

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

REGIONAL

THE FUTURE OF JOBS IN LATIN AMERICA AND THE CARIBBEAN

(RG-T3249)

TC DOCUMENT

This document was prepared by the Project team consisting of: Laura Ripani (Team Leader, SCL/LMK); Graciana Rucci (Co-Team leader, SCL/LMK); Carmen Pages (Co-Team leader, SCL/LMK); Elena Arias (SCL/EDU); Edwin Goñi (IFD/CTI); Monica Centeno Lappas (LEG/SGO); Ethel Muhlstein (SCL/LMK); and Tania Gaona (SCL/LMK).

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CERTIFICATION

I hereby certify that this operation was approved for financing under **OC Strategic Development Program for Social Development (SOC)** through a communication dated May 8, 2013 and signed by Mariana Mendoza. Also, I certify that resources from said fund are available for up to **US\$300,000** in order to finance the activities described and budgeted in this document. This certification reserves resource for the referenced project for a period of four (4) calendar months counted from the date of eligibility from the funding source. If the project is not approved by the IDB within that period, the reserve of resources will be cancelled, except in the case a new certification is granted. The commitment and disbursement of these resources shall be made only by the Bank in US dollars. The same currency shall be used to stipulate the remuneration and payments to consultants, except in the case of local consultants working in their own borrowing member country who shall have their remuneration defined and paid in the currency of such country. No resources of the Fund shall be made available to cover amounts greater than the amount certified herein above for the implementation of this operation. Amounts greater than the certified amount may arise from commitments on contracts denominated in a currency other than the Fund currency, resulting in currency exchange rate differences, i.e. represent a risk that will not be absorbed by the Fund.

Certified by:

Sonia M. Rivera
Chief
Grants and Co-Financing Management Unit
ORP/GCM

Date

Approved by:

Carmen Pages-Serra
Chief
Labor Markets Division
SCL/LMK

Date

Technical Cooperation Document

I. Basic project data

▪ Country/Region:	Regional
▪ TC Name:	The future of jobs in Latin America and the Caribbean
▪ TC Number:	RG-T3249
▪ Team Leader/Members:	Laura Ripani (Team Leader, SCL/LMK); Graciana Rucci (Co-Team leader, SCL/LMK); Carmen Pages (Co-Team leader, SCL/LMK); Elena Arias (SCL/EDU); Edwin Goñi (IFD/CTI); Monica Centeno Lappas (LEG/SGO); Ethel Muhlstein (SCL/LMK); and Tania Gaona (SCL/LMK).
▪ Indicate if: Operational Support, Client Support, or Research & Dissemination.	Research & Dissemination (RD)
▪ Reference to Request: (IDB docs #)	Not applicable. Non-objection from beneficiary countries will be obtained before work is started in each country.
▪ Date of TC Abstract authorization:	May 7, 2018
▪ Beneficiary (countries or entities which are the recipient of the technical assistance):	Ministries of Labor in the LAC region (to be determined; possibly Mexico, Brazil and Colombia; all beneficiaries must be borrowing members of the Bank).
▪ Executing Agency and contact name:	Inter-American Development Bank (IDB), Social Sector, through the Labor Markets Division (SCL/LMK), Laura Ripani, laurari@iadb.org .
▪ Donors providing funding (amount and Funds name):	OC Strategic Development Program for Social Development (SOC).
▪ IDB Funding Requested:	US\$300,000
▪ Local counterpart funding, if any:	0
▪ Disbursement and execution periods:	48 months (36 months)
▪ Required start date:	September 1, 2018
▪ Types of consultants (firm or individual consultants):	Individual consultants
▪ Prepared by Unit:	Labor Markets (SCL/LMK)
▪ Unit of Disbursement Responsibility:	SCL/LMK
▪ Included in Country Strategy (y/n);	No
▪ TC included in CPD (y/n):	No
▪ Alignment to the Update of the Institutional Strategy 2010-2020:	Productivity and Innovation Development, with the objective of developing qualified human capital, and with the cross-sectional area of Institutions and the Rule of Law.

II. Objective and Justification

- 2.1 **Technological advances known as the Fourth Industrial Revolution are changing today's and tomorrow's labor market.** In recent years, many economies in Latin America and the Caribbean (LAC) have expanded use of the Internet and digital technologies but the digital economy remains limited. Latin America and the Caribbean governments are now more aware of the opportunities that digitalization opens for economies to become more productive, expand entrepreneurship, and drive inclusive economic growth. Countries in LAC will have a big opportunity, with an eager private sector and abundant natural resources.
- 2.2 **To capitalize on the opportunities of technological change, talent should be unlocked.** Technology enhances all this potential and bring opportunities for all. However, achieving higher economic growth and regional competitiveness depend not only on technological advances, but also on having the adequate labor force to undertake the coming challenges. Without it, there will not be an alignment of digitalization and development. To prepare workers, countries in LAC will have to understand better the impacts of technology on the labor market, what are the skills that are increasing in demand, and what types of skills are less demanded. The use of administrative record and big data for this type of analysis is fundamental, since traditional surveys (household and firm surveys) are not as timely as they need to be to understand the fast changes that are occurring in the labor market. With a coverage of over 61 million users throughout LAC and 546 million users globally, LinkedIn can bring new, real-time insights which identify key elements of labor markets and skills. After knowing what are the skills that are more demanded, it is key to develop innovative policy tools to bring more and better training for all workers, especially younger individuals that are starting their first steps in the labor market.
- 2.3 **Providing productive jobs for youth in LAC represents a great opportunity for growth.** In the region, 14.9 million young people (77% of them women), are neither in education, nor working, nor looking for work (Alaimo et al., 2015). This figure, together with the number of unemployed youth (roughly 6.6 million), implies that 21.5% of the region's youth are neither in education nor working. This challenge is especially acute among low-income youth. According to Alaimo et al (2015), "The entry of youths who are neither in education, nor working, nor looking for work, and employed youths in the workforce, it is estimated, would boost the region's GDP per capita by 5% on average. However, this potential is even greater in some countries, with figures ranging from 7% to 9% of GDP per capita in the Dominican Republic, El Salvador, Honduras, and Venezuela". Another important challenge is that many young people in the region tend to enter the labor market in informal jobs. The literature mentions one effect that is called a "scarring effect", that means that lack of access to a job has a lasting impact; people who are unemployed or have informal jobs in their youth have poorer job performance as adults (Cruces, Ham, and Viollaz, 2012).

- 2.4 **Beyond youth labor market development, there is a need for a lifelong learning approach.** It is important to recognize, first, that the need for updating the newly demanded skills will be faster than in the past. Secondly, the need for upskilling and reskilling will be for a large part of the workforce (youth, adults and older adults). This requires going beyond updating the academic curriculum of formal education (primary, secondary and higher). An effort will have to be directed to updating the skills of the existing workforce through continuous training: vocational, e-learning, blended learning and, in general, with a framework conceived as "lifelong learning". This is necessary because the newly demanded skills are not going to remain static but are expected to change rapidly throughout the lives of students and workers. Digital technology is creating new opportunities to learn in new ways. New ways of learning include more flexible, accessible and shorter-term opportunities such as MOOCs (massive open online courses), nanodiplomas or coding bootcamps. New types of training service providers are emerging globally to provide this new type of training supply.
- 2.5 **The promise of investment in innovation to increase productivity requires several essential inputs, and human capital is one of the most important.** The investment in reskilling and upskilling for the digital economy will make work more productive because retrained workers will be able to place themselves more easily in the labor market. Both the novelty and the dimension, as well as the urgency of reskilling and digital upskilling needs represent, nevertheless, a challenge that Latin America and the Caribbean countries are just beginning to face.
- 2.6 **Technology brings many opportunities, but there is fear that automation and freelancing will pose a risk for all, especially for the middle class and the most vulnerable.** The study developed by Frey and Osborne generated a debate because the authors argue that, in the US, 47% of the workforce is in jobs that have a high risk of being automated. Recent studies show that the levels of automation in Latin America and the Caribbean are higher, reaching over 75% in countries such as El Salvador and Guatemala¹. In addition, the lower cost of labor relative to capital and the slower introduction of technology bring ambiguity about the pace of these changes. In addition to that, even though there are existing efforts to study the impact of this transformation, higher efforts to understand the specific challenges in the region are needed. There is a need to study the role of automation in labor markets in Latin America and the Caribbean. While much research has been done for the U.S. and Europe, there is limited evidence about the effects of this new wave of automation on workers in Latin America and the Caribbean. A related study was done by Maloney

¹ For more information, see Carl Benedikt Frey and Michael A. Osborne, The future of employment: How susceptible are jobs to computerization? Oxford Martin School, September 17, 2013; Technology at Work v2.0: The future is not what it used to be, Citibank, January 2016; The future of jobs: Employment, skills, and workforce strategy for the fourth Industrial Revolution, World Economic Forum, January 2016; McKinsey Global Institute analysis. Dividends Report, World Bank.

and Molina (2016). They use the methodology developed by Autor and Dorn (2013) to explore polarization in developing countries using available census data from Integrated Public Use Microdata Series (IPUMS) for several countries including many in Latin America:² the findings are inconclusive, but hint at manifestations of polarization. The impacts of automation on the labor market (employment and wages) will not be the same in all sectors; the manufacturing sector has the highest level of automation in the economy (Acemoglu and Restrepo, 2017). The variation will also depend on the demographic composition of the countries (Acemoglu and Restrepo, 2016). As shown in the Table 1, in countries such as Mexico, Brazil and Colombia, youth, especially those who are less educated, have low levels of integration in the labor market compared with adults. Regarding the number of robots that in the International Federation of Robotics (IFR) database, Mexico and Brazil are the countries with the highest number of robots and make these countries the most interesting to investigate.

Table 1. Robots in Latin America and the Caribbean, education and employment

Country	Stock Robots (2016)	Level Education	Employed population (%)		
			15 - 24	25 - 64	65 >
Mexico	20,676	High	49.90	79.14	25.25
		Medium	54.46	70.04	32.87
		Low	45.33	75.09	30.79
Brazil	11,732	High	51.89	67.63	13.78
		Medium	43.88	71.29	18.32
		Low	27.99	63.11	15.9
Argentina	2,078	High	37.96	81.49	27.25
		Medium	32.43	61.72	10.72
		Low	26.97	72.61	15.82
Chile	151	High	31.80	80.22	30.88
		Medium	28.63	60.09	16.37
		Low	27.15	71.67	24.05
Colombia	124	High	55.39	83.82	30.09
		Medium	36.51	71.51	29.30
		Low	42.41	76.13	22.98

Source: IDB's Labor Market and Social Security System (SIMS) and International Federation of Robotics (IFR)

2.7 The objective of this TC is to contribute to the research on the future of jobs in two aspects: adding new data for Latin America and the Caribbean and developing policy tools to confront the challenges that the new trends pose for workers and firms in the region. The TC will analyze how technological change is affecting the labor market, with a focus on understanding the impacts that automation

² Maloney, W. and C. Molina. 2016. "Are Automation and Trade Polarizing Developing Country Labor Markets, Too?" Policy Research Working Paper 7922, World Bank; and Autor, D. and Dorn, D. 2013. "The Growth of low-Skill Service Jobs and the Polarization of the U.S. Labor Market, *American Economic Review*, 103(5): 1553-1597.

will have in the labor market in our region. Secondly, the TC will analyze the skills that will be needed for tomorrow's jobs. In addition, this TC aims to use digital innovation to offer countries innovative tools to change their Technical Vocational Education and Training (TVET) policies. It is expected that the products and learning of this technical cooperation contribute to the Bank's operational program through the development of new policy interventions directed to mitigate the risks of the Fourth Industrial Revolution, while maximizing its opportunities. Examples of operations include labor reforms (new laws and regulations for a changing labor market), skills development programs, TVET reforms, and support to labor intermediation policies that help with more frequent transitions of workers between jobs.

2.8 Strategic alignment. The Technical Cooperation is consistent with the update of the Institutional Strategy (UIS) 2010-2020 (AB-3008). It is strategically aligned with the challenge of Productivity and Innovation Development, with the objective of developing qualified human capital, and with the cross-sectional area of Institutions and the Rule of Law. Along these lines, the TC contributes to the indicators of: (i) institutions and the rule of law; and (ii) productivity and innovation of the Corporate Results Framework (CRF) 2016-2019 (document GN-2727-6). It is also aligned with the Sectoral Framework Document on Innovation, Science and Technology and its update (GN-2791-5) regarding the importance of facing the challenges posed by the digital economy and the need to increase the availability of human capital highly qualified for innovation. Also, in the framework of the Strategic Program for the Development of Institutions (INS) for the year 2018, this TC is aligned with the prioritization criteria related to the strengthening of the institutional architecture of public sector entities in the region, to the attendance of the challenges of the digital revolution to take advantage of the opportunities of the digital economy and the development of platforms and tools for dialogue and knowledge exchange. It is also aligned with the Country Strategy for Mexico (GN-2749) that includes labor market as one of its priority sectors. In particular, the strategic objective in this sector is to improve the productive labor insertion in quality jobs.

2.9 Complementarity with other interventions. This TC complements other projects addressing digital transformation in the region. In the context of the digital transformation, SCL offers technical and financial support to LAC countries' social providers to embrace, adapt, use and take advantage of the digital economy to improve the delivery of the social services. More specifically, SCL provides expertise and financial support on a variety of topics related to the digital economy, such as: electronic health records, learning management systems, platforms for labor intermediation, digital tools for lifelong learning, among others, so the region can provide more efficient, impactful and equitable social services by leveraging digital technologies. The CTI division is making efforts to support countries to take advantage of digital economy opportunities, helping to close information gaps for policy design and promoting the adoption and use of digital technologies in the productive sector through the development of digital extension programs, the promotion of new business

models based on digital technologies and new ways of innovating, the financing of enabling factors to trigger vertical transformation processes, as well as the training of talent with digital skills. This TC complements the work of the RG-T3000 project and will deepen awareness-raising activities with public policy makers to the challenges related to the digital skills developed within the framework of it. In terms of complementarity with country work, two TCs that are in the process of being approved (AR-T1215 and UR-T1178) are designed to strengthen the IDB as a contributor to the inclusive growth in the 21st century agenda in Argentina and Uruguay, respectively, through targeted and reinforced policy dialogue anchored on solid analytical underpinnings.

III. Description of activities and outputs

3.1 Component 1: Understanding the impact of automation in the LAC labor market.

The first objective of this component is to support a study that aims to quantify the role of automation in labor markets in Latin America and the Caribbean. While much research has been done for the U.S. and Europe, there is limited evidence about the effects of this new wave of automation on workers in Latin America and the Caribbean. In this framework it is important to highlight the differences in automation risks when applying different methodologies to understand the challenges of the region, for example the so called "occupation approach" (following Frey and Osborne methodology) delivers a 47% of occupations at risk of automation in the U.S., while a "task approach" (Arntz, Gregory and Zierahn, 2016) only 6%. This study will use data from the International Federation of Robots (IFR) about the variation in automation across different sectors in the U.S. to understand in which way this is affecting at least three countries in Latin America and the Caribbean. According to preliminary information, the economic sectors that are most affected by automation include the automotive industry and the metal and plastics industries. This analysis will require the hiring of external individual consultants. Countries will be selected based on the availability of anonymized social security records and the existence of higher levels of robotization according to the IFR database. It is important to have administrative information that allows microeconomic analysis, in order to exploit within-country variations. This information also allows to learn about the evolution of the automation process. The pre-identified countries are Mexico (using the IMSS), Colombia (PILA) and Brazil (RAIS). A second objective is to use the results of this study to develop a policy toolkit that allows countries to design policies to upskill and reskill workers that are affected by automation. This will help governments be better prepared to face the challenges that the future of work brings and hopefully improve the lives of those workers with greater risks of automation.

3.2 Component 2: Big data analysis to understand how labor markets are changing.

The objective of this component is to have a better grasp of the changes in skills demands due to technological advances. The Bank has an agreement with Microsoft that established a partnership with LinkedIn to work together in the analysis of

anonymized LinkedIn data. The analysis of this database will require the hiring of external individual consultants. This data will be used to understand future trends and inform policymakers about new skills demands. For this purpose, four countries in the region (Argentina, Brazil, Chile and México) and six countries outside of the region (Australia, India, France, South Africa, United Kingdom and USA) will be selected as a benchmark. The selection criteria is based on the best quality in the samples available from LinkedIn for the ten countries selected, and for those outside of the region the additional criteria was that these countries would portrait a variety of possible future skills trends for countries in Latin America and the Caribbean. The final objective is to use this information to inform the TVET system.³ It is important to mention that the LinkedIn database has representation of a set of individuals with specific characteristics that differ from the characteristics of those represented in household surveys. In a separate effort, SCL/LMK and the Division of Education (SCL/EDU) are analyzing the evolution of occupations over time using household surveys. The analysis of LinkedIn data will complement that effort to make a richer overall analysis of the labor markets and its trends for the region. One of the advantages of the LinkedIn data over household surveys is that it can bring new, real-time insights of what is happening in the labor market.

- 3.3 **Component 3: Digital innovation to close the skills gap.** Technological innovation brought new ways to develop skills. Digital learning is getting bigger and bigger as a way to learn new skills and adapt quickly to new skills demands ([IDB, 2016](#); [Chuang and Ho, 2016](#)). This component will study how digital learning can help current and future workers to prepare for the new labor market. More specifically, the technical cooperation will finance a study that will include an analysis of digital learning platforms and programs in a set of countries outside of the region, it will identify innovative programs and experiences in LAC, and it will outline a set of alternative solutions to incorporate these tools in the TVET systems. In this sense, this component will allow the Bank to understand better how to link the work done by skills development systems in the region (National Training Institutes, private firms and private training centers) with online learning platforms and inform new loans about the potential of including these new tools in the TVET systems. This analysis will require the hiring of external individual consultants.
- 3.4 **Component 4: Sharing knowledge about the future of work in LAC.** The knowledge generated in this TC is extremely new and valuable for policymakers in the region. The IDB has a comparative advantage in two aspects: its knowledge about what is happening in the LAC region, and its expertise identifying and working on creative solutions to face the new challenges. For these reasons, it is important to include as part of this TC a component to finance a communication campaign,

³ With the objective of capitalizing on existing efforts, this component will promote the integration of efforts made by other institutions active in the region such as the OCDE, the IDRC and the ILO. The Bank is currently working on TVET with Mexico, Panama, Bahamas, Brazil, Bolivia, Peru, Chile and Dominican Republic.

including infographics, videos, and other impactful dissemination tools, to maximize the impact of the research developed in this Technical Cooperation about the future of work. The communication campaign's design and implementation, as well as the infographics and videos will require the hiring of external individual consultants.

IV. Budget

Activity/Component	Description	IDB/SOC (US\$)
Component 1: Understanding the impacts of automation on the labor markets of the region		
1.1 Analysis of the impact of automation in the labor markets	Analysis of how robots are impacting the demand for labor in the region.	50,000
1.2 Policy toolkit to minimize risks	Development of policy tools to support workers at risk of losing their jobs due to automation	45,000
Component 2: Big data analysis to understand how labor markets are changing		
2.1 Big data analysis of skills trends (using LinkedIn data)	Understanding skills demands for ten countries in the World, including four countries in LAC	50,000
2.2 Policy recommendations to improve their TVET system	Policy recommendations for LAC countries based on detailed analysis of skills demands together with the analysis of TVET supply in LAC countries, identifying skills gaps.	35,000
Component 3: Digital innovation for closing the skills gaps		
3.1 Analysis of digital learning	Development of an international analysis of digital learning (including countries outside and inside LAC), together with the proposal of potential applications for LAC.	50,000
Component 4: Sharing knowledge about the future of work in LAC		
4.1 Dissemination	Communication campaign, including infographics, videos, and other impactful dissemination tools, to maximize the impact of the research developed in this Technical Cooperation about the future of work.	50,000
Monitoring Activities		10,000
Contingencies		10,000
Total		300,000

V. Executing agency and execution structure

- 5.1 This is a Research and Dissemination TC that is an initiative of the IDB. The IDB, through SCL/LMK, will be responsible for the direction, supervision and coordination of this TC. SCL/LMK has particular technical expertise in labor market programs, specifically based on international best practices; and administrative burdens can be reduced on the government. Coordination with benefitting entities will be extensive.

- 5.2 **Procurement.** The activities to be executed are included in the Procurement Plan (Annex IV) and the Bank will contract individual consultants in accordance with current Bank procurement policies and procedures. Specifically, Section AM-650 of the Administrative Manual “Complementary Workforce” will be applied in the case of individual consultants, the Policy for the Selection and Contracting of Consulting Firms for Bank-executed Operational Work (GN-2765-1) and its Operational Guidelines (OP-1155-4) for hiring consulting services of intellectual nature and the Corporate Procurement Policy (GN-2303-20) for other services.

VI. Major issues

- 6.1 There are no risks associated with the execution of this TC.

VII. Environmental and Social Strategy

- 7.1 Due to the nature of this TC, it is not expected to have a significant negative environmental or social impact. The proposed technical assistance has been classified as category C. See safeguard filters: [SPF](#) and [SSF](#).

Required Annexes

- Request from client: Not applicable for R&D⁴
- [Results Matrix](#)
- [Terms of Reference](#)
- [Procurement Plan](#)

⁴ Non-objection from beneficiary countries will be obtained before work is started in each country.