Executive summary

Croatia's innovation achievements and challenges

- Croatia has achieved much since independence. A successful transition to an open, market-based economy and institutional reform underpinned fairly strong pre-crisis growth and convergence and culminated in Croatia's accession to the European Union (EU).
- The financial and economic crisis has exposed structural weaknesses of Croatia's economy and its pre-crisis growth model. To achieve sustainable income and employment growth and strengthen international competitiveness, Croatia needs to become more innovative.
- Croatia does not yet have a mature innovation system with a core of highly innovative businesses as a driver. R&D expenditure is low at 0.8% of GDP, compared to 2% in the European Union and 2.4% in the OECD area. Moreover it has been stagnating during the last decade – in sharp contrast to many emerging economies.
- Croatia compares well in Southeast Europe, but lags in innovation performance against comparable EU members. It nevertheless has some of the prerequisites for building a stronger innovation system, including a comparatively well-educated population (especially in terms of secondary education).

EU integration provides a unique window of opportunity for strengthening science, technology and innovation (STI)

- Integration to the EU offers new perspectives for Croatia's development. Access to EU markets provides many opportunities for businesses; more vigorous competition on domestic markets will benefit consumers and increase pressure on firms to innovate. The outcome of the new opportunities and challenges for Croatian firms will critically depend on their innovation capabilities, however.
- Substantially increased and more stable funding for STI through the Structural Funds (SF), together with Horizon 2020 and other sources, offers a unique opportunity to expand – and rebalance –Croatia's innovation system. However, in the absence of effective institutions and governance, absorption and impact are likely to fall short of expectations. It is critical to enhance national capabilities to provide orientation and develop, co-ordinate and deliver STI policy.

Improve governance and rebalance the innovation policy mix

- So far, governance of Croatia's innovation policy has been characterised by lack of co-ordination and continuity. Low commitment has contributed to low levels and high volatility of R&D funding and has hampered long-term orientations as regards human resources, and investment in innovation.
- Effective innovation policy requires commitment at the highest level of government and better co-ordination across its various parts and levels. Some countries have achieved better co-ordination through an innovation council headed by the prime minister.
- Croatia could benefit from further consolidating overlapping competencies and delegating programming/implementation more fully to the agency level (e.g. BICRO, CSF). Fostering professional agencies with operational autonomy and larger portfolios helps enhancing their effectiveness and efficiency.
- Strengthening innovation capacity calls for carefully designed policy instruments and for reforms in governance and funding mechanisms. To enable learning there is a pressing need to develop an evaluation culture at all levels – from individual researchers and projects, through institutions and policies, to the innovation system.

Foster business innovation

- Business expenditure for R&D has been declining – a trend that has to be reversed. Innovative firms seem to have lacked the inclination, resources and in-house capabilities needed to progress towards new-to-the-market and new-to-the-world innovation.
- Policy for business innovation has been focused on the commercialisation of public research and on high-technology firms. However, innovation, in its diverse forms, is relevant to all businesses. Croatia should base its policy on a broad concept of innovation, to include – in addition to R&D – marketing, organisational, and service innovation. Raising the share of innovative firms and their capabilities should be a priority and be reflected in the innovation policy mix.
- A key task is to strengthen companies' in-house skills in engineering, design, information technology and R&D. There is still much scope in improving the framework conditions for innovation and in leveraging other government policies (such as regulation and public procurement) to raise demand for innovation.
- Public financial support for business innovation (including tax incentives) has been relatively low. Necessary increases should happen alongside the professionalisation of delivery, the use of differentiated instruments and rigorous evaluation.
- Funding is not always the main constraint. Professionalised government agencies – together with business associations – can help in providing information, coaching, and in building communities that link parts of the innovation system.

Strengthen the contribution of universities and public research institutes (PRIs)

- Universities and PRIs are an important part of Croatia's innovation system and the productivity of researchers is rather high. While improving, scientific publications have a low citation impact, and the research system could benefit from further internationalisation.
- Public research has been held back by limited resources *and* complex and inflexible organisation and governance. Fragmentation within universities and between PRIs is a hindrance to effective governance and top performance. Public research funding is insufficiently linked to performance.
- A thorough reform, including the introduction of negotiated performance-based budgeting, would set the basis for entrusting universities and PRIs with more funds, based on improved strategy, autonomy *cum* accountability, and set in motion a virtuous cycle of increasing performance and resources.
- Competitive research funding has been low and volatile. A sufficiently empowered CSF could shift the balance towards competitive funding, and consequently reinforce scientific rigour, encourage internationalisation and social relevance.
- Alignment of universities and industry can be facilitated by systematic consultation on skills and curricula, schemes that encourage industry co-funding of tertiary education, tailored university study programmes for those already in employment, longer and more selective work placements, and a greater quantity and quality of professional tertiary programmes. Gainful international mobility should be a priority.

Use the Structural Funds strategically

- The SF should be used to build capacities and provide a step change in the resources available for innovation (support for skill upgrading, business innovation projects and related equipment, etc.) and to improve the institutional setting for applied research and industry-science collaboration.
- A strategic move towards larger, longer-term programmes would help secure commitment from industry and facilitate a coherent upgrading of both business and public R&D capacities. Among others, this would allow the gradual expansion of doctoral education and post-doctoral research, the establishment of "competence centres" (organised as public-private partnerships), and investment in research infrastructures (provided that they are embedded in long-term research programmes).

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