

Technology Sophistication Across Establishments

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Identification

SURVEY ID NUMBER

WLD_2019-2023_FAT_v01_M

TITLE

Technology Sophistication Across Establishments

ABBREVIATION OR ACRONYM

FAT QJE 2026

COUNTRY

Name
Bangladesh
Brazil
Burkina Faso
Cambodia
Chile
Croatia
Ethiopia
Georgia
Ghana
India
Kenya
Korea, Rep.
Poland
Senegal
Vietnam

STUDY TYPE

Enterprise Survey [en/oth]

SERIES INFORMATION

The Firm-level Adoption of Technology (FAT) Survey was conducted by the World Bank in 15 countries: Bangladesh; Brazil (Ceará, Paraná, and São Paulo); Burkina Faso; Cambodia; Chile; Croatia; Ethiopia; Georgia; Ghana; India (Uttar Pradesh, Tamil Nadu, Gujarat, and Maharashtra); Kenya; Poland; Senegal; South Korea; and Vietnam. This dataset contains data for all countries. The individual country level datasets are also available for download from the Microdata Library.

ABSTRACT

This dataset includes Firm-level Adoption of Technology (FAT) survey microdata used in the Technology Sophistication Across Establishments paper by Cirera, Comin, and Cruz (Forthcoming). It combines primary establishment-level data collected by the World Bank in 15 countries: Bangladesh; Brazil (Ceará, Paraná, and São Paulo); Burkina Faso; Cambodia; Chile; Croatia; Ethiopia; Georgia; Ghana; India (Uttar Pradesh, Tamil Nadu, Gujarat, and Maharashtra); Kenya; Poland; Senegal; South Korea; and Vietnam. Data implementation was conducted by the World Bank in collaboration with National Statistical Offices (NSOs) and official agencies in various countries. Brazil refers to the states of Ceará, Paraná, and São Paulo. India refers to the states of Tamil Nadu, Uttar Pradesh, Gujarat, and Maharashtra.

The paper studies technology sophistication using a novel approach that measures the sophistication of the most advanced (MAX) and the most widely used (MOST) technologies in each of the key business functions within establishments. Using data from over 21,000 establishments across 15 countries, we find that establishments generally underutilize the most sophisticated technologies available within a business function. These MAX-MOST gaps are persistent and strongly

associated with productivity both across establishments and countries. At the establishment level, there is substantial variation in both MAX and MOST, with MOST showing a more skewed distribution. MAX and MOST follow different lifecycle patterns in low-income countries and among small establishments, and they exhibit different associations with several establishment characteristics and performance indicators. This evidence underscores the different nature of the technology upgrading processes that drive MAX and MOST.

The replicability package for the paper is available at: <https://reproducibility.worldbank.org/catalog/463>.

KIND OF DATA

Sample survey data [ssd]

UNIT OF ANALYSIS

Establishments.

Version

VERSION DATE

2026-01-30

VERSION NOTES

Edited, anonymised datasets for public distribution

Coverage

GEOGRAPHIC COVERAGE

Bangladesh; Brazil (Ceará, Paraná, and São Paulo); Burkina Faso; Cambodia; Chile; Croatia; Ethiopia; Georgia; Ghana; India (Uttar Pradesh, Tamil Nadu, Gujarat, and Maharashtra); Kenya; Poland; Senegal; South Korea; and Vietnam. Brazil refers to the states of Ceará, Paraná, and São Paulo. India refers to the states of Tamil Nadu, Uttar Pradesh, Gujarat, and Maharashtra.

Producers and sponsors

PRIMARY INVESTIGATORS

Name	Affiliation
Xavier Cirera	The World Bank
Diego Comin	Dartmouth College
Marcio Cruz	IFC

FUNDING AGENCY/SPONSOR

Name	Abbreviation	Role
The World Bank Group	WBG	Financial Support
World Bank Group Partnership Facility	KWPF	Financial Support
Competitive Industries and Innovation Program	CIIP	Financial Support
InfoDev Multi-Donor Trust Fund	InfoDev	Financial Support

Sampling

SAMPLING PROCEDURE

The sampling frame is based on the most comprehensive and up-to-date establishment-level census data available from the respective National Statistical Office (NSOs) or similar. The samples are nationally representative for formal establishments

with five or more workers. The exceptions are Brazil and India, for which data collection was restricted to the States of Ceará, Paraná, and São Paulo, in Brazil, and Tamil Nadu, Uttar Pradesh, Gujarat, and Maharashtra, in India.

The sample stratifies the universe of establishments by firm size, sector of activity, and geographic regions. The sample is representative across these dimensions.

Section 2 and Appendix A of Cirera, X., Comin, D., & Cruz, M. (Forthcoming) provide detailed information about the sampling frame and sample design.

RESPONSE RATE

Country Response rate

Bangladesh 30%

Brazil 39%

Burkina Faso 45%

Cambodia 16%

Chile 40%

Croatia 15%

Ethiopia 42%

Georgia 86%

Ghana 49%

India 49%

Kenya 77%

Korea* 24%

Poland 47%

Senegal 57%

Vietnam 80%

Average across countries 46%

WEIGHTING

Appendix A4 of Cirera, X., Comin, D., & Cruz, M. (Forthcoming) provides detailed information about the sampling weights.

Data collection

DATES OF DATA COLLECTION

Start	End	Cycle
2019-06-01	2023-12-30	1

DATA COLLECTION MODE

Computer Assisted Personal Interview [capi]

DATA COLLECTION NOTES

The data used in the paper corresponds to the first and second phase of the survey implementation. The surveys were administered between June 2019 and the end of 2023 by the World Bank in partnership with public or private local agencies across ten countries: Bangladesh, Brazil (the state of Ceará), Senegal, and Vietnam in the first phase until January 2020. In the second phase, conducted during the COVID-19 pandemic, after January 2020, it included Brazil (the states of Paraná and São Paulo), Burkina Faso, India (the states of Tamil Nadu and Uttar Pradesh), Georgia, Ghana, Kenya, Poland, and the Republic of Korea. The mode of data collection was primarily face-to-face before the pandemic and mostly via telephone during the pandemic.

questionnaires

QUESTIONNAIRES

The questionnaire is provided for download in English.

data_processing

DATA EDITING

The description of the data processing is provided in the paper, along with the dictionary for each variable included in the dataset.

Additional information for each country will be provided in a complementary document, as part of the "The Firm-level Adoption of Technology (FAT) Survey" project.

data_appraisal

DATA APPRAISAL

Section 2 of Cirera, X., Comin, D., & Cruz, M. (Forthcoming) provides detailed information on several quality checks to validate the survey and the data, including comparability with official business statistics from external sources.

Access policy

CONTACTS

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CONFIDENTIALITY

Publicly available.

CITATION REQUIREMENTS

Use of the dataset must be acknowledged using a citation which would include:

- the Identification of the Primary Investigator
- the title of the survey (including country, acronym and year of implementation)
- the survey reference number
- the source and date of download

In addition to the dataset citation, users of the dataset must also cite the journal publication as follows:

Cirera, X., Comin, D., & Cruz, M. (Forthcoming). Technology Sophistication Across Establishments. The Quarterly Journal of Economics.

ACCESS AUTHORITY

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DISCLAIMER

The user of the data acknowledges that the original collector of the data, the authorized distributor of the data, and the relevant funding agency bear no responsibility for use of the data or for interpretations or inferences based upon such uses.

Metadata production

DDI DOCUMENT ID

DDI_WLD_2019-2023_FAT_v01_M_WB

PRODUCERS

Name	Abbreviation	Affiliation	Role
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Development Data Group	DECDG	World Bank	Documentation of the study
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DATE OF METADATA PRODUCTION
2026-02-19

DDI DOCUMENT VERSION
Version 01

data_dictionary

Data file	Cases	variables
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study_resources