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Chapter:

Executive summary

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Abstract
The 2015 series of RIO Country Reports analyse and assess the policy and the national research and innovation system developments in relation to national policy priorities and the EU policy agenda with special focus on ERA and Innovation Union. The executive summaries of these reports put forward the main challenges of the research and innovation systems.
Executive summary

This Research and Innovation Country Report for Finland provides an overview of the R&I system in 2015. It also examines developments connected with two EU policies – the European Research Area and the Innovation Union. This report was prepared according to a set of guidelines for collecting and analysing a range of materials, including policy documents, statistics, evaluation reports, websites, etc. The quantitative and qualitative data is comparable across all the other EU Member State reports whenever possible.

Economic growth in Finland has been slow for a prolonged period. In recent years, growth has been depressed not only by the weak international economy, but also by sectoral and structural problems. Finland’s gross domestic product (GDP) declined continuously since the second half of 2012. The (GDP) at market prices was €205b in 2014 and GDP per capita €37,600, 37% above the EU-28 average (Eurostat, 2014). The performance of the Finnish economy is lagging well behind most countries in the euro area. Finnish export market shares decreased in most product categories between 2000 and 2013. The cumulated loss in market shares amounts to more than 32% between 2008 and 2013, which is the largest in the EU-28 (EC; Macroeconomic imbalances Country Report: Finland, 2015). Production costs in Finland have increased due to an approximately 10% rise in average wages relative to the euro area since 1999.

The impact of the economic recession and Nokia’s fall have caused a remarkable decline in private and public R&D investments. Gross Expenditure on Research and Development (GERD as a % of GDP) has declined since 2009 when it was 3.75 %. The estimate for the year 2015 is 3.1%, significantly less than the 4% target set by the government. Governmental R&D funding increased during 2006–2010 by 15% but declined during 2010–2014 by 13% in real terms. It increased in 2015 by 0.6% and will fall again due to the new Government Programme1.

Although the situation in Finland is challenging, productivity and living standards still rank high among the developed countries, the Finnish economy is knowledge-intensive, and has achieved a state of a continuous change towards a high and medium-high-tech specialisation. The country has several hot-spot clusters, which compare well internationally, in particular in the ICT, forestry, metal products and machinery, environment, materials, energy, wellbeing, and food and agriculture sectors. Finland also still ranks among the World’s best in R&D intensity (Eurostat) and competitiveness (WEF; The Global Competitiveness Report 2015 – 2016), in terms of scientific and technological excellence and Innovation (Innovation Union Scoreboard or IUS 2015) and (GII - Global Innovation Index 2015; Cornell University, INSEAD, and the World Intellectual Property Organization WIPO). The IUS states that Finland is an Innovation leader (3rd), and its innovation performance steadily increased until 2012, when it declined slightly. Finland’s performance relative to the EU has been declining from its peak of 30% above the EU average in 2007 to 22% in 2014. Therefore, Finland is slowly losing its position as one of the leading countries in innovation. The funding cuts by the new Government in education and research on the one hand target an increase in the quality of the Finnish research by unifying the dispersed research system, on the other hand, there are cuts in funding for building or strengthening the knowledge-base by industries, and boosting industrial research.

The role of private sector in the Finnish R&I system is strong. The share of GERD performed by the Business Enterprise Sector (BES) was 68%, and 66 % was funded by the BES in Finland in 2014. The high share of private funding is positive and a clear target. Segmenting private R&D expenditures based on the company size, 77% of the R&D was executed by large companies, 4% by micro companies and 19% by other SMEs in 2014. Thus, Finland’s R&D is dominated by large companies.

The moderate role of the SMEs is a challenge for Finland. Foreign affiliates’ share of funding has grown to 20% (2014) of the Business sector R&D expenditures which still is quite low, indicating modest internationalising of the economy. Public funding of private sector’s expenses on R&D is very low, about 3%. These incentives are mainly focused on SMEs and start-ups, and their impacts have been proved to increase private investments in R&D but stronger incentives for the whole business sector would be needed for leveraging business expenditures in R&I as well as for increasing the relevance of public research for businesses. The Government has shifted the focus from direct grants to refundable forms of funding which will lower risk-taking and change the focus on near to market interests which may not support long-term building of knowledge capacity for innovation.

The governance of the R&I system is clear and straightforward. The Finnish Parliament and the national Government are responsible for the R&I system supported by the Research and Innovation Policy Council (RIC). Most of the public R&D funding (87%) is allocated through two ministries: Ministry of Education and Culture and Ministry of Employment and the Economy. The major funding agencies are the Academy of Finland (scientific research) and Tekes (innovation) being mainly responsible for the project funding.

Public research organisations perform about 9% and the higher education institutions around 23% of all R&D activities in the country. The share of public research funding (0.97% of GDP in 2015, estimate) is quite high. Project funding (57%) exceeds institutional funding (43%), and institutional funding intended especially for universities includes competitive elements. Competition is aimed at improving the quality, but the low rate of internationalisation and dispersed HEI and PRO systems create a challenge to this objective. It also explains the rationale for the Government reforms of the system. There is a trend towards incentivising universities’ performance to increase outputs.

International funding has grown since 2011 (17% of GERD in 2014). Most of this is multinational’s intramural R&D expenditures. EU funding grew steadily until 2013 but dropped by 4% in 2014. In 2014 it was 2.7% of GERD, mostly FP funding. The role of structural funds in R&D funding is rather minimal.

Smart fiscal consolidation – which seeks to balance Government budgets while protecting R&D investments - remained stable. However, both the structural budget balance and R&D expenditures (GBAORD, government funded GERD) stagnated during the post-crisis fiscal adjustment period of 2010-14.

In 2014, gross R&D expenditures (GERD) totalled €6.5b (3.2% of GDP), with business R&D expenditure (BERD) at €4.4b (2.15% of GDP) and a moderate share of R&D funding from abroad (0.55% of GDP). Although still the EU’s top R&D investor, private sector R&D spending declined and so has public funding more recently so Finland does not meet its 4% R&D intensity target.

Key developments in the R&I system in 2015 include:

- New (PM Sipilä) Government, its Strategic Programme and 26 Spearhead Projects
- Continuing revisions of the research system
- Launch of the Strategic Research Council
- Continuing revisions in Higher Education Institution (HEI) funding models
- Decisions to further cut government expenditure on R&D&I: institutional funding for HEIs and Research Performing Organisations (RPOs) and particularly Tekes funding
- Decision to terminate INKA programme and special funding for SHOK programmes
- Further development of Team Finland activities
The Finnish R&I system is addressing the ERA priorities although there is a need for further development. For a small country with limited resources, the European dimension is seen as a logical extension of national policy.

Finland’s R&I system has demonstrated successes in knowledge exchange and science-based entrepreneurship, along with a well established venture capital market. The current policy approach includes demand-side measures (such as public procurement for innovation), while the majority is still supply-side instruments. Much emphasis has been placed on increasing the performance of public policies for R&I and internationalisation through joint activities and strategic programmes; the new Team Finland and the Council of Strategic Research are prime examples in that regard.

Finland’s R&I system faces the following five challenges:

1. Innovation to boost productivity and competitiveness
2. A new growth mode for public and private R&I investments
3. Swift implementation of R&I policy and governance plans
4. Ensuring a strong science base
5. Increase internationalisation of R&I

**Challenge 1: Innovation to boost productivity and competitiveness**

**Description**

Finland faces the combined effects of the global recession and the challenges related to economic transformation and an ageing population. Productivity and living standards still rank relatively high among the developed countries, but especially the positive development of productivity has halted. Since 2008, Finnish exports have declined by approximately one fifth, which is more than in any other advanced economy. The performance of the Finnish economy is lagging far behind most countries in the euro area. Although Finland also has many structural strengths, their impact on the national economy has not been strong enough to pull the country out of the recession (European Commission, Macroeconomic Imbalances Procedure Country Report – Finland 2015).

In particular, Finland has lost much of its cost competitiveness in global markets for reasons related to the high cost level and losses in multifactor and labour productivity (Maliranta M, 2014, in Finnish). An important factor behind this is the (lack of) flexibility in the labour market. As a consequence, Finnish enterprises have lost their market shares in global markets more than those of any other European country. The impact of Finnish R&I policy measures is deemed to be poor, if at the same time the cost competitiveness does not support the growth and exports of Finnish companies. These challenges call for renewal of existing businesses and creative destruction in the economy.

Converting high R&D investment into medium and high-tech exports (ranked 23rd) is a significant challenge for Finland, while facing low increase in multifactor productivity. Limited investment in non-R&D innovation expenditures (ranked 25th) over recent years could be one explanation for the lack of success in converting the R&D inputs into viable products. On the other hand, it may indicate a lack of innovation, e.g. good investment objects.

**Policy measures**

Finland’s innovation policy and national measures are geared towards speeding up the development, commercialisation and take-up of new technologies and businesses. The Finnish National Reform Programme (2012) and the latest recommendations of the RIC (2014) identified the important reforms needed in research and innovation policy to be the introduction of new means and models to strengthen innovation activity, the
establishment of attractive hubs of expertise, internationalisation, structural development of higher education, the reform of research institutes and research funding, infrastructure policy and setting up the tenure track system.

The current Government has shifted the focus of most state aids from direct grants to refundable forms of funding, such as loans, guarantees and equity investments. The Government’s objective has been to use business aid to restructure the economy and industry and to boost the internationalisation of companies. At the same time the Government significantly cut R&D grants for enterprises.

Overall, the number and scale of reforms taking place signal a continuous commitment to a broad and ambitious R&I policy. In addition to the efforts to enhance the efficiency and improve the internationalisation of the innovation system, the policy reforms are targeted at increasing the number of high-growth innovative companies as they are considered to be major contributors to employment of tomorrow. The innovative high-growth companies are also considered as a means to diversify the Finnish economic structure. Connected with the growth companies, a temporary tax incentive for private investment in start-ups was introduced, and Vigo accelerators were set up and expanded to increase the volume of the domestic venture capital market. The newly founded Tekes Venture Capital Ltd adopts asymmetric profit distribution mechanisms functioning as the fund of funds. Moreover, Tekes funding has been focused on start-ups. In total, these actions are expected to support especially knowledge- and innovation-based young growth enterprises. What is more, the Finnish Government has recently widened Finnvera’s mandate in business and encouraged innovation and the country’s transformation into a digital service economy by releasing non-sensitive public data as open data.

Targets of the new Government Programme related to innovation are i) strengthening competitiveness by improving conditions for business and entrepreneurship by reforming key legislation and removing sectoral regulation that prevents competition, ii) strengthening cooperation between higher education institutions and business to bring innovations to the market, iii) aiming at deregulation and the reduction of the administrative burden as well as iii) creating a culture of experimentation especially by increasing, innovative public procurement.

Assessment

Improving the economic competitiveness and reforming the research and innovation system are at the top of the political agenda of the current Government. Most of the Government Programme’s strategic objectives and specific plans (spearhead projects) are closely relevant to these goals. The target to increase the share of innovative public procurement up to 5% is a strong incentive for innovation, although the means to reach the target have not been defined. As objectives, these are welcomed from an R&I policy perspective. However, there are significant further cuts to the government research and innovation funding especially on its priority areas. The incentives for business – higher education cooperation will mostly be cut. In many respects, the focus of these cuts is not aligned with objectives in the Government Programme (cf. previous section).

The planned actions on cutting red tape and rigidities of the labour market are equally important and likely to improve the productivity and competitiveness. But in the long-term, significant productivity and competitiveness improvements will require also systematic investments in knowledge and innovation.

Despite introducing significant cuts to public R&D expenses, the new Government Programme aims to enhance the funding, equity capital and risk-taking capacity of start-ups and YICs. The cuts to Tekes’ budget are likely to harden the funding for large businesses and research organizations as the needs of young companies and SMEs will be prioritised. Combined with the additional investments to Tekes Venture Capital Ltd, it is evident that the focus of the Finnish R&D system will further shift towards start-ups and YICs in the coming years.
Finland has made some progress in boosting its capacity to deliver innovative products. Policy programmes for new growth areas, such as clean technology, biotechnology and digitalisation are promising but still relatively small-scale.

Health technology is a business sector where progress has been very positive. The sector has been able to grow during the recession and was in 2014 the largest high-tech sector in Finland. Recent success stories can be found also in the ICT related service sector, with an increase in turnover by 8 % in 2013–2014\(^2\). This was achieved mostly due to the gaming (entertainment) industry, with 70 % of its companies being established in the last 5 years (Tekes, 2015). These industries require only modest investments in physical capital, but a well-functioning infrastructure for all companies in the service sector is a necessity.

Implementation of the new university funding model is a good step forward in rewarding for quality and internationalisation, but incentives for creating socio-economic impacts are not yet in place. Nonetheless, the Government has made important policy initiatives focusing on structural reforms to improve the sustainability of the public finances, the most significant of the reforms being pension and health care reforms. These aim at fiscal consolidation, and increasing the labour supply. The reforms were necessary, but the weak trend in the economy indicates that reforms have not significantly raised the productivity. Major decisions in many areas of policy are needed both now and in the years ahead.

An area in which decision-making is needed is the reduction in production costs relative to Finland’s trading partners. Moreover, the need for removing regulatory controls that limit competition and innovation still remains. New means are especially needed to increase multifactor and labour productivity of the whole economy by introducing R&I measures which aim at broadening the innovation base, and increasing the incentives for R&I and risk-taking of businesses and capital.

**Challenge 2: A new growth mode for public and private R&I investments**

**Description**

In 2014, Finland’s gross expenditure on R&D (GERD) was €6.5b, representing a good 3.17 % share of the GDP. Particularly the business of R&D expenditure (BERD) was high, being €4.4b and representing 2.16 % share of GDP (67.7 % of the total). The share of R&D funding coming from abroad was moderate 0.38% in 2013 up to 0.55 % of the GDP in 2014.

Finland is the EU's top R&D investor, but the recent declining trend of both public and private R&D investments may have a negative impact. Statistics Finland’s GERD estimate for 2015 is 3.1 %. In particular, the share of business-relevant research is not high, and has been cut significantly over recent years. According to RIC, the government funding for R&D for boosting the knowledge base and the renewal of industries declined by 35% during 2011–2014. The Government proposed budget allocations for 2016 show a continuation, if not strengthening, of the recent trend of R&I budget cuts. The proposed\(^3\) reductions in Government R&D budget allocations for 2015–2016 are in total of €153m, representing an overall 8% cut in the budget from 2015.

Furthermore, the actual performance of the R&D system in terms of efficiency (inputs to outputs) places Finland much lower down in the comparisons (ranked 23rd) (Edquist & Zabala-Iturriagagoitia, 2015). There are several factors behind this; many of the R&D investments in Finland are not aimed for economic impact, often the economic impacts are only moderate, and the statistics are dominated by few leading companies (e.g. Nokia). The average R&D investments of other than the leading companies are merely average and those of SMEs even below that.

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Measures

Finnish policies well acknowledge that the emergence of new R&I intensive sectors and growth companies are crucial for the future economic and societal well-being of the country. The debate on how to address flagging technology exports, weak productivity growth, and diversification in business R&D is ongoing, involving major national stakeholders. A number of measures have already been taken to address this complex challenge. These include addressing the supply side measures – a number of key actors are involved such as the Research and Innovation Policy Council (RIC), Tekes and the Ministry of Employment & the Economy (MEE). The outcomes so far include R&I recommendations 2015–2020 by the RIC (2014); the action plan and policy framework for demand and user-driven innovation by MEE; the reform of the Act on Public Procurement, so that public procurements pay greater attention to innovation (2015); a joint-service ‘Growth Track’ intended for enterprises aiming at rapid growth and internationalisation; the 2013 Tekes funding concept (2014–2017) for young, innovative enterprises and new companies VC - start-up ecosystem; the enlargement of Finnvera’s mandate; the expansion of the Vigo Accelerator Programme; a tax incentive for private investors; an ICT 2015 working group’s (2012) strategy to mitigate the effects of the sudden structural change; the new strategy of Tekes with emphasis on growth companies; establishment of Tekes Venture Capital Ltd fund of funds with the possibility of asymmetric distribution of profits; and the governmental decision on central government spending limits for 2014–2017 in April 2013. Moreover, the Smart Procurement Programme (2013–16) aims to create new market opportunities for SMEs and produce ground-breaking innovative solutions to serve the needs of the Finnish public sector. Finally, Finland’s smart specialisation strategy, which could serve to increase business investments in R&D at regional levels based on their comparative advantages, is in progress.

Assessment

The focus of public R&I funding has been effectively shifted to SMEs, which are growth-oriented, job creating and successfully establishing international connections. Incentives for the cooperation between businesses and public research organisation have also worked well. Despite the low level of these incentives, Finland ranks 1st in cooperation. Due to cuts in 2011–2014 and the new decisions by the government, the level of incentives for cooperation, and public funding allocations to research boosting growth and competitiveness of companies will remain modest, and incentives for business R&I will remain on a low level compared to competing economies (OECD, Science, Technology and Industry Outlook 2014). The government’s decision to shift the focus from direct grants to refundable forms of funding do not increase R&D investments of businesses. A lack of know-how in dismantling units of PROs, and functions and renewal through reallocating resources is also hindering the progress for efficiency (RIC, 2014). Finland’s smart specialisation plans could offer greater clarity, stronger focus and resource allocation as well as include advanced monitoring and evaluation mechanisms. The proposed reductions in government R&D budget allocations for 2015-2016 total €153m. The cuts in funding for universities and public research organisations will decrease public R&D investments but may increase strategic focus and the scientific excellence. Despite the good targets of the government, there are few practical means to increase R&D investments in Finland and it seems evident that Finland is not able to meet its official 4 % R&D intensity target.


Challenge 3: Swift implementation of R&I policy and governance revisions

Description

Further to the evaluation of the whole innovation system (2009), a number of institutional evaluations were launched, pointing out a number of structural challenges. The Finnish government attempted to respond to these challenges during the past 5 years. A number of specific evaluations and studies have been conducted to address the structural challenges of the research and innovation system, and equally many systemic changes are still in process.

At the level of policy-making, greater coordination is needed to address new and complex R&I challenges in Finland. In the administration of research and innovation, there are some systemic difficulties in making strategic choices, improving the quality of research outputs and developing measures to support new sources of R&D based growth. On the other hand there is a high degree of transparency and data availability, as well as an evaluation and monitoring system in R&I policies to support improvements in governance.

One of the biggest revisions in the current Finnish R&I system has been the university reform (2010), followed with the Polytechnic reform (2011) and reform of the research institutions and research funding (2012). These were immediately followed with a new university funding model (2013), just to name a few. The major R&I funding agencies (Academy of Finland & Tekes) have recently been evaluated and their roles have been adjusted accordingly. Furthermore, new organisations, such as the Council for Strategic Research and the Team Finland concept have been established. Many, if not most, of these revisions will take several years before the organisations are functioning with full efficiency and have found their new roles in the system. Changes particularly in the university sector and research institutions have been slow to take their full effect.

Policy measures

The government is carrying out the Central Administration Reform Project (KEHU) to improve coordination and coherence in government. The Research and Innovation Council (RIC) established new guidelines 2014–2020 aiming to improve the R&I system and governance. The Finnish government also adopted a Resolution on Comprehensive Reform of State Research Institutes and Research Funding in September 2013, which aims to increase multidisciplinary, high-level research of societal relevance and research to support government decision-making. The resolution covers reorganisation of public research institutions and reallocation of some public research funding to competitive research funding. It also created a new, Strategic Research Funding Instrument within the Academy of Finland to support long-term research on challenges facing Finnish society. The government's funding arrangements for 2015 involve a reduction of €22m for public research organisations compared with their allowance for the previous year in order to support strategic research via the SRA (Research Europe, 2015). The Team Finland Strategy is becoming an essential element of Finnish STI policy and will be updated annually with emphasis placed on stability and continuity to maintain its long-term perspective.

Assessment

As stated before, it is seen very positive that reforming the national research and innovation system is among the strategic objectives of the new Finnish government. For many parts, in practice this is likely to mean the follow-through of the revisions planned and started earlier, namely: Central administration reform; Continuing revisions of the research system; Launch of the Council for Strategic Research operations; Continuing revisions in the university funding models; Further development of Team Finland activities.
At the same time, the volume of specific government measures to this end (spearhead projects) is quite marginal compared to decisions and budget cuts introduced in the R&I sector, namely decisions to further cut government expenditure on RDI, (including Tekes funding to key programmes). Furthermore, the decision to further shift the allocation of existing funding from grants to returning instruments (loans, guarantees, VC) will have an additional impact on the overall functioning of the business R&D incentives, moving the balance from competence building to close-to-market activities.

An evaluation of the RIC was conducted to support the development and strengthening of its operations. It made a number of recommendations to meet the needs of a changing operating environment (including increasing funding, use of foresight and assessments, use of external experts and stakeholders, involving sectoral ministries, reinforce transparency, and positioned under the Prime Minister’s Office). In March 2016 (with an effect from April 1st), the Finnish Government approved an amendment to the decree of the Research and Innovation Council (RIC). According to the new amendment, the composition of the council will be reduced (the maximum number of ministers reduced from nine to four) and its tasks will be more strategic and pre-emptive than before. The Council will be headed by the Prime Minister, and supported by the key research ministers; the Minister of Education, Science and Culture and Minister of Employment and the Economy. It is noteworthy that the Council Secretariat will cease to exist and the preparatory tasks will be assumed by the ministries, Tekes and the Academy of Finland.

Coordination and cooperation between funding agencies aims at more streamlined services for companies, and new co-funding models, increasing diversification and supporting growth businesses. These new policy developments should help spur important structural and financial changes in support of improved R&I governance. Such coordination mechanisms may foster new approaches to support research and innovation to contribute to sustainable growth, for example in the clean tech and bio-economy areas. Such long-term measures with strong monitoring and evaluation frameworks, as well as experimental approaches, support future R&D-driven economic growth. At the same time when assessments and evaluations are increased, the government strengthens its own policy intervention, which may discourage operational public-private partnerships to find focus and allocate resources. The need to improve the quality of assessment and evaluation measures grows as their role becomes stronger. The needs are especially related to indirect impacts, long term effects and counter-factual analyses.

**Challenge 4: Measures to improve the quality of science**

**Description**

An important area for improvement is Finland’s leading-edge research. While overall the inputs to the science base are strong, scientific performance has remained flat since 2000 as other countries’ progressed. Despite outperforming the EU, US and many others in terms of R&D investments (ranking 4th for private and public R&D investments among OECD countries) and on shares of new doctoral graduates, increasing input has not yet translated in terms of growth in scientific and technological output. The weaknesses in the system include the range of scientific disciplines at universities and research organisations, which are similar to, or overlapping with other universities. Specialisations in key or strategic fields have not been sufficiently pursued in the current system, resulting in low numbers of researchers at the top of their field. Most Finnish universities reach a mid-level in the international university rankings (Times Higher Education Ranking (?), Shanghai index - though partly due to their approach on a few fields of excellence, and the size of universities), and Finland is weak in top publications or excellence rankings (14 % of publications in top 10 % highly cited, compared with Sweden 15 %, and 70 on the Research Excellence Indicator, against Sweden’s 88 score).

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Related to this, Finland’s regional policies may have also affected its ability to reach scientific excellence with several universities originally established in remote locations with low local demand, and a lack of specialisation to attract top talents or to develop comparative advantages.

Finland has not been able to improve the quality of its research in comparison to other countries, when measured with citation indices. The core of the challenge is related to the fragmented research resources (universities and research performing institutions) and partially to the lack of international mobility of research (in particular the mobility of researchers and the utilisation of international funding opportunities). To this end, Finland is at the average level among EU countries. The current government wishes to address this through the reform of the research system and by setting budget incentives of the universities. Also the government budget cuts are aimed at encouraging stronger specialisation and strategic choices at the universities and research institutions. The relevance of the public research for innovation and the economy of the country is not measured, although there is a strong evaluation culture.

Policy measures

A number of measures in recent years aim to increase the quality of the science base through structural changes, improving financial incentives and reforming the financing models. These include the new University funding model (2013), the structural development scheme for polytechnics implemented in 2014, the reform of research institutes and research funding (starting 2014) including the establishment of Council of Strategic Research (SRA) in 2014, the R&I recommendations for 2015-2020 by the Research and Innovation Council, the Finnish Research Infrastructure Committee, updated Finland’s national roadmap for infrastructures 2013. Furthermore, in 2009, the Academy of Finland found that the country has too many centres of excellence for a country of its size, and recommended mergers to form larger centres to help solve the problem of funding being spread too thinly.

Assessment

Clear results can only be assessed in the longer term, though science quality has shown improvement as a result of excellence-driven funding models and advances in structural reforms of funding agencies, research institutes and universities. Some mergers have also taken place. To date, the means for coordinating and strengthening universities’ strategic choices have been soft and results have been achieved quite slowly. The government has reallocated €50m from universities’ institutional funding to competitive funding (Academy of Finland), and decided further cuts to university funding. These measures may boost the process.

Challenge 5: Increasing the internationalisation of R&I

Description

Success in science, research and innovation is becoming more global in terms of collaboration, and access to human as well as financial resources. However, the degree of STI internationalisation in Finland is quite weak, affecting both public and private sectors. Finland shows moderate levels of international funding for R&D (17% of GERD in 2014) although it has been growing (235% increase in 2010–2014, Statistics Finland, 2015)\(^7\). Finland’s volume of stocks of foreign direct investment (FDI / GDP) is at 38% in 2014, being also lower than in other leading countries. The share of foreign doctoral students is also low (e.g. 7% of doctoral graduates have a citizenship of another EU member state, and 7% of a non-EU, compared with 11% and 22% respectively in Sweden (Deloitte, 2014). And, while levels of international co-publications are increasing, international co-patenting is below the levels of its peers.

While Finland's performance in the Innovation Output Indicator has been very good (ranked 5th) it underperforms on measures of exports in medium and high-tech, indicating a decline in competitiveness. Finland's participation in EU research programmes is also below potential in most areas, particularly in areas where Finland's track record is good. Taken together, this means that Finland is held back from developing leading-edge innovations that can sustain domestic investment and growth (EC Innovation Output).

Policy measures

Finland is committed to addressing the weak internationalisation of its science base. In five years (2007–2012) the share of foreign students in universities increased by 75% from 3.3% to 5.8%, but the level is still very low. In 2012 the share of new foreign student was 12% and the share of foreigners among doctorate graduates 18%, (Finnish National Board of Education (FNBE), Statistical services). In 2010–2013 foreigners’ share of all recruited professors was 14%, (The Academy of Finland, The State of Scientific Research 2014). Co-publishing with foreign researchers has increased slowly but continuously, being 52.7% (% of total) in 2012 (rank 12th among OECD. The share of foreign private R&D investments as a share of private R&D in Finland was 20% in 2014 (Statistics Finland 2015, Research and development 2014), which is moderate in international comparison, but is mainly explained by the low share of foreign affiliates of total entrepreneurial activities in Finland.

To support EU programme participation and broader internationalisation, the University funding model reforms in 2013 sought to increase incentives for internationalisation. The Finland Distinguished Professor Programme (FiDiPro) scheme was established to attract high level foreign talent to Finland. Finally, venture capital funding through the Vigo Accelerator and by YIC funding scheme aims to attract foreign investment for start-ups in Finland. Finland slightly increased its applications to H2020 compared with FP7, though saw a slight decline in signed grants.

The Team Finland strategy for promoting foreign investment, adopted in December 2012, aims to exceed the EU average in the stock of FDI as a share of GDP (46.6% in 2012 by 2020 from its current level (38% in 2014). This strategy seeks to improve the efficiency of existing FDI promotion efforts by bringing them under a single umbrella. It aims to create a clear, flexible and customer-oriented model so that key domestic and abroad actors work towards a coherent goal. In addition, international companies conducting R&D activities in Finland can apply for Tekes' funding even without being registered in Finland or having a Finnish partner (OECD2014), assuming and requiring that there are economic impacts anticipated in Finland.

Assessment

Up until now, the overall progress with regard to increasing the internationalisation of R&I in Finland has been modest, although for some schemes it is too early to assess. In terms of attracting foreign human expertise, schemes like FiDiPro continue to enhance the international dimension of universities and research institutes. The low share of foreign R&D in the private sector is partially explained by the Finnish business structure, having few foreign affiliate companies. Although there is some notable progress, the pace is still slow. The slow progress may reflect the lack of internationalisation of the economy and society as a whole, including immigration policies. Finland should continue to foster participation in EU programmes to support its internationalisation aims.