
The report is thorough, the arguments are convincing, and the recommendations and development suggestions are mostly highly acceptable. The analysts have managed to identify the main development needs of the Finnish innovation system in a very insightful manner. This will be a highly valuable document for the task of reforming the Finnish innovation policy.

Some more detailed comments:

1. A major message is already on page 2:
   “The recent budget cuts for research and innovation risk making sustainable economic recovery more difficult. Without corrective action their impact will still make itself felt in the years to come in the form of dampened innovation activity and productivity growth.” When discussing the report, one should not lose sight of this underlying principle: investments in high-quality research and an innovation are essential for the future success of Finland.

2. The 1st paragraph on p. 4 talks about the role of “public research institutions whose quality was recognised internationally” as a major factor behind Finland’s earlier successes in technology-based business. It would be good to recognize explicitly the role of universities in those successes and write about “universities and other public research institutions”.

3. The 3rd paragraph on page 4 (and similarly on p. 14) discusses the decreasing trend of GERD (as percentage of GNP) and identifies this (especially when combined with the current contractionary funding policy) as a major risk for Finland’s innovative capacity and, thereby, economic growth. While this is an important observation, the Finnish reality
may in fact be even grimmer than the report realises. A peculiarity of the Finnish GERD
is that a disproportionally large part of GERD consists of somewhat unambitious develop-
ment work at companies (improvements and applications of existing products); university
funding and other investments in true innovations is at a very low level.

4. Understanding this point (i.e. point 3 above) is crucial for the major recommendations on
p. 5: Finland must invest on innovative research that can produce true innovations and
disruptive technologies. This requires putting much more emphasis on world-leading re-
search excellence.

5. Point 3 above is also a key for understanding the developments behind the shocking ob-
servation at the bottom of p. 5: the share of high tech exports dropped in Finland from
23% in 2005 to 6% in 2016.

6. Accordingly, the recommendation (p. 5-6) that “there is an acute need to build competi-
tive advantages in new areas of business and to diversify Finland’s pattern of trade” and,
moreover, that these competitive advantages must be based on pioneering research is
highly acceptable.

7. The report identifies internationalisation (or rather, the lack thereof) as a major and sur-
prisingly persistent weakness of the Finnish innovation system.
   - This is familiar from numerous reports and analyses over the years, but the report
goes further and makes an important observation that linguistic and geographical fac-
tors cannot explain satisfactorily why internationalisation remains more challenging
for e.g. the higher education sector in Finland than, say, in other Nordic countries.
   - The report identifies the main obstacle to internationalisation to be the Finnish failure
to create internationally salient concentrations of research and education excellence.
   According to the report, Finland should reduce the fragmentation of the higher educa-
tion and research sector and create stronger units that (i) would attract also interna-
tional talent to Finland and (ii) could connect to the best international networks as
equal partners. This requires strengthening specialisation among higher education
and research institutions, and building upon existing strengths.
   - Currently Finland struggles to create education and research units that reach the
weight, impact and excellence required of significant nodes in international research,
education and innovation networks. The Nordic counterparts, not to mention the Cen-
tral European benchmarks, have been much more successful in this aspect.

8. On page 7 there is a somewhat confusing claim that “links [of higher education institu-
tions] to industry are in many places poor”, and again on p. 21: “In general, the technol-
gy transfer function within Finnish universities is not strong and the broader links to in-
dustry are weaker than those in many other countries.”
   - This is surprising, for a constant feature of the international assessments and audits
of Finnish higher education institutions is the observation that industry cooperation is
in international comparison exceptionally comprehensive (penetrates both teaching
and research) in Finnish higher education. One is tempted to assume that the correct
message is (again) that while the links between industry and higher education institutions in Finland are close, numerous and active, the level of cooperation is largely too unambitious: industry cooperation is content with low-level applications and development work, while the focus should more often be on industry renewal and true innovations.

9. Pages 9 & 14 identify the current low level of public funding to RDI activities (especially cuts to Tekes funding) as a very counterproductive development, given Finland’s aspirations to renew itself as a high-tech-driven innovation economy. The cuts to the public funding of translational research is a major problem for the Finnish economy and its capability for renewal. This problem is further accentuated by the very small role of SMEs in R&D and innovation activities, which is a feature the report identifies as a characteristically Finnish weakness that diminishes the ability of the Finnish economy to adjust to, not to mention lead, rapidly evolving global trends. Finland should support RDI environments where internationally significant universities link with innovative industries (especially SMEs and start-ups).

10. The preliminary conclusion on p. 10 is of utmost importance:

“It is important for Finland to move towards a more integrated and systemic approach to STI policy. This entails conceiving new policy mechanisms to support innovation ecosystems (and communities), challenging traditional roles for both businesses and the higher education sector (and scientific communities). New interactions and more open modes of innovation are needed which include a broad range of communities of knowledge and practice.”

- Again, when reading this important message, the reader must not lose sight of the underlying requirement that (at least some of) the innovation ecosystems Finland needs must be internationally attractive hubs that connect with the best RDI networks across the globe. Regional hubs are not enough.

11. Page 12 discusses the role and constitution of the Finnish Research and Innovation Council (RIC). Since an underlying theme of the whole report is the poor level of internationalisation of the Finnish innovation system, it is somewhat surprising that the report does not comment on the exclusively domestic or even inside-looking constitution of the RIC. One should think that the RIC should include (just like its counterparts in many other leading countries) international members or at least a well-integrated international advisory function.

12. P. 22: The Finnish university sector is too fragmented: “the number of institutions needs to be reduced but, more fundamentally, the number of small branches (ca. 120) of these institutions and a large number of comparatively small departments (in the same field of education/research) scattered across the country.”

- This is important. As the report states, even after the current development measures have been carried out, the process “will still leave Finland with about twice as many institutions per student as is seen in other countries, so there continues to be significant scope for rationalising the system.” The only option for radically reducing the fragmentation appears to be an unforeseen development in the division of labour and specialisation activities of the higher education institutions.
13. The discussion concerning the funding model of Finnish universities (p. 23) is extremely interesting and insightful.

- The report makes an important observation that in Finland an exceptionally large proportion of government funding is allocated in terms of project funding. This makes the long-term, strategic building of the core competences of a university rather difficult. Other countries tend to put more emphasis on (non-project) institutional funding, which gives the university leadership more elbowroom for strategic management, long-term development and profiling of the university. The Finnish system is not ideal for supporting the autonomy of the universities.

- Another feature of the funding model that threatens to undermine the possibilities of strategic management, and especially the profiling, of Finnish universities, is the very comprehensive and detailed performance-based funding model that applies in the same way to all the Finnish universities and accounts for 75% of the universities’ budget funding. Modernisation of the Finnish university should leave room for the possibility that the universities profile themselves not only at the level of academic focus areas/disciplines, but also in terms of their activities: some universities could specialise in post-graduate degrees, while some others might want to emphasise e.g. undergraduate education and open university activities. The current funding model acts to prevent this kind of specialisation development.

- Should the funding model be modified, it is nonetheless of utmost importance that the animating principle of the performance-based funding model is not forgotten: the funding of universities must be based exclusively on the quality and impact of research and education, regardless of the profile of the university. But the funding model should leave room for strategic management and profiling of universities.

14. The observation (bottom, p. 23) that “A particularity of the Finnish PRFS is that the funding system gives no credit for “third mission” activities, thereby discouraging knowledge exchange and the generation of social and economic impacts from research” (and that this particularity is highly negative in nature) is very important.

The main message of the report that the universities should wholeheartedly support: Finland must invest in internationally leading research and innovative capacity. This requires the following development measures:

a) Shifting the focus of GERD from unambitious development work at companies to research-based, disruptive innovations (cf. the recommendation on p. 14: “investment in research and innovation should be increased but with a new approach that is aimed more on the development and adoption of “radical” innovation and new technological solutions for building new competitive advantages in both existing and new industries. This should also include the pursuit of technologies and business models that enable companies to upgrade business and shift from existing activities to new, related ones”). International research excellence plays a crucial part here.

b) Developing universities into internationally significant hubs (critical mass of excellence, talent, ideas, multidisciplinary capacity etc.) that can attract top talent, ideas and investments into Finland and that can connect Finnish stakeholders with the best international research and innovation networks. The presence of world-class universities supports the
whole higher education sector of Finland, not to mention the Finnish businesses across the country.
This requires in turn that the universities must specialise and create distinctive profiles for themselves. In particular, specialising in certain fields may not necessarily suffice for the required diversification and specialisation of the higher education sector: some universities could profile them as internationally leading research universities, while some other universities could reinvent them as education hubs. The only credible alternative to this diversification appears to be a radical reduction of the current fragmentation of the Finnish higher education sector.