeting in R&D policy. One advantage of focusing policy resources on particular areas of research is that this can help reach the critical mass needed to set off a virtuous circle of network and scale effects. On the downside, increased targeting means taking greater risks on which research areas have the potential to become research specialities. On this latter point, the use of both private and public-sector advisors to help develop policy suggests that the authorities are wisely canvassing a wide range of opinion in selecting research areas. *Increased targeting also means it is important for the government to follow-up its plans to create a monitoring system of projects supported by grants. The monitoring system could usefully include broad monitoring of the targeted research fields as well as tracking of the individual R&D projects that have received support so as to help strategic responses to developments in the international research industry.* A range of considerations need to play a role in allocating funds, partly because allocation on the basis of likely success in commercial application is difficult. For example, *one additional criterion the authorities might consider is the potential for spillover effects in research projects.*

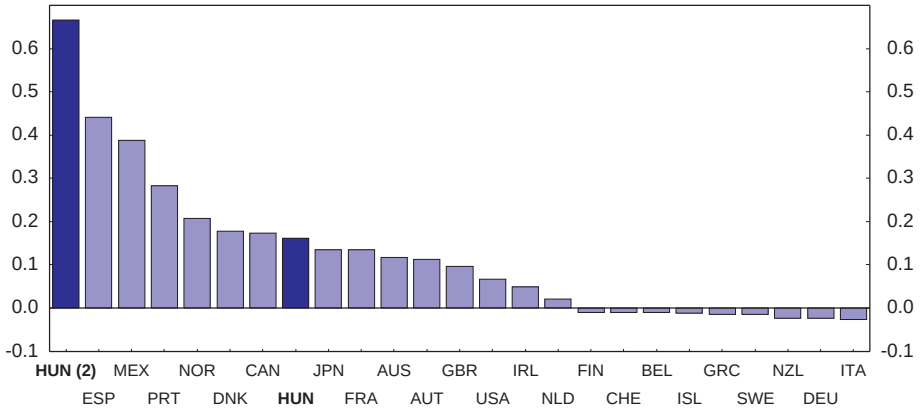
Tax breaks for R&D expenditure: at best having a limited impact

18. Tax-breaks on R&D expenditure have been increased in recent years. In 2001 the basic deduction of R&D expenditure from the profit base used to calculate corporate tax was increased from 20 to 100%. Since then further tax allowances have been introduced, including a 300% allowance when R&D is conducted by a public research institution and an allowance on R&D-related wage costs (see Box 2).

19. The tax allowances imply a relatively high tax subsidy on R&D spending compared with other OECD countries (OECD, 2004a). Calculations show the 100% tax allowance implies a subsidy of 0.16 cents for every dollar equivalent of R&D expenditure and the 300% allowance implies a subsidy of 0.66 cents (Figure 5). By comparison quite a few OECD countries have no (or negligible) tax subsidies and only a few have higher subsidy rates than that implied by the 100% allowance, while the 300% allowance implies the highest subsidy rate among those countries compared.

Figure 5. **Tax breaks for R&D activities**

Percentage ratio of tax subsidies for $1 of R&D, 2004[1]



1. Tax subsidies are calculated as 1 minus the B-index. The figure shows calculations for large firms. For one or two countries (not including Hungary) the results of the calculation for small firms are different.

2. HUN refers to the standard care of a 100% tax allowance for research and technology development (which also applies to subcontracted R&D if the partner is a public or non-profit research organisation). HUN (2) refers to a 300% allowance which is available if the company's R&D laboratory is located at a university or public research site.

Source: OECD (2004), *OECD Science, Technology and Industry Outlook*.

20. Only a relatively small number of firms (currently around 400) utilise the tax allowance, though their average size is large.[12] The low number is perhaps less surprising than it appears; as pointed out earlier statistics suggest there are only several hundred identifiable private-sector R&D units. While the allowances clearly support the profitability of some firms it is much more difficult to assess the impact on R&D activity. The increase in the tax allowance from 20 to 100% in 2001 did not obviously prompt an increase in the number of firms taking-up the allowance. However, around this time private-sector R&D activity did increase, suggesting that the impact might have been more through firms with already established R&D facilities. Whatever the nature of the increase, international evidence suggests the size of impacts on R&D of tax-breaks are low. In a review of the evidence, a report by the European Commission concludes that the price-elasticity of R&D is low (European Commission, 2003), implying that when tax measures are used to reduce the costs of R&D, there is little reaction in R&D activity. This is supported by recent OECD regression analysis (OECD, 2005a) which finds R&D tax-breaks to play a minor role in explaining cross-country differences in R&D intensity.

21. Given that the current tax-allowances are relatively generous in international comparison, and that the conclusions of research on the impact of tax relief are often sceptical, the allowances may be too high and deadweight losses substantial. Bearing this in mind, the authorities' should focus on evaluating the impact of the current level of support before deciding on further changes.

New schemes for innovative SMEs

22. Access to finance is one of the key constraints for innovative SMEs. The amount of venture capital investment in Hungary is small – indeed an OECD review of trends in venture capital suggests Hungary has one of the lowest levels of venture capital investment in international comparison.[13] The main reason for this is that Hungarian investment proposals are not typically large enough to be considered by venture capital businesses because of overheads both in the evaluation of proposals and in the resources that these investors often put into the joint management of firms. The government is countering this

problem with a scheme, run in conjunction with the Hungarian Development Bank, to provide financial support for innovative SMEs. It is also introducing special subsidies to help firms overcome the financial constraints generated from the payment of EU grants only after research projects are completed.

23. The authorities have also introduced measures to encourage SMEs to patent and market new products and processes. SME's can deduct the cost of applying for intellectual property rights (IPRs) from the income-tax base and the government is funding services to help with patents and marketing. In addition, as part of a project to encourage IPRs (VIVACE), the Hungarian Patent Office is to provide a new customer service system and training courses for firms applying for patent or copyright protection. The VIVACE programme also aims to improve the system for resolving disputes between firms – this being seen as one factor putting off high-risk investors.

Regulatory changes to help science-industry links

24. One of the key steps to increase commercially oriented research has been the introduction of lighter regulations on university spin-off companies. Under legislation introduced this year, universities (and similar institutions) can now set up a spin-off company without applying for government approval and a rule that the spin-off had to have at least 50% public ownership has been scrapped.[14] The same legislation also introduced a new mechanism for the secondment of researchers to the private sector. With agreement from their employers, researchers at universities and public-sector research institutes can now go and work for private-sector R&D companies on unpaid leave. There are no regulations on the length of the period of unpaid leave or on how frequently it can be taken.

25. While these are useful steps, more regulatory reform is needed. In particular, the Hungarian Academy of Science (HAS) needs to be given stronger incentives to engage in commercially oriented research. The HAS reflects an approach to public-sector research taken in some other OECD countries, in which the state creates a national research institute that aims to attract the best researchers across a wide range of disciplines through relatively attractive conditions, most notably freedom from teaching commitments. Such arrangements can work well for producing basic research but many of the research areas have very little potential for links with industry and there is often little incentive for researchers in areas where the links are potentially strong. Some also argue that the lack of contact with students in these research centres reduces creativity and that many researchers work hard to get into the institution but then lose momentum once they have entered. *One way of helping HAS reform would be to raise the importance of joint work with business in evaluating HAS's research activities and to strengthen the link between performance and budget allocation;* at present only about 10 to 15% of HAS's budget is based on research performance. *Reforms may also require changes to the tenure status of researchers.*

Education policy and innovation

26. In some respects Hungary's human capital resources for R&D activity are good. In particular its emergence as a production platform in manufacturing, often in high-tech products, has further developed engineering skills in the workforce. Even if this activity may not involve much formally recorded R&D, it is likely in itself to involve a degree of innovation and can serve as a transition to the provision of formal R&D services in product and process development. At the same time, however, the education system could be doing a better job in providing the right skills for such changes as well as in the development of interest and expertise in R&D in the economy in general.[15]

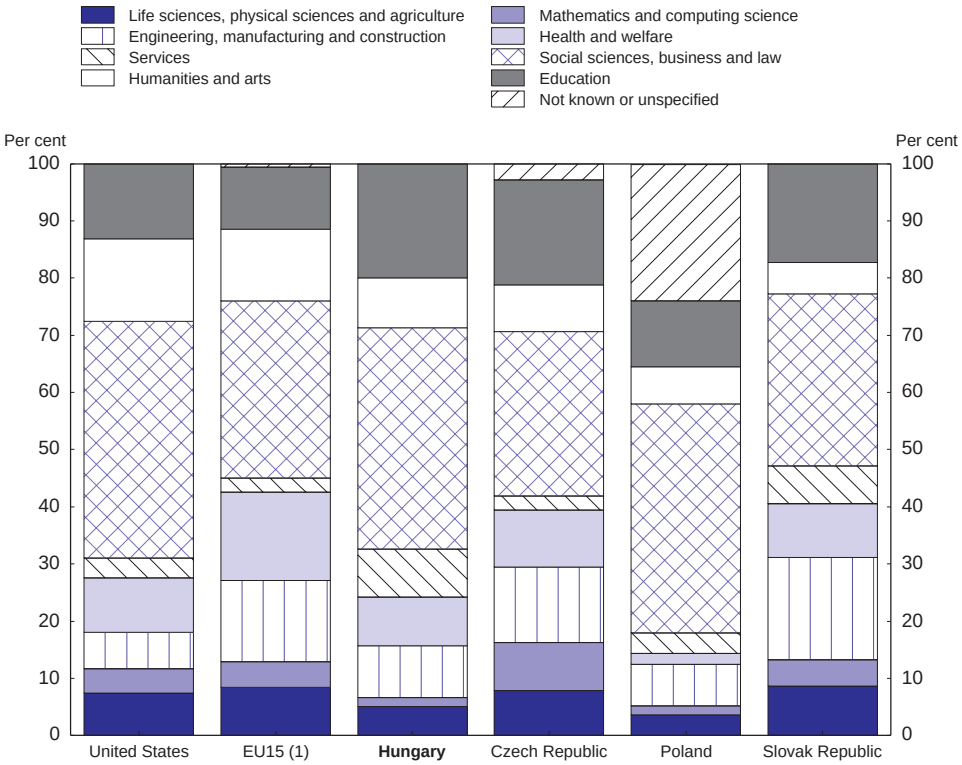
Boosting market signals in tertiary education

27. One weak spot in Hungary's potential for innovation is the relatively low share of tertiary-education graduates in areas relating to science and technology. Indeed, according to the OECD's

Education at a Glance, only about 15% of Hungary's tertiary students graduate in either science, engineering, mathematics or computing (Figure 6). By comparison, for example, the Czech Republic and Slovakia have about twice the share of graduates in these areas.[16]

Figure 6. **Tertiary graduates by field of study**

2002



1. Unweighted average of the latest available data for the EU15 countries less Greece, Luxembourg and Portugal.

Source: OECD (2004), *Education at a Glance*.

28. To some extent the low share of graduates with R&D-relevant degrees reflects weak demand signals. Because the R&D sector is relatively small, it has generated correspondingly small signals to education providers and students compared to the much stronger signals sent by the labour markets in some other areas, notably business-related courses. Though some demand signals get through to the tertiary sector, there has long been criticism that the supply response is nevertheless inadequate and that courses in tertiary education are too long, have insufficient vocational content and are too focused on specific subjects.[17] Students commonly take four-year Masters courses and these often entail unnecessary prolongation and specialisation for the needs of the labour market which weakens the returns to tertiary education.[18]

29. The introduction of shorter more vocational degrees as part of a new act on education (passed in June this year) is therefore welcome. The new three-year Bachelor-level degree courses will be broader than current courses, have more vocational content and also contain compulsory work experience. On completing this new degree, students will have the option of taking an additional year's study to complete a specialised Masters' course. The new degree structure could well make an important difference to the efficiency of tertiary education in providing labour market skills.[19] Other steps in the new act on education

should also strengthen signals in the education system. In particular, the new act makes it easier for students to transfer between universities during their studies, sets up a mechanism for feedback from the career experiences of graduates to new admissions and has established new governing structures.

30. Market signals nevertheless need further strengthening in tertiary education. In particular, the government should try again to introduce greater consultation between the tertiary sector and business on the content and mix of courses. Early drafts of the 2005 Innovation Act proposed setting up a new system in which tertiary-education providers would have to regularly consult employers and respond more than they currently do to industry demands for changes to the mix and content of courses. This proposal was however resisted by tertiary-education representatives during the re-drafting of the Act on the grounds that the proposal would compromise the independence of educational bodies.

31. In addition, more pressure is needed for the tertiary education system to shift more quickly out of areas of excess supply. Understandably, it has been easier for the system to respond in subject areas where there is growing demand for courses and the supply response has been more sluggish in areas where falling demand implies the downsizing of university departments. This problem is exemplified by the relatively large number of students taking teaching qualifications; the data in Figure 6 suggest about 20% of tertiary students graduate in Education. Even though the number of graduates has fallen considerably, supply continues to exceed demand and many graduates with teaching qualifications do not become professional teachers.[20]

32. Shifting the subject mix and improving the quality of degree courses could be helped by making greater use of incentives in tertiary-education funding to encourage changes in the allocation of teaching resources. Currently, these transfers are based on per-capita payments. The per-capita amounts vary across courses (roughly reflecting teaching costs) and are set by agreement between the universities and the government. Each year the government sets limits on how many per-capita payments it will fund and these are very tightly defined (over 400 sub-limits are set). Legislation currently before parliament contains proposals aimed to make the system more flexible for universities and the limits more responsive to student demand for places. The incentive structure for students and universities could also be strengthened by the introduction of tuition fees for public-university courses although this would be a sensitive political issue – fees for students were introduced in the mid-1990s but political opposition led to them later being abolished and subsequent governments have not approached the issue again.[21] The main economic argument for fees is that it would help better connect investment with return for university students and provide useful price signals for universities. Fee systems can also help fine-tune subsidy for tertiary education by designing subsidy mechanisms, such as government loans, so that they provide extra help to students from low income households or extra support for certain types of courses.

33. *In vocational training, stronger supply responses to changing labour market demands are also needed.* Similar to higher-education, vocational training is often found to not have enough practical content and courses often fail to keep pace with changing labour market demands. In this regard *practical training as well as consultation and cooperation with the business sector should be strengthened*. Proposals in the Hundred Steps programme on vocational training (see Annex A4) look set to tackle some of these issues.

Addressing weaknesses in compulsory education

34. Compulsory education has a less immediate influence on innovative capacity compared with tertiary education but is nevertheless important as the content and quality of primary and secondary schooling determines the level of basic knowledge and interest in science and technology. Among the recent policy initiatives the most relevant for innovation is a move to bring more problem-solving and work-related skills into school curricula. This has been in part prompted by relatively mediocre PISA 2000 results. The results of PISA 2003 do not show much change over the 2000 results though it is difficult to

yet tell whether this reflects policy failure or that curricula changes and changes in teaching methods take time to implement and even longer to show up in school results.[22] In terms of improving the overall quality of compulsory education there is also a welcome move to introduce a new measurement and evaluation system of school and pupil performance (though there are no plans to make the results public).

35. The authorities have also recently taken steps to boost foreign language skills.[23] The Ministry of Education has launched its World Language programme, the most important measures being the introduction of opportunities for secondary school students to take an extra year of study in intensive language training and a new school-leaving exam in foreign languages. Also, additional financial support is being provided for teachers to learn languages and new tax breaks on the costs of foreign-language courses have been introduced.[24] In addition, programmes are in place to install more ICT equipment and increase IT training in schools.

36. Some argue there are important weaknesses in the structure of compulsory education that also need attention. Students are split into separate vocational and academic schools at an early stage on the basis of a single examination and the possibility of transferring between streams is limited. *The authorities should take stock of this aspect of the system given its likely propensity to misallocate students and that the division into vocational and academic streams is anyway less useful in the context of providing skills for modern labour markets.*

37. Furthermore, the teaching profession currently faces considerable challenges. There is widespread concern that, though there is a degree of over-staffing (particularly in primary and secondary schools), inflows of new teachers are nevertheless needed but the profession is failing to attract recent graduates of the desired ability.[25] In addition it is proving difficult to motivate practising teachers. For instance, a survey of school heads and deputies indicates a lack of opportunities to motivate teachers as the most serious problem affecting schools (National Institute of Public Education, 2004). Another sign of problems in the system is that it is common for teachers to hold second jobs, suggesting that focus on professional career development is weak.

38. To tackle these problems, a recent review of teacher policy in Hungary (OECD, 2005b) calls for *better alignment of teacher education, reward structures, professional development and school needs.* The recruitment and motivation problems in the teaching profession are largely due to a mixture of poor pay but at the same time strong job protection. *Pay structures need to be reformed.* As for other public-sector employees, prior to the 50% pay increase made over the period 2001-03, pay relative to the private sector had long been deteriorating. For instance, between 1989 and 2001 secondary-school teachers' earnings fell from two-thirds to one half of average earnings among those with tertiary education (OECD, 2005b). The recent large pay increase should have helped somewhat ease problems with motivation. Nevertheless, problems remain in teachers' pay scales. Performance-linked components are weak; for junior teachers, initial salaries are low and rise slowly – the salary schedule concentrates most rewards for senior teachers. The recently large pay increase is however unlikely to have significantly reduced the number of teachers holding second jobs, as it was not accompanied by a change in job requirements. In addition to pay issues, *excessive job protection needs to be addressed.* The high level of job-protection is associated with teachers' status as civil servants, and is undermining mechanisms to address underperformance and prevents the implementation of redundancy policies, contributing to the problem of over-staffing and hindering rejuvenation of the profession.

Summary

39. The government is paying special attention to innovation. The government's focus on increasing innovation has included setting up a new decision-making structure involving senior politicians which has a welcome focus on encouraging commercially sustainable innovation. In terms of specific measures, R&D

grants are being funded through a new special levy on businesses and grant allocation for applied research is focusing more on research with strong commercial potential. There is also greater targeting on specific areas of scientific research. In addition, tax breaks for R&D spending have been increased and regulatory changes have made it easier for universities to create spin-off companies.

40. Healthy general business conditions are the precondition for Hungarian innovation to take off. This should be a key consideration in overall thinking on innovation policy. The country's sizeable small-and-medium enterprise sector means the creation of new products and processes on an informal basis is an important aspect of innovation. In addition, good framework conditions are also important for ensuring that the embodied know-how in imported capital equipment and foreign business techniques continue to pull Hungary up the value-added chain through imported innovation. In terms of framework conditions relating to ICT, a significant step to further strengthen competition among providers was taken just last year (the 2004 Telecommunication Act) but it is too early to tell how it is working. However, price data signalling relatively high telephony costs suggests that *the market, particularly the dominant player, needs to be closely monitored*.

41. Following the recent changes made in the financial incentives for R&D through tax relief and grants, the authorities should now focus on critical evaluation of the impact of measures. This process should bear in mind the following:

- R&D tax relief is already high in international comparison and coupled with the often sceptical conclusions from research on the impact of tax relief, suggests that these incentives may be too high and deadweight costs could be substantial.

- Given the increased spending on grants, it is important that the authorities follow up on plans to improve monitoring of individual programmes. *The authorities should also consider the potential for spillover effects to other sectors in deciding which areas to target. Unsuccessful programmes should be closed.*

- *Assessment of the Innovation Fund system should focus on whether the opportunity for businesses to reduce their innovation levy by increasing R&D activity has successfully widened private-sector innovation.*

42. One of the key steps to increase commercially oriented public-sector research has been the introduction of lighter regulations relating to university spin-off companies and the secondment of researchers to the private sector. However, more regulatory work needs to be done, particularly regarding the Hungarian Academy of Science (HAS). *One way of helping HAS reform would be to raise the importance of joint work with business in evaluating HAS's research activities and to strengthen the link between performance and budget allocation. Reforms may also require more performance related pay components for HAS's researchers, and the abandonment of unconditional tenure.*

43. In tertiary and vocational education, weak response to changing labour market demands could stifle innovation. The introduction of shorter and more vocational degrees and several other measures, as part of a recent act on higher education, that strengthen responsiveness of tertiary education are therefore welcome. However, more progress in reforms to tertiary-level teaching is needed to raise the long-term potential for innovation. Despite the recent reforms, there is still some criticism of supply responses in courses offered by the tertiary sector to changing labour market demands. For innovation these weaknesses risk that any take-off in research industries will get stifled by shortages of suitably qualified graduates. Further reform efforts should include:

- *The government should try again to introduce greater consultation between the tertiary sector and business on the content and mix of courses.*

- More pressure is needed for the tertiary education system to shift more quickly out of areas of excess supply. *In this regard the government should consider making greater use of incentives in tertiary-education funding to encourage changes in the allocation of teaching resources.*

- *In vocational education, stronger supply responses to changing labour market demands are also needed. In particular, practical training, consultation and cooperation with the business sector should be strengthened.*

44. In compulsory education the authorities recently took welcome steps to improve quality, notably with the introduction of output measures of student and school performance as well as teaching of ICT and language skills. *However, the authorities should take stock of the current system of segregating secondary-school students into vocational and academic streams.* The system has a tendency to misallocate students and the division into vocational and academic streams is anyway less useful in the context of providing skills for modern labour markets. *In addition, the teaching profession needs a better alignment of teacher education, career incentives, professional development and school needs. Excessive job protection needs to be addressed as it is undermining motivation.* It is also limiting scope for redundancy plans to bring down the number of teachers to match falling student numbers and rejuvenate the profession through larger graduate intakes. *Pay structures also need reform;* though teachers, along with other public servants, have received large pay increases over the past couple of years, the salary structure overly rewards senior teachers and performance-related pay components remain low. Also, the recent pay increases are unlikely to have dissuaded a common practise of teachers holding second jobs, a situation that is likely to detract from skill development and focus in the teaching profession.

Notes

1. This paper was originally prepared for the OECD's 2005 *Economic Survey of Hungary*. Philip Hemmings is a senior economist in the OECD's Economics Department. The author is grateful to the experts from Hungarian government and non-government bodies that provided information and comment as well as suggestions from OECD colleagues, in particular Val Koromzay, Andrew Dean, Mike Feiner, Andreas Wörgötter, Alessandro Goglio and Márton Szili (now at the Hungarian Ministry of Finance). Thanks are also due to Marie-Christine Bonnefous for her research assistance and to Susan Gascard and Sheila McNally for assistance in preparing the document.

2. The Hungarian authorities have chosen to use the term "National Innovation System" in English translation for the new structure of government bodies (see Annex 5.A1). It should be noted that the term 'national innovation system' is also used by experts on science and technology policy to refer more broadly to the overall system of institutions that contribute to the creation and diffusion of technology, including firms research institutes and universities, as well as government bodies.

3. For an assessment of R&D expenditure targeting see Sheehan and Wyckoff (2003). Details of EU-funded projects relating to R&D can be seen in European Commission (2005).

4. More detailed international comparisons of innovative activity can be seen in OECD (2003b) and in the European Commission's survey-based Innobarometer (European Commission, 2004).

5. An interesting assessment of the process of innovation in Hungary can be found in Borsi (2004).

6. For example data in the latest OECD *Communications Outlook* (OECD, 2005b) show that in mid-2004 Hungary had one of the lowest numbers of broadband subscribers per head of population. Data for Hungary on wider indicators of household and business access to the internet are as yet not available in OECD databases. Among businesses the gaps in internet access are much lower than across households across OECD countries and so Hungary is likely to be less far behind on this front compared with the situation among households. For OECD assessment of the economic impact of ICT see OECD (2004c).

7. Training on ICT and tax refunds for teachers and pupils buying computer equipment are to be extended to all households. The National Broadband Strategy (2004-06) aims for broadband services to be available to 80% of households and 90% of businesses by 2006. The Strategy also entails increasing broadband links in the public sector. The Act on Electronic Communication (2004) also aimed to improve ICT diffusion by increasing transparency in the markets for phone and internet services and by increasing consumer protection.

8. Not only are prices high for the volume and type of telephone calls made by business, they are also relatively high for household Internet access. Price data on an exchange-rate basis from the OECD's latest *Communications Outlook* (OECD, 2005b) show:

   - as measured in November 2004, an internet access package with 512 kilobits per second download speed cost the equivalent of about $42 per month, in many other OECD countries the price for a similar product is at least $10 cheaper than this. An informal look at prices at end March 2005 suggests Hungarian prices may have come down by about $5 since then.

   - as measured in August 2004, a composite basket of fixed-line telephone charges including international calls and calls to mobile networks had the highest price in Hungary at about $750 per annum, the price in other OECD countries being typically between $600 and $700.

- as measured in August 2004, mobile phone service price comparisons with Hungary varied a lot according to the level of use. With low-level and medium level use, mobile telephony appears to be one of the cheapest in the OECD, however high-level use appears to make it one of the most expensive.

9. For a description of innovation policy by the government authorities see NKTH (2004).

10. The public administration costs for the NKTH and the KPI are estimated to have been 2% of the value of the Fund in 2004. However estimates of the cost of collection by the Tax Authority are not available.

11 As explained in an annex to Chapter 2 of the OECD's 2005 *Economic Survey* of Hungary, Structural Funds are made available on the basis of member countries' Development Plans.

12. 2001 data show that 400 firms using the tax-breaks for R&D employed around 8% of employees (though most of the employees would not be working directly on R&D). A subset of about 90 large firms received about HUF 22 billion of the total of HUF 29 billion of tax allowances in that year.

13. The OECD has conducted a series of peer reviews on venture capital. See OECD (2003c) for the summary report.

14. In order to protect against spin-off ventures taking excessive risks with government property, universities can only invest an amount equal to one half of the profit earned on commercial ventures in the previous year.

15. A comprehensive overview of education in Hungary can be found in National Institute of Public Education (2004).

16. It is likely these differences reflect in part (though not significantly) differences in education systems and classification methods across countries. The low number of engineering graduates in Hungary is partly because some engineering qualifications are "below" degree level and not reflected in these statistics. Also, there are thought to be some differences in how those taking teaching qualifications are classified. In Hungary, for example, those who have science degrees but who then go on to get a teaching qualification are classified as teaching graduates and this may differ from practices in other countries.

17. An example of the business community's view on the education system can be found in Amcham (2004).

18. A research paper by Galasi (2004) estimates wage equations for Hungarian higher-education graduates and concludes that a broader degrees can indeed be advantageous because they allow access to a wider range of jobs. The paper also underscores (perhaps not surprisingly) that qualifications in information and communication technologies, economics and business and foreign languages are particularly significant in boosting earnings.

19. For example a recent OECD review of the Finnish polytechnic system (OECD, 2003a) finds that shorter and more vocationally oriented degrees have been popular with students and evaluations of labour market experience on graduation have been positive. Finland is similar to Hungary in that university degree courses are typically fairly long with a strong academic component. The policy response in Finland was to set up polytechnics to provide more vocational courses, in contrast to the Hungarian approach of providing more vocational degrees through the existing university system.

20. According to a report on higher education by the Ministry of Education (Ministry of Education, 2002) over 20% of students were in teacher training in 1990 and by 2000 this had fallen to less than 15%.

21. There was an attempt to introduce university tuition fees in the mid-1990s as part of the so-called Bokros Package. Although the fees were small and there was extra assistance for students from low-income households, they were met with strong resistance and later abolished.

22. The 2006 PISA study will focus on scientific literacy and should provide useful input to future policymaking on developing the appropriate approach to innovation in the education system.

23. The focus on language skills has in part been prompted by data in the EU's Innobarometer (European Commission, 2004) that show foreign-language skills to be relatively weak in Hungary.

24. The World-Language Programme also made a special promotion of languages in the 2003/04 school year.

25. Overly high numbers of teachers is shown, for example in OECD indicators which show the ratio of students to teaching staff to be very low in Hungary in international comparison, particularly in primary and lower-secondary education (OECD, 2004b).

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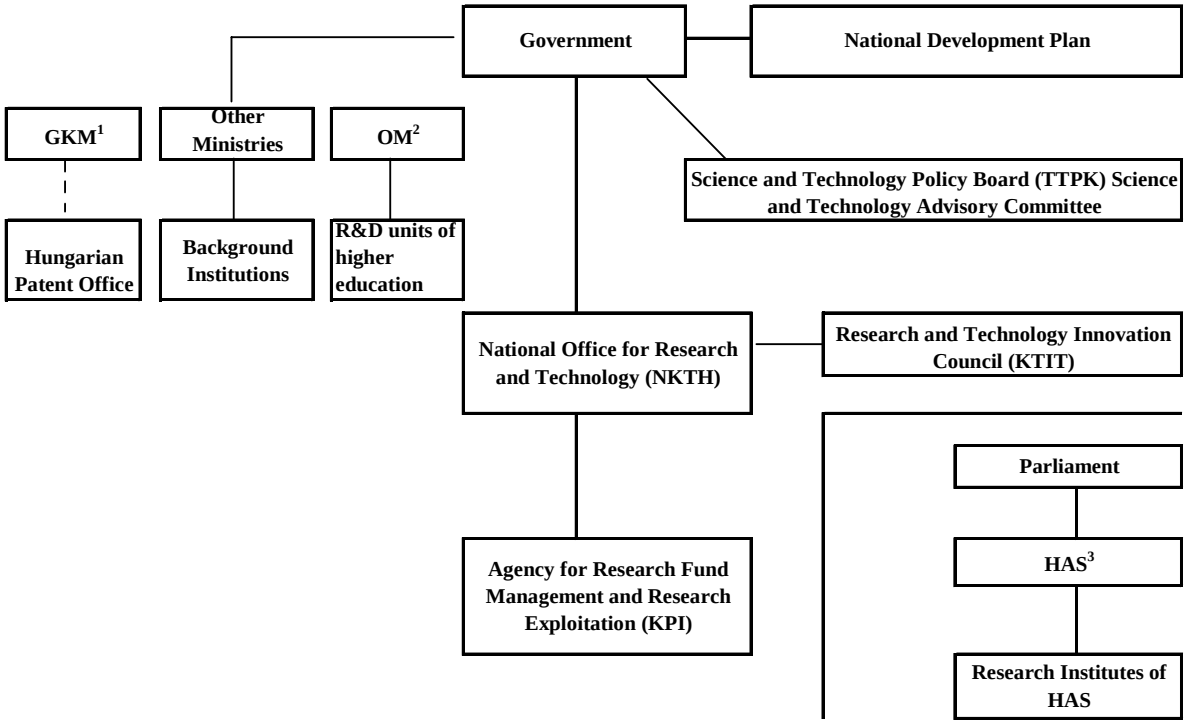
ANNEX A1. THE NATIONAL INNOVATION SYSTEM

The decision-making and administrative framework for innovation policies has been changed significantly over the past couple of years. The new National Innovation System is headed up at the political level by the Science and Technology Board (TTPK) (Figure A1.1**)** which is chaired by the Prime Minister with the Minister of Education and the President of the Hungarian Academy of Sciences as Vice Presidents.[1] This board is advised by the Science and Technology Advisory Committee (the TTTT) which comprises R&D and science experts and manages a new executive body, the National Office for Research and Technology (NKTH). The Office is responsible for overseeing the implementation of the government's R&D strategy, and part of its work includes the management of the new Research and Technology Innovation Fund (often referred to as the Innovation Fund) as well as EU Structural Funds relating to innovation (see below). Other tasks of the NKTH include maintaining international relations on science and technology issues (notably with the European Commission) and raising public understanding and awareness in research and innovation. Much of the work of the NKTH is carried out by a subsidiary body, the Agency for Research Fund Management and Research Exploitation (KPI).[2]

Figure A1.1. **The National Innovation System of the Hungarian Government**



1. Ministry of Economy and Transport.
2. Ministry of Education.
3. Hungarian Academy of Sciences.

Source: National Office for Research and Technology.

Notes

1. The Science and Technology Board was set up in April 2003, a similar board existed in the past but had been dissolved.

2. The Agency for Research Fund Management and Research Exploitations (KPI) has the following roles:

   - Financing R&D and innovation projects through a system of open tender funded by the Innovation Fund. The open-tender system has been in existence for some years but was previously funded by central government transfers.
   - The KPI is the accredited intermediary body in the management of EU-Structural Funds that fall under the Research, Development and Innovation priority laid out in Hungary's National Development Plan submitted to the European Commission.
   - KPI is also responsible for running programmes promoting public-private partnerships and for providing advisory services to stakeholders in science and technology at the national and regional level.

ANNEX A2. THE PRINCIPAL HEADINGS OF THE *SMART HUNGARY PROGRAMME*

The Smart Hungary Programme is a term used by the Hungarian authorities for tax and support schemes aimed at encouraging investment (both by small and large businesses). The aim of the programme is that its various elements can be selectively packaged up to suit investor needs. Some of the elements, such as tax-related incentives provide general support, while others are limited and granted through competitive tender. Furthermore, the individual schemes listed in Smart Hungary are often relevant in other contexts. Notably a number of schemes are targeted innovation measures. EU membership has brought a change in financing of some of the Smart Hungary schemes with the government tailoring administrative structures so as to tap into EU structural and cohesion funds. From 2004 onwards most tender applications were incorporated into the Operational Programme of the National Development Plan, mainly in the Economic Competitiveness Programme.

Tax-related incentives

New development tax benefit. "Tax holidays" for relatively large investments (see main text).

Tax-free investment reserve. Under certain conditions, if firms set up an investment reserve, tax payment can be deferred to the year following the utilisation of the reserve.

Tax-base reduction for R&D expenditure.

Tax-related incentive for adult education.

Reduction of health care contribution.

Support schemes

A wide range of support packages are available for different aspects of business activities including:

Infrastructure. For large investments, a business site can be provided.

Outbound infrastructure. Subsidies for infrastructure outside the business site boundaries for large investments of more than € 50 million. Non-refundable grants are available both for greenfield and non-greenfield investments.

Vocational training, adult education and employment subsidy. Various subsidies funded by the Labour Market Fund.

IT development. Support for investment in broadband Internet networks and internet activities.

Environment-friendly investment such as those that use renewable sources of energy, or reduce noxious emissions.

There is also support for particular types of business, notably *high-value-added activities* and *international service centres.*

Administrative support

Packaged investment promotion. Potential investors are offered investment promotion packages.

A "one-stop shop" system for investors.

Other administrative support measures include: acceleration of the issue of work and residence permits, uniform positions on tax issues and faster customs procedures.

ANNEX A3. HUNGARIAN SME POLICY

Some years ago, SME policy was given additional impetus with the launch of the Széchenyi Development Programme which grouped together and reformed a number of existing SME measures and also brought in new measures (notably the "Széchenyi Card" – a system of subsidised loans). Policymakers still sometimes refer to the Széchenyi Programme as embodying SME policy, even though there are a number of schemes that are not included in it.

In terms of specific measures, financial support includes targeted tax relief, loan subsidies and grants for high-tech and knowledge-based investment projects. Non-financial support includes assistance in e-business, support for network clusters and technical assistance for SMEs applying for EU grants. As this list suggests (and similar to support for large-investment) there is some common ground between SME policy and innovation policy.

Guidance to the range of support on offer is provided through a new SME website (www.lendulet.hu) developed by the Ministry of Economy and Transport introduced in April 2005 (this has replaced the publication of an annual "funding map", see OECD (2005e) for further details on policy measures). As in many other areas of policy, the authorities have geared up the structure of SME programmes so as to take advantage of opportunities for EU structural and cohesion funds.

One of most important measures taken recently has been the introduction of an option for a simplified tax treatment (the "EVA") in 2003 which has proved very popular among small businesses. Figures presented by the Hungarian authorities to the European Commission show that the amount paid under EVA is no lower than that which would be paid through the various taxes that the EVA replaces. The previous *Economic Survey* suggested that leakage of loan support may be significant and contributing to the exceptionally high profits of the banking sector. Also of note, the adoption of EU regulations into SME legislation in 2004 has meant that about one thousand previously "large" companies are now eligible for SME support.

ANNEX A4. MEASURES PROPOSED IN THE HUNDRED STEPS PROGRAMME ON VOCATIONAL TRAINING

As described in Chapter 1 of the OECD's 2005 *Economic Survey* of Hungary, in April 2005 the government began to announce a large number of structural reform measures – collectively called the Hundred Steps programme. This annex outlines the measures proposed in vocational training based on available information provided by the Ministry of Finance in mid-June 2005.

1. An employee training card will be introduced.
2. Training in professions where there is a shortage of workers will be supported.
3. The number of professions in National Register of Qualifications will be halved.
4. Training for professions in strong demand will be supported by a supplementary norm.
5. From 2006 there will be a preparatory education in technical schools for young people who could not finish elementary education.
6. Establishment of 22 regional integrated vocational training centres partly financed from EU and labour market resources.
7. An advisory board will be established in vocational training centres.
8. The number of young people with 'study contracts' will be increased from 22 000 to 26 000.
9. Exam requirements will be changed.
10. People over 50 will be able to get new qualifications with subsidy.
11. In the 9th and 10th year of compulsory education the role of practical training will be increased.
12. New financing of the career-oriented education in vocational training.
13. Practical training will be assured in adult training.
14. 2 000 young people will be supported through the "Provision" scholarship program.

GLOSSARY

ECOP	Economic Competitiveness Operational Programmes
EVA	Simplified Entrepreneurial Tax
GDP	Gross domestic product
HAS	Hungarian Academy of Science
ICT	Information and communication technology
IPR	Intellectual property rights
KPI	Agency for Research Fund Management and Research Exploitation
NKTH	National Office for Research and Technology
PISA	Programme for International Student Assessment
R&D	Research and development
SME	Small and medium-sized enterprises
TTPK	Science and Technology Board
TTTT	Science and Technology Advisory Committee

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