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ARGENTINA

SUPPORT PROGRAM FOR KNOWLEDGE ECONOMY EXPORTS

(AR-L1357)

LOAN PROPOSAL

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ABBREVIATIONS	
AAICI	Agencia Argentina de Promoción de Inversiones y Comercio Internacional [Argentine Investment and International Trade Promotion Agency]
Agencia I+D+i	Agencia Nacional de Promoción de la Investigación, el Desarrollo Tecnológico y la Innovación [National Research, Technological Development, and Innovation Promotion Agency]
AGN	Auditoría General de la Nación [Office of the Auditor General of the Nation]
AI	Artificial intelligence
CAMIA	Centro Argentino Multidisciplinario de Inteligencia Artificial [Argentine Multidisciplinary Center for Artificial Intelligence]
IC	Individual consultant selection
INT/TIN	Trade and Investment Division
IRR	Internal rate of return
KIGs	Knowledge-intensive goods
MCTI	Ministry of Science, Technology, and Innovation
NPV	Net present value
NRC	Nonreimbursable contribution
OECD	Organisation for Economic Co-operation and Development
OEDE	Observatorio de Empleo y Dinámica Empresarial [Observatory of Employment and Business Dynamics]
PCIAS	Pan-Canadian AI Strategy
QCBS	Quality- and cost-based selection
R&D	Research and development
RICYT	Red Iberoamericana e Interamericana de Ciencia y Tecnología [Ibero-American and Inter-American Science and Technology Network]
SEC	Secretaría de Economía del Conocimiento [Knowledge Economy Department]
SENCE	Servicio Nacional de Capacitación y Empleo [National Training and Employment Service]
SMEs	Small and medium-sized enterprises
SOFR	Secured Overnight Financing Rate
SSS	Single-source selection
STEM	Science, technology, engineering and mathematics
TIPAs	Trade and investment promotion agencies

PROJECT SUMMARY
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Financial Terms and Conditions				
Borrower			Flexible Financing Facility ^(a)	
Argentine Republic			Amortization period:	25 years
Executing agency:			Disbursement period:	5 years
Ministry of Science, Technology, and Innovation (MCTI), acting through the National Agency for the Promotion of Research, Technological Development, and Innovation (Agencia I+D+i); and Ministry of Economy, acting through the Knowledge Economy Department (SEC)			Grace period:	5.5 years ^(b)
Source	Amount (US\$)	%	Interest rate:	SOFR-based
IDB (Ordinary Capital):	35 million	100%	Credit fee:	(c)
			Inspection and supervision fee:	(c)
Total:	35 million	100%	Weighted average life:	15.25 years
			Currency of approval:	United States dollars
Project at a Glance				
Project objective/description:				
The program objective is to help the knowledge economy sectors increase exports by sourcing specialized human capital, developing and adopting technologies based on artificial intelligence (AI), and positioning themselves in international markets. The specific objectives are: (i) to strengthen the formation of human capital required by the knowledge economy sectors; (ii) to increase collaboration between the science/technology system and the productive sector in AI-based technologies; and (iii) to contribute to the internationalization of companies in the knowledge economy sectors.				
Special contractual conditions precedent to the first disbursement of the financing:				
(i) Evidence that the coexecuting agencies have established a program execution team specifically for the activities under their responsibility; (ii) entry into force of the program Operating Regulations to be used by each coexecuting agency on the terms agreed upon with the Bank; (iii) evidence that the technical committee has been created on the terms agreed upon with the Bank; and (iv) evidence that an agreement has been signed between the Ministry of Science, Technology, and Innovation (MCTI) and the National Research, Technological Development, and Innovation Promotion Agency (Agencia I+D+i) for execution of the Component 2 resources and activities on terms previously agreed upon with the Bank (paragraph 3.3).				
Special contractual condition for execution:				
Before assuming any commitments with beneficiaries of the program’s nonreimbursable financing, the coexecuting agencies will submit the model agreements to be used for such financing to the Bank for its no objection (paragraph 3.4).				
Exceptions to Bank policy: None.				
Strategic Alignment				
Challenges: ^(d)	SI <input checked="" type="checkbox"/>		PI <input checked="" type="checkbox"/>	EI <input checked="" type="checkbox"/>
Crosscutting themes: ^(e)	GE <input checked="" type="checkbox"/> and DI <input checked="" type="checkbox"/>		CC <input checked="" type="checkbox"/> and ES <input type="checkbox"/>	IC <input checked="" type="checkbox"/>

^(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, interest rate, commodity, and catastrophe protection 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) GE (Gender Equality) and DI (Diversity); CC (Climate Change) and ES (Environmental Sustainability); and IC (Institutional Capacity and Rule of Law).

I. PROJECT DESCRIPTION AND RESULTS MONITORING

A. Background, problem addressed, and rationale

- 1.1 **Background.** The knowledge economy¹ has grown steadily around the world in the last 20 years.² In 2019, it employed 1 billion people.³ The production of new technologies such as artificial intelligence (AI),⁴ big data, machine learning, the internet of things, and their incorporation into other knowledge economy sectors have been key drivers of that growth.
- 1.2 The knowledge economy companies that birthed these new technologies have exported their solutions, while companies that adopted these technologies have increased their exports.⁵ Yet, despite this, knowledge economy companies in Argentina have not seized the opportunity to increase their exports as fast as the knowledge economy has grown globally.
- 1.3 Global demand for knowledge economy services rose 90% between 2011 and 2021.⁶ However, even though Argentina's exports of knowledge economy services increased in amount (US\$) in that period, the percentage of total world exports from Argentina decreased from 0.45% to 0.26%.⁷ Moreover, exports of

¹ The knowledge economy is an ensemble of sectors that are more highly sophisticated based on intensive use of knowledge, talent, and investment in intangibles. In the case of Argentina, according to [Law 27,506](#), as amended, these sectors include: knowledge-based services (software and computer services, audiovisual, professional services, geological, financial, research and development, and health services), bioeconomics, nanotechnology, experimental research and development, industry 4.0 (focusing on the incorporation of 4.0 technologies into manufacturing, such as: advanced robotics, internet of things, artificial intelligence, cloud computing, simulation, big data, sensors, etc.), and the space, satellite, and nuclear industries.

² [Corrado, et al. \(2022\)](#) report an annual growth rate of 4.9% between 2000 and 2021 for investments in knowledge, talent, and intangible capital in the United States, surpassing the growth rate for tangible investment (2.5%) and income (4%) in that period. Additionally, [Eberley \(2022\)](#) offers evidence that between 1975 and 2019 the share of investment in intangible components over total investment increased 31 percentage points, reaching 69% of investment in 2019. [Mckinsey \(2021\)](#) confirms the evidence for 10 European countries.

³ [Link](#).

⁴ Artificial intelligence (AI) is a general-purpose technology that can be applied to practically any activity. It can transform activities by improving efficiency or creating opportunities for new ways of doing things.

⁵ Goldfarb and Tucker (2019), [INTAL \(2018\)](#), [Volpe Martincus \(2016\)](#), and others.

⁶ Calculated as the sum of telecommunication, computer and information services, other business services, and audiovisual and related services, according to WTO Stats data. Global exports rose 17.6% in the postpandemic period. The global market for exports of knowledge economy goods cannot be easily estimated based on standardized codes commonly used in international trade because they differ in their use of specific technologies or knowledge incorporated into their knowledge processes but may be classified within different products or product chapters. For example, biotechnology can be found in a medicine, seed, food, etc., but one cannot distinguish which portion of exported pharmaceuticals are biotechnology products.

⁷ A year-on-year increase of 19.6% was seen in 2022. The change in the last year can be attributed mainly to accounting and legal services and computer software and services. According to Argenconomics data, the contribution of Argentina's knowledge-based services exports to total global exports fell 40.87% in the period 2012-2021. This decrease is greater than for regional economies such as Costa Rica (+46.88%), Colombia (-17.01%), and Uruguay (-24.47%) or for nonregional economies such as Poland (+50.81%), Romania (+1.16%), and the Czech Republic (+1.11%).

knowledge-intensive goods (KIGs)⁸ have fallen gradually year after year from US\$2.1 billion in 2011 to US\$600 million in 2021 (UNCTAD, 2022).

- 1.4 **Problem to be addressed.** The Argentina's relatively small share of exports of knowledge economy goods and services can be attributed to macro factors and to specific sector-related factors. Macro factors include: (i) economic instability;⁹ and (ii) regulatory barriers related to intellectual property, investment, starting a business, employment and taxes, and sector promotion systems.¹⁰ Sector-related factors include: (i) absence of trained human capital;^{11 12} (ii) lack of collaboration between the science and technology system and the productive sector; and (iii) inability of national and subnational trade and investment promotion agencies (TIPAs) to promote knowledge economy sectors.¹³
- 1.5 **Trained human capital.** The development and retention of human capital are key to the growth of the knowledge economy because it is driven by innovation, creativity, adaptability, and the creation and transfer of knowledge.¹⁴
- 1.6 Although Argentina has 4.7 researchers for every 1,000 employees, which is a much higher-than-average figure for the region (1.7 for every 1,000 employees),¹⁵ it has great difficulty retaining talent, given the salaries and benefits offered by companies in developed countries.¹⁶ According to data from Argentina's Software and Computer Services Industry Association (CESSI), this has led to a deficit of

⁸ The definition of KIGs uses the classification developed in [Lall \(2000\)](#). KIGs are high-intensity goods that include, among other classes, basic pharmaceutical products and pharmaceutical preparations, computer, electronic, and optical products, and air and spacecraft and related machinery. For the complete list, see the [link](#).

⁹ Other notable factors include economic policy shifts, degrees of openness, and macroeconomic conditions, which have made rapidly delocalizing sectors like the knowledge economy less attractive to foreign investment and have affected the number of exporting companies in general. However, compared to traditional goods sectors, the sectors included in the knowledge economy are less intensive in inputs or imports and so have fewer trade restrictions. Additionally, the fact that most knowledge economy sectors are intangible means they are less exposed to such macroeconomic dysfunctions and represent an opportunity for the country to generate foreign currency, increasing revenue and creating higher value-added jobs. At the same time, by supporting the internationalization of knowledge economy companies, the program will be contributing to better working conditions (higher pay, access to cutting-edge technology and knowledge, and higher productivity levels), as well as countering brain drain. ([International Monetary Fund \(IMF\) \(2022\)](#); [Office of Chief Economist, Government of Canada \(2012\)](#); [World Economic Forum \(2015\)](#); [Wang, Mei, and Xion \(2020\)](#), "How Does Technology Import and Export Affect the Innovative Performance of Firms? From the Perspective of Emerging Markets Firms"; [Castro \(2021\)](#), "Brain Drain: Programmers Go Abroad to Collect in Dollars").

¹⁰ Software being the knowledge economy's main export, the Software Promotion Law was plagued by stops and starts, administrative impasses in its sunset years, and declining investments and exports due to uncertainty about operating costs and profit margins. The clearest case was the transition from the Software Promotion Law to the Knowledge Economy Law, its amendments, and the delays in implementation of the promotion system (Lachman and López, 2022).

¹¹ Driven by the emigration of highly-skilled people in fields like technology and engineering (net emigration rate of 1.2 per 1,000 people vs. 1.1 in Chile and 0.9 in Uruguay), and the low levels of investment in R&D (0.6% of GDP vs. 2.2% in Chile and 2.6% in Brazil).

¹² [Oecd.ai](#).

¹³ Carballo, J., and Volpe Martincus, C. (2020). "Evaluación de impacto de las asistencias brindadas por la AAICl sobre las exportaciones de las firmas argentinas." IDB, Integration and Trade Sector (INT).

¹⁴ [Link](#).

¹⁵ [Link](#), section 3.3.2.

¹⁶ [Link](#).

15,000 information technology jobs in the economy and 30% job turnover, year after year.¹⁷ The lack of a workforce with digital skills¹⁸ is especially evident in industry 4.0 technologies (AI, cybersecurity, robotics, cloud computing, internet of things, and others).¹⁹

- 1.7 Evidence shows the importance of labor information systems, mechanisms and instruments to identify and anticipate demand for skills and guide the development of relevant training paths ([Amaral et al., 2017](#)). Such systems include mechanisms for management, monitoring, and job placement and contribute to data-based decision-making. They usually include employer surveys, analysis of administrative data and big data from open portals, sector forums, and sector studies ([Echeverria and Rucci, 2022](#)).
- 1.8 In Argentina, there is significant demand for occupations and skills in the knowledge economy sectors. Of the 11,300 job offers published in January 2023, 38% are in the knowledge economy, concentrated in the professional, scientific, and technical services sector (28%). Full-time positions account for 93%; 61% require considerable qualifications, and 24% some or moderate qualifications; and 40% require cognitive skills, the most sought-after being oral comprehension, oral expression, written comprehension, and deductive reasoning.
- 1.9 Faced with similar challenges, several countries have implemented programs to build and retain human capital for the knowledge economy by strengthening science, technology, engineering, and mathematics (STEM) education, research and development, and innovation. For example, the Singapore government's SkillsFuture program, launched in 2015, works with educational institutions, employers, and students to ensure access to continuous learning in subject areas matching productive sector demand. The program offers grants, scholarships, fellowships, internships, and other types of support for young people and midcareer professionals to strengthen their capabilities in such areas as digital skills, data analysis, and cybersecurity. It also offers a Web portal to link students with employers.²⁰ An impact study estimates that graduates of SkillsFuture programs earn 10% higher salaries than polytechnic graduates.²¹
- 1.10 The Canada Research Chairs Program invests in attracting and retaining world-class researchers in knowledge economy and AI issues, to ensure the excellence of the country's higher education institutions and enhance their international competitiveness.²² Impact studies of the program have shown its effectiveness in attracting world-class talent, and that the reputation of these

¹⁷ [Argencon \(2022\)](#).

¹⁸ Bartesaghi and Weck (2022).

¹⁹ The shortage of trained personnel was noted as the first obstacle to AI development in a survey of knowledge economy companies supported by the current system, according to over 70% of developer companies and 40% of adopters (Ministry of Productive Development, 2022).

²⁰ [SkillsFuture](#).

²¹ [Link](#).

²² Through the Canadian Institute for Advanced Research (CIFAR), the Canadian government created 113 [Canada CIFAR AI Chairs](#) as part of its AI strategy.

attracted researchers and the innovation level of their research has served to attract other professors and highly qualified personnel.²³

- 1.11 The public-private “[Digital Talent for Chile Initiative](#)”²⁴ offers a vocational training rationale based on productive sector demand that includes identification of demand for talent, training content design, establishment of talent accelerators, course delivery, skills certification, and job placement. Demand is identified via a combination of National Training and Employment Service (SENCE) instruments such as the skills demand survey and in-depth interviews with industry experts.
- 1.12 **Collaboration between the science/technology system and the productive sector.** Collaboration between the science/technology system and the private sector is essential for development of the knowledge economy. Casas, et al. (2000) show its importance for the development of sectors driven by biotechnology, materials science, and telecommunications in Mexico. Stubrin (2022) documents a similar process for biotechnology in Argentina.²⁵
- 1.13 Levels of private collaboration with the science/technology sector are lower than in countries on the global technological frontier: in Argentina, 19.6% of manufacturing companies collaborate with academic institutions, but 30% in Finland, and 33% in Denmark (Navarro, et al., 2023). Meanwhile, the science/technology sector has low levels of collaboration with industry compared to the region’s average: only 0.9% of scientific publications in Argentina are produced in collaboration with private parties, versus an average 1.6% for Latin America and the Caribbean (Confraria and Vargas, 2019).
- 1.14 This affects the speed of business activity growth in AI. Furthermore, the slowdown of Argentina’s scientific output on AI is thwarting growth of the AI-driven knowledge economy:²⁶ Argentina’s scientific system is the third largest in Latin America but ranks fifth in computer science and AI (Confraria, et al., 2023).
- 1.15 The majority of local companies do not develop or adopt AI-based solutions or have begun such efforts only recently.²⁷ At the same time, Argentina shows low levels of indirect export of knowledge-based services embedded in goods exports.²⁸
- 1.16 Faced with a similar challenge, the Singapore government supports collaboration between academia and the productive sector for research, development, and innovation through the [National Research Foundation](#), which has launched the AI

²³ [Link](#).

²⁴ As part of Bank program [4362/OC-CH](#).

²⁵ Although R&D investment levels are high for the region (RICYT, 2023), the bulk of these activities occur exclusively at public and academic institutions. Private R&D expenditure accounts for no more than 21% of the total, far below the OECD’s 47%.

²⁶ Similarly, venture capital investments in Argentina are small ([OECD, 2023](#)).

²⁷ Only 23.5% of knowledge economy companies said they are developing or implementing AI projects (Ministry of Productive Development, 2022), suggesting even lower levels of adoption in the economy as a whole. In any case, these levels are lower than average for Latin America (29%) and globally (34%) (IBM, 2022).

²⁸ [Svarzman and Rozemberg \(2022\)](#), Table 10, p. 274. The ratio of indirect exports to total direct and indirect exports in Argentina is near 40%, below countries that export fewer knowledge economy services directly such as Colombia, Chile, or Mexico (55%, 82%, and 90%, respectively) and countries that export more knowledge economy services directly (such as Brazil with a ratio of 51%).

Singapore [Technology Challenges](#) providing nonreimbursable financial support to university/business consortia to develop AI solutions. It also offers corporate memberships where AI Singapore trains and certifies staff of private businesses on AI issues. Singapore's National Research Foundation has also created the Datascience Consortium to foster collaboration between industry and big data analytics researchers.

- 1.17 Chile's Technology Transfer Program encourages the transfer of technology and knowledge from research centers to small and medium-sized enterprises (SMEs), to bridge the gap between research and commercialization and promote the knowledge economy. An impact analysis of the program shows that public funding for R&D and the number of R&D projects in which the lead researcher has been involved make technology transfer more likely.²⁹
- 1.18 Additionally, leading countries in AI strategies and research are focusing on implementation and application of the technology by companies.³⁰ For example, while in Canada the first Pan-Canadian AI Strategy (PCIAS, 2017-2022) had a sizeable basic research component, the second stage of the strategy approved in June 2022 seeks to realign efforts towards the implementation of AI in the productive sector.
- 1.19 **Promotion of internationalization of knowledge economy companies.** Trade promotion is a specialized technical function focused on closing information gaps.³¹ The trade promotion of knowledge economy goods and services requires even more specific promotional capabilities,³² including: (i) information access and integration (e.g., regulations, sales and distribution channels, and certifications); (ii) identification and contact with potential clients; (iii) validation and adaptation of value propositions; and (iv) ease of access to finance. More investment can also be attracted through actions to help overcome information problems and the associated market failures.³³
- 1.20 Export promotion policies are cost-effective. Volpe (2010)³⁴ concludes that each US\$1 invested in export promotion in the region generates between US\$38 and US\$45 of exports. Mesquita Moreira, et al. (2019) document that companies benefiting from these programs (i) diversify their exports and open new export markets in the long run; and (ii) increase their sales, employment, and worker

²⁹ [Link](#).

³⁰ Pan-Canadian AI Strategy (PCIAS) (2017-2022).

³¹ [Volpe Martincus \(2016\)](#).

³² [Information barriers to trade in this type of goods and services are significant](#), and trade and investment promotion agencies (TIPAs) do not reduce those barriers as much as they should, given their limited capabilities. Castro, L., and Saslavsky, D. (2009), Cazadores de mercados. Comercio y promoción de exportaciones en las provincias argentinas; and Castro, L., and Szenkman, P. (2017), Construyendo capacidades institucionales de programas de desarrollo productivo: Evidencia de tres casos de estudio de Argentina.

³³ [Volpe Martincus \(2021\)](#).

³⁴ Volpe Martincus (2010), Odyssey in International Markets.

productivity, particularly in the case of small firms.³⁵ Volpe (2010)³⁶ examines export promotion programs and concludes that the positive impacts appear to be greater when the programs are combined to support exporters at different stages of export development, and when they seek to not only increase exports but contribute to their diversification.³⁷

- 1.21 The evidence shows that trade and investment promotion agencies (TIPAs) should target their actions to sectors with higher value-added, such as those in the knowledge economy.³⁸ According to an IDB study assessing the impact of assistance provided by the Argentine Investment and International Trade Promotion Agency (AAICI), much of the positive outcomes, in terms of number of destinations reached or total volume exported, is concentrated in undifferentiated goods. Differentiated products like those created by knowledge economy sectors are not being supported effectively by AAICI.³⁹ Subnational TIPAs lag even further behind national TIPAs, showing little ability to promote exports and investments in nontraditional sectors, such as those in the knowledge economy.⁴⁰ They are limited, mainly, by issues of access to finance, information, and data. In particular, these agencies need strengthening in access to international positioning strategies for the sector,⁴¹ quality information focused on the knowledge economy, international best practices in sector promotion programs, staff training on the knowledge economy, implementation of instruments to support companies specifically targeting this sector, and other areas.
- 1.22 Several countries have developed programs focused on promoting these sectors. The Israel Export Institute offers: (i) sector-specific business development services, identifying customers and partners and organizing trade missions and event attendance; (ii) financial assistance in the form of grants and loans to help cover the costs of developing and marketing products abroad; and (iii) information services in the form of market research, market trends, and analysis of global

³⁵ Mesquita Moreira, M., and Stein, E. (2019), *De promesas a resultados en el comercio internacional*, pp. 228-232. Freixanet, J., and Ayob, A. H. (2014). *Evaluation and Program Planning* 46, 2014, pp. 38-46.

³⁶ Volpe (2010) IDB. *Special Report on Integration and Trade*.

³⁷ Virtually all studies report that export promotion agencies have a significant positive effect on firms' exports. Alvarez and Crespi (2000); Alvarez (2004), Chile; Volpe Martincus (2010), Argentina, Chile, Colombia, Costa Rica, Peru, and Uruguay; Van Biesebroeck, et al. (2015), Canada; Cansino, et al. (2013), Spain; and Crozet, et al. (2013), France; Kanda, et. al. (2013), on externalities and other export-related market failures.

³⁸ [Assessments of world-class agencies like Costa Rica's](#) show that the agency support only has a significant positive impact on exports of differentiated goods. This is as one might expect, because trade in goods of this kind must sometimes contend with greater information problems, which are exactly what an export and investment promotion agency seeks to solve.

³⁹ Carballo, J., and Volpe Martincus, C. (2020), "Evaluación de impacto de las asistencias brindadas por la AAICI sobre las exportaciones de las firmas argentinas."

⁴⁰ Castro, L., and Saslavsky, D. (2009), *Cazadores de mercados. Comercio y promoción de exportaciones en las provincias argentinas*; and Castro, L., and Szenkman, P. (2017), *Construyendo capacidades institucionales de programas de desarrollo productivo: Evidencia de tres casos de estudio de Argentina*.

⁴¹ Unlike other countries of the region and the world, Argentina has not developed a knowledge economy positioning and internationalization strategy. Although the goals of the "[Productive Argentina Plan 2030](#)" include increasing total exports attributable to knowledge-based services, this has not been reflected in the prioritization of resources and activities related to the sector. For example, only 17% of actions (53 out of 305) in the [2023 Export Promotion Plan](#) target knowledge economy sectors. Activities to strengthen TIPAs should be linked to the recommendations of the knowledge economy positioning and internationalization strategy.

economic conditions for the knowledge economy sector.⁴² Uruguay XXI has developed a specific strategy for targeting knowledge economy sectors, particularly in global export services, which combines the creation of instruments to attract investment and promote exports of companies related to the knowledge economy,⁴³ as well as set up a bureau to manage postinvestment services.

- 1.23 **AI and the knowledge economy.** AI is the 4.0 technology used by knowledge economy companies with the greatest potential to generate economic growth,⁴⁴ focusing on the development of algorithms and systems to perform tasks that generally rely on human intelligence, such as perception, learning, and problem-solving. AI is used to automate tasks, improve efficiency, and enhance data-driven decision-making.
- 1.24 Unlike other 4.0 technologies (such as cybersecurity, robotics, cloud computing, or internet of things), to avoid irreversible losses of competitiveness, knowledge economy companies must develop their own AI applications and solutions and avoid copying or adapting solutions created by others because adapting an AI solution to a specific production process requires: (i) large amounts of data specific to one sector or company; (ii) incorporation of taxonomies and local knowledge (knowledge engineering); (iii) large efforts to integrate the AI into existing processes and technology architectures because it will be used for specific processes and actions that require changes in other processes and actions throughout the production stream; (iv) adaptation of personnel because AI tends to increase human capacity, not replace it entirely; and (v) new governance structures to monitor and update solutions as contexts change.⁴⁵ Faced with this reality, many governments have designed initiatives and centers to support AI development by the productive sector.⁴⁶
- 1.25 **Gender and diversity gaps.** The region has a gender gap in technology-intensive jobs, only 30% of which are held by women.⁴⁷ In Argentina, one out of three students in STEM courses of study is a woman; this same ratio is seen in the STEM labor market. There are also gender gaps in science and technology, where only 8.1% of women researchers work in the fields of engineering and technology, as opposed to 16.9% of men. In scientific organizations, two out of ten authorities are women (MCTI, 2023).⁴⁸ In 2021, only 12% of science/technology innovation projects within the thematic area of information and communication technologies (ICT) were awarded to women lead researchers. A range of activities in the country have sought to promote women's involvement in STEM fields, including the Argentina Program, which graduated 39% women in its first stage during 2022.

⁴² [Link](#).

⁴³ Examples are the “finishing schools” programs, which have trained more than 10,000 people and created the smarttalent.uy integrated platform for access to talent in the sector, with more than 32,000 registered (loan [2590/OC-UR](#)).

⁴⁴ [McKinsey has estimated that AI will deliver an additional global economic output of US\\$13 trillion by 2030.](#)

⁴⁵ [Link](#).

⁴⁶ [Examples of AI promotion centers worldwide.](#)

⁴⁷ Basco, et al. (2021), Una olimpiada desigual: la equidad de género en las empresas latinoamericanas y del Caribe. IDB: Washington, D.C. Technical note 2255.

⁴⁸ [Link](#).

MCTI has also launched a National Program for Gender Equality in Science, Technology, and Innovation ([optional link 5](#)).

- 1.26 According to data gathered by the National Study on the Profile of Persons with Disabilities in 2018, the activity rate for persons with disabilities is 35.9%, so approximately one third are economically active. The employment rate is 40.3% for men, and 25.8% for women. The national public sector in Argentina has made a commitment to fill 4%⁴⁹ of positions with persons with disabilities. The programs of the Knowledge Economy Department (SEC) do not currently track how many persons with disabilities are beneficiaries of their programs. Efforts will be made to mainstream and train persons with disabilities in new technologies.
- 1.27 **Climate change.** The knowledge economy and AI can play a key role in climate change adaptation and mitigation. Argentina is vulnerable to climate change and natural disasters, given its large land area. In the northern part of the country, the wine sector has been suffering its worst drought in decades. In 2022, 20% of grain production was lost due to drought, a historical record.⁵⁰ Climate change models forecast heavier rainfalls and rising temperatures towards the end of the century (0.5°C to 1°C) with dire consequences for the productive sector.⁵¹ Corn and wheat, which are major exports for Argentina, could see output shrink 11% and 8% by 2050,⁵² respectively. Since 60% of exports come from the agricultural sector, droughts affect tax revenues and macroeconomic stability. Without investments in adaptation, the country could forfeit 5% of its GDP and 10% of tax revenue by 2050.⁵³ Moreover, importing countries are increasingly requesting verification that imported products have not generated destructive environmental impacts,⁵⁴ so to continue exporting certain products or open new import markets, Argentine's goods and services must be ready to meet these requirements. Improving export value-added by obtaining deforestation-free, environmental footprint or carbon neutral, and organic production value chain certifications will become increasingly important as a distinctive feature for expanding exports and securing trade agreements. Consequently, support for the knowledge economy and the development of AI applied to this productive sector, in particular, are expected to enable this operation to identify possible solutions related to increasing efficiency in the application of agrochemicals and irrigation technology (precision agriculture), facilitating traceability and certification of deforestation-free production plots (European Union import requirements), and incorporating autonomous teams and other solutions, where the synergy of the knowledge economy and AI development with the sector will play a key role in the future.^{55 56}
- 1.28 **Existing initiatives in Argentina.** In 2019, the Government of Argentina passed Law 27,506, known as the "Knowledge Economy Law," which offers tax incentives

⁴⁹ [Law 22,431](#).

⁵⁰ [Sequía](#), 3/2023. Rosario Board of Trade.

⁵¹ [Climate Change Risk Map Systems](#).

⁵² IDB (2020). [Vulnerabilidad al cambio climático e impactos económicos en el sector agrícola](#).

⁵³ [World Bank \(2022\). Poverty and Macroeconomic Impacts of Climate Shocks](#).

⁵⁴ [European Union \(2022\). European Union Regulation on Deforestation-free Supply Chains](#).

⁵⁵ [INTA \(2023\). Un hackathon para enfrentar fenómenos climáticos en el agro](#).

⁵⁶ [United Nations \(2018\). World Economic and Social Survey 2018: Frontier Technologies for Sustainable Development](#).

and financing to promote the growth of the technology and innovation sectors, as well as benefits for individuals and businesses. In May 2022, the Government of Argentina also launched the Argentina Program 4.0 with the objective of training people in programming languages and capabilities, testing, and digital skills to make them more employable in the software and technology sector. The program, led by the Ministry of Economy, trains people nationwide and strengthens coordination between market needs (labor demand) and the technology training offered by public and private universities and other private providers.

- 1.29 **Complementarity with other portfolio operations.** This operation builds on and supplements other portfolio operations that promote innovation in Argentina's private sector, such as the Technological Innovation Program IV (loan [3497/OC-AR](#)); Technological Innovation Program V (loan [4025/OC-AR](#)); and Federal Innovation Program (loan [5293/OC-AR](#)), all executed by the National Agency for the Promotion of Research, Technological Development, and Innovation (Agencia I+D+i). Not only have these operations increased the scientific productivity of researchers, they have prompted an increase in business investment in R&D and an increase in the rate of technological innovation of beneficiary companies. The science/technology institutions with which the beneficiary companies of the current program will be able to collaborate in the development of AI-based technology were strengthened to achieve these development objectives. This series of operations has also fostered collaboration between the private sector and science/technology institutions on vertical issues, oriented around productive and social challenges, yielding lessons in the development and maturation of instruments that will be put into use in this operation. Specifically, preliminary calls for proposals (project ideas) are important, to pre-identify demand and improve the quality of consortium proposals. This operation will complement the vertical/sector actions of loans [3497/OC-AR](#), [4025/OC-AR](#), and [5293/OC-AR](#) through horizontal actions targeting a technology that cuts across the economy as a whole and extends the technological focuses previously developed by Agencia I+D+i in information and communication technologies, biotechnology, and nanotechnology with support from the World Bank. By getting the productive sector and the science/technology system collaborating on AI at an early stage, this operation increases the chances of catching the window of opportunity that opens with the arrival of each new wave of technology.
- 1.30 **Sector knowledge.** The Bank has executed several operations demonstrating the effectiveness of the actions proposed in this operation. **Human capital:** The Program to Support Global Export Services (loan [2590/OC-UR](#)), Support for Business Development Services to Paraguayan Exporting Companies (loan [3865/OC-PR](#)), and Program to Support Chile's Global Services Export Sector (loan [4362/OC-CH](#)) have shown the effectiveness of building human capital through curricula co-created with the productive sector to meet its specific needs. For example, this last program trained more than 14,500 people in the first four years of execution; 70% have found a job at an average wage premium of 50%. **Linking the science/technology system with the productive sector for development of AI:** The conditional credit line for investment projects [AR-X1015](#) has shown the effectiveness of incentives to collaborate on innovation between academia and the private sector in frontier technologies associated with higher levels of risk and uncertainty. Moreover, the beneficiary companies of the High Technology Sector

Fund generated 13% more employment and 9% more sales than average for the rest of innovative companies (Pereira and Molina, 2022). **Internationalization:** The Bank has worked with almost all countries of the region on internationalization issues, including creation of the only network for the exchange of knowledge and good practices among TIPAs in Latin America and the Caribbean,⁵⁷ as well as experience in the design and execution of loan operations in Argentina, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Jamaica, Nicaragua, Paraguay, Peru, Trinidad and Tobago, and Uruguay. On recent operations in Argentina, for example, loan [2239/OC-AR](#) has shown that training for TIPAs strengthened them, based on the institutional evaluation, and that business development services created for SME exporters led to a 16% increase in their growth rate.⁵⁸

- 1.31 **Strategic alignment.** The program is consistent with the second Update of the Institutional Strategy (document AB-3190-2) because it is aligned with the strategic objective of promoting development through the private sector, and seeks to counteract the development challenges of: (i) social inclusion and equality, (ii) low levels of productivity and innovation, and (iii) lagging economic integration. The program is aligned with the crosscutting themes of: (i) gender equality, because specific actions will help close gender gaps by promoting advanced AI research networks led by women, promoting new research projects led by women in AI, and training women in new technology skills; (ii) diversity, because persons with disabilities will be trained in new technologies based on the needs of knowledge economy companies; (iii) climate change and environmental sustainability, because climate change will be mainstreamed in human capital building actions, support for public-private consortia to develop AI solutions, and the quality standards and certifications offered to companies through nonreimbursable contributions (NRC); and (iv) institutional capacity and rule of law, because national and subnational TIPAs will be strengthened in their management and digital technology capabilities. The program is also aligned with the IDB Country Strategy with Argentina 2021-2023 (document GN-3051) in the priority areas of: (i) economic recovery and productive development 4.0, because it will contribute to the strategic objective of promoting engagement in foreign trade with products and services of value; and (ii) digital transformation, because it will contribute to the strategic objective of promoting the adoption and effective use of digital technologies and innovation by companies. It is also aligned with the Corporate Results Framework 2020-2023 (document GN-2727-12) because it will contribute to the level 1 indicators of (i) growth rate of the value of total exports of goods and services, and (ii) foreign direct investment net inflows as percentage of GDP; and to the level 2 indicators of (i) students benefited by education projects, (ii) beneficiaries of employment support initiatives, (iii) enterprises provided with technical assistance, (iv) amount of international trade supported; and (v) women beneficiaries of economic empowerment initiatives. The program also contributes to: (i) the Integration and Trade Sector Framework Document (document

⁵⁷ [Ibero-American Network of Trade Promotion Organizations](#).

⁵⁸ Component 1: Activities (i), (ii), and (iii) incorporate lessons learned from loan [4362/OC-CH](#), which generated (i) demand pulse mechanisms with companies, to prepare tenders for training courses; and (ii) a job placement system similar to the one proposed in this operation. Component 2: Activity (i) to be executed by Agencia de I+D+i incorporates lessons learned from loan [1843/OC-AR](#) in the design of consortia and incentives for public-private collaboration. Component 3: Activity (iv) incorporates experience from the execution of loan [2239/OC-AR](#).

GN-2715-11), because it will promote the export of services through flexible, nimble, demand-driven instruments, as well as cofinancing; and (ii) the Labor Sector Framework Document (document GN-2741-12), particularly line of action 2 to increase productivity, and line of action 4 to promote a more inclusive labor market; and (iii) the Climate Change Sector Framework Document (document GN-2835-10), because it will promote the development of advanced technologies by forming a technology/production consortium for development of AI research, development, and innovation projects related to climate change, to promote new market-driven solutions for climate change, and facilitate the adoption of new rules, such as the sustainability and climate change certifications and standards required for export. Additionally, according to the [Joint Methodology of the Multilateral Development Banks for Tracking Climate Finance](#), an estimated 4.45% of the IDB resources will be allocated to climate change mitigation and adaptation. Lastly, the operation was analyzed using the [Joint Multilateral Development Bank Assessment Framework for Paris Alignment for Direct Investment Operations](#). Under that methodology, the operation is regarded as an activity aligned with the Paris goals (see [optional link 4](#), Climate Change Annex).

B. Objectives, components, and cost

- 1.32 **Program objective.** Help the knowledge economy sectors increase exports by sourcing specialized human capital, developing and adopting technologies based on artificial intelligence (AI), and positioning themselves in international markets. The specific objectives are: (i) to strengthen the formation of human capital required by the knowledge economy sectors; (ii) to increase collaboration between the science/technology system and the productive sector in AI-based technologies; and (iii) to contribute to the internationalization of companies in the knowledge economy sectors.⁵⁹
- 1.33 **Component 1: Human capital for knowledge-intensive goods and services sectors (US\$7,800,000).** Objective: Strengthen the supply of human capital with advanced technology skills required by knowledge economy companies with internationalization potential. Financing will be provided for: (i) development and execution of a methodology for identifying the specific skills required in the different regions by the productive sector exporting knowledge-intensive goods and services; (ii) competitive processes for the selection of educational institutions⁶⁰ to receive nonreimbursable funding from the program for consulting services to adjust their curricula or create new curricula responding and offering training to meet the identified needs;⁶¹ and (iii) development and deployment of a computerized system for management, monitoring, and evaluation of the courses⁶² and state-of-the-art job placement,⁶³ while also promoting existing talent with the aim of attracting new

⁵⁹ [Program beneficiaries](#).

⁶⁰ To receive funding, public institutions must conduct procurement/contracting with the loan proceeds in accordance with the Bank's procurement/consultant policies.

⁶¹ The eligibility criteria for these competitive processes will be stipulated in the program [Operating Regulations](#).

⁶² The system must allow the quality of the courses to be monitored and evaluated from the perspective of students and employers, dropout levels and their causes to be measured, and actions to improve the courses to be identified during implementation of the training.

⁶³ The system must facilitate job placement and allow the program's effectiveness to be monitored and evaluated in terms of job creation.

investments. Emphasis will be put on promoting the participation of women and diverse groups, and climate change mainstreaming. Specifically, the goal is for 50% of the training beneficiaries to be women, and 8%, persons with disabilities.

- 1.34 **Component 2: Promotion of development and adoption of new AI-based applications (US\$17,000,000).** Objective: Promote the development and adoption of AI-based applications at knowledge economy companies that are exporters or have export potential. Financing will be provided for creation and incubation of the Argentine Multidisciplinary Center for Artificial Intelligence (CAMIA),⁶⁴ which will promote the generation and adoption of AI solutions applied to the needs of the productive sector. To do so, CAMIA will: (i) generate knowledge and produce and promote publications and dissemination events, to spur interest and demand; (ii) make existing databases available to researchers and generate synthetic databases and sandboxes⁶⁵ as open knowledge goods;⁶⁶ and (iii) support the design of regulatory frameworks and public policies that strike a balance between fostering innovation and using AI safely and responsibly. The National Agency for the Promotion of Research, Technological Development, and Innovation (Agencia I+D+i) will: (i) provide nonreimbursable funding for AI research and development (financial support for consortia⁶⁷ between the science/technology system⁶⁸ and the productive sector, and research networks); and (ii) support the formation of human capital trained in AI fields through nonreimbursable financing for the strengthening of professorships⁶⁹ in AI.⁷⁰ Special emphasis will be put on promoting the participation of women and diverse groups and on climate change mainstreaming in the solutions to be developed. Specifically, the goal is for (i) women and diverse groups to be represented on the technical teams of the consortia receiving program support;⁷¹ (ii) two of the supported research networks to be led by women; and (iii) 25% of the women participating in the supported research networks to lead new research projects after their involvement in the project. Another goal is for one of the supported consortia develop a project related to climate change.

⁶⁴ The CAMIA incubation period is expected to end in year 4 of project execution. CAMIA will be incubated by UBATEC S.A., the Technological Linkage Unit of the University of Buenos Aires. [Link to more information about UBATEC and its main role in the CAMIA incubation process](#). The CAMIA incubation expenses to be financed include the incubation fee, regular staff, equipment, and consulting services. No financing of works is foreseen.

⁶⁵ Sandboxes are isolated development environments that allow AI models to be tested without affecting production processes.

⁶⁶ Large databases are essential inputs for the development of AI algorithms.

⁶⁷ The consortia must (i) consist of at least one company and at least one group or institution in the science/technology system; and (ii) seek to develop AI solutions applied to the needs of the productive sector. The consortia proposals for the development of AI solutions will be evaluated by representatives of the MCTI/Agencia I+D+i and CAMIA: Prior to publication of the competitive process for consortia, CAMIA will work to identify possible projects with the potential to be financed by the program, and facilitate linkages between science/technology system stakeholders and productive sector representatives.

⁶⁸ See footnote 64.

⁶⁹ Idem.

⁷⁰ The eligibility criteria for these competitive process for consortia and professorships will be stipulated in the program [Operating Regulations](#).

⁷¹ The proportion of representation of women and diverse groups will be defined in the program [Operating Regulations](#), along with the mechanisms for achieving such representation.

- 1.35 **Component 3: Promotion of internationalization of knowledge economy sector companies (US\$9,125,000).** Objective: Contribute to increased knowledge economy exports through development and implementation of national, subnational, and sector strategies for the development international positioning of Argentina's knowledge economy. Financing will be provided for: (i) development of a global positioning strategy; (ii) development of four sector strategies for international positioning; (iii) strengthening of the strategies for knowledge economy positioning in international markets of ten subnational trade and investment promotion agencies (TIPAs)⁷² and/or subnational entities with trade and investment promotion responsibilities through nonreimbursable contributions (NRCs);⁷³ (iv) partial NRCs for productive sector micro, small, and medium-sized enterprises to strengthen their capabilities and production processes, in order to earn certifications and meet quality and climate change standards that facilitate access to foreign markets,⁷⁴ and to develop business internationalization strategies; (v) NRCs for national and subnational TIPAs⁷⁵ and/or subnational entities with trade and investment promotion responsibilities to develop and offer guided business development services;⁷⁶ and (vi) organization of matchmaking events to connect Argentina's knowledge economy companies with global customers and investors. Special emphasis will be put on promoting the participation of women and diverse groups and on climate change mainstreaming.⁷⁷
- 1.36 **Administration, evaluation, and audit (US\$1,075,000).** Financing will be provided for administrative, monitoring, and evaluation expenses, including the program strategic evaluation and audit.⁷⁸

C. Key results indicators

- 1.37 The program **impacts** are: (i) increased knowledge economy exports; (ii) increased employment at knowledge economy companies; and (iii) increased AI development and adoption at knowledge economy companies. The program **outcomes** include: (i) strengthened formation of human capital required by the knowledge economy sectors; (ii) increased collaboration between the

⁷² The criteria for the selection of the beneficiary agencies will be defined in the program [Operating Regulations](#), which will require IDB clearance. See footnote 55.

⁷³ The export promotion and investment attraction capabilities of subnational entities are currently more effective in promoting undifferentiated traditional sectors (Volpe, 2010).

⁷⁴ International evidence shows that certifications and compliance with standards and export requirements facilitate the international positioning of knowledge economy companies. The [link](#) provides information on the current status of companies within the system and the most common requirements.

⁷⁵ See footnote 64.

⁷⁶ Includes support in the creation of business and internationalization plans, participation in business matchmaker events and fairs, and content development to help overcome information barriers limiting levels of knowledge economy exports from Argentina.

⁷⁷ The selection criteria for beneficiary agencies, as well as the eligibility criteria for the NRCs and the financial support to TIPAs under this component, will be stipulated in the program [Operating Regulations](#).

⁷⁸ The program has a budget of US\$500,000 and US\$575,000 for administration, evaluation, and audit expenditures by MCTI/Agencia I+D+i and Ministry of Economy/Knowledge Economy Department, respectively. All reports required by the Bank will be delivered by each executing agency separately, including audits. The program impact evaluation will be financed with technical cooperation funding from the IDB's Integration and Trade Sector (INT).

science/technology system and the productive sector in AI-based technologies; and (iii) promoted internationalization of knowledge economy companies.

- 1.38 In the base-case scenario, the estimated net benefits of the program in incremental social net present value (NPV) were positive at US\$4.1 million, exceeding the 12% per annum social opportunity cost of the invested resources. The benefits of the program would support even higher discount rates because, in the same base-case scenario, the internal rate of return (IRR) was estimated at 18%. A cost-benefit analysis of the program as a whole was done as part of the evaluation, and sensitivity exercises were also performed, modifying the estimates of the project's impact on a set of key variables. The program would still yield a return with a positive NPV in several distinct scenarios: (i) if the wage return on human capital formation decreases by up to 20%; or (ii) if the projected beneficiaries of the science and technology or internationalization component decrease by 40%; or (iii) if the program has cost overruns of 10%. With these exercises, it can be concluded that significant deviations from the baseline would still sustain returns. For more details on the analysis, see [optional link 1](#).

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing instruments

- 2.1 **Modality and financing structure.** The program will be financed through a specific investment loan because the outputs to be financed are associated with specific objectives, and their successful execution is tied to the indivisibility of the program itself.
- 2.2 The total cost of the program is US\$35 million, to be financed from the Ordinary Capital resources.

Table 2.1. Estimated program costs (US\$000s)

Components*	Bank	Total	%
1. Human capital for knowledge-intensive goods and services sectors	7,800	7,800	22.3
2. Promotion of development and adoption of new AI-based applications	17,000	17,000	48.6
3. Promotion of internationalization of knowledge economy sector companies	9,125	9,125	26.0
Administration, evaluation, and audit	1,075	1,075	3.1
(a) MCTI/Agencia I+D+i	500		
(b) Ministry of Economy	575		
Total	35,000	35,000	100.0

* The breakdown of resource distribution within each component is described in the program Operating Regulations.

- 2.3 **Disbursement period.** A multiyear execution plan was prepared ([required link 1](#)) with a disbursement period of five years.

Table 2.2. Disbursement projection (US\$ million)

Year	January-June	July-December	Total	%
2023	0	7	7	20.0
2024	0	5	5	14.3
2025	7	5	12	34.3
2026	5	2	7	20.0
2027	0	4	4	11.4
Total	12	23	35	100.0

B. Environmental and social safeguard risks

- 2.4 The operation was classified as Category “C” because is likely to cause minimal or no negative environmental or social impacts. Environmental and Social Performance Standards 1, 2, and 10 were triggered; for the actions to be considered during program design, see [required link 3](#).

C. Fiduciary risks

- 2.5 The main risk identified is an economic/financial risk related to possible failure to allocate budgetary appropriations and quarterly expenditure quotas during the life of the program. In response, a comprehensive planning of activities is proposed, to identify the resource needs and process budget allocations or modifications and quarterly quotas in a timely manner with the relevant authorities.

D. Other key issues and risks

- 2.6 The program carries the following risks: (i) **economic/financial environment:** medium-high risk that the allocation of the annual budget appropriations and quarterly quotas will be insufficient during the life of the program (in response, sufficient allocation of annual budget appropriations and quarterly quotas will be coordinated with the Ministry of Economy) and a medium-high risk that the macroeconomic context will deteriorate, which could lower private sector demand for the nonreimbursable support offered by the program requiring a counterpart, leading to delays in execution (in response, the program’s communication mechanisms will be strengthened, to disseminate the medium- and long-term benefits for companies in a sector like the knowledge economy, which are not input- or import-intensive and so are less affected by the macroeconomic context); (ii) **institutional environment:** medium-high risk that the support offered by the program to develop curricula and content will not meet with demand among educational institutions (in response, educational institutions interested in promoting activities of this kind will be clearly identified through prior analysis and included in the membership of advisory boards); medium-high risk that consortia will not be identified between the science/technology system and the private sector to originate quality proposals (in response, the needs and benefits of the program

will be promoted effectively, along with actions to assist potential consortia); medium-high risk that the productive sector and key public sector actors will not be well represented on the advisory boards surveying the demand for human capital (in response, the productive sector entities interested in promoting such demand will be clearly identified through prior analysis and included in the membership of advisory boards); and medium-high risk that too much time will pass between the identification of human capital strengthening needs and the availability of trained human capital, such that the developed skills become obsolete (in response, the training curricula design will be accelerated, setting specific time frames for activity programming, to keep the time between identification of needs and delivery of the training as short as possible); (iii) **organizational structure:** medium-high risk that the coexecuting agencies (including relevant UBATEC stakeholders) will not coordinate effectively, affecting the flow of information between activities and components (in response, the program [Operating Regulations](#) will establish the workings and membership of the Coordination Committee as a regular venue for discussion on progress of the Results Matrix and goodness of fit of the activities to the central objective); and (iv) **human resources:** medium-high risk that sufficiently trained candidates with qualifications cannot be attracted to lead CAMIA and form its management structure (in response, a request for candidates will be issued for a competitive process and examination with terms attractive to trained professionals with the right qualifications).

III. IMPLEMENTATION AND MANAGEMENT PLAN

A. Summary of implementation arrangements

- 3.1 **Borrower and executing agencies.** The borrower will be the Argentine Republic. There will be a coexecution arrangement, under which the executing agency for Components 1 and 3 will be the Ministry of Economy, acting through the Knowledge Economy Department (SEC), and the executing agency for Component 2 will be the Ministry of Science, Technology, and Innovation (MCTI), acting through the National Research, Technological Development, and Innovation Promotion Agency (Agencia I+D+i).⁷⁹ Execution will be coordinated through a technical committee with the involvement of the coexecuting agencies, led by SEC, with productive sector participation (see paragraph 3.6).
- 3.2 **Execution mechanism.** The program will be executed under a coexecution arrangement via two subprograms,⁸⁰ as described below. The MCTI will be in charge of subprogram 1, consisting of program component 2 and the administration funds under item (a) of Table 2.1, “Estimated program costs.” The MCTI will act through Agencia I+D+i and the Office of the Deputy Secretary for

⁷⁹ All fiduciary aspects of Component 2 will be executed by staff of an existing execution unit at Agencia I+D+i that has executed Bank-financed operations [3497/OC-AR](#), [4025/OC-AR](#), and [5293/OC-AR](#). The rest of the actions described in paragraph 1.34 will be executed by the Argentine Multidisciplinary Center for Artificial Intelligence (CAMIA). MCTI plays the role of substantive area, where the instruments will be designed, and the execution of Agencia I+D+i will be monitored.

⁸⁰ The term “subprogram” was incorporated at the borrower’s request for consistency with the terminology used in its prioritization documents for the program.

Science, Technology, and Innovation Policies, reporting to the Secretary of the Planning and Science, Technology, and Innovation Policy Department, both with primary responsibility for technical aspects of the program, and the Office of the General Director of External and Local Financing of Agencia I+D+i, with fiduciary responsibility. The Ministry of Economy will be in charge of subprogram 2, consisting of program components 1 and 3 and the administration funds under item (b) of Table 2.1. The Ministry of Economy will act through the SEC, with primary responsibility for technical aspects of the program, and the Office of the General Director of Sector and Special Programs and Projects, reporting to the Office of the Deputy Secretary for Administrative Management of Industry and Productive Development, with fiduciary responsibility. The coexecuting agencies will have fiduciary responsibility for the strategic evaluation activities, and the Office of the Deputy Secretary for International Financial Relations of the Office of the Secretary of the International Economic and Financial Affairs Department of the Ministry of Economy will have technical/methodological responsibility for execution. If their organizational structure changes, the coexecuting agencies will act through the departments or reporting units replacing them in the future with similar roles and responsibilities, subject to the Bank's prior approval, for the purposes of this program. Each coexecuting agency will carry out its own fiduciary (procurement and financial management) and operational planning and management for execution of the components under its responsibility. Accordingly, each coexecuting agency is expected to be able to separately request disbursements from the Bank and submit accountability reports for advances received. The coexecuting agencies will also separately prepare and deliver multiyear execution plans (and/or annual work plans), procurement plans, six-monthly status reports, financial plans, and other instruments required by the Bank. Each executing agency must comply with the contractual clauses related to the separate delivery of plans and reports.

- 3.3 **Special contractual conditions precedent to the first disbursement of the financing.** The following conditions must be met: (i) evidence that the coexecuting agencies have established a program execution team specifically for the activities under their responsibility; (ii) entry into force of the program [Operating Regulations](#) to be used by each coexecuting agency on the terms agreed upon with the Bank, containing details on all operational aspects of the execution mechanism described above; (iii) evidence that the technical committee has been created on the terms agreed upon with the Bank, to ensure coordination and effective flow of information between coexecuting agencies; the technical committee must be created before disbursements start; and (iv) evidence that an agreement has been signed between the Ministry of Science, Technology, and Innovation (MCTI) and the National Research, Technological Development, and Innovation Promotion Agency (Agencia I+D+i) for execution of the Component 2 resources and activities on terms previously agreed upon with the Bank, to ensure that the two legally separate entities (MCTI and Agencia I+D+i) executing different parts of the same component can work together as they should.
- 3.4 **Special contractual condition for execution.** Before assuming any commitments with beneficiaries of the program's nonreimbursable financing, the coexecuting agencies will submit the model agreements to be used for such financing to the Bank for its no objection.

- 3.5 **Retroactive financing.** The Bank may retroactively finance, against the loan proceeds, up to US\$1.75 million (5% of the proposed loan amount) in eligible expenditures incurred by the borrower prior to the loan approval date for actions related to general consulting and/or equipment expenditures involved in strengthening human capital, provided that requirements substantially similar to those established in the loan contract have been met (see Annex III).
- 3.6 **Technical committee.** Program execution will be coordinated through a technical committee of the coexecuting agencies. The technical committee's core mission will be: (i) coordination between the coexecuting agencies to ensure the effective flow of information between components and activities; (ii) coordination between the executing agencies and the productive sector; and (iii) review of progress on compliance with the program's Results Matrix. The technical committee will also review the program from a strategic perspective, ensuring that activities are aligned with the general and specific objectives of the operation. It will be led by the Secretary of the Knowledge Economy Department and the President of Agencia I+D+i. The program [Operating Regulations](#) will contain details on the program's execution mechanism, creation of the program execution teams, and public and private agencies represented on the technical committee.

B. Summary of arrangements for monitoring results

- 3.7 The monitoring and evaluation plan ([required link 2](#)) will support execution of the operation consistent with the targets and progress indicators in the Risk Matrix and in the program [Operating Regulations](#). Each coexecuting agency, separately, will be responsible for monitoring and evaluation of the program outcomes and impacts using the following mechanisms: (i) project execution plan; (ii) six-monthly status reports, including indicators for monitoring impact, outcomes, component execution, and compliance with environmental requirements and programs; (iii) midterm evaluation report prepared by each executing agency, separately, and delivered to the Bank within 90 days after the date on which 50% of the loan proceeds under its responsibility has been disbursed, or 24 months after the loan contract signature date; and (iv) final evaluation, including the ex post economic evaluation, to be delivered to the Bank within 90 days after the end of the original disbursement period, or as extended. Each executing agency will commission and deliver the program midterm and final evaluations separately.⁸¹ A strategic evaluation of the program will also be performed with content previously agreed upon with the borrower.

⁸¹ These evaluations will include dimensions and lessons learned related to coordination between executing agencies.

Development Effectiveness Matrix		
Summary		AR-L1357
I. Corporate and Country Priorities		
Section 1. IDB Group Strategic Priorities and CRF Indicators		
Development Challenges & Cross-cutting Issues	<ul style="list-style-type: none">-Social Inclusion and Equality-Productivity and Innovation-Economic Integration-Gender Equality and Diversity-Climate Change-Institutional Capacity and the Rule of Law	
CRF Level 2 Indicators: IDB Group Contributions to Development Results	<ul style="list-style-type: none">-Students benefited by education projects (#)-Jobs supported (#)-Enterprises provided with technical assistance (#)-Amount of international trade supported (\$)-Women beneficiaries of economic empowerment initiatives (#)-Agencies with strengthened digital technology and managerial capacity (#)	
2. Country Development Objectives		
Country Strategy Results Matrix	GN-3051	Áreas prioritarias de recuperación económica y desarrollo productivo; 4.0 y de transformación digital como eje transversal del desarrollo.
Country Program Results Matrix	GN-3154-1	The intervention is included in the 2023 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		8.7
3.1 Program Diagnosis		2.0
3.2 Proposed Interventions or Solutions		3.5
3.3 Results Matrix Quality		3.2
4. Ex ante Economic Analysis		7.5
4.1 Program has an ERR/NPV, or key outcomes identified for CEA		1.5
4.2 Identified and Quantified Benefits and Costs		3.0
4.3 Reasonable Assumptions		0.0
4.4 Sensitivity Analysis		2.0
4.5 Consistency with results matrix		1.0
5. Monitoring and Evaluation		8.9
5.1 Monitoring Mechanisms		4.0
5.2 Evaluation Plan		4.9
III. Risks & Mitigation Monitoring Matrix		
Overall risks rate = magnitude of risks*likelihood		Medium High
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, Internal Audit. Procurement: Information System, Price Comparison, Contracting Individual Consultant, National Public Bidding.
Non-Fiduciary		
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	Par V.I El Banco brindará apoyo y capacitación en temas fiduciarios

The Program for the Support of Knowledge Economy Exports (AR-L1357) has as a general development objective to contribute to the increase of exports in sectors related to the knowledge economy (KE). The Program proposes to contribute to that objective through three specific development objectives: (i) to strengthen the training of human capital required by KE sectors; (ii) to increase collaboration between the technological and scientific system and the productive sector in technologies based in Artificial Intelligence (AI); and (iii) to contribute to the internationalization of KE firms. The operation's diagnosis indicates the relatively low participation of Argentina in KE goods and services exports as the general problem; and (i) the absence of qualified human capital; (ii) the lack of coordination and collaboration between the technological and scientific system and the productive sector; and (iii) the lack of specific capabilities to promote KE sectors among national and subnational trade and investment promotion agencies as the problem's determinants. To address this, the program proposes outputs to improve the supply of trainings in KE, stimulate the adoption of AI, and strengthen capabilities of national trade and investment promotion agencies in aspects related to the KE.

Results indicators associated to specific objectives have seen improvements in order to be SMART and help measure the scope of objectives.

The economic analysis quantifies benefits in terms of salary increases and additional investment and yields an IRR of 18%. The analysis contains detailed explanations around assumptions.

The monitoring and evaluation plan proposes evaluation strategies based on differences in differences and matching. The main source of data for the majority of indicators is institutional information from the Knowledge Economy Secretariat.

RESULTS MATRIX

Project objective:	The specific objectives are: (i) to strengthen the formation of human capital required by the knowledge economy sectors; (ii) to increase collaboration between the science/technology system and the productive sector in AI-based technologies; and (iii) to contribute to the internationalization of companies in the knowledge economy sectors. Achievement of these objectives will contribute to the general objective to help the knowledge economy sectors increase exports by sourcing specialized human capital, developing and adopting technologies based on AI, and positioning themselves in international markets.
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GENERAL DEVELOPMENT OBJECTIVE

Indicator	Unit of measure	Baseline value	Year Baseline	Expected year achieved	Target	Means of verification	Comments
General development objective: Contribute to increased exports from the knowledge economy sectors							
Increased knowledge economy exports	(US\$000s)	7,817	2022	2028	12,100	Quarterly balance of payments report (INDEC) with quarterly and annual measurements of exports	Observed over the life of the project. Calculated as knowledge-based services exports. Target assumes export growth at an annual cumulative rate of 8.1%, similar to observed rate between 2006 and 2022. Target assumes that Argentina's exports will have a larger share of world trade.
Increased employment at knowledge economy companies	Job positions	480,000	2022	2028	515,000	Observatory of Employment and Business Dynamics (OEDE), Ministry of Labor, based on information from monthly employment declarations filed with Argentina's Integrated Pension System (SIPA).	Observed over the life of the project. Calculated based on the number of employees registered for companies operating in knowledge economy sectors, according to Argentine regulations. The baseline uses data from the second quarter of 2022, which is the latest data available, and assumes that the amount of exports per employee rises from the baseline US\$18,000 to US\$23,000 in 2028, above the historical average of US\$21,000 per employee.
Increased AI adoption at knowledge economy companies	% Companies using AI	23.2	2022	2028	50	Survey of companies included in the promotion regime of the Knowledge Economy Law and applicants supported by the Knowledge Economy Department	Observed over the life of the project. Includes companies using AI as developers, suppliers, and adopters. The baseline uses data from a Ministry of Productive Development survey of companies benefiting from the Knowledge Economy Law (today over 700 registered firms, just over 15% of all knowledge economy companies). Companies covered by the Knowledge Economy Law routinely report their sales, employment, payroll, research and development, and export data to the Knowledge Economy Department. The target was based on the evidence of the percentage of

Indicator	Unit of measure	Baseline value	Year Baseline	Expected year achieved	Target	Means of verification	Comments
							companies in the region that are exploring AI pilots but have not adopted AI at scale (43%) (IBM, 2022). The Stanford University Artificial Intelligence Index Report 2023 of May 2023 with evidence from McKinsey shows that the percentage of adopting companies worldwide is around 50% to 60%.

SPECIFIC DEVELOPMENT OBJECTIVES

Indicator	Unit of measure	Baseline value	Base-line year	Year	Year	Year	Year	Year	End of project	Means of Verification	Comments
Specific development objective 1: Strengthen the formation of human capital required by the knowledge economy sectors											
1.1. % Increase in Argentina's score in the "people skills and availability" subcategory on the improved A.T. Kearney Global Services Location Index	% Change in institutional capacity score	1.25	2021					15	15	AT Kearney biannual publication	See monitoring and evaluation plan (required link 2) for a detailed discussion of all outcomes.
1.2 Curricula developed incorporating content sought after by the private sector	Curricula	0	2022		5	7	8	5	25	Records of curricula selection processes demonstrating that: (i) the private sector was involved in the curricula selection process; and (ii) the demand identified at regional panels to identify gaps were incorporated into the selected curricula.	Demand identified at regional panels to identify gaps (output indicator 1.2). The monitoring and evaluation plan explains the target in detail, given the desire to develop at least 2 or 3 curricula for each knowledge economy sector that has no training and talent and skills development programs.
Specific development objective 2: Increase collaboration between the science/technology system and the productive sector in AI-based technologies											
2.1. Additionality of AI investment at beneficiary companies	Investment in AI as % of sales	0	2022				15	20	20	Monitoring report on Agencia I+D+i projects of beneficiary companies. Additionally, a control group will be constructed with	See required link 2 .

Indicator	Unit of measure	Baseline value	Base-line year	Year	Year	Year	Year	Year	End of project	Means of Verification	Comments
										data from the Administrative Registry of Beneficiaries of the Knowledge Economy Law.	
2.2. % Research consortia and networks supported by the program with private sector involvement (at least one publication author)	Quantity of peer-reviewed articles that include private sector authors	0	2024				45	50	60	Monitoring reports on projects supported by Agencia I+D+i	See required link 2.
2.3. AI solutions applicable to the productive sector with export potential developed jointly by companies and the science/technology system	Quantity of solutions at minimum viable product (MVP) or higher stage	0	2022					7	7	Monitoring report on Agencia I+D+i projects	See required link 2.
2.4. % Women who, after participating in the groups leading the AI research networks supported by the program, lead new research projects	%	0	2022					25	25	Agencia I+D+i records on applicants and applicant lead researcher	See required link 2.
Specific development objective 3: Contribute to the internationalization of companies in the knowledge economy sectors											
3.1. % Increase in the score of subnational export and investment promotion agencies in knowledge economy on the institutional capacity index	Points	0	2023				10	20	20	Self-diagnostic included in the monitoring and evaluation plan	See required link 2.
3.2 Local companies or startups matched with foreign investors	Quantity of matches made between local companies or startups and foreign investors	0	2023				5	5	10	Follow-up survey of matchmaking event participants. Survey included in the monitoring and evaluation plan	See required link 2.

OUTPUTS

Indicator	Unit of measure	Baseline value	Base-line year	Year 1	Year 2	Year 3	Year 4	Year 5	End of project	Means of verification	Comments
Component 1: Human capital for knowledge-intensive goods and services sectors											
1.1. Methodological guides for development and evaluation of regional panels to identify gaps	Quantity of studies published	0	2023	1					1	Published study	See monitoring and evaluation plan (required link 2 for a detailed discussion of all outputs.
1.2. Regional panels to identify and monitor overall demand for qualified personnel	Public-private panels	0	2023	10	16	16	8		50	SEC records	
1.3. People trained in skills related to knowledge economy sectors	Quantity of people	0	2023	0	2,500	2,500	2,500	2,500	10,000	Calculated as the sum of beneficiaries accessing knowledge economy sector-related skills training	The program Operating Regulations establish that those interested in the training must take an entrance exam as part of the preregistration process. Demand is expected to exceed the number of vacancies, and a minimum score on the exam will be required to access the training.
1.4. % Women beneficiaries of knowledge economy sector-related skills training	% of people trained	39	2023	0	41%	43%	45%	47%	50%	SEC records. Calculated as the percentage of women beneficiaries accessing the knowledge economy sector-related skills training	
1.5. % Persons with disabilities trained in the subcomponent	% of people trained	0	2023	0	3%	4.5%	6%	7.5%	8%	SEC records. Calculated as the percentage of beneficiaries who are persons with disabilities accessing the knowledge economy sector-related skills training	
1.6. Training and talent attraction studies to improve the availability of knowledge economy skills	Quantity of published studies	0	2023		1	1			2	Published studies	

Indicator	Unit of measure	Baseline value	Base-line year	Year 1	Year 2	Year 3	Year 4	Year 5	End of project	Means of verification	Comments
1.7 Studies of definition, functionalities, and agreements required to establish an information system on talent and job placement, include terms of reference	Quantity of studies	0	2023	1					1	IDB no objection to study as basis of call for bids	
1.8. Competitive bidding or development of information system	Open competitive bidding processes	0	2023		1				1	Published call for bids	
1.9. Quantity of training institutions connected and sharing information with the system	Quantity of training institutions	0	2023			30	40	50	50	Management report issued by the system	
1.10. Quantity of users using the platform for job training and placement	Quantity of users	0	2023			6,000	8,000	10,000	10,000	Management report issued by the system	
1.11. Quantity of companies using the platform for recruitment of qualified personnel	Quantity of companies	0	2023	0	0	250	350	400	500	Management report issued by the system	
Component 2: Promotion of development and adoption of new AI-based applications											
2.1. Argentine Multidisciplinary Center for Artificial Intelligence (CAMIA) created	AI centers	0	2023	1					1	Strategic plan developed via single-source selection, after completing management roles via competitive processes	
2.2. CAMIA created as independent institution	AI centers	0	2023				1		1	CAMIA created as independent entity in the selected form	
2.3. Call for proposals for ideas-projects for production/technology consortia in AI and projects for AI development and adoption at companies	Open competitive bidding processes	0	2023	1					1	Publication of call proposals on the Agencia I+D+i website	
2.4 Quantity of technology/production consortia formed for AI research, development, and innovation projects	Consortia	0	2023		9				9	Signed contract	

Indicator	Unit of measure	Baseline value	Base-line year	Year 1	Year 2	Year 3	Year 4	Year 5	End of project	Means of verification	Comments
2.5 Technology/production consortium for development of AI research, development, and innovation projects related to climate change	Consortia	0	2023		1				1	Signed contract	
2.6 Networks formed for research on AI for export	Networks	0		8					8	First disbursement to the networks project recorded in the Agencia I+D+i accounting system	
2.7 Women-led networks formed for research on AI for export	Networks	0		2					2	First disbursement to the networks project recorded in the Agencia I+D+i accounting system	
2.8. University professorships in AI strengthened	University professorships at public or private universities				10				10	First disbursement to the AI professorships project recorded in the Agencia I+D+i accounting system	
2.9 Dissemination events to generate AI interest and demand in the productive sector and public sector	Quantity of dissemination events	0	2023	2	2	2	2	2	10	Agencia I+D+i report providing evidence of events held	
Component 3: Promotion of internationalization of knowledge economy sector companies											
3.1. Study on strategy for global positioning of Argentina's knowledge economy	Published studies	0	2023	1					1	Published report as input for policy-making	
3.2. Sector internationalization strategies	Quantity of published studies	0	2023		4				4	Published reports as input for policy-making	
3.3. Training workshops for knowledge economy companies on market entry	Quantity of workshops	0	2023		6	6	4	4	20	SEC records	
3.4. Strengthening of subnational export and investment agencies in knowledge economy positioning strategy through partial nonreimbursable contributions	Quantity of subnational agencies strengthened	0	2023		5	5			10	SEC records	

Indicator	Unit of measure	Baseline value	Base-line year	Year 1	Year 2	Year 3	Year 4	Year 5	End of project	Means of verification	Comments
3.5. Events for positioning of Argentina's knowledge economy and attracting companies	Events held	0	2023			1		1	2	SEC records	
3.6. Knowledge economy companies supported in development and implementation of business internationalization strategies for knowledge economy companies through partial nonreimbursable contributions	Quantity of companies	0	2023	25	25	25	25	25	125	SEC records	
3.7. Knowledge economy companies supported for adoption of certifications and standards required for export at knowledge economy companies	Quantity of companies	0	2023	10	10	10	10	10	50	SEC records	
3.8. Knowledge economy companies with adoption of climate change-related certifications and standards required for export	Quantity of companies	0	2023		5	5	5		15	SEC records	

Country: Argentina

Division: INT/TIN

Operation no.: AR-L1357

Year: 2023

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Executing agency: Ministry of Science, Technology, and Innovation (MCTI), acting through the National Agency for the Promotion of Research, Technological Development, and Innovation (Agencia I+D+i); and Ministry of Economy, acting through the Knowledge Economy Department (SEC).

Operation name: Support Program for Knowledge Economy Exports

I. Fiduciary Context of the Executing Agency

1. Use of country system in the operation¹

<input checked="" type="checkbox"/> Budget	<input checked="" type="checkbox"/> Reports	<input checked="" type="checkbox"/> Information system	<input type="checkbox"/> National competitive bidding (NCB)
<input checked="" type="checkbox"/> Treasury	<input type="checkbox"/> Internal audit	<input type="checkbox"/> Shopping	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Accounting	<input checked="" type="checkbox"/> External control	<input type="checkbox"/> Individual consultants	<input type="checkbox"/> Other

2. Fiduciary execution mechanism

<input checked="" type="checkbox"/>	Specific features of fiduciary execution	<p>The borrower will be the Argentine Republic. Under a coexecution arrangement, the executing agency for Components 1 and 3 will be the Ministry of Economy, acting through SEC, and the executing agency for Component 2 will be MCTI, acting through Agencia I+D+i. Execution will be coordinated through a technical committee of the coexecuting agencies, chaired by SEC, with private sector participation.</p> <p>The two coexecuting agencies will be independent and will create separate program execution units. Each will have the following responsibilities: (i) verify and/or prepare disbursement requests and justifications of expenditures and submit them to the Bank; (ii) commission and serve as counterpart for the external audit of the program and deliver audited financial statements; (iii) ensure that records are kept and maintained; (iv) conduct program monitoring and evaluation; and (v) monitor and ensure compliance with Bank policies for the planned bidding processes.</p>
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3. Fiduciary capacity

Fiduciary capacity of the executing agency	<p>The Institutional Capacity Assessment Platform (ICAP), applied together with the two executing agencies (Agencia I+D+i and MCTI), determined that both possess the institutional capacity for program execution, since they have previous experience in executing Bank resources.</p> <p>Even so, tracking of the following needs is recommended: (i) the two agencies will identify staff assigned exclusively for execution of the program; (ii) the program Operating Regulations establish the workings and membership of the Coordination Committee as a regular venue for discussion on progress of the Results Matrix and goodness of fit of the</p>
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¹ Any system or subsystem that is subsequently approved may be applicable to the operation, in accordance with the terms of the Bank's validation.

	activities to the central objective; (iii) after staff have been designated exclusively for execution of the program actions, if necessary, qualified personnel will be hired to strengthen the procurement, financial management, planning, and monitoring and supervision areas.
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4. Fiduciary risks and risk response

Risk taxonomy	Risk	Risk level	Risk response
Economic/ financial	If the allocation of the annual budget appropriations and quarterly quotas is insufficient during the life of the program.	Medium-High	Comprehensive planning of activities will identify the resource needs and process budget allocations or modifications and quarterly quotas in a timely manner with the relevant authorities. The executing agencies will notify the Bank whenever the quarterly quotas allocated are below the estimates for execution of the operation, and in the update of the IDB/Ministry of Economy Integration Table.

- 5. Policies and guidelines applicable to operation.** The Financial Management Guidelines for IDB-financed Projects (documents GN-2811, OP-273-12, or current version) will be used for the financial management of the program. The policies of document GN-2349-15, or current version, approved by the Bank on 2 July 2019, will be used for the contracting of works and nonconsulting services and the procurement of goods. The policies of document GN-2350-15, or current version, approved by the Bank on 2 July 2019, will be used for selection and contracting processes for consulting services.

- 6. Exceptions to policies and guidelines:** N/A.

II. Considerations for the Special Provisions of the Loan Contract

1. Special conditions precedent to the first disbursement. N/A.
2. Applicable exchange rate for justification of expenditures incurred in the local currency of the borrower's country. The rate used for accountability reporting of the program resources will be the effective exchange rate on the date of conversion of the approval currency or disbursement currency into the borrower's local currency, in accordance with Article 4.10(b)(i) of the General Conditions of the loan contract. The agreed exchange rate for determining the equivalency of expenditures incurred in local currency related to the reimbursement of expenditures chargeable against the program will be the exchange rate on the first working day of the month of payment.
3. The annual audited financial statements of each program coexecuting agency will be delivered to the Bank no more than 120 days after the close of each fiscal/financial year of the executing agencies, duly audited by an independent audit firm acceptable to the Bank or by Argentina's Office of the Auditor General of the Nation (AGN). The final audited financial statements will be delivered within 120 days after the date of the program's last disbursement.

III. Procurement Execution Agreements and Requirements

<input checked="" type="checkbox"/>	Bidding documents	Procurements of works, goods, and nonconsulting services conducted in accordance with the procurement policies (document GN-2349-15), subject to international competitive bidding (ICB), will use the Bank's standard bidding documents or those agreed upon between the executing agency and the Bank for the specific procurement. Additionally, the selection and contracting of consulting services will be conducted in accordance with the consultant selection policies (document GN-2350-15), using the standard request for proposals issued by the Bank or agreed upon between the executing agency and the Bank for the specific selection. National competitive bidding and shopping processes for goods and nonconsulting services will use the Bank's standard model documents in Argentina with their corresponding model evaluation reports. The Project Team Leader will be responsible for reviewing the technical specifications and terms of reference for procurements during the preparation of selection processes. This technical review may be ex ante and is independent of the procurement review method.																								
<input checked="" type="checkbox"/>	Advance procurement / retroactive financing	The Bank may retroactively finance, against the loan proceeds, up to US\$1.75 million (5% of the proposed loan amount) in eligible expenditures incurred by the borrower prior to the loan approval date for actions related to general consulting and/or equipment expenditures involved in strengthening human capital, provided that requirements substantially similar to those established in the loan contract have been met. Such expenditures must have been made on or after 21 February 2023, but in no case more than 18 months prior to the loan approval date. The amount of retroactive financing will be subject to the limitations applicable to disbursements. (See documents GN-2349-15, GN-2350-15, and the Bank policy on recognition of expenditures, retroactive financing, and advance procurement (document GN-2259-1).)																								
<input checked="" type="checkbox"/>	Procurement supervision	<p>The supervision method will be ex post, except for the first two processes of each selection method, which will require ex ante supervision. Ex post reviews will be every year in accordance with the project supervision plan, subject to changes during execution. Ex post review reports will include at least one visit.</p> <p>The thresholds for ex post review are as follows:</p> <table><tr><th colspan="3">WORKS</th><th colspan="3">GOODS AND SERVICES</th><th colspan="2">CONSULTING</th></tr><tr><th>ICB</th><th>NCB</th><th>Shopping</th><th>ICB</th><th>NCB</th><th>Shopping</th><th>International publicity consulting</th><th>Short list 100% national</th></tr><tr><td>≥ 25,000,000</td><td>> 350,000 and < 25,000,000</td><td>≤ 350,000*</td><td>≥ 1,500,000</td><td>> 100,000 and < 1,500,000</td><td>< 100,000*</td><td>> 200,000</td><td>≤ 1,000,000</td></tr></table> <p>* This amount can be raised up to the amount for NCB, if previously agreed upon with the Bank and approved in the procurement plan.</p>	WORKS			GOODS AND SERVICES			CONSULTING		ICB	NCB	Shopping	ICB	NCB	Shopping	International publicity consulting	Short list 100% national	≥ 25,000,000	> 350,000 and < 25,000,000	≤ 350,000*	≥ 1,500,000	> 100,000 and < 1,500,000	< 100,000*	> 200,000	≤ 1,000,000
WORKS			GOODS AND SERVICES			CONSULTING																				
ICB	NCB	Shopping	ICB	NCB	Shopping	International publicity consulting	Short list 100% national																			
≥ 25,000,000	> 350,000 and < 25,000,000	≤ 350,000*	≥ 1,500,000	> 100,000 and < 1,500,000	< 100,000*	> 200,000	≤ 1,000,000																			
<input checked="" type="checkbox"/>	Direct contracting and single-source selection	Given its background and experience, the single-source selection of UBATEC S.A. is envisaged under paragraph 3.11(d) of document GN-2350-15. UBATEC S.A., the Technological Linkage Unit of the University of Buenos Aires, founded in 1991 and incorporated in the City of Buenos Aires under the laws of the Argentine Republic, will be the initial incubator of the Argentine Multidisciplinary Center for Artificial Intelligence (CAMIA).																								

		<p>UBATEC's main functions in the incubation stage of CAMIA will be to: (i) build and commission the AI center; (ii) coordinate actions of all AI-related public and private agents in Argentina's science/technology ecosystem; and (iii) identify, incentivize, and connect supply with demand for AI solutions in export chains and at export companies.</p> <p>The estimated total amount for these functions is US\$1 million.</p>
<input checked="" type="checkbox"/>	Records and files	The executing agencies (Agencia I+D+i and MCTI) will be responsible for maintaining the original records of procurement, contracting, and financial management under their responsibility as part of program execution.

Main procurements

Procurement description	Selection method	New procedures/ tools	Estimated date	Estimated amount US\$
Consulting services, firms				
Single-source selection of UBATEC S.A., the Technological Linkage Unit of the University of Buenos Aires, for creation of CAMIA	SSS	No	Sep-2023	1,000,000
Contracting of consulting engagement for technology development projects and solutions	QCBS	No	Sep-2023	10,000,000
Contracting of consulting engagement for monitoring, information, and intermediation system	QCBS	No	Sep-2023	1,500,000
Consulting services, individuals				
Contracting of individual consultants for strengthening of executing agency teams	IC (3CV)	No	Sep-2023	1,000,000

See [procurement plan](#).

IV. Financial Management Agreement and Requirements

<input checked="" type="checkbox"/>	Programming and budget	The executing agencies will be responsible for formulating and programming the annual budget and will perform all procedures for consolidating the annual budget for approval. As needs arise to increase or reallocate line items, the execution unit will request the modifications and take charge of managing their approval. Budget appropriations are executed through quarterly and monthly accrued commitment quotas, which are allocated by the National Budget Office (Ministry of Economy).
<input checked="" type="checkbox"/>	Treasury and disbursement management	Bank accounts: Each executing agency will maintain a special account in dollars and an account in pesos at Banco Nación, separated and identified for accounting and operational purposes, for exclusive management of the program resources.

		<p>Financial plan: Disbursements will be based on a detailed financial plan reflecting the program's actual liquidity needs.</p> <p>Disbursement method: The Bank will disburse resources under the advance of funds modality, as the preferred method or, in prior coordination with the Bank, another modality established in the Financial Management Guidelines for IDB-financed Projects (document OP-273-12, or current version). Subsequent disbursements after the first advance of funds may be processed, when the level of justification of the previous advances reaches 80%.</p> <p>The Online Disbursement electronic platform (or current version) will be used to manage disbursements.</p>
<input checked="" type="checkbox"/>	Accounting, information systems, and reporting	<p>The executing agencies will use the UEPEX system as a financial administration system. It will be used by the central execution unit and by the subexecuting agencies. The UEPEX system makes it possible to identify the program funds and the sources of financing. The UEPEX system assigns program investments by component from the cost table in accordance with the chart of accounts approved by the Bank. Accounting will be on a cash basis, following International Financial Reporting Standards, where applicable, in accordance with country criteria.</p>
<input checked="" type="checkbox"/>	External control and financial reports	<p>External control is performed by the Office of the Auditor General of the Nation (AGN). The AGN is a supreme external control institution, reporting to and assisting the National Congress in overseeing the status of public sector accounts, established and operating under Title VII, Chapter I, of Law 24,156 on Financial Administration and External Control Systems.</p> <p>The audited financial statements to be delivered to the Bank by each of the coexecuting agencies on the program activities and resources under their responsibility during the original disbursement period, or as extended, within 120 days after the close of each fiscal year of the program, will be certified by the AGN or by an independent audit firm acceptable to the Bank, based on terms of reference previously agreed upon with the Bank. The coexecuting agencies will deliver the last such audited financial statements to the Bank within 120 days after the expiration date of the original disbursement period, or as extended.</p>
	Financial supervision of the operation	<p>The initial financial supervision plan will be based on risk assessments and fiduciary capacity evaluations of the executing agencies through onsite supervision visits and desk reviews, as well as the analysis and monitoring of results and recommendations of the audits of the project's annual financial reports.</p>

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/23

Argentina. Loan ____/OC-AR to the Argentine Republic. Support Program for Knowledge Economy Exports

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 Argentine Republic, as borrower, for the purpose of granting the former a financing aimed at cooperating in the execution of the Support Program for Knowledge Economy Exports . Such financing will be for the amount of up to US\$35,000,000, 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 ____ 2023)