

# Firm-level Adoption of Technology

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 **Georgia**. 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

**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:**

Day (dd)	Month (mm)	Year (yyyy)	Hour (00 to 23)	Minutes (00 to 59)
<b>a1a</b>	<b>a1b</b>	<b>a1c</b>	<b>a1d</b>	<b>a1e</b>

**A.2 SCREENER**

<b>A5</b>	<p>Over the year [2021], please describe the type of product or service represents this establishment's greatest share of annual sales?</p> <p style="color: blue;">INTERVIEWER: PLEASE RECORD THE DESCRIPTION OF THE ACTIVITY AND PRODUCT IN DETAIL, FOR EXAMPLE, "RETAIL SALE OF WOMEN'S OUTDOOR CLOTHING" NOT JUST "CLOTHING".</p>
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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 ?
			<p style="color: red;">IF <b>a5c IS DIFFERENT FROM s6b, PLEASE DOUBLE CHECK THE INFORMATION.</b></p> <p style="color: red;">CONDITION: <b>IF a5c=0 SKIP SECTION C.</b></p>
Agriculture (except	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	102		0
<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).		

Yes	1	<i>IF S.4=2, GO TO S.5</i>
No	2	
		<b>s4</b>

**S.4a** How many establishments are part of the firm?

Number of establishments	<b>s4a</b>
<b>DON'T KNOW (SPONTANEOUS)</b>	<b>-9</b>

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

**S.4b** Is this establishment the headquarters location?

Yes	1	<i>IF S.4b=2, GO TO S.4f</i>
No	2	
		<b>s4b</b>

**S.4c** Are the financial statements of the headquarters location separate from the rest of the other establishments?

Yes	1	<b>s4c</b>
No	2	

**S.4d** Does this headquarters location engage in production or sales at this location?

Yes	1	<i>IF S.4d=1, GO TO S.5</i>
No	2	
		<b>s4d</b>

CHECK IF SAMPLING FRAME IS ESTABLISHMENT WITH GEOSTAT

PLEASE ADD A REQUEST TO THE RESPONDENT PROVIDE THE INFORMATION ON THE ESTABLISHMENT FOR THE INTERVIEW.

**S.4e** **INTERVIEW THE ESTABLISHMENT THAT REPRESENTS THE LARGEST SHARE OF PRODUCTION OR SALES, WHICH ALSO MAINTAINS ITS OWN SALES, EMPLOYMENT, AND COST RECORDS.**

Address and name of the establishment	<b>s4e1</b>	Code according to regional strata <b>s4e2</b>
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**GO TO S.5**

S.4f		Are this establishment's financial 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**

S.7a	Does this establishment have more than 4 workers?
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Number of workers
<b>CONDITION: IF NO, TERMINATE.</b>

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

**1=Yes**  
**2=No**  
**s7**

**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	Share	DON'T KNOW (SPONTANEOUS)
Private foreign individuals, companies or organizations	a3b%	-9
Government or state	a3c%	-9

Condition: The sum of a3b + a3c should be below or equal to 100%.

Question	Variable	Answer
Is this firm owned by the founder or someone of her/his family?	a4b	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?	a4e	1 = Yes 2 = No -9 = Don't know

**ONLY IF s4=1 (yes)**

**The following questions apply to this establishment only.**

Question	Variable	Answer
In what year did this establishment begin operations?	a6	(year) 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?	a7a	(Number of years) 1 = If less than a year -9 = Don't know
Is the Top Manager female?	a7b	1 = Yes 2 = No -9 = Don't know
What is the highest level of education of the Top Manager? SHOW CARD 2	a7c	1 = Primary school 2 = Secondary school 3 = Complete high-school 4 = Bachelor 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

In a typical month, over the year [2021], 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
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#### B.2 Use of generators

Over the year [2021], did this establishment own or share a generator? [SKIP: IF <b>b2a=2</b> OR <b>b2a=-9</b> , GO TO <b>b4a</b> ]	<b>b2a</b> 1 = Yes 2 = No -9 = Don't know
What is the main source of energy used by this establishment owned or shared generator?  SHOW CARDS 3	<b>b2c</b> 1 = Solar power 2 = Fuel 3 = Grid or Battery-stored backup 4 = Wind power 5 = Other

Does this establishment use any of the following sources of energy in 2021?	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 2021 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.3 Mobile phone coverage

How many mobile phone lines does this establishment use for business purpose? INTERVIEWER: IT INCLUDES OWNED DEVICES AND COVERAGE PLANS PAID TO EMPLOYEES	<b>b3b</b> (number of cell phone lines) -9 = Don't know
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### B.4 Computers use

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 of 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
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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  2 = Computers with standard software such as Excel or equivalent  3 = Mobile Apps or digital platforms  4 = Specialized software for production planning and demand forecast  5 = Enterprise Resource Planning (ERP) integrated with other administrative functions  6 = Other  -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
<p>What is the procedure used more often by this establishment to select and manage suppliers and purchase materials and services?</p> <p>[CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE <b>b10a</b> VARIABLES]</p> <p>SHOW CARDS 8</p>	<b>b10a</b>	<p>1 = Manual search of suppliers, including personal visit or phone calls.</p> <p>2= Management of supply chain information using PCs, manually updated (e.g. Microsoft Excel)</p> <p>3 = Online social media, specialized Apps or digital platforms</p> <p>4 = Supplier Relation Management (SRM) specialized software not integrated with production planning</p> <p>5 = Supplier Relation Management (SRM) specialized software integrated with production planning</p> <p>6 = Other</p> <p>-9 = Don't know</p>

Question	Variable	Answer
<p>For how many years has this establishment been using SRM for supply chain management?</p> <p>[CONDITION: ASK ONLY IF <b>b10a4=1</b> OR <b>b10a5=1</b>]</p>	<b>b10c</b>	<p>(Number of years)</p> <p>1= If less than a year</p> <p>-9 = Don't know</p>

### 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

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</b> OR <b>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 establishment 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

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 <b>b12a3=1 OR b12a4=1 OR b12a5=1 OR b12a6=1</b> ]	<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, MY.GE, Vendoo.ge))	<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 <b>b13b</b> 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 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 2020? [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 2021? [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 -9 = Don't know

		2 = No	
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?  [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE <b>b14a</b> VARIABLES]	<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 5 = Online or electronic payment through a bank wire 6 = Online payment through platform 7 = Virtual or Cryptocurrency 8 = Other -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
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: <DO 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: <DO 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

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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: READ OUT	Answer
Purchase or lease new or second-hand equipment or machines?	<b>d1a</b> 1 = Yes, new 2 = Yes, second hand 3 = Yes, both (new and second hand) 4 = No -9 = Don't know
Purchase or lease licence for software?	<b>d1b</b> 1 = Yes 2 = No -9 = Don't know

### D.2 Awareness and information

What was the source of information more often used by this establishment to make decisions about the acquisition of new machines, equipments, or software?  SHOW CARDS 15	<b>d2a</b> 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
Over the years [2019, 2020, and 2021], did this establishment have business, as a supplier or a buyer, with a multinational firm?	<b>d2d</b> 1 = Yes 2 = No -9 = Don't know
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?	<b>d2e</b> 1 = Yes 2 = No -9 = Don't know

### 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?	<b>d3a</b> 1 = Yes 2 = No -9 = Don't know
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Over the years [2019, 2020, and 2021], how many times this establishment needed to borrow money to expand production, but could not get it?	<b>d3c</b> Number of times
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#### 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 [2021], 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>	<b>d7c</b> 1 = Information 2 = Technical assistance 3 = Tax incentive 4 = Grant

SHOW CARD 21	5 = Loan 6 = Other
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### D.8 Obstacles and Drivers - ranking

Please select three of the major obstacles faced by this establishment to adopt new equipment, machine, software, or process?  SHOW CARDS 22  <b>CONDITION: SAME OPTION CANNOT BE REPEATED ACROSS VARIABLES</b>	<b>d8a</b> 1 <sup>st</sup> obstacle	<b>d8b</b> 2 <sup>nd</sup> obstacle	<b>d8c</b> 3 <sup>rd</sup> obstacle
	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 infrastructure 7 = Other 8 = No obstacles or need to adopt -9 = Don't know -7 = not applicable		

Please select three of the major reasons for the acquisition of new equipment, machine, or software by this establishment?  SHOW CARDS 23  <b>CONDITION: SAME OPTION CANNOT BE REPEATED ACROSS VARIABLES</b>	<b>d8d</b> 1 <sup>st</sup> reason	<b>d8e</b> 2 <sup>nd</sup> reason	<b>d8f</b> 3 <sup>rd</sup> reason
	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		

### D.9 Green management Practices

Question: Which of the following practices related with environment are used by this establishment?	Variable	Answer	
Certified under the ISO 14000 family of environmental management standards	<b>d9a</b>	1 = Yes 2 = No	-9 = Don't know
Monitors emissions of CO <sub>2</sub> yearly or more frequently	<b>d9e</b>	1 = Yes 2 = No	-9 = Don't know

## E. LABOR, BALANCE SHEET AND PERFORMANCE

<b>A.2</b>	On which calendar date did the last completed fiscal year end?
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<b>Year</b>	<b>Month</b>	<b>Day</b>
<b>a2a</b>	<b>a2b</b>	<b>a2c</b>

### 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

<b>E.1</b>	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. <b>(INTERVIEWER: INCLUDE INTERVIEWEE IF APPLICABLE).</b>
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	<b>Number</b>
Total number of workers currently?	<b>e1a</b>
Total number of workers by the end of the year [2021]	<b>e1</b>
Total number of workers by the end of the year [2019]	<b>e2</b>
<b>DON'T KNOW (SPONTANEOUS)</b>	<b>-9</b>

<b>E.4</b>	How many individuals were working in this establishment according to their main occupation, by the end of 2020, and by the end of 2018? <b>(INTERVIEWER: READ EACH CATEGORY)</b>
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	<b>Number 2020</b>	<b>Number 2018</b>	<b>DON'T KNOW</b>
CEO Managers, Professionals, and Technicians	<b>e3a</b>	<b>e4a</b>	<b>-9</b>
Clerical support workers and sales workers	<b>e3d</b>	<b>e4d</b>	<b>-9</b>
Production workers (directly involved in the production process)	<b>e3e</b>	<b>e4e</b>	<b>-9</b>
Service workers	<b>e3f</b>	<b>e4f</b>	<b>-9</b>

<b>E.5</b>	What is the percentage of workers who completed the following degrees as maximum level of schooling achievement?
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	<b>Share (%)</b>	<b>DON'T KNOW</b>
Completed secondary school (about 12 years of education)	<b>e5b</b>	<b>-9</b>
Vocational training (about 12 years of education)	<b>e5c</b>	<b>-9</b>
Completed college degree or more (15+ years of education)	<b>e5d</b>	<b>-9</b>

How many engineers, scientific professionals, and Research and Development workers does this establishment have?	<b>e3h</b> Numbers -9 = Don't know
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### 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?

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

**E.7** From this establishment's Income Statement or book records for the year [2021], please provide the following information:

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

During the year 2021, what was the total quantity of electricity purchased and delivered to this establishment, regardless of when payment was made.	<b>b7e</b> <hr/> <b>(Kwh)</b>
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**E.8** Hypothetically, if this establishment were to purchase all the machinery, vehicles, equipment, and buildings it **uses now**, 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?

	LCUs	DON'T KNOW
Machinery, vehicles, and equipment	e8a	-9
Buildings	e8b	-9
Power plant for renewable sources [CONDITION: ASK ONLY IF b2d5=1]	e8c	-9

**E.9** What is the total expenditure on R&D (external and internal) by this establishment in 2021?

	LCUs	DON'T KNOW
Total expenditure on R&D	e9rd	-9

**E.10** Currently, with respect to the main product produced by this establishment?

	% (share)	DON'T KNOW
What is the share in total sales?	e10a	-9
What is the average markup (the percentage over total costs to derive the final price)?	e10b	-9

**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 (CFO/COO)	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.11 Please complete the following information about the interviewee(s)

	<b>Years with the establishment</b>	<b>Gender</b>	<b>Email</b>
<b>Main respondent</b>	<b>a11a</b>	<b>a11b</b>	<b>a11c</b>

DROP FOR ONLINE

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

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 estimates	4

**a12**

**A.15 If option 2 or 3 in A.14, estimate duration of the whole interview**

<b>Hour</b>	<b>Minutes</b>

**a15h**

**a15m**

SUPERVISOR SECTION

A.14 Supervisor code

a16

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**INFORMATION BASED ON LOCATION OF INTERVIEW (s2d). ENSURE s2d IS THE NAME OF AN OFFICIAL LOCALITY AND NOT A NEIGHBORHOOD**

Is this city the official tal city?	a3b	Is this city the main business city?	a3c	Size of locality	a3
Yes	1	Yes	1	City with population over 1 million	2
No	2	No	2	Over 250.000 to 1	3
				50.000 to 250.000	4
				Less than 50.000	5

SUPERVISOR: THE DESCRIPTION OF THE ESTABLISHMENT'S MAIN PRODUCT AND ACTIVITY IS PROVIDED IN c1b. PLEASE REVIEW c1b IN ORDER TO IDENTIFY THE CORRESPONDING SECTOR CODE IN c1d

C.1d

**PLEASE CHOOSE THE 4-DIGIT ISIC REV. 4 SECTOR CODE THAT BEST APPLIES TO THE ESTABLISHMENT'S MAIN ACTIVITY AND PRODUCT.**

	Code
<b>CODE OF THE MAIN PRODUCT AND ACTIVITY</b>	<b>a17</b>