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ACRONYMS

ACES	Albanian Centers of Excellence in Science
AIDA	Albanian Investment and Development Agency
ANE	Albanian Export Agency
ANIH	Albanian Investment Agency
AREF	Albanian Reconstruction Equity Fund
ARTI	Agency for Research, Technology and Innovation
BITS	Business Innovation and Technology Strategy
BRIC	Business Relay and Innovation Centre
CARDS	Community Assistance for Reconstruction, Development and Stabilization
CEEOL	Central and Eastern European Online Library
EBRD	European Bank for Reconstruction and Development
ECA	Europe and Central Asia
EIB	European Investment Bank
EIF	European Investment Fund
EPO	European Patent Office
ERA	European Research Area
EU	European Union
FP6	Framework Program 6
FP7	Framework Program 7
FTE	Full Time Equivalent
GDP	Gross Domestic Product
GERD	Gross Expenditure on R&D
HEIs	Higher Education Institutions
IBRD	International Bank for Reconstruction and Development
ICT	Information and Communication Technologies
IFC	International Finance Corporation
IP	Intellectual Property
IPA	Instrument for Pre-Accession Assistance
IPRs	Intellectual Property Rights
IT	Information Technology
KEI	Knowledge Economy Index
MDGs	Millennium Development Goals
METE	Ministry of Economy, Trade and Energy
MITIK	Ministry of Innovation and ICT
MoES	Ministry of Education and Science
NAIS	National Agency for Information Society
NGOs	Non-governmental Organizations
NSTTI	National Strategy for Science, Technology and Innovation
OECD	Organisation for Economic Co-operation and Development

PAAHE	Public Agency for Accreditation of Higher Education
PCT	Patent Cooperation Treaty
PROs	Public Research Organizations
R&D	Research and Development
RDI	Research Development and Innovation
RTDI	Research, Technology Development and Innovation
S&E	Science and Engineering
S&T	Science and Technology
SAA	Stabilization and Association Agreement
SME	Small and Medium-size Enterprises
SMEA	Small-Medium Enterprises Agency
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
WBCs	Western Balkan Countries

FOREWORD

This *Paper* was prepared under the *Western Balkans Regional R&D Strategy for Innovation --* World Bank Technical Assistance Project funded by the European Commission (DG ENLARG – TF011064), as part of the *Country Paper Series*.

The *Country Paper Series* aims to provide for each project beneficiary (Albania, Bosnia and Herzegovina, Croatia, Kosovo*,   FYR Macedonia, Montenegro and Serbia) a brief profile of the current conditions of the national research system (rather than an exhaustive assessment of the country's national innovation system). Emphasis on selected issues reflected the priorities identified by participants during the implementation of the Technical Assistance.

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DISCLAIMER

The findings, interpretations and conclusions expressed herein are those of the authors and do not necessarily reflect the view of the World Bank or the Government of the respective country.

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* This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

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EXECUTIVE SUMMARY

1. As part of its efforts to integrate into the larger European economy and research area, and in line with its *Stabilization and Association Agreement* (SAA) signed with the European Union (EU) in June 2006, Albania has undertaken a number of strategic reforms and has adopted policies aimed at developing its research, development, and innovation (RDI) system. The country reorganized the Academy of Sciences to reflect the model used by many other European countries. Higher education autonomy has been enhanced; curricula and education standards have been revised; monitoring and quality auditing mechanisms have been adopted; and higher education public institutions have been integrated with research institutes to enhance research capabilities. In 2009, the nation prepared its first national strategy for innovation.

2. The government has implemented reforms in the governance of innovation policy, regarding its design and implementation, by re-allocating decision-making authority and implementation in new operating and coordinating bodies. An example of this is the creation of the Agency for Research, Technology and Innovation (ARTI) in March, 2010. The government is also taking steps toward more effective consultation and dialogue with stakeholders, while also establishing new funding programs to support technology transfer.

3. Profound challenges remain, however. Albania lags substantially behind other Western Balkan and EU countries in terms of research capabilities and innovation. Among the most important constraints to the successful implementation of research and innovation policy are the lack of human capital, low levels of public financing, and weak governance of

research systems. The country does not have a critical mass of specialized researchers, nor does it have sufficient infrastructure and funding for research excellence. It is not adequately capitalizing on knowledge from skilled nationals abroad through enhanced innovation linkages, much less reversing migration trends by providing professionals new and better employment opportunities. Without an enhanced program of RDI, the country will remain a source of low technology (and low value added) exports, which, together with the self-imposed exile of its scientific talent, will delay if not altogether divert its development path away from more rapid growth based on higher technology and valued added goods and services.

4. Top priorities for national action, in line with Albania's National Strategy of Science, Technology, and Innovation, as well as the broader Western Balkans Innovation Strategy being developed in collaboration with the World Bank and the EU, include the following:

- Strengthen the integration of the R&D and innovation system through explicit programs to increase official and citizen understanding of the linkages between research, development, and innovation among key stakeholders, and improve system governance;
- Improve the basic research infrastructure to sufficiently support university training at three levels (BSc, MSc, and PhD);
- Create scientific excellence in key research areas;
- Educate, retrain, retain, and attract qualified people into the Albanian research system;

- Strengthen links between science and companies to foster innovation as a basis for future growth and job creation; and
- Enhance the quality of research and the measurement and evaluation of research (data collection according to the Organisation for Economic Co-operation and Development (OECD) indicators).

INTRODUCTION

5.   There is growing worldwide awareness of the critical role that innovation plays in economic development. In April, 2009, in Sarajevo, the Western Balkan Countries (WBCs) signed a Ministerial Joint Statement calling for enhanced regional cooperation to promote innovation. The European Union (EU) has been at the forefront of this approach, urging member countries to spend more and better on research and innovation. To support the effort in the Western Balkans, the EU contracted the World Bank in June, 2011, to assist the region in developing a Regional R&D Strategy for Innovation.

6.   A two-pronged strategy is emerging, following extensive and multiple consultations with public and private sector representatives. This strategy combines: (i) the advocacy of policy reforms at the national level to improve the impact of research and innovation on economic growth and job creation for the long term; and, (ii) joint investments in selected regional initiatives that will help alleviate existing bottlenecks in the short-to-medium term. At the national level, countries will need to substantially enhance Research and Development (R&D) investment on a sustained basis, and transform national innovation systems – the research base, public institutions, private sector, market actors, and linkages across them – into more effective, coherent, and competitive systems. In this process, enabling policy frameworks and offering adequate incentives to actors are crucial to stimulate new ideas, their transfer to industry, and private sector investment in risky and long-term projects related to innovation.

7.   In the context of the recent economic downturn, many developed countries have increased investment in R&D and have used innovation policy as a counter-cyclical instrument to secure new sources of growth. If WBCs do not emulate such efforts and increase investment in knowledge, the gap – both technological and economic – between WBCs and their future EU partners may increase. To avoid this, governments will, in short, need to spend more and better in research and innovation.

8.   This note describes Albania's profile in terms of R&D capacity, and discusses the main features of the national research system, its strengths and weaknesses, recent policy trends, and challenges. The first section details the importance of R&D for innovation and economic development and growth. The second section briefly describes national trends in both economic performance, and R&D and innovation. The third section outlines the governance system for research, the process of policy making, main agencies, and actors, and briefly discusses recent national strategies for research and innovation. Section five reports the current policy programs and instruments and other important policy developments. The note concludes with a discussion of remaining challenges in the area of research and development, and identifies potential policy areas suitable to policy collaboration among the WBCs.

IMPORTANCE OF R&D AND INNOVATION

9. The capacities to undertake scientific and applied industrial research, and to transfer, adapt and assimilate new technologies into economic structures and diffuse them into society, are critical to national competitiveness and growth, as nearly everyone can perceive from the ferocious pace of technological change in consumer goods alone.

10. Ample and compelling evidence confirms this perception. Several international studies demonstrate that increases in R&D spending result in a corresponding increase in productivity, leading to per capita income growth. R&D and productivity mutually reinforce each other and lead countries to long-term sustained growth rates. At the country level, R&D explains up to 75 percent of the differences in total factor productivity growth rates, once externalities are taken into consideration.[2] At the firm level, R&D expenditures of enterprises are often correlated to higher sales and productivity growth, as well as propensity to export. Furthermore, product innovation, which results from R&D efforts, leads to employment growth and more qualified and better paid jobs by expanding demand and new business opportunities.[3]

11. The potential impact of investments in research and innovation on productivity growth is even higher for developing countries, given the opportunity for "catching up" associated with larger investments in innovation.[4]

12. Results from a study using firm-level data for the Western Balkans show that innovative firms grow 15 percent faster in sales and 8 percent faster in labor productivity than non-innovative firms.[5] Business R&D expenditures significantly contribute to growth in sales by 14 percent and labor productivity by 7 percent. Furthermore, when firm R&D, training, and infrastructure services are compared, R&D is shown to have the highest correlation to sales growth.

13. For neighboring countries, similar evidence is reported. Reaching the Lisbon Agenda target (R&D spending of 3 percent of Gross Domestic Product (GDP)) could generate a permanent increase between 8 and 13 percent in Bulgaria and Romania's export levels, for example.[6]

14. Investing in R&D is necessary not only to enhance firms' innovation capacity but also to "absorb" external technology properly by: screening and identifying technology options; adopting and adapting foreign technology and know-how; and, benefiting from spillover effects from foreign direct investments and from other sources of knowledge transfer. As is well recognized, informal knowledge activities and day-to-day learning are also sources of ideas. Formal R&D is important, however, as it represents a systematic and more effective approach to technological innovation – both radical and incremental innovation – in both the manufacturing and non-manufacturing sectors.

15. Public support of research and innovation is critical particularly in the context of stagnant economies. Public investments in research and innovation consistently have been a priority in economic

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[2] Griliches (1979).
[3] Harrison *et al* (2008).
[4] See Lederman and Maloney (2003) for estimates of social rates of return for R&D.
[5] Seker (2012).
[6] World Bank (2009).

stimulus packages of OECD economies. In this sense, a growing consensus on the importance of counter-cyclical innovation policies – increasing R&D investment and improving framework conditions – is emerging. Finland and South Korea are at the forefront of this approach, increasing public spending on innovation even in the context of tighter fiscal policies.

16.   Building an environment conducive to enduring innovation requires a comprehensive policy agenda and multiple resources, which are often scarce in developing countries. Smart policy design is needed, which requires devising cost-effective and sustainable strategies that will bring results in both the short and long run.

17.   Market and coordination failures may hinder progress. The lack of linkages among actors in an innovation system – between public research institutions and the private sector, within and across industries – can prevent innovation investment and business from reaching their growth potential. Failures in financial services and other specialized resources discourage private investment in innovation and new business creation leading to an inefficient allocation of resources. Interventions are therefore needed at different levels and through different mechanisms, in collaboration with the private sector and other relevant decision-makers.

WHERE THE COUNTRY STANDS

Economic Performance and Structure

18.   Over the past decade, Albania has been one of the fastest-growing countries in Europe, enjoying average annual real GDP growth rates of 6 percent, accompanied by rapid reductions in poverty. Between 2002 and 2008, poverty fell by half, to about 12.4 percent, while extreme poverty now affects less than 2 percent of the population. Albania is one of a very few countries in Europe that was able to maintain positive, albeit significantly reduced, growth rates and financial stability in 2009, the year following the beginning of the global financial and economic crisis. Thus far, the impact of the crisis has been transmitted mainly through lower remittances and slower trade.[7]

19.   Since the early 1990s, the Albanian Government has undertaken several structural reforms, involving land reform, financial market liberalization, and privatization. During this time, almost all Small and Medium-sized Enterprises (SMEs) have been privatized, and significant progress has been made lately in the privatization of strategic sectors such as telecommunications and banking. The banking sector has gradually increased the amount and quality of loans and financial services to SMEs.

20.   In 2006, Albania signed the Stabilization and Association Agreement (SAA), which is considered a milestone on its path toward EU membership. Albania has benefited from national and regional financial assistance under the Community Assistance for Reconstruction, Development and Stabilization (CARDS) program. Between 2001 and 2006, more than 315 million euros were earmarked for Albania through CARDS. Under the reformed EU external aid system, this support was continued by the new Instrument for Pre-Accession Assistance (IPA) in 2007. One part of the assistance focused on implementing the main priorities of the European partnership, while the other supported cross-border

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[7] World Bank (2013).

cooperation activities between Albania and EU member states, as well as with adjacent candidate and potential candidate countries.

21.   With a GDP per capita of US$3,836, Albania is a lower middle-income country. The country has experienced rapid social change, including internal migration from rural to urban areas, and mass emigration of economically active citizens who are now a source of substantial remittances (ranging from 11 to 14 percent of GDP annually). In addition, the country has made solid progress towards achieving the Millennium Development Goals (MDGs), although social indicators still lag significantly behind those of the EU countries and Croatia.

22.   However, competitiveness is still low and based on low factor (labor) costs rather than high value added products or services. The economy is heavily skewed towards low-technology activities – according to World Bank statistics, agriculture accounted for 20.8 percent of GDP in 2009, and agricultural employment was relatively high (58 percent) in 2006. Exports are still low in both absolute and relative terms; exports of goods and services accounted for 28.7 percent of GDP in 2009. Sharp increases in imports, particularly capital goods, have led to large and growing trade deficits.

R&D and Innovation Trends

23.   Albania's growth reflects in part the one-time benefits of restructuring toward a market economy, relatively easy "catch up" advances using widely known technologies, and remittance flows stemming from more open borders. Future gains will be increasingly dependent on sound macro and micro-economic policies, particularly attention to growth drivers in the private sector. This, in turn, requires increased R&D and innovation to enhance competitiveness and national value added. But Albania is lagging in many measures of R&D and innovation, and faces the critical challenge of enhancing human capital and reversing brain drain of highly-skilled workers.

R&D Spending

24.   According to United Nations Educational, Scientific, and Cultural Organization (UNESCO) estimates based on partial data, gross expenditure on R&D (GERD) in Albania represented only 0.15 percent of GDP in 2008, funded almost exclusively by the public sector and by foreign sources. In 2009, funding for academic research amounted to 0.075 percent of GDP, while the Ministry of Education and Science allocated another 0.18 percent of GDP for scientific research.

25.   The National Strategy for Science, Technology and Innovation (NSTTI) foresaw tripling GERD from 0.2 to 0.6 percent of GDP over 2009-2015. Even if this objective is fully achieved, Albania would still be far below the European 1.9 percent GERD average recorded in 2009. The country faces a huge challenge in further increasing R&D investment and closing the gap with the EU average.

Human Resources and Brain Drain

26.   Albania has only 245 researchers per million of population,[8] representing less than 10 percent of the EU average of 3,166 researchers per million of population, based on UNESCO estimates for 2010.

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[8] Until recently, R&D and innovation statistics were not collected in Albania following international standards (e.g., OECD, EUROSTAT, and UNESCO). A first survey of public and academic institutes was launched recently, and a business R&D and

The same estimates indicate that there were a total of 578 scientists in Albania distributed between the Academy of Sciences (274) and other public research institutions (304). There are no data on the employment of researchers in the private sector, which may confirm a broadly held view that researchers are only employed in the public sector. For 2008 and according to UNESCO, there were 1,721 headcount and 467 full time equivalent (FTE) researchers employed in Albania.

27. Albania is particularly affected by the brain drain phenomenon. During the last 20 years, about half of all university professors, researchers, and intellectuals who graduated abroad remain outside the country. The driving forces behind the brain drain were poor professional and career prospects (due to poor research infrastructure and limited funding) and deteriorating living conditions. Several studies have been conducted and provide the following data:

- A survey of 40 research institutions and 10 public universities in Albania revealed that more than half of all lecturers and researchers emigrated during the 1991–2005 period, causing a significant loss to the academic community. [9]

- Other studies (AIIS, 2005; UNESCO, 2007) indicate that Tirana University lost 40 percent of its academic staff in the 1990s, 90 percent of them under the age of 40. It is estimated that every year about 2,000 to 4,000 Albanian students leave the country to study abroad, which poses a critical problem to renewal and expansion of human capital. Italy seems to be the country of choice, followed by the United States, Austria, France, Germany, Turkey, and United Kingdom. [10]

- According to a recent study by OECD, the emigration rate of the highly-educated (i.e., holding at least a first-stage tertiary degree) has been increasing, from 26.8 percent in 2000 to 35 percent in 2005/2006. For the last period, Albania shows an emigration rate six times larger than the regional average for non-OECD European and Central Asian economies (5.9 percent in 2005/2006) [11].

28. New initiatives launched under the National Strategy of Science, Technology and Innovation (NSSTI) 2009-2015 aim to double the number of researchers by 2015 through the "brain gain" program and the training of young researchers through doctoral study programs and PhD qualification. In 2009, new doctoral studies were supported for the first time with curricula and standards based on the Bologna Process. The number of students enrolled in the third cycle study program for the academic year 2011-2012 was 3,427. The government has approved a quota of 1,400 students for the academic year 2012-2013.

Public Research Institutions and R&D Infrastructure

29. The overall status of R&D infrastructure in Albania is poor. As of 2008, there were still no local and regional research centers, or new technology or innovation parks. Despite improvements in recent years, technology and technical research equipment is still insufficient. Some ASA institutes have no new or upgraded scientific environments (for instance, Institute of Nuclear Physics, Institute of Biological Researches, Institute of Hydrometeorology and Institute of Seismology).

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innovation survey is currently under way.
[9] Center for Economic and Social Studies (2006).
[10] According to some Italian sources, Albanian students and researches currently represent about 50 percent of the total number of foreign students and researchers in Italy. Other sources indicate that 20,000-22,000 Albanian students are presently in Italy.
[11] OECD (2012a).

30.   The communication and information infrastructure for research is inadequate; network access for higher education and research institutes is partial and slow, and the library information systems do not meet research needs. Apart from the ASA initiatives, which have enabled access to the Central and Eastern European Online Library (CEEOL) and Science Citation Index databases since 2004, there is almost no electronic access to international scientific and research journals.

31.   The capacities and competence to manage both fundamental and applied research in Albania are limited and below the standards enabling co-operation and integration into European or international programs. In sum, the scientific infrastructure overall is outdated and inadequate to support quality research and teaching. Sustained investment programs would be required to upgrade equipment and facilities across all scientific fields to meet minimal quality requirements for teaching purposes.

The Business Sector and Industry-science Linkages

32.   Private sector investment in Science and Technology (S&T) in Albania is extremely low. There are only about 750 medium and larger companies in the country, and the sector tilts heavily towards low technology activities, while exports are low in both absolute and relative terms. Micro-enterprises with fewer than five employees make up the vast majority of private businesses. Their survival strategy focuses on labor-intensive, low-cost production.[12]

33.   In terms of private sector human capital, which is fundamental for technology upgrades and innovation, Albania lags substantially behind the Europe and Central Asia (ECA) average. According to the World Bank Enterprise Survey (2007), the average large Albanian firm has 22 highly skilled employees, compared to an average 41 for the ECA region, and only one in five Albanian firms provides training to its employees, as opposed to 35 percent in the Europe and Central Asia region).

34.   Industry-university collaboration in Albania is among the lowest in the world.[13] In 2012, Albania ranked 139 out of 144 countries. This constrains opportunities for growth and represents an untapped knowledge potential for innovation.

S&T Outputs and Innovation Performance

35.   Scientific performance is also weak. Data on scientific publications confirm the low output of the research system. According to the bibliometrics study commissioned for this project, Albania has experienced a modest increase in the number of scientific publications per year from 46 to 201 between 2003 and 2010 (data used for analysis are from Scopus-Elsevier, SCIMAGO, 2012). Albania ranks fifth in the Western Balkan region, falling far behind Croatia and Serbia, and is in the bottom five of Eastern Europe countries. Publications per thousand inhabitants have grown in the period, from 0 to 121, the highest in the WBCs in 2010. Nevertheless, this increase has been driven by a modest surge in total publications and a significant decrease in population.

36.   The quality of scientific output is measured by citation impact indicators.[14] Over the entire period of analysis (2003-2010), Albania shows an overall normalized citation index of 0.72, reaching the second

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[12] World Bank (2009a).
[13] World Economic Forum Indicators for 2010.

position in the WBC right behind Serbia (0.74). The country is far below the EU-27 average (1.30). The same pattern is observed when analyzing the average of citations per publication. Over the period, Albania presents an average of 4.03 per document, one of the highest of the region, but still below EU-27 averages.

37.   In terms of research specialization, the activity index (also called "Relative Specialization Index"[15]) per area for the WBC shows that Albania (see table 1) reports the following three areas with the highest specialization: Earth and Planetary Sciences (3.3), Environmental Science (2.9) and Immunology and Microbiology (2.3). Other areas where Albania shows a high specialization are: Agricultural and Biological Sciences (1.99), Arts and Humanities (1.88), Physics (1.47) and Astronomy and Social Sciences (1.38). Further details about research productivity are reported in Box 1.

38.   Progress in technological performance is also slow. According to the data of the Innovation Union, the number of resident patents granted increased from 55 to 70 between 2005 and 2007.[16] In 2007, the number of patent applications at the European Patent Office (EPO) was 352, with 4 Patent Cooperation Treaty (PCT) patents. For the first time since 1997, there was an increase in the number of national patent applications, from 3 in 2006 to 10 in 2007.[17]

39.   The largest number of patent applications was in pharmaceuticals and cosmetics, followed by the chemical industry, biotechnology, and medical engineering. These industries account for over three quarters of all patents filed. Other important technological fields are civil engineering, architecture and mining, and service users and equipment. In terms of quality norms, the number of certificates has rapidly increased over the last decade (as shown in Table 1 below), which indicates strengthened efforts to catch up with international technology and product standards.[18]

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[14] Normalized Impact scores indicate the scientific impact that institutions/countries/regions have on the scientific community. Normalized Impact values show the ratio between the average scientific impact of an institution/country/region and the world average impact of publications of the same time frame, document type, and subject area. The values are expressed in decimal numbers and show the relationship of the institution's average impact to the world average, which is 1 For Example a score of 0.8 means the institution is cited at 20 percent below the world average, and 1.3 means the institution is cited at 30 percent above world average. Normalized Impact is computed using the methodology established by the Karolinska Intitutet in Sweden, where it is called the "Item oriented field normalized citation score average."

[15] The activity index highlights the relative research efforts of a country to a given field. The concept was suggested by Frame (1977) to compare any country's performance with the world's performance. The activity index (also called the "Relative Scientific Specialization," (RSS) is a measure of the degree of specialization of a country in a particular field. It is calculated by dividing the percent of all papers in a field from Country X by the same proportion calculated at the world level. Thus a RSS between 0 and 1 indicates that a country is relatively unspecialized in that field, while any RSS above 1 represents a relative specialization in that field; the higher the RSS above 1, the greater the degree of specialization in that field. SCIMAGO Research Group (2012).

[16] European Union (2011).

[17] In 2007, 420 patents were registered. Also in 2007, 528 certificates of deposit were issued, compared to 208 in the previous year, out of which 298 are pending the expiry of the opposition/objection deadline following their publication in the Intellectual Property Bulletin No. 17 and No 18. For that same year, 268 notifications for completion of formalities were issued, compared with 135 in the previous year; 1,228 applications for upholding into force, compared with 460 of the previous year; and there were 30 applications for change of ownership/address/name.

[18] Also see World Bank (2009a).

Box 1: The state of scientific performance in Albania

- In Albania, the most productive institutions are higher education institutions (60 percent), followed by health (20 percent) and government (15 percent) institutions, which follow similar patterns to WBCs and EU27. There are three institutions in the country with more than 100 publications during the period: University of Tirana, Mother Teresa University Hospital Center, and Polytechnic University of Tirana. The normalized citation rate for these institutions during the period is below the world average, although the Polytechnic University of Tirana has the highest value (0.93).

- The percentage of publications with international collaboration in Albania is above 60 percent in the period 2003 to 2010 (67.06 percent), higher than the WBC and EU27 averages (around 50 percent and 45 percent, respectively). Most collaborations are with countries from the rest of Europe (Italy, Greece, Germany, UK, France, Switzerland and Spain) and only a small proportion is with institutions in Serbia, Croatia, and Macedonia. Collaborations outside Europe are also relevant, and mostly are with the United States, and Japan.

- Inter-sector collaborations are rare in Albania, with only a few cases in 2006 and 2010. Collaborations are only identified between higher education and private institutions. In the WBC, collaborations are only present between these two sectors but represent no more than 0.02 percent of collaborations, far below the EU27 average of 1.38 percent. In addition, collaborations between private and government institutions represent 0.56 percent of total collaborations in EU27, while this type of collaboration is non-existent in the WBC.

Source: SCIMAGO Research Group (2013).

Table 1: Research Specialization Areas in the WBCs (Activity Index of the total volume of publications over the period 2003-2010

		Albania	Bosnia & Herzegovina	Croatia	FYR of Macedonia	Montenegro	Serbia
Most Specialized	1	Earth and Planetary Sciences 3,3	Medicine 2,8	Social Sciences 2,5	Chemistry 2,2	Computer Science 0,6	Mathematics 3,6
	2	Environmental Science 2,9	Social Sciences 2,7	Veterinary 1,8	Mathematics 1,4	Physics and Astronomy 0,5	Chemistry 3,2
	3	Immunology and Microbiology 2,3	Agricultural and Biological Sciences 1,1	Agricultural and Biological Sciences 1,7	Physics and Astronomy 1,3	Agricultural and Biological Sciences 0,3	Decision Sciences 3,1
Least Specialized	24	Engineering 0,4	Arts and Humanities 0,3	Neuroscience 0,4	Arts and Humanities 0,2	Pharmacology, Toxicology and Pharmaceutics 0,03	Economics, Econometrics and Finance 0,6
	25	Health Professions 0,2	Neuroscience 0,3	Decision Sciences 0,3	Nursing 0,2	Veterinary 0,03	Arts and Humanities 0,3
	26	Chemical Engineering 0,2	Nursing 0,04	Nursing 0,1	Health Professions 0,1	Nursing 0,03	Nursing 0,2

Source: SCIMAGO Research Group (2013).

Table 2: Number of quality certificates

ISO 9001						ISO 14001				
	2007	2008	2009	2010	2011		2008	2009	2010	2011
Albania	23	43	155	52	164	Albania		1		11
BiH	652	811	909	944	1119	BiH	60	87	100	148
Croatia	2073	2302	2567	2102	2117	Croatia	343	469	451	488
FYR Macedonia	255	271				FYR Macedonia	26			
Montenegro	136	160	157	85	146	Montenegro	17	18	15	25
Serbia	1987	2091	2733	1790	2868	Serbia	176	298	318	520

Source: The ISO Survey of Certifications (2011).

40. Both the European Innovation Scoreboard and the World Bank Knowledge Assessment Scorecard demonstrate Albania's weak position in several innovation indicators. Though some of the indicators shown below are not fully evaluated due to missing data, they still highlight the most pressing issues for action. Albania's poor performance in comparison to Europe and Central Asia for indicators spanning the knowledge economy is illustrated below in Figure 1, using the most recent data from the World Bank Knowledge Assessment Methodology. Albania lags behind regional (ECA) averages on all fronts, including regulatory indicators, innovation indicators, and infrastructure. The largest gaps are in science (number of science and engineering (S&E) articles per population) and secondary school enrollment, both fundamental pillars for the knowledge economy. In these areas, Albania is among the ECA countries with the lowest scores.

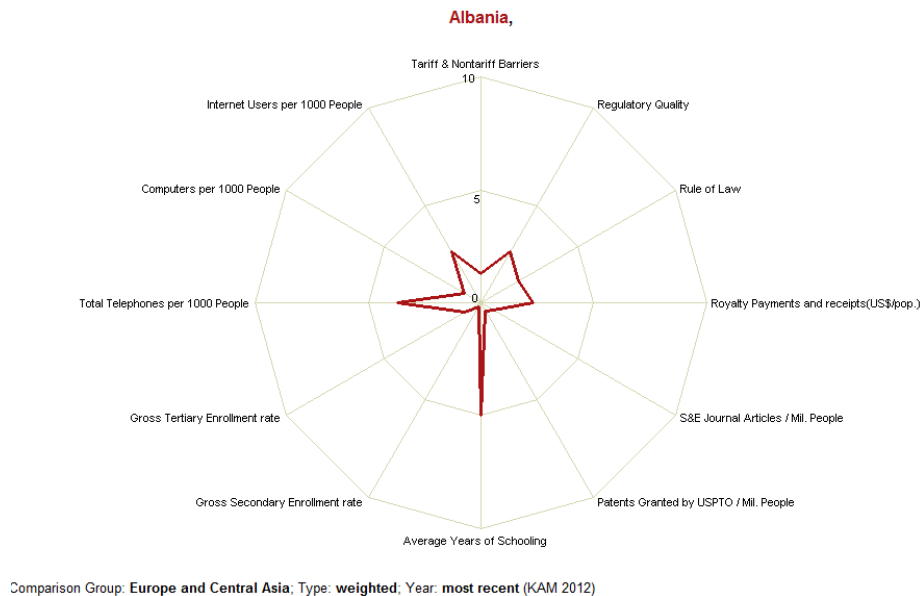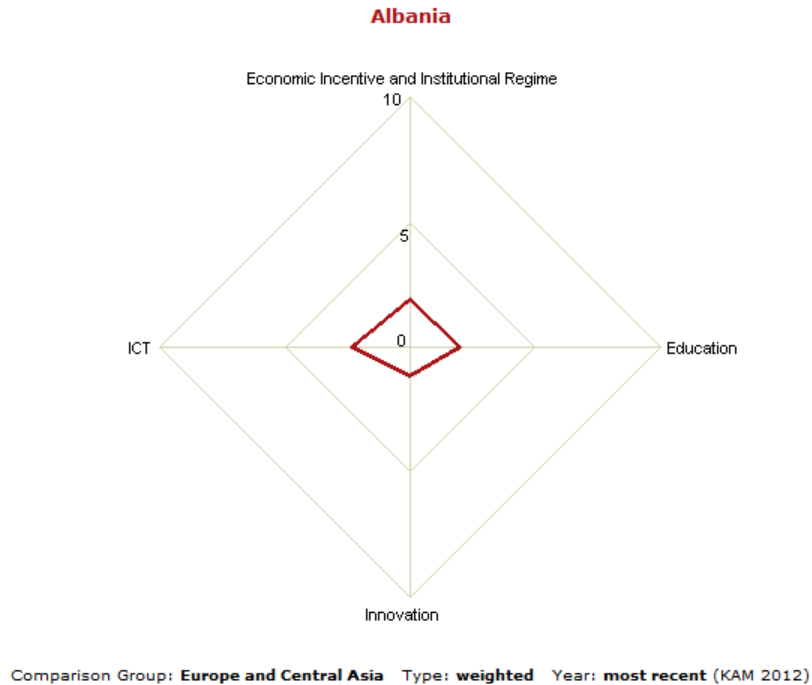**Figure 1: Albania performance on key variables in comparison to Europe and Central Asia**

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Figure 2: Knowledge Economy Index (KEI) pillars – Albania vs. Europe and Central Asia

Source: World Bank KAM indicators.

41.   As Figure 2 illustrates, Albania lags behind the average in European and Central Asian economies in all pillars of the knowledge economy tracked by the Knowledge Economy Index (KEI) and the most recent indicators provided by the World Bank Knowledge Assessment Methodology. Rankings are below 2.5 in a normalized scale of 1-10, with 10 being the highest in ECA countries.[19] The highest gap refers to innovation capacity, measured here by a composite index summarizing the relative level of innovation inputs and outputs.

ICT Infrastructure and Diffusion

42.   In Albania, progress in the diffusion of Information and Communication Technologies (ICT) is mixed. Albania has been catching up in terms of Internet use and mobile subscriptions, which are about 60-70 percent of European averages. For 2011, there were 49 Internet users per 100 people, close to the

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[19] The Knowledge Assessment Methodology consists of two indices – Knowledge Economy Index (KEI) and Knowledge Index (KI) – to allow countries to identify the challenges and opportunities they face in making the transition to the knowledge-based economy. The indices provide insight into the conditions facilitating effective use of knowledge for economic development (KEI) and whether the economy has the capacity to generate, adopt, and diffuse knowledge (KI). KEI is based on four foundations: (1) economic incentives and institutional regime; (2) education; (3) innovation; and (4) ICT. KI is based on education, innovation, and ICT. The economic incentives and institutional regime comprises tariff and non-tariff barriers, regulatory quality, and rule of law. Education is gauged by average years of schooling, and gross enrollment ratios at the secondary and tertiary levels. Innovation in this context spans inputs and outputs of the national innovation system and comprises three key variables: royalty and license fees payments and receipts; patent applications granted by the U.S. Patent and Trademark Office; and the number of scientific and technical journal articles published. The ICT foundation measures penetration of various technologies, including the Internet, telephones, and computers.

WBC average of 54, and mobile subscriptions were 96 per 100 people, while the EU averages were 72 and 125, respectively.

43.   However, Albania's telecommunications infrastructure continues to be perceived by industry as an obstacle to doing business. Significant numbers of Albanian firms have reported that inadequate and costly telecommunications services hamper business.[20] In 2007, the government passed a telecommunications framework law, which is helping to create a competitive market and has already led to significant improvements such as the entrance of a third mobile service provider into the market. Further progress is needed in effectively implementing the law.

Intellectual Property Rights

44.   Intellectual property systems – laws and institutions managing and enforcing intellectual property rights (IPRs) – are one of the main instruments to encourage innovation and diffusion of new ideas. By providing exclusive ownership and commercialization rights to inventors, the IPR system allows inventors to "appropriate" innovation returns – exclude others from exploitation – and thereby recoup costs of R&D and creativity.

45.   Albania has made progress in the legal protection and enforcement of IPRs. The country has its own Patent and Trademark Office. The intellectual property (IP) legislation is fully in compliance with the TRIPs Agreement and also with the EU Directives on IP matters. Reforms include the adoption by the Parliament of the Law on Accession to the European Convention on Cinematographic Co-production in December 2008. However, the 2005 Law on Copyright is not yet compliant with European standards and adoption of the draft national strategy on intellectual and industrial property is still pending.

1.   RESEARCH, DEVELOPMENT, AND INNOVATION SYSTEM, AND ITS CHALLENGES

46.   Despite the many initiatives, new legislation, adoption of strategies, etc., it is evident that Albania has made little tangible progress in the area of R&D capacity, technology transfer, and innovation. Undoubtedly, limited funding is a serious factor. However, reforms can still proceed in an environment of resource scarcity if there is a clearer understanding of the systemic nature of R&D and innovation and a comprehensive program to address key binding constraints.

47.   The following section explores the nature of Albania's R&D and innovation system – stakeholders, governance, stated strategy, funding and dynamics – with the aim of identifying possible weaknesses and resultant reform possibilities. It posits, in line with its own national strategy plus the emerging Western Balkans R&D Strategy for Innovation, that Albania can accelerate its innovation and resulting economic gains by combining selected R&D governance reforms with prioritized initiatives to strengthen the research base, enhance effective research commercialization from public funded research institutions, and encourage large expenditures in research and innovation by the business sector.

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[20]World Bank Enterprise Survey (2005 and 2008).

Need for a Systemic View

48.   Albania's R&D and innovation effort should be seen by policy makers and the broader public as a system of many stakeholders within the public and private sectors spending on R&D and interacting as parts of a value chain that should move ideas to market. When properly functioning, R&D transforms into innovation and leads to products and services that strengthen the country's business investment, technological sophistication, comparative advantage, and economic performance.

49.   Performance of national innovation systems depends on both the capabilities of the actors and well-articulated and strong linkages among them. Different stakeholders act at different stages in the innovation process.

50.   More simply, in the context of developing countries, a well-functioning innovation system facilitates incremental private sector technological improvements through various means, including employment of highly qualified science and technology personnel, collaboration with researchers, training, extension services (R&D and engineering services; quality certification and standards), and the ability to access and utilize global technological developments.

51.   Improving knowledge capacity (R&D) and innovation is not a simple or quick task, and it requires the active participation of all stakeholders. Challenges are inherent in the multiplicity of players, in the difficulty in aligning incentives and establishing modern legal frameworks and government policies, and in encouraging private sector actions. Overcoming ingrained cultural differences, if not distrust, between entrepreneurs and researchers, reducing red tape, or stimulating the private sector to take a more proactive interest in R&D to gain global market share require concerted and well-conceived initiatives. The weakest element can determine overall success, so ignoring key links can be costly.

Need for Good Governance

52.   On the path toward research excellence, it is essential to have research systems that are competitive and transparent, with competitive recruitment and efficient administrative procedures. Providing the right enabling conditions to improve scientific research and its quality is the result of appropriate governance mechanisms and adequate and competitive research funding. In Albania, increasing funding for research and ensuring its continuity over time remains a great challenge. In parallel, governance of research institutions needs to improve in line with the aim of research excellence.

53.   Good governance in research funding implies meritocracy and transparency in grant funding, as well as accountability, evaluation and monitoring practices, transparency, and performance evaluation that can gauge contributions to knowledge, local economic and social needs, and growth.[21] Good governance also entails having a clear rationale behind both institutional funding, which ensures stability, and project-based funding.

- Merit-driven research funding means competitive granting, subject to a peer-review system and international criteria in which projects are selected on the basis of the quality of proposals and expected results. Limited competition amongst research institutions and universities leads to insufficient specialization, which in turns hinders opportunities for innovation.

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[21] OECD (2011a) and OECD (2011b).

- In research-performing institutions, appropriate governance mechanisms provide performance-driven career development, clear and transparent recruitment policies, and well-defined rules regarding ownership and commercialization of intellectual outcomes — revenue participation by researchers — resulting from research. This also implies that results of publicly funded research are protected and published in a way that encourages their exploitation.[22]

54. In order to stimulate economic growth and increase employment, research and innovation systems must make science careers attractive. The European Charter for Researchers and the Code of Conduct for the Recruitment of researchers provides examples of governance principles to make research careers more attractive, a key element in improving governance for research excellence, and consistent with the aim of a better integration to the European Research Area (ERA).

55. Good governance of universities requires enhanced autonomy to organize their activities in the areas of education and training; research and innovation ("third mission"); open transparent and merit-driven recruitment methods; institutional accountability; quality assurance systems, and, the ability to access alternative sources of funding and engage in interactions with industry.[23] Competitive education implies more involvement by the business sector in curricula development and doctoral training so that skills better match industry needs. Funding based on competition, market mechanisms, participation of external stakeholders, and publication of performance measures are other means used to pursue accountability of higher education institutions (HEIs).

56. Some of these policy areas are covered by the Bologna Declaration within the framework of the European Higher Education Area signed in 2007 by 46 governments. Countries agreed on 10 action lines aimed at making higher education in Europe more compatible and comparable, and more competitive and attractive for students and researchers in Europe and worldwide.[24]

57. Most of the WBCs have entered the Bologna process and are currently implementing reforms in that direction. Yet implementation of reforms is difficult and is proceeding at different rates across the countries, particularly reforms that require changes in culture, additional resources, and skills – e.g., managerial competences, internationalization — in addition to other requirements related to integration and governance. In Albania, implementation of "fully integrated" university systems is in process and several meaningful steps have been undertaken. As in other WBCs, HEIs in Albania are still struggling with traditional systems of education and some fundamental changes.

Key Stakeholders

58. The research system in Albania includes a wide range of institutions in higher education, scientific research, development and technology, and the private sector. Businesses, however, have minor participation in R&D and other knowledge generation activities.

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[22] Merit-based recruitment implies not only scientific productivity but also a wider range of evaluation criteria, such as teaching, supervision, teamwork, knowledge transfer, management, and public awareness activities (see Innovation Union and the Code of Conduct for Recruitment of Researchers, EC).

[23] OECD (2011a) and OECD (2011b).

[24] This entails comparability in degrees. Countries are setting up national qualifications frameworks that are compatible with the overarching framework; adoption of quality assurance mechanisms in accordance with the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG); and fair recognition of foreign degrees and other higher education qualifications in accordance with the Council of Europe/UNESCO Recognition Convention.

Research Agencies

59.   Research is conducted by a number of institutions.

a) Eleven public and 31 private HEIs have a mandate for tertiary education, scientific research, development, and transfer of knowledge and technology, although the duration and level of scientific research among the universities differs. Integrated with public universities in Tirana are three Public Centers/Agencies for development and technology transfer.

b) National research centers are research-oriented academic institutions whose mission is to carry out scientific research, educate and deepen university education in the secondary and tertiary cycle, and develop and transfer knowledge and technology. In this area, the Albanologic Study Center has been established based on the reorganization of the Albanologic Institutes of the Academy of Sciences.

c) Several ministries have subordinate research institutes, including the Environment, Forests, and Water Administration; the Ministry of Tourism, Culture, Youth and Sports; the National Agency of Natural Resources; the Albanian Geological Survey; and the Ministry of Public Works and Transport. The extent of pure or applied scientific research differs among these organizations, however.

d) Private institutes or non-governmental organizations (NGOs) conduct some research in Information Technology (IT), but little is done in other fields relevant for science and technology.

Policy Formulation and System Governance

60.   The main policy-making and advisory bodies formally include: the Albanian Parliament, the Council of Ministers; the Council for Scientific Policy and Technological development; the Ministry of Education and Science; Ministry of Innovation and ICT; Council of Higher Education and Science; Academy of Science of Albania; Rectors' Conference; Agency for Research, Technology and Innovation; and other ministries. Several of these agencies or councils do not significantly impact R&D policy. The policy formulation is mostly confined to the Ministry of Education and Science supported by the Agency for Research, Technology and Innovation, and advised by interested line agencies and universities, with overall strategic decisions ultimately validated at senior government levels and overall funding levels apparently negotiated with national finance agencies as part of normal Ministry of Education and Science and agency budget processes.

61.   Core agencies include:

- *Ministry of Education and Science (MoES)* is the main government body responsible for R&D policy design. It transferred the administration of national S&T programs to the Agency for Research, Technology and Innovation (ARTI) in March 2010.
- *Ministry of Innovation and ICT (MITIK)* was established in 2009, with the key role of overseeing the new National Agency on Information Society (NAIS).
- *The Ministry of Economy, Trade and Energy (METE)* department on Competitiveness Policy and on Business Promotion plays an important role in designing policies to promote investment, exports, and SME development, focusing in particular on encouraging business innovation to raise competitiveness in regional and global markets. METE developed the Business Innovation

and Technology Strategy (BITS) (2011 – 2016). In addition, it oversees activities of the Albanian Investment and Development Agency (AIDA) and the Business Relay and Innovation Centre (BRIC) and periodically monitors their work.

- *Other ministries:* As indicated above, a number of line ministries with research institutions attached to them are stakeholders in the Albanian national innovation system.

- *The Rectors' Conference* represents Albanian higher education institutions and has an advisory role regarding research undertaken in their universities and programs involving cooperation with the private sector.

Implementation and Financing Agencies

62. Key agencies engaged in policy coordination and implementation of innovation programs include:

- *The Agency for Research, Technology and Innovation (ARTI),* which was launched in March 2010 as a public, legal institution under the auspices of the Council of Ministers, and charged to build a modern system of science and to strengthen the role of S&T. It operates as a coordinating and funding body for national, bilateral, and international programs and projects, and cooperates with different institutions in the field of R&D and innovation. Its mission is to evaluate, finance, monitor, and manage programs and projects in the fields of science, technology and innovation. ARTI has taken over some of the coordinating functions in technology transfer and R&D support from MoES. ARTI also serves as a coordinating and guiding structure for sustainable technological and innovation development of the country. Among other activities, the Agency funds projects supporting the development of SMEs and the renewal of technological equipment used by SMEs.

- *The Business Relay and Innovation Centre (BRIC),* created in 2011, was designed to be an entirely independent institution delivering a wide range of services for the technological support of private enterprises based on knowledge. This agency is responsible for the implementation of the Action Plan of the Business Innovation and Technology Strategy 2011-2016,[25] and therefore must engage in systematic coordination and periodic monitoring of the business innovation and technology policy.

- *National Agency for Information Society (NAIS)* coordinates government activities in the field of information and communication. It interfaces with other ministries and government institutions as well as the private sector ICT companies.

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[25] ERAWATCH (2012).

2.   POLICY DEVELOPMENT

National Strategy

63.   Governance capability is crucial for the success of any public policy. Good governance for research and innovation policy means having an integrated and coherent policy-making process in place, with stable institutions and deploying policy agencies performing according to policy objectives and well-defined implementing procedures. Elements of good governance are: formulation mechanisms (consultation and priority identification); target setting and programming (medium and long run); monitoring and accountability; and, information dissemination mechanisms.[26]

64.   Definition of policy priority and targets, action lines, and corresponding resource planning are made possible through national strategies for research and innovation. National strategies articulate countries' vision regarding the contribution of research and innovation to national economic development, and are therefore helpful to organize efforts and policy reforms into a specific direction. In some cases, national strategies outline the specific policy instruments to be used to meet a set of goals or objectives.[27]

65.   The first national innovation strategy was prepared in 2009 by the MoES Department of Strategy and Donor Coordination, and included stakeholder input from academics, researchers, specialists, and government officials. The National Strategy of Science, Technology and Innovation (NSSTI) 2009-2015 introduced major changes to improve the effectiveness of the national innovation system. The NSSTTI aimed to achieve the level of research needed to support quality university education and respond to the needs of the productive sector (i.e., systematic support in innovation activities and technology transfer). Priority sectors were chosen from a broader list of priorities identified in the national development strategy (energy, tourism, agriculture, agro-processing, IT, geosciences, etc.)

66.   The strategy can be summarized as follows:

- Increase public spending on research to 0.6 percent of GDP by 2015.

- Increase the share of gross expenditure on R&D from foreign sources, notably from the EU and international donors, to cover 40 percent of all research spending in the period 2010–2015.

- Create four or five Albanian Centers of Excellence in Science (ACES), including dedicated laboratory equipment or workspaces that could be used for new technology-based firms (pre-incubation, testing, certification, etc.).

- Double the number of researchers, through "brain gain" incentives and training of new researchers (establish graduate schools; train 500 PhDs). This assumes the creation of up to three new "graduate schools" or doctoral programs in Albanian universities, which is consistent with the Higher Education Strategy action plan. The new graduate schools should be in the priority

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[26] The European Commission's White Paper on Governance (2001) has set out five principles that underpin good governance. They are: openness, participation, accountability, effectiveness, and coherence. These are required for the sound management of public resources and essential in creating environment conducive to business, as well as a productive partnership between public and private sectors.
[27] OECD (2012b).

areas identified by the government in consultation with the national RDI council and/or be linked to the selected centers of excellence.

- Increase innovation activity in 100 companies through investment in R&D laboratories; via consortia with the academic RIs; or in partnership with foreign partners. This figure may be revised once the results from the first business Research, Technology Development, and Innovation (RTDI) survey are published.

67.   Despite notable efforts to increase research cooperation with the EU and other stakeholders, implementation of the NSSTI strategy has been slow due to lagging research capacity at the national level. This has been mainly due to insufficient policy effort to strengthen RTI, capacity constraints (lack of human resources), low public financing, and lack of critical inputs to achieve research excellence (e.g., the absence critical mass of researchers in relevant fields, inadequate research infrastructure, wrong incentive systems, etc.).

Monitoring, Policy Evaluation, and Statistics

68.   True levels of investment in R&D and innovation in Albania are difficult to assess. Currently, statistics are either not available or collected on a consistent basis and in line with international (OECD, Eurostat or UNESCO) standards. There are no data or studies available that would allow an estimate of the extent of innovation activity (innovation expenditure, etc.) or relevant types of output in the enterprise sector (e.g., sales from new products or services, etc.).[28] This hinders both policy design and Monitoring and Evaluation of R&D activities.

69.   Without a consistent S&T monitoring and impact evaluation system in place, the government relies on a range of different implementing bodies to evaluate project implementation and confirm that funds are allocated in line with pre-determined criteria and guiding principles. As a consequence, there is a lack of reliable statistics and other necessary information that would enable both the assessment of policy results in this area, and the measurement of progress achieved under various innovation programs (not to speak of proper impact evaluation).

70.   ARTI, which has a mandate to support, monitor, and evaluate programs and projects in the fields of science, technology, and innovation in the entire country, seeks to accomplish this objective through preliminary evaluation, monitoring of implementation, and final assessment of RDI programs based on the existing Monitoring and Evaluation (M&E) system. The Public Agency for Accreditation of Higher Education (PAAHE) and HEIs are working together in drafting the main principles and criteria for strengthening the Internal Quality Assurance Systems in the HEIs, though it may take a while before Albania has a broader and more reliable information system relevant for monitoring of R&D activities.

Policy Reforms under Implementation

71.   In addition to the creation of a national strategy and ARTI, Albania has undertaken other reforms that should positively impact R&D and innovation, and demonstrate its commitment to improved performance in this sector. Notable advances include:

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[28] A first questionnaire survey to public and academic institutes was launched in the first semester of 2009, and a business RDI survey was planned to be launched by summer 2009, both with the support of UNESCO. Results are not yet public.

a) The Academy of Sciences was re-organized along the model adopted by many EU countries.

b) Higher-education autonomy has been enhanced; curricula and education standards have been revised following the Bologna process; monitoring and quality auditing mechanisms have been adopted; and higher education institutions have been integrated to research institutes to enhance research. The reforms undertaken in the area of higher education and basic research, first and foremost, aimed at integrating once entirely separate fields of research and entrepreneurship for better results in RDI and economic growth.

c) Improvements in human resources in science and technology are being pursued by: (i) raising interest in and awareness of science among youth; (ii) revising academic curricula to make science and technology more attractive to students (e.g., by expanding interdisciplinary training in science education); (iii) improving teaching in mathematics and science, including through the use of ICT in teaching content and delivery; (iv) reducing gender and ethnic minority gaps in science and technology education; (v) enhancing financing opportunities for PhD studies and post-doctorate training (such as through fellowships, funded research opportunities, etc.); and, (vi) improving the quality of university research laboratories and infrastructure. For the first time, the Albanian government implemented in 2007 a program for PhD studies. This program, "The Excellence Fund," supports the best PhD candidates to partially or fully complete PhD studies abroad. A total of 45 PhD students were supported by this fund during year 2007.

d) A brain gain program has been crated to address the diaspora (see Box 2 below). Through the medium-term plan (2008–2009) of the Brain Gain Program (co-financed by the United Nations Development Program (UNDP)), the Albanian government has, for the first time mobilized funds from the state budget and opened 550 vacancies in higher education and scientific research institutions.

Box 2: The Brain Gain Program

- The Brain Gain program, collaboration between the government of Albania and the UNDP, began operating in April 2006. The objective of the project is to support the creation of the incentives and national policy mechanisms necessary to effectively engage the Albanian diaspora in the scientific, administrative, and economic development of the country.

- This program has supported the preparation of a policy framework and has put in place an electronic database to link the demands of academic institutions, public administration, and the private sector with expertise provided from abroad. Between 2008 and 2011, the program supported the financial packages of reintegration for 137 individuals who returned to Albania permanently or contributed as visiting professors at various academic institutions in the country.

- The program is being managed using the implementing modalities recommended by UNDP, which require a high commitment of the national partner, in this case represented by the Council of Ministers. The Minister of the Education is the national leader of this project. The project is also managed daily though a dedicated unit in the prime ministry office.

e) Improve the country's intellectual property rights regime (see Box 3 below).

f) To increase technology transfer from research institutions and enhance industry-science collaboration in the field of innovation, the Albanian government has taken steps to build a

legal and policy framework for the creation and commercialization of intellectual property rights at research institutions and universities.

- Twelve technology transfer centers and agencies have been created, focusing on agriculture, rural development, environment, energy, transport and telecom, economy, commerce, and other fields.
- Policy reforms have been undertaken in: (i) providing a legal framework governing ownership and commercialization of publicly-funded research results (allowing research institutions and HEI to own and commercialize technology derived from publicly-funded research); (ii) creating rules for intellectual property creation and licensing of technologies derived from publicly-funded research; (iii) defining rules concerning the creation of spinoff companies and provision of incentives to researchers to participate in technology transfer activities; and, (iv) generating public support for the creation of technology transfer units.

3. FUNDING AND POLICY INSTRUMENTS

Research Funding –Public Research Institutions and PROs

72. Public financing of scientific institutions is implemented in line ministries and public institutions through three mechanisms: direct financing of research institutions in line ministries, university R&D financing, and competitive research project funding. In addition, substantial EU funds support Albanian membership in EU framework programs.

Table 3: Financing of R&D in public research organizations and HEI (by source of funding)

Funding (million Euro)	2009	2010	2011	2012	2013	2014	2015	2009-2015
Primary financing for Research Institutes at HEI	6.1	6.7	8.1	8.0	8.5	10.0	12.7	60.1
Financing of research projects (MoES)	7.1	6.9	7.7	8.3	9.5	11.2	13.5	64.2
Financing from World Bank regarding research infrastructure	2.7	0.0	0.0	0.0	0.0	0.0	0.0	2.7
Funds for Research Infrastructure (MoES+MEFWA+private HEI)	0.1	3.9	4.7	4.5	7.5	8.4	9.3	38.3
Centers of Excellence in Science	0.1	1.2	1.2	1.2	1.2	1.2	1.2	7.4
Grant Program of Albans for Research	0.1	0.1	0.2	0.2	0.2	0.2	0.2	1.2
National Program(s) for Technology (MoETE)	0.0	0.0	0.1	1.6	1.6	1.6	1.6	6.6
Agency of Research, Technology and Innovation (ARTI)	0.2	0.4	0.4	0.4	0.4	0.4	0.4	2.6
TOTAL	16.4	19.2	22.3	24.3	28.9	33.0	39.0	183.1

73. The MoES allocates research funds based upon national programs for R&D and bilateral agreements under four criteria: (i) financing needed for overall functioning of public education and research institutions; (ii) financing of programs and projects in scientific research; (iii) financing of IT-related projects; and, (iv) participation in national and international scientific conferences. The state budget supports scientific research by funding R&D institutions and financing national R&D programs.

The institutional financing goes directly to central research organizations, which in turn support the R&D activities of their dependent institutions. Competitive financing of projects in priority areas is done through ARTI, following established international standard procedures, for national and international (bilateral and multilateral) cooperation.[29]

Box 3: The IPR system in Albania –recent developments

- There has been progress in the legal protection and enforcement of IPRs. In 2005 and 2007, respectively, Albania joined the European Patent Convention and the International Patent Treaty. In 2010, the government created a strategy to help enforce IPRs within a 5-year time frame: the National Strategy for IPR Enforcement 2010-2015. Legislative reforms include: the amendment of the current Copyright Law; amendments to the Albanian Penal Code to recognize counterfeiting as a criminal offense; authorization of the Internal Market Inspectorate related to IP protection; and, accession to the European Convention on Cinematographic Co-production. However, the 2005 Law on Copyright is not yet compliant with European standards, and adoption of the draft national strategy on intellectual and industrial property is still pending.

- To enhance enforcement, the Strategy has delegated strengthening co-operation and coordination to a number of competing authorities, including the General Directorate of Patents and Trademarks; Albanian Copyright Office; General Directorate of State Police; General Directorate of Customs; Ministry of Justice; and, Market Inspectorate.

- Structural problems remain, such as the lack of enforcement, which is almost non-existent. Other challenges include hiring qualified personnel, and improving IPR management and technical support at the national level.[30]

Private Sector R&D and Innovation Incentives

74.   The Albanian government has provided policy incentives and support to both SMEs and new technology-based firms for expenditures on R&D and innovation. The support includes periodic provision of funds, management training, and information services. There is still no specialized funding agency that could provide seed capital for innovation-based firms, nor is there an integrated facility that could provide non-financial support to new and small firms. Initiatives that promote collaboration and networking among private firms include joint R&D programs and consortia (private, public-private), funding support for international co-operation (attracting research labs of foreign firms), and supporting access of domestic firms to foreign funding programs.

75.   The Business Relay and Innovation Centre (BRIC), created in 2011, was designed as an entirely independent institution aimed at delivering a wide range of services for the technological support of private enterprises based on knowledge. Through the Innovation Fund, BRIC will provide funding for SME projects and the renewal of SME technological equipment. The total planned budget for the implementation of the Business Innovation and Technology Strategy is about €10.3 million for a period

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[29] Around 5.71 million Euros from the budget allocated to higher education are spent for research, which consisted of 0.054 percent of the GDP for 2009.
[30] Inside Views (2012).

of 6 years (2011– 2016). About 60 percent of the budget will be allocated to the Innovation Fund and the respective Innovation Services, with the remaining 40 percent for the Cluster and Incubation Programs.[31]

76.   The government has merged the Albanian Investment Agency (ANIH), the Small and Medium Enterprises Agency (SMEA), and the Albanian Export Agency (ANE) to create Albinvest, a new structure that provided services for innovation and technology transfer to enterprises. This organization also complied with government policy to reduce the operational cost of public administration. Albinvest's capacity to provide effective one-stop shop assistance to foreign investors was tested by a growing number of trade and investment missions visiting Albania. Albinvest reported directly to the Minister of Economy, Trade and Energy. However, with the new strategy for the SMEs Albinvest was replaced by the Albanian Investment Development Agency (AIDA).

77.   Multilateral financial organizations provide substantial support to private sector innovation activities. The Albanian Reconstruction Equity Fund (AREF), created by the European Bank for Reconstruction and Development (EBRD), is a venture capital fund that provides support to private investments in the productive and service sector. MIGA provides guarantees for innovation investments, while the EIB (European Investment Bank), EBRD, World Bank (IBRD, IFC), and European Investment Fund (EIF) provide regular loans and soft loans (credits) in support of private sector innovation projects in Albania.

78.   To increase the competitiveness and capacity growth of Albanian enterprises, a Strategic Program for Innovation and Technology Development of SMEs for the period 2011-2016 has been prepared with the assistance of IPA funds.[32] The main objectives of national strategic program are to:

- Develop innovation in key sectors;

- Initiate, import, modify, and diffuse new technologies in enterprises;

- Increase the capacity of business supporting organizations to assist innovation activities in enterprises;

- Assist directly with technical information;

- Assist enterprises in gaining external funding for innovation activities; and,

- Enable the creation and survival of new innovative firms.

4.   INTEGRATION TO ERA AND INTERNATIONAL COLLABORATION

79.   Better integrating Albania's science and technology with the European Research Area is a goal of the National Strategy of Science, Technology, and Innovation 2010-2015. Full participation in the EU's 7th Research Framework Programs for R&D (since 2008) is an important first step, which opens prospects for additional funding in the medium term. Albania will be better positioned to participate in future EU FP7 programs based on ARTI's increased capacity and past advocacy work, which helped raise

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[31] The BRIC budget is to be financed by both international donor programs (EU through IPA -€2.87m and IFIs- €5m) through grants and soft loans, and Albanian state budget contributions. The total national contribution will be around €2.4m, or 23 percent of the total budget. This contribution covers staff and operational costs of BRIC as a department within AIDA.
[32] Project IPA (2007).

awareness and shared information on participation in research programs with the EU and other international partners. ARTI has organized training sessions, workshops, and FP7 information days. Electronic communication channels have also been used for dissemination purposes.

80. Albania also has ample experience in international cooperation in the broader fields of socio-economic development and higher education, through EU CARDS, Tempus Higher Education, Education Excellence, EU FP5, FP6, FP7, and Equity Projects financed by the World Bank, the European Investment Bank, and the Council of Europe Development Bank. The country has also engaged in multilateral cooperation with multiple agencies of the United Nations.

81. During 2005 - 2007, several agreements were signed. Of particular note is the project SEE ERA.NET, which has contributed to the enlargement of bilateral research cooperation. Albania has active bilateral agreements with Italy, Greece, Slovenia, and FYRO Macedonia, and is making intensive efforts to finalize such agreements with Austria, France, Croatia, Turkey, Montenegro, and Poland, although the scope of cooperation is still narrow and the implementation progress quite slow.

5. CONCLUSIONS: POLICY CHALLENGES AND PENDING REFORMS

82. Further sustained efforts are required at the national level to strengthen the research and innovation capacity and increase Albania's competitiveness. The level of investment in research remains very low and there is an ongoing need to strengthen the building of human capital. Efforts should be made to improve the integration of the R&D and innovation system through explicit programs to increase official and citizen understanding of the linkages between research, development, and innovation across key stakeholders. Moreover, based on the National Strategy of Science, Technology and Innovation, the Albanian government should continue and increase its efforts to:

- Improve the basic research infrastructure able to support sufficiently university training at three levels (BSc, MSc, PhD levels);

- Create scientific excellence in key research areas;
- Educate, retrain, retain, and attract qualified people into the Albanian research system;
- Strengthen links between science research organizations and the private sector to foster innovation as a basis for future growth and job creation; and,
- Improve public perception and understanding of science in order to generate improved awareness of the role of innovation and new technologies for society and the economy.

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ANNEX

Table A 1: Legal Framework for Scientific Research and Technological Development

Law on Science and Technological Development (1994), amended in 1998	Sets out the objectives of S&T policy, including incentives for global integration of national R&D and measures to encourage privatization. Defines the main functions of the Committee for Science and Technology, currently performed by the Ministry of Education and Science, with a very limited number of staff assigned to design S&T policy and develop national R&D programs needed to implement the policy.
Law on Higher Education (amended in 2007)	Regulates the activities of universities and faculties, the establishment and work of managing bodies, appointments and promotions of teaching staff, etc. The role of university, its scope of work and basic work conditions and objectives are regulated by laws, while the overall organization and activities are more closely elaborated by their statute.
Law and Statute of the Academy of Sciences, Nr.9182, 2nd May 2004	Regulates the activity of Academy of Sciences of Albania and its scientific institutes and research centers.
Law No. 7819 on Industrial Property (1994), amended by Law No. 8477 (1999)	Regulates industrial property, trademarks, and industrial designs. These fields are also partly regulated by the Penal Code, Civil Code, Penal Procedure Code, Civil Procedure Code and Customs Code Law No. 8449 (1999).
Law on Copyright No. 7564 (1992), amended by Law No. 7923 (1995), Law No. 8594 (April 2000) and Law No. 8630 (July 2000).	Regulate copyright and related rights. Those fields are also partially regulated by the Council of Ministers' decision Act No. 309 (2000) on "User's Tariffs," as well as in parts of the Penal Code, Civil Code, Penal Procedure Code and Civil Procedure Code.
Law No.9741, 21st May 2007	For the Higher Education in Republic of Albania
Law No. 7819 27th April 1994	On Industrial Property
Law on No. 8488 13th May 1999	Protection of Topographies of Integrated Circuits
Council of Ministers Decision Act, No.313, 13th June 2000	Functioning of Albanian Patent and Trademark Office
Council of Ministers Decision Act, No. 568, 23rd October 1995	Fees of Albanian Patent Office for Industrial Property Objects
Law No. 9648, 27th November 2006	On the accession of the Republic of Albania to Hague Act of the Hague Agreement concerning the international registrations of industrial designs

Box A 1: Policy initiatives in the National Strategy of Science, Technology and Innovation –Selected Programs

According to the National Strategy of Science, Technology and Innovation as of 2009:

The budget for scientific research and higher education was 2.2 times higher than that for 2005. For the first time, the higher education budget reached USD 100 million in 2009, of which USD 6 million are for "institutional funding" of scientific research (compared to USD 800,000 in 2005).

The only research-funding program is a small scale competitive funding program (currently 56 projects for a total budget of USD 5.4 million, implemented over 2–3 years, 2008-2019), run by MoES.

The World Bank has funded the equipping of teaching laboratories, which were funded under the Education Excellence and Equity Project financed by the World Bank, the European Investment Bank and the Council of Europe Development Bank.

Through the medium-term plan (2008–2009) of the Brain Gain Program (co-financed by UNDP), the Albanian Government has for the first time mobilized funds from the State Budget and opened 550 vacancies in higher education and scientific research institutions.

For the first time, the Albanian government implemented in 2007 a program for PhD studies "'The Excellence Fund," which supports the best PhD candidates to partially or fully complete PhD studies abroad. A total of 45 PhD students were supported by this fund during 2007.

As indicated in the Strategy, the government funding of research may also be carried out through a number of other line ministries and public organizations, directly or indirectly involved in research and innovation policies or activities, or both. These, in particular, include the following:

The Ministry of Agriculture funds activities in the field of applied research and technology transfer. The activities are carried out by six Centers for Transferring Agricultural Technologies (QTTB) dependent on the ministry. The ministry has a consolidated extension program implemented through cooperation with the QTTB and other research structures.

The Ministry of Defense envisages the intensification of R&D activities for security and defense as part of a long-term plan for the Development of Military Forces 2020.

The Ministry of Health has its own research agenda related to the improvement of health services.

The Ministry of Economy is planning to establish a Center for Innovation that would provide services to enterprises related to innovation and technology transfer.

Table A 2: Statistical Profile

	ALBANIA	WBC	EU-27
ECONOMY & BUSINESS ENVIRONMENT			
GDP (2010)	€8,872 M	€15,523 M	€12,279,401 M
GDP per Capita (2011)	€3,080	€4,454	€23,400
Population (2011)	2,831,741	22,832,917	502,404,702
Exports to GDP ratio (2010)	12.0	19.2%[33]	-
Imports to GDP ratio (2010)	36.5	40.3%[34]	-
Trade to GDP ratio (2010)	48.5	60.5%[35]	-
Net Foreign Direct Investment, % GDP (2011)	10.25 (inflows)	4.92 (inflows)	2.86 (outflows)
HUMAN CAPITAL AND RESEARCH & DEVELOPMENT (R&D)			
Gross Domestic Expenditure on R&D, % GDP (2009)	0.15	0.33[36]	2.03
Researchers[37] per Million Population (2010)	245	787[38]	3,166[39]
University-Industry Collaboration Rank 2012 (of 144 countries)[40]	139	88[41]	40[42]
TECHNOLOGY TRANSFER & INFRASTRUCTURE			
Percentage of Enterprises with Internationally Recognized Quality Certification (2009, Enterprise Survey)	24.6	19.3[43]	-
Percentage of Firms Using Technology Licensed from Foreign Companies (2009, Enterprise Survey)	38.6	25.7	-
Royalties & License Fees Payments, % GDP (2011)	0.10	0.23[44]	0.58
Royalties & License Fees Receipts, % GDP (2011)	0.10	0.09[45]	0.42
Internet Users per 100 People (2011)	49	54[46]	72
Mobile Cellular Subscriptions per 100 People (2011)	96	106	125
Intellectual Property Protection Ranking 2012 (of 144 countries)[47]	94	95[48]	40[49]
S&T OUTPUTS AND INNOVATION PERFORMANCE			
Utility Patents Filed in the US per Million Population (2009)	0.31	2.8[50]	117
S&T Journal Articles per Million Population (2009)	2.7	125[51]	496
High-technology Exports, % Manufactured Exports (2010)	0.89	4.2[52]	15.3
Global Innovation Index Rank 2012 (of 125 countries)[53]	90	60[54]	24[55]
Trademark Applications per Million Population (2010, WIPO)	911	1,832[56]	130[57]

Note: If not indicated otherwise, indicators are from World Development Indicators (see footnotes). "-": Not available.

[33] Excluding Kosovo. (This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.)

[34] Ibid.

[35] Ibid.

[36] Average of UNESCO's available data for Albania, Bosnia and Herzegovina, Croatia, Serbia and FYR Macedonia for 2008-08.

[37] Full-time equivalents – one person-year for example 30% time spent on R&D would count as 0.3 FTE.

[38] Average of UNESCO's data on Albania, Bosnia & Herzegovina, Croatia, Macedonia, and Serbia.

[39] Average of World Development Indicators data on EU 27 countries

[40] Global Competitiveness Report 2012.

[41] Average of Global Competitiveness Report ranks for Albania, Bosnia, Croatia, FYR Macedonia, Montenegro, and Serbia.

[42] Average of Global Competitiveness Report data on EU 27 countries

[43] Average of Enterprise Survey data on Albania, Bosnia, Croatia, Kosovo, FYR Macedonia, Montenegro, and Serbia.

[44] Average of World Development Indicators data on Albania, Bosnia, Croatia, Macedonia and Serbia.

[45] Average of World Development Indicators data on Albania, Bosnia, Croatia, Macedonia and Serbia.

[46] Average of World Development Indicators data on internet users per 100 people in Albania, Bosnia & Herzegovina, Croatia, FYR Macedonia, Montenegro, and Serbia.

[47] Global Competitiveness Report 2012.

[48] Average of Global Competitiveness Report ranks for Albania, Bosnia, Croatia, FYR Macedonia, Montenegro, and Serbia.

[49] Average of ranks of the EU 27.

[50] Average of USPTO data on Albania, Croatia, Macedonia, and Serbia.

[51] Average of World Development Indicators data on Albania, Bosnia, Croatia, Kosovo, Macedonia, Montenegro and Serbia.

[52] Average of World Development Indicators' available data for Albania, Bosnia and Herzegovina, and Croatia for 2010.

[53] GII 2012 (INSEAD and WIPO).

[54] Average of ranks of 6 Western Balkan countries – Albania, Bosnia and Herzegovina, Croatia, Macedonia, Montenegro and Serbia.

[55] Average of ranks of the EU 27.

[56] Average of World Development Indicators data on Albania, Bosnia, Croatia, Macedonia, Montenegro and Serbia.

[57] Total trademark applications per million population in the EU 27 from World Development Indicators.

Table A 3: Broad share of available budgets by main categories of research and innovation measures

Broad category of research and innovation policy measure	Approximate total annual budget for 2010 (in euro)	Commentary
Governance & horizontal research and innovation policies	RDI strategy: TOTAL € 14.45m for 2010	Total planned budget of RDI strategy for 2009- 2015 is €151.95m 2010 breakdown: • Baseline funding for HEI research institutes €8.25m • Fund for research infrastructure €4m • Fund for centers of excellence in research €1.5m • Fund for new researchers/Research Eagles grants €0.2m • Fund for transfer of technology and innovation €0.15m • Agency for Research, Technology and Innovation €0.5m
Research and Technologies	ARTI: TOTAL €1m for 2010 "National Programs of Research and Development" and "Bilateral Programs" totaling 140,000,000 ALL (€1,015,965.16, of which Bilateral cooperation with Slovenia is valued at €36,284.47 in 2010)	ARTI began operating in 2010 National Programs for Research and Development Budget 2010 – 2012 (planned) • Social Sciences and Albanology (€366,959.3 or 51,000.000 ALL) • Information Systems and Technologies (ICT) (€575,622.4 or 80,000.000 ALL) • Biodiversity and the Environment (€352,568.7 or 49,000.000 ALL) • Agriculture (veterinary, zoo-technical), Food and Biotechnology (€568,427.1 or 79,000.000 ALL) • Health (€330,982.9 or 46,000.000 ALL) • Water and Energy (€338,178.1 / 47,000.000 ALL) • Materials (€230,249 or 32,000.000 ALL)
Human Resources (education and skills)	Total €279,131 for 2010	Brain Gain program for 2010. Actual expenditures • Project Total: $1,000,000, of which UNDP • Contribution $300,000 & Donor Funding • Sought $700,000) April 2006-Dec. 2011, to continue in 2012-2013. • Also note above under NSSTI: Basic funding for HEI research institutions **€8.25m for 2010** • Fund for new researchers/Research Eagles grants **€0.2m**
Promote and sustain the creation and growth of Innovative enterprises	Business Innovation and Technology Strategy (BITS): supposed to start in June 2011	€10m over a 6-year period. Budget only for 2011: • Awareness Raising €28,650 • Business Innovation Services €182,650 • Innovation Fund €355,200 • Clusters Program 2012 start-up €141,650 • Incubation Program 2012 start-up €82,500 **TOTAL for 2011: €566,500**
Markets and innovation culture	No specific initiatives can be determined	See above—awareness raising –BITS as promoted by the BRIC is supposed to promote an innovation culture among SMEs

Source: Pro Inno Europe/ Inno Policy Trendchart (2011)

Table A 4: Innovation budgets of the main government departments and agencies

Name of the Organization	Number of staff Responsible for innovation measures (% of total)	Innovation budget Managed (2011)	Estimated share of budget earmarked for specific policy measures
Minister of Innovation, Technology, of Information and Communication (MITIC)	12 of 12 (100%)	---	----- • Digital Albania
The Albanian Investment and Development Agency (AIDA)	20 of 20 (100%)	€ 29,061,870 (201028)	AIDA € 29,061,870 • From this: • Support for SMEs €26,475 (Loan) • Institutional Support for BITS €2,587,050 (Loan)
Business Relay and Innovation Centre (BRIC)	BRIC is under AIDA 5 of 20 (25%)	• €566,500	• Awareness Raising €28,650 • Business Innovation Services €182,650 •Innovation Fund €355,200
ARTI	3 of 15 (20%)	€431,65429 (2010 – 2012)	• National Research and Development Program: Information Technology €431,654
NAIS	40 of 40 (100%)	€5,065,514.28	• Computer equipment for ministries and government agencies €142,800 • VAT payment for computer equipment for ministries and government agencies €142,800 • Purchase of office equipment €14,200 • Agreement with Microsoft €750,000 • Total 2009: €1,050,000

Source: Pro Inno Europe/ Inno Policy Trendchart (2011) Available information regarding MITIC is partial.

Table A 5: FP7 proposals and success rates

	Number of eligible proposals with at least one applicant in country					Number of proposals retained for funding (Main listed) in calls with closure in reference year					Success rates				
	All FP7	2007	2008	2009	2010	All FP7	2007	2008	2009	2010	All FP7	2007	2008	2009	2010
AL - Albania	148	77	29	32	10	24	6	5	9	4	16%	8%	17%	28%	40%
BA – BiH	155	78	24	41	12	23	8	4	6	5	15%	10%	17%	15%	42%
HR - Croatia	878	331	233	252	61	138	50	34	35	19	16%	15%	15%	14%	31%
MK - FYR Macedonia	271	113	66	68	23	47	19	14	7	6	17%	17%	21%	10%	26%
ME - Montenegro	111	51	27	26	7	24	8	9	3	4	22%	16%	33%	12%	57%
RS - Serbia	836	323	198	263	49	114	40	27	33	14	14%	12%	14%	13%	29%
Sum SEE countries	19,416	8,006	4,965	5,374	1,035	3,238	1,190	742	1,012	290	17%	15%	15%	19%	28%
Sum Baltic countries	2,466	1,094	606	615	144	552	212	141	156	42	22%	19%	23%	25%	29%
All EU27 countries	45,544	14,632	14,680	14,377	1,855	9,470	2,931	2,581	3,407	551	21%	20%	18%	24%	30%

Source: Rivera Leon & Reid (2010)

Table A 6: FP7 proposals and success rates

	Participant EC Contribution (only in signed contracts of calls closed in reference year)		Applicant Requested EC Financial Contribution (cumulative, not only of signed agreements)		Share of signed contracts in requested contributions	
	All FP7	2007	2008	2009	All FP7	
AL - Albania	765,652	369,800	167,244	228,608	1,505,469	51%
BA - BiH	1,217,869	668,482	158,073	391,314	1,409,863	86%
HR - Croatia	18,206,608	8,783,021	7,483,541	1,940,046	28,012,392	65%
MK - FYR Macedonia	5,414,426	2,175,478	2,779,948	459,000	7,511,762	72%
ME - Montenegro	858,821	368,436	458,385	32,000	2,413,771	36%
RS - Serbia	16,447,410	10,062,498	4,124,798	2,260,114	27,406,094	60%
Sum SEE countries	525,881,138	273,144,167	154,255,017	98,481,954	815,630,228	64%
Sum Baltic countries	59,993,584	30,375,922	20,279,471	9,338,191	90,965,830	66%
All EU27 countries	15,941,623,108	6,248,486,973	4,118,181,974	4,609,196,801		

Source: Rivera Leon & Reid (2010)

Table A 7: IPA Programs per component

Component	2007	2008	2009	2010	2011	2012
Transition Assistance and Institution Building	54,3	62,1	70,9	82,7	84,3	85,9
Cross-border Co-operation	6,6	8,5	10,2	10,4	10,6	10,9
TOTAL	61,0	70,7	81,2	93,2	95,0	96,9

Source: *http://ec.europa.eu/enlargement/potential-candidates/albania/financial_en.htm*