Record Nr. UNINA9910813808403321

Autore Cirera Xavier

Titolo Bridging the technological divide: technology adoption by firms in

developing countries

Pubbl/distr/stampa Piraí:,: World Bank Publications,, 2022

©2022

ISBN 1-4648-1859-2

Edizione [1st ed.]

Descrizione fisica 1 online resource (241 pages)

Altri autori (Persone) CominDiego

CruzMarcio

Disciplina 658.4063

Soggetti Business enterprises - Technological innovations

Technology and state Developing countries

Lingua di pubblicazione Inglese

Formato Materiale a stampa

Livello bibliografico Monografia

Nota di contenuto Front Cover -- Contents -- Foreword -- Preface -- Acknowledgments

-- About the Authors -- Abbreviations -- Introduction -- The

Imperative of Technology in Developing Countries -- The Technological Divide -- Road Map to the Volume -- Contributions to the Literature --Main Messages from the Volume -- Notes -- References -- Part 1 Measuring the Technological Divide -- 1. A New Approach to Measure Technology Adoption by Firms -- Introduction -- Measuring Adoption and Use of Technology by Firms -- Opening the Black Box: The Firmlevel Adoption of Technology (FAT) Survey -- The Data Used in This Volume -- Using the FAT Data to Understand Some of the Limitations of Standard Measures of Technology -- Summing Up -- Notes --References -- 2. Facts about Technology Adoption and Use in Developing Countries -- Introduction -- Cross-Country Technology Facts -- Cross-Firm Technology Facts -- Other Technology Facts --Summing Up -- Notes -- References -- 3. Adoption of Sector-Specific Technologies -- Introduction -- Technology Differences across and within Sectors -- Technology Upgrading and the Limits to Leapfrogging -- Specialization, Technology, and Outsourcing -- Summing Up --

Notes -- References -- Part 2 The Implications of the Technological

Divide for Long-Term Economic Growth -- 4. Technology Sophistication, Productivity, and Employment -- Introduction --Technology and Firm-Level Productivity -- Technology Adoption and Employment -- Summing Up -- Notes -- References -- 5. Digital Technologies and Resilience to Shocks -- Introduction -- Digital Technologies -- Technology and Resilience -- Summing Up -- Notes -- References -- Part 3 What Countries Can Do to Bridge the Technological Divide -- 6. What Constrains Firms from Adopting Better Technologies? -- Introduction -- Firm-Level Determinants of Adoption. Perceived Drivers of and Obstacles to Technology Adoption -- Factual Evidence on Drivers of and Obstacles to Technology Adoption --Summing Up -- Notes -- References -- Chapter 7. Policies and Instruments to Accelerate Technology Adoption -- Introduction -- A Checklist to Design Technology Upgrading Programs -- Using the FAT Survey to Inform the Design and Implementation of Policies Supporting Technology Upgrading -- Instruments to Support Technology Upgrading at the Firm Level -- Summing Up -- Notes -- References --Appendix A. The Firm-level Adoption of Technology (FAT) Survey, Implementation, and Data Set -- Boxes -- Box I.1 Defining Technology and Business Functions -- Box 1.1 The Technology Index at the Firm Level: An Example from the Food-Processing Sector in Senegal -- Box 2.1 The Large Gap in Technology Sophistication between Formal and Informal Firms -- Box 3.1 The Strong Sector Composition of the Use of Industry 4.0 Technologies -- Box 3.2 The Closeness of Pharmaceutical Firms to the Technology Frontier -- Box 6.1 Specific Barriers to the Use of Digital Platforms -- Box 7.1 Digital Platforms Are Prone to Market Concentration and Dominance -- Box 7.2 The Firm-Level Technology Diagnostic Tool -- Box 7.3 Agriculture Extension: The Case of Embrapa -- Box 7.4 Credit Guarantees for Technology through the Korea Technology Finance Corporation (KOTEC) -- Box 7.5 The Difference between Vouchers and Grants -- Box 7.6 Fraunhofer Institutes --Figures -- Figure 1.1While Countries Are Converging in Their Adoption of Technology, They Are Diverging in the Intensity of Use --Figure 1.2Conceptual Framework for the Firm-level Adoption of Technology (FAT) Survey -- Figure 1.3General Business Functions and Their Associated Technologies -- Figure 1.4Share of Firms Using Technologies Applied to Various General Business Functions, All Countries.

Figure 1.5Sector-Specific Business Functions and Technologies --Figure 1.6An Example of the Technology Index -- Figure B1.1.1 Comparing Technology Sophistication of a Large and a Small Firm in the Food-Processing Sector -- Figure 1.7Firms Vary Widely in the Status of Their Adoption of General-Purpose Technologies -- Figure 1.8Among Firms with Access to Computers and the Internet, a Large Share Relies Mostly on Less Sophisticated Methods to Conduct Business Functions -- Figure 2.1Estimated Technology Sophistication, by Country: Manufacturing -- Figure 2.2Estimated Technology Sophistication, by Country: Agriculture and Services -- Figure 2.3 There Is a Strong Correlation between the Technology Sophistication of a Region and Regional Productivity -- Figure 2.4Cross-Country Differences in Technology Are Also Explained by the Number of Firms Using Sophisticated Technology -- Figure B2.1.1Technology Sophistication Is Significantly Greater among Formal Firms in Senegal -- Figure 2.5The Level of Technology Sophistication for General Business Functions Varies Greatly -- Figure 2.6Technology Sophistication Varies across Firm Size -- Figure 2.7The Likelihood of Adopting Frontier Technologies for General Business Functions Varies across Firm Size -- Figure 2.8The Likelihood of Adopting Frontier

Technologies for Sector-Specific Business Functions Varies across Firm Size -- Figure 2.9Rank Orderings of the Distribution of Technology Sophistication Are Consistent across Select Countries -- Figure 2.10 Most Productive Countries and Regions Have Firms That Use More Sophisticated Technologies on Average -- Figure 2.11Within-Firm Variance of Technology Sophistication Is Positively Associated with Regional Productivity -- Figure 2.12Technology Disruption in Telecommunications -- Figure 2.13Diffusion Curves, by Firm Size (Early versus Late Adopters).

(Early versus Late Adopters). Figure 2.14Firms with Lower Levels of Technological Capabilities Tend to Overestimate Their Technological Sophistication -- Figure 3.1 Firms in Agriculture Tend to Use More Sophisticated Technologies in Sector-Specific Business Functions -- Figure 3.2The Technology Gaps Are Larger in General Business Functions in Agriculture Compared to Sector-Specific Business Functions -- Figure 3.3Technology Sophistication for Fabrication in Manufacturing Is Low in Developing Countries -- Figure B3.1.1The Likelihood of Adopting Advanced Manufacturing Technologies Varies Widely across Sectors -- Figure B3. 1.2More Capital-Intensive Agricultural Firms Are More Likely to Adopt Advanced Technologies -- Figure 3.4Differences in Technology across Countries Roughly Follow Income Differences in the Food-Processing Sector -- Figure 3.5Cross-Country Comparisons in Wearing Apparel Are Not So Large among Exporter Countries -- Figure B3.2.1Pharmaceutical Firms Are Relatively Close to the Technology Frontier, but There Is Significant Room for Improvement in Developing Countries -- Figure 3.6Digitalization of Sector-Specific Business Functions Is at an Early Stage in Retail Services -- Figure 3.7The Diffusion Curves of Newer Sector-Specific Technologies Do Not Suggest Leapfrogging -- Figure 3.8Tractor Ownership, Renting, and Digital Renting Do Not Suggest Leapfrogging through Digital Platforms --Figure 3.9Across Sectors, There Is Large Heterogeneity in Outsourcing Sector-Specific Business Functions -- Figure 3.10Within Sectors. There Is Heterogeneity in the Degree of Outsourcing within Sector-Specific Business Functions -- Figure 3.11The Significant Correlation between Outsourcing Tasks and Technology Sophistication (All Business Functions) Is Restricted to Some Business Functions. Figure 3.12There Are No Significant Differences between Traders and Nontraders in Outsourcing Business Functions -- Figure 4.1Several Drivers Affect the Margins of Productivity Growth -- Figure 4.2 Technology Sophistication Is Correlated with Labor Productivity --Figure 4.3The Level of Technology Sophistication Varies Considerably across Agriculture, Manufacturing, and Services Sectors -- Figure 4.4 Differences in Technology Sophistication between the Republic of Korea and Senegal Are Larger in the Agricultural Sector than in Nonagricultural Sectors and Are Driven Mainly by the Low Sophistication of Informal Firms -- Figure 4.5Firms Generally Keep the Same Number of Jobs When They Adopt New Technologies --Figure 4.6Firms That Have Adopted Better Technology Have Increased Employment -- Figure 4.7More Sophisticated Technologies in Some Business Functions Are More Associated with Employment Growth --Figure 4.8Firms with a Higher Level of Technology Are Creating More Jobs but Not Changing Their Share of Low-Skilled Workers -- Figure 4.9Firms Using More Sophisticated Technologies Pay Higher Wages -- Figure 4.10Technology Sophistication Contributes to Wage Inequality within Firms -- Figure 5.1Use of Internet and Adoption of Applications of Digital Technologies Vary by Sophistication and Firm Size -- Figure 5.2Digital Technology Intensity Varies across Sectors and Business Functions -- Figure 5.3Some Technologies Diffuse More

Rapidly than Others -- Figure 5.4Market Concentration Poses a Challenge for the Supply of Digital Business Solutions -- Figure 5.5 The Large Drop in Sales at the Beginning of the COVID-19 Pandemic Persisted for Many Firms, and the Loss Was Greater for Microenterprises and Small Firms -- Figure 5.6Demand for Digital Solutions Increased Greatly in Response to the COVID-19 Pandemic. Figure 5.7A Large Share of Businesses Digitalized during the COVID-19 Pandemic.

Sommario/riassunto

Many of the main problems facing developing countries today and tomorrow-- growth, poverty reduction, inequality, food insecurity, job creation, recovery from the COVID-19 pandemic, and adjustment to climate change-- hinge on adopting better technology, a key driver of economic development. Access to technology is not enough: firms have to adopt it. Yet it is precisely the uptake of technology that is lagging in many firms in developing countries. Bridging the Technological Divide: Technology Adoption by Firms in Developing Countries helps open the "black box†? of technology adoption by firms. The seventh volume in the World Bank Productivity Project series, it will further both research and policy that can be used to support technology adoption by firms in developing countries.