

# Technology Adoption Survey

The World Bank

2022

## INTRODUCTION

This survey is being conducted by \_\_\_\_\_ on behalf of \_\_\_\_\_.

The goal of this survey is to gather information about technologies adopted by firms in **CHILE**. The information gathered here will help the World Bank to develop new policies and programs that enhance employment, economic growth and shared prosperity.

The information obtained here will be anonymized. Neither your name nor the name of your business will be used in any document based on this survey.

**INTERVIEWER: WE DEFINE TECHNOLOGY AS MACHINERY, EQUIPMENT, SOFTWARE, OR PROCESS USED BY THE FIRM TO PRODUCE SOMETHING.**

Structure of the questionnaire

- A. GENERAL INFORMATION AND FIRM CHARACTERISTICS
- B. GENERAL BUSINESS FUNCTIONS
- C. SECTOR SPECIFIC TECHNOLOGIES
- D. DRIVERS AND BARRIERS FOR ADOPTION
- E. BALANCE SHEET AND PERFORMANCE



**SCREENER SCRIPT BEGINS HERE**

**S. SCREENER CONTROL INFORMATION**

Good morning/afternoon/evening. I am calling from [insert implementing contractor], on behalf of the World Bank. We are carrying out a firm-level survey in [insert country name] to better understand the current conditions and key barriers for **technology adoption** to businesses like yours.

Could I please speak to the person who most often represents the firm for official purposes, that is the individual who most often deals with banks or government agencies or institutions?

**IF THE REQUESTED PERSON IS UNAVAILABLE, ASK IF THE PERSON ON THE PHONE CAN ANSWER SOME QUESTIONS ABOUT THE BUSINESS OR ARRANGE A CONVENIENT TIME TO CALL BACK.**

**IF PUT THROUGH, CONTINUE**

Good [morning/afternoon/evening]. I'm calling from [insert implementing contractor]. On behalf of the World Bank, we are conducting a survey about technology adoption in [insert country name]. Would you please answer a few questions to determine if we should establish an appointment to complete the survey?

<b>S.4</b>	Is this establishment part of a multi-establishment firm? (that is, a firm with several establishments, each with its own location, management, activity, and financial statements).
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Yes	1	<i><b>IF S.4=2, GO TO S.5</b></i>
No	2	
		<i><b>s4</b></i>

<b>S.4a</b>	How many establishments are part of the firm?
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Number of establishments	<i><b>s4a</b></i>
<i><b>DON'T KNOW (SPONTANEOUS)</b></i>	<i><b>-9</b></i>

CONDITION: ***s4a variable must be larger than 1.***

<b>S.4b</b>	Is this establishment the headquarters location?
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Yes	1	<i><b>IF S.4b=2, GO TO S.4f</b></i>
No	2	
		<i><b>s4b</b></i>

<b>S.4c</b>	Are the financial statements of the headquarters location separate from the rest of the other establishments?
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Yes	1
No	2

**s4c**

<b>S.4d</b>	Does this headquarters location engage in production or sales at this location?
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Yes	1
No	2

***IF S.4d=1, GO TO S.5***

**s4d**

<b>S.4f</b>	Are this establishment's financial statements prepared separately from headquarters' statements?
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Yes	1
No	2

***CONTACT HQ TO INTERVIEW THE ESTABLISHMENT THAT REPRESENTS THE LARGEST SHARE OF PRODUCTION OR SALES: GO BACK TO S.4e***

**s4f**

<b>S.5</b>	Please tell me what type of product or service represents this establishment’s greatest share of annual sales?
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	Please circle one of the numbers below <b>s5</b>	Detailed description of main activity and product
Agriculture (except Livestock)	1	
Livestock	2	
Food Processing	3	
Wearing apparel	4	
Pharmaceuticals	5	
Motor vehicles	6	
Wholesale or retail	7	
Financial services	8	
Land transport	9	
Health services	10	
Other manufacturing	11	
Other Services or	12	

**INTERVIEWER: PLEASE RECORD THE DESCRIPTION OF THE ACTIVITY AND PRODUCT IN DETAIL, FOR EXAMPLE, “RETAIL SALE OF WOMEN'S OUTDOOR CLOTHING” NOT JUST “CLOTHING”. IF MANY GOODS ARE SOLD, SUCH AS IN A GROCERY STORE OR PHARMACY, INDICATE THE TYPE OF STORE. THEN CODE THE INDUSTRY IN THE FOLLOWING TABLE S6.**

*INTERVIEWER: BASED ON THE MAIN SECTOR OF ACTIVITY (s6a) IDENTIFY WHAT SECTOR SPECIFIC QUESTIONNAIRE WILL APPLY (s6b).*

**CONDITION: APPLY THE SECTOR-SPECIFIC QUESTIONNAIRE ACCORDING TO TABLE S.6.**

**S.6 Industry**

		Screener sector <b>s6a</b>	What sector specific questionnaire should be used ? <b>s6b</b>
<b>Agriculture</b>	Agriculture (except Livestock)	01	1
	Livestock	014	2
	Food	10	3

<b>Manufacturing</b>	Beverage	11	0
	Tobacco	12	0
	Textiles	13	0
	Wearing Apparel	14	4
	Leather	15	11
	Wood	16	0
	Paper	17	0
	Publishing, printing, and recorded media	18	0
	Refined petroleum product	19	0
	Chemicals	20	0
	Pharmaceuticals	21	6
	Plastics & rubber	22	0
	Nonmetallic mineral products	23	0
	Basic metals	24	0
	Fabricated metal products	25	0
	Computer and electronics	26	0
	Electronics	27	0
	Machinery and equipment	28	0
	Motor vehicles	29	5
	Other transport equipment	30	0
Furniture	31	0	
Other manufacturing	32	0	
Repair of machinery and equipment	33	0	
<b>Construction</b>	Construction of building	41	0
	Civil engineering	42	0
	Specialized construction activities	43	0
<b>Services</b>	Wholesale (45 and 46)	46	7
	Retail	47	7
	Land transport	49	9
	Water transport	50	0
	Air transport	51	0
	Warehousing	52	0
	Postal and courier	53	0
	Hotel and Restaurants (Section I, 55-56)	55	0
	Publishing	58	0
	Telecommunications	61	0
	Computer programming	62	0
	Information service activities	63	0
	Monetary Intermediation	641	8
	Travel agency	79	0
	Services Health (hospital activities)	861	10
Repair services	95	0	
	IF FIRM'S PRIMARY ACTIVITY IS OUTSIDE OF THE ENTERPRISE SURVEY UNIVERSE, INPUT CODE 8 INTO PROGRESS REPORT		

S.7	How many workers does this establishment have?
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Number of workers
<b>CONDITION: IF FEWER THAN 5, TERMINATE.</b>

**TERMINATE** (Enter Code 5 into progress report)

s7
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**S.8. APPOINTMENT INFORMATION:**

We would like to schedule an appointment for an interview. The purpose of this survey is to better understand the current conditions and key barriers for **technology adoption** to businesses like yours. Your responses, and those of other business leaders, will help to design new policies and programs to improve the business environment. All information and opinions you provide will be anonymized. Neither your name nor the name of your establishment will be used in any document based on this survey.

APPOINTMENT DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

NAME OF RESPONDENT: \_\_\_\_\_

POSITION OF RESPONDENT: \_\_\_\_\_

UPDATE THE INFORMATION SHEET IF CONTACT INFORMATION IS DIFFERENT THAN WHAT IS LISTED

**CAPI QUESTIONS BEGIN HERE**

**A. CONTROL AND GENERAL INFORMATION**

TO BE COMPLETED AT THE TIME OF THE INTERVIEW  
TO BE MERGED WITH THE SCREENING QUESTIONNAIRE

**A.1 Time interview begins:**

<b>Day (dd)</b>	<b>Month (mm)</b>	<b>Year (yyyy)</b>	<b>Hour (00 to</b>	<b>Minutes (00 to</b>
<b>a1a</b>	<b>a1b</b>	<b>a1c</b>	<b>a1d</b>	<b>a1e</b>

**READ OUT THE FOLLOWING INTRODUCTORY SENTENCE ONLY IF s4= 1 (yes):**  
**The first few questions apply to the firm which this establishment is part of.**

**A.3 Ownership**

What percentage of this firm is owned by each of the following: SHOW CARD 1	<b>Share</b>	<b>DON'T KNOW (SPONTANEOUS)</b>
Private foreign individuals, companies or organizations	<b>a3b%</b>	<b>-9</b>
Government or state	<b>a3c%</b>	<b>-9</b>

Question	Variable	Answer
Is this firm owned by the founder or someone of her/his family?	<b>a4b</b>	1 = Yes. By the founder. 2 = Yes. By the founder's family (2nd generation or more) 3 = No -9 = Don't know -7 = Not applicable
Amongst the owners of the firm, are there any females?	<b>a4e</b>	1 = Yes 2 = No -9 = Don't know

**READ ONLY IF s4=1 (yes)**  
**I want to proceed by asking you about this establishment only.**

<b>A5</b>	Over the year [2020], please tell me what type of product or service represents this establishment's greatest share of annual sales? INTERVIEWER: PLEASE RECORD THE DESCRIPTION OF THE ACTIVITY AND PRODUCT IN DETAIL, FOR EXAMPLE, "RETAIL SALE OF WOMEN'S OUTDOOR CLOTHING" NOT JUST "CLOTHING".
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	<b>a5a</b>	<b>DETAILED DESCRIPTION OF MAIN ACTIVITY AND PRODUCT</b>	<b>a5c</b> What sector specific questionnaire should be used ? <b>IF a5c IS DIFFERENT FROM s6b, PLEASE DOUBLE CHECK THE INFORMATION.</b> CONDITION: <b>IF a5c=0 SKIP SECTION C.</b>
Agriculture (except Livestock)	1	<b>a5b</b>	1
Livestock	2		2
Food Processing	3		3
Wearing apparel	4		4
Motor vehicles	5		5
Pharmaceuticals	6		6
Wholesale or retail	7		7
Financial services	8		8
Land transport	9		9
Health services	10		10
Leather goods	11		11
Accommodation	12		12
Other manufacturing	101		0
Other Services or Construction	102		0

Question	Variable	Answer
In what year did this establishment begin operations?	<b>a6</b>	(Number of years) Year the establishment began operations -9 = Don't know

INTERVIEWER: PROVIDE FOUR DIGITS FOR YEAR

Question	Variable	Answer
How many years of experience working in this sector does the Top Manager have?	<b>a7a</b>	(Number of years) 1 = If less than a year -9 = Don't know
Is the Top Manager female?	<b>a7b</b>	1 = Yes 2 = No -9 = Don't know
What is the highest level of education of the Top Manager? SHOW CARD 2	<b>a7c</b>	1 = Primary school 2 = Secondary school 3 = Complete high-school 4 = College degree 5 = Post-Graduation (MBA, Master or PhD) 6 = Vocational training -9 = Don't know

Did the Top Manager study abroad for more than a month?	<b>a7d</b>	1 = Yes 2 = No -9 = Don't know
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## B. GENERAL BUSINESS FUNCTIONS

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### READ THE FOLLOWING TO THE RESPONDENT BEFORE PROCEEDING:

The next topic to be covered is about use of water, electricity, telecommunications, and internet for business purpose.

### TECHNOLOGY ENABLERS

#### B.1 Use of electrical energy

Does this establishment have an electrical connection from the grid? [SKIP: IF <b>b1a</b> =2 OR <b>b1a</b> =-9, GO TO <b>b2a</b> ]	<b>b1a</b> 1 = Yes 2 = No -9 = Don't know
Over the year [2020] did this establishment experience power outages? [SKIP: IF <b>b1b</b> =2, GO TO <b>b2a</b> ]	<b>b1b</b> 1 = Yes 2 = No
In a typical month, over the year [2020], how many power outages did this establishment experience?	<b>b1c</b> (Number of power outages in a typical month) 1 = Less than one per month -9 = Don't know

#### B.2 Use of generators

Over the year [2020], did this establishment own or share a generator? [SKIP: IF <b>b2a</b> =2 OR <b>b2a</b> =-9, GO TO <b>b2a</b> ]	<b>b2a</b> 1 = Yes 2 = No -9 = Don't know
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Does this establishment use any of the following sources of energy in 2020?	Variable	Answer	
Natural Gas	<b>b2d1</b>	1 = Yes 2 = No	-9 = Don't know
Fuel Oil	<b>b2d2</b>	1 = Yes 2 = No	-9 = Don't know
Liquefied Petroleum Gases (LPG)	<b>b2d3</b>	1 = Yes 2 = No	-9 = Don't know
Coal or Wood fuels (wood, charcoal, others)	<b>b2d4</b>	1 = Yes 2 = No	-9 = Don't know
Own renewable sources, such as power plants using solar, wind, hydro, biomass or geothermal energy	<b>b2d5</b>	1 = Yes 2 = No	-9 = Don't know

What percentage of the energy use in 2020 comes from own renewable sources such as solar, wind, hydro, biomass or geothermal energy? [CONDITION: ASK ONLY IF b2d5=1]	<b>b2d5a</b>	$\frac{\quad}{\quad}\%$ (0-100%)	
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#### B.4 Computer coverage

How many desktop or laptop computers does this establishment use for business purpose? INTERVIEWER: IT INCLUDES OWNED OR RENTED COMPUTERS	<b>b4a</b> (number of computers) -9 = Don't know
How many tablets or smartphones does this establishment use for business purpose? INTERVIEWER: IT INCLUDES OWNED OR RENTED DEVICES	<b>b4b</b> (number) -9 = Don't know

#### B.5 Internet service and coverage

Does this establishment have an Internet connection?	<b>b5a</b> YES = 1, NO = 2
What is the fastest type of Internet connection does this establishment has?  SHOW CARDS 4	<b>b5b</b> 1 = Dial up 2 = DSL or Fiber 3 = Wireless or Satellite 4 = BPL 5 = Other
At the present time, does this establishment (or firm) have its own website?	<b>b5f</b> YES = 1, NO = 2 -9 = Don't know
At the present time, does this establishment (or firm) use an account on an online social media for business purpose?	<b>b5g</b> YES = 1, NO = 2 -9 = Don't know
Does this establishment (or firm) use cloud computer services for business purpose?	<b>b5h</b> YES = 1, NO = 2 -9 = Don't know

### READ THE FOLLOWING TO THE RESPONDENT BEFORE PROCEEDING:

Now, we turn to questions about methods and procedures to perform general business functions

#### TECHNOLOGY ADOPTION

##### B.7 Self-evaluation on this establishment level of adoption

Question	Answer
In a scale from 1 to 10, where 10 means that the establishment is using the most advanced production processes available in its sector, where do you think this establishment stands with respect to:	

other firms in [ADD COUNTRY NAME]?	<b>b7a</b> score (1-10)
most advanced firms in the world?	<b>b7b</b> score (1-10)

### B.8 Business administration

Question: Does this establishment use any of the following methods for managing finance, accounting, and HR processes?	Variable	Answer	
Handwritten processes	<b>b8a1</b>	1 = Yes 2 = No	-9 = Don't know
Computers with standard software such as Excel or equivalent	<b>b8a2</b>	1 = Yes 2 = No	-9 = Don't know
Mobile Apps or digital platforms	<b>b8a3</b>	1 = Yes 2 = No	-9 = Don't know
Computers with specialized software	<b>b8a4</b>	1 = Yes 2 = No	-9 = Don't know
Enterprise Resource Planning (ERP) or equivalent software integrated with other back office functions	<b>b8a5</b>	1 = Yes 2 = No	-9 = Don't know
Other	<b>b8a6</b>	1 = Yes 2 = No	-9 = Don't know

Question:	Variable	Answer
What is the method used more often by this establishment for managing finance, accounting, and HR processes? [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE <b>b8a</b> VARIABLES] SHOW CARDS 5	<b>b8b</b>	1 = Handwritten processes 2 = Computers with standard software 3 = Mobile Apps or digital platforms 4 = Computers with specialized software 5 = Enterprise Resource Planning (ERP) 6 = Other -9 = Don't know

Question	Variable	Answer
For how many years has this establishment been using specialized or ERP software for managing HR processes, finance, and accounting? [CONDITION: ASK ONLY IF <b>b8a4=1</b> OR <b>b8a5=1</b> ]	<b>b8c</b>	(Number of years) 1= If less than a year -9 = Don't know

### B.9 Production or service operations planning

Question: Does this establishment use any of the following methods for production or service operations planning?	Variable	Answer	
Handwritten processes	<b>b9a1</b>	1 = Yes 2 = No	-9 = Don't know

Computers with standard software such as Excel or equivalent	<b>b9a2</b>	1 = Yes 2 = No	-9 = Don't know
Mobile Apps or digital platforms	<b>b9a3</b>	1 = Yes 2 = No	-9 = Don't know
Specialized software for production or service operations planning and demand forecast	<b>b9a4</b>	1 = Yes 2 = No	-9 = Don't know
Enterprise Resource Planning (ERP) software integrated with other administrative functions	<b>b9a5</b>	1 = Yes 2 = No	-9 = Don't know
Other	<b>b9a6</b>	1 = Yes 2 = No	-9 = Don't know

Question:	Variable	Answer
<p>What is the method used more often by this establishment for production planning?</p> <p>[CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE <b>b9a</b> VARIABLES]</p> <p>SHOW CARDS 7</p>	<b>b9b</b>	<p>1 = Handwritten production planning</p> <p>2 = Computers with standard software such as Excel or equivalent</p> <p>3 = Mobile Apps or digital platforms</p> <p>4 = Specialized software for production planning and demand forecast</p> <p>5 = Enterprise Resource Planning (ERP) integrated with other administrative functions</p> <p>6 = Other</p> <p>-9 = Don't know</p>

### B.10 Sourcing, Procurement, and Supply Chain Management

Question: Does this establishment use any of the following procedures to select and manage suppliers and purchase materials and services?	Variable	Answer
Manual search of suppliers, including personal visit or phone calls	<b>b10a1</b>	1 = Yes 2 = No -9 = Don't know
Management of supply chain information using PCs, manually updated (e.g. Microsoft Excel)	<b>b10a2</b>	1 = Yes 2 = No -9 = Don't know
Online social media, specialized Apps or digital platforms	<b>b10a3</b>	1 = Yes 2 = No -9 = Don't know
Supplier Relation Management (SRM) specialized software ( <b>not</b> integrated with production planning)	<b>b10a4</b>	1 = Yes 2 = No -9 = Don't know
Supplier Relation Management (SRM) specialized software (integrated with production planning)	<b>b10a5</b>	1 = Yes 2 = No -9 = Don't know
Other	<b>B10a6</b>	1 = Yes 2 = No -9 = Don't know

Question	Variable	Answer
What is the procedure used more often by this establishment to select	<b>b10a</b>	1 = Manual search of suppliers, including personal visit or phone calls.

and manage suppliers and purchase materials and services? [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE <b>b10a</b> VARIABLES] SHOW CARDS 8		2= Management of supply chain information using PCs, manually updated (e.g. Microsoft Excel) 3 = Online social media, specialized Apps or digital platforms 4 = Supplier Relation Management (SRM) specialized software not integrated with production planning 5 = Supplier Relation Management (SRM) specialized software integrated with production planning 6 = Other -9 = Don't know
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Question	Variable	Answer
For how many years has this establishment been using Supplier Relation Management (SRM) software for managing suppliers and purchasing materials and services? [CONDITION: ASK THIS QUESTION ONLY IF <b>b10a4=1</b> OR <b>b10a5=1</b> ]	<b>b10c</b>	(Number of years) 1= If less than a year -9 = Don't know

### B.11 Marketing and product development

Question: Does this establishment uses any of the following methods to collect and analyze information from customers for marketing purposes or product development?	Variable	Answer	
Face-to-face chat	<b>b11a1</b>	1 = Yes 2 = No	-9 = Don't know
Online chat (e.g. Whatsapp or Internet)	<b>b11a2</b>	1 = Yes 2 = No	-9 = Don't know
Structured surveys by phone, face-to-face, online, or focus groups	<b>b11a3</b>	1 = Yes 2 = No	-9 = Don't know
Customer Relationship Management software (CRM) or equivalent specialized software	<b>b11a4</b>	1 = Yes 2 = No	-9 = Don't know
Big data Analytics or Machine learning algorithms (Artificial Intelligence) with Big Data	<b>b11a5</b>	1 = Yes 2 = No	-9 = Don't know
Other	<b>b11a6</b>	1 = Yes 2 = No	-9 = Don't know

Question:	Variable	Answer
What is the method used more often by this establishment to collect and analyze information from customers? [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE <b>b11a</b> VARIABLES]	<b>b11b</b>	1= Face-to-face chat 2 = Online chat (e.g. Whatsapp or Internet) 3 = Structured customer surveys by phone, face-to-face, online, or focus groups 4 = Customer Relationship Management software (CRM) or other equivalent specialized software

		5 = Big data Analytics or Machine learning algorithms (Artificial Intelligence) with Big Data 6 = Other -9 = Don't know
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Question	Variable	Answer
For how many years has this establishment been using a specialized software to analyze customer information? [CONDITION: ASK THIS QUESTION ONLY IF <b>b11a4=1 OR b11a5= 1</b> ]	<b>b11c</b>	(Number of years) 1 = If less than a year -9 = Don't know

**B.12 Fabrication [MANUFACTURING ONLY]**

[CONDITION: ASK B.12 QUESTIONS ONLY IF **a5a =3 OR a5a =4 OR a5a =5 OR a5a =6 OR a5a =11**]

Question: Does this establishemnt use any of the following processes for assembling and production? SHOW CARDS 10	Variable	Answer	
Manual processes	<b>b12a1</b>	1 = Yes 2 = No	-9 = Don't know
Machines controlled by operators without computers	<b>b12a2</b>	1 = Yes 2 = No	-9 = Don't know
Computer numerical controlled machine or other machines controlled by computers	<b>b12a3</b>	1 = Yes 2 = No	-9 = Don't know
Robots	<b>b12a4</b>	1 = Yes 2 = No	-9 = Don't know
Additive manufacturing including rapid prototyping and 3D printers	<b>b12a5</b>	1 = Yes 2 = No	-9 = Don't know
Other advanced manufacturing processes (e.g. as laser, plasma sputtering, high speed machine, E-beam, micromachining)	<b>b12a6</b>	1 = Yes 2 = No	-9 = Don't know
Other	<b>b12a7</b>	1 = Yes 2 = No	-9 = Don't know

Question:	Variable	Answer
What is the assembling and production process used more often by this establishment? [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE <b>b12a</b> VARIABLES]	<b>b12b</b>	1 = Manual processes 2 = Machines controlled by operators without computers 3 = Computer numerical controlled machine or other machines controlled by computers 4 = Robot(s) 5 = Additive manufacturing/3D printers 6 = Other advanced manufacturing

		7 = Other -9 = Don't know
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Question	Variable	Answer
For how many years has this establishment been using computer numerical controlled machine, robots, 3D printers, or other advanced manufacturing? [CONDITION: ASK THIS QUESTION ONLY IF b12a3=1 OR b12a4=1 OR b12a5=1 OR b12a6=1]	<b>b12c</b>	(Number of years) 1 = If less than a year -9 = Don't know

### B.13 Sales methods

Question:	Variable	Answer	
Does this establishment sell some or all of its products directly to final consumers?	<b>b13a</b>	1 = Yes 2 = No	-9 = Don't know

Question: Does this establishment use any of the following sale methods?	Variable	Answer	
Sales at the establishment's premises	<b>b13b1</b>	1 = Yes 2 = No	-9 = Don't know
Sales by phone, email orders, or sales representatives	<b>b13b2</b>	1 = Yes 2 = No	-9 = Don't know
Sales through social media platforms or apps	<b>b13b3</b>	1 = Yes 2 = No	-9 = Don't know
Online sales using external digital platforms (ex. Amazon, eBay, Alibaba)	<b>b13b4</b>	1 = Yes 2 = No	-9 = Don't know
Online sales (e-commerce) using its own website	<b>b13b5</b>	1 = Yes 2 = No	-9 = Don't know
Electronic orders integrated to specialized supply chain management systems	<b>b13b6</b>	1 = Yes 2 = No	-9 = Don't know
Other	<b>b13b7</b>	1 = Yes 2 = No	-9 = Don't know

Question:	Variable	Answer	
What is the sale method used more often by this establishment? [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE b13b VARIABLES]	<b>b13c</b>	1 = Direct sales at the establishment's premises 2 = Direct sales by phone, email orders, or sales representatives 3 = Sales through social media platforms or apps 4 = On line sales using external digital platforms 5 = On line sales using using its own website 6 = Electronic orders 7 = Other -9 = Don't know	

Question	Variable	Answer
For how many years has this establishment been using online sales or electronic orders? [CONDITION: ASK THIS QUESTION ONLY IF <b>b13b4=1</b> <b>OR b13b5=1 OR b13b6=1</b> ]	<b>b13d</b>	(Number of years) 1 = If less than a year -9 = Don't know

Question:	Variable	Answer
What was the share of online sales in total sales in 2019? [CONDITION: ASK THIS QUESTION ONLY IF <b>b13b4=1 OR b13b5=1 OR b13b6=1</b> ]	<b>b13e</b>	(Share) -9 = Don't know
What was the share of online sales in total sales in 2020? [CONDITION: ASK THIS QUESTION ONLY IF <b>b13b4=1 OR b13b5=1 OR b13b6=1</b> ]	<b>b13e2</b>	(Share) -9 = Don't know

#### B.14 Payment methods

Question: Does this establishment use any of the following payment methods? SHOW CARDS 12	Variable	Answer	
Exchange of goods	<b>b14a1</b>	1 = Yes 2 = No	-9 = Don't know
Cash	<b>b14a2</b>	1 = Yes 2 = No	-9 = Don't know
Cheque, voucher, or bank wire at the branch	<b>b14a3</b>	1 = Yes 2 = No	-9 = Don't know
Prepaid card, Debit card, or Credit card	<b>b14a4</b>	1 = Yes 2 = No	-9 = Don't know
Online or electronic payment through a bank wire	<b>b14a5</b>	1 = Yes 2 = No	-9 = Don't know
Online payment through platform (including mobile money, mobile wallet, PayPal or similar App-based payment service)	<b>b14a6</b>	1 = Yes 2 = No	-9 = Don't know
Virtual or Cryptocurrency (e.g. Bitcoin, Ether, or others)	<b>b14a7</b>	1 = Yes 2 = No	-9 = Don't know
Other	<b>b14a8</b>	1 = Yes 2 = No	-9 = Don't know

**"INTERVIEWER: <DO NOT READ> When in doubt please explain that the question is about how the clients can pay. "**

Question:	Variable	Answer
What is the payment method used more often by this establishment?	<b>b14b</b>	1 = Exchange of goods 2 = Cash 3 = Cheque, voucher, or bank wire at the branch 4 = Prepaid card, Debit card, or Credit card

[CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE <b>b14a</b> VARIABLES]	5 = Online or electronic payment through a bank wire 6 = Online payment through platform 7 = Virtual or Cryptocurrency 8 = Other -9 = Don't know
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**"INTERVIEWER: <DO NOT READ> When in doubt please explain that the question is about how the clients can pay. "**

Question	Variable	Answer
For how many years has this establishment been using online or electronic payment methods? [CONDITION: ASK THIS QUESTION ONLY IF <b>b14a5=1 OR b14a6=1 or b14a7=1</b> ]	<b>b14c</b>	(Number of years) 1 = If less than a year -9 = Don't know

### B.15 Quality control inspection

Question: Does this establishment use any of the following quality control inspection methods? SHOW CARDS 13	Variable	Answer	
Manual, visual, or written processes	<b>b15a1</b>	1 = Yes 2 = No	-9 = Don't know
Human inspection with the support of computers or phones	<b>b15a2</b>	1 = Yes 2 = No	-9 = Don't know
Statistical process control with software monitoring and data management	<b>b15a3</b>	1 = Yes 2 = No	-9 = Don't know
Automated systems for inspection such as laser-based, sensor-based, voice-control	<b>b15a4</b>	1 = Yes 2 = No	-9 = Don't know
Other	<b>b15a5</b>	1 = Yes 2 = No	-9 = Don't know

**"INTERVIEWER: <NO NOT READ> Quality refers to quality of products, services and processes."**

Question:	Variable	Answer
What is the quality control method used more often by this establishment?  [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE <b>b15a</b> VARIABLES]	<b>b15b</b>	1 = Manual, visual, or written processes 2 = Human inspection with the support of computers or phones 3 = Statistical process control 4 = Automated systems for inspection 5 = Other -9 = Don't know

**"INTERVIEWER: <NO NOT READ> Quality refers to quality of products, services and processes."**

Question	Variable	Answer
For how many years has this establishment been using statistical process control with software monitoring and data management or automated systems for inspection as a quality control method?  [CONDITION: ASK THIS QUESTION ONLY IF <b>b15a4=1</b> OR <b>b15a5=1</b> ]	<b>b15c</b>	(Number of years) 1= If less than a year -9 = Don't know

## B.16 Green Business Function

### B.16A Energy efficiency

Are the premises of this establishment LEED certified?	<b>b16a</b>	1 = Yes 2 = No	-9 = Don't know
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Question: Does this establishment use any of the following energy efficiency methods?	Variable	Answer	
Energy Star/efficient rated equipment, computers and appliances	<b>b16a1</b>	1 = Yes 2 = No	-9 = Don't know
Energy efficient lighting (LED/CFL lamps in lieu of incandescent)	<b>b16a2</b>	1 = Yes 2 = No	-9 = Don't know
VAV (variable air volume) HVAC systems	<b>b16a3</b>	1 = Yes 2 = No	-9 = Don't know
Programmable thermostats, timers, robots, motion sensors	<b>b16a4</b>	1 = Yes 2 = No	-9 = Don't know
IoT enabled system to control premises temperatures, lighting system and/or refrigeration units	<b>b16a5</b>	1 = Yes 2 = No	-9 = Don't know

### B.16B Water/chemicals management

Does this establishment treat wastewater from production? [SKIP: Go to section C if <b>b16b=2</b> ]	<b>b16b</b>	1 = Yes 2 = No	-9 = Don't know
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Question: What type of wastewater treatment does this establishment implement?	Variable	Answer	
Primary treatment through sedimentation tanks to remove settleable solids, and/or scrape fats and oils.	<b>b16b1</b>	1 = Yes 2 = No	-9 = Don't know
Secondary treatment methods to remove organic contaminants: such as bioreactors/ aerobic bacteria additives, filter	<b>b16b2</b>	1 = Yes 2 = No	-9 = Don't know

beds, aerated ponds, activated sludge or rotating biological contactors			
Tertiary treatment methods disinfecting water and treating wastewater for public water systems, including UV disinfection or chemical disinfection	<b>b16b3</b>	1 = Yes 2 = No	-9 = Don't know

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**C. SECTOR SPECIFIC TECHNOLOGIES**

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**READ THE FOLLOWING TO THE RESPONDENT BEFORE PROCEEDING:**

**Now, we turn to questions about methods and procedures to perform sector specific business functions**

ADD SECTOR SPECIFIC QUESTIONNAIRE – SEPARATED DOCUMENT

INTERVIEWER: ASK THESE QUESTIONS ONLY FOR FIRMS THAT BELONG TO THE SECTORS FOR WHICH SECTOR SPECIFIC QUESTIONS ARE AVAILABLE.

IF THE FIRM DO NOT BELONG TO THOSE, SKIP THIS SECTION AND GO TO SECTION D.

Agriculture (except Livestock)	C1
Livestock	C2
Food Processing	C3
Wearing apparel	C4
Motor vehicles	C5
Pharmaceuticals	C6
Wholesale or retail	C7
Financial services	C8
Land transport	C9
Health services	C10
Leather goods	C11
Accommodation	C12

## D. DRIVERS OF TECHNOLOGY ADOPTION

INTERVIEWER: The next questions aim to understand the main drivers of technology adoption.

### D.1 Acquisition of machines, equipments, and software

Question: Over the years [2019, 2020, and 2021], did this establishment:	Answer
Purchase or lease new or second-hand equipment or machines?	<p><b>d1a</b></p> <p>1 = Yes, new            2 = Yes, second hand            3 = Yes, both (new and second hand)            4 = No            -9 = Don't know</p>
Purchase or lease licence for software?	<p><b>d1b</b></p> <p>1 = Yes            2 = No            -9 = Don't know</p>

### D.2 Awareness and information

<p>What was the source of information more often used by this establishment to make decisions about the acquisition of new machines, equipments, or software?</p> <p>SHOW CARDS 15</p>	<p><b>d2a</b></p> <p>1 = Other firms            4 = Industrial or trade associations            5 = Public technology extension services            6 = Private consultants            7 = Fairs, events, and missions            8 = Other            -9 = Don't know</p>
Over the years [2019, 2020, and 2021], did this establishment have business, as a supplier or a buyer, with a multinational firm?	<p><b>d2d</b></p> <p>1 = Yes            2 = No            -9 = Don't know</p>
Does the CEO or top manager of this establishment have previous experience working in a multinational or a national firm with more than 50 employees in the same sector?	<p><b>d2e</b></p> <p>1 = Yes            2 = No            -9 = Don't know</p>

### D.3 Access to finance

Over the years [2019, 2020, and 2021], has this establishment got a loan for purchasing machines, equipment, or licensing software or processes?	<p><b>d3a</b></p> <p>1 = Yes            2 = No            -9 = Don't know</p>
Over the years [2019, 2020, and 2021], how many times this establishment needed to borrow money to expand production, but could not get it?	<p><b>d3c</b></p> <p>Number of times</p>

#### D.4 Management

Question	Answers
Does this establishment provide formal incentives for workers in the form of money, gift, or recognition to suggest and/or use better ways to produce goods or provide services?	<b>d4a</b> 1 = Yes 2 = No -9 = Don't know
In the year [2020], how many key performance indicators were monitored at this establishment? Examples: Metrics on production, cost, waste, quality, inventory, energy, absenteeism and deliveries on time (mark one option):	<b>d4b</b> 1 = 1-2 key performance indicators 2 = 3-9 key performance indicators 3 = 10 or more key performance indicators 4 = No key performance indicators

#### D.6 Trade barriers and uncertainty of demand

Question	Answers
Over the years [2019, 2020, and 2021], did this establishment export?	<b>d6a</b> 1 = Yes 2 = No -9 = Don't know
In the year 2021, what percentage of this establishment's sales were direct exports? <b>[CONDITION: ASK THIS QUESTION ONLY IF d6a=1]</b>	<b>d6b</b> (Percent)
Over the years [2019, 2020, and 2021], has this establishment imported material inputs, machines, or equipment directly?	<b>d6c</b> 1 = Yes 2 = No -9 = Don't know

#### D.7 Government support

Are you aware of any government support program or subsidy in relation to the adoption of a new machines, equipment or software that could benefit this establishment?	<b>d7a</b> 1= Yes 2= No -9 = Don't know
Over the years [2019, 2020, and 2021], has this establishment benefited from any government support program or subsidy in relation to the adoption of a new machine, equipment, or software?	<b>d7b</b> 1 = Yes 2 = No -9 = Don't know
Which kind of government support in the adoption of a new technology has this establishment received? <b>[CONDITION: ASK ONLY IF d7b=1]</b> SHOW CARD 21	<b>d7c</b> 1 = Information 2 = Technical assistance 3 = Tax incentive 4 = Grant 5 = Loan 6 = Other

### D.8 Obstacles and Drivers - ranking

<p>Please select the most important obstacle faced by this establishment to adopt new equipment, machine, software, or process?</p> <p>SHOW CARDS 22</p>	<p style="text-align: center;"><b>d8a</b></p> <p>1 = Lack of information, knowledge, or technical capacity                  2 = Lack or uncertainty of demand                  3 = Cost                  4 = Lack of finance                  5 = Government regulations                  6 = Lack of infrastrucutre                  7 = Other                  8 = No obstacles or need to adopt                  -9 = Don't know                  -7 = not applicable</p>
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<p>Please select the most important reason for the acquisition of new equipment, machine, or software by this establishment?</p> <p>SHOW CARDS 23</p>	<p style="text-align: center;"><b>d8d</b></p> <p>1 = Depreciation or replacement                  2 = Competition                  3 = Other firms adopted                  4 = Produce new products                  5 = Access new markets                  6 = Reduce costs                  7 = Adjust to regulations                  8 = Other                  -9 = Don't know                  -7 = not applicable</p>
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### D.9 Green management Practices

Question: Which of the following environmental and sustainability management practices are used by this establishment?	Variable	Answer	
ISO 14001 (or at least in one of the ISO 14000 family) certified.	<b>d9a</b>	1 = Yes 2 = No	-9 = Don't know
ISO 50001 certified.	<b>d9b</b>	1 = Yes 2 = No	-9 = Don't know
Periodically audited for compliance with environmental regulatory requirements by a third party.	<b>d9c</b>	1 = Yes 2 = No	-9 = Don't know
Formally evaluates contractors and suppliers' environmental compliance.	<b>d9d</b>	1 = Yes 2 = No	-9 = Don't know
Participates in any form of carbon-trading, tracking, purchasing and/or selling carbon offset credits.	<b>d9e</b>	1 = Yes 2 = No	-9 = Don't know
Monitors CO2 and/or CO emissions explicitly at least annually.	<b>d9f</b>	1 = Yes 2 = No	-9 = Don't know

## E. LABOR, BALANCE SHEET AND PERFORMANCE

### LABOR

**READ THE FOLLOWING TO THE RESPONDENT BEFORE PROCEEDING:**

Now I would like to ask you a few questions about this establishment's labor force and performance

**E.1** How many paid workers (full-time and part-time) does this establishment have currently, by the end of 2020, and by the end of 2018? Please include all employees and managers. **(INTERVIEWER: INCLUDE INTERVIEWEE IF APPLICABLE).**

	Number
Total number of workers currently?	e1a
Total number of workers by the end of the year [2020]	e1
Total number of workers by the end of the year [2018]	e2
<b>DON'T KNOW (SPONTANEOUS)</b>	-9

What was the total share of female workers by the end of the year [2020]?	<b>e1f</b> (share) -9 = Don't know
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**E.3** At the end of the year [2020], how many individuals were working in this establishment according to their main occupation?

**(INTERVIEWER: READ EACH CATEGORY)**

Professionals are highly skilled workers with university degree working on their field, such as science and engineering, architecture, finance, IT, and law.

Technicians are skilled workers with technical training working on their field associated with professionals, such as science and engineering or financial technicians.

Other production employees are workers directly involved in the production process, excluding professionals and technicians.

	Number	DON'T KNOW
CEOs and Managers	e3a	-9
Clerical support workers [e.g. administrative support]	e3d	-9
Production workers (directly involved in the production process)	e3e	-9
Service or sales workers	e3f	-9

How many workers are exclusively dedicated to Research and Development activities in this establishment? <b>[CONDITION: ASK ONLY IF e3g=1]</b>	<b>e3h</b> Numbers -9 = Don't know
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**E.5** What is the percentage of workers who completed the following degrees as maximum level of schooling achievement?

	Share (%)	DON'T KNOW
Completed secondary school (about 12 years of education)	e5b	-9
Vocational training (about 12 years of education)	e5c	-9
Completed college degree or more (15+ years of education)	e5d	-9

**BALANCE SHEET**

**READ THE FOLLOWING TO THE RESPONDENT BEFORE PROCEEDING:**

Now, we would like to ask you a few questions about the financial results of this establishment. It is important that this information be as accurate as possible. The individual data are treated as confidential. The identity of this establishment will not be revealed at any point.

**E.6** What were this establishment's total annual sales for **ALL** products and services?

	LCUs
Complete year [2021] total sales	e6a
Complete year [2019] total sales [CONDITION: ASK ONLY IF e2>0]	e6b
<b>DON'T KNOW (SPONTANEOUS)</b>	-9

**E.7** From this establishment's Income Statement or book records for the year [2020], please provide the following information:

	LCU	DON'T KNOW
Total annual cost of labor including wages, salaries, bonuses, social security payments	e7a	-9
Total annual cost of raw materials and intermediate goods used in production or materials purchased to resell	e7b	-9
Total annual cost of electricity	e7c	-9
Total annual cost of natural gas [CONDITION: ASK ONLY IF b2d1=1]	e7c1	-9
Total annual cost of fuel oils [CONDITION: ASK ONLY IF b2d2=1]	e7c2	-9
Total annual cost of Liquefied Petroleum Gases (LPG) [CONDITION: ASK ONLY IF b2d3=1]	e7c3	-9
Total annual cost of Coal or Wood fuels (wood, charcoal, others) [CONDITION: ASK ONLY IF b2d4=1]	e7c4	-9
Total annual cost of own renewable sources used in your production [CONDITION: ASK ONLY IF b2d5=1]	e7c5	-9
<b>TOTAL COST OF OF PRODUCTION SHOULD INCLUDE ALL ABOVE COSTS AND OTHER COSTS NOT LISTED ABOVE</b>		

Total cost of production or service operations (it also includes costs of marketing, distribution, and others not listed above)	<b>e7d</b>	<b>-9</b>
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During the year 2020, what was the total quantity of electricity purchased and delivered to this establishment, regardless of when payment was made.	<b>e7e</b> <hr/> <b>(Kwh)</b>
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<b>E.8</b>	Hypothetically, if this establishment were to purchase all the machinery, vehicles, equipment, and buildings it <b>uses now</b> , in their current condition and regardless of whether the establishment owns them or not, how much would they cost, independently of whether they are owned, rented or leased?
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	<b>LCUs</b>	<b>DON'T KNOW</b>
Machinery, vehicles, and equipment	<b>e8a</b>	<b>-9</b>
Buildings	<b>e8b</b>	<b>-9</b>
Power plant for renewable sources <b>[CONDITION: ASK ONLY IF b2d5=1]</b>	<b>e8c</b>	<b>-9</b>

<b>E.9</b>	What is the total expenditure on R&D (external and internal) by this establishment in 2020?
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	<b>LCUs</b>	<b>DON'T KNOW</b>
Total expenditure on R&D	<b>e9rd</b>	<b>-9</b>

<b>E.10</b>	Currently, with respect to the main product produced by this establishment?
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	<b>% (share)</b>	<b>DON'T KNOW</b>
What is the share in total sales?	<b>e10a</b>	<b>-9</b>
What is the average markup (the percentage over total costs to derive the final price)?	<b>e10b</b>	<b>-9</b>

**CONTROL QUESTIONS**

**INTERVIEWER READ AT THE END OF THE INTERVIEW:**

The survey ends here. I would like to gather a few final details. Thank you for your time and cooperation.

**A.10 Please indicate which option best describes the main respondents position:**

Owner	1
President, Executive Director, or CEO	2
Chief Financial, Chief Operational Officer	3
Operational or plant manager	4
Sales or marketing manager	5
Accountant	6
Lawyer	7
Other Administrative	8
Other Management	9
Other (Specify) - <b>a10b</b>	10

**a10a**

**A.12 The responses to the questions regarding figures (productivity and employment numbers)**

Taken directly from establishment records	1
Estimates computed with some precision	2
Arbitrary and unreliable numbers	3
In some case taken from books and in some case	4

**a12**

**INTERVIEWER COMMENTS: (IF DONE BY PHONE)**

**a13**

(Problems occurred/extraordinary circumstances which could influence results)

**A.14 This questionnaire was completed in:**

One call interview with one person	1
One call interview with different managers/staff	2
Several calls	3

**STOP HERE**

**a14**