Toward an innovative Poland: The entrepreneurial discovery process and business needs analysis
Toward an Innovative Poland:
The Entrepreneurial Discovery Process and Business Needs Analysis
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Preface

This report presents the findings of a project conducted by the World Bank during 2014–2015 at the request of Poland’s Ministry of Economic Development.

The key objective of the project was to help Poland enhance the impact of the more than 10 billion euro that it will invest in innovation by 2020, largely financed by the European Union. Such funding is likely to diminish after 2020. It will therefore be critical for Poland to spend it efficiently, to gradually shift from a growth model based on imitation to a growth model based on innovation and sustain a fast pace of income convergence with the West.

To invest more effectively, Poland needs to better prioritize its innovation spending and focus it on economic activities with the largest innovation potential. The best way to achieve this is to move away from an old-fashioned, top-down, supply-driven, bureaucratic innovation policy that tends to perpetuate the status quo and to adopt a new, bottom-up, demand-driven policy that puts business in the driver’s seat of innovation policy making and helps discover new areas of growth.

The World Bank project summarized in this report contributes to this objective by proposing a pioneering approach to engaging the private sector, as well as science, public administration, and civic society, in co-creating innovation policy, selecting priorities for public innovation spending, and adjusting public support instruments to the real needs of Polish enterprises.

The new approach, called the entrepreneurial discovery process (EDP), consists of (i) face-to-face interviews with the top management of mostly small and medium-size enterprises (SMEs), which help to understand the real drivers and constraints to enterprise innovation that are hard to detect through standard surveys; (ii) Smart Labs, which are a series of business-friendly, time-efficient workshops that help assess the innovation potential of a specific economic activity; (iii) innovation maps, which help tease out information about technological trends perceived by the private sector; and (iv) crowdsourcing, online surveys that reach enterprises that usually do not interact with the public sector.

The EDP designed and tested within the project helped produce new, bottom-up, and heretofore often unavailable information about the needs, ambitions, strengths, and potential of the enterprise sector.

For instance, it helped identify companies with large innovation-based growth potential, so-called “champions,” which—if properly supported by the public sector—could become national, European, or perhaps even global leaders and key drivers of growth. The Polish “champions” are characterized by above-average revenue growth rates; high expenditure on research and development (R&D); a high percentage of export sales; a large proportion of science, technology, engineering, and math (STEM) employees; and—above all—a specific “growth mind-set” among top management, which considers innovation the key source of their company’s competitive advantage. The proposed EDP also helped identify “sleeping beauties,” companies that do not yet seem to fully leverage their growth potential and could grow much faster if they were “awakened” through, for instance, improved management practices, better access to “smart” financing, and support for exports. The project also found that many SMEs did not seem to be well networked, were often wary of cooperating with peer companies in the same sector, and seemed to have a low level of social capital, which might be a key barrier for innovation development. Finally, it showed that there was a large scope for improvement in the quality of enterprise support among public institutions.

The report concludes with policy recommendations on how to implement the EDP; use it to validate, modify, or eliminate innovation policy priorities (so-called “smart specializations”); and make it sustainable. It provides ideas on how to build social capital in the private sector, reform business support institutions, and help coordinate national and regional smart specialization policies. Finally, it suggests how to adjust public support instruments to the needs of Polish enterprises, encourage the public sector to be more proactive, and ensure that innovation spending will have a real impact.
Executive Summary

**Poland is the European growth champion.** Since 1989, it has more than doubled its gross domestic product (GDP) per capita, coming in ahead of all European peers. It was the only EU economy to avoid the 2008–2009 global financial crisis. It has also grown faster than all its global peers, including the so-called Asian Tigers. Quality of life improved in tandem. Poland has never done so well before. It is now entering its new Golden Age.

**But past success does not guarantee future success.** With only two-thirds of the level of income of the euro zone, Poland is still far from full convergence with the West. Although midterm growth prospects are positive, becoming a fully developed economy will be a challenge: only a few countries in the past have succeeded in doing so, including Japan, Singapore, Taiwan, South Korea, and Ireland. Poland’s longer-term growth prospects will depend on its ability to further reform higher education, stem demographic decline, and—above all—enhance innovation.

**Poland needs to innovate to invigorate its growth.** Outside oil-based economies, there are no countries that have ever become rich without innovation. Poland needs to follow in the footsteps of innovators. It will need to do much more to raise its research and development (R&D) spending and innovation potential. Given the still large difference in labor productivity levels (Poland’s GDP per hour amounts to around half that of Germany), Poland should continue to support innovation new to the firm and to the country (technology absorption) by further improving the business climate, access to financing, infrastructure, and availability of skills. However, to raise its current growth rate and fully catch up with the West, Poland will need to start shifting to innovation new to the world, producing original products and services developed by the country’s new global champions. This will be a long and difficult process because technological innovation does not yet seem to be a part of Poland’s economic DNA.

**Poland needs to prioritize its innovation spending.** In line with the new smart specialization policy promoted by the European Commission (EC), in the new 2014–2020 budget perspective all EU member states are required to focus their innovation support policies on business areas with the largest economic and scientific potential, based on endogenous strengths and comparative advantages. This is a necessary condition to access the innovation-related funding from the EU.

**The entrepreneurial discovery process (EDP) is the key part of the new smart specialization framework and research and innovation strategies for smart specialization (RIS3s).** The aim of the EDP process is to help countries and regions to identify, validate, and modify priorities for their innovation spending, the so-called “smart specializations,” based on a bottom-up process involving the private sector, science, business support institutions, nongovernmental organizations (NGOs), public administration, and society. The EDP process should help the government “listen” to companies to identify new technological trends and new business opportunities and adjust public innovation policies and instruments accordingly. It should thus help the authorities shift from “supply-driven” to “demand-driven” policies. Moreover, the EDP process should help eliminate market and coordination failures, helping the private sector reach a critical mass of innovation-based development. Finally, it should also help create new public goods, such as new coordination, networking, and knowledge-sharing opportunities that will strengthen indigenous entrepreneurial discovery. In the end, the rate of return on public investment in innovation should increase and help spur sustained productivity growth.

**The World Bank has helped the government of Poland strengthen the smart specialization process.** At the request of the Ministry of Economic Development (MoED), the World Bank has designed and tested an EDP “made in Poland” as an element of the National Smart Specialization process (Krajowa Inteligentna Specjalizacja, KIS). The three main goals of the Bank project were to: (i) identify and assess Polish enterprises’ needs in terms of innovation and development potential and provide recommendations on how to adjust the public support system accordingly, (ii) help meet the EC’s ex ante conditionalities to access EU funding in the 2014–2020 budget perspective, and (iii) strengthen the capacity of the public administration and selected business support institutions (BSIs) to ensure EDP continuity.
after termination of the project by the end of 2015. The EDP process is part of the government’s Action Plan to meet the EU ex ante conditionality.

**The proposed EDP process comprises several components.** It includes: (i) in-depth interviews with top management of innovation-oriented small and medium-size enterprises (SMEs) selected from within 10 national smart specializations, conducted by seasoned experts; (ii) “Smart Labs,” focus groups featuring companies with high growth potential (“champions”) selected through interviews, representatives of science and research and development institutions (RDIs), business support institutions, and public administration, which aim to “discover” a business area and prove its innovation and growth potential; (iii) crowdsourcing, a new platform of public–private innovation dialogue; and (iv) innovation maps, a new way to collect and analyze data from the private sector’s R&D and innovation grant applications to identify emerging areas of business and technological strengths (Figure 1).

![Figure 1. Proposed elements of the EDP process “made in Poland”](source: The World Bank)

**The proposed EDP has been tested thoroughly.** As part of the project, the Bank conducted more than 630 face-to-face interviews with firms in five regions, four of which were chosen by the MoED (Dolnoslaskie, Zachodniopomorskie, Swietokrzyskie, and Slaskie) and one (Lubuskie) that volunteered to join the project in July 2015. Bank experts conducted more than 500 of these interviews, and regional consultants selected by the Bank and working under its supervision conducted an additional 130 interviews. The Bank also organized a number of Smart Labs (SLs) in each of the four regions and one national-level Smart Lab. It prepared a “business and technology roadmap” (BTR) as an element of the Smart Lab process and a blueprint for how to create public goods for national and regional smart specializations. The Bank collected information from more than 40 companies through crowdsourcing and helped the National Center for Research and Development (NCBR) create a pioneering innovation map based on applications for R&D support submitted by the private sector during 2007–2013 and within the ongoing “fast track” R&D matching grant program. The Bank also organized two Champions Clubs, a new networking and knowledge-sharing platform for the “champion” companies identified through the EDP. To ensure the sustainability of the EDP going forward, the Bank held workshops for BSIs in each of the regions to discuss the parameters of their participation in the EDP and trained more than 40 regional consultants, whom the Polish government will be able to leverage to continue the EDP beyond the Bank’s involvement.
The proposed EDP is one of the elements of a national smart specialization policy. In response to the new EU policy and with a view to meeting the ex ante criteria for accessing EU funding, the MoED has developed a system of identifying, modifying, and monitoring national smart specializations as part of the “Program of Enterprise Development.” The MoED selected 20 smart specializations that aim to enhance competitiveness and labor productivity growth based on R&D and innovation. The list of smart specializations is expected to be constantly monitored and updated based on the results of the proposed bottom-up EDP process.

The proposed EDP complements the existing national EDP institutional framework. The National Smart Specialization (KIS) document designed an institutional framework for management of smart specialization policy at the national level, including a country-level EDP framework. The proposed bottom-up approach contributes additional elements to the EDP system to further enhance its efficiency, quality, and sustainability (see Figure 2).

![Figure 2. Envisaged institutional setup of the national EDP](image)

**Figure 2. Envisaged institutional setup of the national EDP**

NOTE: BTR = business and technology roadmap; EDP = Entrepreneurial discovery process; M&E = monitoring and evaluation; PARP = Polish Agency for Enterprise Development; SL = Smart Lab.

The proposed EDP, although optional for the regions, can complement each region’s own EDP. The regions have taken various approaches to developing the EDP process, depending on the local endowments and decisions of stakeholders. They are also at various stages of development: some EDPs (as in the case of Wielkopolskie) have already been approved by the European Commission, while in other regions the EDPs are still being developed. Most regional EDPs differ in terms of institutions, processes, and objectives. That said, such heterogeneity can be considered a strength because—provided that there are strong impact and evaluation frameworks—it will allow for testing
various approaches to entrepreneurial discovery, learning from one another, and creating optimal EDPs. Although the proposed EDP process is fully optional for the regions, which are autonomous in their decision making, it is meant to complement their efforts by providing alternative methods of conducting the EDP across all the proposed elements.

The EDP provides a new mechanism for coordinating the national innovation policy and for collaboration between the national and regional levels. Poland is one of only a few EU countries that decided to develop both national and regional EDPs, meaning that aside from the national EDP, all 16 voivodships have also developed their own EDPs. As a result, there are now 20 national and 81 regional smart specializations. Given such a large number of smart specializations, their partly overlapping scope, and the diverse institutional setup at the national and regional levels, robust cooperation between the regional and national levels will be key, including thematic, institutional, and process cooperation.

Thematic cooperation should aim at a number of objectives. It should help: (i) identify interregional smart specializations (S3s), (ii) detect synergies between the national and regional S3s, and (iii) allow for modification of smart specializations at the national and regional levels. As to the latter, some national S3s are the same as the regional ones. The proposed EDP will help verify and assess the potential of national S3s and might also provide data useful for regional EDPs. Given the large number of national S3s, it might be useful to consider merging some national specializations that have a similar scope. Finally, new national smart specializations could be identified based on input from regional EDPs and interregional collaboration.

Institutional collaboration requires joint work between the main EDP counterparts. EDPs in Poland function in a diverse set of institutional frameworks on both the regional and the national levels. This means that similar EDP functions are fulfilled by different actors. Therefore, EDP coherence requires a good understanding of these differences and a robust information flow among all stakeholders. The national group for monitoring and evaluating RIS3s, which has already proven to be an effective mechanism of national–regional collaboration, could also become a key platform for EDP cooperation. Interactive and workshop-like group meetings can aim to: (i) efficiently share knowledge gathered through EDPs at the national and regional level, (ii) leverage insights delivered by the regional EDP consultants, and (iii) advise on areas of collaboration in selected smart specializations. This group should have access to data from the National Statistical Office (GUS), tax offices, the National Bank of Poland, the European Commission, academia, and the private sector.

Cooperation related to the EDP process will be especially important. Given that each region has its own unique EDP process with a specific institutional arrangement, it will be important to be flexible in accommodating each EDP and to promote best practices across the country. The modular character of the EDP proposed in this report allows for the comparison of various EDPs in achieving the objectives of the smart specialization policy, enhancing synergies across regions, and exchanging information about the best functioning and most effective EDP solutions. One of the premises of EDP cooperation is that information gathered by national and regional EDPs should be publicly available to enhance knowledge sharing.

Cooperation on EDPs should help regions reach a number of objectives. It should help them to: (i) access national databases for data tailored to their regional needs and share their own data with national authorities; (ii) access otherwise unavailable information on the potential to develop various business areas, including existing and emerging smart specializations; and (iii) in consultation with the MoED, direct the national EDP toward the areas of the largest regional relevance. Figure 3 shows the proposed interaction between the regional (orange) and national (purple and green) EDPs (discussed in more detail in Chapter 4).
Figure 3. National–regional cooperation on EDPs—regional perspective

MO: Regular analysis conducted by the MO within the M&E of regional smart specializations (working groups, RTO, call for applications, Innovation Council etc.)

MoED: Data analysis conducted on the national level with regional disaggregation (common indicator package, an opening report, additional analysis)

From the national perspective, the suggested EDP cooperation process should: (i) help maintain dialogue with the regions and share their EDP experience, (ii) share results of the national EDP, and (iii) learn from the bottom-up EDPs conducted by the regions. The methodology for research and analysis, company interviews, Smart Labs, and BTRs will serve as an instrument to achieve these objectives. Regional consultants could play a crucial role in national–regional cooperation. Their role would be to conduct the national EDP process in close cooperation with each of the regions (Figure 4).

Smart interviews

Firm-level interviews are at the core of the proposed EDP. Interviews aim to identify key drivers for and constraints on SME innovation, identify the key attributes of companies that could benefit the most from public intervention, and take stock of key business and technological trends, as perceived by the companies. The interviews are conducted by seasoned experts with relevant professional experience. Unlike most surveys conducted by the national statistical office and international institutions, the interviews are conducted face to face with the company’s top management and/or owners. They usually take about 2 to 2.5 hours and are based on a questionnaire with quantitative and qualitative questions. Each interview is summarized in a “one pager” by the interviewing expert. The experts separate the interviewed firms, based on their expert judgment and a number of key innovative attributes, into five categories: “champions,” “emerging champions,” “sleeping beauties,” “steady state,” and “declining” (see the definitions in Box 22). At the end of each interview, the firm receives feedback from the expert. Data from each interview are aggregated and analyzed for policy insights.

NOTE: BTR = business and technology roadmap; M&E = monitoring and evaluation; MO = Marshal Office; MoED = Ministry of Economic Development; PARP = Polish Agency for Enterprise Development; RC = regional consultants; ROP = Regional Operational Program; RTO = Regional Territorial Observatory; SL = Smart Lab; WG = working group.
Figure 4. EDP process cooperation—national perspective

NOTE: Econ. Obs. & Cons. Group = Economic Observatory and Consultative Group; GIG = Mining Institute; H2020 = Horizon 2020; OP = Operational Program; St. Comm. = Steering Committee. Other abbreviations are the same as in Figure 3.

There are a number of benefits of firm-level interviews. The interviews help:

- Identify differences between national smart specializations in terms of R&D intensity, companies’ needs, and firms’ focus on innovation as the key driver of competitiveness
- Provide early evidence for verifying/modifying smart specializations
- Identify firms with the most innovation-based growth potential and the greatest need for public support (e.g., “champions” and “sleeping beauties”)
- Select priority firms for the Smart Lab part of the EDP and identify endogenous strengths in the economy
- Identify firms’ biggest barriers to growth and their most pressing needs, as well as recommend how to adjust the public support system accordingly
• Identify emerging business and technology trends that the public sector can act upon

• Assess the quality of the public support system

• Provide an indirect way of increasing the companies’ competitiveness, based on the experts’ feedback

• Enhance the proactive attitude of the public sector, give it access to firms that do not normally interact with the public sector and reduce the risks of innovation policy being driven by vested interests

The main findings from the firm-level interviews are the following:

• National smart specializations are different in terms of number of firms with high growth potential, R&D intensity, and company needs; the differences are more pronounced at the level of meta-specializations.

• Firms with the largest innovation-based growth potential (“champions”) are characterized by high revenue growth rates, investment in R&D, large export intensity, high proportion of STEM (science, technology, engineering, mathematics) employees, strong growth mind-set of the company’s management, and extensive networking with clients, suppliers, and other partners.

• The main barriers for firms’ innovation-based development include access to financing, access to new markets, availability of skilled R&D personnel, mental barriers among owners (focused on short-term profits), risk-averse customers, management skills, a low level of networking, and weak support from the public sector.

• The interviews identified a large number of firms with high growth potential: “champions” and “sleeping beauties” that could benefit the most from public support. “Champions” have different needs than “sleeping beauties” and other types of firms. The public sector should adjust support instruments to their needs.

• Most firms are not sufficiently networked, especially internationally. Many firms lack up-to-date and comprehensive knowledge about key business and technology trends in their business area and rarely use the broad range of information available about the market and innovation.

• Most firms are skeptical about cooperation with the public sector. They generally do not cooperate with BSIs and RDIs and appear concerned with the quality of their services. They need more proactive approaches from public-sector stakeholders to build networks and trust.

• Firms are aware of the available public innovation support programs, but lack details on which support instruments to access and how. It would be useful to create a “one-stop shop” for all public support instruments.

• Firms generally share similar innovation drivers and constraints across all smart specializations, suggesting a need for horizontal support policies.

Going forward, interviews could be used in modified ways. Although the interviews provide a tested way to audit companies, based on international good practice and a rigorous and replicable methodology, national and regional authorities can adjust the interview process to their needs. The questionnaire could be shortened to, for instance, focus only on the key barriers to innovation-based growth and require only about an hour-long interview, complemented by additional modules (such as on the quality of management practices) or a deep dive into specific parts of the company’s business. Moreover, the interviews could focus more on the strategic feedback from the experts to increase firms’ capacity to conduct an innovation process.

The quality of the interviewing experts and the post interview analysis will be key. Interaction with the top management of a company and the need to provide feedback require that the interviewing experts are credible partners with substantial professional experience and a comprehensive understanding of the public innovation support system. It is also critical to ensure that the information from the interviews is properly analyzed and used in policy making.
**Smart Labs**

**Smart Labs (SLs) are expert groups built around firms in a selected business area.** Smart Labs in principle comprise up to 10 “champion” companies selected during the interviews representing an economic area with a perceived endogenous strength (e.g., smart buildings, recycling, or computer numerical control [CNC] machines). SLs also include representatives of RDIs, universities and science entities, BSIs, and local authorities. The SLs have up to 20 participants and follow practices modeled on business focus groups. They are led by an experienced business expert (the World Bank experts led SLs in the initial stage; future SLs should be led by a regional consultant, possibly with help from local business angels and BSI experts) and usually last about four hours.

**Smart Labs are a key proposed element of the EDP and smart specialization policy.** The main aim of Smart Labs is to help validate, specify in more detail, and/or modify existing smart specializations and identify emerging ones. Smart Labs are designed to quickly test the potential of a business area and prepare a midterm strategy for its development. This is achieved in several steps (see Figure 5). SLs may be organized through regional, interregional, or national initiatives. The whole process should, in principle, take no longer than six months and be repeated for all new areas of interest. At every stage the SL can result in a “by-product” in terms of individual or joint research and development and innovation (R&D&I) project applications to regional EU-funded operational programs (OPs), sectoral OPs (managed by NCBR), national OPs (managed by the Polish Agency for Enterprise Development [PARP]), and the EU-wide Horizon 2020 program.

![Figure 5. The proposed Smart Lab process](source: The World Bank.)
The main benefits of Smart Labs:

- They are a fast, flexible, and efficient way to assess the R&D/innovation-based potential of a selected economic area and thus help validate, deepen, or modify existing smart specializations.
- Participation in SLs is driven by a bottom-up process of selecting companies with high growth potential, minimizing the power of vested interests. Thanks to the careful selection of participants, the quality of outputs tends to be high.
- SLs apply a mezzo perspective that concentrates on a business area and not on individual firms.
- The SL process is stage-driven and aims to work like a filter that selects the most promising areas. The process can be halted after each stage.
- SLs are not formally institutionalized to reduce the risk of bureaucratic inertia and mission creep.
- SLs are business-oriented and business-friendly to help sustain interest of the private sector.
- SLs help initiate collaboration between the private sector, public sector, and academia.
- SLs help identify emerging business and technology trends and thus give rise to new smart specializations.
- SLs help generate ideas for R&D and innovation projects to be submitted to regional, national, and international calls for proposals (Horizon 2020).
- SLs help reduce coordination failures among the participating companies, which are too small to promote ideas and technologies on their own.
- Through BTRs, SLs help align the private sector’s development vision and investment plans with smart specialization priorities.
- They help identify key growth bottlenecks and adjust public policy accordingly

**Smart Labs can provide a useful format for industry-level value-chain analyses.** SLs can help identify the elements of the value chain with the highest added value and ways of moving there. This approach was tested during the project. For instance, the nanotechnology Smart Lab in the Slaskie region helped identify the main development challenges for this young sector. Challenges include difficulties with the regulatory process (certification, registration, and security confirmation) and a preponderance of companies that produce component parts rather than final products, where there is more added value. The Smart Lab concluded that there is a need to: (i) concentrate on connecting the nanotechnology industry with other sectors that can use its products and bring them to the final stages of the value chain, (ii) update the regulatory system in line with Western European good practices, and (iii) promote further internationalization of the nanotechnology industry (see Chapter 4 for more details).

**The case of Smart Labs on “CNC machines” has proven that a bottom-up EDP is possible.** The Smart Lab process was initiated after a number of interviews in the Dolnoslaskie region showed that the area of CNC material processing has significant business and innovation potential. That finding was then discussed and deepened during two regional Smart Labs, which were followed by preparation of a BTR together with a business leader who emerged during the SLs. The subsequent national Smart Lab corroborated the findings of the BTR and the overall potential of the CNC area in Poland, and the national smart specialization working group took over the process. In a final step, the findings of the Smart Lab process helped verify the national smart specialization no. 17 on “automation and robotics of technology processes” and shape its vision of development.

**Smart Labs focused on CNC showed that the process can also help meet additional objectives.** Aside from its main focus on smart specializations, the Smart Lab process on CNC machines: (i) helped create a new network of firms, scientists, BSI’s, and public-sector officials focused on the development of the CNC area; (ii) generated new knowledge among the stakeholders and firms in related industries (through the BTR and other SL results, including a strengths, weaknesses, opportunities, and threats (SWOT) analysis and key success factors, which will be made public); (iii) helped guide public and private technology and business development strategies; and (iv) is likely to generate new R&D&I projects to be submitted to regional, national, and international innovation programs.
Business and technology roadmaps (BTRs) help verify the potential of selected business areas. A BTR is a short (about 50 pages) business-style document that can be delivered in around three months and at a relatively low cost. Its objective is to: (i) analyze the business and scientific potential of a specific economic activity (for instance “CNC machines,” as undertaken in the project) to verify/modify existing smart specializations or identify new ones; (ii) assess the main business and technology trends in a specific economic activity; (iii) describe the main market players in Poland, Europe, and worldwide; and (iv) provide a roadmap of R&D and innovation investment, with corresponding budgets, that could help create a critical mass of innovation-based development for the selected business area. The BTRs should be made public, in order to share knowledge among all Polish market players and guide their investment decisions, as well as to help firms align their development plans with smart specializations. BTRs should be prepared by external experts supported by selected firms and academia, with costs shared between the public and private sectors.

Going forward, SLs can complement working groups at the regional and national levels. The added value of SLs lies in their flexible format, fast turnaround, quick results, and limited life span. As such, they could be a useful instrument to quickly assess the innovation-based development potential of a large number of existing and/or emerging regional and national business areas and provide timely input into the existing EDPs at the regional and national levels. Unlike the working groups, SLs are not meant to become permanent institutions, unless the participants decide to transform them into cooperation networks, clusters, or knowledge-sharing platforms.

High-quality participants, experts, and immediate feedback are key. SLs are likely to be successful only if they feature participants (entrepreneurs and scientists) who rise high above the industry average. They should be moderated by experienced professionals who carry credibility among the private-sector participants. Finally, all participants, and especially the private sector, expect timely and productive feedback after each of the SLs, in the form of meeting summaries, clear action plans, and a vision of how the SL can provide added value going forward.

Innovation maps

There has been little effort so far to analyze data from the private sector’s R&D and innovation-oriented grant applications, both at the national and regional levels. Public-sector institutions at the national and regional levels have collected thousands of applications for R&D support from the private sector since the EU accession in 2004. Yet, even though such applications provide excellent bottom-up information about the new emerging business and technology trends perceived by the private sector, there has been no systematic effort to leverage the data to inform public innovation policy and complement other analyses, including foresight exercises. Given that each grant application requires the applying firm to co-finance the project, the information in the applications is likely to be more credible than the firms’ official declarations (firms are “putting money where their mouth is”).

Innovation maps help uncover critical bottom-up information embedded in firms’ R&D applications for public support. The idea of an innovation map is to collect and analyze data from thousands of grant applications submitted annually to national and regional innovation support institutions. For instance, NCBR accepts more than 1,500 grant applications per year. From 2007 to 2013, as part of the “Innovative Economy Operational Program,” NCBR collected more than 13,000 grant applications across all of its support programs. The objective of the data analysis is to create “innovation maps” built along a business/technology matrix, combining the business area of a grant application (Organisation for Economic Co-operation and Development [OECD] classification) with the technological classification (NABS 2007), to identify business and technology trends and new areas of competitive strengths based on the preferences revealed by the private sector.

Innovation maps have the following benefits:

- They can complement the top-down foresight programs, macro and sectoral data, and innovation surveys with a bottom-up approach.
- They can help verify/modify/create smart specializations selected at the national and regional levels based on the revealed preferences of the private sector and thus help better prioritize public support for innovation and enhance its efficiency.
• They can help monitor business and technology trends in real time, based on an online, standardized, and automated system of submission of enterprise grant applications.

• They can provide credible and granular information: grant submissions are based on the statistical code of a project, not of a firm (where there are many). The data can be analyzed with respect to the status of the applicant (private vs. public sector), whether it has been accepted or rejected, and show the regional distribution of applications around the country.

Innovation maps produced within the project helped identify key priorities for business innovation spending. NCBR, with the support of the Bank, has produced the first set of innovation maps (see Chapter 4) based on more than 1,000 applications received so far within the new, open-ended, “fast track” innovation support program started in April 2015. The innovation maps showed that “health & medicine” (NABS 7) is the key technology that the private sector wants to invest in; “electronics and IT engineering” is in turn the key business area of declared investment (OECD 2.2), followed by “mechanical engineering” and “material engineering.” The maps also showed that most applications were received from the Mazowieckie and Slaskie regions.

Going forward, innovation maps should become a default option for all innovation support institutions. Following the NCBR’s example, which has now decided to use innovation maps in all of its application processes, other public support institutions at the national level, such as PARP or the Ministry of Economic Development, and at the regional level (ROP/RIS3 units in each of the regions) could produce their own innovation maps to support policy making. Innovation maps should ideally aggregate data from a number of support programs to reach a critical mass of information. Given the small administrative and technical effort required, there are no obvious barriers preventing innovation maps from being used universally around the country. The resulting innovation maps should also be available to the public (posted on the respective websites) to help guide the developmental visions of the private sector. The Ministry of Economic Development could, for instance, aggregate standardized data from all support institutions and produce a comprehensive national innovation map.

Crowdsourcing

Crowdsourcing is a new platform to directly engage SMEs in innovation policy making. Crowdsourcing allows authorities to reach out to a large number of SMEs that cannot be directly engaged through the limited number of interviews and Smart Labs. It is modeled on international benchmarks, such as the U.S. Open Government initiative, and a review of the literature, but adjusted to the specific conditions in Poland. Crowdsourcing is meant to be a cost-effective, flexible, and fast way to establish a systematic dialogue between the private and the public sectors. It aims to seek the private sector’s feedback on, for instance, priority areas for policy intervention, barriers to innovation-based growth, emerging business and technological trends, or the efficiency of public support policy, on an ongoing basis. Crowdsourcing can also be used to help identify firms that could later be interviewed within the EDP and invited to Smart Labs. Crowdsourcing thus complements the other elements of the EDP process.

Analysis of data received through crowdsourcing is largely in line with the analysis produced through firm interviews. More than 70 percent of the respondents in the Bank-administered firm survey believed that the application process for innovation public support was too long and too complicated, which is consistent with the information gained in the interviews. The quantitative data also seemed to match the data set collected during firm interviews. The most important constraints for SMEs included access to financing, legislation, and availability of hard and soft skills. The crowdsourced companies relied on internal company resources, customers, and the Internet to foster innovation.

Going forward, proper incentives for firms to participate in crowdsourcing and commitment from the public sector will be key. So far, the public sector has used surveys to reach out to companies on an ad hoc basis; only a few companies have been exposed to the public sector’s surveys, if at all. As a result, both a low level of trust and a low level of dialogue have been established. To change this, it will be important for the public sector to start using online surveys on a regular basis and thus create a new cultural norm. To make it work, firms will need incentives to participate in the surveys. These could include, for instance, information on how the participating companies compare with
their industry peers or access to technology/business newsletters from the BSIs. Many firms did not fill out the survey because they believed it would not have any impact. Changing this perception is therefore crucial. Making crowdsourcing successful will likely be a slow process, but it needs to start now.

Conclusions and recommendations

The proposed EDP, “made in Poland,” appears to meet the project’s main objectives:

- It offers a new way to conduct innovation policy based on a bottom-up process of entrepreneurial discovery, which helps to monitor/validate/modify and/or eliminate existing smart specializations. The proposed EDP engages the whole set of stakeholders and puts companies at the very center of innovation policy.
- It helps identify new smart specializations by collecting and analyzing firm-level data about emerging technological and business trends and areas with innovation-based growth potential.
- It helps distinguish enterprises’ deeper needs and their innovation potential, and it proposes how to adjust public-sector support instruments accordingly.
- It helps reinforce linkages between regional, interregional, and national smart specialization policies.
- It helps ensure the sustainability of the EDP process going forward.
- It is likely to be in line with the ex ante conditionality of the European Commission (subject to the independent decision of the EC).

<table>
<thead>
<tr>
<th>Detailed project objectives</th>
<th>Report coverage</th>
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<tbody>
<tr>
<td>Matrix of identified business needs/constraints</td>
<td>Chapter 4.1</td>
</tr>
<tr>
<td>Proposals on how to engage entrepreneurs in the creation of innovation policy and how to assure their participation in the EDP</td>
<td>Description of each element of the proposed EDP in Chapter 3.</td>
</tr>
<tr>
<td>Recommendations about how to implement the outcomes of the project within current EDP at the national level</td>
<td>Chapters 3.4, 4.7, 5</td>
</tr>
<tr>
<td>Gap analysis of how BSIs currently respond to private sector’s business needs</td>
<td>Chapter 4.6</td>
</tr>
<tr>
<td>Recommendations on how to improve the efficiency of BSIs</td>
<td>Chapter 4.6</td>
</tr>
<tr>
<td>Proposals to foster the relationship between SMEs and knowledge institutions</td>
<td>Chapters 3.3, 4.1, 4.2, 4.4, 4.6</td>
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</tbody>
</table>


The EDP also tries to meet additional objectives. It helps:

- Identify the characteristics of firms with high innovation-based growth potential (for the purposes of the project, called “champions” and “sleeping beauties”; see the definitions in Box 18)
- Introduce a new scoring system to assist in identifying firms with high innovation-based growth potential
• Identify emerging business and technology trends
• Reduce coordination failures in the private sector, where small companies on their own are unable to develop their innovative ideas without cooperating with others
• Access new information from firms that up to now have not taken part in the smart specialization process and have not been leveraging public sector resources
• Generate new R&D&I project ideas from participating stakeholders
• Provide a new platform for enhanced dialogue with the business sector
• Provide a new way for firms to network
• Offer a direct way of increasing the participating firms’ innovation capacity by providing interview feedback and follow-up knowledge sharing and training with the BSIs
• Enhance knowledge and technology absorption by producing publicly available industry business and technology roadmaps

The proposed EDP can productively complement regional EDPs. The EDP is not mandatory for any of the regions, which are autonomous in their decision making. There is also no “one-size-fits-all” model to carry out EDP. However, every region is expected to develop a fully functioning EDP that meets the objective of the EC’s smart specialization policy. The proposed EDP can help regions achieve this objective by complementing the efforts of the regions that have already developed EDPs and by contributing to the design of EDPs that are still being developed by other regions. The modular framework of the proposed EDP elements should facilitate its adoption.

The EDP can help enhance the efficiency of public innovation policy. It can achieve this in a number of ways. First, as one of the first systemic attempts in Poland to involve the private sector in the development of the country’s innovation priorities, it can help find an optimal balance between top-down and bottom-up innovation policy making. Second, it can help concentrate scarce resources, reach a critical mass of investment, and build trust between the private and public sectors along the same vision of innovation-based development. Third, it promises to enhance cooperation, collaboration, and knowledge sharing among all public-sector stakeholders and between the national and regional levels of public administration. Finally, it provides a robust instrument for monitoring and evaluation of the impact of public policies on enterprise innovation.

However, a number of conditions will need to be met for the EDP to function properly. First, a successful EDP will require a significant increase in the capacity of innovation support units at the national and regional levels. Second, it will be critical to improve the efficiency of BSIs, including by increasing their capacity, clarifying objectives, and introducing strong incentives. Third, the EDP will need to be supported by a strong monitoring and evaluation (M&E) system and systemic feedback from and to policy makers. Finally, it will also need an improved business environment, enhanced quality of innovation, and entrepreneurship education, as well as strong leadership across all levels of public administration and in the private sector. Table 1 summarizes the main recommendations.
TABLE 1. Main recommendations

<table>
<thead>
<tr>
<th>Short term</th>
<th>Medium term</th>
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<tbody>
<tr>
<td>• Implement the proposed elements of the EDP to complement the existing national-level process</td>
<td>• Invest in capacity building of innovation support institutions</td>
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<tr>
<td>• Create a well-staffed and well-funded EDP coordination unit at the MoED</td>
<td>• Consider reducing the number of national smart specializations, including by merging them where appropriate</td>
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<tr>
<td>• Introduce a robust national-regional EDP cooperation system</td>
<td>• Introduce clear guidelines for performance management of business support institutions; consider developing a nationwide ranking</td>
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<tr>
<td>• Hire top-quality consultants to conduct national EDP</td>
<td>• Introduce “open data” across the innovation system: all information collected during the EDP process should be made public by default</td>
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<td>• Designate a key institutional partner for the national EDP</td>
<td>• Introduce rigorous impact evaluation methods on most innovation support instruments</td>
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<tr>
<td>• Develop a standardized blueprint for information sharing for all the regions, for voluntary, but recommended use</td>
<td>• Expand demand-led innovation: use public procurement to drive innovation, especially among SMEs</td>
</tr>
<tr>
<td>• Introduce professional investment panels as a default option for all relevant innovation support instruments</td>
<td>• Open up to the world: introduce English in calls for proposals, invite international experts</td>
</tr>
<tr>
<td>• Introduce innovation and management practices training programs for innovative SMEs</td>
<td>• Lead by example: encourage administration to become a leader in the use of technology</td>
</tr>
<tr>
<td>• Adjust public support instruments to the specific needs of enterprises, especially those with high growth potential</td>
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</table>


The report is organized into the following sections: Section 1 introduces the project rationale; Section 2 provides background on “WHY” Poland needs innovation to grow; Section 3 focuses on “HOW” innovation can be fostered through the entrepreneurial discovery process; Section 4 concentrates on “WHAT” the preliminary findings from the survey and Smart Labs sessions are; Section 5 concludes on “SO WHAT” policy recommendations. The full version of the report is available at www.worldbank.org/poland/innovation/edp.