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URUGUAY

BUSINESS INNOVATION AND ENTREPRENEURSHIP PROGRAM II
(UR-L1158)

SECOND INDIVIDUAL OPERATION UNDER THE CONDITIONAL CREDIT LINE FOR INVESTMENT PROJECTS (CCLIP) TO PROMOTE INNOVATION, ENTREPRENEURSHIP, HUMAN CAPITAL, AND RESEARCH
(UR-O1153)

LOAN PROPOSAL

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3. Environmental and social management report
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ABBREVIATIONS

ANII	Agencia Nacional de Investigación e Innovación [National Research and Innovation Agency]
CCLIP	Conditional Credit Line for Investment Projects
CONICYT	Consejo Nacional de Innovación, Ciencia y Tecnología [National Innovation, Science, and Technology Council]
EAIs	Encuestas de Actividades de Innovación [Surveys of Innovation Activities]
ERP	Enterprise resource planning system
LBR	Loan based on results
LIBOR	London Interbank Offered Rate
OECD	Organisation for Economic Co-operation and Development
PENCTI	Plan Estratégico Nacional de Ciencia, Tecnología e Innovación [National Strategic Plan for Science, Technology, and Innovation]
R&D	Research and development
RICYT	Red de Indicadores de Ciencia y Tecnología Iberoamericana e Interamericana [Network of Ibero-American and Inter-American Science and Technology Indicators]
TFP	Total factor productivity

PROGRAM SUMMARY

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<table>
<tr><th colspan="5">Financial Terms and Conditions</th></tr>
<tr><td colspan="3">Borrower:</td><td colspan="2" rowspan="3">Flexible Financing Facility[a]</td></tr>
<tr><td colspan="3">Eastern Republic of Uruguay</td></tr>
<tr><td colspan="3">Executing Agency:</td></tr>
<tr><td colspan="3" rowspan="4">National Research and Innovation Agency</td><td>Amortization period:</td><td>25 years</td></tr>
<tr><td>Disbursement period:</td><td>3 years</td></tr>
<tr><td>Grace period:</td><td>5.5 years[b]</td></tr>
<tr><td>Interest rate:</td><td>LIBOR-based</td></tr>
<tr><td>Source</td><td>Second loan (US$)</td><td>%</td><td>Credit fee:</td><td>[c]</td></tr>
<tr><td>IDB (Ordinary Capital):</td><td>30 million</td><td>100</td><td>Inspection and supervision fee:</td><td>[c]</td></tr>
<tr><td rowspan="2">Total:</td><td rowspan="2">30 million</td><td rowspan="2">100</td><td>Weighted average life:</td><td>15.25 years</td></tr>
<tr><td>Approval currency:</td><td>United States dollar</td></tr>
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<table>
<tr><th>Program at a Glance</th></tr>
<tr><td>Program objective: The program's general objective is to increase public and private investment in research and innovation activities. The specific objectives are to: (i) expand the supply of applied knowledge geared toward productive and social challenges; (ii) increase the availability of financing for business innovation; and (iii) strengthen ANII's institutional capacities.
The program is the second individual operation under the CCLIP, approved by the Board of Executive Directors via Resolution DE-58/17.</td></tr>
<tr><td>Special conditions precedent to the first disbursement of the loan proceeds: These are: (i) the entry into effect of the agreement between the borrower and executing agency for the execution of program resources and activities, in terms satisfactory to the Bank; (ii) presentation of evidence that the program Operating Regulations have entered into effect, in accordance with the terms previously agreed upon with the Bank; and (iii) the contracting of the consulting firm tasked with the external validation of the program's outcomes, in accordance with the terms agreed upon with the Bank (paragraph 3.6).</td></tr>
<tr><td>Special contractual condition for execution: The executing agency will obtain the Bank's no objection prior to approving specific projects for amounts in excess of US$150,000 (paragraph 3.7).</td></tr>
<tr><td>Exceptions to Bank Policies: None.</td></tr>
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<tr><th colspan="4">Strategic Alignment</th></tr>
<tr><td>Challenges:[d]</td><td>SI ☐</td><td>PI ☑</td><td>EI ☐</td></tr>
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(a) Under the terms of the Flexible Financing Facility (document FN-655-1), the Borrower has the option of requesting changes to the amortization schedule, as well as currency and interest rate conversions. The Bank will take operational and risk management considerations into account when reviewing such requests.

(b) Under the flexible repayment options of the Flexible Financing Facility, changes to the grace period are permitted provided that they do not entail any extension of the original weighted average life of the loan or the last payment date as documented in the loan contract.

(c) The credit fee and inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with the applicable policies.

(d) SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).

(e) GD (Gender Equality and Diversity); CC (Climate Change and Environmental Sustainability); and IC (Institutional Capacity and Rule of Law).

I. DESCRIPTION AND RESULTS MONITORING

A. Background, problems addressed, and rationale

1.1 **Background.** Uruguay faces the challenge of making its recent growth sustainable. To this end, it must focus on closing the productivity gap separating it from the more advanced countries.[1] Addressing this challenge calls for implementing initiatives that promote sustained productivity growth, which is partially achieved by stepping up promotion of business innovation through long-term science, technology, and innovation policies focused on the needs of the productive sector.

1.2 To encourage businesses to innovate more, the Uruguayan government arranged a Conditional Credit Line for Investment Projects (CCLIP) with the Bank in the context of the National Strategic Plan for Science, Technology, and Innovation (PENCTI). The CCLIP, which provides for US$100 million over the period 2017-2027, will finance technical and financial support to the National Research and Innovation Agency (ANII).[2] This program, for US$30 million, is the second individual operation under the CCLIP and is a loan based on results (LBR).

1.3 **Economic context.** The Uruguayan economy has enjoyed more than a decade of uninterrupted growth (4.3% annual growth between 2005-2018, and annual growth over 2.5% since 1960).[3] This growth, driven by investment and exports,[4] has occurred in a favorable international context. Total factor productivity (TFP) also posted annual growth of 1.6%.[5] Since 2012, however, the growth of the Uruguayan economy has slowed. In the less favorable international and regional context of 2012-2018,[6] annual economic growth was only 2.5%, while TFP growth contracted by 1%. Recovering TFP growth is critical in the new context: while the correlation between the accumulation of productive factors and GDP growth is 0.46, the correlation between TFP growth and GDP is 0.94.[7]

1.4 The challenge for sustaining TFP growth is to increase the contribution from innovation. The share of research and development (R&D) investment in TFP growth is 17% in Uruguay, compared to a share of 40% previously attained by more advanced countries when they were at a stage of development comparable to Uruguay's[8] (IDB, 2016). A greater contribution from innovation is needed to converge toward the productivity frontier. Recent studies using microeconomic

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1 In 2014, Uruguay's total factor productivity (TFP) was 67% of TFP in the United States, which is seen as the benchmark for the technology frontier (Feenstra, Robert C., Robert Inklaar, and Marcel P. Timmer (2015), The Next Generation of the Penn World Table*,* American Economic Review, 105(10), 3150-3182). TFP is the growth that is not explained by factor accumulation (OECD, 2014). See Sector Technical Note: Competitiveness and Innovation. Implications for Uruguay.

2 ANII provides funds for research, human capital, innovation, and entrepreneurship for the private and public sector.

3 Central Bank of Uruguay (2019).

4 Which increased by 5.3% and 4.3% per annum, respectively, during the 2005-2018 period (Central Bank of Uruguay, 2019).

5 Country Development Challenges (IDB, 2019).

6 During 2005-2011, growth of exports slowed to 1.2%, while investment saw practically no growth during 2012-2018 (IDB, 2019).

7 Technical Note IDB-TN-936 (IDB, 2016).

8 The comparators are Finland, Israel, Singapore, and South Korea (IDB, 2016).

data from Uruguay find that firms that invest in innovation achieve higher growth of productivity (3.5%), exports (14%), and employment (4.3%) than similar firms that do not.[9]

1.5 **The problem.** The national innovation system[10] has strengths as well as weaknesses. Its strengths include a solid institutional and legal framework, and sound information technology infrastructure. However, the country invests very little in R&D, even as growth increased from 0.34% of GDP in 2005 to 0.49% of GDP in 2017, driven by public investment. Indeed, the proportion of private investment to total investment fell from 38% in 2005 to 24% in 2017.[11] Uruguay's limited investment in R&D is even more pronounced when compared with similar countries, i.e. small, remote countries whose production is based on natural resources. Statistics show that the country's total R&D investment is outpaced by that of Estonia, New Zealand, and Norway by a factor of three, four, and five, respectively. Two remarkable stylized facts are seen in those countries: first, in all three cases, the public sector already invests more than the private sector in innovation (which is also the case in Uruguay); but secondly, innovation has been accompanied by public effort, which has not occurred in Uruguay.[12] This suggests important differences not only in the amount of public effort but also the quality of that effort and its role in promoting increased private investment.

1.6 The aggregate figures for investment in innovation have their corollary among businesses. The typical Uruguayan business invests 1.27% of sales in innovation, substantially less than in the OECD countries (3.67%). Also, OECD countries allocate 65% of innovation investment to R&D and 22% to capital goods, while in Uruguay it is the reverse: capital goods account for 74%, and R&D represents only 8%. This means that the intangible component, specifically R&D, accounts for nearly the entire investment gap. Accordingly, if Uruguay hopes to move closer to the technology frontier, businesses' R&D investment should be expected to increase more than proportionally. An additional aspect of innovation investment calling for attention is the limited external R&D, which are the efforts conducted in collaboration with other system stakeholders. In Uruguay, only 1.7% of businesses' investment goes to external R&D, while in OECD countries the figure is 10 times higher. Increased collaboration would better leverage the knowledge created by public institutions involved in R&D.

1.7 Significant shortcomings of the national innovation system explain much of the gap in innovation investment between a typical Uruguayan business and its OECD counterpart. Obstacles relating to institutions' science, technology, and innovation capabilities—including limited infrastructure, rigidity in cooperating with industry, and lack of focus on national challenges in the context of research projects[13]—account for 33% of the gap. Second in importance, at 28%, are the size and

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9 Country Development Challenges (IDB, 2019).

10 SNI is the "network of public and private institutions that absorb, improve, and disseminate new technologies" (Freeman, 1995).

11 ANII, Boletín de Indicadores [Bulletin of Indicators], available at: www.anii.org.uy.

12 Main Science, Technology, and Innovation Indicators (OECD, 2019).

13 An analysis of public spending for R&D indicates that 45% is focused on specific missions. While this figure is above the 42% regional average, it is still well below the 71% average for the OECD countries (IDB, 2017).

buoyancy of the market, which are too limited to influence investment decisions.[14] Third, at 21%, are innovators' difficulties appropriating the results of their innovations. Last in line are access to financing (11%) and access to human capital and information (7%).[15] Note that this ranking is indicative, since 60% of businesses face combinations of multiple obstacles. Addressing these gaps calls for long-term policies with stable funding to develop institutional capacities (CCLIP theory of change).

1.8 To address the problem described, this second individual operation under the CCLIP will focus on two challenges: (i) generating scientific and technological knowledge to respond to productive and social needs, by supporting young and consolidated researchers; and (ii) improving incentives to individual and collaborative innovation for Uruguayan businesses. The institutional strengthening of ANII will continue in areas that have not yet been addressed, such as the impact evaluation capacity of instruments that support business innovation and direct support for firms. These activities will build on the efforts of the first operation (loan contract 4329/OC-UR for US$25 million), which focused on early-stage financing for innovation, with particular emphasis on young firms with innovation potential, support for the supply of advanced human capital, and the strengthening of ANII capacity related to its institutional strategy and business practices.[16]

1.9 **Limited capacity to apply knowledge.** The growing public effort in investment in R&D, in which ANII plays an important role,[17] has led to increased knowledge production in Uruguay. The number of articles published in peer-reviewed scientific journals increased from 671 in 2007 to 1,564 in 2016 (Network of Ibero-American and Inter-American Science and Technology Indicators (RICYT), 2019). The number of researchers also increased, from 2,329 in 2007 to 2,641 in 2017 (RICYT, 2019). However, the evidence shows that the productive application of this knowledge, approximated by the number of publications required to produce a patent, is still limited: 55.8 in Uruguay compared to 2.2 in the OECD countries (RICYT, 2019). This is due in part to the allocation of far greater resources to basic research than to applied research. Also, the performance of Uruguayan research centers is limited by lack of technological infrastructure and weak capacities for the transfer of knowledge. A recent study[18] found that 87% of units dedicated to R&D are in need of new equipment, not only to replace old equipment but also to undertake new lines of research enabling them to provide services to businesses. The researchers consulted also indicated the need for new mechanisms to promote more efficient assessment of knowledge and transfer of technology.

[14] This shortcoming is being addressed by a series of programmatic policy-based loans: the Program for Strategic International Positioning (operations 2920/OC-UR, 3365/OC-UR, and 3418/OC-UR) and the Investment, Trade, and Innovation Framework Modernization Program (operation UR-L1140).

[15] Country Development Challenges (2019), Chapter 3. The lack of access to advanced human capital and early-stage financing for innovative startups are being addressed by the Business Innovation and Entrepreneurship Project (operation 4329/OC-UR), under the first tranche of the CCLIP.

[16] The approval of two additional operations under CCLIP UR-O1153 is anticipated by 2027, which would fully exhaust the US$100 million approved under the CCLIP.

[17] Between 2008 and 2018, ANII financed more than 4,000 projects at Uruguayan research centers for a total of US$117 million.

[18] Batista B. et al. (2012), Relevamiento Nacional de Equipamiento Científico Tecnológico [National Survey of Scientific and Technological Equipment].

1.10 **Market defects and innovation in Uruguayan businesses.** The inability to fully appropriate knowledge that is generated is an important limitation for at least one of every five potentially innovative businesses in Uruguay.[19] The problem stems from the status of knowledge as a public good, which discourages businesses from investing in knowledge. The impact of this problem varies for individual innovation projects, and is most apparent in the early stages of innovation, when knowledge is more generic and its applicability less certain. While these externalities justify public support for business innovation, it is important to align the amount of support with the life cycle of the innovation. While ANII's instruments supporting innovation are suited to this approach, the process should be deepened. To date, only 9% of innovative businesses have received any type of public support for innovation, well below the figures of up to 50% for the OECD countries.[20]

1.11 At the same time, the acceleration and increased complexity of technological change are transforming business innovation models. Open innovation models, in which firms actively collaborate with other actors of the ecosystem, are becoming increasingly widespread. Yet open innovation is still the exception in Uruguay,[21] as evidenced by the fact that only 1.7% of private investment in innovation is from external sources, and barely 7% of firms actively collaborate on innovation with science and technology institutions. Information asymmetries, misaligned incentives, and low levels of social capital inhibit broader dissemination of open innovation models in Uruguay. Consequently, public policies are needed to promote the deepening of open innovation models.

1.12 **The Bank's experience and lessons learned.** The design of this program incorporates the Bank's lessons learned in similar operations in the region. Specifically, the review of the Innovation, Science, and Technology Sector Framework Document (document GN-2791-8), which examined 15 Bank projects in 14 countries, identified a number of lessons that are relevant to the program: (i) in the current context of accelerated technological change, according highest priority to investment in innovation is critical; (ii) leveraging the capacities of the institutions participating in national innovation systems is key for the effective implementation of programs to promote innovation; (iii) instruments used to promote innovation should foster multisector collaboration; for example, through the creation of funds in which innovation agencies and sector ministries (e.g. energy, health, and agriculture) participate; (iv) promotion instruments should be designed with a view to expanding the base of innovative firms; and (v) rigorous evaluations are critical to establishing evidence of outcomes and impacts.

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[19] According to the Uruguayan National Institute of Statistics, in 2017 there were 182,564 legal entities economically active in the private sector, of which 155,941 had fewer than 4 employees, 20,519 had between 5 and 19, 5,267 had between 20 and 99, and the remaining 837 had 100 or more employees. According to the Innovation Activities Survey (EAI) for the period 2013-2015, the percentage of businesses conducting innovation activities was 31% for industry and 25% for services.

[20] Country Development Challenges (2019), Chapter 3.

[21] Grandes empresas + startups = nuevos modelos de innovación: tendencias y desafíos en América Latina [Large Businesses + Startups = New Innovation Models: Trends and Challenges in Latin America] Hugo Kantis. First edition. Rafaela: Asociación Civil Red PyMES Mercosur, 2018.

1.13 The design of this program also took into account ANII knowledge and lessons learned in managing, monitoring, and evaluating its instruments promoting research and innovation, which have been supported by the Bank.[22] With respect to research, the experiences most relevant to this program are the María Viñas Fund and sector funds, which have supported 747 research projects between 2008 and 2018.[23] A recent evaluation of the María Viñas Fund found that approximately 40% of its projects generated knowledge for social or production-related applications. Half of these already have specific applications, while the other half will require additional resources or support from government entities or businesses to move forward with application (ANII, 2016). In terms of improving applicability, one of the lessons learned from the María Viñas Fund is that the candidates' project proposal forms should identify the strategies to be used to transfer the new knowledge generated, and those strategies should be evaluated by experts in the field of applied knowledge rather than academicians. Regarding sector funds, which finance research projects to address sector priorities, another lesson learned is that ANII should maintain ongoing dialogue with the stakeholders that define the sector agendas (i.e. ministries, agencies, institutions, and public corporations) in an effort to make them increasingly specific and relevant. In addition, the sector funds mechanism should also be used to facilitate the exchange of results and provide human resources training. Finally, a third lesson learned is that support aimed at strengthening research infrastructure should follow a broad approach, including not only the procurement of new equipment, but also update and upgrade existing equipment, training of specialists, and related small-scale works. These three lessons were incorporated into the program for the design of instruments (e.g. Operating Regulations, terms of reference, and forms used in competitive procedures) and in the management practices of ANII executives.

1.14 ANII has also generated important knowledge in the area of innovation. Since its founding in 2007, ANII has financed 697 individual innovation projects and 75 collaborative projects[24] whose positive impacts have been demonstrated. In fact, a quasi-experimental impact evaluation of businesses supported by ANII found that its support effectively boosted R&D investment, which was 230% higher than that of nonbeneficiary firms (ANII, 2017).[25] Strictly from an operational standpoint, a first lesson learned by ANII is the importance of having instruments

[22] The Bank provided technical and financial support to ANII through the Technology Development Program II (loan 2004/OC-UR), approved in 2008 for US$34 million; the Program to Support Future Entrepreneurs (loan 2775/OC-UR), approved in 2012 for US$8 million; the Innovation Program for Productive Development (loan 3315/OC-UR), approved in 2014 for US$40 million; and the Business Innovation and Entrepreneurship Project (loan 4329/OC-CR), approved in 2017 for US$25 million, which was the first operation under the CCLIP to Promote Innovation, Entrepreneurship, Human Capital, and Research (UR-O1153).

[23] Chapter 3 of the 2018 monitoring report, prepared by ANII's Evaluation and Monitoring Unit, details the number of research projects submitted and approved, the corresponding areas of knowledge, regional distribution, and profiles of the researchers supported.

[24] Chapter 1 of the 2018 monitoring report, prepared by ANII's Evaluation and Monitoring Unit, details the number of innovation projects submitted and approved, the corresponding sectors, regional distribution, and information on the businesses and institutions supported.

[25] These results are in line with those obtained in the impact evaluations of similar programs implemented in other countries of the region with levels of development and production-related structures similar to Uruguay's. For a summary of those evaluations, see: Rethinking Productive Development: Sound Policies and Institutions for Economic Transformation, Chapter 3, IDB (2014).

that address the different innovation-related needs of businesses, from building capacity to developing prototypes and launching them on the market. Also, the firms' access to ANII instruments should be simple, ideally through platforms and managers who connect the firms' challenges with the different types of support available. In regard to collaborative projects, a second lesson learned is that identifying and preparing these projects requires ANII to take on a significant coordination role. This role becomes even more important when there are a large number of participants, as with technology centers, for example, or if the private sector is not well organized. In the case of technology centers, it has been observed that the time required for them to achieve sustainability varies in each case, with longer lead times seen in the more traditional sectors. The design of instruments for the second component of this program takes those lessons into consideration.

1.15 The program design also draws on experience with the first operation under the CCLIP, which achieved results in terms of early outputs and outcomes, and has demonstrated the effectiveness of the LBR instrument.[26] Specifically, the design of the current program's main results indicators is based on the performance of indicators from the first operation. Lastly, the program design incorporates the lessons learned from a series of policy-based loans under the Program for Strategic International Positioning (loans 2920/OC-UR, 3365/OC-UR, and 3418/OC-UR), that in small countries with productive bases that are structurally constrained, it is important that actions simultaneously address international market integration—to increase the size of the potential market and create higher-value market segments—and domestic innovation capacities, so as to access those markets and leverage the spillover effects of increased foreign investment in the domestic economy.

1.16 **The program's strategic framework is based on the PENCTI.** The general framework for the program is based on the National Strategic Plan for Science, Technology, and Innovation (PENCTI), which directs all institutions of the national innovation system, including ANII, to focus their operating and budget plans and promotion programs on the plan's priority objectives and areas. The PENCTI's mission is to facilitate the conditions necessary to ensure that knowledge and innovation become the fundamental drivers of economic and social development, increasing social investment in innovative activities. To this end, five objectives were defined for the period 2010-2030: (i) consolidate the scientific-technological system and its linkages to Uruguay's productive and social context; (ii) boost the competitiveness of productive sectors in the context of globalization; (iii) develop capacity and opportunities for promoting buy-in and ownership of knowledge and inclusive innovation; (iv) train and prepare the human resources required to build a knowledge society; and (v) develop a system for the planning, technological oversight and assessment, and evaluation of public policies and instruments in the area of science, technology, and innovation. The PENCTI prioritizes three fields of technology—i.e. information and communication technologies, biotechnology, and nanotechnology—and eight sectors or clusters of opportunities/problems, namely:

[26] The most important of which are financing of 95 projects supporting innovative businesses; six business incubators financed, and more than 100 grants for postgraduate studies in Uruguay and abroad. In regard to results indicators, a key success was the achievement of the targets defined for investment of own resources by the businesses supported.

software, information-processing and audiovisual services; human and animal health; agricultural and agroindustrial production; the environment and environmental services; energy; education and social development; logistics and transportation; and tourism. This program will further the achievement of PENCTI objectives (i) and (ii) by promoting the generation of new scientific and technological knowledge (Component 1) and supporting business innovation (Component 2), respectively. In addition, part of the program resources will address PENCTI priority areas and sectors.

1.17 **Strategic alignment.** The operation is aligned with the Update to the Institutional Strategy 2010-2020 (document AB-3008) through the challenge of increasing productivity and innovation, since the program will help promote the knowledge generation and innovation activities of businesses. It is also aligned with the crosscutting area of institutional capacity and rule of law insofar as it will help strengthen ANII institutional capacity, particularly in the evaluation of instruments and relationships with beneficiary businesses. The operation contributes to the Corporate Results Framework 2016-2019 (document GN-2727-6) through the indicators *number of micro/small/medium enterprises financed*; *number of micro/small/medium enterprises provided with nonfinancial support*; *number of students benefited by education projects*; and *number of government agencies benefited by projects that strengthen technological and managerial tools to improve public service delivery*. It is also consistent with the guidelines for updating the Innovation, Science, and Technology Sector Framework Document (document GN-2791-8) and with the priority area of the Sector Strategy: Institutions for Growth and Social Welfare (document GN-2587-2) concerned with strengthening institutional capacity to implement innovation policies. Lastly, the program is aligned with the IDB Country Strategy with Uruguay 2016-2020 (document GN-2836) in the priority area of promoting innovation and the strategic objective of promoting business innovation, and was included in the 2019 Operational Program Report (document GN-2948).

B. Objectives, components, and cost

1.18 The program's general objective is to increase public and private investment in research and innovation activities. The specific objectives are to: (i) expand the supply of applied knowledge geared toward productive and social challenges; (ii) increase the availability of financing for business innovation; and (iii) strengthen ANII's institutional capacities.

1.19 **Theory of change.** The theory of change comprises the analysis and connection of factors influencing the achievement of the expected policy changes. The program uses a result-driven financing model in which the expected changes are achieved with financial support (nonreimbursable contributions for research and innovation projects) and technical support (awareness-raising and advisory services for researchers and businesses). The conceptual basis of the interventions aims to effectively address the main obstacles to increasing businesses' investment in innovation, namely: (i) limited capacity to conduct R&D focused on solving social and production-related problems; (ii) lack of public and private financing for innovation activities; and (iii) strengthening institutional capacity. The source of these obstacles is the shortage of mechanisms to identify and connect users (e.g. businesses and communities) with actors that generate scientific and technological knowledge, as well as problems of information asymmetries, externalities, scale, and constraints on the collateralization of assets, which discourage greater private investment in innovation (theory of change and estimated cost). To address these challenges, the program is structured into three components and associated activities to produce the outputs, outcomes, and impacts are described below.

1.20 **Component 1. Support for generating new scientific and technological knowledge (US$11 million).** The outcome of this component will be the increased generation of new scientific and technological knowledge and the application of that knowledge to the productive sector and society. The following activities will be financed: (i) research projects in applied science and technology; (ii) sector research projects in science and technology; (iii) procurement and upgrading of sophisticated scientific and technological equipment, including the training of specialists to use them; (iv) postdoctoral grants in Uruguay; and (v) enhanced value for scientific and technological knowledge through the development of instruments to protect intellectual property. The program Operating Regulations detail the criteria for the selection of beneficiaries[27] and the operation of this component.

1.21 **Subcomponent 1.1. Research projects in applied science and technology.** This activity will promote the generation of new applied scientific-technological knowledge to help solve social and production-related problems. Nonreimbursable contributions of up to US$120,000 per project will be awarded through competitive selection. The projects will have implementation periods of up to 36 months. The beneficiaries will be young researchers and/or researchers in the process of consolidation, from Uruguayan public or private scientific or technology institutions. The projects will be selected by competition based on criteria of innovation, relevance, and technical quality (e.g. researcher's background, methodology, work plan, and valuation strategy). The expenses eligible for financing include the purchase of materials and inputs, minor equipment, hiring of support personnel, and technical services. This subcomponent is expected to support an estimated 56 applied projects in all areas of knowledge.[28]

1.22 **Subcomponent 1.2. Sector research projects in science and technology.** This activity will promote the generation of new scientific and technological knowledge geared toward resolving the challenges identified by the sector agenda committees.[29] Nonreimbursable contributions of up to US$420,000 per project will be competitively awarded, with implementation periods of up to 60 months. The beneficiaries must be researchers affiliated with Uruguayan public or private scientific or technological institutions. The projects will be selected competitively based on criteria of innovation, relevance, and technical quality (e.g. researcher's

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[27] The researchers to be supported will sign contracts with ANII detailing the parties' obligations and responsibilities.

[28] These areas will include life sciences and physical sciences, engineering and technologies, medicine and health, agricultural sciences, social sciences, and the humanities.

[29] The agenda committees, consisting of representatives of the ANII and partner organizations that contribute resources to each sector fund, are the entities that establish the thematic agendas to be addressed by the projects financed. A number of agenda committees have already been established in sectors including agriculture, energy, health, education, citizen security, and open data.

background, methodology, work plan, and valuation strategy). The expenses eligible for financing include the purchase of materials and inputs, small equipment, hiring of support personnel, and technical services. This subcomponent is expected to support an estimated 161 projects aimed at challenges identified in the sector agendas developed by ANII and its partner organizations.

1.23 **Subcomponent 1.3. Equipment for scientific and technological research.** The objective of this activity is to optimize the procurement, availability, use, and performance of equipment supporting scientific and technological research. It will finance three types of projects through competitive selection: (i) the procurement of major scientific equipment (e.g. microscopes, magnetic resonance imaging machines, lasers, high-performance computers, and spectrometers). The financing will be provided through a nonreimbursable contribution covering up to 80% of the cost of the equipment procurement projects, for a maximum of US$500,000; (ii) updating or upgrading of major equipment. The financing will be provided through a nonreimbursable contribution covering up to 80% of the cost of the projects, for a maximum of US$100,000; and (iii) training of technical personnel to operate and maintain major equipment. The financing will be provided through a nonreimbursable contribution of up to US$10,000. The beneficiaries must be divisions of Uruguayan public or private scientific or technological institutions. This subcomponent will finance an estimated 29 projects to be selected on the basis of relevance (e.g. dearth of equipment or the need to acquire equipment incrementally) and technical quality (e.g. rationale, maintenance plan, and operating environment characteristics).

1.24 **Subcomponent 1.4. Postdoctoral grants.** This activity will support postdoctoral studies at Uruguayan universities and research centers, thereby strengthening their research teams in specific areas in the medium term. Eligible candidates will be Uruguayan residents or foreign nationals who are university graduates and hold doctoral degrees. Nonreimbursable contributions of up to US$60,000 program will be offered on a competitive basis. The maximum implementation period for the grants will be 24 months. Candidates will be selected based on the following criteria: (i) academic background; (ii) reputation and performance of the institution and research group where the funded studies will be conducted; (iii) work plan; and (iv) contribution to closing talent gaps in strategic areas. This subcomponent will finance 25 professionals. The host institutions will be expected include the grant recipients in their research and development activities, taking advantage of the full range of research and innovation incentives available in Uruguay and supported by this program.

1.25 **Subcomponent 1.5. Development and application of knowledge.** This activity will support the development of locally produced scientific and technological knowledge that can be transferred to the productive sector and society in general. Nonreimbursable contributions will be offered through an open window to co-finance the preparation and submission of patent applications, utility models, and other documents to establish intellectual property rights abroad, with a maximum proposed execution period of up to 36 months. The benefit will cover up to 80% of the project costs, for a maximum of US$50,000. This subcomponent will finance 12 projects.

1.26 **Project evaluation, selection, and monitoring.** The projects to be financed by this component will be evaluated by project evaluation and monitoring committees consisting of external evaluators appointed by ANII's board of directors and approved by the National Innovation, Science, and Technology Council (CONICYT). The selection of committee members will be based on their technical and professional qualifications, and cover a wide range of productive activities and issues. All projects selected by the committees must be approved by ANII's board of directors. The researchers to be supported will sign contracts with ANII detailing the parties' obligations and responsibilities. Intellectual property matters will be governed by applicable national regulations establishing standard provisions to be included in terms of reference and other conditions applicable to competitive procedures and windows. ANII will monitor the projects and corresponding payments. With respect to projects with execution periods that extend past the loan disbursement period (paragraphs 1.22 and 1.31), the project designs will consider the need to achieve the results on which disbursements are based within the loan disbursement period. ANII contributions to such projects after the loan disbursement period has ended will be made with its own resources. Further details in this regard are provided in the program Operating Regulations.

1.27 **Component 2. Support for business innovation (US$18.5 million).** The outcome of this component will be increased financing available for business innovation. The following activities will be financed: (i) business innovation projects; and (ii) projects or initiatives to promote coordination on innovation among businesses, entrepreneurs, and scientific or technological institutions and centers. The program Operating Regulations set out the criteria for the selection of beneficiaries and the operation of this component.

1.28 **Subcomponent 2.1. Business innovation projects.** This subcomponent will support the strengthening of business innovation capacities, the technical validation of innovative ideas, prototype development, and the market launch of new products, services, and processes. Accordingly, this subcomponent will co-finance three types of projects: (i) projects to install or strengthen capacity for innovation, which may include training and technical assistance actions in innovation management, placement of specialized human resources, validation of technological ideas, and other areas; (ii) innovation projects targeting products (goods and services) or business processes; and (iii) projects to market innovations, including pilot testing, protection of intellectual property rights, and deepening of market linkages.

1.29 The projects will be selected through an open window mechanism based on criteria of economic feasibility (project costs/benefits and firm's financial capacity) and technical quality (e.g. capacity of project team, innovative merit, technical feasibility, and business plan). The selected projects will be supported with a nonreimbursable contribution covering up to 80% of the cost, for a maximum of US$400,000, and will have implementation periods of up to 36 months. Businesses that successfully complete innovation projects may access the marketing phase without undergoing an evaluation of innovative merit;[30] instead, the evaluation will focus primarily on the market opportunity identified. The criteria for success will include the idea, validated technically by ANII evaluators, and an

[30] The criterion of innovative merit will not apply to projects focused exclusively on capacity building.

analysis of the market opportunity for the innovation. The subcomponent will finance a total of 239 projects under the three modalities.

1.30 **Subcomponent 2.2. Projects or initiatives to promote coordination of innovation.** The aim of this subcomponent is to expand businesses' innovation efforts through improved coordination of those efforts with the supply of technological knowledge. Four types of collaborative projects will be supported: (i) partnerships: these projects will involve at least one private firm and one R&D center and will provide for activities to solve businesses' technology problems and/or develop innovative processes or products; (ii) sector technology networks: these projects will bring together relevant businesses and institutions in a priority value chain. Projects may include activities to identify technological bottlenecks, investigate solutions through R&D, transfer new technologies, train human resources, and disseminate good practices. Eligible networks will have at least three member entities, including private firms, chambers of commerce, and/or R&D centers, will have a membership agreement in place, and will have appointed a manager and legal representative; (iii) sector technology centers: these projects will create or upgrade[31] technology centers to strengthen innovation capacity and the competitiveness of the priority sectors and productive chains identified in the PENCTI. Eligible associations of businesses and institutions will account for a significant percentage of sector value added or exports, will be legally established, and will have a board of directors and manager with relevant experience; and (iv) open innovation projects: these projects will aim to solve problems and/or address demands presented by the public and/or private sectors in the form of challenges.[32]

1.31 The four categories of projects will be selected by means of an open window, based on criteria of relevance, economic and financial evaluation (i.e. impacts on competitiveness, sustainability through the sale of services and management of R&D, and financial capacity), and technical quality (e.g. the association's technological merit, technical feasibility, governance, and management capacity). The selected projects will be supported with a nonreimbursable contribution covering 80% of the cost, up to a maximum of US$4 million. The maximum execution period will be four years. An estimated 31 projects will be financed.

1.32 **Project evaluation, selection, and monitoring.** The projects to be financed by this component will be evaluated by project evaluation and monitoring committees consisting of external evaluators appointed by ANII's board of directors and approved by the CONICYT. The selection of committee members will be based on their technical and professional qualifications, and cover a wide range of productive activities and issues. All projects selected by the committees must be approved by ANII's board of directors. With respect to projects whose execution periods extend past the loan disbursement period (paragraphs 1.22 and 1.31), the project designs will consider the need to achieve the results on which

[31] The term center is used to mean a platform that promotes coordination between the technology supply and the businesses and business associations of a productive sector.

[32] The challenges are significant problems impacting the efficiency and/or quality of businesses' or institutions' products and services, and the solutions will be the innovative projects submitted by individuals, businesses, technology centers, universities, and other entities that generate knowledge individually or collectively.

disbursements are based within the loan disbursement period. Once the loan disbursement period has ended, ANII contributions to those projects will be made with its own resources. Further details are provided in the program Operating Regulations.

1.33 **Component 3. Strengthening institutional capacity (US$500,000).** The outcome of this component will be strengthened institutional capacity at ANII, particularly in evaluating promotion instruments and encouraging businesses to innovate. The component is also expected to help strengthen program capacity in results-based management. The following activities will be financed: (i) professional team activities to promote innovation support instruments among businesses; (ii) design and implementation of a methodology to evaluate the impact of innovation support instruments; (iii) technical audits to verify disbursement milestones, in accordance with the requirements established in the implementation and management plan (paragraph 3.5); and (iv) financial audits.

C. Key results indicators

1.34 **Beneficiaries.** The program will benefit two main groups of beneficiaries. The first group are researchers at Uruguayan public and private scientific and technology institutions. Through the various instruments set out in Component 1, the program aims to provide direct support (nonreimbursable contributions and grants) to an estimated 450 researchers. The second group of beneficiaries are businesses interested in pursuing innovation activities. Accordingly, the instruments set out in Component 2 (nonreimbursable contributions) aim to support an estimated 300 businesses.

1.35 **Anticipated impacts, outcomes, and outputs.** The program will produce positive impacts on private investment in innovation and labor productivity.[33] It is anticipated that the beneficiary businesses will boost labor productivity by 13% in comparison with a control group. Private investment in R&D among those businesses is likewise expected to increase by 220% more than among nonbeneficiaries.

1.36 In line with these impacts are a set of expected outcomes, some of which will serve as triggers for program disbursements, and others for monitoring purposes. Indicators for the former include: (i) patent applications submitted by ANII-supported research institutions; (ii) investment leveraged by ANII partners in research projects, procurement and upgrading of equipment, and human resources training; (iii) investment leveraged by the program's participating businesses; (iv) coordination initiatives designed and approved by ANII; and (v) new businesses supported by ANII. The additional outcomes indicators used for monitoring are: (vi) increase in the average number of papers by supported researchers published in scientific and technological journals; (vii) percentage of women-led research projects supported by the María Viñas Fund and sector funds; and (viii) businesses' annual invoices (income from sales) (see Annex II and monitoring and evaluation plan).

1.37 **Economic evaluation.** A cost/benefit evaluation was conducted over a 13-year horizon on an aggregate basis and by component. The evaluation identified a positive net present value of US$42 million for the program, and an internal rate of

[33] These impact indicators apply to all operations under the CCLIP.

return of 27%, which is above the 12% annual discount rate used by the Bank. The evaluation by component identified an internal rate of return of 14% for the first component and 30% for the second. The results are robust to sensitivity analyses for the key program parameters, namely: business survival rate, gross operating margin, percentage of postgraduate students who complete their degrees, discount rate, and GDP growth rate (program economic analysis).

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing instruments

2.1 The amount of this second individual operation under the CCLIP (UR-O1153) is US$30 million, to be financed with resources from the Ordinary Capital. The instrument is a loan based on results, which is justified by its support for a government plan or program (PENCTI) in delivering results by financing its expenditure framework (document GN-2869-1). The focus on results serves to align incentives to improve the performance of public programs. Lastly, the LBR instrument enhances the Bank's added value by changing the nature of its dialogue with the executing agency, thereby making more room for the Bank's technical contribution.

2.2 The budget by component and source of financing is presented in Table 1. The program will have a three-year disbursement period. In view of ANII's institutional capacity and previous experience with Bank-financed operations (paragraph 2.4), this period is considered sufficient to implement the planned activities and achieve the program's expected outcomes. Disbursements will be based on verification of the results indicators described above (paragraph 1.36) as detailed in Annex II and the monitoring and evaluation plan. The program disbursement schedule is presented in Table 2. The Bank will make an initial disbursement of up to US$3 million (10% of the loan amount), which is justified in order to provide the financing needed to achieve the results for the first year of program execution, as stipulated in the matrix of disbursement indicators of Annex II, Results Matrix. That disbursement will be deducted in equal amounts from the last two disbursements of the loan.

Table 1. Program cost

Components	Total IDB (US$ millions)	%
Component 1. Support for the generation of new scientific and technological knowledge	11	36.7
Component 2. Support for business innovation	18.5	61.7
Component 3. Strengthening of institutional capacity	0.5	1.6
Total	**30**	**100**

Table 2. Disbursement schedule (US$ millions)

	Year 1	Year 2	Year 3	Total
Advance	3	-	-	3
Net results-based disbursements	14	10.5	2.5	27
% advance discount	0%	50%	50%	100%

2.3 **Eligibility criteria for the second operation under the CCLIP.** It was determined that the second operation satisfactorily meets the eligibility requirements established in the policy governing the CCLIP instrument (document GN-2246-9) and related operational guidelines (document GN-2246-11) for individual operations under CCLIPs, inasmuch as: (i) the operation is included in the Bank's 2019 Operational Program Report (document GN-2948); (ii) it is consistent with the CCLIP sector and objective (UR-O1153);[34] (iii) the executing agency is the same one that executed the first operation under the CCLIP (loan contract 4329/OC-UR) and has maintained its capacity and performance; (iv) the first operation (loan contract 4329/OC-UR) has disbursed 53.7% of the loan proceeds, its performance is satisfactory, and it will likely achieve the development objectives; and (v) the financial and operational reports for the first operation were submitted acceptably, and the contractual conditions and the Bank's financial and procurement policies were observed.

2.4 **Compliance with requirements for use of the LBR instrument.** The analysis of ANII institutional capacity conducted in 2017, during the preparation of the first operation under the CCLIP, found that the executing agency had the necessary legal capacity, governance, and institutional environment, as well as sufficient management and technical capacity to administer an LBR. Evaluations were also conducted of its procurement (evaluation of the executing agency's procurement system) and financial management systems, which found they were compatible with fiduciary principles and good practices applicable to procurement. In preparing this operation, it was determined that the executing agency's institutional capacity and procurement systems continue to be appropriate for an LBR, having addressed the opportunities for improvement identified in the first operation, namely: (i) ANII's institutional strategy was updated; (ii) its regulatory framework for procurement was strengthened; and (iii) its key work processes were formalized and automated. It was also determined that ANII has the appropriate regulations and mechanisms in place to ensure institutional integrity. In light of the above institutional aspects, it was determined that ANII meets the requirements for use of an LBR (document GN-2869-1 and related guidelines, document GN-2869-3).

B. Environmental and social risks

2.5 In accordance with Directive B.13 of the Environment and Safeguards Compliance Policy (Operational Policy OP-703), and based on the results of the safeguards policy filter, this operation does not require impact classification. The program's potential environmental and social risks and ANII's institutional capacity were evaluated by the project team, which confirmed that the operation would be considered low risk (B.13). In executing the program, ANII will apply the eligibility criteria for activities to be financed according to the IDB's exclusion list and the requirement of a valid environmental license, if necessary. The details of the social and environmental policy applied to this program are presented in the

[34] The objective of the CCLIP is to improve businesses' productivity through increased investment in knowledge, human resources, innovation, and entrepreneurship. The programs to be financed to achieve this objective pursue, inter alia, the following major lines of work: (i) support for business innovation and innovative entrepreneurship; (ii) training of advanced human capital; and (iii) the generation of new applied knowledge and institutional strengthening.

environmental and social management plan and the program Operating Regulations.

C. Other risks and key considerations

2.6 The small domestic market, which limits the potential returns on businesses' investments in innovative projects, was identified as a high-level development risk. This risk will be mitigated by the evaluation criteria established in the program Operating Regulations that accord priority to innovation projects that produce goods and services for export. Two medium-level risks were also identified. The first, related to the macroeconomic context and fiscal sustainability, is that reduced growth rates of the economy during the 2005-2018 period could lead to fewer opportunities for innovative projects and less business demand for projects supported by the program. This risk will be mitigated through field visits to businesses by trained ANII executives, who will identify innovative projects. The second medium-level risk, related to public management and governance, is that ANSII's public partners (e.g. other ministries and public enterprises) may lose interest in making contributions to finance research projects through the sector funds (paragraph 1.22). This risk will be mitigated by the ongoing review of the funds' thematic agendas to adapt them to changing needs and/or priority challenges, and through the study and dissemination of successful projects.

2.7 **Sustainability.** Measures to ensure medium-term sustainability were identified along two dimensions. The first relates to the continuity of the lines of work or instruments proposed for the program's components. In this respect, to the extent the instruments are effective and efficient at narrowing gaps (e.g. in investment and capacity) caused by market failures and the coordination problems identified in the diagnostic assessment (section I.A hereof), they are expected to be sustained by the country's public policy framework until those issues are resolved. ANII and program budgets provide resources and methodological arrangements to produce evidence of the effectiveness and efficiency of the proposed instruments. The second dimension of sustainability refers to the projects to be financed through the program, particularly projects contributing to the creation of networks, platforms, and technological centers. Accordingly, one of the evaluation criteria for these projects will be the inclusion of an appropriate sustainability strategy based on the sale of services, R&D management, and beneficiary contributions.

III. IMPLEMENTATION AND MANAGEMENT PLAN

A. Summary of implementation arrangements

3.1 **Borrower and executing agency.** The borrower will be the Eastern Republic of Uruguay and the executing agency will be ANII, a nongovernmental public-law entity created by Law 17,930 of 2005. ANII's responsibilities and areas of authority are established by Law 18,084 of 2008. Its functions include implementing the government's policy strategies for research and innovation by promoting, coordinating, and strengthening the capacities of the national innovation system. ANII has experience executing Bank-financed projects. Since 2009, it has executed the Technology Development Program II (loan 2004/OC-UR), the Program to Support Future Entrepreneurs (loan 2775/OC-UR), the Innovation Program for Productive Development (loans 3315/OC-UR and 3316/CH-UR), and the Business Innovation and Entrepreneurship Project (loan 4329/OC-UR), posting strong performance in all projects in terms of achievement of the results indicators and financial execution.

3.2 ANII is governed by a board of directors of five members representing the public, academic, and private sectors, one of whom serves as chairperson. Its senior management is headed by an executive secretary who reports to the board and supervises two areas (operations and administration and finance) and four units (information technologies, evaluation and monitoring, cooperation, and communication). ANII has a permanent staff of 60 professionals and an annual budget of US$40 million.

3.3 **Program execution mechanism and administration.** ANII professional team will be responsible for executing all program activities. The operations area will be in charge of: (i) instituting competitive procedures and financing windows; (ii) providing advice to beneficiaries; (iii) coordinating the evaluation of proposals submitted by the beneficiaries; (iv) formalizing the contracts governing the transfer of resources to the beneficiaries; and (v) monitoring the projects financed. All projects will be evaluated by committees of experts independent of ANII and approved by ANII's board. The project activities will be conducted by the beneficiaries. ANII's administration and finance area will be responsible for program fiduciary management, including payments to the beneficiaries.

3.4 **Institutional coordination.** ANII, working through its team of professionals and instruments, will promote coordination among the various stakeholders of the national innovation system to ensure that program activities are effectively implemented. For Subcomponent 1.2 specifically, ANII will coordinate efforts with other public and private institutions to define thematic sector agendas and finance research projects to address them. For Subcomponent 2.2, ANII will promote coordination between businesses and technological R&D centers. ANII's role in each of the program's subcomponents and instruments is defined in the program Operating Regulations.

3.5 **External verification of outcomes.** A specialized consulting firm (or consultants) will independently evaluate the achievement of outcomes. It will be responsible for submitting to the Bank a report verifying program outcomes Bank prior to each disbursement request. The verification of outcomes will focus on two objectives: (i) issuing an opinion as the accuracy, reliability, validity, and consistency of information on outcomes; and (ii) determining the values of the results indicators established for each disbursement tranche. The firm or consultants must be experienced in project evaluation and monitoring, the use of results indicators, and evaluating the reliability of information sources and methods used to produce them.

3.6 **Special conditions precedent to the first disbursement of the loan proceeds. The first disbursement will be subject to the following special contractual conditions: (i) the entry into effect of the agreement between the borrower and executing agency for the execution of program resources and activities, in terms satisfactory to the Bank; (ii) presentation of evidence that the program Operating Regulations have entered into effect, in accordance with the terms previously agreed upon with the Bank; and (iii) the contracting of the consulting firm tasked with the external validation of the program's**

outcomes, in accordance with the terms agreed upon with the Bank. The first condition is justified in view of the need to ensure that the loan proceeds are available to the executing agency. The second contractual condition aims to ensure that the various competitive processes are conducted under the terms agreed upon with the Bank, as described in detail in the program Operating Regulations. Lastly, the contracting of external consulting services is considered essential in order to verify program outcomes and the retroactive recognition of expenditures.

3.7 **Special contractual condition for execution.** The executing agency will obtain the Bank's no objection prior to approving specific projects for amounts in excess of US$150,000. This condition will ensure that competitive processes are conducted in accordance with the terms agreed upon with the Bank, and that the Bank team is duly informed of the most important projects of the operation and able to make recommendations for them.

3.8 **Fiduciary agreements and requirements.** Annex III reflects the financial management and procurement guidelines to be applied for program execution. Procurement carried out directly by ANII—the executing agency—will be guided by its own systems, policies, and procedures, which will be validated by the Bank. Transfers of the program's proceeds will be governed by the procedures set out in the program Operating Regulations and any ANII procurement directives included therein.

3.9 **Retroactive financing of outcomes.** The Bank may retroactively finance, against the loan proceeds, up to US$4.5 million (15% of the proposed loan amount) in outcomes achieved by the Borrower between 13 November 2018 (date of the program's official entry into the project pipeline) and the loan eligibility date, consisting of: (i) at least one patent application submitted by ANII-supported research institutions; (ii) leveraged investments in sector funds amounting to at least US$1,307,896 made by ANII partner institutions; (iii) leveraged investments in the program amounting to at least US$1,454,741 made by participating businesses; and (iv) at least three coordination initiatives, designed and approved by ANII, provided that the expenses accrued in attaining the outcomes are eligible in accordance with the scope of the project and were incurred in achieving the corresponding development outcomes, which will be subject to an independent external evaluation (program Operating Regulations). This financing is justified based on the need for the window of financing for projects supporting the generation of new scientific and technological knowledge and business innovation to remain open prior to the overall start of the program.

B. Summary of results monitoring arrangements

3.10 **Monitoring.** Program monitoring will be conducted by ANII's evaluation and monitoring unit. ANII will present semiannual reports to the Bank documenting the progress made in terms of the output and intermediate outcome indicators included in the results matrix and monitoring and evaluation plan. For reports corresponding to the second half of each year, these will include an annual work plan and, as applicable, revised targets for the remainder of the program.

3.11 **Evaluation.** During program implementation, ANII's evaluation and monitoring unit will evaluate the impact of the instruments supporting innovation, according to the guidelines established in the monitoring and evaluation plan. The evaluation will focus on the achievement of the results indicators described in the Results Matrix. The schedule of impact evaluations by the Evaluation and Monitoring Unit is subject to the availability of information from the Innovation Activities Survey (a triennial survey), as described in the monitoring and evaluation plan. A project completion report will be prepared at the conclusion of the last operation under the CCLIP, and will describe the project achievements, lessons learned, and sustainability.

Development Effectiveness Matrix		
Summary		
I. Corporate and Country Priorities		
1. IDB Development Objectives	**Yes**	
Development Challenges & Cross-cutting Themes	**-Productivity and Innovation -Institutional Capacity and the Rule of Law**	
Country Development Results Indicators	**-Students benefited by education projects (#)* -Micro / small / medium enterprises financed (#)* -Micro / small / medium enterprises provided with non-financial support (#)* -Government agencies benefited by projects that strengthen technological and managerial tools to improve public service delivery (#)***	
2. Country Development Objectives	**Yes**	
Country Strategy Results Matrix	**GN-2836**	**To promote business innovation**
Country Program Results Matrix	**GN-2948**	**The intervention is included in the 2019 Operational Program.**
Relevance of this project to country development challenges (If not aligned to country strategy or country program)		
II. Development Outcomes - Evaluability		**Evaluable**
3. Evidence-based Assessment & Solution	**9.4**	
3.1 Program Diagnosis	**3.0**	
3.2 Proposed Interventions or Solutions	**4.0**	
3.3 Results Matrix Quality	**2.4**	
4. Ex ante Economic Analysis	**9.0**	
4.1 Program has an ERR/NPV, or key outcomes identified for CEA	**3.0**	
4.2 Identified and Quantified Benefits and Costs	**3.0**	
4.3 Reasonable Assumptions	**1.0**	
4.4 Sensitivity Analysis	**2.0**	
4.5 Consistency with results matrix	**0.0**	
5. Monitoring and Evaluation	**8.1**	
5.1 Monitoring Mechanisms	**1.1**	
5.2 Evaluation Plan	**7.1**	
III. Risks & Mitigation Monitoring Matrix		
Overall risks rate = magnitude of risks*likelihood	**Medium**	
Identified risks have been rated for magnitude and likelihood	**Yes**	
Mitigation measures have been identified for major risks	**Yes**	
Mitigation measures have indicators for tracking their implementation	**Yes**	
Environmental & social risk classification	**B.13**	
IV. IDB´s Role - Additionality		
The project relies on the use of country systems		
Fiduciary (VPC/FMP Criteria)	**Yes**	**Financial Management: Budget, Treasury, Accounting and Reporting, External Control, Internal Audit. Procurement: Information System, Price Comparison, Contracting Individual Consultant, National Public Bidding.**
Non-Fiduciary	**Yes**	**Strategic Planning National System, Monitoring and Evaluation National System, Statistics National System, Environmental Assessment National System.**
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:		
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project	**Yes**	**RG-T3310 - Several consultancies were financed to support the evaluation of different instruments for promoting ANII innovation. Likewise, ANII participates in a Regional Public Goods project that promotes collaboration among the Innovation Agencies of Latin America.**

Note: (*) Indicates contribution to the corresponding CRF's Country Development Results Indicator.

Despite a decade of growth of the Uruguayan economy, total factor productivity (TFP) has increased at low levels and during the most recent period from 2012-2018 growth has declined to 2.5% per year with TFP growth declining to just 1%. In order to boost and sustain TFP, innovation must increase. In Uruguay, it is estimated that the contribution of research and development (R&D) to TFP is only 17%, while in similar countries this contribution is as high as 40%. The country invests up to 5 times less in R&D than comparable countries, and private participation is low. The typical Uruguayan firm invests only 1.27% in innovation, but this is mostly comprised of capital goods and only a small fraction stems from R&D. To better support Uruguayan economic growth, these trends must be reverted with greater support for and investment in R&D. In this context, the general objective of this second operation under the CLIPP is to increase public and private investment in research and innovation activities. The specific objectives are: (i) increase the supply of applied knowledge targeted at productive and social challenges; (ii) increase the availability of financing for innovation at the firm level; and (iii) strengthen the institutional capacity of ANII. The project's outcomes adequately capture its benefits such as the increase in both the publications in scientific journals and the requests for patents submitted; as well as the leveraged investment from firms benefitting from innovation financing. Furthermore, the cost benefit analysis shows the project is of net benefit to society. The program also calls for an impact evaluation to measure productivity gains in the medium-to-long term.

RESULTS MATRIX

Project objective:	The general objective of the second individual operation under the CCLIP (UR-O1153) is to increase public and private investment in research and innovation activities. The specific objectives are to: (i) expand the supply of applied knowledge geared toward productive and social challenges; (ii) increase the availability of financing for business innovation; and (iii) strengthen ANII's institutional capacities.

EXPECTED IMPACT

Indicators	Unit of measure	Baseline value	Baseline year	Final target Year 3	Means of verification	Comments
Increased labor productivity (estimated, based on sales per worker) of beneficiaries relative to the control group	U.S. dollar	43,913	2015	49,622	Panel of businesses submitting responses to ANII in the 2013-2015, 2016-2019, and 2020-2023 Surveys of Innovation Activities (EAIs)	The growth of labor productivity for supported businesses is 13% higher than for businesses not supported. Consistent with the increased investment in innovation attributable to program projects and an estimated elasticity of sales to investment in innovation of 0.12, according to EAIs data (2010-2012).
Increased private investment in the innovation activities of beneficiaries relative to the control group	U.S. dollar	44,393	2015	142,058	Panel of businesses submitting responses to ANII in the 2013-2015, 2016-2019, and 2020-2023 EAIs	Supported businesses' investment in innovation activities increases by an average of 220% with respect to unsupported businesses, according to the quasi-experimental impact evaluation (ANII, 2016).

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Country:	Uruguay
Project number	UR-L1158
Name:	Business Innovation and Entrepreneurship Program II
Executing agency:	National Research and Innovation Agency (ANII)
Fiduciary team:	Abel Cuba and Emilie Chapuis (FMP/CUR)

I. EXECUTIVE SUMMARY

1.1 This operation is a loan based on results (LBR) and the program cost is US$30 million. This is the second operation under the US$100 million Conditional Credit Line for Investment Project (CCLIP) UR-O1153. The borrower is the Eastern Republic of Uruguay and the program's executing agency will be ANII. ANII has an organizational and administrative unit that will be responsible for the program's execution.

1.2 The fiduciary agreements and requirements established for the program are based on ANII's experience as the executing agency for loans 2004/OC-UR, 2775/OC-UR, 3315/OC-UR, 3316/CH-UR, and 4329/OC-UR. The latter of these, which is being executed as an LBR, is the first operation under the current CCLIP.

1.3 The Bank also conducted an assessment of the executing agency's capacity in April 2017 using the Institutional Capacity Assessment System (ICAS) tool, which identified satisfactory results. Given that the instrument in question is an LBR, fiduciary evaluations (financial management and procurement) were conducted in parallel, as required for that instrument. The results of the various evaluations show that ANII has sufficient fiduciary systems in place to manage the program so as to achieve the expected results. For the current operation, the institutional conditions are considered improved insofar as the opportunities identified in 2017 have been implemented.

II. FIDUCIARY CONTEXT OF THE EXECUTING AGENCY

2.1 Law 18,084, promulgated in 2006, created ANII as a nongovernmental public-law entity.

2.2 ANII's management is supported by a modern organization that has worked internally to strengthen its process-driven management. This has enabled ANII to internalize the strengthening received and develop a process to continually update and improve the facets of its management.

2.3 ANII has maintained satisfactory fiduciary performance in its execution of previous operations, backed by audited financial statements with unqualified opinions. Support is also found in the results of the Bank's supervision activities applied in the context of the operations cited above.

III. Fiduciary Risk Evaluation and Mitigation Measures

3.1 Based on the evaluations and ANII's knowledge, the fiduciary risk is considered low.

IV. Considerations for the Special Provision of Contracts

4.1 **Exchange rate.** The exchange rate to be used for reporting in dollars will be that of the effective date of payment, with details provided on the conversion method as stated in Article 4.10(b)(ii) of the General Conditions of the loan contract.

4.2 **Audited financial statements.** These statements will be submitted within 120 days after the close of each year. The audit firm must be acceptable to the Bank and the terms of reference must be agreed upon with the Bank, specifying the submission deadline referenced in Article 7.03 of the General Conditions of the loan contract.

V. Agreements and Requirements for Procurement Execution

5.1 The fiduciary agreements and requirements for procurement establish the applicable provisions for carrying out all procurement planned under the program.

A. Procurement execution

5.2 Based on the evaluation, the executing agency's procurement and contracting systems will be used for LBRs.

B. Use of the executing agency's procurement system

5.3 The executing agency's procurement system was evaluated by the Bank and considered compatible with internationally accepted principles, practices, and standards for all procurement methods, and open to bidders from all countries. The system will be used for the procurement of goods, nonconsulting services, and consulting services (firms and individuals). The procedures established in the Policies for the Selection and Contracting of Consultants Financed by the Inter-American Development Bank (document GN-2350-9) will apply only to the selection of the independent consultants or firm contracted to verify the achievement of results.

C. Strengthening measures

5.4 Following the institutional assessment of the first operation under the CCLIP, ANII updated and documented its procurement processes. The procurement manual was approved by ANII's board of directors in October 2018. According to the conclusions of the assessment report and agreements with ANII, the procurement manual is up to date and provides a basis for carrying out procurement activities in accordance with good practices.

D. Retroactive financing of outcomes

5.5 The Bank may retroactively finance, against the loan proceeds, up to US$4.5 million (15% of the proposed loan amount) in outcomes achieved by the Borrower between 13 November 2018 (date of the program's official entry into the project pipeline) and the loan eligibility date, consisting of: (i) at least one patent application submitted by ANII-supported research institutions; (ii) leveraged investments in sector funds amounting to at least US$1,307,896 made by ANII partner institutions; (iii) leveraged investments in the program amounting to at least US$1,454,741 made by participating businesses; and (iv) at least three coordination initiatives, designed and approved by ANII, provided that the expenses accrued in attaining the outcomes are eligible in accordance with the scope of the project and were incurred in achieving the corresponding development outcomes, which will be subject to an independent external evaluation (program Operating Regulations). This financing is justified based on the need for the window of financing for projects supporting the generation of new scientific and technological knowledge and business innovation to remain open prior to the overall start of the program.

E. Procurement supervision

5.6 Procurement will be supervised through the program's planned audits.

F. Records and files

5.7 ANII has a records management system for procurement and contracting documentation that:

a. Facilitates direct identification of the procedures followed from the opening of bidding;

b. Facilitates direct identification of processed transactions;

c. Facilitates monitoring of procured goods and records them in its inventory system; and

d. Is available for review.

5.8 ANII outsources its recordkeeping to a third-party records management firm.

VI. AGREEMENTS AND REQUIREMENTS FOR FINANCIAL MANAGEMENT

A. Programming and budget

6.1 Under the execution agreement between ANII and the Ministry of Economy and Finance, ANII receives an annual budget appropriation. ANII has a budget management system, which is integrated with resources planning but not execution. Consequently, budget execution requires manual data entry and monitoring, which is performed using electronic spreadsheets together with established control and authorization procedures. In 2017, ANII adopted an integrated enterprise resource planning system (ERP) that will fully automate all its processes. Integration of the budget process is currently pending, but its implementation is scheduled for 2019. Since ANII maintains separate budget revenue and expenditure records for each project, program-specific budget records will be available. Uruguay's country system records both the allocation of the budget by the Ministry of Economy and Finance and its execution.

B. Accounting and information systems

6.2 ANII-financed projects are monitored using a project management system (GESPRO) developed for this purpose, and ANII's accounting is performed using the Odoo module of the integrated ERP system. That agency's accounting is governed by the International Accounting Standards and Ordinance 81 of the Office of the Auditor General. The system of codes used in the chart of accounts is linked to the budget items and projects defined in the budget execution system. As a result, a transaction entered to the accounting system that identifies the corresponding appropriation will be reflected in the execution of the project budget in the budget management system. This process is fully automated through the ERP system.

6.3 For the purposes of this program, it is agreed that ANII will define subledgers (accrual basis) to record the use of resources provided by the Bank, and therefore the institutional financial statements will include the balances of the accounts used in the context of project execution.

C. Advance, disbursements, and cash flow

6.4 The ERP system include the cash management module that tracks the inflow and execution of funds through the use of distinct budget items, projects, and accounts. ANII will open separate bank accounts to administer the financing for this program. ANII will execute the program using the proceeds of the financing only, and plans to request retroactive financing of results and an initial disbursement totaling US$7.5 million (25% of the total loan). The first disbursement will be deducted in equal parts in the last two years. The estimated flow of funds over the life of the program is presented below:

Table 1. Estimated flow of funds over the life of the program

	Execution year			Total
	2019	2020	2021	
Opening balance		**3,205,384**	**1,640,968**	
IDB disbursements	**17,000,000**	**10,500,000**	**2,500,000**	**30,000,000**
Retroactive financing of outcomes	4,500,000			4,500,000
First disbursement	3,000,000			3,000,000
Disbursements against outcomes	9,500,000	12,000,000	4,000,000	25,500,000
First disbursement discount		1,500,000	1,500,000	3,000,000
Execution of funds	**13,794,616**	**12,064,417**	**4,140,967**	**30,000,000**
Component 1: Support for generating new scientific and technological knowledge	4,723,226	4,113,807	2,162,966	11,000,000
Component 2: Support for business innovation	9,026,990	7,906,210	1,566,801	18,500,000
Component 3: Strengthening of institutional capacity	44,400	44,400	411,200	500,000
Balances	**3,205,384**	**1,640,968**	**0**	**0**

6.5 The proceeds of the Bank financing will be made available to ANII, to facilitate the linking of intermediate outcomes and the attainment of the targets proposed in the disbursement indicators matrix.

D. Internal control and audit

6.6 ANII maintains a control environment focused on the systematization of its processes and the definition of formal internal control procedures that are formalized and published on its intranet portal. Its board of directors is involved at different points in the project evaluation and approval process. ANII also has a procedures review committee, made up of experts with proven experience, which is tasked with reviewing procedures if a decision not to approve a project is challenged.

E. External control and reports

6.7 ANII undergoes an annual financial audit conducted by an independent audit firm, contracted through a competitive process for a term of at least three years. The audit reports, which are submitted to the board for consideration and approval during the first quarter of each year, have always resulted in unqualified opinions. In addition, at the request of the financiers of the projects it implements, ANII has submitted the financial statements of those projects for independent review, the results of which have not revealed any qualifications or material issues.

6.8 For purposes of the program, it has been agreed that ANII's financial audit report will suffice for the contractual compliance required by the Bank, provided that: (i) the audit firm is deemed eligible by the Bank; (ii) the terms of reference were agreed upon with the Bank; (iii) international audit standards are applied in the audit of financial statements; and (iv) the report contains a section on the balances of accounts that record the uses made of the proceeds of the Bank loan. The Tribunal de Cuentas de la República [Office of the Auditor General of the Republic] may also audit the program.

F. Financial supervision plan

6.9 The financial supervision plan considers the possibility of reviewing the annual audit report at the meetings held to monitor the program's risk matrix. This could result in onsite visits to update knowledge of the entity's internal systems.

EXPECTED OUTCOMES

Indicators	Unit of measure	Baseline value	Baseline year	Final target, year 3	Means of verification	Disbursement indicator (Yes/No)	Internal comments
COMPONENT 1: Support for the generating new scientific and technological knowledge							
Increase in the average number of papers by supported researchers published in scientific and technological journals	Publications	1.57	2001-2009	1.8	Database of Uruguayan researchers' curricula vitae	No	The baseline represents the average publications of researchers supported by the Clemente Estable Fund and María Viñas Fund Modalities I and II.
Percentage of women-led research projects supported by the María Viñas Fund and sector funds	Percentage of women-led research projects	43%	2017-2018	50%	María Viñas Fund project management laboratory (GESPRO)	No	The baseline is derived from GESPRO data. Of the researchers not yet consolidated, 52% are women, whereas women account for 43% of consolidated researchers.
Patent applications submitted by research investigations supported by ANII	Patent applications submitted	0	2018	10	Contracts between ANII and beneficiaries signed (cumulative)	Yes	
Investments in sector funds supported by ANII partners	U.S. dollar	3,900,000	2017-2018	11,700,000	Agreements signed with ANII partners (cumulative)	Yes	The baseline is calculated using data from ANII's accounting system.
COMPONENT 2: Support for business innovation							
Businesses' annual invoices (income from sales)	U.S. dollar	5,238,729	2015	6,600,799	Panel of businesses submitting responses to ANII in the 2013-2015, 2016-2019, and 2020-2023 EAI	No	The baseline is calculated using data from the panel of businesses submitting responses to ANII in the 2010-2012 and 2013-2015 EAIs. Annual average.
Investments supported by businesses participating in the program	U.S. dollar	1,818,427	2016-2018 average	5,455,280	Project status report and completion report	Yes	The baseline is the 2016-2018 average of the counterpart contribution executed by ANII beneficiary businesses in the context of projects financed.
Coordination initiatives designed and approved by ANII	Projects signed	7	2018	31	Board resolution	Yes	The baseline is calculated using data from ANII activity reports.

Indicators	Unit of measure	Baseline value	Baseline year	Final target, year 3	Means of verification	Disbursement indicator (Yes/No)	Internal comments
COMPONENT 3: Strengthening institutional capacity							
Impact evaluation	Evaluation completed	0	2018	1	Board resolution	No	
New businesses supported by ANII	Beneficiary businesses that did not previously receive ANII support	57	2018	171	GESPRO	Yes	This refers to the number of businesses supported by ANII through the program that did not previously receive ANII support for innovation projects between 2013 and 2018.

OUTPUTS

Outputs	Unit of measure	Baseline value	Baseline year	Year 1	Year 2	Year 3	Final target, year 3	Means of verification	Comments
COMPONENT 1: Support for generating new scientific and technological knowledge									
1. Projects in applied scientific/technological research	Projects financed	2018	20	24	22	10	56	Contracts signed	
2. Projects in sector scientific/technological research	Projects financed	2018	81	79	44	38	161	Contracts signed	
3. Procurement projects and projects to update complex scientific/technological equipment	Projects financed	2018	16	5	20	4	29	Contracts signed	
4. Postdoctoral grants	Projects financed	2018	9	0	17	8	25	Contracts signed	
5. Projects to assess the value of and apply knowledge	Projects financed	2018	8	5	5	2	12	Contracts signed	
COMPONENT 2: Support for business innovation									
6. Business innovation projects (tools, implementation and strengthening, inclusive innovation, and formulators)	Projects financed	2018	126	102	93	44	239	Contracts signed	
7. Coordination initiatives for innovation (challenges, partnerships, networks , and centers)	Projects financed	2018	7	13	13	5	31	Contracts signed	
COMPONENT 3: Strengthening institutional capacity									
8. Actions to promote innovation	Actions / site visits / events / campaigns	15	2018	10	10	10	30	Document approved by the executive secretary	
9. Financial audits	Audit	2	2018	2	2	2	6	Approved by the executive secretary	

Outputs	Unit of measure	Baseline value	Baseline year	Year 1	Year 2	Year 3	Final target, year 3	Means of verification	Comments
10. Audit of completed milestones	Audit	2	2018	1	1	1	3	Audit report	
11. Impact evaluations completed	Evaluation report	0	2018	0	0	1	1	Board of directors document	Evaluation of businesses' impact

MATRIX OF DISBURSEMENT INDICATORS

Indicators[1]	Year 1		Year 2		Year 3		Total amount (US$)
	Target	Amount (US$)	Target	Amount (US$)	Target	Amount (US$)	
Patent applications submitted by ANII-supported research institutions	4	1,000,000	4	1,000,000	2	500,000	**2,500,000**
Investment leveraged by ANII partner institutions in sector funds	3,750,000	4,000,000	2,000,000	2,000,000	3,500,000	1,000,000	**7,000,000**
Investment leveraged by the program's participating businesses	1,454,741	6,000,000	1,454,741	6,000,000	1,454,741	1,500,000	**13,500,000**
Coordination initiatives designed and approved by ANII	10	2,000,000	10	2,000,000	4	500,000	**4,500,000**
New businesses supported by ANII	46	1,000,000	46	1,000,000	46	500,000	**2,500,000**
Total		**14,000,000**		**12,000,000**		**4,000,000**	**30,000,000**

[1] These indicators are described in the program's monitoring and evaluation plan.

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/19

Uruguay. Loan ____/OC-UR to the Eastern Republic of Uruguay. Business Innovation and Entrepreneurship Program II. Second Individual Operation under the Conditional Credit Line for Investment Projects (CCLIP) UR-O1153

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Eastern Republic of Uruguay, as Borrower, for the purpose of granting it a financing aimed at cooperating in the execution of the Business Innovation and Entrepreneurship Program II, which constitutes the second individual operation under the Conditional Credit Line for Investment Projects (CCLIP) UR-O1153 approved on October 11, 2017 by Resolution DE-58/17. Such financing will be in the amount of up to US$30,000,000, from the resources of the Bank's Ordinary Capital, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.

(Adopted on ___ ____________ 2019)

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