



Board of Executive Directors

Simplified Procedure

On or after 2 December 2015

PR-4348
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Simultaneous Disclosure

To: The Executive Directors
From: The Secretary
Subject: Paraguay. Proposal for a loan for the "Paraguayan Business Innovation Project"

Basic Information: Loan type Specific Investment Operation (ESP)
Borrower Republic of Paraguay
Amount up to US\$10,000,000
Source Ordinary Capital

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Remarks: Management has determined that this loan proposal meets the requirements for presentation by Simplified Procedure, in accordance with Part III, Section 2 (paragraph 3.29(b)) of the Regulations of the Board of Executive Directors and document GN-1838-1, paragraph 2.

Reference: GN-1838-1(7/94), DR-398-17(1/15), GN 2696(1/13)

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PARAGUAY

PARAGUAYAN BUSINESS INNOVATION PROJECT

(PR-L1070)

LOAN PROPOSAL

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CONTENTS

PROJECT SUMMARY

I.	DESCRIPTION AND RESULTS MONITORING	1
A.	Background, problem addressed, and rationale.....	1
B.	Objectives, components, and costs	5
C.	Key results indicators	9
II.	FINANCING STRUCTURE AND MAIN RISKS	10
A.	Financing instruments	10
B.	Environmental and social safeguard risks.....	10
C.	Fiduciary and other risks.....	10
III.	IMPLEMENTATION AND MANAGEMENT PLAN	11
A.	Summary of implementation arrangements	11
B.	Summary of arrangements for monitoring results	12

ANNEXES	
Annex I	Development Effectiveness Matrix (DEM) Summary
Annex II	Results Matrix
Annex III	Fiduciary Agreements and Requirements

ELECTRONIC LINKS
REQUIRED <ol style="list-style-type: none">1. Multiyear execution plan2. Annual work plan (AWP)3. Monitoring and evaluation plan4. Procurement plan
OPTIONAL <ol style="list-style-type: none">1. Project Operating Regulations2. Itemized budget3. Project economic analysis4. Study of demand for tools to support innovation and human resource training5. Technical note on innovation and competitiveness for Paraguay6. Project completion report for 1698/OC-PR7. Report from the Institutional Capacity Assessment System8. Information on PROCIT I beneficiaries9. Safeguard Policy Filter (SPF) and Safeguard Screening Form (SSF)

ABBREVIATIONS

AWP	Annual work plan
CONACYT	Consejo Nacional de Ciencia y Tecnología [National Science and Technology Council]
DGEEC	Dirección General de Estadística, Encuestas y Censos [Division of Statistics, Surveys and Censuses]
FONACIDE	Fondo Nacional de Inversión Pública y Desarrollo [National Fund for Public Investment and Development]
GDP	Gross domestic product
ICAS	Institutional Capacity Assessment System
ICB	International competitive bidding
LCO	Licitación por concurso de ofertas [Call for proposals procurement method]
NCB	National competitive bidding
PROCIENCIA	Programa Paraguayo para el Desarrollo de la Ciencia y la Tecnología [Paraguayan Program for Science and Technology Development]
PROCIT	Support Program for the Development of Science, Technology, and Innovation
PRONII	Programa Nacional de Incentivos a Investigadores [National Researcher Incentives Program]
QCBS	Quality- and cost-based selection
R&D	Research and development
RICYT	Red de Indicadores de Ciencia y Tecnología – Iberoamericana e Interamericana [Ibero-American and Inter-American Network of Science and Technology Indicators]
SBE	Subasta a la Baja Electrónica [Electronic reverse auction procurement method]
SIAF	Integrated Financial Administration System
WAL	Weighted average life
WEF	World Economic Forum

PROJECT SUMMARY

PARAGUAY PARAGUAYAN BUSINESS INNOVATION PROJECT (PR-L1070)

Financial Terms and Conditions				
Borrower: Republic of Paraguay			Flexible Financing Facility^(a)	
			Amortization period:	25 years
Executing agency: Consejo Nacional de Ciencia y Tecnología [National Science and Technology Council] (CONACYT)			Original WAL:	15.25 years ^(b)
			Disbursement period:	5 years
			Grace period:	6.2 years ^(b)
Source	Amount	%	Inspection and supervision fee:	(c)
IDB (OC)	US\$10,000,000	100	Interest rate:	LIBOR-based
Local	0	0	Credit fee:	(c)
Total	US\$10,000,000	100	Currency:	U.S. dollars from the Bank's Ordinary Capital (OC)
Project at a Glance				
Project objectives/description: The general objective of the project is to help boost the productivity of the Paraguayan economy. The specific objectives are: (i) to foster greater investment in applied research and innovation, especially in priority production and social sectors; and (ii) to increase the quantity and improve the quality of skilled human capital for innovation.				
Special contractual conditions precedent to the first disbursement of the loan: The following will be special conditions precedent to the first disbursement of the loan: (i) appointment of the technical team needed to manage the project; (ii) entry into force of the project Operating Regulations previously agreed upon with the Bank; and (iii) a computer system for submitting and evaluating projects online (paragraph 3.3).				
Exceptions to Bank policies: None				
Project qualifies as:^(d) SV <input checked="" type="checkbox"/> PE <input type="checkbox"/> CC <input type="checkbox"/> CI <input type="checkbox"/>				

^(a) Under 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) The original weighted average life (WAL) and grace period may be shorter, depending on the effective signature date of 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 applicable policies.

^(d) SV (Small and Vulnerable Countries), PE (Poverty Reduction and Equity Enhancement), CC (Climate Change, Sustainable Energy, and Environmental Sustainability), CI (Regional Cooperation and Integration).

I. DESCRIPTION AND RESULTS MONITORING

A. Background, problem addressed, and rationale

- 1.1 The Paraguayan economy has performed well in recent periods, with average GDP growth of 5.3% over the past five years and robust growth in exports, which, led primarily by cattle and soybeans, rose from US\$7.7 billion in 2009 to US\$13.1 billion in 2014.¹ Buoyed by favorable terms of trade, per capita GDP increased from US\$915 in 2002 to US\$4,500 in 2014.² However, despite its good recent economic performance, the Paraguayan economy has productivity problems that could limit its future growth prospects. Indeed, annual productivity growth in the 2001-2011 period was 0.3%, well below the 1% productivity growth rate of the typical Latin American country over the same period.³ This performance is related to gaps in operating efficiency among Paraguayan businesses. For example, the productivity of a typical local manufacturing firm is only 28% of the global best practice in productivity.⁴
- 1.2 Paraguay's growth process has been primarily based on the accumulation of production factors. Making this process sustainable requires generating more favorable conditions to boost innovation capacity at firms. There is evidence showing that research and development (R&D) and design, the installation of new equipment, and training and consulting activities translate into innovation and subsequent productivity growth.⁵ However, in the case of Paraguay, businesses invest just 0.17% of sales revenue in R&D, well below the regional average of 0.38%.⁶ Market failures arising from information asymmetries between firms and lenders, coupled with the difficulties faced by firms in harnessing all the benefits associated with innovation, lead to suboptimal private investment, necessitating public interventions such as those provided in this operation. Additional factors limiting investment have to do with the low availability of qualified personnel, technical services, and knowledge generated by the firms themselves as well as by educational, scientific-technological, and development institutions. This array of public and private actors, and their interactions, comprise the National Innovation System.
- 1.3 Paraguay's National Innovation System has become more developed in recent years, particularly following the launch of the Support Program for the Development of Science, Technology, and Innovation (PROCIT, 1698/OC-PR) in 2008, which was partially financed by the Bank. However, various studies and indicators suggest that this system is not yet consolidated and therefore fails to provide suitable conditions for innovation. According to the World Economic Forum (WEF),⁷ there is little capacity among local businesses and institutions in the Paraguayan economy to develop applied knowledge and generate innovation. Of

¹ [Central Bank of Paraguay](#).

² Export and per capita GDP data in current dollars, according to CEPALSTAT (2014).

³ [Penn World Table – II](#).

⁴ [Enterprise Survey \(2010\)](#).

⁵ Crespi, G. and P. Zúñiga (2010), *Innovation and productivity: evidence from six Latin American countries*. IDB working paper series (218).

⁶ First National Innovation Survey of Paraguay (2013) and IDB (2010).

⁷ WEF (2012), *The Global Competitiveness Report 2012/13*, World Economic Forum, Geneva.

the 12 pillars of competitiveness analyzed by the WEF, the largest gaps are in infrastructure, higher education and training to assimilate technology and innovate. In particular, according to the project team's diagnostic assessment, the primary causes for the lack of innovation in Paraguay are: (i) low public and private investment in innovation activities; (ii) lack of capacity to generate and transfer knowledge and technology at local universities and institutions; and (iii) limited availability of highly skilled human resources, resulting in limited capacity among firms to absorb existing knowledge. These underlying causes are analyzed below.

- 1.4 **Low investment in innovation activities.** According to data from the National Science and Technology Council (CONACYT),⁸ investment in R&D doubled between 2008 and 2012, but this represents just 0.08% of GDP (2012), among the lowest rates in the region (the regional average being 0.74%).⁹ To illustrate the magnitude of this investment shortfall, R&D investment in countries with the same per capita income level as Paraguay is 0.30% of GDP.¹⁰ As for investment in innovation, most is made by institutions and public universities rather than by businesses. According to the 2011 economic census, there are 223,000 economic units in Paraguay. Of these, 3% have more than 50 employees, 6% have 11 to 49 employees, and the remaining 91% have fewer than 10 employees. As to sector, 11% of enterprises are manufacturing companies, 34% are in the service sector, and all others are in the commercial sector. In general, local firms are highly concentrated in low-technology subsectors and their business strategies are not closely associated with innovation. In fact, average spending on innovation per employee among Paraguayan firms is 73% lower than average spending by typical firms in the region.¹¹ Low investment in innovation by businesses is the result of various restrictions, including difficulties with appropriability and access to financing, applied knowledge, and good practices in technology, and a limited supply of highly skilled human capital, which diminishes the internal capacity of businesses to absorb and manage technology.
- 1.5 The problem of access to financing for innovation arises from information asymmetry¹² between firms and financial institutions regarding the quality of innovative ideas. The local financial market is small and shallow, with a poorly developed venture capital segment. This affects the ability to properly evaluate projects that seek financing for risky and intangible investments such as those related to innovation. This problem is even more serious for new innovative enterprises, which cannot even show prior business experience. According to the World Bank's knowledge assessment methodology, which uses a scale of 1 to 10, Paraguay is in the lower third of countries in terms of access to venture capital for

⁸ [CONACYT](#) (2012), Science and technology indicators in Paraguay 2011.

⁹ Data from the Network of Science and Technology Indicators ([RICYT](#)).

¹⁰ IDB (2010), Science, Technology, and Innovation Indicators.

¹¹ Enterprise Survey (2010) and Arias, E., G. Crespi, E. Tacisr, and F. Vargas (2013): *Innovation for Economic Performance: The Case of Latin American and Caribbean Firms*, IDB-TN-494.

¹² Information asymmetry happens in decision-making situations in which one party has better information than the other. In this case, it refers to the problem that arises when a project owner has better information on the project's chances of success than the investor or the bank. Specifically, the difficulty that banks have in differentiating good projects from bad ones has a penalizing effect in terms of access to credit and prevents potentially profitable projects from materializing.

innovation.¹³ Furthermore, according to the Enterprise Survey (2010), lack of financing affects 25% of Paraguayan firms.

- 1.6 **Limited capacity to generate and transfer applied knowledge.** Despite the existence of nearly 50 universities and several research and technology institutes in Paraguay, in very few cases is there adequate capacity to generate and transfer knowledge aimed at solving production problems (the limited capacity that does exist is concentrated in the areas of agricultural production and technology and human health protection and improvement).¹⁴ Most universities and institutes need additional resources to avail themselves of the researchers, technology specialists, and equipment required to provide technology services to the production sector. Researchers and technology specialists, in turn, lack an organizational support infrastructure (e.g., incubators, technology service centers, etc.) to foster closer relations with businesses. As a result, there is a risk that the knowledge generated will not address the specific requirements of the private sector. In fact, according to data from the latest innovation survey (2013), only 10% of local firms have undertaken innovation projects jointly with other firms and R&D institutes. This figure is 25% lower than the average for the region.
- 1.7 **Limited supply of skilled human capital for business innovation.** Firms indicate that the low number of available engineers, technology specialists, and managers limits their ability to adopt new technologies and innovate (FEM, 2012; CONACYT, 2008). In effect, just 10% of workers in Paraguayan firms have a university education, a level that is 50% lower than the figure for the average firm in the region (Enterprise Survey, 2010). According to the latest survey on innovation in Paraguay, the lack of skilled personnel is a major obstacle to innovation in nearly 40% of innovative firms. For 55% of firms, problems related to internal organization, human resources management, financial management, and capacity to make long-term investments are also a major obstacle to innovation. These problems are the result of deficiencies in the higher education system. For example, Paraguay graduates fewer than 450 engineers per year, below countries with relatively similar development levels such as El Salvador (1,473) and Honduras (1,815). Moreover, there is a sharp gender imbalance. At the National University of Asunción, for example, more than 80% of engineering graduates are male. Furthermore, only three universities offer established post-graduate programs in engineering, which means that the capacity to train more and better teachers is very limited.¹⁵ Lastly, there is no local supply of experts trained in methodologies for organizational management for innovation who could help firms fill in the gaps in this regard.
- 1.8 **Rationale.** In response to these challenges, Paraguay has made greater efforts in recent years to strengthen its National Innovation System. In 2008, CONACYT, the entity in charge of national innovation policy, initiated a period of institutional strengthening with Bank support through PROCIT. This allowed it to implement a

¹³ According to the [World Bank's](#) knowledge assessment methodology, which uses a scale of 1 to 10, Paraguay has a score of 3.3 in domestic credit to private sector as a percentage of GDP and 3.9 in availability of venture capital, placing Paraguay in the lower third of countries.

¹⁴ The institutions with the greatest capacity include Universidad Nacional de Asunción, Universidad Nacional del Este, Universidad Católica, and Centro para el Desarrollo de la Investigación Científica.

¹⁵ Dávalos, L. (2009), Baseline and prequalification system for national graduate degrees. Consulting report.

small-scale deployment of various instruments to support research, training of highly skilled human capital, and innovation.¹⁶ The PROCIT budget was US\$7.2 million, of which US\$6.5 million was financed by the Bank. The program was fully executed, and outcomes have been significant. More than 40 enterprises expressed an interest in starting innovation projects, and 19 were given financing. Of these, 72% succeeded in developing or improving products or processes, and 83% strengthened their human resources. In addition, local research institutes have received financing to implement 37 applied research projects and to create or strengthen 11 national graduate degrees in areas in which advanced academic training was not previously available anywhere in the country, and these generated new scientific and technological knowledge. Furthermore, through PROCIT, 32 national scholarships were awarded for masters and/or doctoral programs, as well as over 80 scholarships for training abroad, which served to strengthen the country's pool of skilled human capital (see [the project completion report for 1698/OC-PR](#)).

- 1.9 The capacities that were generated by PROCIT helped CONACYT to undertake other initiatives. Thus, in 2011, using own resources, CONACYT launched the National Researcher Incentives Program (PRONII), an essential tool for promoting careers in research through performance-based incentives. The Technological Development, Innovation, and Conformity Assessment Project (DETIEC), financed through the MERCOSUR Structural Convergence Fund, is also nearing completion and will enhance the competitiveness of Paraguayan products and services. More recently, in September 2012, the National Fund for Public Investment and Development (FONACIDE) was created through Law 4,758, providing CONACYT with further resources (around US\$20 million) for the Paraguayan Program for Science and Technology Development (PROCIENCIA), which finances various activities in basic and applied research as well as human resource training and scientific dissemination.
- 1.10 Against this backdrop, the Paraguayan government has requested this project in order to continue to consolidate and scale up its technology and innovation policies. In particular, the project will address the challenges faced by enterprises seeking to innovate and will thus complement the efforts that the country plans to make through FONACIDE, as support for businesses is not an eligible area under that fund. To achieve this, the project will use a series of promotional tools designed to leverage investments in innovation by new and established businesses and by public-private partnerships. The experiences of the entrepreneurs and firms served by the project are expected to send messages and build capacities for subsequent support from the financial sector, ameliorating the aforementioned problems of information asymmetry. In addition, the project will aim to increase the availability of skilled human capital for business innovation.
- 1.11 The project takes into account and is justified by the learnings and lessons of PROCIT, which notably include the following: (i) CONACYT employs a project selection, financing, and monitoring methodology based on rigorous transparency, quality, and relevance criteria; (ii) there is demand for development tools on the

¹⁶ CONACYT was created in 1997 through the General Science and Technology Law (Law 1028). It reports to the Office of the President of the Republic and is governed by a body of 14 representatives of government agencies, business entities, and academic institutions.

part of businesses and research institutes, with PROCIT having received more than 300 proposals for financing between 2008 and 2012, of which it funded fewer than one third due to insufficient resources, and moreover, the [demand study](#) performed for project preparation purposes indicates that over 50 firms would be interested in using project resources for innovation projects; (iii) in certain areas or subsectors of interest, such as agribusiness, pharmaceutical products, and computer services, conditions favor investments in innovation that are more targeted and larger in scale; (iv) despite advances made in strengthening CONACYT, there is still no data collection and analysis system in place to evaluate the impacts of innovation policies, an aspect that will receive strong support during this operation; and (v) one factor for success in innovation support programs is the design and implementation of a meaningful dissemination and communication strategy, an element that is included in this project.

- 1.12 **Strategic alignment.** The project is aligned with the Bank's country strategy with Paraguay for the period 2014-2018 (document GN-2769), specifically in the priority area of productive development through organizational and technological innovation in firms and job training in the skills and competencies required by the productive sector (paragraphs 3.18, 3.19, and 3.23). It is also aligned with the Report on the Ninth General Increase in the Resources of the Inter-American Development Bank (document AB-2764), in that it will support a small and vulnerable country (in the Group C and D countries) and will contribute to the small and medium-sized enterprise financing product. Similarly, the project is aligned with the Institutions for Growth and Social Welfare Sector Strategy (document GN-2587-2), one priority of which is to improve productivity by strengthening institutional capacities to carry out innovation policies. Lastly, the project is consistent with the Innovation, Science, and Technology Sector Framework Document (document GN-2791-3), in particular with respect to boosting investment in science, technology, and innovation, and providing adequate financing for business innovation.
- 1.13 **Coordination with other donors and programs.** During project preparation, other initiatives for promoting competitiveness and innovation were identified and studied. Such initiatives, which will be coordinated with and will complement this project, include some led by CONACYT, the Ministry of Industry and Trade, the Itaipú Technology Park, the Paraguayan Industrial Union, and the Paraguayan Association of Business Incubators and Technology Parks.¹⁷ Coordination will take place through CONACYT, of which the heads of the aforementioned institutions are board members. In addition, the project supervision plan will include specific actions to facilitate interagency coordination as well as coordination with other Latin American agencies that work to promote business innovation.

B. Objectives, components, and costs

- 1.14 The general objective of the project is to help boost the productivity of the Paraguayan economy. The specific objectives are: (i) to foster greater investment in applied research and innovation, especially in priority production and social

¹⁷ The [Technical Note on Innovation and Competitiveness in Paraguay](#) includes a list of existing Paraguayan institutions and programs dedicated to promoting competitiveness and innovation.

sectors;¹⁸ and (ii) to increase the quantity and improve the quality of skilled human capital for innovation.

- 1.15 **Component I. Promotion of innovation (US\$6,373,000).** This component will promote activities aimed at stimulating investment in knowledge generation and innovation and strengthening the links between the various National Innovation System stakeholders. To this end, calls for proposals will be issued with a view to financing various project types, the details of which are set forth below and in the [Operating Regulations for the project](#). For each call for proposals, CONACYT, upon receiving the Bank's no objection, will publish the relevant terms of reference on its website, along with the list of selected beneficiaries.
- 1.16 **Individual projects for technological development and innovation.** These projects are intended to generate product and process innovation at firms and will be supported by nonreimbursable contributions covering up to 80% of project costs but not to exceed US\$120,000. The cofinancing percentage will be up to 50% for firms that have had previous support from CONACYT. Projects will be selected on an ongoing first-come, first-evaluated basis. Any legally established business in Paraguay that presents a project satisfying CONACYT requirements will be considered eligible. In addition, projects will be evaluated on their technical merits by an expert independent from CONACYT. The evaluation criteria will include: (i) the innovative merit and technical feasibility of the project; (ii) its socioeconomic impact; and (iii) the technical, administrative, and financial capacity of the applicant. It is expected that 18 projects of this type will be financed over the life of the project.
- 1.17 **Group projects for technological development and innovation.** These projects are intended to generate technological innovations with an impact on priority supply chains or clusters in Paraguay (see the footnote to Table 1, Project Costs). These projects will be supported through nonreimbursable contributions covering up to 80% of project costs but not to exceed US\$250,000. Projects will be selected through an open call for proposals divided into two stages: a first stage for selecting project ideas and a second stage for selecting detailed projects. Consortiums of technological or sector firms and institutions (such as universities, technology development centers, and business associations) legally established in Paraguay and presenting a project idea and project that satisfy CONACYT requirements will be eligible for this line of financing. Both the project ideas and the projects themselves will be evaluated on their technical merits by an expert independent from CONACYT. The evaluation criteria will include: (i) the innovative merit and technical feasibility of the project; (ii) its economic impact on the priority sector; and (iii) the technical, administrative, and financial capacity of the consortium. It is expected that four projects of this type will be financed over the life of the project.

¹⁸ The priority sectors should be consistent with the National Development Plan 2014-2030 and with the selection criteria established in the CONACYT White Paper on National Science, Technology, and Innovation Policy (economic, social, and environmental impact; comparative advantages, favorable institutional conditions, and strategic importance for improving living conditions). Examples of these sectors are: agribusiness, forestry and biomass, clean and renewable energies, biotechnologies, and information technology. The priority sectors will be specified in the terms of reference of each call for proposals under the operation, which will require the Bank's no objection.

- 1.18 **Technology-based business projects.** These projects are intended to support the creation and startup of technology-based enterprises and will be supported by nonreimbursable contributions covering up to 80% of subproject costs but not to exceed US\$27,500. Projects will be selected on an ongoing first-come, first-evaluated basis. Individuals and recently created businesses (less than 18 months since their first invoice) presenting a project that satisfies CONACYT requirements and sponsored by an institution specialized in entrepreneur support will be eligible for financing. Projects will be evaluated on their technical and economic merits by an expert independent from CONACYT. The evaluation criteria will include: (i) the entrepreneurial and innovative merit of the project; (ii) its social and economic impact; and (iii) the technical, administrative, and financial capacity of the business team. It is expected that 30 projects of this type will be financed over the life of the project.
- 1.19 **Projects to strengthen technology and incubation services.** These projects are intended to create or strengthen structures for technology transfer and the provision of technology and pre-incubation and incubation services for entrepreneurs and firms. Universities and technology and research institutes established in Paraguay that have links to the production sector and present projects satisfying CONACYT requirements will be eligible for financing. The financing will cover up to 80% of the project cost, subject to a maximum of US\$250,000. In the case of incubation services, the maximum will be US\$100,000. Projects will be selected through an open call for proposals and will be evaluated by experts who are independent from CONACYT. Evaluation criteria will include: (i) project quality and rationale; (ii) the economic impact; (iii) the financial sustainability plan; and (iv) the technical, administrative, and financial capacity of the applicant. It is expected that 10 projects of this type will be financed during the life of the project, 6 of which will be for business pre-incubation and incubation services.
- 1.20 **Innovation statistics, studies, and activation of demand.** This component will also provide financing for surveys to prepare statistics on innovation and for a series of activities to build a culture of innovation and encourage the business community to adopt innovation support instruments, including prospective sector studies for guiding public and private investments in innovation.
- 1.21 **Component II. Human capital for innovation (US\$2,506,000).** This component will promote activities aimed at boosting the supply of highly skilled human resources with capacity for applied research and innovation, complementing the basic research training activities to be conducted through PROCENCIA. To this end, calls for proposals will be issued with a view to financing various types of projects and activities, described in detail below and in the project Operating Regulations. For each call for proposals, CONACYT, upon receiving the Bank's no objection, will publish the relevant terms of reference on its website, along with the list of selected beneficiaries.
- 1.22 **Projects to create and strengthen post-graduate programs.** Financing will be provided to create or strengthen national post-graduate programs designed to train high-level professionals in innovation and technology management. Paraguayan universities and public or private higher education institutions presenting projects that satisfy CONACYT requirements will be eligible for financing. The programs will

target science, technology, and engineering professionals who hold a national or foreign university degree (registered and recognized by the Ministry of Education and Culture). Projects will be selected through an open call for proposals and will be evaluated by international experts who are independent from CONACYT. Evaluation criteria will include: (i) project quality and rationale; (ii) the impact in terms of human resource training; (iii) the financial sustainability plan; and (iv) the technical, administrative, and financial capacity of the applicant. Support will consist of a nonreimbursable contribution of up to 90% of project costs, subject to a maximum of US\$100,000. Eligible expenses for financing will include: (i) design and evaluation of academic programs; (ii) limited-term contracts with local professors; (iii) recruitment of visiting professors from other countries; (iv) research equipment and supplies; and (v) communication and dissemination activities. It is expected that six projects of this type will be financed over the life of the project.

- 1.23 **Support for the incorporation of innovation managers at firms.** Financing will be provided for interventions to put modern innovation management capacities in place at businesses by hiring professionals trained in innovation management. All legally established businesses in Paraguay that present projects in line with CONACYT requirements will be considered eligible. Projects will be accepted on an ongoing first-come, first-evaluated basis. The evaluation will be conducted by CONACYT technical experts, taking into account criteria that will include the following: (i) project quality and rationale; (ii) the impact on the business; and (iii) the technical, administrative, and financial capacity of the applicant. In the activities for disseminating this instrument, as well as in the evaluation of projects, the inclusion of women will be encouraged as a way of enhancing their participation in the management of innovation and technology. Projects will be considered that call for a comprehensive intervention including at least the following aspects: (i) business strategy; (ii) business reorganization for innovation; (iii) innovation measurement; (iv) establishment of an innovation culture at the firm; (v) design of incentives consistent with innovation; (vi) design of skill profiles for innovation; (vii) risk management; and (viii) creation of a portfolio of innovation projects. Innovation management projects will have a maximum duration of one year, and the maximum contribution amount will be for up to US\$30,000 per project. It is expected that 50 projects of this kind will be financed over the life of the project.

- 1.24 **Technology missions.** This line will finance visits to technology firms and institutes abroad. The results of these missions are expected to include, among other knowledge and technology transfer activities, the formulation of collaborative innovation projects between R&D institutions and firms, the promotion of technology cooperation agreements between businesses in Paraguay and in the countries visited, technology transfer agreements such as joint ventures, technology licensing and other agreements, and the adoption of new technologies and best practices in technology, administrative, and innovation management at Paraguayan firms. Firms presenting projects that satisfy CONACYT requirements will be eligible for this line of financing. Support will consist of a nonreimbursable contribution of up to 80% of the project cost, subject to a maximum of US\$10,000. This support will cover the following expenses: registration for events, travel and per diems, translation services, and activities and inputs to transfer mission results. Projects will be selected on an ongoing first-come, first-evaluated basis. The

evaluation will be conducted by CONACYT technical experts, taking into account criteria that will include the following: (i) project quality and rationale; (ii) the impact on the firm or group of firms and on the sector; and (iii) the technical, administrative, and financial capacity of the applicant(s).

- 1.25 **Project cost.** The total cost of the project is estimated at US\$10 million, to be financed by the Bank (Table 1). It is estimated that the project's beneficiary firms and institutions will make an additional counterpart contribution of US\$2 million (not included in Table 1).

Table 1: Project costs (in thousands of U.S. dollars)

Components	IDB	%
Component I. Promotion of innovation	6,373	63.73
Component II. Human capital for innovation	2,506	25.06
Administration, evaluation, and audit	1,033	10.33
Administration	828	8.28
Audit and evaluation*	205	2.05
Contingencies	88	0.88
TOTAL	10,000	100

* Category 3.2 includes the cost of the midterm and final project evaluations and audits. The budget for the [monitoring and evaluation plan](#) includes, in addition to the midterm and final evaluations, a monitoring and evaluation specialist (under Category 3 in Table 1) and the innovation surveys (under Component I).

C. Key results indicators

- 1.26 **Expected impacts.** The project is expected to boost the productivity of the Paraguayan economy. This will be measured through aggregate indicators set forth in the results matrix in Annex II: (i) total factor productivity and labor productivity growth indicators, to be obtained from the national innovation survey and the Enterprise Survey; and (ii) indicators on national investment in R&D, to be obtained from RICYT.
- 1.27 **Key indicators.** In line with the above-described objective and goals, the key indicators for the project show the number of outputs that will be generated in terms of projects completed with firms, consortiums, and researchers, masters programs created or strengthened, innovation managers trained and employed in firms, and technology missions conducted. The number of women who participate in the project will be tracked. With regard to outcomes, the objective is to confirm that the investments had a favorable impact on the firms. This will be done by measuring the growth in investment in innovation at these firms, the percentage of firms that innovate in products and processes, the percentage of firms that cooperate with other National Innovation System stakeholders, and the percentage of employees at the firms who are university graduates. The details and targets can be found in the results matrix in Annex II.
- 1.28 **Focus on results, impact, and evaluability.** To achieve the proposed results, the project uses a set of instruments for fostering innovation and developing human resources that are characterized by their specificity, complementarity, and evaluability. The Bank's Office of Evaluation and Oversight and other independent evaluators have already conducted studies that show positive impacts and the feasibility of performing complex evaluations. In fact, recent studies on programs

with similar instruments (nonreimbursable contributions for firms, consortiums, and researchers) in Argentina, Brazil, Colombia, Chile, Panama, and Uruguay show that such instruments have been effective for generating and applying scientific and technological knowledge to resolve social and production problems and help businesses to innovate. In aggregate terms, these programs produced positive economic results, as shown by internal rate of return and net present value estimates (López, A., 2009, [IDB](#)). It is possible that this evidence cannot be extrapolated to relatively less developed countries, where similar programs have encountered difficulties due to lack of institutional capacity. However, Paraguay, through PROCIT, has installed basic capacity to implement this project.

- 1.29 **Economic viability and robustness of project benefits.** An economic analysis of the project's main interventions was performed, estimating the potential benefits primarily on the basis of CONACYT information recorded in connection with the PROCIT experience. To this end, the effects that project support would have on the firms in terms of sales were considered. The findings of the analysis indicate that, if the project targets are met, and assuming a conservative scenario, the project would achieve a positive net present value of US\$27.4 million. The sensitivity analysis that was performed indicates that these positive results will continue to hold in the event of changes in critical variables such as level of sales and productivity at the firms, rate of social return, and rate of success of the projects (see [economic analysis](#)).

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing instruments

- 2.1 The loan is a specific investment operation with an execution period of five years.

B. Environmental and social safeguard risks

- 2.2 The project calls for financing human resource development activities and projects involving transfers to the production sector. Consequently, no negative environmental or social impact is expected. According to the Environment and Safeguards Compliance Policy (OP-703), the project is classified as a category "C" operation and does not require any additional environmental or social review.

C. Fiduciary and other risks

- 2.3 A risk management workshop conducted during the analysis mission, with the participation of CONACYT and the Bank, identified eleven risks, of which four are high, two are medium, and the rest are low. The CONACYT team has committed to implement a mitigation plan that includes specific actions for each of the high and medium risks.
- 2.4 The high risks, which are classified as such due to their large impact even though their likelihood is medium, include fiduciary risks, such as a delay in project execution due to lack of knowledge of procurement practices on the part of the beneficiaries, and public management risks, arising from identified delays in congressional approval of sovereign guaranteed loans. The proposed mitigation measures include preparing procurement and reporting handbooks, conducting institutional capacity assessments of the beneficiaries and training them, and

holding informational meetings with legislators and technical experts together with the Ministry of Finance team that is to submit the project to Congress.

- 2.5 In addition, the identified medium risks include a potential lack of coordination between multiple actors and a potential slowdown of economic growth affecting business investment decisions on innovation. The mitigation measures are aimed at facilitating agreements between institutions and groups of firms that require long negotiation and implementation periods. For its part, CONACYT will develop an alternative design of innovation incentives for crisis situations, in order to weather a potential economic slowdown.

III. IMPLEMENTATION AND MANAGEMENT PLAN

A. Summary of implementation arrangements

- 3.1 **Borrower and execution mechanism.** The borrower will be the Republic of Paraguay. The executing agency will be the National Science and Technology Council (CONACYT), an autonomous government institution comprised of public and private sector representatives that reports to the Office of the President of the Republic. Created in 1997 under the General Law on Science and Technology (Law 1028), CONACYT is responsible for steering and coordinating the National System of Science, Technology, Innovation, and Quality, advising the government on these matters, and supporting the country's scientific and technological development through specific policies and programs, which are driven by the public sector and duly coordinated with the private sector. CONACYT's organizational structure consists of a board composed of representatives of 14 public and private institutions, a chairman, an executive secretary in charge of science, technology, and innovation, and an executive secretary in charge of quality. Among the private institutions participating in the CONACYT board are the Unión Industrial Paraguaya [Paraguayan Industrial Union], the Asociación Rural del Paraguay [Rural Association of Paraguay], the Federación de la Producción, Industria y el Comercio [Federation of Production, Industry and Trade], and the Asociación de Pequeñas y Medianas Empresas [Association of Small and Medium-Sized Enterprises]. The presence of these organizations ensures that CONACYT has direct knowledge of business needs when it comes to innovation, and will also give it a better balance and stronger links to efforts geared to generating scientific knowledge and training skilled human resources.
- 3.2 CONACYT will assemble a work team to carry out all project activities. This team will include at least a general coordinator, a planning and monitoring specialist, an administrative and financial coordinator, an innovation specialist, a human resources specialist, and a procurement specialist. The duties of the technical team will include: (i) managing the loan proceeds; (ii) planning execution of the loan; (iii) supervising project progress; (iv) handling all fiduciary matters; (v) processing payments and filing the corresponding documentation; (vi) preparing financial statements and disbursement requests; and (vii) monitoring and evaluating the project. All work plans and technical and financial reports on the project will be approved by the CONACYT board before delivery to the Bank. In addition, clearance from the CONACYT board or its designee will be required for all professionals who participate in the project evaluation process and for all

projects to be financed under the operation. The details of the execution mechanism will be included in the Operating Regulations for the project.

- 3.3 Based on the foregoing, the following will be special conditions precedent to the first disbursement of loan proceeds: (i) appointment of the technical team needed to manage the project; (ii) entry into force of the project Operating Regulations previously agreed upon with the Bank; and (iii) a computer system for submitting and evaluating projects online.**

- 3.4 Financial and fiduciary management.** Procurement and financial administration under the project will be handled in accordance with applicable Bank policies and the provisions of the fiduciary agreements and requirements set forth in Annex III. Since the project mostly consists of financial assistance to businesses and individuals, very little procurement is anticipated. In general, there will only be procurement of consulting services. Consulting assignments will be included in the procurement plan approved by the Bank through the Procurement Plan Execution System (SEPA) and in accordance with the special conditions of the loan contract. The contracting of execution unit staff will be based on job qualifications, by comparing the qualifications of at least three candidates for each position, and will require ex ante review and the no objection of the Bank.

B. Summary of arrangements for monitoring results

- 3.5 Annual work plan (AWP).** This plan will be prepared by CONACYT and delivered together with the previous year's semiannual year-end report. It will include a schedule of activities, a disbursement projection, and the updated procurement plan.
- 3.6 Semiannual progress reports.** Within 60 days following the end of each six-month calendar period or as otherwise agreed upon, CONACYT will submit a report describing progress on the execution of project activities, including a list of outputs achieved and in execution pursuant to the indicators in the results matrix; a monitoring and evaluation report based on the plan prepared by the project team; and an analysis of problems encountered and corrective measures taken.
- 3.7 Project monitoring and evaluations.** A project [monitoring and evaluation plan](#) has been prepared. The team in charge of managing the project will include a person responsible for monitoring and evaluation. CONACYT will submit semiannual reports showing [AWP](#) activities completed. The impact evaluations will focus on technological change, business performance, and employment indicators as defined in the results matrix. Quasi-experimental methodologies will be used to measure these impacts, including difference-in-differences designs with statistical pairing and regression discontinuity. The costs of the monitoring and evaluation activities will be financed under the project.
- 3.8 Financial statements and external audits.** CONACYT will submit audited reports for the project on an annual basis and at the end of the project. These reports will be presented within 120 days following the end of the fiscal year (31 December), and the final report will be presented 120 days following the last disbursement, as provided by the Financial Management Guide for Bank-financed Projects (document OP-273-6). The report will contain the external auditors' opinion on income and expenditures, additionally itemizing the eligibility of each expenditure in line with the purposes indicated in the loan contract. For financial supervision,

supporting documentation for expenditures will be submitted following the Bank's disbursement of resources. Consistent with a medium financial risk, the project calls for at least a semiannual review of the supporting documentation for disbursement requests.

Development Effectiveness Matrix				
Summary				
I. Strategic Alignment				
1. IDB Strategic Development Objectives		Aligned		
Lending Program	-Lending to small and vulnerable countries			
Regional Development Goals				
Bank Output Contribution (as defined in Results Framework of IDB-9)	-Micro/small/medium productive enterprises financed			
2. Country Strategy Development Objectives		Aligned		
Country Strategy Results Matrix	GN-2769	Mejorar la productividad y competitividad de las empresas		
Country Program Results Matrix		The intervention is not included in the 2015 Operational Program.		
Relevance of this project to country development challenges (If not aligned to country strategy or country program)				
II. Development Outcomes - Evaluability		Highly Evaluable	Weight	Maximum Score
		9.2		10
3. Evidence-based Assessment & Solution		9.0	33.33%	10
3.1 Program Diagnosis		2.4		
3.2 Proposed Interventions or Solutions		3.6		
3.3 Results Matrix Quality		3.0		
4. Ex ante Economic Analysis		8.5	33.33%	10
4.1 The program has an ERR/NPV, a Cost-Effectiveness Analysis or a General Economic Analysis		4.0		
4.2 Identified and Quantified Benefits		1.5		
4.3 Identified and Quantified Costs		1.5		
4.4 Reasonable Assumptions		0.0		
4.5 Sensitivity Analysis		1.5		
5. Monitoring and Evaluation		10.0	33.33%	10
5.1 Monitoring Mechanisms		2.5		
5.2 Evaluation Plan		7.5		
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		C		
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. Procurement: Information System.		
Non-Fiduciary				
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:				
Gender Equality	Yes	In the activities and in the evaluation of projects, the inclusion of women to improve their participation in management of innovation and technology will be promoted.		
Labor				
Environment				
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	The Bank provided support to CONACYT through technical cooperation PR- T1140.	
The ex-post impact evaluation of the project will produce evidence to close knowledge gaps in the sector that were identified in the project document and/or in the evaluation plan		Yes	The program will measure the additionality in terms of investment in R&D and the impact on productivity.	

The project has the objective of improving the productivity of companies in Paraguay by increasing the investment in innovation. The specific objectives of the program are: i) to promote the growth of investment in applied research and innovation, especially in priority productive and social sectors; and ii) increase the quantity and quality of advanced research and innovation human capital. The program is aligned with the regional development goal "number of micro, small, and medium enterprises financed". The program contributes to one of the priority sectors in the current Country Strategy.

The diagnosis has adequate information on the factors affecting the productivity of the Paraguayan companies and has properly identified market failures which justify the intervention of the program. It is stated that the low productivity of the companies, that are generally small and medium, is caused by demand factors such as lack of innovation, lack of knowledge generation, lack of connection and coordination between productive units and centers for the generation of research and development (R + D). Additionally, the productivity of Paraguayan firms is affected by the lack of infrastructure.

The vertical logic of the program is clearly stated; the activities and products seek to encourage investment in innovative firms and improvement of human capital.

The economic analysis suggests net, operant positive benefits through improvements in firms' productivity. The sensitivity analysis shows a high probability of maintaining positive social returns. The project has appropriate monitoring mechanisms and plans to evaluate the impact on key indicators using non-experimental differences in differences methodologies and statistical matching. The risk profile of the program is medium. It is worth mentioning that the fiduciary risks are high but the program includes mitigation measures.

RESULTS MATRIX

General and specific objectives	The general objective of the project is to help improve the productivity of the Paraguayan economy. The specific objectives are: (i) to foster greater investment in applied research and innovation, especially in priority production and social sectors; and (ii) to increase the quantity and improve the quality of skilled human capital for innovation.
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IMPACT INDICATORS

Impact	Unit of measurement	Baseline 2015	Target 2020	Means of verification/Comments
1. Growth of total factor productivity	Index	1.00	1.15	<p>Final impact indicator aligned with the program's general objective. Calculated as the ratio of total factor productivity of beneficiary firms, relative to the control group:</p> $\left(\frac{Y_t^B}{(K_t^\alpha L_t^{1-\alpha})^B} \right) / \left(\frac{Y_t^{NB}}{(K_t^\alpha L_t^{1-\alpha})^{NB}} \right)$ <p>where t=2016 in the baseline and t=2020 in the target. A ratio of 1 means that the beneficiary group and the control group have the same total factor productivity in the baseline. Source: Third Innovation Survey of Paraguay (2020). Baseline: First Innovation Survey of Paraguay (2013). The present value of the TFP baseline is not reported, as it is generally presented in the literature as a ratio (and its trend over time).</p>
2. Growth of labor productivity	Index	1.00	1.20	<p>Impact indicator aligned with the program's general objective. Calculated as the ratio of labor productivity of beneficiary firms, relative to the control group.</p> $\left(\frac{Y_t^B}{L_t^B} \right) / \left(\frac{Y_t^{NB}}{L_t^{NB}} \right)$ <p>where t=2016 in the baseline and t=2020 in the target. A ratio of 1 means that the beneficiary group and the control group have the same labor productivity in the baseline. Source: Third Innovation Survey of Paraguay (2020). Baseline: First Innovation Survey of Paraguay (2013). By way of reference, the <i>Enterprise Survey</i> reports a relative productivity for the baseline of 0.28 for Paraguayan firms with respect to the international best practice. This exercise approximates the productivity best practice in the United States, using the methodology of R. Griffith, S. Redding, and J. Van Reenen (2004) <i>Mapping the two faces of R&D: productivity growth in a panel of OECD industries. Review of economics and statistics</i>, 86 (4). pp. 883-895.</p>
3. National investment in R&D	% of GDP	0.06	0.08	<p>Science, technology, and innovation indicators from the Ibero-American and Inter-American Network of Science and Technology Indicators (RICYT). The indicator refers to gross expenditure on R&D financed and executed by the public and private sectors and nongovernmental organizations as a percentage of GDP, under the following assumptions: (a) baseline expenditure grows at the same rate as GDP (scenario without project); and (b) the scenario with project assumes additionality of US\$0.50 for every US\$1 of subsidy (limit retained from the matching grant rule).</p>

OUTCOME INDICATORS

Outcomes	Unit of measurement	Baseline 2015	Target 2020	Means of verification/Comments
Component I:	Promotion of innovation			
1. Increase in investment in innovation in the production sector	%	0.00	0.50	<p>Calculated as investment in innovation (I) by beneficiary firms as a % of sales (Y), less investment in innovation by control firms as a % of sales:</p> $\left[\left(\frac{I_t^B}{Y_t^B} \right) - \left(\frac{I_t^{NB}}{Y_t^{NB}} \right) \right] \times 100$ <p>where t=0 corresponds to 2016 in the baseline and t=2020 in the target. Baseline: The First Innovation Survey of Paraguay (2013) reports investment in innovation at 0.17% of sales in Paraguayan firms. Source: DGEEC, Paraguay 2013.</p>
2. Increase in the percentage of firms introducing product innovations	%	0.00	12.00	<p>Calculated as the difference between the % of beneficiary firms that introduce product innovations (pd) and the % of control firms that introduce product innovations:</p> $\left[\left(\frac{Npd_t^B}{N_t^B} \right) - \left(\frac{Npd_t^{NB}}{N_t^{NB}} \right) \right] \times 100$ <p>where t=0 corresponds to 2016 in the baseline and t=2020 in the target. Baseline: The First Innovation Survey of Paraguay (2013) reports that 40% of firms introduce product innovations. Source: DGEEC, Paraguay 2013.</p>
3. Increase in the percentage of firms introducing process innovations	%	0.00	12.00	<p>Calculated as the difference between the % of beneficiary firms that introduce process innovations (pc) and the % of control firms that introduce process innovations:</p> $\left[\left(\frac{Npc_t^B}{N_t^B} \right) - \left(\frac{Npc_t^{NB}}{N_t^{NB}} \right) \right] \times 100$ <p>where t=0 corresponds to 2016 in the baseline and t=2020 in the target. Baseline: The First Innovation Survey of Paraguay (2013) reports that 28% of firms introduce process innovations. Source: DGEEC, Paraguay 2010.</p>
4. Increase in the percentage of firms cooperating with other National Innovation System stakeholders for innovation	%	0.00	5.00	<p>Calculated as the difference between the % of beneficiary firms that report cooperation for innovation (C) and the % of control firms that report cooperation for innovation:</p> $\left[\left(\frac{C_t^B}{N_t^B} \right) - \left(\frac{C_t^{NB}}{N_t^{NB}} \right) \right] \times 100$ <p>where t=0 corresponds to 2016 in the baseline and t=2020 in the target. Baseline: The First Innovation Survey of Paraguay (2013) reports that 10% of firms introduce innovations in cooperation with other firms. Source: DGEEC, Paraguay 2010.</p>

Outcomes	Unit of measurement	Baseline 2015	Target 2020	Means of verification/Comments
Component II:	Human capital for innovation			
1. Increase in percentage of employees who are university graduates or postgraduates	%	0.00	3.00	<p>Calculated as the difference between the % of workers with a university degree (U) in beneficiary firms and the % of workers with a university degree in the control group:</p> $\left[\left(\frac{U_t^B}{E_t^B} \right) - \left(\frac{U_t^{NB}}{E_t^{NB}} \right) \right]$ <p>where t=0 corresponds to 2016 in the baseline and t=2020 in the target. Baseline: The First Innovation Survey of Paraguay (2013) reports that 9% of the workforce in Paraguayan manufacturing firms has a university degree.</p>

OUTPUT INDICATORS

Outputs	Cost (US\$)	Base-line 2015	Year 1 2016	Year 2 2017	Year 3 2018	Year 4 2019	Year 5 2020	Total	Unit of measurement	Means of verification/ Comments
Component I: Promotion of innovation										
• Output indicator 1:		Individual projects for technological development and innovation								
1. Individual technological development and innovation projects completed	1,845,500	-	-	-	3	5	10	18	Projects	Signed contracts and final reports
• Output indicator 2:		Group projects for technological development and innovation								
2. Group technological development and innovation projects completed	848,000	-	-	-	-	-	4	4	Projects	Signed contracts and final reports
• Output indicator 3:		Technology-based business projects								
3. Projects to support the creation and startup of technology-based firms completed	885,000	-	-	-	5	10	15	30	Projects	Signed contracts and final reports
• Output indicator 4:		Projects to strengthen technology and incubation services								
4. Projects for technology service centers completed	800,000	-	-	-	-	2	2	4	Projects	Signed contracts and final reports
5. Projects for business incubators completed	915,000	-	-	-	-	3	3	6	Projects	Signed contracts and final reports
• Output indicator 5:		Generation of innovation statistics, studies, and activation of demand								
6. Survey of innovation indicators	180,000	-	-	-	1	-	1	2	Database and study of indicators	Microdata and report on findings
7. Activities to activate demand for innovation	300,000	-	2	2	2	2	2	10	Events, hackathons, etc.	Signed contracts and final reports
8. Prospective studies to guide program investments	600,000	-	-	3	3	-	-	6	Number of studies	Signed contracts and final reports
Component II: Human capital for innovation										
• Output indicator: 6		Projects to create and strengthen post-graduate programs with an impact on the country's priority production sectors								
9. Projects completed to create and strengthen postgraduate programs	606,000	-	1	2	1	1	1	6	Postgraduate programs	Signed contracts and final reports
• Output indicator: 7		Incorporation of innovation managers at firms								
10. Projects financed for managing innovation in firms	1,500,000	-	5	10	10	10	15	50	Projects	Signed contracts
• Output indicator: 8		Technology missions								
11. Technology missions conducted ¹	400,000	-	4	4	4	4	4	20	Missions conducted	Signed contracts and final reports

¹ A technology mission consists of a field visit (normally outside a country or region) to learn about projects that reflect good practices in production and management for a given sector. The idea is to transfer the experience of innovative firms and leading-edge technology centers to mission participants. On their return to Paraguay, participants will be able to capitalize on the knowledge gained during the mission, thus providing the industry and their firm with new techniques for boosting competitiveness and innovation.

Special milestones		Gender indicators and SMEs financed			
Outcomes	Unit of measurement	Baseline 2015	Target 2018	Target 2020	Means of verification/Comments
1. Innovation management experts who are women	%	0		20	One program output is to incorporate 50 innovation managers into firms. A special milestone for the program is that 20% of these individuals should be women.
2. SMEs financed	firms	0	100	218	This indicator is prepared by recording and counting all SMEs participating in the different types of projects to be financed by the program. A total of 301 firms are expected to be supported, of which 218 will be small and medium-sized enterprises.

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Country: Paraguay
Project number: PR-L1070
Name: Paraguayan Business Innovation Project
Executing agency: Consejo Nacional de Ciencia y Tecnología [National Science and Technology Council] (CONACYT)
Prepared by: Bruno Candia, Mariano Perales (CSC/CPR); Raúl Lozano (FMP/CPR); Alberto de Egea (FMP/CPR)

I. EXECUTIVE SUMMARY

- 1.1 The institutional evaluation of the project's fiduciary management was based on: (i) the fiduciary context of the country; (ii) the results of the fiduciary risk assessment; (iii) the analysis of the update of the Institutional Capacity Assessment System (ICAS) review of CONACYT; (iv) meetings with staff in the different areas of CONACYT; and (v) current use of country systems. The fiduciary agreements on procurements and financial administration that will be applied for project execution were formulated on the basis of this evaluation.

II. FIDUCIARY CONTEXT OF THE COUNTRY AND THE EXECUTING AGENCY

- 2.1 In general, the country's financial management systems have a medium level of development. They need to be supplemented, for execution of Bank-financed projects, in the areas of specific financial reports, which are produced through auxiliary accounting systems. The tools for financial control, such as the Integrated Financial Administration System (SIAF), the Accounting System (SICO), and other subsystems, allow the executing agencies to arrange for transfers of payments to suppliers of goods and services through the Central Bank under acceptable conditions. The integration of these tools will enable audited financial statements for programs or projects to be generated from the SIAF in the near future. In the meantime, parallel systems are being used. External control is currently performed through private audit firms. However, a pilot project is underway with the Office of the Comptroller General of Paraguay, so that it will soon be able to take over audits of Bank-financed projects.
- 2.2 The Public Procurement Information System, which is in full use for Bank operations as of 2015, will be supplemented by use of the country's electronic reverse auction (SBE) and call for proposal (LCO) subsystems for amounts and categories established in the agreement on the use of such subsystems, signed by Paraguay and the Bank on 17 June 2014.
- 2.3 In the case of the executing agency, the updated assessment of CONACYT, performed using the ICAS tool in September 2015, produced an average score of

- 71.86%, which represents a medium degree of development and is associated with a medium level of risk. The execution capacity of the personnel management, goods and services management, and financial management subsystems was rated at 82.43%, with a satisfactory level of development. The conclusion from the updated ICAS is consistent with the satisfactory performance that CONACYT has maintained, thanks to its experience in the use and application of various Bank tools in the course of implementing the previous operation with the Bank, now concluded. Given these results, with the exception of internal and external control, there are areas of risk and areas for improvement as set out in the updated ICAS.
- 2.4 The aspects to focus on in the procurement area are as follows:
- 2.5 **Areas of risk.** Technical staff have little training in Bank procurement policies, and this could jeopardize effective management of the procurement plan, resulting in errors and inefficiencies in selection and contracting processes and inferior quality in the goods and services procured.
- 2.6 **Opportunities for improvement.** (i) Once the execution unit is established, a training plan dealing with procurement policies should be prepared and implemented with the Bank; and (ii) calls for tender as identified in the procurement plans should be authorized *ad referendum*, until such time as CONACYT has taken steps with the Ministry of Finance to amend the budget to be able to cover such items.
- 2.7 The same evaluation of oversight capacity identified the need for urgent measures to be taken as quickly as possible, preferably within a defined schedule. Their adoption would mean a substantial improvement in capacity, and they should be implemented at an early stage of execution. The rating of 43.86% means an inadequate level of development, posing a high risk. In this context, the procurement and financial management processes run risks of delay, with the possible determination of ineligible expenditures in the future, even though a table of areas for improvement has been presented.
- 2.8 Lastly, consideration must be given to the following: (i) prioritizing planning, programming, and monitoring activities for the project; (ii) developing a technological platform for integrated management of projects; (iii) establishing a project implementation plan that will simplify processes, reducing as much as possible intervention in areas that do not add value to the process; (iv) ensuring greater coordination of financial management with the DIGAF, and defining a system for ongoing reconciliation of SICO, SIGADE, and other records; and (v) defining a training program on issues relating to project management, risk management, and fiduciary management of Bank-financed projects, together with preparation of procurement documents and financial reports for the Bank.

III. FIDUCIARY RISK EVALUATION AND MITIGATION MEASURES

- 3.1 The medium risk resulting from the evaluation of CONACYT may require measures that are of only minor importance but that constitute suggestions for efficient and effective administration of project resources. Consequently, the fiduciary mitigation measures will be the usual ones for this type of risk (see the financial supervision plan, paragraph 6.14).

- 3.2 Although the financial risk is medium, it could have an impact on the project if financial information is not available in a timely and reliable manner. The necessary interaction with the Ministry of the Presidency allows for a Subunit of Financial Administration (SUAF) and a Subunit for Procurement Operations (SUOC), thus simplifying complex processes that require proper monitoring of all procedures. As a mitigation measure, the coordinating unit will be asked to maintain a minimal core team throughout project execution, one that includes a financial specialist, and to continue using the more integrated system to keep project records.
- 3.3 Project management depends on the performance of the coordinating unit, and is therefore very sensitive to changes in personnel.

IV. CONSIDERATIONS FOR THE SPECIAL CONDITIONS OF THE CONTRACTS

- 4.1 The agreements and requirements to be considered in the special conditions are as follows:
- 4.2 The Policies for the Procurement of Works and Goods Financed by the Bank (document GN-2349-9) and the Policies for the Selection and Contracting of Consultants Financed by the Bank (document GN-2350-9) will apply.
- 4.3 CONACYT should have a core team in its coordinating unit, comprising a general coordinator, a procurement specialist, a financial specialist, and a planning and monitoring specialist.
- 4.4 **Exchange rate.** The executing agency has been advised of the exchange rate alternatives (date of payment or conversion of dollars transferred by the Bank), which will be confirmed prior to negotiation of the loan.
- 4.5 Financial statements are to be presented at the close of each year and should be audited by the Office of the Comptroller General or by a firm of independent auditors acceptable to the Bank. That audit may include assurance reports and reports on the institutional capacity situation.
- 4.6 Documentation supporting expenditures incurred will be reviewed ex post by the Bank or by the corresponding audit entity.

V. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

- 5.1 **Execution of procurements.** The procurement policies applicable to this loan are those set forth in documents GN-2349-9 and GN-2350-9. As well, the Bank's Board of Executive Directors has approved Acceptance of the Partial Use of the Country Procurement System in Argentina, Bolivia, Costa Rica, El Salvador, Jamaica, Panama, Paraguay and Peru (document GN-2538-11), and use of the electronic reverse auction (SBE) and call for proposal (LCO) systems under the Public Procurement System of Paraguay (Law 2051/03). Other country systems approved subsequent to approval of the project will be applied automatically, and this will be indicated in the procurement plan.

- 5.2 **Procurement of works, goods, and nonconsulting services.** Contracts for works, goods, and nonconsulting services¹ subject to international competitive bidding (ICB) will be procured using the Bank's standard bidding documents. Bidding processes subject to national competitive bidding (NCB) will be conducted using national bidding documents agreed upon with the Bank. The project sector specialist will be responsible for reviewing the technical specifications for procurement during the preparation of selection processes. Initially, no selection processes are planned that involve direct contracting.²
- 5.3 **Selection and contracting of consultants.** Consulting services contracts generated under the project will be executed using the standard request for proposals issued by or agreed upon with the Bank. The project sector specialist will be responsible for reviewing the terms of reference for the contracting of consulting services.
- 5.4 **Selection of individual consultants.** Individual consultants are expected to be contracted for general, administrative, and technical coordination of the execution unit.
- a. **Use of the country system.** Pursuant to document GN-2538-11 of October 2013, use of the SBE and LCO subsystems of Paraguay's Public Procurement System for Bank-financed operations will be applicable to:
 - b. All contracts for goods and nonconsulting services subject to the use of the electronic reverse auction procedure as established in Paraguay's Public Procurement System and involving amounts below the Bank's established threshold for the shopping method for off-the-shelf goods (for reference, US\$250,000);
 - c. All contracts for works involving amounts below the Bank's established threshold for use of the price comparison (shopping) method for simple works (for reference, US\$250,000), and for contracts for goods and nonconsulting services up to the amount established by the Bank for use of the shopping method for complex goods and services (for reference, US\$50,000);
 - d. Contracts for amounts equal to or greater than the above amounts will be governed by the policies set forth in document GN-2349-9.
- 5.5 Section 1 of the Bank's policies (document GN-2349-9) will remain applicable for all contracts executed, regardless of their amount or contracting method. Any system or subsystem approved subsequently will be applicable to the operation. The procurement plan for the operation and updates thereto will indicate which contracts are to be executed through the approved country systems.³
- 5.6 **Recurring expenses.** None are envisaged for this operation.
- 5.7 **Advance procurement/Retroactive financing:** None is envisaged for this operation.

¹ Policies for the Procurement of Goods and Works Financed by the IDB (document GN-2349-9), paragraph 1.1. Nonconsulting services are treated as goods.

² Policies for the Procurement of Goods and Works Financed by the IDB (document GN-2349-9), paragraph 3.6. Direct contracting must be duly justified.

³ In the event that another system or subsystem is validated by the Bank, it will apply to the operation, pursuant to the provisions of the loan contract.

5.8 **National preference:** None is envisaged for this operation.

Threshold amounts for ICB and the international shortlist (US\$000)

Method	ICB works	ICB goods and nonconsulting services	International shortlist for consulting services
Maximum amount	US\$3,000	US\$250	US\$200

Main procurement processes

Activity	Type of bidding	Estimated date	Estimated amount US\$000
Firms ⁴			
Prospective studies	QCBS	1Q-2017	500
Individual consultants			
Consultants for establishing the coordinating unit and a consultant for the midterm evaluation in year 3.	3CV	1Q-2017	858

* See the [procurement plan](#).

- 5.9 **Procurement supervision.** All procurement and/or contracting processes governed by the policies set forth in documents GN-2349-9 and GN-2350-9 will be reviewed by the Bank on an ex ante basis, taking into account the position of the government in this regard. Supervision of all procurement and/or contracting processes under the SBE and LCO subsystems of Paraguay's Public Procurement System will be conducted using the country system,⁵ in accordance with document GN-2538-11.
- 5.10 **Special provisions.** No special provisions other than those indicated in paragraph 5.2 of this annex are anticipated.
- 5.11 **Records and files.** For the preparation and filing of project reports, the procedures and formats that have been agreed upon and are described in the fiduciary manual of functions and procedures for the project will be used.

VI. FINANCIAL MANAGEMENT

A. Programming and budget

- 6.1 CONACYT will coordinate budget execution through the General Directorate of Administration and Finance. The execution unit will have the logistical support of the other directorates, as well as the executive secretariat of CONACYT.
- 6.2 The execution unit will also be responsible to the Bank for: (i) coordinating all activities related to the project; (ii) preparing physical and financial progress reports; (iii) presenting requests for no objection and disbursement of the loan, and maintaining accounting records that will be the main source for preparing

⁴ In the case of consulting services, this involves compiling a shortlist of firms of various nationalities. See paragraph 2.6 of the Policy for the Selection and Contracting of Consultants Financed by the IDB (document GN-2350-7).

⁵ According to the scope of use of the system, supervision may be supplemented with project audits, in which case this should be mentioned in this annex.

- those requests and any financial report; (iv) implementing and maintaining an oversight system that will guarantee proper use and safekeeping of the resources, as well as maintaining a documentary archive on transactions; and (v) preparing and updating the initial project report, annual work plans, semiannual monitoring reports, evaluations, and the project completion report, before submitting those reports to the Bank. Lastly, it will be responsible for timely fulfillment of the conditions and agreements set out in the loan contract and project-related activities.
- 6.3 Budgetary programming, administration, and execution will be conducted by the department of budget and accounts, under the zero-based budgeting system. It has been agreed that prior to the first disbursement, the borrower will provide the resources needed to launch the project at a minimum level, complementary to the resources to be provided by the Bank for the first year of execution.
- 6.4 A budgetary allocation of US\$10 million will be needed for the project in 2016.

B. Accounting and information systems

- 6.5 Accrual accounting will be used; however, accountability processes for projects partially financed by the IDB will operate on a cash basis, in line with local practices and international accounting standards. The SIAF is the principal manager for budgetary and accounting transactions, connected to the SICO accounting subsystem, which together with other subsystems makes it possible to download information and prepare reports that can be accessed by the Bank and other sources of financing.

C. Cash management, disbursements, and cash flow

- 6.6 For purposes of executing project funds, the Ministry of Finance, at the request of the execution unit, will authorize a special account at the Central Bank of Paraguay. This account will hold the funds disbursed by the Bank. For other types of bank transfers such as to suppliers, a specific bank account must be opened for the project at the Central Bank of Paraguay or a commercial bank, for purposes of making the corresponding payments.
- 6.7 The disbursement modality will be that of fund advances, based on the actual liquidity needs of the project and substantiated by a proper financial and disbursement projection. These advances will be made preferably on a semiannual basis, once at least 80% of the previous advance has been substantiated. As documentation, the reporting forms, processed by its own systems, will be presented.

D. Internal control and internal audit

- 6.8 The execution unit will be responsible for keeping financial records of transactions and disbursements and for maintaining financial information on the project. It is recommended that prior to the first disbursement, the execution unit should hire a consultant with auditing expertise to oversee the financial aspects of the project and to ensure accountability. The consultant will serve as the liaison or counterpart between the execution unit and the audit firms responsible for preparing the financial statements for the project. As well, the consultant will prepare a program for reviewing payments or transfers ordered by the supervisory firms, as the works progress.

E. External control and reports

- 6.9 The Office of the Comptroller General and the government auditor are responsible for the external control system. For purposes of the project, the audit will be prepared by the Office of the Comptroller General or by a firm of independent auditors acceptable to the Bank.
- 6.10 The executing agency, through the PCU, will deliver annual audit reports on the project, prepared by a firm of independent auditors acceptable to the Bank in accordance with the Financial Management Guidelines for Projects Financed by the IDB (documents OP-273-6 and OP-274-2), and terms of reference previously approved by the Bank. Audits will be performed throughout the execution period. The auditors will be selected and contracted in accordance with Bank procedures (documents AF-200 and AF-400).
- 6.11 The auditing costs will be financed from project resources.

F. Execution mechanism

- 6.12 CONACYT will be responsible for: (i) executing program resources and supervising their proper use; (ii) providing the necessary human, technological, and budgetary resources in due time and manner; and (iii) presenting to the Bank the documentation required for fulfilling the disbursement conditions, as well as the operational information needed for execution.
- 6.13 **Operating Regulations.** The Operating Regulations for the project will be updated and: (i) will be consistent with the standards and policies of CONACYT and the Bank, as well as with financial legislation and practices in the country; (ii) their approval and implementation by the execution unit, to the Bank's satisfaction, will be a condition precedent to the disbursement of resources; and (iii) any changes will require the Bank's no objection.

G. Financial supervision plan

- 6.14 Financial supervision will be performed through three channels: (i) control of disbursement reports and review visits; (ii) onsite supervision visits planned by the Bank; and (iii) financial information taken from the financial statements and the production of execution reports.

Supervision activity	Supervision Plan			
	Nature and scope	Frequency	Responsible entity	
			Bank	Other
Operational	Review of the progress report	Semiannual	Fiduciary and sector team	
	Portfolio review with the executing agency and the Ministry of Finance	Semiannual	Fiduciary and sector team	
Financial	Inspection visits	Semiannual	Fiduciary specialist	
	Financial audit	Annual	Fiduciary specialist	Executing agency
	Ex post review of disbursements	Annual	Fiduciary specialist	
	Review of disbursement requests	Periodic	Fiduciary team	
Procurement	Ex ante review of procurement processes	N/A	Project team leader with the support of the procurement specialist	Executing agency
	Update of the procurement plan	Quarterly until implementation of SEPA	Project team leader with the support of the procurement specialist	Executing agency
Compliance	Fulfillment of conditions precedent	Once	Fiduciary team	
	Budgetary allocation	Annual	Fiduciary specialist	Executing agency
	Presentation of audited financial statements	Annual	Fiduciary specialist	

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-____/____

Paraguay. Loan ____/OC-PR to the Republic of Paraguay
Paraguayan Business Innovation Project

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 Republic of Paraguay, as Borrower, for the purpose of granting it a financing to cooperate in the execution of the Paraguayan Business Innovation Project. Such financing will be for an amount of up to US\$10,000,000 from the Ordinary Capital resources of the Bank, 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 ____ 20__)

LEG/SGO/CSC/IDBDOCS: 39905158
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