



E-Commerce Development: *Experience from China*



E-Commerce Development: *Experience from China*



© 2019 International Bank for Reconstruction and Development / The World Bank and Alibaba Group

The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent, or those of the Alibaba Group. The World Bank and the Alibaba Group do not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank or the Alibaba Group concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

RIGHTS AND PERMISSIONS

The material in this work is subject to copyright. Because The World Bank and the Alibaba Group encourage dissemination of their knowledge, this work may be reproduced, in whole or in part, for noncommercial purposes as long as full attribution to this work is given. Any queries on rights and licenses, including subsidiary rights, should be addressed to World Bank Publications, The World Bank Group, 1818 H Street NW, Washington, DC 20433, USA; fax: 202-522-2625; e-mail: pubrights@worldbank.org.

Cover photos: © Xubei Luo, World Bank. Further permission required for reuse.

Cover design: Xiaohui Han, Xuejiao Xu.

Contents

<i>Foreword</i>	<i>I</i>
<i>Foreword</i>	<i>III</i>
<i>Acknowledgements</i>	<i>VI</i>
<i>Overview</i>	<i>1</i>
<i>Abbreviations</i>	<i>21</i>
Part I E-Commerce Development in China	23
1. The Phenomenal Development of E-Commerce in China	25
1.1 E-Commerce Market Structure	26
E-Commerce Growth at the National and Subnational Levels	28
E-Commerce Growth at the National Level	28
E-Commerce Growth at the Provincial Level	30
E-Commerce Growth at the County Level	31
E-Commerce Growth at the Household and Individual Levels	32
Internet Use and Online Consumption	32
Online Consumption Patterns at the Household Level	33
Online Consumption Patterns at the Individual Level	36
2. E-Commerce Development in Poverty-Stricken Counties and Targeted Support Programs	43
2.1 E-Commerce Development in Poverty-Stricken Counties	44
Rapid Development of E-Commerce Activities	45
Uneven Development and Spatial Concentration of E-Commerce Activities	48
Top Products Bought and Sold	51
2.2 Government and Private Sector Targeted Support	53
China Rural E-Commerce Demonstration Program	54
Alibaba Rural Taobao Program	56
Alibaba Poverty Alleviation Fund	58
Part II E-Commerce Development, Employment, Economic Growth, and Welfare Improvement	65
3. Literature Review and Research Framework	67
3.1 Literature Review	68
Enabling Factors for E-Commerce Development	68
E-Commerce Development and Job Creation	70

E-Commerce Development and Economic Growth	73
E-Commerce Development and Household Welfare	75
Distributional Aspects of the Role of E-Commerce	79
3.2 Research Framework, Data Sources, Value Added, and Limitations	80
4. E-Commerce Development, Economic Growth, and Household Welfare	87
4.1 Demographics of E-Commerce Merchants	88
4.2 Initial Conditions	91
4.3 E-Commerce Development and Economic Growth	94
4.4 E-Commerce Development and Household Welfare	96
5. Taobao Villages	101
5.1 Rapid Expansion and Spatial Concentration	103
5.2 Top Products Sold in Taobao Villages	105
5.3 A Profile of Taobao Villages, E-Tailers, and E-Shops	107
Profile of Taobao Villages	108
Profile of Households and Individuals Who Participate in E-Commerce	111
Profile of E-Shops	115
5.4 Obstacles and Supportive Measures	118
5.5 E-Commerce Participation and Household Income Growth	121
Part III Conclusions	129
6. Ingredients for Success	131
6.1 Main Findings	132
6.2 Readiness for E-Commerce Development	133
Practical Skills and Entrepreneurial Spirit	134
Infrastructure and Logistics	138
A Conducive Business Environment	140
6.3 Risks and Challenges	143
6.4 Future Research	146
Appendices	149
Appendix A. Definition of E-Commerce Indicators	149
Appendix B. Definition of Online Business Index (OBI) and Online Shopping Index (OSI)	151
Appendix C. Definition of National Poverty-Stricken County	153
Appendix D. Uneven Development of E-Commerce in Poverty-Stricken Counties	154
Appendix E. Targeted Programs to Support E-Commerce Development for Poverty Alleviation	157
Appendix F. Association between E-Commerce Development and Economic Characteristics	177

Appendix G. Link between E-Commerce Development and Economic Growth	182
Appendix H. Taobao Village Survey	186
References	188

Boxes

Box 1.1. Online Business Index and Online Shopping Index	31
Box 2.1. Taobao Villages in Former Poverty-Stricken Counties	47
Box 2.2. Building Agricultural Brands and Supporting Development of Digital Agriculture	56
Box 4.1. Women and Youth Entrepreneurship in E-Commerce	89
Box 4.2. Case Study: E-Commerce Development and Jobs Creation in Suining County	90
Box 4.3. Panel Analysis of the Links between E-Commerce Development and Economic Growth	96
Box 4.4. E-Commerce Development and Household Consumption Growth in China	97
Box 5.1. Taobao Villages and Taobao Towns	102
Box 5.2. A Taobao Village Selling Ethnic Specialty Products	107
Box 5.3. E-Commerce Participation and Household Income Growth in Taobao Villages	122
Box 6.1. Readiness Checklist for E-Commerce	134
Box 6.2. Lower Barriers and Enable Entry to Get Started	142

Figures

Figure 1.1. Market Shares of B2C versus C2C	27
Figure 1.2. B2C Market Share in China	28
Figure 1.3. Total E-Commerce Trade Volume in China	29
Figure 1.4. Online Retail Sales in China	29
Figure 1.5. Share of Online Retail Sales of Goods to Total Retail Sales of Consumer Goods in Provinces (2017)	30
Figure 1.6. Frequency of Internet Use to Do Commercial Related Activities	32
Figure 1.7. Perception of Importance in Terms of Commercial Related Activities While Using the Internet	33
Figure 1.8. Share of Households Purchasing Online in 2015, by Household Expenses	34
Figure 1.9. Share of Households Purchasing Online in 2015, by Regions	34
Figure 1.10. Share of Households Purchasing Online in 2015, by Rural and Urban	34
Figure 1.11. Average Online Consumption Amount per Household Purchasing Online (RMB), by Household Expenses	35
Figure 1.12. Average Online Consumption Amount per Household Purchasing Online (RMB), by Regions	35

Figure 1.13. Average Online Consumption Amount per Household Purchasing Online (RMB), by Rural and Urban	35
Figure 1.14. Share of Online Consumption to Total Consumption per Household Purchasing Online, by Household Expenses	35
Figure 1.15. Share of Online Consumption to Total Consumption per Household Purchasing Online, by Regions	35
Figure 1.16. Share of Online Consumption to Total Consumption per Household Purchasing Online, by Rural and Urban	35
Figure 1.17. Share of People Shopping Online, by Regions	36
Figure 1.18. Average Online Consumption Amount per Person (RMB), by Regions	36
Figure 1.19. Share of People Shopping Online, by Gender	37
Figure 1.20. Average Online Consumption Amount per Person (RMB), by Gender	37
Figure 1.21. Share of People Shopping Online, by Age	37
Figure 1.22. Average Online Consumption Amount per Person (RMB), by Age	37
Figure 1.23. Share of People Shopping Online, by Education Level	38
Figure 1.24. Average Online Consumption Amount per Person (RMB), by Education Level	38
Figure 1.25. Average Online Consumption Amount per Person (RMB), by Length of Leisure Time Spent on Internet per Week	39
Figure 2.1. Online Sales Amount in Poverty-Stricken Counties	45
Figure 2.2. GDP in Poverty-Stricken Counties	45
Figure 2.3. Number of Packages Sent from Poverty-Stricken Counties ..	45
Figure 2.4. Number of Online Shops in Poverty-Stricken Counties ..	45
Figure 2.5. Online Purchases Amount in Poverty-Stricken Counties	46
Figure 2.6. Number of Packages Received in Poverty-Stricken Counties ..	46
Figure 2.7. Number of Online Buyers in Poverty-Stricken Counties	46
Figure 2.8. Distribution of Online Sales Amount in Poverty-Stricken Counties in 2016	48
Figure 2.9. Distribution of Packages Sent from Poverty-Stricken Counties in 2016	48
Figure 2.10. Distribution of Online Shops in Poverty-Stricken Counties in 2016	48
Figure 2.11. Distribution of Online Purchases Amount in Poverty-Stricken Counties, 2016	49
Figure 2.12. Distribution of Packages Received in Poverty-Stricken Counties, 2016	49
Figure 2.13. Distribution of Online Buyers in Poverty-Stricken Counties, 2016	49
Figure 2.14. Online Sales in Poverty-Stricken Counties across Regions, 2016	50
Figure 2.15. Online Purchases in Poverty-Stricken Counties across Regions, 2016	51

Figure 4.1. E-Commerce Employment in China	88
Figure 4.2. Correlation between GDP Per Capita and OBI	93
Figure 4.3. Correlation between GDP Per Capita and OSI	93
Figure 5.1. Number of Taobao Villages	103
Figure 5.2. Number of Taobao Towns	103
Figure 5.3. Number of Taobao Villages by Province, Autonomous Region, and Municipality in 2018	104
Figure 5.4. Number of Active Online Shops in Taobao Villages	105
Figure 5.5. Number of Logistics or Express Delivery Companies in Taobao Villages (Percentage)	108
Figure 5.6. Witness of Couriers and Packages with Waybills in Taobao Villages at the Time of Survey	108
Figure 5.7. Purposes for Using the Internet	109
Figure 5.8. Devices to Use the Internet	109
Figure 5.9. Share of People Using the Internet, by Education Level	109
Figure 5.10. Average Distance to Preschool and Compulsory Education Institutions from Taobao Villages	110
Figure 5.11. Average Distance to Post-Compulsory Education Institutions from Taobao Villages	110
Figure 5.12. Self-Rated Social Status Changes in E-Households	110
Figure 5.13. Self-Rated Social Status Changes in Non-E-Households	111
Figure 5.14. Household Per Capita Income in 2017	112
Figure 5.15. Number of Cars Owned Per Household	112
Figure 5.16. Car Ownership in E-Households	112
Figure 5.17. Car Ownership in Non-E-Households	112
Figure 5.18. Income Composition of E-Households in Taobao Villages ..	113
Figure 5.19. Income Composition of Non-E-Households in Taobao Villages	113
Figure 5.20. Income Composition of Rural Households in China	113
Figure 5.21. Income Composition of Urban Households in China	113
Figure 5.22. Age Structure	114
Figure 5.23. Education Structure	114
Figure 5.24. Urban Work Experience Structure	115
Figure 5.25. E-Shop Scale, by Number of Employments	115
Figure 5.26. E-Shop Related Work	116
Figure 5.27. Worker's Average Wages Per Month	116
Figure 5.28. E-Shop Establishment Year	117
Figure 5.29. Establishment Year and Gross Merchandise Values	117
Figure 5.30. Closure and Gross Merchandise Values	117
Figure 5.31. Obstacles to Developing E-Commerce	118
Figure 5.32. Desired Government Support for E-Commerce Development	119
Figure 5.33. Sources of Finance for E-Shop Owners	120
Figure 5.34. Loan Amount from Different Sources	120
Figure 5.35. Relative and Absolute Gains from E-Commerce Participation by Wealth Level	124

Figure 5.36. Relative and Absolute Gains from E-Commerce Participation by Age of Household Head	124
Figure 5.37. Relative and Absolute Gains from E-Commerce Participation by Education of Household Head	125
Figure 5.38. Relative and Absolute Gains from E-Commerce Participation by Knowledge and Urban Experience of Household Head	125
Figure 6.1. Human Capital Index in UMICs, 2017	136
Figure 6.2. Learning-Adjusted Years of Schooling in UMICs, 2017	137
Figure 6.3. LPI Score in UMICs, 2018	139
Figure 6.4. Ease of Doing Business Score in UMICs, 2019	141

Tables

Table 1.1. E-Commerce Development in the World (2017)	26
Table 1.2. Internet Penetration in the World (2017)	27
Table 2.1. Ten Best-Selling Products in Poverty-Stricken Counties by GMV, 2016	52
Table 5.1. Top 5 Countries Purchasing Products from Taobao Villages Based on Amount (2017)	105

Foreword

Digital technology is altering the way we produce and consume and ultimately affects the way we live. It brings new opportunities or new and more productive jobs, but also the risk of exacerbating the digital divide and economic inequality. E-commerce stands out among digital applications relevant to development because of its ability to instantly link sellers with buyers, lower transaction costs, and create new niche markets tailored to consumer demand. While large producers and enterprises reap the greatest benefit from e-commerce in absolute terms, the market access afforded by e-commerce can be a boon for small producers and enterprises facilitating their integration into value chains.

China has one of the fastest growing e-commerce markets in the world. In 2018, total e-commerce trade volume in China reached 32 trillion yuan. According to McKinsey, China accounted for more than 40 percent of the value of e-commerce transactions worldwide. At these volumes, more than 5 percent of total employment in China is already in e-commerce and online purchases have become part of daily life for many Chinese households.

The success of e-commerce in China shows that the benefits of digital technology are not necessarily limited to high-income countries and urban areas. With the right conditions, it can flourish in developing countries and in rural areas. The rapid growth of e-commerce also has not been confined to the high-tech sector and is providing employment opportunities for semi-skilled workers, creating new types of employment, such as express delivery, e-shop design, and e-modeling, as well as supporting more flexible entrepreneurship.

Clusters of e-commerce villages (called Taobao Villages) have increased sharply in number and have gradually been spreading inland, though they are still concentrated in more populous coastal areas. Case studies show that some poverty-stricken areas of China have been enriched by e-commerce development and people have gained wealth and improved their lives by participating in e-commerce. In several cases, migrants have returned home to work in e-commerce—seizing job opportunities that would not have been available in rural areas without online platforms. This has enabled them to enjoy life among elder family members and children, restoring the social fabric of their hometowns. These developments offer hope that e-commerce can be a powerful instrument for rural vitalization and poverty reduction.

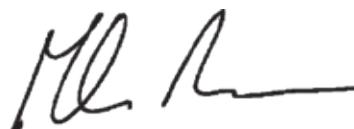
Yet, little is known yet about how digital technologies contribute to growth and equity, what conditions are needed to support healthy development, and how to address the tendency for the technology to produce winners and losers. Analysis of the contribution of digital technologies to economic development

and social welfare has been hindered by the lack of data. This report, the result of joint research by the World Bank and Alibaba Group, seeks to fill this research gap, drawing on unique primary data about Taobao Villages, poverty-stricken counties, and online selling and purchasing through the Alibaba platforms, supplemented by secondary data from government agencies, international organizations, think-tanks, and academia.

Among the study findings is that participation in e-commerce has a positive association with household welfare improvement, especially in rural China and that beneficiaries include vulnerable populations—women and youth. The development of e-commerce, where it has taken hold, is associated with higher household consumption and reduced inequality, bringing to people in rural areas the convenience, variety, and low prices enjoyed by urban dwellers.

China's rapid development of e-commerce has built on both digital development and its analog complements: development of human capital through education, as well as investment in transport and logistics infrastructure. The government, partnering with the private sector, has provided important support to e-commerce development. While the combination of factors may be unique to China, the country's experience offers lessons on the development of e-commerce and its impact that may be applicable elsewhere. Notably, the China experience shows that, targeted support to improve skills and entrepreneurship, lower entry barriers and an improved business environment, and measures to address information asymmetries between producers and consumers and allow new entrants to participate in online markets, can help to launch e-commerce also in less advantaged areas.

We hope the report will stimulate debate about ways to support inclusive growth through digital technology and e-commerce. It will be particularly important to address questions about the effectiveness and efficiency of specific government policies and private sector initiatives to support e-commerce development in less developed regions and rural areas; tease out the causality between e-commerce development and household welfare improvement and its distributional aspects; and understand the dynamics of the platform economy and its potential risks and opportunities for all. With the implementation of evidence-based policies that support e-commerce development for poverty alleviation, other countries can learn from the China experience to help make the dream of a world without poverty a reality.



Martin Raiser
World Bank Country Director for China, Korea and Mongolia

Foreword

The year 2019 marks the 50th anniversary of the birth of the Internet, the 25th anniversary of China's access to the Internet, and the 20th anniversary of Alibaba.

To "make it easy to do business anywhere," Jack Ma and a group of youngsters founded Alibaba 20 years ago in the hope of empowering SMEs, young people, and entrepreneurs.

This is an easier-said-than-done task. However, we believe that we can make a difference to the world through unremitting efforts.

Fortunately, Alibaba has made its way into prominence nowadays with dreams, amid China's rapid economic growth over the past 20 years, the Chinese government's open attitude towards the Internet industry, and its support for e-commerce.

Looking back on the path we have trodden, we saw not only the enormous vitality the Internet injected to China's economy, but also the new opportunities and shared benefit e-commerce brought to remote areas, tens of millions micro, small and medium-sized merchants and the general public.

The equal opportunities brought by e-commerce have outweighed the transaction itself.

E-commerce enables all merchants to display their products online on an equal footing no matter where they are and whether their business is big or small. Merchants doing small business or living in remote areas can also stand out as long as they sell high-quality or creative products. Besides, vicious competition is never an option for long-term and stable online business operation. Instead, merchants are encouraged to continuously introduce or develop more high-quality and innovative products.

Fund-raising difficulties and the lengthy process for getting loans have always been a threat to the survival of small and micro-sized businesses. Traditional lenders cannot provide services for tens of thousands of small and micro-sized merchants without considering the cost, and the long approval process cannot address the pressing needs of the merchants. Using big data and AI technologies, MYbank has granted loans to 27 million merchants instantly based on their social credit scores. It has greatly enhanced the resource allocation efficiency

and reduced the cost of lending, saving precious time for many small and micro-sized businesses. The fund lent to these businesses may be petty (only RMB 30,000 in average), but it could be a straw for them to clutch at.

E-commerce has also brought special benefits for consumers in remote areas. A survey shows that 62% products on Alibaba platforms could not be found in rural stores, and their prices are lower than those sold in general physical stores. Alibaba provides the same opportunity for rural residents to buy a variety of better and cheaper products as for urban residents. Meanwhile, the convenience of getting high-grade products also stifles counterfeit production in remote areas, safeguarding the rights of local consumers.

Today, fewer and fewer people say that e-commerce is unfair, because it is visibly bringing equal opportunities for all small and micro-sized businesses. A number of e-commerce players have worked their way up to power sellers with RMB 10 million revenue in just two to three years. More people have benefited from the social progress in this process.

The changes in regional development brought by e-commerce have also outweighed the commerce itself.

Online retail is just a beginning. What we expect to see is a virtuous circle: When more individuals, merchants, and governments embrace the power of the Internet, big data, and cloud computing, and understand the way of thinking in the digital age, they will not only change themselves with their burgeoning creativity, but also boost the transformation of local industries such as retail, wholesale, finance, foreign trade, manufacturing, and service.

When we studied Taobao villages a few years ago, we noticed that e-commerce development is not exclusive to high-income regions, and innovation is not necessarily driven by highly educated people. Instead, it is small and micro-sized businesses that swing into action more quickly and march into the mainstream market.

This phenomenon is especially observable in rural areas. In most cases, the success of one online merchant in a village will drive the growth of surrounding industries, thus forming a large Taobao village or even a Taobao town. This proves that innovative business started by grass-roots entrepreneurs in rural areas of developing countries can thrive via the e-commerce platform under the right conditions.

Daniel Zhang, chairman of Alibaba Group, said that "people are connected by big data as never before in the digital era. The global market has already become a place where our interests are intertwined." In the development of

digital economy, e-commerce will definitely play a key role in accelerating new business civilization and fostering new technologies.

It is a great honor for Alibaba to represent China's e-commerce industry to contribute to the research, discussion, analysis, and drafting of this World Bank report. We would like to express our gratitude to the research team of World Bank for their expertise, devotion, and international perspectives. The report's conclusion is very encouraging: With the support of the government and e-commerce platforms, developing countries and rural areas could leverage the power of rapidly growing digital technologies to eliminate poverty and vitalize rural economy.

The 20-year-old Alibaba would like to share its digital prowess with the whole society, and promote inclusive, green, and sustainable development with the World Bank and other development partners all over the world.

A handwritten signature in black ink, appearing to read "WEN Jia".

WEN Jia
Partner of Alibaba Group
President of Public Affairs of Alibaba Group

Acknowledgments

This report was a product of the joint work of the World Bank and the Alibaba Group, prepared as per the joint research agreement signed between the two parties in October 2016. The joint research was undertaken under the guidance of Martin Raiser (Country Director, World Bank); Bert Hofman (Former Country Director, World Bank); Carolina Sanchez (Global Director, Poverty and Equity Global Practice), Salman Zaidi (Practice Manager, Poverty and Equity Global Practice, East Asia), and Wen Jia (Partner and President of Public Affairs of Alibaba Group), Jiansheng Fang (Vice President, Alibaba Group), and Hongbing Gao (Vice President and Head of AliResearch, Alibaba Group).

The study was carried out by a joint research team consisted of staff and consultants from the World Bank and the Alibaba Group. The World Bank authors were Xubei Luo (Senior Economist, team leader), Xuejiao Xu (consultant), and Chiyu Niu (consultant). The Alibaba Group authors were Ruidong Zhang (Director of Rural and Government Affairs Department, team leader), Zhenzhong Sheng (Senior Expert, AliResearch), and Zhengwei Jiang (Senior Expert). Two background papers were prepared, one co-authored by Xubei Luo, Yue Wang (Ph.D. candidate, Cornell University) and Xiaobo Zhang (Professor, Peking University, and senior research fellow of International Food Policy Research Institute), the other by Xubei Luo and Chiyu Niu. William Hurlbut edited the report. Mildred Gonsalvez and Qiujing Yang provided administrative support.

Deepak K. Mishra (Practice Manager, World Bank), Samuel Freije-Rodriguez (Lead Economist, World Bank), and Hoon Soh (Special Representative, World Bank), peer reviewed the report.

For their comments and guidance at various stages, the team thanks Shaohua Chen (Former Lead Statistician, World Bank), John Giles (Lead Economist, World Bank), Ruth Hill (Lead Economist, World Bank), Christoph Lakner (Economist, World Bank), Ambar Narayan (Lead Economist, World Bank), Qinghua Zhao (Former Senior Statistician, World Bank), and Meixiang Zhou (Senior Social Development Specialist, World Bank). For their collaboration on the Taobao Village Survey, the team thanks Ramiro Flores Cruz (Sistemas Integrales), Hua Ding (Peking University), Tao Kong (Peking University), Qiang Li (Peking University), Juan Munoz (Sistemas Integrales), Jinjie Wang (Nankai University), Yunbo Zhou (Nankai University), the entire team of the Institute of Social Science Survey of Peking University, China, and all survey interviewers. The team is also grateful to all the participants in the Taobao Village Survey for sharing their information and experience.

OVERVIEW

The potential contribution of digital development to economic and social welfare remains a topic of debate and active empirical inquiry. Unfortunately, for developing countries, data are relatively scarce, and we have little robust evidence on whether and how digital technologies contribute to income growth, what this depends on, and who are the potential “winners and losers” in digital development. Policy makers, the private sector, and others in the development community have a strong and growing interest in how to harness digital technology to aid growth and support job creation in an inclusive manner.

Among the many digital technologies with relevance for development, e-commerce stands out because of its potential to overcome market barriers and connect consumers and businesses even when traditional commercial and market transactions are relatively limited. It can create jobs directly as well as through forward and backward linkages in the e-commerce ecosystem, such as logistics services; it can improve household welfare by offering a wider variety of products, potentially at lower prices; and it can contribute to economic growth by lowering the asymmetry of information and increasing economic efficiency.

China has one of the fastest growing e-commerce markets in the world. As such it is an important case study to analyze the potential of e-commerce to generate welfare benefits, including in rural communities previously considered relatively distant from the market. The experience in China shows that e-commerce is not necessarily limited to high-income countries or urban areas, and it has not been confined to the high-tech sector. E-commerce also offers employment opportunities in developing countries and in rural areas for semi-skilled workers and other groups (including people with disabilities) who, in the past, had more limited opportunities in the labor market. The ratio of women to men entrepreneurs in e-commerce is at or near parity on the Alibaba platforms, compared to 1:3 in all business. Three quarters of rural e-tailers are 20-29 years old.

The present volume presents a series of analytical studies that attempt to bring more evidence to bear on the discussion about the development benefits of e-commerce. It is based on a combination of statistical data collected for China as a whole, as well as data from a specifically commissioned survey (a joint work with Peking University in collaboration with Nankai University) of Taobao Villages, rural villages in China substantially engaged in e-commerce. The present volume is the result of a joint research initiative between the World Bank and the Alibaba Group offering rich and unique evidence on the growth of e-commerce in China and how this has been associated with improvements in people's livelihoods in select communities.

Key Research Questions, Findings, and Caveats

This volume aims to address four research priorities:

- Describe the patterns and evolution of e-commerce development in China.
- Describe the specific government policies and private sector initiatives to foster e-commerce development in rural villages.
- Identify pre-conditions for successful e-commerce development by examining empirically the association between county-level characteristics and level of e-commerce development.
- Investigate the links between e-commerce development and household welfare improvement, including its distributional aspects across different types of households.

Overall, the data in the present volume suggest a positive association between participation in e-commerce and household welfare for China's rural citizens. Younger, better educated households benefit more and women are strong beneficiaries. E-commerce development is associated with higher household consumption and lower spatial inequality. Access to an online market allows people in rural areas to enjoy the convenience, variety, and low prices enjoyed by people in big cities. In Taobao Villages, households that participate in e-commerce have per capita income 80 percent higher than households that do not participate; and e-shop workers have wage levels equal to or higher than workers in urban private industries. Most people in Taobao Villages, especially e-households, perceived their social status as equal to or higher than it was five years ago, and they believe they will have equal or even higher social status two years in the future.



While the evidence in the present volume is rich, there are several reasons it needs to be interpreted with considerable care and with awareness of the data limitations. First, the development of e-commerce has gone hand-in-hand with rapid economic development overall. China has made substantial progress in building what the 2016 World Development Report called the “analog complements” to digital development, namely investment in physical infrastructure, education and skills, and improvements in the business climate. China’s progress along both dimensions—digital development and analog complements—creates a fertile ground from which to reap digital dividends. Countries in which the analog complements are not similarly strong are unlikely to get the same benefits. Getting the pre-conditions in place, particularly the human capital with skills and entrepreneurial spirit, good infrastructure and logistics, and an overall conducive business environment, is crucial for fostering entrepreneurship and supporting growth in an inclusive manner through e-commerce development.

Second, the data in this report are drawn from a representative sample of Taobao Villages, most of which are clustered in the more developed coastal provinces. As the analysis in the report suggests, Taobao Villages share certain characteristics of market proximity, connectivity, and a pool of returned migrants with the necessary entrepreneurial skills. While the Chinese government and Alibaba are keen to expand the Taobao Village experiment further inland, so far there is no evidence of assured success. Other countries need to bear this in mind when looking to China for evidence of the potential of e-commerce to leapfrog market development. Again, the analog complements would seem to matter—perhaps a lot. More data and rigorous research are needed to distill lessons about whether and how the successful experience of e-commerce development in rural China could be replicated and scaled up.

Third, the institutional characteristics of China’s economy, and specifically the relationship between the government and the private sector, mean that the specific policies adopted may have only limited transferability to other country contexts. Nonetheless, the report includes a description of how the public and private sector collaborated in facilitating the expansion of e-commerce which adds to the understanding of China’s reform strategy in this particular area, even if lessons need to be drawn with care. Tailoring the lessons learned from the experience in China to the local conditions and developing a beneficial collaboration between the public and private sectors are keys to success.

The remainder of this summary is structured as follows. The next section introduces basic definitions and data sources used. This is followed by a summary of e-commerce development in China, including the rapid growth in the number of Taobao Villages as well as their geographical distribution (Chapter 1 of the main report). The subsequent section describes the key policy initiatives launched by the government and the Alibaba Group to foster the expansion of e-commerce in rural villages, including recent initiatives to focus on poor counties (Chapter 2 of the main report). This is followed by a summary

of the basic characteristics of Taobao Villages, which confirms that e-commerce development is more likely in counties with better initial endowments (Chapter 5 of the report). The next section summarizes the findings on the association between participation in e-commerce and household welfare (Chapters 3 and 4 of the report). The final section discusses the main findings and next steps.

Definitions, Data Sources, and Limitations

This volume, in addition to providing analysis at the national level, builds on a first-hand micro-survey—with information at the village, household, individual, and e-shop levels—that is representative of all the 2,118 Taobao Villages in 2017 where e-commerce is most developed in rural China. The analysis at all levels is used to distill lessons.

Taobao Villages and Taobao Towns are special phenomena of e-commerce development in rural China. Taobao Villages are areas where e-commerce is most developed or concentrated in rural areas, specifically, they are defined as villages where at least 10 percent of households engage in e-commerce (or where there are at least 100 active e-shops) with annual online sales of at least 10 million yuan (or \$1.5 million). A Taobao Town is defined as a town, township, or street that consists of at least three Taobao Villages.

The report draws on a variety of data sources, including primary data sources of micro survey and aggregate transaction data from the Alibaba platforms¹ and secondary data sources—government agencies, international organizations, think-tanks, and academia (see box below).

Data Sources

Three unique sources of primary data provide information about Taobao Villages, poverty-stricken counties, and online selling and online purchasing in China.

- **Taobao Village Survey.** This collaboration between the World Bank, Alibaba Group, and Peking University and Nankai University joint research team is, to our knowledge, the first of its kind on rural e-commerce clusters. It is representative for the universe of 2,118 Taobao Villages in 2017, covering the characteristics of the villages, detailed household-level information—demographic characteristics, assets and income, risk aversion and social attitudes, e-shop operations and employment, as well as subjective constraints and support needed for e-commerce development.
- **Alibaba Transaction Data.** Alibaba transaction data from Tmall.com and Taobao.com, aggregated at the county level, provide a detailed picture of e-commerce development in China, including in nearly all poverty-stricken counties.² The transaction data include volume of online sales and purchases, number of online sellers and online buyers, and numbers of packages sent and received.
- **Online Business Index (OBI) and Online Shopping Index (OSI).** AliResearch developed these indexes from the Alibaba platform online transaction numbers. Given Alibaba's dominant market share, this largely reflects the e-commerce development levels from both the buying side and the selling side at the county level.

Two sources of secondary data are also used:

- **Administrative data and statistics.** Statistics from government agencies (such as the Ministry of Commerce of China and National Bureau of Statistics of China), international organizations (such as the UNCTAD and World Bank), and other sources (such as Boston Consulting Group, Goldman Sachs, and McKinsey) provide a picture of e-commerce development in China from various angles and the basis for the study of the links between e-commerce and broader development characteristics.
- **Household survey data.** China Family Panel Study data, administered by Peking University, provide nationally representative information of consumption, including online consumption, at the household level.

Due to data constraints, this report does not investigate or assert a causal relationship between e-commerce development and economic growth or household welfare improvement. More research is needed to quantify the costs and benefits of targeted support for e-commerce to foster inclusive growth and rural vitalization. The availability of county-level data from the statistics yearbook limits the analysis at the county level to the association of e-commerce development and a few economic indicators. The availability of information at the village level (only from the Taobao Village Survey, which covers a representative sample of Taobao Villages but no other villages) limits the ability to examine e-commerce participation and household income growth to within Taobao Villages.

Patterns and Evolution of E-Commerce Development in China

E-commerce has developed rapidly in China. According to a McKinsey report, in 2016, China accounted for more than 40 percent of the value of worldwide transactions in e-commerce. The current value of China's e-commerce transactions is estimated to be larger than that of France, Germany, Japan, the United Kingdom, and the United States combined.³ Annual e-commerce trade volume in China grew from RMB 930 billion in 2004 to RMB 31,630 billion in 2018.

Online purchases have become part of daily life for many Chinese households. The Ministry of Commerce reports that China had 772 million Internet users in 2017, 533 million (69 percent) of whom made purchases online. The pace of e-commerce growth has been particularly notable: e-commerce trade volume increased at a compound annual growth rate of 26 percent between 2008 and 2018 and online retail sales grew even faster, at a compound annual rate of 53 percent. According to the State Post Bureau of China, 51 billion parcels were delivered in 2018, a large share of which were related to e-commerce. In a 12-month period in 2015–2016, over one-quarter of households made online purchases; the share of their online consumption among those households increased by 2 percentage points from 6 percent in 2013 to 8 percent in 2015.

Despite the apparent scale of e-commerce development, the growth of e-commerce has been unevenly distributed among provinces and between urban and rural areas. In Shanghai 49 percent and in Beijing 44 percent of total retail sales of consumer goods were purchased online in 2017, but the share was much lower (less than 2 percent) in seven inland provinces.⁴ Ministry of Commerce data indicate that nearly three-quarters of online stores and Internet users were concentrated in urban areas. In 2018, urban Internet users accounted for about 73 percent of the national total (829 million), much higher than their share of the total population (60 percent). Online purchases and online sales are both much more developed in coastal areas, and gaps between the coastal and inland regions have remained wide. Compared with online purchases, online business is even more concentrated, particularly in Jiangsu, Shanghai, and Zhejiang.

Household survey data indicate that online purchases in rural areas are expanding much more rapidly than in urban areas, even if still comparatively less well-developed. Internet penetration in rural areas was 38 percent in 2018, compared to 75 percent in urban areas.⁵ China Family Panel Study data show that 15 percent of rural households purchased online in 2015, compared to 33 percent of urban households. From 2014 to 2017, however, online retail sales in rural China increased from RMB 180 billion to 1.24 trillion, a compound annual growth rate of 91 percent, compared to 37 percent nationally. With the strong

urban concentration so far, the potential for continued growth and expansion of e-commerce remains strong as penetration into the rural areas continues.

Alibaba Taobao Villages have emerged and expanded rapidly—from 20 in 2013 to 3,202 in 2018—offering useful examples of e-commerce development in rural China. As the numbers of these rural villages expand, clusters of them come to form Taobao Towns. The number of these towns grew from 19 in 2014 to 363 in 2018. While the majority of Taobao Villages and Taobao Towns are concentrated in the coastal region, particularly in Guangdong, Jiangsu, Zhejiang provinces, they also have spread to inland areas. The rapid expansion and prosperity of Taobao Villages and Taobao Towns shows that e-commerce is not only a phenomenon of urban areas in high-income countries; with the right conditions, it can flourish in rural areas in developing countries.

E-commerce experience in China offers many examples of ways in which such business can support existing economic activities and develop new ones, create employment, and improve household welfare. Case studies by AliResearch show the prosperity of Taobao Villages and that people gain wealth and have better lives when they participate in e-commerce.

- In Shuyang and Suining, Jiangsu province, many young and talented people, including women, have returned, bringing back with them the skills and entrepreneurial spirit needed to develop e-commerce businesses and earn incomes similar to or higher than they did in the cities, while enjoying family life with their elders and children. Many have become leaders of e-commerce in their home villages and are role models for fellow villagers.
- In Heze, Shandong province, people gained wealth by creating and developing niche products and whole new industries—in this case, special clothing, such as performance dresses for holiday occasions—and sell large volumes through online platforms serving the domestic and international markets.
- In Mengjin, Henan province, people are enriched by access to new markets through online platforms for traditional cultural products, such as peony painting and Tang tri-color ceramics. Many young people have started to (re)learn traditional skills that will sustain the local cultural heritage.
- In Xifeng, Guizhou province, households receive a higher farmgate price for kiwis and therefore have an incentive to increase production through online sales to domestic as well as European markets.
- In Huimin, Shandong province, building on traditional net production, not only developing large-scale automated production of nets for construction and agriculture usage, but also innovating to create customized products with higher value added, such as string lamps and climbing facilities for playgrounds.

- In Wuyi, Zhejiang province, households developed e-commerce building on the advantage of proximity to hardware industrial park with support from the government, including subsidized office space rental and targeted support to attract migrants to return to develop e-commerce.⁶

E-commerce is growing in poverty-stricken counties though still at a level lagging behind other counties. From 2013 to 2016, online purchases through the Alibaba platforms in those counties increased from RMB 67.5 billion to RMB 205.2 billion, while online sales for those counties increased from RMB 8.4 billion to RMB 29 billion, faster than the 10 percent growth in GDP from 2013 to 2015. According to AliResearch, in 2016, the average poverty-stricken county sold its products to 280 prefecture-level cities through Alibaba. In 2018, the poverty-stricken counties had 45 Taobao Villages, including Pingxiang county, Hebei province, which had a cluster of 18 Taobao Villages.

However, the volume of online sales per county varies considerably among poverty-stricken counties and the distribution is highly uneven. From 2013 to 2016, the top 25 percent of poverty-stricken counties accounted for 90 percent of online sales amount and packages sent, as well as 70 percent of online stores. Poverty-stricken counties in the central and eastern regions, though only 46 percent of the poverty-stricken county population, accounted for 77 percent of online sales. Online purchases were also unevenly distributed. From 2013 to 2016, a quarter of the poverty-stricken counties represented 60 percent of the online purchase amount, packages received, and online buyers. The regional distribution of online purchases was in line with population distribution: the central and eastern regions account for 47 percent of online purchases in poverty-stricken counties (similar to their population share). Some poverty-stricken counties experienced a decline in e-commerce activities, especially online sales. The reasons e-commerce has grown faster in some poverty-stricken areas than in others are unclear and merit further research.

Targeted Interventions by the Government and the Private Sector to Support E-Commerce Development in Less-Developed Areas

The government and private sector companies have implemented several programs to support e-commerce development in less-developed areas. This report describes three of these programs:

- The government's Rural E-Commerce Demonstration Program seeks to promote e-commerce in rural areas by establishing and improving rural e-commerce public service, fostering rural e-commerce supply chains,



promoting connectivity between agriculture and commerce, and enhancing e-commerce training.

- Alibaba's Rural Taobao Program set out to establish an e-commerce service system in 100,000 administrative villages in 1,000 counties across China to bring consumer goods to rural areas and agricultural products to urban areas.
- The Alibaba Poverty Alleviation Program, building on the Alibaba Rural Taobao Program, aims to contribute to poverty alleviation in five target areas: e-commerce, ecology, education, health, and women.

The Rural E-Commerce Demonstration Program annually selects a limited number of new counties, many of which are poverty-stricken counties, to demonstrate the role of e-commerce for poverty alleviation in rural areas. The provinces determine which counties will be included in the program using logistics, Internet availability, and characteristic industries as criteria. By 2018, the program had supported 1,016 demonstration counties, including 737 poverty-stricken counties, among them 137 counties with extreme poverty. By the end of 2016, according to Ministry of Commerce, the program had created 120,000 jobs for poor households. Online stores registered in rural areas grew from 8.17 million in 2016 to 9.86 million in 2017 and resulted in employment for 28 million. With the assistance of the program, e-commerce enterprises have accelerated their penetration into rural areas and cooperate with demonstration counties to help implement the Rural E-Commerce Demonstration Program. At least 15 e-commerce companies have joined the effort to reduce poverty in rural areas.

The Alibaba Rural Taobao Program engages in multiple activities that help promote the development of e-commerce in rural areas. It promotes entrepreneurship among rural returnees and creates new sources of rural employment by establishing “incubators” at the village level. By 2018, according to the Alibaba Group, it had established more than tens of thousands village-level service stations in 29 provinces, autonomous regions, and municipalities, and recruited more than 30,000 rural full-time shop assistants and nearly 30,000 part-time aides. The program improves logistical connections with underserved villages to ensure timelier pickup and delivery by expanding existing private logistical systems from county centers to villages. The program agent not only helps villagers navigate the platforms to support online transactions, but also expands the availability of customer services, such as charging stations, Internet access, online booking travel. The program provides training in e-commerce through 11 training centers throughout the country and a series of online e-commerce training courses for self-learning by entrepreneurs. It also supports rural financial services, such as online payment, small collateral-free loans, insurance, and other financial services.

The Alibaba Poverty Alleviation Fund is an umbrella for multiple initiatives focused on the five focal areas and targeting nationally identified poverty-stricken counties, including e-commerce, women, education, health, and green economy. To reduce poverty through e-commerce, the program aims to help impoverished regions build on their natural endowments to incubate and develop industries to sell agricultural or local handicraft products online. Through the Rural Compulsory Education Plan and Occupational Education Plan, education poverty alleviation is to introduce incentives to enhance teaching practice and improve rural education. Health poverty alleviation provides health insurance to impoverished areas using donations gathered online and resources from the program. Women poverty alleviation provides targeted support to women and offers insurance, business development training, and childcare instruction tailoring to their needs. From the ecological perspective, the program aims to help impoverished regions explore ways to use local resources in a manner that ensures a balance between ecological conservation and economic development, helping to develop conservation forests and supporting the online sales of sustainable products (such as honey from alpine bee farming).

Pre-Conditions for E-Commerce Development

The main enabling factors for e-commerce development, as revealed in the literature and from the experience of China, include human capital, infrastructure and logistics, and a business environment conducive to e-commerce. Besides

access to the Internet, e-commerce development requires most of the same facilitating factors that enable traditional offline trade, including skills to manage or operate in the online platform, a spirit of entrepreneurship to identify business opportunity (particularly as an online platform enables access to a wide range of customers and therefore new niches in the long-tail market) to develop business and willingness to take risk and innovate, good infrastructure and logistics for timely delivery of packages from producers to consumers, and a conducive enabling business environment (see box below). Besides that, it requires a platform ecosystem that is beneficial for all parties—sellers, buyers, and platform companies.

Local production structures and other endowments condition e-commerce development, particularly the extent to which e-commerce can take off in the early stages. Analysis based on the statistics for about 2,000 counties for four years shows that e-commerce, including both online business and online shopping, is more developed in counties with higher economic development level, smaller secondary sector, larger household savings, and more developed financial sector, and with the presence of Taobao Villages, while online shopping also has positive relationship with population density and fixed asset investment and negative relationship with size of primary sector. After controlling for local economic characteristics, the positive association between e-commerce development and initial GDP per capita remained.⁷ The experience in China largely supports findings in the theoretical literature. E-commerce is more developed in areas where initial endowments are more favorable and GDP per capita is higher.

Readiness Checklist for E-Commerce

- **Skills and entrepreneurship**, including the skills needed to use the Internet for operations, provide customer service, and develop online products. A capacity for training followed by incubation services. The presence of an entrepreneurial spirit with a willingness to take risks and be flexible in pursuit of new opportunities in a digital economy.
- **Infrastructure and logistics**, including access to the Internet and an e-commerce platform, access to roads and a logistics network, and access to finance and a mobile payment system.
- **Enabling business environment**, including all traditional factors as well as factors specific to e-commerce: direct subsidies, logistics, training, and online product services and incubation services, improved roads and regulations to make it easier to do business.

In Taobao Villages, individuals with skills and entrepreneurial spirit, many of them returned migrants, are important in establishing e-commerce businesses

and creating role models for fellow villagers. Knowledge sharing within circles of friends and relatives is an important driver for the e-commerce development and clustering in Taobao Villages (Zeng et al. 2015). Infrastructure and logistics connect people to the market. All Taobao Villages have access to broadband and more than half of people in Taobao Villages use the Internet. People with higher education are more likely to do so, particularly for work and learning. The Internet penetrates people's lives with news, entertainment, online shopping, work, and education. Nearly all Taobao Villages have package pickup and express delivery services, with a wide range of logistics services providers. Nearly half of the Taobao Villages had logistic centers in the village at the time of the survey in 2018. Government support, including subsidized training or a one-stop shop for registration, provides a conducive environment for e-commerce development, as does non-monetary support and verbal encouragement from local government leaders.

E-Commerce Development and Household Welfare in Taobao Villages

A large and growing body of literature examines the links between e-commerce on job creation, economic growth, and welfare improvement. E-commerce can improve the efficiency of resource allocation by reducing the transaction costs (UNCTAD 2001) and facilitate the integration of SMEs into value chains (OECD 2017). However, research is limited on the causality between the e-commerce development, economic growth and welfare improvement, the additionality and substitutability of e-commerce to traditional business, and the magnitude of the impact of e-commerce on total employment and economic growth.

E-commerce can stimulate household consumption growth through the mechanisms that expand product variety, embrace consumer demand, and lower prices (see box below). The results of the data analysis done for this report show that the relationship between e-commerce development and household consumption growth is stronger for the rural sample, inland regions, and poor households, suggesting that e-commerce development helps reduce spatial inequality in consumption (Luo et al. 2019). For people in remote areas with limited access to markets, the saving in search costs and the increase in variety of products accessible online compared with traditional brick-and-mortar stores can be particularly large.

E-Commerce Development and Household Consumption Growth

Access to an online market allows people in rural areas to enjoy the convenience, variety, and low prices enjoyed by people in big cities. This is driven by two main factors.

Lower search cost makes price discovery easier, bringing the law of one price closer to reality (Gorodnichenko and Talavera 2017). Lower transaction costs increase the level of specialization in the society and create more trade. According to a McKinsey report by Dobbs et al. (2013), e-tailing may have lowered China's average retail price by 0.2 to 0.4 percent in 2011 and 0.3 to 0.6 percent in 2012.

The saving in search costs and the increase in variety of products accessible online compared with traditional brick-and-mortar stores can be particularly large for people in remote areas. E-tailing is not just a replacement of purchases that would otherwise take place but could spur incremental consumption particularly in small cities and towns. Couture et al. (2018) show that 62 percent of goods bought through Alibaba's Rural Taobao platform were not available in the village.

While the increase in market access is most likely beneficial for consumers, particularly those in remote areas, the declining effect of distance and national geographic barriers might negatively affect local producers due to increased competition from outside. The extent to which e-commerce can help raise income levels among the poor or disproportionately support the development of poorer regions remains an open question. While the platform companies can generate significant network effects and high user values, they can also carry risks, including the potential risks faced by consumers as well as producers (particularly small producers) in the "winner takes all" situation (Moreau 2017, Choudary 2017).

E-commerce can contribute to new job creation. The Taobao Village Survey shows that it has done so mainly through three channels: fostering entrepreneurship (such as self-employed e-shop owners); creating jobs directly related to e-commerce (such as e-shop workers as well as jobs that directly serve e-shops, such as website designers, e-shop models, and e-shop photographers); and creating jobs indirectly related to e-commerce with linkages upstream or downstream (such as logistics services, materials and intermediate input providers to e-shops, and the like). About half of the entrepreneurs on Alibaba platforms are women, compared to only one-quarter among all entrepreneurs in China; three-quarters of rural e-tailers are 20-29 years old.

E-commerce participation can contribute to household income growth. An examination of the pattern of e-commerce participation in Taobao Villages as it related to household income and growth had three main findings. First, e-commerce participation is not random: participation is higher among the households with younger household heads, with secondary education, particularly those with technical and vocational education, urban work experience, and knowledge of

e-commerce. Second, e-commerce participation is associated with higher household income, with some indications that participation has a strong positive effect on household incomes. Third, e-commerce appears to yield benefits that are broadly shared among participants in an equitable way in Taobao Villages.

However, as reported in the Taobao Village Survey, the high cost of online advertising, tough competition, and lack of skills are considered by e-shop owners the top three obstacles to developing e-commerce. Access to finance remained an important constraint. The majority of e-households have never borrowed for operations, or only borrowed from household members, friends, and relatives. The turnover rate for e-shops is high, particularly for smaller e-shops and those that are only one or two years old. While targeted support at the beginning of a new e-shop can help overcome some of the challenges, much depends on the products offered, the level of competition, and the ability to market the e-shop.

To scale up success where e-commerce is already in place and enhance its effect on people's living standards, it is necessary to continue upgrading the value chain and increasing the value added of online product sales, as well as supporting expansion of "winners" (selected by the market) and the entry of more e-shops.

- First, most e-shops sell the same or similar products within their market. Many Taobao Villages focus on niche products for which they have a comparative advantage. However, as e-commerce continues to develop, replication can result in low-end competition within the same village or with an adjacent village, driving down profit margins or leading to disputes where there are no patents or ownership rights for products or process innovations are unclear.
- Second, most e-shops are small-scale operations. Nearly two-thirds of Taobao Village e-shop owners are self-employed and have no employees and a third have fewer than five workers. While this allows flexibility of production and may make it easier to change products to meet evolving demand, it limits the ability to scale up or upgrade the technology when demand surges. Such limits can be severe for agricultural produce or products that require long periods to produce (such as a season for fruit or years for tree products) and cannot be outsourced to increase the scale of production. In these situations, e-shop owners need to manage the supply in line with the demand and not accept more orders online than they can reasonably fulfill given their production capacity.
- Third, an online market provides low-cost entry for small businesses, but it is also important to support the continuing growth of "winners" to generate employment for other villagers. Support is also needed for upgrades to the value chain, exploration of clustering and agglomeration to achieve economies of scale, and continuation of innovation. Many e-shop owners are women and youth, who often have difficulty accessing finance, and for women, have more responsibility taking care of the family. Targeted support that helps them continue to grow, including providing equal-opportunity access to resources, is important.

Conclusion and Next Steps

The success of e-commerce development in rural China shows that the benefits of digital technology are not necessarily limited to high-income countries and urban areas. With the right conditions, it can flourish in developing countries and in rural areas and can be a powerful instrument for rural vitalization and poverty reduction. The rapid development of e-commerce in rural China has built on tremendous improvements in human capital as well as in logistics and transport infrastructure. The former includes compulsory nine-year education as well as the experience and entrepreneurial spirit that returned migrants bring home. These “analog complements” are reflected in a Human Capital Index of 0.67 and a Logistics Performance Index of 3.61 and, ranking China 46 and 26 in the world, or 6 and 1 among all upper-middle-income countries respectively.

E-commerce is not suited to all locations, all households, or all products and should be deployed with care. Considering local conditions and drawing on the existing and latent comparative advantages are important for selecting e-commerce as an instrument for poverty reduction and inclusive growth. The available data are not sufficient to quantify the effects of e-commerce development on local economic development. More research is needed on the cost-effectiveness of the targeted inventions and the causal relationship between e-commerce participation and improved lives and to identify the channels through which such benefits are realized. Where e-commerce is a suitable and desirable development option, policymakers and development partners can benefit from information and lessons learned about policies that can support its development in rural areas and enhance its effect on job creation and inclusive growth.

Risks and Challenges in E-Commerce Development. As e-commerce continues to prosper and becomes more important in the economy, new risks and challenges arise. While technology transformation and platform economy increase market efficiency, the accompanied disruption brings risks for sellers and buyers, as well as to the e-commerce ecosystem. On the regulatory side, there are critical issues to grapple with, such as how to regulate the platform providers to ensure a level playing field for comparable digital services, protect consumers, and ensure fairness between online and physical vendors.

As indicated in the literature, sellers and buyers face special risks online compared to offline business—from cyber security, privacy, fraudulent or defective/counterfeit products, and technical concerns regarding electronic payment, and risks stemming from imbalances in competition among platform providers. Large platform companies can generate significant network effects and create high user values and can be efficient and socially beneficial. But existing large platform companies with significant advantages over new entrants can potentially distort the market. With rising challenges and opportunities in

the platform economy, a regulatory and policy framework is needed to support the healthy development of the ecosystem, providing level playing field and protection to all parties, including sellers and buyers, as well as the platform companies.

Due to the potential reach of all sellers in an e-commerce marketplace, competition is fierce and survival uncertain. In Taobao Villages, e-shops that have been in operation for two years or more show strong performance, but few survive the earliest years. Low profit margins are a major challenge for young online shops. In addition, the “one-click-away” nature and “just-in-time” delivery requirement can make it difficult for sellers to determine the right level of stock required to maximize profits (and still quickly respond to market demand) and minimize risks (due to large stocks of unsellable products). Yet, however harsh that is for small online shops, the platform economy can provide a niche market that may not exist in traditional brick-and-mortar business, which is particularly important for the small shops, and produces efficiency gains overall. In addition, customers can benefit from the reduction of information asymmetry, allowing them to find products and compare prices more quickly.

Where to Go from Here. The sun is rapidly setting on the “wild frontier days” of e-commerce development and a new phase is beginning during which new balance between online buyers, online sellers of all sizes, platform companies, and traditional offline business is being developed. This new frontier will require careful testing of policies, and any resulting regulations, to ensure their effectiveness and assess their effects on the market and implications for the entire economy and human welfare. New institutional arrangements, from business registration to tax administration, will need to be developed or strengthened to meet evolving needs. It is therefore essential to continue serving e-merchants as well as supporting cross-fertilization with traditional offline businesses.

The success of e-commerce development in rural China has unique elements. Countries that look to China for evidence need to keep in mind the importance of the “analog complements.” Nevertheless, China’s experience offers pointers for supporting the development of e-commerce for fostering employment and support growth. Most notably, the China experience shows that, targeted support that lowers entry barriers and transaction costs, addresses information asymmetry, and allows new entrants to participate in online markets, can help to launch e-commerce in less advantaged areas.

It may not be necessary to wait for perfect conditions to develop e-commerce. Creative solutions can go a long way to overcome hurdles, but execution of the arrangement must consider the local culture and have solid business and institutional supports in place. Where large domestic markets are already established, specific improvements may be required. Where markets are less developed or fragmented, a step-by-step approach may be needed, letting the market play a role in “selecting the winners,” focusing support in areas with most potential, and supporting the demonstration effects of early successes spill

over to other areas. The additional resources generated from the early successes can then be used to support the next round and provide equitable opportunities for all. As always where poverty reduction and shared prosperity are the goal, the government cannot operate alone—private sector partners, citizens, and local communities need to help develop solutions and spur action.



Notes

1. China has two large e-commerce platform companies, Alibaba and JD, and many smaller ones. Alibaba Group has the largest share of the e-commerce market. According to eMarketer.com, in 2018, Alibaba accounted for 58 percent of the total retail e-commerce sales, followed by JD.com (16 percent), while the market shares of the smaller companies, despite rapid growth by some in recent years, remain less than 5 percent each. In this report, unless otherwise specified, e-commerce transaction data refer only to the Alibaba platforms, which account for the majority of the market in China. Source: Sharon Kwok, "Alibaba tops e-commerce market share while facing fresh competition in China," 11/7/2018: <https://www.marketing-interactive.com/alibaba-tops-e-commerce-market-share-while-facing-fresh-competition-in-china/>
2. Poverty-stricken counties are defined by the State Council Leading Group Office of Poverty Alleviation and Development. See Appendix C for details. Source (in Chinese): http://www.cpad.gov.cn/art/2013/3/1/art_50_23734.html.
3. See McKinsey 2017.
4. These seven inland provinces are Gansu, Heilongjiang, Inner Mongolia, Jilin, Qinghai, Tibet, and Xinjiang.
5. Source: China, Ministry of Commerce 2019.
6. Several of the case studies, including Heze and Huimin in Shandong province and Wuyi in Zhejiang province, used to be poverty stricken-counties by provincial standards.
7. See details in Appendix F.

References

- China, Ministry of Commerce. 2019. E-commerce in China 2018 (中国电子商务 2018) .
- Choudary, Sangeet Paul. 2017. "The Dangers of Platform Monopolies." <https://knowledge.insead.edu/blog/insead-blog/the-dangers-of-platform-monopolies-6031#jw4PATGfLBsUm3M5.99>
- Couture, Victor, Benjamin Faber, Yizhen Gu, and Lizhi Liu. 2018. E-commerce integration and economic development: evidence from China. National Bureau of Economic Research.
- Dobbs, Richard, Yougan Chen, Gordon Orr, James Manyika, and Elisie Chang. 2013. *China's E-tail revolution: Online shopping as a catalyst for growth*: McKinsey Global Institute.
- Gorodnichenko, Yuriy, and Oleksandr Talavera. 2017. "Price setting in online markets: Basic facts, international comparisons, and cross-border integration." *American Economic Review* 107 (1):249-82.
- Kwok, Sharon. 2018. "Alibaba tops e-commerce market share while facing fresh competition in China." November 7. <https://www.marketing-interactive.com/alibaba-tops-e-commerce-market-share-while-facing-fresh-competition-in-china/>
- Luo, Xubei, Yue Wang, and Xiaobo Zhang. 2019. E-Commerce Development and Household Consumption Growth in China. The World Bank.

- McKinsey. 2017. Digital China: powering the economy to global competitiveness. Mckinsey Global Institute.
- Moreau, Bastien. 2017. "Why is Konga worth 'only' \$35 m and Jumia \$1 billion?"<https://www.linkedin.com/pulse/why-konga-worth-only-35m-jumia-1-billion-bastien-moreau>
- OECD (Organisation for Economic Co-operation and Development). 2017. Harnessing E-Commerce for sustainable development, in Aid for Trade at a Glance 2017: Promoting Trade, Inclusiveness and Connectivity for Sustainable Development, OECD Publishing, Paris, https://doi.org/10.1787/aid_glance-2017-10-en.
- UNCTAD (United Nations Conference on Trade and Development). 2001. *E-commerce and development report 2001*. United Nations Conference on Trade and Development.
- Zeng, Yiwu, Dongmao Qiu, Yiting Shen, and Hongdong Guo. 2015. "Study on the formation of Taobao village: taking Dongfeng village and Junpu village as examples." *Economic Geography* 35 (12): 90-97. (曾亿武, 邱东茂, 沈逸婷, and 郭红东. 2015. "淘宝村形成过程研究 : 以东风村和军浦村为例 ." 经济地理 35 (12):90-97.)

Abbreviations

CAGR	Compound annual growth rate
CFPS	China Family Panel Studies
GDP	Gross domestic produce
GMV	Gross merchandise value
HCI	Human Capital Index
ICT	Information and communications technology
IT	Information technology
LPI	Logistics Performance Index
OBI	Online Business Index
OSI	Online Shopping Index
RMB	Renminbi
SME	Small and medium enterprise
UMIC	Upper-middle income country

Part I

E-Commerce

Development in China

E-commerce is rapidly changing the way people buy and sell, bringing convenience to consumers, increasing competition in production, and overshadowing traditional brick-and-mortar retail.¹ E-commerce platforms can lower product search costs, fill gaps in matching demand and supply, increase the variety of products available online, align prices across market segments, reduce prices through competition, and improve consumer welfare. This way of doing business has already started to reshape production and consumption patterns, with an increasing share of trade taking place through e-commerce platforms. E-commerce, by using information and communication technology to support innovation and entrepreneurship, is showing promise as a means of improving people's lives.

The reach of e-commerce has expanded in step with expansion in the extent and use of the Internet. Since the early 1990s, Internet users have grown from under 1 percent of world population to 46 percent in 2016 (World Development Indicators 2016), a large percentage of whom use the Internet to buy and sell merchandise. In consequence of that growth, the Internet and e-commerce now reach a broad and growing population of users. The number of online shoppers worldwide reached 1.3 billion people in 2017.²

China has quickly become the largest e-commerce market in the world. The 2018 China E-Commerce Report by the Ministry of Commerce shows that total e-commerce trade volume reached 31.63 trillion RMB, with year-on-year growth of 8.5 percent. Total online retail volume reached 9.01 trillion RMB, with year-on-year growth of 25.5 percent. This rapid growth is expected to continue. A recent Goldman Sachs (2017) report projected that China's online retail market will reach \$1.7 trillion (roughly 11.6 trillion RMB)³ by 2020, more than double its size in 2016.

E-commerce development in China is uneven, with e-commerce much more developed in coastal provinces and urban areas and a high concentration of e-commerce activities in Guangdong, Jiangsu, Zhejiang, and within less-developed areas, some places much more than others. Nonetheless, the growth rate of online business is much faster in rural areas. In part this has been supported by targeted interventions of the government and private sector companies to support e-commerce development in rural and less-developed areas for poverty alleviation and rural vitalization.



CHAPTER ONE

The Phenomenal Development of E-Commerce in China

E-commerce developed rapidly in China, though with large disparities among regions and across households. This chapter examines that growth in detail, profiling e-commerce in China at the national, provincial, household, and individual levels using public data as well as statistical yearbooks and household surveys.⁴ It presents basic facts about the e-commerce market structure in China, and the patterns and evolution of the development of e-commerce—its beginnings and its geographic evolution from the early 2000s to the present—at the national, provincial, household, and individual levels.

1.1 E-Commerce Market Structure

China currently has the world's biggest e-commerce market with one of the fastest growth rates (Table 1.1). Asia and the Pacific region share 58.6 percent of the world's online retail market. The Chinese market alone accounts for 78.3 percent of the region or 45.8 percent of the world, which is more than the combination of North America, Europe, Latin America, Middle East, and Africa. The annual growth rate of online retail sales in China is twice that in North America, and that in Western Europe. The Internet penetration rate in China is 55.8 percent, which is slightly higher than the world average but with room to grow to the levels in Europe and the Americas (Table 1.2). According to Morgan Stanley research (2015), Internet penetration, especially through mobile devices, goes hand-in-hand with e-commerce adoption. Further progress in Internet penetration will likely keep fueling the development of e-commerce in China.

Table 1.1. E-Commerce Development in the World (2017)

	Annual online retail sales (billion USD)	Share of world total	Annual growth compared to previous year
Asia and Pacific	1,349.2	58.6%	31.1%
Central Eastern Europe	44.8	1.9%	24.6%
Latin America	44.6	1.9%	21.9%
Middle East and Africa	23.3	1.0%	24.9%
North America	486.8	21.1%	16.7%
Western Europe	355.4	15.4%	15.4%
China*	1,055.9	45.8%	32.2%
Total	2,304.1	100%	24.8%

Note: China, Ministry of Commerce 2018a.

*According to WDI (World Bank), 2017 average exchange rate is 6.8 yuan per US dollar.

Table 1.2. Internet Penetration in the World (2017)

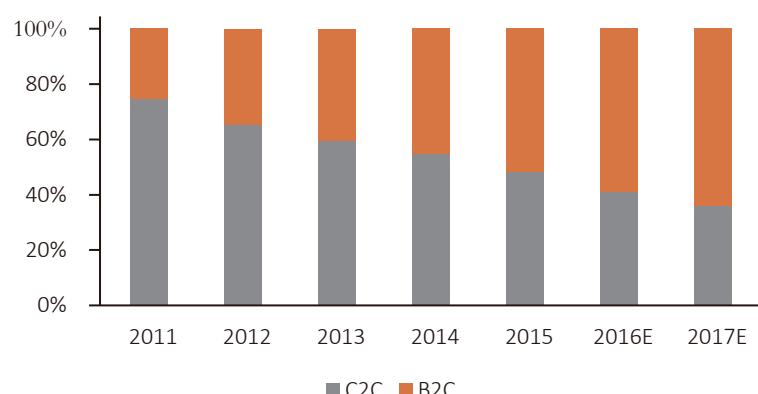
	Number of people using Internet (millions)	Penetration rate as percent of population
World	3,578	48.0%
Africa	213	21.8%
Arab States	173	43.7%
Asia and Pacific	1,813	43.9%
Europe	501	79.6%
The Americas	662	65.9%
China*	772	55.8%

Note: China, Ministry of Commerce 2018a. For region definitions, see <https://www.itu.int/en/ITU-D/Statistics/Pages/definitions/regions.aspx>

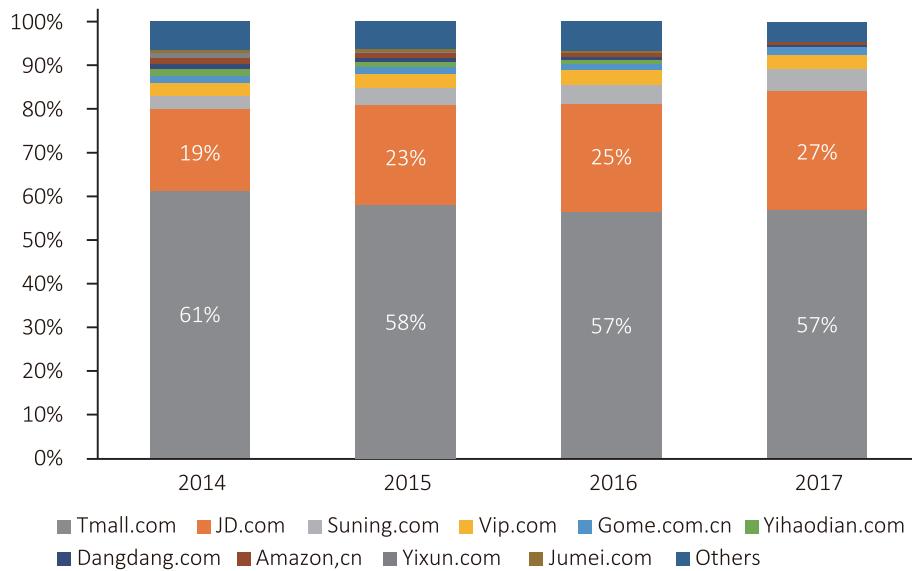
*China numbers are from CNNIC (2019).

China has two large e-commerce platform companies—Alibaba and JD—and many smaller ones. Alibaba Group has the largest share of the e-commerce market. According to eMarketer.com,⁵ in 2018, Alibaba accounted for 58 percent of the total retail e-commerce sales in China, followed by JD.com (16 percent), while the market shares of the smaller companies—despite rapid growth by some in recent years—remain less than 5 percent each.

The patterns of e-commerce market share in China differ across B2B, B2C, and C2C.⁶ In the B2B market, which exclusively involves businesses, Statistica.com⁷ reports that in 2018, Alibaba had 30.1 percent of the market, while JD.com did not participate. B2C retail business has been rapidly expanding compared to the consumer-to-consumer (C2C) model. A Deloitte report documents an increase in the B2C share from 25 percent in 2011 to 52 percent in 2015, a trend that is expected to continue (Figure 1.1). Data from iResearch.com indicate that, in 2017, Tmall.com (B2C platform of Alibaba Group) had 57 percent of the market while JD.com had 27 percent (Figure 1.2), changing from 61 percent and 19 percent respectively in 2011. In the C2C market, Taobao.com (C2C platform of Alibaba Group) was dominant in 2017; at the time, JD.com had just announced the launch of its C2C platform.⁸

Figure 1.1. Market Shares of B2C versus C2C

Source: Delloitte, China E-Retail Market Report 2016.

Figure 1.2. B2C Market Share in China

Source: iResearch.com

1.2 E-Commerce Growth at the National and Subnational Levels

E-Commerce Growth at the National Level

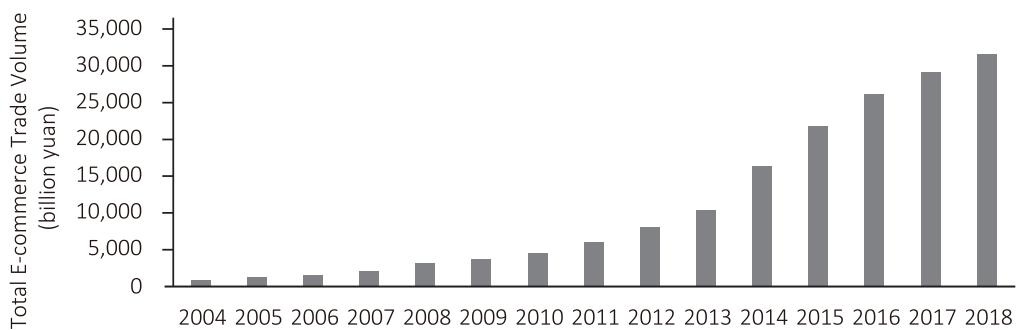
This section uses statistics from the Ministry of Commerce and National Bureau of Statistics to examine the patterns and evolution of e-commerce growth at the national and subnational levels. See Appendix A for definitions of the e-commerce indicators used in this report.

China has become the largest and one of the fastest growing e-commerce markets in the world. Annual e-commerce trade volume in China increased rapidly from 2004 to 2018, growing from RMB 930 billion (\$112 billion) to RMB 32 trillion (\$5 trillion), a compound annual growth rate (CAGR) of 29 percent (Figure 1.3). In 2018, the total volume of e-commerce imports and exports inspected by customs was RMB 134.7 billion, an increase of 49 percent compared to 2017.⁹

Online retail sales have grown rapidly (Figure 1.4). As of 2017, China had 772 million Internet users, 533 million of whom made purchases online.¹⁰ The total volume of retail sales (goods and services) online in China vaulted from

RMB 126 billion (\$18 billion) in 2008 to RMB 9 trillion (\$1.36 trillion) in 2018.¹¹ The growth in sales was accompanied by similarly large increases in the number of packages shipped from 3.7 billion in 2011 to 40 billion in 2017 and 51 billion in 2018,¹² the majority related to e-commerce (China, State Post Bureau 2017). The share of total retail sales of consumer goods increased from 11 percent in 2015 to 18 percent in 2018. Nationally in 2018, online retail sales of goods alone were RMB 7.02 trillion, representing a year-to-year increase of 25.5 percent. According to the Ministry of Commerce (2018c), online retail sales of goods from January to November in 2018 contributed 44 percent of the growth of total retail sales of consumer goods.

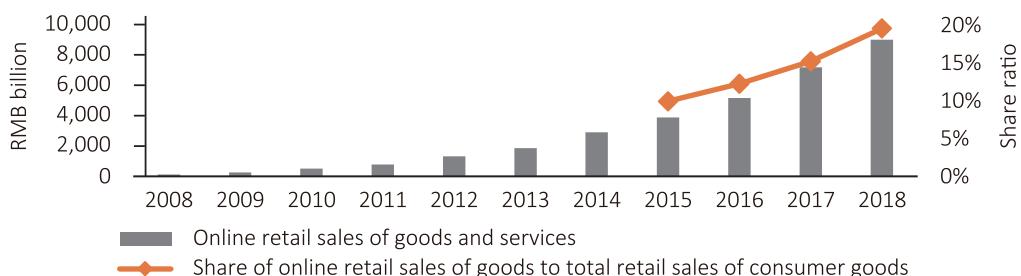
Figure 1.3. Total E-Commerce Trade Volume in China



Source: China, Ministry of Commerce 2014, 2015, 2016a, 2017b, 2018a, 2019.

The share of e-commerce in total retail sales in China is one of the highest in the world. At about 18.4 percent in 2018, it slightly surpasses the share in United Kingdom. According to the Office for National Statistics, the share of Internet sales in the United Kingdom ranged from 17.1 to 18.3 percent each month in 2018.¹³ The U.S. Census Bureau data indicate that e-commerce retail accounted for 9.6 percent of total retail in the United States in 2018.¹⁴

Figure 1.4. Online Retail Sales in China



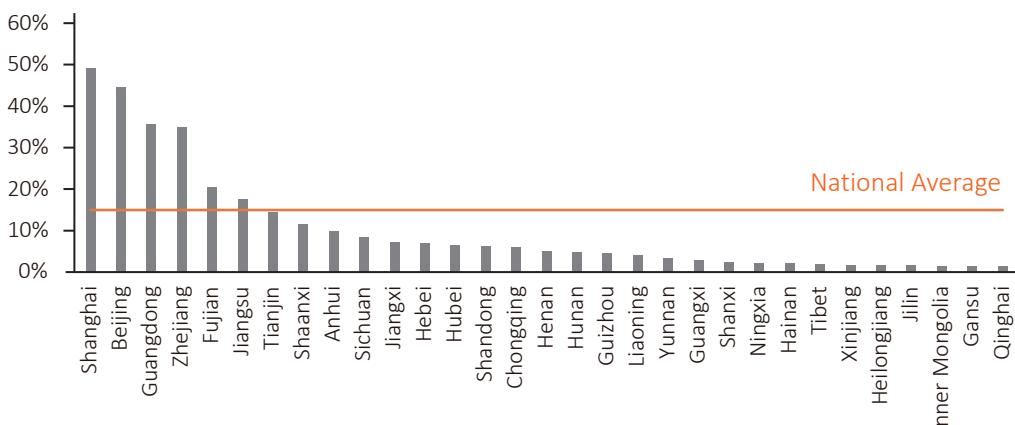
Note: The share ratio only takes retail sales of goods into account, since total retail sales of consumer goods does not include services.

Sources: China, Ministry of Commerce 2014, 2015, 2016a, 2017b, 2018a, 2019; National Bureau of Statistics of China. The share ratio is staff calculation based on data from the two sources.

E-Commerce Growth at the Provincial Level

The development of online retail has been unevenly distributed among Chinese provinces. In Shanghai, for example, 49 percent of total retail sales of consumer goods were purchased online in 2017, followed by nearly 44 percent in Beijing, 36 percent in Guangdong, and 35 percent in Zhejiang, which are at coastal area and with higher economic development level. However, the share is much lower (less than 2 percent) in seven inland provinces (Figure 1.5).¹⁵

Figure 1.5. Share of Online Retail Sales of Goods to Total Retail Sales of Consumer Goods in Provinces (2017)



Source: Staff calculation based on China Statistical Yearbook 2018.

Moreover, regional concentration of online retail sales has been decreasing. The top five provinces in online retail sales amount—Guangdong, Zhejiang, Jiangsu, Beijing, and Shanghai—jointly shared almost 68 percent of online retail sales in 2017, 4 percentage points smaller than in 2015. Online retail sales also grew faster in the western region than in the eastern region. In 2017, the western region achieved an annual growth of online retail sales of 45 percent, 12 percentage points higher than in the eastern region. The number of online shops increased at a relatively high rate in some western provinces as well, such as Qinghai, Tibet, and Gansu (China, Ministry of Commerce 2018b).



There is a notable difference in the development of online retail between urban and rural areas. In 2018, rural Internet users (222 million) accounted for about 27 percent of the national total (829 million), while urban Internet users were 73 percent, much higher than the share of urban population (60 percent). Similarly, Internet penetration in rural areas was 38 percent, compared to 75 percent in urban areas.¹⁶

The wide gaps across regions and between rural and urban areas imply large growth potential in less-developed areas. Nearly three-quarters of online stores and Internet users are in urban areas.¹⁷ In fact, total online retail sales have grown faster in rural areas than in urban areas in the past several years.¹⁸ Rural online retail sales increased from RMB 180 billion in 2014 to RMB 1.24 trillion in 2017, representing 17 percent of the total online retail sales, an increase from 6 percent in 2014.¹⁹ Nonetheless, from January to November 2018, online retail sales in rural China reached RMB 1.24 trillion, increasing 31 percent compared to 2017, and the national online retail sales of agricultural products was RMB 201.35 billion, a year-to-year increase of about 34 percent.²⁰

E-Commerce Growth at the County Level

The concentration and unevenness of e-commerce development are significant at the county level. Drawing from the Online Business Index and Online Shopping Index developed by AliResearch (Box 1.1), both online purchase and online sales developed rapidly over the period 2013–2017. Online purchases and online sales are both much more developed in the coastal areas, and gaps between the coastal region and the inland region remained wide over time. Compared with online purchases, online business is even more concentrated, particularly in Zhejiang, Jiangsu, and Shanghai.

Box 1.1. Online Business Index and Online Shopping Index

AliResearch developed the OBI and OSI. OBI is a constructed index measuring the density of online stores and the percent of online stores with annual online sale above RMB 240,000. The value of the index ranges from 0 to 100. The higher the value, the more developed the online sales. OSI is a constructed index measuring the density of online buyers and the percent of online buyers with annual online consumption above RMB 10,000. The value of the index ranges from 0 to 100. The higher the value, the more developed the online purchase.

The OBI and OSI data were obtained from the AliResearch team. The online transaction numbers are from the Alibaba platform, which accounts for most online transactions in China, and therefore the OBI and OSI value calculated from the Alibaba platform may largely reflect the e-commerce development levels. See Appendix B for details of the construction of OBI and OSI.

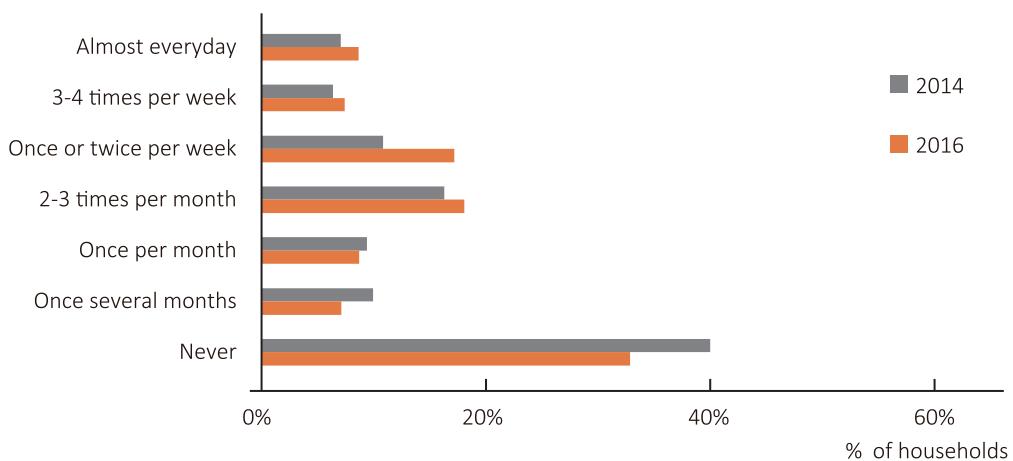
1.3 E-Commerce Growth at the Household and Individual Levels

Using the Internet and online purchasing have increasingly become a part of daily life in China. Many households and individuals use the Internet to conduct various activities and are such regular users of online stores that they receive one or more packages per day. The share of households making online purchases and the amount of consumption online has increased sharply. This section draws from data from the China Family Panel Studies (CFPS),²¹ a nationally representative household survey conducted by Peking University, to examine the patterns of Internet use and online consumption.

Internet Use and Online Consumption

Households use the Internet to conduct various commercial activities. Drawing from the CFPS survey data, in 2014, about 40 percent of households did not use the Internet to do commercial related activities such as online banking and online shopping; in 2016, this had declined by 7 percentage points to about 33 percent of households.²² The frequency of Internet use to do commercial related activities tended to increase from 2014 to 2016. Identified by the highest frequency conducting commercial activities online among all household members, in 2016, most households with online commercial activities engaged in those activities once or twice per week (17 percent) or two to three times per month (18 percent), while in 2014, 16 percent do two or three times per month, 11 percent do once or twice per week, and 10 percent do once every several months (Figure 1.6).

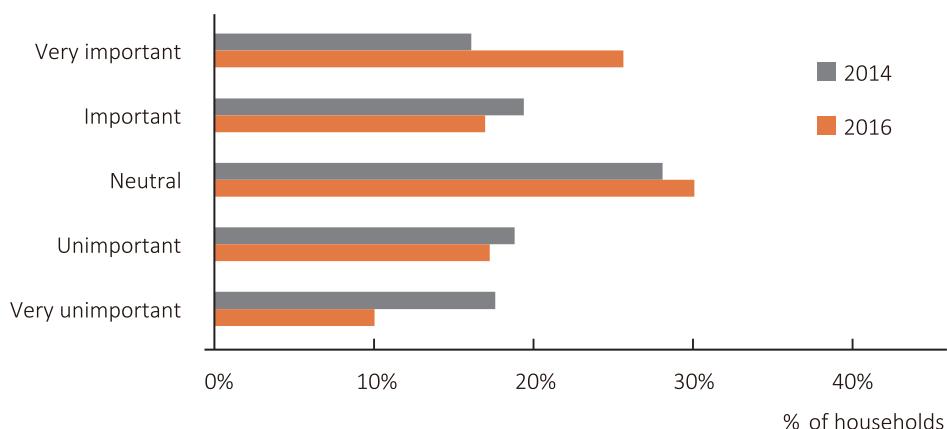
Figure 1.6. Frequency of Internet Use to Do Commercial Related Activities



Source: Team estimates based on CFPS 2014, 2016.

The perception of the importance in terms of commercial related activities while using the Internet increased over time.²³ Among households using the Internet for commercial activities, 43 percent believed that commercial activities are important, and 30 percent were neutral in 2016, compared to 35 percent and 28 percent in 2014, respectively (Figure 1.7).²⁴

Figure 1.7. Perception of Importance in Terms of Commercial Related Activities While Using the Internet

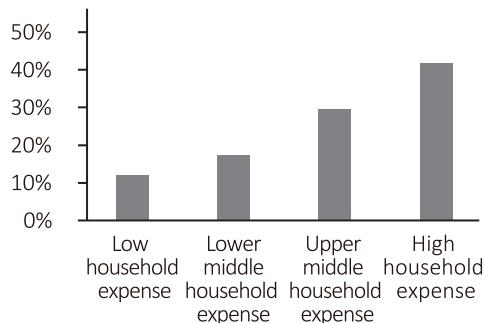


Source: Team estimates based on CFPS 2014, 2016.

Online Consumption Patterns at the Household Level

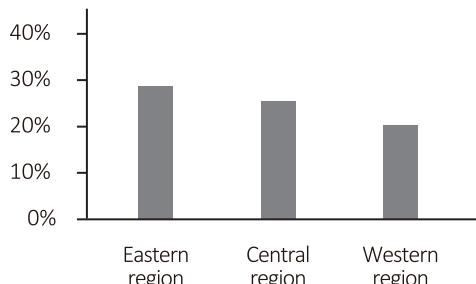
Drawing from CFPS data, in 2015 the share of households that made online purchases reached 26 percent; and for households that purchased online, those purchases accounted for 8 percent of the total consumption.²⁵

Households with higher income or that live in more developed areas are more likely to purchase online. The shares of households with higher per capita expenses, in coastal regions, and in cities that have made purchases online are higher than those with lower per capita expenses, in inland regions, and in rural area (Figure 1.8–Figure 1.10). Across income levels, 42 percent of the richest quartile of households made online purchases in 2015 and 12 percent of the poorest quartile did so. Across regions, the share is nearly 30 percent in the eastern region, 25 percent in the central region, and 20 percent in the west. Across urban and rural, one-third of the households in urban areas have made purchases online compared to 15 percent in rural areas.

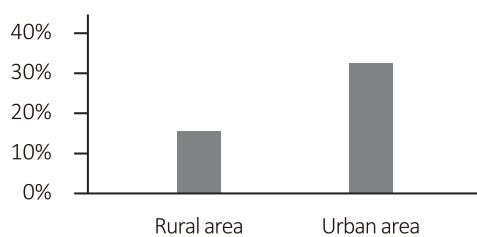
Figure 1.8. Share of Households Purchasing Online in 2015, by Household Expenses

Note: Household expense groups are divided by annual total household expenses in quartile.

Source: Team estimates based on CFPS 2016.

Figure 1.9. Share of Households Purchasing Online in 2015, by Regions

Source: Team estimates based on CFPS 2016.

Figure 1.10. Share of Households Purchasing Online in 2015, by Rural and Urban

Source: Team estimates based on CFPS 2016.

The amount of online consumption spending as well as the share of online consumption to total consumption among households purchasing online increased sharply. Among households purchasing online, the average total online consumption amount per household in 2015 was RMB 5,106 compared to RMB 4,227 in 2013, a 21 percent increase (Figure 1.11–Figure 1.13).²⁶ Moreover, the average share of online consumption to total consumption in households purchasing online, at 8 percent in 2015, was two percentage points higher than in 2013.²⁷

Between 2013 and 2015, for all household that purchased online in all regions and in both rural and urban areas, the average ratio of online consumption to total consumption increased (Figure 1.15 and Figure 1.16). This ratio increased for all households that purchased online except the poorest quartile during this period. In 2015, in average, households that purchased online of all income levels spent roughly the same ratio (8 percent) of total consumption online (Figure 1.14).

Figure 1.11. Average Online Consumption Amount per Household Purchasing Online (RMB), by Household Expenses

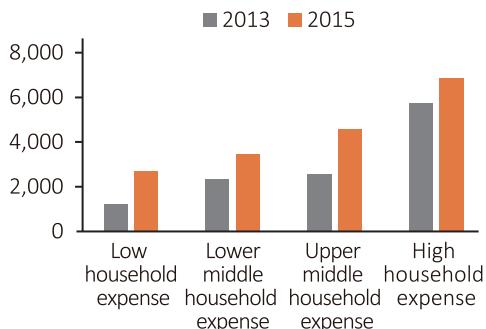


Figure 1.12. Average Online Consumption Amount per Household Purchasing Online (RMB), by Regions

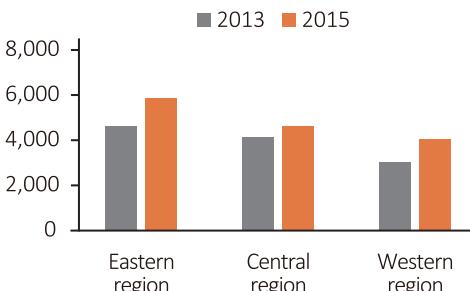


Figure 1.13. Average Online Consumption Amount per Household Purchasing Online (RMB), by Rural and Urban

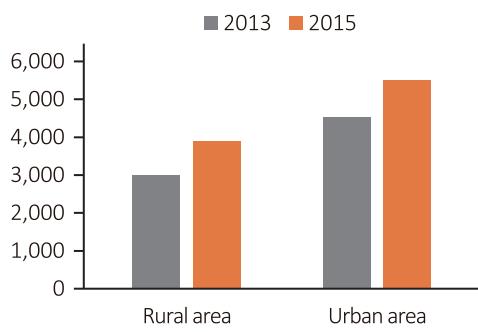


Figure 1.14. Share of Online Consumption to Total Consumption per Household Purchasing Online, by Household Expenses

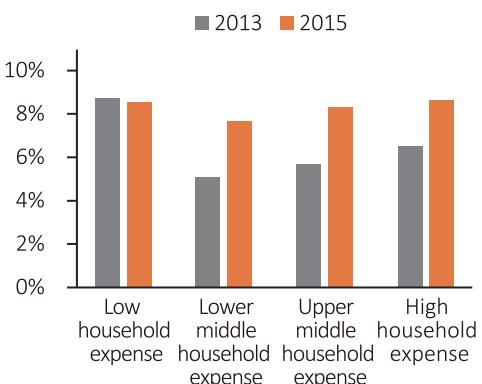


Figure 1.15. Share of Online Consumption to Total Consumption per Household Purchasing Online, by Regions

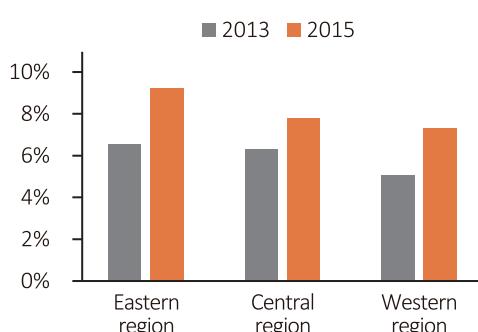
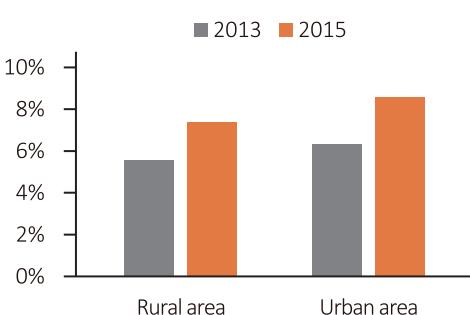


Figure 1.16. Share of Online Consumption to Total Consumption per Household Purchasing Online, by Rural and Urban



Source: Team estimates based on CFPS 2014, 2016.

Online Consumption Patterns at the Individual Level

The share of people who shopped online has increased, as has their amount of online consumption.²⁸ In 2013, 17 percent of adults²⁹ purchased online, and the share increased to 19 percent in 2015. Accompanying the growing number of online buyers is a rise in their online consumption amount. Among adults who shopped online, average online consumption increased 15 percent, from RMB 3,031 in 2013 to 3,487 in 2015.

People in the eastern region are more likely to shop online and spend larger amounts, followed by the central region, while those in the western region are less likely to consume online and more likely to spend less (Figure 1.17 and Figure 1.18). Growth in the share of people shopping online is higher in the central and western region; while the growth rate of average online consumption amount per person is higher in the eastern region. In 2015, 21 percent of people in the eastern region, 19 percent in the central region, and 16 percent in the western region shopped online, compared to 12 percent, 16 percent, and 12 percent in 2013, respectively. The online consumption amount per person who purchased online increased in all three regions. The average amount in the eastern region grew 20 percent, from RMB 3,460 in 2013 to RMB 4,147 in 2015, the largest amount and highest growth compared to the other two regions. The average online consumption amount in the central region increased 14 percent, from RMB 2,708 in 2013 to RMB 3,092 in 2015, while that in the western region rose 14 percent, from RMB 2,408 in 2013 to 2,752 in 2015.

Figure 1.17. Share of People Shopping Online, by Regions

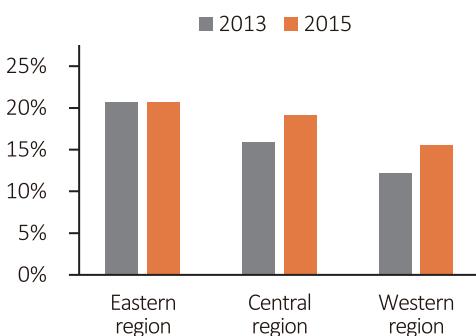
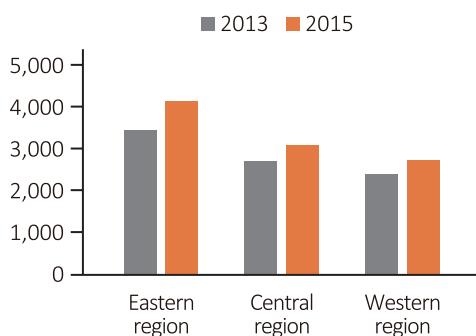


Figure 1.18. Average Online Consumption Amount per Person (RMB), by Regions



Source: Team estimates based on CFPS 2014, 2016.

Women are more likely to shop online, but men tend to spend more and with a faster growth rate (Figure 1.19 and Figure 1.20). Twenty percent of women shopped online in 2015, compared to 18 percent of men, and the share increased by 2 percentage points for both from 2013 to 2015. The average consumption amount per man who shopped online is higher than that per woman, and the gap grew. Men consumed RMB 3,054 online in 2013 and RMB 3,680 in 2015 on average, compared to RMB 3,004 in 2013 and RMB 3,309 in 2015 per woman.

Figure 1.19. Share of People Shopping Online, by Gender

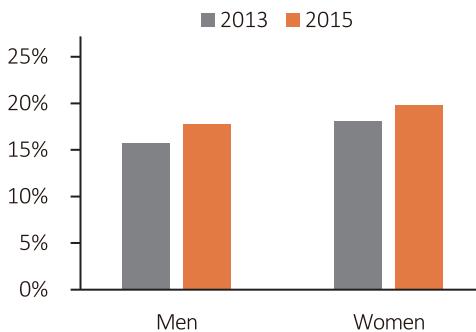


Figure 1.20. Average Online Consumption Amount per Person (RMB), by Gender



Source: Team estimates based on CFPS 2014, 2016.

Younger people are more likely to shop online, while people 30–45 years old spend the most (Figure 1.21 and Figure 1.22). More than half (60 percent) of people under 30 years old shopped online in 2015, an increase from 45 percent in 2013, and the share is much higher than the other age groups. Of people 30–45 years old, 29 percent purchased online in 2015, growing from 19 percent in 2013. Seven percent of people between 45 to 60 years old shopped online in 2015, compared to 3 percent in 2013. Very few people 60 or older purchased online, 0.3 percent in 2013 and 1 percent in 2015. The average online purchase amount per person 30–45 years old who shopped online was RMB 4,153 in 2015, much higher than that spent by others, which was RMB 3,469 for both people 45–60 years old and 60 or above and RMB 3,180 for people younger than 30 years old. The average online consumption amount increased across all age groups. In 2013, the averages are RMB 3,806 by people 30–45 years old, RMB 3,158 by people 45–60 years old, RMB 2,719 by people 60 years old or older, and RMB 2,641 by people younger than 30.

Figure 1.21. Share of People Shopping Online, by Age

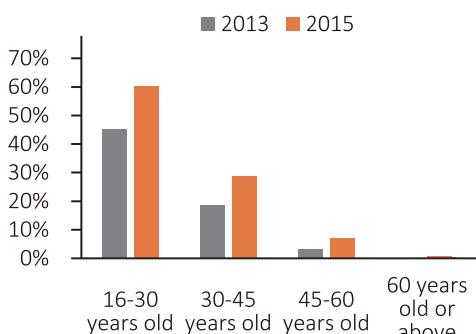
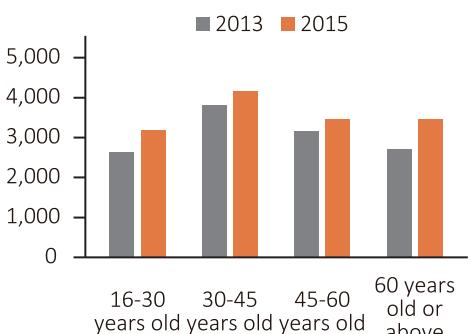


Figure 1.22. Average Online Consumption Amount per Person (RMB), by Age



Source: Team estimates based on CFPS 2014, 2016.

People with higher education levels are more likely to shop online and spend more, and both likelihood of online shopping and online consumption amount increased across all education groups (Figure 1.23 and Figure 1.24). Seventy-two percent of people with university education or above shopped online in 2015, increasing from 65 percent in 2013. Among people with 2 or 3 years of college education, those who shopped online accounted for 52 percent in 2013 and 63 percent in 2015. The share among people with high school education is 32 percent in 2013 and 36 percent in 2015, and for people with junior high school education, the share is 18 percent in 2013 and 22 percent in 2015, while for those with primary education, it is nearly 7 percent in 2013 and slightly above 7 percent in 2015. Very few people who are illiterate or semi-literate shopped online, 0.3 percent in 2013 and 0.9 percent in 2015. People with university education or above achieved the largest online consumption amount per person compared to others, which is RMB 6,879 in 2015, raising from RMB 5,022 in 2013. The average amount consumed online per person who shopped online decreases with each step down in education level. For people with 2 or 3 years of college education, it was RMB 4,618 in 2013 and RMB 4,629 in 2015; for people with high school education, it was RMB 2,891 in 2013 and RMB 3,081 in 2015; for people with junior high school education, it was RMB 1,776 in 2013 and RMB 2,404 in 2015; for people with primary education, it was RMB 1,430 in 2013 and RMB 2,280 in 2015; and for illiterate or semi-literate people, it was RMB 1,049 in 2013 and RMB 1,406 in 2015.

Figure 1.23. Share of People Shopping Online, by Education Level

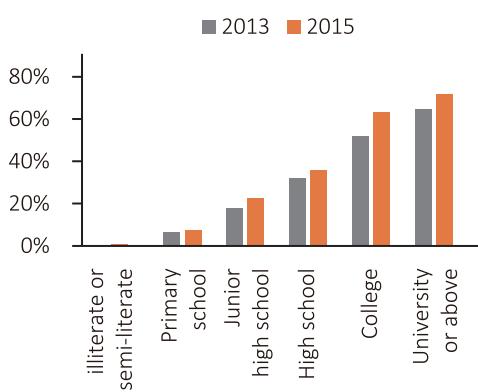
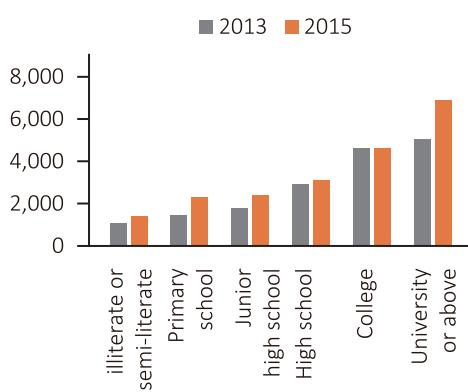


Figure 1.24. Average Online Consumption Amount per Person (RMB), by Education Level

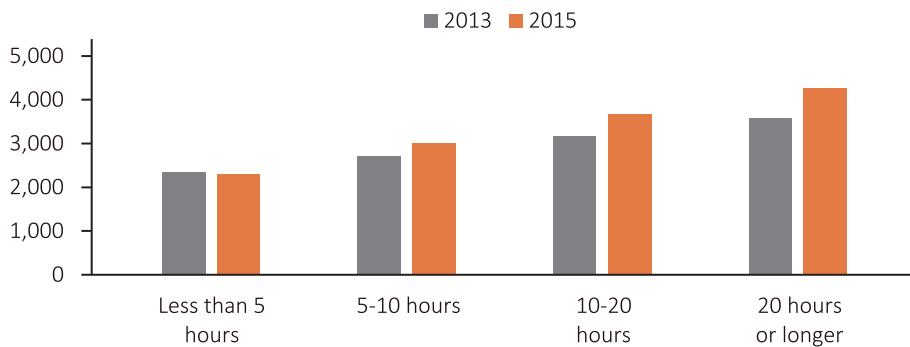


Source: Team estimates based on CFPS 2014, 2016.

The amount of time people spent on the Internet during their leisure time and the amount of online consumption seem to be positively correlated (Figure 1.25). In 2015, people who spent 20 hours or more on the Internet per week for leisure consumed RMB 4,267 per person on average. This is compared to RMB 3,676 for those who spent 10 to 20 hours on the Internet per week, RMB 3,019 for those who spent 5 to 10 hours per week, and RMB 2,288 for those who spent less than 5 hours on the Internet per week for leisure. The increasing pattern was

seen in 2013 as well.

Figure 1.25. Average Online Consumption Amount per Person (RMB), by Length of Leisure Time Spent on Internet per Week



Source: Team estimates based on CFPS 2014, 2016.



Notes

1. E-commerce includes sales and purchases of goods and services conducted electronically over computer networks, with telephone calls, faxes, and manually typed e-mails excluded, and is realized by receiving and placing orders.
 2. Source: UNCTAD (2019), Global e-commerce sales surged to \$29 trillion. <https://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=2034>
 3. If using the exchange rate of US\$1 = 6.8 RMB, the average exchange rate in 2017.
 4. Drawn from public data available to describe the e-commerce development pattern. The definition of e-commerce and the statistics may differ according to the specific sources. The numbers do not represent the views of the World Bank or the Alibaba Group and are not an endorsement of their accuracy.
 5. Source: Kwok 2018.
 6. E-commerce transactions can be categorized into four types based on participants involved: business-to-business (B2B), business-to-consumer (B2C), business-to-government (B2G), and consumer-to-consumer (C2C).
 7. <https://www.statista.com/statistics/243845/market-share-of-b2b-online-retailers-in-china/>
 8. Source: Zhang 2017.
 9. Source: China, Ministry of Commerce 2018a.
 10. Source: China, Ministry of Commerce 2018a.
 11. The U.S. online market in the same period grew from \$142 billion to \$513 billion by comparison. Staff calculation based on U.S. Census Bureau.
 12. Source: China, Ministry of Commerce 2018a.
 13. Internet sales and total retail figures do not include services. Monthly data, seasonally adjusted and excluding automotive fuel. Office for National Statistics, UK: <https://www.ons.gov.uk/businessindustryandtrade/retailindustry/datasets/retailsalesindexinternetsales>
 14. Staff calculation based on U.S. Census Bureau <https://www.census.gov/retail/index.html#ecommerce>. The e-commerce retail and total retail include both goods and services.
 15. These seven inland provinces are Gansu, Heilongjiang, Inner Mongolia, Jilin, Qinghai, Tibet, and Xinjiang.
 16. Source: Internet users and penetration data are from CNNIC (2019). Share of urban population is staff calculation based on National Bureau of Statistics of China.
 17. Source: China, Ministry of Commerce 2017b.
 18. Total rural online retail sale is the sum of online retail sales transaction from e-commerce enterprises—including individuals—operated in administrative regions at or below the county level, excluding city districts (<http://dzsws.mofcom.gov.cn/article/ztxx/ndbg/201706/20170602591881.shtml>).
 19. Source: staff calculation based on China, Ministry of Commerce 2018a and National Bureau of Statistics of China.
 20. See China, Ministry of Commerce 2018c.
 21. <http://opendata.pku.edu.cn/dataverse/CFPS?language=en>.
- Noted that in the round of the survey in 2014, 93 percent of sample households were interviewed in 2014 and 7 percent were interviewed in 2015; in the 2016 round, 88 percent of sample households were interviewed in 2016 and 12 percent were

- interviewed in 2017.
- 22.The survey asks for household adult members' current Internet using behavior. When a household has at least one member using the Internet to do commercial related activities, the household is treated as using the Internet to do commercial related activities.
 - 23.The survey asks for household members' perception of the importance in terms of commercial related activities while using the Internet at the time of the interview.
 - 24.The importance at household level is identified by taking the highest perception of importance among all household members.
 - 25.In CFPS 2014 and 2016, the survey questionnaires include the following question for each adult member: "how much did you spent on online shopping (including paying online) in the past 12 months."
 - 26.The survey asks for household members' online consumption behavior in the past 12 months. The top 1 percent of observations, including households not purchasing online, are treated as outliers and excluded.
 - 27.The top 1 percent of observations, including households not purchasing online, are treated as outliers and excluded.
 - 28.A caveat: it is possible that within a household only one person shops online, using his or her online account to purchase for other members. This might result in a bias of the number of individuals shop online or amount on online shopping per person with online shopping behavior.
 - 29.The pattern of individual behavior discussed in this section is built on observations of adults who are at least 16 years old.

CHAPTER TWO

E-Commerce Development in Poverty-Stricken Counties and Targeted Support Programs



As noted in the preceding chapter, e-commerce development has spread rapidly into less-developed regions and rural areas. Yet that development has been unevenly distributed among counties and online sales have been heavily concentrated in a few counties. According to Ministry of Commerce of China,¹ during the period of China's 12th five-year plan, e-commerce became central to boosting economic development. In the e-commerce 13th Five-Year Plan,² the System of Society-Wide Services for Agriculture encourages e-commerce development in rural areas to strengthen the development of distribution facilities and markets for agricultural products.³

The first section of this chapter draws on Alibaba data to describe the rapid growth of e-commerce in poverty-stricken counties, as well as its uneven development and spatial concentration. It also characterizes the online product structure in these counties, how it differs from products sold elsewhere, and the higher probability that these counties can find success by selling products with unique local character. The second section presents targeted interventions introduced by the government and the Alibaba Group to support e-commerce development for poverty alleviation and rural vitalization in less-developed regions and rural areas.

2.1 E-Commerce Development in Poverty-Stricken Counties

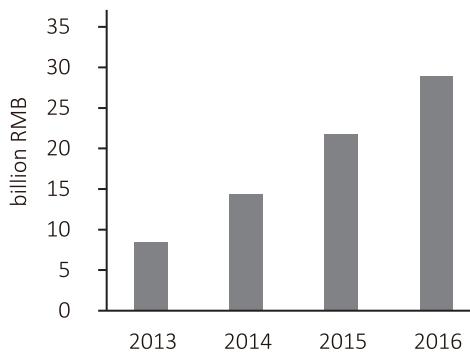
In the 13th Five-Year Program, e-commerce is expected to serve goals for both economic development and social development.⁴ Poverty-stricken counties,⁵ more than half of them in the west, face many development challenges, including limited financial resources, insufficient infrastructure, less diversified industries, overreliance on natural resources, and employment difficulties. To alleviate poverty, these counties are encouraged to promote e-commerce development by increasing infrastructure construction, building logistics networks, promoting local industry development, providing education and training to e-commerce entrepreneurs and workers, and enhancing cooperation with developed areas.⁶



Rapid Development of E-Commerce Activities

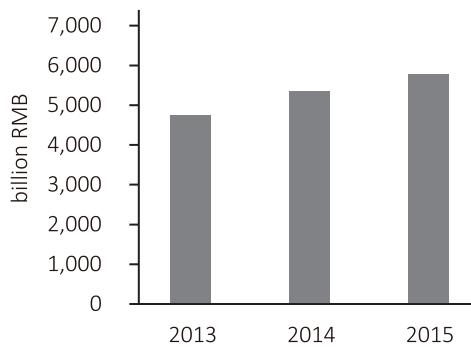
E-commerce development has grown rapidly from a low base in poverty-stricken counties. In 2017, poverty-stricken counties achieved RMB 120.79 billion in online sales, up 52 percent from 2016.⁷ From 2013 to 2016, online sales through the Alibaba platforms⁸ in those counties increased from RMB 8.4 billion to 29 billion (51 percent CAGR), faster than the 10 percent growth in GDP from 2013 to 2015 (Figure 2.1 and Figure 2.2). At the same time, the number of packages sent increased from 17.5 million pieces to more than 129 million (95 percent CAGR), and the number of online shops in the Alibaba platform grew from 141,939 to 331,147 (33 percent CAGR) (Figure 2.3 and Figure 2.4).⁹

Figure 2.1. Online Sales Amount in Poverty-Stricken Counties



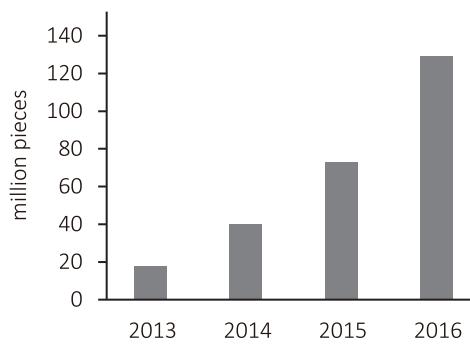
Source: AliResearch.

Figure 2.2. GDP in Poverty-Stricken Counties



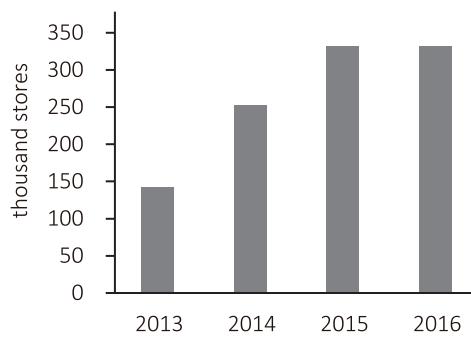
Source: China Statistical Yearbook (County Level).¹⁰

Figure 2.3. Number of Packages Sent from Poverty-Stricken Counties



Source: AliResearch

Figure 2.4. Number of Online Shops in Poverty-Stricken Counties



Online purchases grew rapidly from a low base in poverty-stricken counties. From 2013 to 2016, online purchases through the Alibaba platforms in those counties increased from RMB 67.5 billion to RMB 205.2 billion (45 percent CAGR, Figure 2.5). The number of packages received grew from 268 million

pieces to 1.14 billion (62 percent CAGR, Figure 2.6). The number of online buyers¹¹ increased from 10.3 million to 28 million (40 percent CAGR, Figure 2.7). Online purchases in poverty-stricken counties have exceed online sales, but the rate of growth for sales exceeds the rate of growth for purchases.

Figure 2.5. Online Purchases Amount in Poverty-Stricken Counties

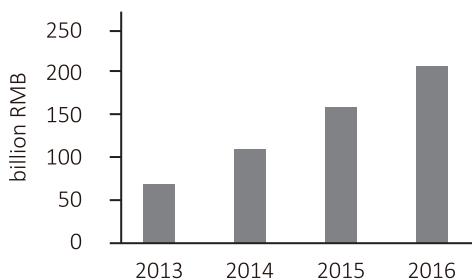


Figure 2.6. Number of Packages Received in Poverty-Stricken Counties

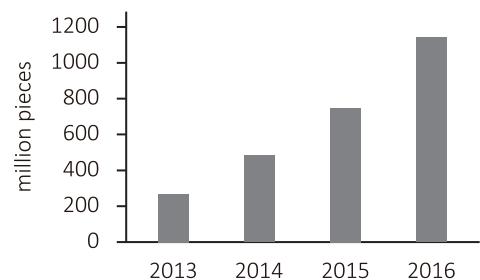
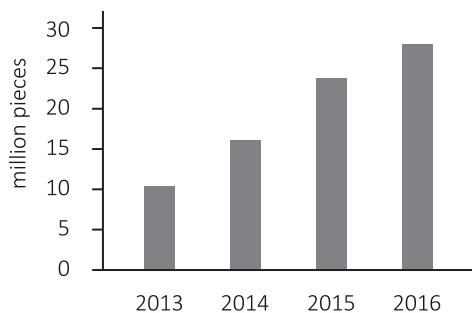


Figure 2.7. Number of Online Buyers in Poverty-Stricken Counties



Source: AliResearch.

E-commerce shows potential for linking poverty-stricken counties with national markets. AliResearch data show that, in 2016, the average poverty-stricken county sold its products to 280 prefecture-level cities (about 96 percent of the total) through Alibaba's platform. More than 100 million products from small firms in poverty-stricken counties have been posted or sold online. Two hundred thousand express mail shipping routes were built between poverty-stricken counties and cities across the nation, and more than 400 of the counties shipped over 1 million packages from e-commerce activities in 2016, compared to only 44 counties in 2013. Financial services provided to entrepreneurs and small firms also promoted e-commerce development. By March 2017, more than RMB 140 billion in loans had been issued by Ant Financial to 15.4 million users in poverty-stricken counties.¹²

Taobao Villages (defined and described in Chapter 5) started to form in

impoverished areas. Nationwide in 2017, poverty-stricken counties had 33 Taobao Villages, with e-commerce supporting employment generation and income growth (Box 2.1). In 2018, poverty-stricken counties had 45 Taobao Villages, including 18 in Pingxiang county of Hebei province, 6 in Quyang county of Hebei province, 3 each in Hua county of Henan province and Zhenping county of Henan province, 2 each in Wuqiang county and Raoyang county of Hebei province, and one each in 11 other poverty-stricken counties. Alibaba's incomplete statistical data show that provincial poverty-stricken counties nationwide account for about 600 Taobao Villages in 2018.

Box 2.1. Taobao Villages in Former Poverty-Stricken Counties

While most Taobao Villages concentrate in the more developed coastal areas, some started to blossom in less developed counties.

Pingxiang county, Hebei province, once a national poverty-stricken county, was lifted out of poverty in 2018, at a time when it had 18 Taobao Villages. The county government used e-commerce as an instrument for poverty reduction, providing targeted support, training, and knowledge exchange to build on an existing industry that makes children's bicycles. The government provides subsidies for e-commerce development, including machinery purchase (for sewing and molding), low-interest financing, and building supporting systems for e-commerce. Government support for training villagers includes basic e-commerce skills, online marketing skills, and knowledge tours with professionals in other places. In 2017, Pingxiang hosted the E-Commerce Industry Development Summit Forum for knowledge exchange with participants from Alibaba, JD.com, and Amazon. Pingxiang has become the country's largest production base for bicycle parts. The production of baby carriages and electric baby carriages and toys accounts for 80 percent of the domestic market. As of 2018, the county has supported e-commerce development in 42 poor villages, which achieved annual online sales of 1.6 billion RMB. It is estimated that 1,320 poor households (4,600 poor individuals) were lifted out of poverty by this e-commerce development.^a

Cao county, Shandong province, a poverty-stricken county by provincial standards, had only 2 Taobao Villages in 2013, but had 74 in 2017. In 2018, the county's online sales amount reached RMB 15.8 billion. The county has guided impoverished villages and farmers to get rid of poverty through "One Village, One Product," "One Household, One Plan," and "One Person, One Position," and other measures. The county had more than 50,000 online stores, creating 200,000 employments, and 50,000 returned migrants. Twelve provincial poverty-stricken villages in Cao county have become Taobao Villages.^b

a. Government of Hebei Province. 平乡：“脱贫小院”让贫困群众走上致富路，河北省人民政府，<http://www.hebei.gov.cn/hebei/11937442/10761139/14388642/index.html>

b. Source: Shandong Poverty Alleviation and Development Office. http://www.sdfp.gov.cn/xxdt/201905/t20190524_4261.htm

Uneven Development and Spatial Concentration of E-Commerce Activities

The rapid development of e-commerce in poverty-stricken counties masks disparities between counties.¹³ Where they occur, e-commerce activities through the Alibaba platforms, particularly online sales, are highly unevenly distributed. From 2013 to 2016, the top 25 percent of poverty-stricken counties accounted for 90 percent of the online sales amount and packages sent, as well as 70 percent of online stores. Figure 2.8–Figure 2.10 show the distribution of online sales across poverty-stricken counties, following a long-tail pattern. Few poverty-stricken counties, most of them in the central and coastal regions, achieved very large online sales.^{14,15}

Figure 2.8. Distribution of Online Sales Amount in Poverty-Stricken Counties in 2016

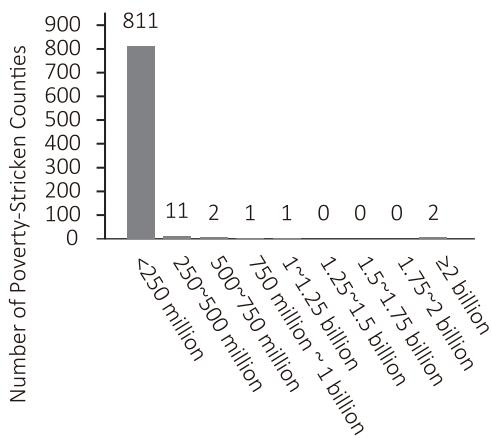


Figure 2.9. Distribution of Packages Sent from Poverty-Stricken Counties in 2016

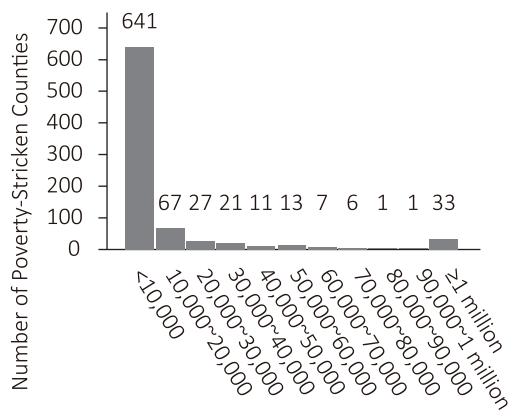
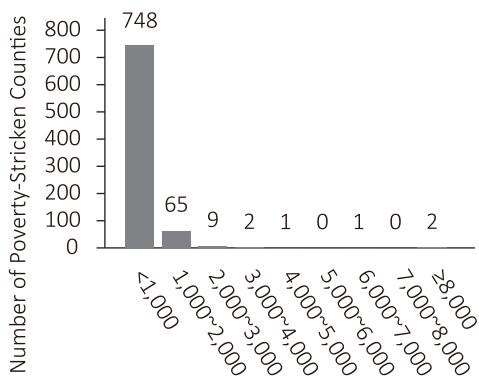


Figure 2.10. Distribution of Online Shops in Poverty-Stricken Counties in 2016



Source: AliResearch.

Online purchases through the Alibaba platforms are also concentrated

spatially, but much less so compared with online sales (and the counties that have large online sales are not those with large online purchases). From 2013 to 2016, a quarter of the poverty-stricken counties represented 60 percent of the online purchase amount, packages received, and online buyers. Most poverty-stricken counties reporting large online purchases were in urban areas close to big cities (districts and county-level cities). Figure 2.11–Figure 2.13 show the distribution of online purchases. Counties with exceptionally large online purchases are mainly in the southwest.¹⁶

Figure 2.11. Distribution of Online Purchases Amount in Poverty-Stricken Counties, 2016

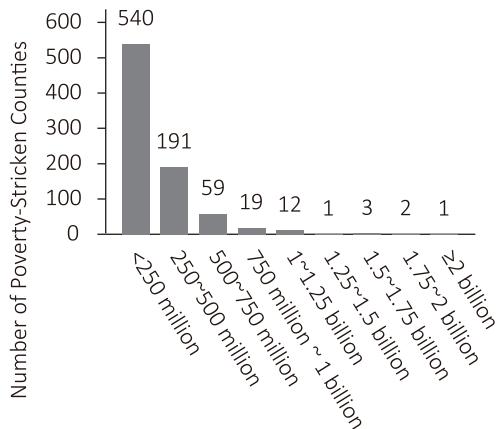


Figure 2.12. Distribution of Packages Received in Poverty-Stricken Counties, 2016

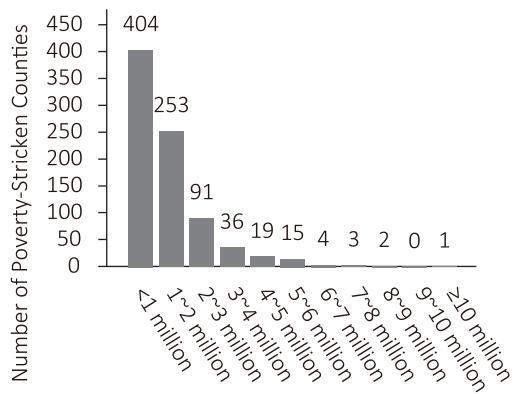
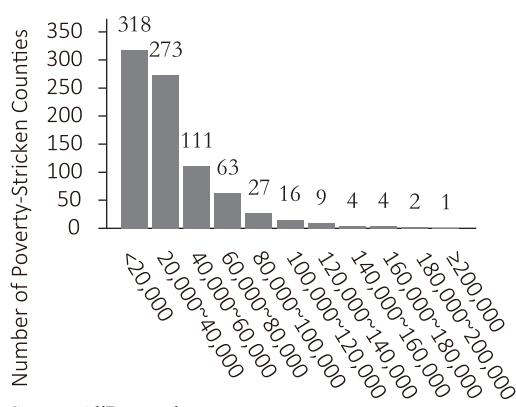


Figure 2.13. Distribution of Online Buyers in Poverty-Stricken Counties, 2016



Source: AliResearch.

Some poverty-stricken counties experienced a decline in e-commerce activities, especially online sales, and the number of these counties has been increasing. Closures of online shops in some poverty-stricken counties are significant and have increased. The overall growth in online sales, accompanied by the decline in some counties, especially for online shops, suggests that

survival is difficult for online shops, particularly small ones.¹⁷ However, those online shops that have survived and those counties that have grown have experienced overall rapid growth, raising the total gross merchandise value (GMV) of online sales in the poverty-stricken counties. On the consumption side, the number of online buyers declined in some counties. The reasons for the disparity that e-commerce continues to grow rapidly in some counties but not others are unclear and deserve further research. Information on what types of online shops in the poverty-stricken counties are created or closed; or information on what types of online buyers continue or stop making online purchases was not available for this report.¹⁸

Online sales in the poverty-stricken counties of the western region are smaller, and the growth rate is slightly lower, compared to others. The slower growth of e-commerce in the western region is to be expected. The region has the largest number of poverty-stricken counties and they are generally poorer than the national average for such counties. About 20 percent of the online sales amount and packages sent are from the western region, which is small considering that the region accounts for 68 percent of the poverty-stricken counties and 54 percent of the Hukou population in such counties (Figure 2.14).¹⁹ It is worth noting that the western region accounts for 38 percent of online shops in poverty-stricken counties, implying that online shops in those counties achieve smaller sales or are less active compared to those in other poverty-stricken counties. Growth of online sales in poverty-stricken counties in western region is slightly lower, resulting a small decrease in the share of online sales achieved. The share of number of online shops in the western region remained roughly unchanged.

Figure 2.14. Online Sales in Poverty-Stricken Counties across Regions, 2016



Source: AliResearch.

The distribution of online purchases in poverty-stricken counties is consistent with population and GDP figures for the regions and the growth rates are about the same. The western region accounts for 53 percent of online purchase amount, 52 percent of packages received, and 52 percent of online buyers in poverty-stricken counties (Figure 2.15).

Figure 2.15. Online Purchases in Poverty-Stricken Counties across Regions, 2016

Source: AliResearch.

Top Products Bought and Sold

People in poverty-stricken counties bought a wide variety of goods through the Alibaba platforms, including necessities such as clothing, household appliances, and furniture, as well as agricultural production materials such as fertilizers and farm implements. E-commerce has brought consumers in these counties great convenience by offering a large diversity of products at reasonable prices.

In 2016, furniture, toys, and clothing were the three best-selling products on Alibaba's online platform from poverty-stricken counties. Other popular products include nutritional supplements, jewelry and gold ornaments, maternal and baby supplies, produce, snacks, shoes, and personal care and health care products (Table 2.1).



Table 2.1. Ten Best-Selling Products in Poverty-Stricken Counties by GMV, 2016

Rank	Product	Rank	Product
1	Furniture	6	Maternal and Baby Supplies
2	Toys	7	Produce
3	Clothing	8	Snacks
4	Nutritional Supplements	9	Shoes
5	Jewelry and Gold Ornaments	10	Personal Care/Health Care Products

Source: AliResearch 2017b.

Like e-shops throughout China, those in poverty-stricken counties sell a wide range of products, but unlike elsewhere, these counties are more likely to sell specialty items. Through online platforms, entrepreneurs and small firms in poverty-stricken counties sell specialty products nationwide and even overseas, such as solid wood beds in Nankang, down jackets in Guangshan, navel oranges in Xunwu, jadeware in Hetian, tea in Meitan, and ginseng in Jingyu.

In 2017, total online sales reached 28 million for agriproducts from national-level poverty-stricken counties, with over 50 percent growth on a year-on-year basis. The most popular agriproducts from poverty-stricken counties include oranges, Chinese caterpillar fungus, Pu'er tea, apples, and jujube. According to the “list of best-selling agriproducts from poverty-stricken counties in 2017” released by AliResearch, the top three poverty-stricken counties selling agriproducts on Alibaba were Chengguan district, Lhasa city, Tibet, Menghai county, Yunnan province, Xunwu county, Jiangxi province.²⁰ Most of the best-selling agriproducts from poverty-stricken counties (regions) have distinctive local features, such as Chinese caterpillar fungus from Chengguan district, Lhasa city, Pu'er tea from Menghai county, navel orange from Xunwu county, Astragalus mongolicus from Minxian county, and dried persimmon from Fuping county.

However, selling agriproducts online is often challenging. Compared with manufacturing products, agriculture or agricultural processing products often have greater requirement for logistics, including cold chain, as well as product standardization and food sourcing. This is particularly challenging in poverty-stricken counties, where logistics networks are often less developed, distances to economic centers are larger, and human capital is often more limited. Anecdotal evidence suggests that only a small share of agriculture products is sold through online platforms and only a small share of farmers is directly engaged in online sales.

2.2 Government and Private Sector Targeted Support

In 2016, the 13th Five-Year Plan (2016–2020) set five tasks to expand the e-commerce market: speeding the upgrading of e-commerce, promoting the deep integration of e-commerce with traditional industry, developing e-commerce factor market, improving the public service system of e-commerce, and optimizing the governance of e-commerce.²¹ The State Council website states that it “has set goals to increase the trading volume of e-commerce to 40 trillion yuan (\$5.76 trillion) by 2020, including 10 trillion yuan from online retail businesses.” The e-commerce market is expected to employ 50 million people by the end of 2020, according to the plan.²²

In January 2017, the Ministry of Commerce, Office of the Central Leading Group for Cyberspace Affairs, and National Development and Reform Commission jointly distributed the 13th Five-Year Development Plan for E-Commerce.²³ The plan proposes to optimize the governance environment of e-commerce, and actively carry out innovation in the systems, modes, and forms of management to improve monitoring of the quality of e-commerce products. The innovations feature “risk monitoring, online spot checks, source tracing, local investigations and handling, and credit management,” use the Internet, big data, and other information technology to master the development of the e-commerce market, discover and investigate violations of laws and regulations in time, and establish a governing mechanism and regulation system applicable to the rules of the e-commerce market.

This section describes three targeted programs, one by the government of China and two by Alibaba, that support e-commerce development.²⁴ The discussions focus on the goals, financing, implementation, and outcome of these targeted programs. In these programs, the government and the private sector put in place measures, including supporting the last-mile logistics and subsidizing training, to support e-commerce development in less-developed areas, including rural areas and poverty-stricken counties. These experiences with e-commerce to support growth and expand employment opportunities have sparked strong interest among researchers, policymakers, and the private sector, and have



encouraged them to explore the use of e-commerce as a tool for poverty alleviation and rural vitalization. Exploring what works and what needs to be improved in such programs is crucial for the successful harnessing of digital technology for those ends.

China Rural E-Commerce Demonstration Program

Goal: Contribute to the reduction of rural poverty and modernization of rural areas through the promotion of e-commerce. This was to be accomplished by establishing and improving rural e-commerce public service, fostering rural e-commerce supply chains, promoting connectivity between agriculture and commerce, and enhancing e-commerce training.

Objectives: The objectives of the program evolved during implementation.

2014: to promote e-commerce policies and systems in demonstration counties and leverage the capacity of e-commerce to promote rural economy development and urbanization, thereby improving the commodification rate of agricultural products and facilitating farm production activities and improving the lives of farmers.

2015: added objective to promote poverty alleviation.

2016: added objective to establish rural e-commerce public service systems and promote online sales of agricultural products.

2017: removed objective to reduce logistics costs.

2018: added objective to make effective progress in rural product online sales, employment, and income growth among poor households, and expand convenience of service.

Implementation Arrangements: The Ministry of Finance, Ministry of Commerce, and State Council Leading Group Office of Poverty Alleviation and Development are responsible for overall planning. The provincial governments have oversight responsibility, and city and county governments implement the program.

Selection Criteria for Demonstration Areas: Demonstration areas are selected annually by the Ministry of Finance, Ministry of Commerce, and State Council Leading Group Office of Poverty Alleviation and Development. Criteria for selection are level of economic development, e-commerce basis, and regional balance. Also considered are the priorities of the demonstration counties, as well as the number of new selected counties in each demonstration province. In 2014, each demonstration province was required to choose at most seven demonstration counties. In 2017, each demonstrative province was requested to include a third to half of their poverty-stricken counties (defined at the national level) and underdeveloped counties as demonstration counties. In 2018, new demonstration counties were limited to poverty-stricken and underdeveloped

counties. Provinces independently determine the conditions for inclusion of counties in the program using logistics, Internet, and characteristic industries as criteria.

Financing: Financial funds for the program come from the central government and are issued by the Ministry of Finance. The funds started with RMB 1.1 billion RMB in 2014 and increased incrementally to RMB 3.9 billion in 2017. The financial funds mainly helped to promote online sales in rural areas, improve rural public service systems, and conduct rural e-commerce training. They were also used to support logistics systems before 2017.

Outputs: By 2018, the program had supported 1,016 demonstration counties, covering 737 poverty-stricken counties (89 percent of the total), including 137 counties with extreme poverty (41 percent of the total). The share of poverty-stricken counties among demonstration counties increased from 27 percent in 2014 to 45 percent in 2015 and 65 percent in 2016, while in 2017 and 2018, more than 90 percent were poverty-stricken counties with the rest as underdeveloped counties.

Outcomes: According to Ministry of Commerce of China, by the end of 2016, the program had created 120,000 jobs for poor households.²⁵ Online stores registered in rural areas grew from 8.17 million in 2016 to 9.86 million in 2017 and resulting in employment for 28 million.²⁶

Example:²⁷ Min county, Gansu province, has explored the use of “e-commerce cooperating poor households” to develop online sales of products from the local traditional medicine industry, resulting in increases in annual per capita income of 4,100 poor households by RMB 600 RMB. Liuhe county, Jilin province, has achieved RMB 60 million in online sales of agricultural products, RMB 4 million RMB of which was from 35 poor villages, where per household annual income increased by RMB 400 for more than a thousand poor households. Xixiang county, Shaanxi province, sold 690 thousand pieces online in 2017 with sales of RMB 41 million, increasing income for 1,190 poor households by an average of RMB 865.

E-commerce enterprises have accelerated their penetration into rural areas and cooperate with demonstration counties to help implement the Rural E-Commerce Demonstration Program. At least 15 e-commerce companies have joined the effort to reduce poverty in rural areas.²⁸ Alibaba’s Rural Taobao Program covered about 1,000 counties and 30,000 villages as of September 2018, with 30,000 partners, helping with online purchases and online sales in rural area and providing logistics services.

Examples:²⁹ The e-commerce enterprise Cainiao has improved logistics systems in rural areas. By 2018, the company could deliver 60 percent of county-to-

village packages the same day and 99 percent by the next day. By the end of 2016, JD had set up county service centers and “JD Help” shops in more than 1,700 counties and cultivated over 300,000 rural e-commerce promoters, covering 440,000 administrative villages (out of 560,000 administrative villages in China in total), and helping people to purchase household appliances by providing services including authorized purchase, order delivery, installation, maintenance, and exchange and return. Suning has established 1,770 direct-sale stores and more than 10,000 authorized service sites in more than 1,000 counties. Demonstration counties actively cooperate with big e-commerce platforms to promote sales of their agricultural products online. Hunan has opened provincial agricultural product pavilions on the e-commerce platforms of Alibaba, JD, and Suning, as well as 13 pavilions for its cities and prefectures and 20 for its counties. The provincial Department of Commerce and Alibaba jointly launched the “rural revitalization and poverty alleviation” program in the province and set up service stations in 18 counties, promoting online sales of agriculture products from impoverished areas.

Alibaba Rural Taobao Program

Goal: Enable rural residents to have a greater access to a broader variety of goods and services and help farmers to earn more by selling agricultural products directly to urban consumers using online platforms. Establish a service system in 100,000 administrative villages in 1,000 counties across China to build an e-commerce ecosystem in rural areas.

Financing: Funded by Alibaba, which is investing RMB 10 billion over three to five years, in collaboration with the local governments.

Box 2.2. Building Agricultural Brands and Supporting Development of Digital Agriculture

Under Rural Taobao 3.0, a team of about 100 agricultural experts focus on building local agricultural brands. Leveraging the power of the cloud, the team built an intelligent agricultural infrastructure platform to improve agricultural product quality and productivity. The team also uses big data to develop new sales models, including “pre-sales,” “contract farming,” and “central warehousing,” to increase farmgate prices and reduce price fluctuations.

Evolution of the Program: The program has evolved in stages. Initial efforts to establish a rural e-commerce system focused on developing familiarity with online shopping among villagers. This generally consisted of village partners who worked part-time helping villages to make online purchases (Rural Taobao 1.0). As the program grew and e-commerce became more familiar to villagers, commitments began to expand and some partners began to work full time, supported in some cases by part-time partners (Rural Taobao 2.0). Starting in

2016, Rural Taobao became a comprehensive rural online service system. In this stage the focus shifted to helping villagers to sell agricultural products online (including through technical support to farmers and developing the “Tao Yum supply chain,” a local branding effort). During Rural Taobao 3.0, village-level service stations were upgraded to provide higher-quality services to rural villages.

Activities:

- ***Set up county and village-level e-commerce service network and create new source of rural employment.*** This activity seeks to build “incubators” to develop partners in e-commerce, including suppliers and providers of logistics and services. The main vehicle is the creation of “Rural Taobao partners,” or Taobao shop assistants at the village level (“CunXiaoEr,” full time) and “Taobao aides” (“TaoBangShou,” part-time). These assistants introduce the Alibaba online platforms to villagers, help villagers navigate the e-commerce platforms to select products and services online, and use their online payment account to place orders for villagers and collect payment when villagers are satisfied with their purchase. By 2018, more than 30,000 village-level service stations had been established in more than 1,000 counties in 29 provinces, autonomous regions, and municipalities, and more than 30,000 full time rural shop assistants had been recruited along with nearly 30,000 part-time aides.
- ***Improve logistical connections for villages (including remote ones) and promote two-way circulation of goods and services.*** Although the China Post covers all of China, for remote areas, deliveries can sometimes take several days. Commercial express delivery companies, by comparison, provide logistic service mainly only to counties and large towns. As a result, villagers in remote areas often need to collect their packages in county/town centers, as the cost of shipping them the “last kilometer” can be prohibitive for commercial delivery especially when the number of packages is small and delivery vehicles are returning empty. The Rural Taobao Program seeks to address this problem through “two-stage delivery,” building out the Cainiao network using local logistics providers to deliver packages from counties to villages. Alibaba works with more than 20 local providers across the country provide secondary distribution and warehouse services, as well as subsidizing cooperatives that run distribution from the county level to villages. As of 2018, according to the Alibaba Group, the Rural Taobao network was delivering 60 percent of the goods on the same day (from county to village) and 99 percent within the next day in more than 30,000 villages covered, a significant improvement over the previous average delivery time of two days. Besides connecting the “last-kilometer” for online purchases, the Cainiao network also helps connect the “first kilometer” for online sales from villages (mainly agricultural products, such as oranges and apples) to develop the e-commerce ecosystem.

- ***Provide training in e-commerce and promote entrepreneurship.*** Taobao University has built 11 e-commerce training bases across the country and has produced a series of online e-commerce training courses for self-learning by entrepreneurs. By the end of 2017, the training bases had conducted 133 training sessions.
- ***Provide rural financial services (through Ant Financial).***

Provide credit/loans:

- Provide small loans through the digital platform to villagers, including e-merchants, farmers, and consumers, drawing from the online transaction data and credit records; as well as drawing from online/offline “insider” information collected by Rural Taobao partners.
- Provide agriculture financing to farmers and cooperatives through the agricultural supply chain and through collaboration with local government and local leading enterprises.
- Provide online payment support: Rural Taobao partners can help villagers to pay utility bills, buy travel tickets, as well as provide online payments for some governmental and medical services.
- Provide online insurance support: Ant Financial, in collaboration with local governments and insurance companies, provides insurance to breadwinners in poor counties to cover part of the out-of-pocket costs beyond basic medical insurance and disability insurance in case of major illness, accidental injuries, disabilities, deaths, and property damage.

As of the end of 2017, according to Alibaba Group, Ant Financial had provided rural financial services to 816 national poverty counties and underdeveloped areas (98 percent of all of the national poverty counties and underdeveloped areas) and provided RMB 11.2 billion in loans through the Rural Taobao Program platform.

Outcomes: By the end of 2018, the Rural Taobao Program had a business team of 1,000 people, covering 1,174 counties in 29 provinces, including 349 national poverty counties. There were more than 30,000 village-level service stations and a rural service team at the village level of nearly 60,000 people (including part-time and full time). A total of 160 regional agricultural brands had been incubated.

Alibaba Poverty Alleviation Fund ³⁰

Launched: December 2017, though some portions grew out of existing programs that trace their beginnings to 2015.

Goal: Contribute to poverty reduction and alleviation in five target areas: e-commerce, ecology, education, health, and women.

Funding: RMB 10 billion over five years, entirely funded by Alibaba. Some activities are joint efforts with other entities that may or may not provide any funding, and one provides grants through the Jack Ma Foundation.

Implementation: The program is an umbrella for multiple initiatives focused on the five focal areas. It specifically targets its efforts on nationally identified poverty-stricken counties. In its initial year of operation, the program identified ten such counties for e-commerce poverty alleviation, two for ecological poverty alleviation, five for poverty alleviation through education, and four for women's poverty alleviation (one of which was also among those selected for e-commerce). No counties were identified for health, though the initiative under that focal area has operated in impoverished counties.

Activities:

- **E-commerce poverty alleviation.** The program helps impoverished regions build on their natural endowments to incubate and develop industries that sell high-quality agricultural products online. Alibaba assists with building a sales platform, arranging resource support, implementing the incubation mechanism, and helping the county sell its products. The Tao Yum supply chain provides technical support, supply chain connections, and brand building services. Alibaba also supports online and offline training to help sellers in impoverished counties master online sales.
- **Ecological poverty alleviation.** The program helps impoverished regions explore ways to use local resources in a manner that ensures a balance between ecological conservation and economic development. The Ant Forest platform, launched in 2016, is used to help regions through two mechanisms a “philanthropy reserve” and an “ecological economic forest.” Ant Forest converts carbon emissions savings through individual behavior, such as walking instead of driving or making online payments, into virtual “green energy” that is then used to grow virtual trees that, at maturity, result in planting real trees or protecting existing forest. The first economic species was introduced at the end of 2018 and will provide fruit and other products for markets while also creating jobs and preserving forested area.
- **Education poverty alleviation.** The Rural Education Plan and Occupational Education Plan, supported by the Jack Ma Foundation since 2015, help to enable rural education through improved teaching. The program provides awards and capacity enhancement services for rural teachers and rural education leaders with proven ability. A Rural Normal Student Plan seeks to cultivate future rural educators and the Rural Boarding School Plan seeks to improve the learning environment in boarding schools. The Occupational Training Skill Plan provides occupational training for people in impoverished regions who are employed or self-employed in e-commerce and cloud computing. An Occupational School Talent Cultivation Plan boosts

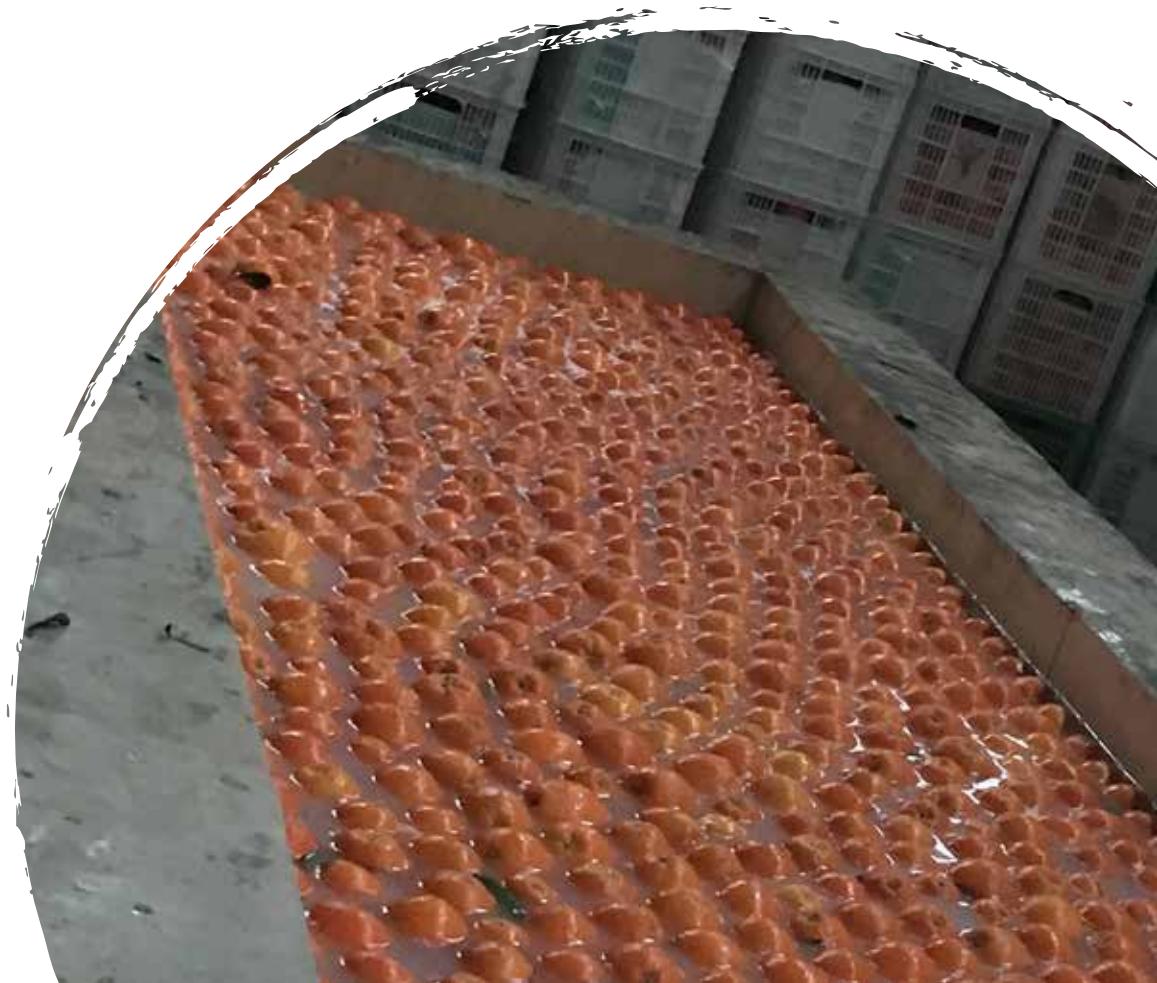
development and growth of occupational education in rural and impoverished areas through such techniques as dual teacher teaching and on-the-job training on location.

- **Women's poverty alleviation.** Activities for women include insurance, business development, and childcare instruction. The insurance activity is based on a philanthropic model that accepts online donations that can then be drawn on by rural women to help pay for schooling or medical services. The business development effort provides entrepreneurship and employment training that will enable women to become cloud customer service specialists or to start an e-commerce business or get employed. The Nursing the Future program builds nursing centers in impoverished region and supports rural caretakers who provide instruction in the care of children aged 0 to 3 and their families for nearby villages.
- **Health poverty alleviation.** A partnership between Alibaba Philanthropy, Ant Financial Philanthropy, Ant Financial Insurance, and China Foundation for Poverty Alleviation provides health insurance to impoverished areas using donations gathered online. Villagers make claims by submitting copies of their bills online, and claims are also paid online. Information on donations, insurance coverage, and claims is available in real time online.

Outcomes (as per Alibaba Group)³¹ :

- The program has worked with 435 counties in 22 provinces and autonomous regions, including 151 poverty-stricken counties, and incubated 2,532 products since January 2018.
- Poverty-stricken counties in China recorded sales revenues of more than RMB 63 billion on Alibaba's Internet platforms in 2018; more than 100 counties achieved revenues of RMB 100 million or more.
- Ant Forest has nearly 400 million users worldwide who have reduced carbon emissions by 3.08 million tons, safeguarding 69,000 mu (1 mu=0.165 acres) of philanthropy reserves. Ant Forest has planted 55.52 million real trees covering over 760,000 mu and controlled a desert area of more than one million mu. The program had created 180,000 green job opportunities and realized a labor service income of RMB 27 million.
- From 2015 to 2018, the program awarded 400 rural teachers, including 267 (67 percent) from impoverished counties and 40 rural headmasters, including 33 (83 percent) from impoverished counties. The Rural Education Plan has directly reached more than 2,000 schools, 80,000 rural teachers, and a million students.

- In 2018, Alibaba trained more than 260,000 people who were employed or self-employed in e-commerce and cloud computing and opened 9 e-commerce training bases in impoverished counties.
- The program also trained 18,200 women and helped 10,600 women gain employment in e-commerce.
- The program had built 10 nursing centers and one nursing service point in Ningshan county of Shaanxi province, and 30 caretakers served 548 children and 1,040 people taking care of these children.
- The "Breadwinner" Philanthropy Insurance Project for Health Poverty Alleviation received 2.7 billion donations totaling RMB 136 million from 360 million members of the public and 1.12 million merchants. The project insured 4.25 million people in registered impoverished households from 66 poverty-stricken counties in 12 provinces and autonomous regions.



Notes

1. See China, Ministry of Commerce 2011a, 2011b, 2011c.
2. See China, Ministry of Commerce 2016b.
3. See Fan 2017.
4. See China, Ministry of Commerce 2016c.
5. China has 832 national poverty-stricken counties that are defined by the State Council Leading Group Office of Poverty Alleviation and Development (see Appendix C for definition of national poverty-stricken counties). Sixty-eight percent are in the western region and 26 percent are in the central region. Yunnan province has the largest number of the counties (88). All counties in Tibet (74) are poverty-stricken. Other provinces with large numbers are Guizhou (66), Sichuan (66), Gansu (58), and Shaanxi (56).
6. See China, The State Council Leading Group Office of Poverty Alleviation and Development 2016.
7. Source: China, Ministry of Commerce 2018b.
8. The analysis in this chapter was drawn from e-commerce activities based on Alibaba's online platform only, unless otherwise specified. The data used are from 828 poverty-stricken counties due to data unavailable in the remaining 4 poverty-stricken counties (涿鹿县赵家蓬区, 大柴旦行委, 冷湖行委, 茫崖行委). The results are to be interpreted with caution as there might be difference between the market structure and coverage of Alibaba and its competitors at the county level.
9. The increase in the number of online shops seemed to slow in 2015–2016.
10. Due to data availability, GDP in 2013 is a summation of GDP in 808 poverty-stricken counties, in 2014 it is a summation of GDP in 822 of the counties, and in 2015 it is a summation for 818 counties.
11. Measured by number of user accounts. Several people can share one account.
12. See AliResearch (2017). E-commerce helps reduce poverty in China – E-commerce poverty reduction and shared prosperity report. (电子商务助力中国减贫 – 电商减贫与普惠发展研究报告)
13. See Appendix D for details of the geographical concentration and e-commerce decline.
14. In central and coastal regions, only Heilongjiang, Jilin, Hebei, and Hainan have poverty-stricken counties.
15. See the list of poverty-stricken counties with the highest amount of online sales in Appendix D.
16. See the list of the poverty-stricken counties with the highest amount of online purchases in Appendix D.
17. Information at the county level outside of the poverty-stricken counties about the number of online shops and their GMV is not available to the report; therefore, comparison between poverty-stricken counties and other counties is not possible.
18. Information at the individual level is confidential and not available to the report.
19. Staff calculation based on 2015 data from China Statistical Yearbook (County Level).
20. This is followed by Pingjiang county, Hunan province, Linxian county, Shaanxi province, Minxian county, Gansu province, Fuping county, Shaanxi province, Yu'an district, Liu'an city, Anhui province, Zhaoyang district, Zhaotong city, Yunnan province, and Zigui county, Hubei province from the 4th to the 10th, respectively.

- 21.See China, Ministry of Commerce, website of 13th Five-Year Development Plan for E-commerce. http://www.mofcom.gov.cn/article/zt_dzsw135/.
- 22.See Fan 2017.
- 23.See China, Ministry of Commerce 2017a.
- 24.More details and case studies available in Appendix E.
- 25.See China, Ministry of Commerce 2016c.
- 26.See China, Ministry of Commerce 2018b.
- 27.Examples are cited from China, Ministry of Commerce (2018b); China, the State Council Leading Group Office of Poverty Alleviation and Development (2018b, 2018c).
- 28.See Xinhua Net. http://www.xinhuanet.com//tech/2017-09/18/c_1121683241.htm
- 29.Examples are cited from China, Ministry of Commerce (2016c); China, The State Council Leading Group Office of Poverty Alleviation and Development (2018a)
- 30.See more details in Alibaba Poverty Alleviation Fund 2019.
- 31.See Alibaba Poverty Alleviation Fund 2019.

Part II

E-Commerce Development, Employment, Economic Growth, and Welfare Improvement

A growing body of literature suggests that e-commerce is more likely to prosper in areas with conducive initial conditions, including infrastructure and logistics, skills and entrepreneurship, and where the government is supportive and provides an enabling business environment. E-commerce development requires human capital, access to the Internet and to digital technology, logistics and transport infrastructure, and other factors needed for traditional commerce. The rapid development of e-commerce in China, including in rural areas and less-developed regions, has built on tremendous improvements in infrastructure (hard and soft) and human capital development.

E-commerce has been associated with expanded employment opportunities (particularly for women and youth), economic growth, and welfare improvement. Many studies provide useful examples in China and in other countries of how e-commerce creates jobs, including upstream and downstream jobs connected with e-commerce, and how this interacts (complements or replaces) with the traditional business sectors, including the retail sector. Many studies examine how e-commerce development affects economic growth and household welfare through various channels, including reducing transaction costs, improving efficiency and productivity, creating more trade and therefore producer and consumer surplus to stimulate growth; and through increasing labor income (job creation), reducing prices (increasing real income), increasing variety and customization of consumption goods and services. However, some regions gain from e-commerce and some lose, the same is true for households and individuals. The net effect of e-commerce on the economy and the society and its distribution remains a question.

Analysis of 2013–2016 panel data of more than 2,000 counties in China found that initial economic development (GDP per capita) is positively associated with e-commerce development. The data also indicate that economic growth (GDP per capita growth) is positively associated with initial e-commerce development when controlled for initial development level and other county characteristics. The development of e-commerce has been associated with household consumption growth, including in less-developed areas and among less-affluent populations, helping to reduce inequalities of consumption.

To understand the profiles of the individuals, households, and villages where e-commerce is most developed in rural China and the profiles of the e-shops there, this study closely examines Taobao Villages. Participation there is higher among the households with younger household heads, with secondary education, particularly those with technical and vocational education, urban work experience, and knowledge of e-commerce. Participation in e-commerce has also been associated with higher household incomes in Taobao Villages, in some cases having a strong positive effect on those incomes. E-commerce seems to yield benefits that are broadly and equitably shared among participants in Taobao Villages.



CHAPTER THREE

Literature Review and Research Framework

E-commerce is rapidly reshaping production and consumption and is increasingly important to job creation, economic growth, and household welfare. The first section of this chapter reviews the literature on enabling factors for e-commerce development and the implications of e-commerce for job creation, economic growth, and welfare. It also discusses the potential risks of e-commerce development on the equitable distribution of the fruits of the resultant growth and possible replacement of or substitution for existing employment. The second section lays out the framework of the research, and presents the sources of data, the value added, and limitations of the study.

3.1 Literature Review

This section draws on findings from existing work and lessons learned in other countries about the pre-conditions for e-commerce development and its impact on the economy.

Enabling Factors for E-Commerce Development

The main enabling factors for e-commerce development revealed in the literature are human capital (skills and entrepreneurship), infrastructure and logistics, a conducive business environment, and partnership between the public and private sectors.

Infrastructure is a necessary condition for e-commerce adoption and development. E-commerce requires Internet and other relevant digital technology, not only its accessibility but also its quality, readiness, and affordability (Uzoka et al. 2007, Rahayu and Day 2015). According to OECD (2017), access to reliable and affordable information and communications technology (ICT) services, logistics, and transport infrastructure, as well as electronic payment systems are important to facilitate e-commerce. Supporting industries that affect e-commerce initiatives, such as telecommunications, information technology, financial, and trust enablers are also needed (Molla and Licker 2005). The availability of large-scale telecommunication transmission capability (broadband), Internet security, credible online payment channels, and digital escrow accounts to allow payments to be disbursed only after both parties are satisfied with an online transaction are important supportive conditions (Lawrence and Tar 2010, Oxley and Yeung 2001, Guzzo et al. 2016).

E-commerce also requires more than Internet and digital infrastructure. Transport infrastructure and logistics to ship packages from sellers to purchasers on time and at low costs are critical to encouraging e-commerce development. Logistics is key for e-commerce to start and achieve its full potential, and even in developed countries such as the United States, logistics services still need

improvement given the failure of online sellers to fulfill orders during peak demand periods and the reluctance to integrate into the international market due to complex logistics requirements. Improvement can be achieved by cooperating with logistics services providers, implementing technology and software applications to improve logistics efficiency, simplifying and harmonizing trade and logistic regulations and procedures, and the like (UNCTAD 2001).

Human capital, including skills and entrepreneurship, is equally important for e-commerce adoption. Necessary skills include both the traditional and the e-commerce specific (such as IT skills and e-commerce marketing skills). Entrepreneurship needs include innovativeness and a willingness to take risks and explore new solutions (Rahayu and Day 2015). Adequate experience and exposure to technologies and relevant skills are important human resources for e-commerce development (Molla and Licker 2005). Astuti and Nasution (2014) find that younger, better-educated managers are more likely to display readiness in adopting technology. Nyame et al. (2013) find that lack of awareness of technology capabilities and its efficient use in trade limited the adoption of e-commerce.

Government support and regulation are critical in e-commerce development. Lack of supportive government strategies can be a barrier of e-commerce adoption in developing countries (Lawrence and Tar 2010). Drawing from Southern Italian cases, Scupola (2006) finds that small and medium enterprises (SMEs) require institutional intervention in e-commerce adoption and diffusion, in terms of influence and regulation, and the government should concentrate on knowledge development such as e-commerce training, indirect subsidies aiming at improving e-government and direct subsidies such as financial support and e-commerce pilot programs, and increasing public's awareness of Internet technologies and e-commerce. A fair playing field between e-commerce and traditional business is a key consideration for policymakers to ascertain the existing legal frameworks in terms of e-commerce development, and government can promote e-commerce engagement through e-procurement and otherwise raising the visibility of e-commerce (OECD 2017). Guo (2016) states that to promote agricultural e-commerce development in China, the government needs to enhance quality regulation and cooperate with associations and companies to create local brands and enterprise brands. National respect for the "rule of law" is important for e-commerce activities (Oxley and Yeung 2001).

Firm size and market force may also play a role in e-commerce adoption. On one side, Rahayu and Day (2015) state that the size of business impacts a firm's adoption of e-commerce technology by its ability of providing certain resources, and larger firms tend to have greater ability. Willis (2004), in contrast, believes that small firms with low overhead are easier and with lower cost to change their business model to e-commerce, while large companies are likely to face higher investment to replicate their model in an e-commerce framework due to the large scale of operations. UNCTAD (2004) finds that SMEs have the largest

potential for productivity gains from e-commerce, but the harvest rests on good managerial capacities, technical skills, and innovations, which tend to be lacking in developing country SMEs. Molla and Licker (2005) took firms' capabilities and intangible assets as determinant factor of e-commerce adoption. External pressures from consumers and suppliers adopting particular technology and from competitors that forces the firms to obtain competitive advantages are significant determinants of e-commerce adoption as well (Saffu et al. 2013, Rahayu and Day 2015, Molla and Licker 2005).

E-Commerce Development and Job Creation

E-commerce can contribute to new job creation via three channels. First, it can foster entrepreneurship, such as self-employment by e-shop owners. Second, it can create jobs directly related to e-commerce, such as e-shop workers and jobs that directly serve e-shops, such as website designers, e-shop models, and e-shop photographers. Third, it can create jobs indirectly related to e-commerce with upstream or downstream links, such as logistics services, materials and intermediate input providers to e-shops.

However, the literature on the impact of e-commerce on jobs is inconclusive. Two key concerns—how to define jobs created by e-commerce, in net and in gross terms; as well as how to define (or attribute) the disruptive effect of e-commerce on offline retail sector—are the starting points of the inconclusive discussions of the impact of e-commerce on jobs. As Vandevelde put in a recent Financial Times (2017) article: “The jobs created (by e-commerce) are hard to pinpoint. Amazon employs fewer than three times as many people in the US as Walmart did in 1985...but whereas Walmart ran most of its logistics in house, Amazon relies extensively on parcel carriers and agency workers; UPS alone



has added 100,000 jobs in the past 16 years.” As a result, there is no consensus on how to count the e-commerce jobs, or jobs created directly or indirectly by e-commerce.

Several studies show employment in the traditional offline retail sector declined when e-commerce developed rapidly. Americo and Veronico (2018) find a negative effect of e-commerce on traditional retail employment in 35 European countries in the past 10 years, but for lack of e-commerce employment data the research is inconclusive about the overall effect on retail jobs. Chava et al. (2018) estimates the impact of e-commerce on offline retail employment in the short term and finds a negative effect on income of retail workers, driven by a decrease in working hours, and number of employments. A decrease of entry and increase of exits have also been found in the traditional retail sector where e-commerce was introduced, especially among smaller and younger retail stores. Terzi (2011) finds that e-commerce generates jobs in ICT sector and indirectly creates jobs through increases in demand and productivity, while it also causes employment loss in traditional sectors through e-commerce substitution effects. The net gains or losses of employment depend on demand for certain skills.

According to research by Joe Song, an economist at Bank of America Merrill Lynch, “E-commerce actually leads to more jobs by paying people to do things we used to do ourselves.”¹ His study shows that working women are spending less time shopping—nearly 25 hours less per year compared with a decade earlier, due to e-commerce. As more families increasingly outsource shopping to e-commerce employees, more jobs are created.

Overall, most of the studies suggest more jobs are created than destroyed (again depending on how that is measured) related to e-commerce.²

- Many studies of the impact of e-commerce on job creation or destruction focus on the United States. According to a New York Times article by Gebeloff et al. (2017), while e-commerce jobs are growing fast, they are still a small component of overall retail employment, partly because e-commerce is less labor intensive. Most e-commerce jobs go to large cities. More positively, Mandel (2017) from Progressive Policy Institute finds “in the United States, ecommerce jobs in fulfillment centers and ecommerce companies rose by 400,000 from December 2007 to June 2017, substantially exceeding the 140,000 decline of brick-and-mortar retail jobs.... Based on a county-by-county analysis, fulfillment center jobs pay 31% more than brick-and-mortar retail jobs in the same area.”
- The literature suggests e-commerce creates more jobs than it destroys in the developing world as well. A Boston Consulting Group article (2019) states that the potential downside impact of online marketplaces on offline business in Africa is small given the underdeveloped formal labor markets and retail sector and projects the creation of 3 million jobs by 2025 in

online marketplaces, including direct (0.1 million), indirect (1 million), and induced (1.8 million) employment.³ It also concludes that online marketplaces in consumer goods will create the largest employment gain. A report by McKinsey (2018) estimates that e-commerce in Indonesia will support 26 million jobs by 2022, including direct jobs that would not exist without e-commerce and indirect jobs favorably influenced by e-commerce. When considering the effect on local retail employment of the entry of a large chain store, Basker (2005) examines the impact of Walmart's entry on retail employment in Mexico and finds that employment in the retail sector increased by 100 jobs in the first year but diminished to 50 in the long run due to closure of small retail establishments. The study finds a smaller negative effect, a 20-job decline, on wholesale employment due to vertical integration by Walmart, implying no significant agglomeration externality being created.

Meanwhile, the effects of job creation and job destruction vary for different regions and different individuals, and in different time horizons. The areas with new jobs created related to e-commerce (mostly large metro areas) are not necessarily those experiencing the decline of the traditional brick-and-mortar retail jobs; and the workers who take the new jobs in e-commerce are not necessarily those that lost their jobs in brick-and-mortar businesses. While in aggregate, the number of jobs created by e-commerce might be larger than the number of jobs replaced by e-commerce, as the literature indicates, the job loss related to e-commerce might be felt more in some areas.

The literature also includes work on the inflow of retail foreign direct investment. A case study of the entry of Walmart in Mexico (Akin et al. 2018) found that the adverse effects of that investment on a select group of households working in the traditional retail sector are swamped by reductions in the local cost of living, resulting in real income gains across all household income groups. The study found that, on the nominal income side, while there is evidence of domestic store exit as well as employment, labor income, and profit declines in the traditional retail sector, there is no evidence of average income or employment effects.

In the future, with more application of robots and artificial intelligence, whether e-commerce will create or destroy jobs is a hot debate. As the labor intensity of e-commerce varies and might change with the increasing application of artificial intelligence in all types of businesses, it might reduce the number of jobs related to e-commerce. According to a recent Fox Business article by Rugaber (2017), a case study of Boxed finds that “automation has actually helped create jobs in e-commerce, rather than eliminate them, and stands to create more in the years ahead...The robots didn’t take jobs from people, because many of the jobs didn’t exist before.”

E-Commerce Development and Economic Growth

E-commerce can contribute to economic growth by reducing the transaction cost and increasing the efficiency of production. First, it can increase productivity. As it lowers the information asymmetry supporting price equalization (market clearing), it facilitates the (re)allocation of resources to more efficient producers, including through creative destruction of online and offline firms, and increases the productivity of the economy. Second, it can create trade, and therefore producer surplus and consumer surplus. As it supports the long-tail market and customization of products and services to customer demands, it increases the welfare of the economy, including providing a platform for SMEs to access a wide online market.

The existing literature on the role of e-commerce in economic growth largely focuses on the developed world. With a focus on the U.S. economy, Willis (2004) surveys the literature and finds that the expansion of e-commerce is a structural change that can support productivity growth and reduce price level. Jo et al. (2019) uses Japanese government surveys of e-commerce sales data for hundreds of products over about three decades to examine the impact of the Internet on Japanese prices and welfare. It shows that e-commerce results in lower prices and higher welfare as e-commerce has driven down the average prices of goods available online, enabling consumers to purchase from other regions, and arbitraging intercity price differences, with the first two playing the major roles. Litan and Rivlin (2001) estimated that the existence of e-commerce and the Internet would add between 0.25 to 0.5 of a percentage point to productivity growth between 2001 and 2005 in the United States economy, according to experts' estimations or educated guesses from various sectors, and the impact mainly comes from reductions in information-related transaction costs in the old economy and information-intensive noncommercial sectors, as well as increased competition due to market expansion.

E-commerce firms can improve productivity through better managing supply chains to save costs. For example, by integrating the sales transaction system directly with the production side of its business, Dell Inc., which generates about 50 percent of its revenues through online sales, streamlined its production process by limiting inventory to a four-day supply (Maguire 2003). Fine and Raff (2001), based on a Goldman study by Lapidus (2000), project that the cost savings attributed to the use of e-commerce and related Internet-based management improvements in the auto industry in the 2000s are about 13 percent of total production costs.

While research on the role of e-commerce in price changes is inconclusive, the majority of studies suggest that it reduces prices online and offline. As the search for a product can be conducted online at low costs, e-commerce allows buyers to quickly compare prices across sellers to find the lowest price for a product or service. For example, Brynjolfsson and Smith (2000) show that, in the

early days of e-commerce, the online price of new CDs and books (homogeneous products with little or no quality difference between sellers) were 9 to 15 percent lower than prices at conventional stores in 1998 and 1999. Jo et al. (2019) show that, in Japan, goods available online exhibit lower inflation rates than goods not available online, and goods sold intensively online exhibit lower rates of price increase than in physical stores. Goolsbee and Klenow (2018) show that, in the United States, price trends of goods sold online exhibited lower inflation rates than the consumer price index between 2014 and 2017.

E-commerce, with the support of increasingly sophisticated technology, allows purchasers to overcome the information asymmetries and creates downward pressure, pushing price equalization with the most efficient providers. Smith and Brynjolfsson (2001) show that, using computer application “shopbots” buyers can make price comparisons from five stores about 10 times faster than by calling each store on the telephone. The effect of e-commerce expansion on price is not limited to the online market. Over time, as more individuals become savvy online shoppers, the price differential between online and offline products will create downward pressure for the traditional offline market as well, therefore pushing the general price down.

Meanwhile, e-commerce allows firms to provide more products and services customized to buyer demand. Bakos (2001) shows that, even for standardized products such as computers, e-firms can provide customization, taking advantage of manufacturing products after orders placed online, and customization is more cost-effective in information-rich products, such as electronic newspapers. Customization is more feasible for online retailers because it is much easier to identify and track consumers and estimate their preferences. Customization then creates additional demand and increases the willingness to pay, and hence increases profit margins.

The role of e-commerce on the development of firms of different sizes may vary and the results are not conclusive in the literature. Goldmanis et al. (2010) study how the diffusion of e-commerce has influenced the number or type of producers that operate in an industry. Using U.S. county business patterns data from 1994–2003, they find that as diffusion of e-commerce among consumers increases, the number of small firms decreases, and the large firms become more dominant. The rationale behind their finding is that e-commerce improves market efficiency by eliminating firms with high costs. In the developing world context, studies have also analyzed e-commerce and its interaction with rural agricultural production, especially for smallholders. Zeng et al. (2017) systematically review the literature of e-commerce in the agri-food sector and point out that besides establishing farmer organizations (Hazell et al. 2010 and Markelova et al. 2009) and promoting contract farming between smallholders and agribusiness firms (Abebe et al. 2013), e-commerce can serve as an efficient alternative to enhance market access for smallholders.

The Internet in general and beyond e-commerce affects income and the labor market. Hjort and Poulsen (2019) show that the Internet has large positive effects on employment rates and average incomes by studying how the arrival of submarine fiber optic Internet cables in Africa affected labor market outcomes. Their results show that, through firm entry, productivity, and export, the probability of being employed in a skilled position increases substantially, but the probability of holding an unskilled job is unaffected.

E-Commerce Development and Household Welfare

E-commerce development can contribute to household welfare improvement both from the income and consumption sides.

- First, as discussed earlier in this chapter, e-commerce can create jobs, including jobs with higher wages and more flexibility to meet individual demand (such as part-time and home-based jobs, which are often more attractive to women), which fundamentally increase household welfare. Growth, jobs, and services are the most important returns to digital investments (World Bank 2016). Digital platforms can create instant business opportunities for entrepreneurs, thereby creating jobs (World Bank 2019). Increasing the stock of jobs and stimulating wage growth can help increase household income.
- Second, e-commerce development has the potential to increase consumption. E-commerce development is associated with higher consumption growth. Lower search cost is a key feature of e-commerce (Bajari and Hortaçsu 2003; Hong and Shum 2006; Brynjolfsson et al. 2010; Lieber and Syverson 2012; Levin 2011). Lower search cost makes price discovery easier, bringing the law of one price closer to reality



(Gorodnichenko and Talavera 2017). Lower transaction costs increase the level of specialization in society and create more trade. Couture et al. (2018) show that the expansion of e-commerce to the Chinese countryside is associated with lower cost of living, and for the goods that are available at both the Rural Taobao online terminal and in the village, the median price from the online terminal is cheaper by 15 percent. According to a McKinsey report by Dobbs et al. (2013), online retailing may have lowered China's average retail price by 0.2 to 0.4 percent in 2011 and 0.3 to 0.6 percent in 2012. Holding disposable income constant, lower cost of living means more discretionary spending power, which implies higher consumption.

E-commerce development has the potential to change consumer and producer welfare through three channels. By enabling traders to locate near producers and sell products directly to consumers, e-commerce can lower travel costs and contracting costs associated with remote ordering. With lower costs, sellers can restock more frequently and provide consumers with newer, more stylish products and greater variety. If the cost saving is passed on, consumers also get lower prices. As the importance of stylishness and degree of cost savings vary by goods and services, the association of e-commerce with changes in consumer welfare is likely to differ.

E-commerce can lower costs, including search costs, operational costs, and inventory and fixed costs.

- *Search costs:* The Internet, as already noted, reduces the product search cost for consumers. Powerful search engines can tailor results to individual queries and provide customized information based on purchase and search history to better match products and services with potential buyers (Levin 2011). Lieber and Syverson (2012) point out that, although the search cost is not completely free, it is modest compared with the time it would take to travel and search among offline sellers.⁴ The time savings, particularly for people in remote areas with limited access to markets, can be large.
- *Operational costs:* E-business makes it easier to use information during producer operations. Kumar and Petersen (2006) argue that e-commerce can reduce operational costs by improving the availability of information, reducing processing errors, reducing response times, and lowering the cost of services. Garicano and Kaplan (2001) suggest that e-commerce has potentially large marketplace benefits as it reduces coordination costs and improves efficiency through process improvements. Reduced operational costs and increased efficiency can provide a margin that allows the seller to pass on gains to consumers through lower prices.
- *Inventory costs and fixed costs:* An online platform reduces the number of intermediaries between producers and consumers and therefore reduces

inventory costs and fixed costs. A typical online seller can quickly respond to demand and order from upstream manufacturers or wholesalers as needed (Lieber and Syverson 2012). This allows online sellers to hold less inventory than offline sellers, which reduces fixed costs for warehouse and showroom rentals. Dai and Zhang (2015) find that an online seller in Baigou, China, can post pictures of available suitcases, then buy the product from manufacturers only when consumers place online orders for them. In this way, online shops need only half the inventory typically held by offline shops. With low fixed costs and low inventory costs, online shops require much lower startup capital than offline shops; this facilitates the entry of new firms, particularly small and medium-size firms.

The reduction of costs, particularly, those related to transportation, can also alleviate institutional barriers and lower product search and contracting frictions between intermediaries and suppliers. Provincial boundaries in some parts of China have become barriers to trade because of local protectionism (Bai 2017; Barwick et al. 2017; Poncet 2003), but barriers become meaningless with e-commerce as local governments have no way to block online “imports” (Bai 2017). With e-commerce, consumers can also buy directly from producers without an intermediary, further reducing costs (Startz 2016). Third-party payment platforms guarantee the delivery of payment, an important form of assurance for intermediate online shops (Dai and Zhang 2015).

Lower costs also can encourage trade in a larger variety of products. When the Internet lessens geographic barriers, online sellers can access a much larger market and online buyers get the advantages of increased competition. Demand for niche goods can be met more easily as trade expands to a larger variety of products as well as similar products of varying quality, and thus price, which results in a wider and deeper online market. Online sellers can provide a more diversified mix of goods without the risks associated with large inventories and high fixed costs.

A diversity of online products can better meet specific consumer requirements for niche goods. This can create welfare gains. For example, Brynjolfsson et al. (2003) estimate that annual consumer surplus from sales of niche books on Amazon could be as high as \$1 billion, 7 to 10 times larger than the gains from increased competition. In later work, Brynjolfsson et al. (2010) report that the estimated consumer surplus for 2008 increased to \$5 billion, indicating continued gains. At the same time, sales of the top 10,000 titles as a share of total book sales on Amazon decreased from 70 percent in 2003 to 35 percent in 2008, implying that niche goods are of growing importance to the online book market.

The reduced costs and increased competition created by the Internet can reduce prices for consumers. If lower prices do occur, either through lower online prices or through lower offline prices for similar products due to competition,

consumer welfare may be increased. Online sellers can afford a smaller profit margin per product sold as they can reap high benefit from economies of scale, compared with traditional sellers. Gorodnichenko and Talavera (2017) find that online prices have shorter spells, smaller changes, larger pass-through, and faster adjustment speed, which is consistent with the prediction of reduced friction and increased integration. In the life insurance industry, the increase in consumer surplus due to the lower prices brought by the Internet is estimated to be \$115–215 million per year (Brown and Goolsbee 2002).

Moreover, e-commerce may yield an indirect income effect thanks to lower prices that translates into more disposable income. The extra income is likely to be spent on goods and services with high income elasticity not available online, such as travel and dining out. However, some personal services, such as kindergarten and health care, require frequent interactions between suppliers and consumers. In this case, local service providers enjoy a greater advantage than remote ones. As a result, e-commerce development likely will have little effect on such locally provided personal services.

E-commerce may have greater potential in developing countries. This is because in developing countries, a large proportion of people live in remote areas with limited access to offline retail stores; e-commerce can therefore reach a wider range of consumers who are otherwise constrained by limited access to markets than in developed countries. Building a multiregional general equilibrium model and using city-level data, Fan et al. (2018) show that e-commerce development in China disproportionately improves consumer welfare in remote cities. Drawing data from eight counties in three provinces where Alibaba's Rural Taobao Program was present, Couture et al. (2018) finds that e-commerce expansion reduces the cost of living for certain groups of the rural population who are induced to use it, though the average effect is muted.



Distributional Aspects of the Role of E-Commerce

Multiple factors can contribute to the rapid growth of online consumption, including wider selection, convenience and accessibility, and fast and reliable delivery. For people in small and remote areas, e-commerce can be particularly helpful in overcoming barriers to market access. A McKinsey report by Dobbs et al. (2013) argues that online transactions raised total spending in China.

E-commerce can stimulate production by lowering the threshold for market entry and favoring business clustering. Drawing from evidence in Shuyang county, Jiangsu province, Zeng et al. (2018) find that e-commerce adoption can increase farmer household income by increasing profit and sales amount but also enlarge the income inequality within those adopting e-commerce, owing to differences in human capital, physical capital, and social capital.

Several studies show that e-commerce can help alleviate barriers of distance, disproportionately benefiting buyers in remote areas. Sinai and Waldfogel (2004) find that consumers in small markets can use the Internet to overcome differences in consumption opportunity due to isolation. They show that, relative to offline spending, online spending on books and clothing increases with distance to the nearest offline store. Forman et al. (2005) find that businesses in rural areas are more likely to adopt Internet technology for communication purposes, which supports the argument that the Internet reduces the costs of performing economic activities in isolated areas. Fan et al. (2016) quantify the welfare gains from e-commerce and show that e-commerce disproportionately improves the access of remote cities to varieties of goods and reduces the associated real income inequality across cities. However, several studies show that distance still matters. Hortaçsu et al. (2009) find that distance is a deterrent to trade on the Internet, though the effect is much smaller than for offline trade using the transaction data of eBay and MercadoLibre. The negative distance effect on trade is highly non-linear as it is high within the same city but relatively small beyond that.

Several studies show that e-commerce can start with a lower amount of capital compared with traditional business. The timely payments through online services reduce the reliance of entrepreneurs on network-based trade credit and promotes the growth of entrepreneurship, including for those with limited starting capital (Dai and Zhang 2015). Timely online payment can lower the barriers for outsiders and the requirement of social capital. Dai and Zhang documented in their case study in Baigou, China, 67 percent of the online shops receive full payment in a month while only 38 percent of offline shops do so.

Meanwhile, e-commerce raises new risks and challenges. Pre-existing disadvantages may hamper the ability to harness e-commerce and causes inequitable benefit distribution. OECD (2017) pointed out that uneven access to ICT infrastructure and human capital endowments can lead to an inequitable distribution of benefits from e-commerce, such as micro, small, and medium

enterprises in remote rural areas with limited connection to infrastructure and people with little education and literacy. Couture et al. (2018), investigating a nationwide rural e-commerce expansion program in China, find that the sizable welfare gains were captured only by a minority of rural households who tend to be younger and richer, rather than a significant welfare improvement among the general producers and workers in rural areas.

The declining effect of distance and national geographic barriers might negatively affect local producers due to increased competition from outside. The extent to which e-commerce can help raise income levels among the poor or disproportionately support the development of poorer regions is an open question that has yet to be addressed in the literature.

The net impact of e-commerce on total retail depends on the net effect of two major forces. First, lower search costs, access to a larger market, and bigger variety of goods associated with e-commerce can have a negative impact on offline retailers. Consumers may switch from offline shops to online shops and thus the traditional retail market may shrink. Second, the new demand generated by online trade can create complementary demand for offline products and asymmetric information about product quality between online and offline shops may result in segmentation between the two that ultimately supports the expansion of offline trade. The low costs of selling online may induce participation by producers who previously would not trade, thereby expanding the retail market. The new market can also provide positive shocks along the vertical supply chain. Houngbonon and Liang (2017) look at the effect on income and inequality within townships from household broadband Internet adoption in France. They find that between 2009 and 2013, broadband adoption contributed 34 percent of the rise in average income and 80 percent of the fall in the Gini index of income inequality, and the gain is greater for the bottom income decile groups.

3.2 Research Framework, Data Sources, Value Added, and Limitations

The study used both primary and secondary data sources, including a household survey conducted in Taobao Villages in collaboration with Peking University and Nankai University joint research team, aggregate transaction data from the Alibaba platforms, indicators constructed by Alibaba using data from its platforms, and public data from multiple sources.

The study addresses four research priorities:

- Describe the patterns and evolution of e-commerce development in China.
- Describe the specific government policies and private sector initiatives to foster e-commerce development in rural villages.
- Identify pre-conditions for successful e-commerce development by examining empirically the association between county-level characteristics and level of e-commerce development.
- Investigate the links between e-commerce development and household welfare improvement, including its distributional aspects across different types of households.

The primary data sources include:

- **Taobao Village Survey.** This collaboration between the World Bank, Alibaba Group, Peking University and Nankai University joint research team is, to our knowledge, the first of its kind on rural e-commerce clusters. It covers the characteristics of the Taobao Villages, detailed household-level information—demographic characteristics, assets and income, risk aversion and social attitudes, e-shop operations and employment, as well as subjective constraints and supports needed for e-commerce development. The survey, conducted between August and September 2018, is representative of the universe of 2,118 Taobao Villages in 2017. The sample covers 1,371 households in 80 villages across eight provinces (Beijing, Hebei, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Yunnan), of which 616 households own e-shops (e-households) and 755 do not (non-e-households).
- **Alibaba Transaction Data.** Alibaba shared transaction data from its platform (Tmall.com and Taobao.com) aggregated at the county-level for 828 (out of 832) national poverty-stricken counties in China from 2013 to 2016, including (i) online sales amount and online purchases amount; (ii) number of online sellers and number of online purchasers; and (iii) number of packages sent and number of packages received. Alibaba also shared the same information for 162 counties covered by the China Family Panel Studies, which is nationally representative. The data for these 162 counties are converted into z-scores for confidentiality. To our knowledge, this is the first time that Alibaba has shared its transaction data at the county level with an international organization. That data provides a detailed picture of e-commerce development in China.
- **Online Business Index (OBI) and Online Shopping Index (OSI).** AliResearch developed both indexes. OBI is a constructed index measuring

the density of online stores and the percent of online stores with annual online sale above RMB 240,000. OSI is a constructed index measuring the density of online buyers and the percent of online buyers with annual online consumption above RMB 10,000. The online transaction numbers are from the Alibaba platform, which accounts for most online transactions in China, and therefore the OBI and OSI value may largely reflect the e-commerce development levels.

Secondary data are accessed online from the following sources:

- **National government agencies** including the Ministry of Commerce, Ministry of Human Resource and Social Security, National Bureau of Statistics, State Post Bureau of the People's Republic of China, U.S. Census Bureau, and Office for National Statistics in the United Kingdom.
- **Think-tanks and international organizations**, such as United Nations Conference on Trade and Development, McKinsey & Company, Goldman Sachs, Boston Consulting Group, China International Electronic Commerce Center, and AliResearch.
- **Research-oriented surveys such as China Family Panel Studies (CFPS)**. This nationally representative, annual longitudinal survey of Chinese communities, families, and individuals was launched in 2010 by the Institute of Social Science Survey of Peking University. CFPS collects individual-, family-, and community-level longitudinal data on economic activities, education outcomes, family dynamics and relationships, migration, health, and the like. This study uses the panel from 2012, 2014, 2016 waves of CFPS to describe the pattern of consumption of households and individuals, as well as to merge the CFPS data with OBI and OSI provided by Alibaba to examine the links between e-commerce development and income growth.

This study adds value by:

- Providing a comprehensive picture of e-commerce development in China. While many studies offer snapshots of e-commerce development in select areas of China, this study puts together the public information and the Alibaba data (representing about 60 percent of the e-commerce retail market in China) to provide a more comprehensive picture. In particular, the description of e-commerce development in poverty-stricken counties using the Alibaba data provides detailed information on transactions, buyers and sellers, packages sent and received, specialty products sold, and discusses patterns of spatial concentration of e-commerce development in the least-developed areas of China.
- Providing systematic empirical analysis nationwide on:

- ***Characteristics of counties where e-commerce development level is higher*** (to provide support to the identification of pre-conditions for e-commerce development).
- ***Links between e-commerce development and economic growth at the county level.*** By matching the AliResearch e-commerce indicators (OBI and OSI) and county-level variables from the official statistics yearbooks to construct a four-year panel (2013–2016), the study can examine links between e-commerce development and economic growth controlling for county-level characteristics in an innovation manner.
- ***Links between e-commerce development and household consumption growth.*** By using the Alibaba non-public transaction data to construct a series of new indicators to measure the development of e-commerce, including e-commerce penetration, intensity, and market size, and matching them with the CFPS data, the study examines links between e-commerce development and household consumption growth, including variations across regions, between rural and urban areas, between poor and rich households, as well as among the different categories of consumption goods and services.
- Providing an in-depth picture with firsthand information about Taobao Villages. Using the Taobao Village Survey, the study profiles of the villages, households, and individuals that engage in e-commerce and compares them with those that do not, as well as the e-shops and their workers, and examines who participates in and benefits from e-commerce. This complements the many case studies of Taobao Villages to provide a systematic picture of the villages (not cherry-picking) and derive lessons that can be used to further the development of e-commerce in rural areas.

The study has limitations due to data constraints:

- The lack of data at the county level (measures of infrastructure development, such as road density, and of human capital, such as education or skill level of the labor force), prevents examination of the direct links between these important factors and endowments with e-commerce development, neither in the analysis of the pre-conditions for e-commerce development nor controlling those variables in the analysis of links between e-commerce development and economic growth or welfare improvement. Should those data become available, the empirical analysis can provide further insight on the policy actions to support the development of e-commerce and strengthen the impact of e-commerce development on economic growth and welfare improvement.
- Due to the mismatch between the data available from the Alibaba platform (2013 onwards), the county-level data (before 2015/16), and the household

survey data (before 2016), it is only possible to construct panel analysis for the overlapping years, which limits the power to explain the pattern and evolution of e-commerce development and the links between e-commerce development and economic growth and welfare improvement.

- The Taobao Village Survey has two limits: First, it covers only Taobao Villages (it does not cover non-Taobao Villages). The information collected in the survey therefore is only representative for the Taobao Villages. While it provides valuable information about e-commerce development in those villages, it does not provide information about the general development of e-commerce in China (Taobao Villages are only a small subset of villages in China, and they are special in many ways, see details in chapter 5). Second, it collects information for only one round in 2018. This limits understanding of the patterns of change within these villages and the impact of e-commerce participation on household income changes. In addition, the survey does not have information to allow study of the indirect effect of e-commerce participation (which requires more comprehensive information on input-output links).
- Due to the data limits, in a strict econometric sense, it is not possible to identify causality between specific policy interventions and e-commerce development, or causality between e-commerce development and economic growth and welfare improvement.

Notes

1. See Rugaber 2017.
2. The majority of the existing work focuses on the U.S., European countries, and China, and more research on the developing countries is needed.
3. Direct employment here is defined as online marketplace workers such as platform developers and operations and marketing personal; indirect employments are merchants, logistic clerks, passenger-vehicle drivers, hotel staff, housekeepers, and others; induced employments are created through additional online marketplaces stimulated activities, such as car mechanics and cleaners, tourist guides, and craftspeople. Indirect employment created by e-commerce includes jobs created in the upstream and downstream activities with close links to e-commerce.
4. As also confirmed by Bajari and Hortaçsu 2003; Brynjolfsson, Dick, and Smith 2010; and Hong and Shum 2006.

CHAPTER FOUR

E-Commerce Development, Economic Growth, and Household Welfare



Numerous case studies of China show that regions get richer with more developed e-commerce and people gain wealth and have better lives after participating in e-commerce. This chapter includes four sections that focus on the experiences in China and empirical evidence from the national and subnational levels. First, it describes the demographics of e-commerce merchants. Second, it examines the association between county-level characteristics and e-commerce development. Third, it explores the links between e-commerce development and economic growth at the county level. Finally, it presents the empirical results of the association of e-commerce development with household consumption growth nationwide and across regional and rural or urban areas, as well as by consumption categories.

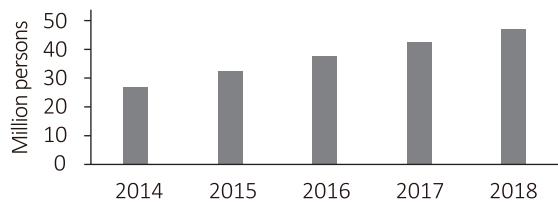
4.1 Demographics of E-Commerce Merchants

Various sources suggest a large number of people engage in employment related to e-commerce.¹ In 2018, 47 million people were employed in e-commerce (Figure 4.1), over 6 percent of total employment in China.²

A report by Renmin University of China (2019), indicates that e-commerce in China promotes increased employment, both direct and indirect. The channels leading to that increase include stimulating demand, enlarging existing industrial clusters and creating new ones, online and offline integration, and diversifying preference of consumption. The Ministry of Commerce³ reports that e-commerce has absorbed much surplus rural labor, returning migrants, and veterans, and offers disabled people new opportunities for home-based work. Employment directly and indirectly driven by rural online stores reached more than 28 million in 2017,⁴ Boston Consulting Group (2017), finds that digital jobs in e-commerce, online entertainment, finance, and smart manufacturing have been important sources of new job creation in the recent years.⁵

Women and youth account for a disproportionately high share of employment related to e-commerce (Box 4.1). Alibaba, the largest e-commerce platform nationally and globally, supports about 10 million jobs, or 1.3 percent of China's workforce. Adding the indirect jobs created, Alibaba alone may account for as much as 3 percent of the workforce. Six out of 10 online entrepreneurs on Alibaba have SMEs, 40 percent are women, 19 percent are previously unemployed, 7 percent are farmers, and about 1 percent are persons with disabilities (World Bank 2016). A recent study by the Renmin University of

Figure 4.1. E-Commerce Employment in China



Source: China, Ministry of Commerce 2019. Estimated by National Engineering Laboratory for E-Commerce Technologies and China Center for Internet Economy Research, Central University of Finance and Economics.

China (2019)⁶ finds that the Alibaba online retail platform created 40.82 million jobs in 2018, of which 15.58 million are from online transaction activities and 25.24 million are derived by production activities related to online sales.⁷ In 2014, Alibaba's online retail platform had 8.5 million active online shops and indirectly created over 3.5 million jobs, about 1.5 million of which are couriers, while others include models, authorized operators, shopping guides, designers, customer representatives, and software development programmers, among others.⁸

Box 4.1. Women and Youth Entrepreneurship in E-Commerce

- On Taobao and Tmall platforms, the ratio of women to men entrepreneurs in e-commerce is at or near parity,^a compared to 1:3 in all business in China.^b
- In 2016, 47 percent of sales on Taobao and Tmall platforms are achieved by e-shops owned by women.^c
- In 2014, 64 percent of e-shop owners in China are between 25 and 34 years old, and 22 percent are 24 years old or below, while more than 80 percent of e-shop workers are under age 34.^d
- On Alibaba's Taobao platform, 80 percent of Taobao shops were opened by people between 16 and 40 years old; Seventy-six percent of rural e-tailers are 20–29 years old, and those between ages 30 and 39 account for 19 percent.^e
- In 2013, the average age of off-line female entrepreneurs in China is 47.6, while online counterparts tend to be younger, at 31.4 years old in average. In 2016, on Taobao and Tmall platforms, 31 percent of female entrepreneurs are between 25 and 29 years old, and 26 percent are between 18 and 24.^f
- By the end of June 2016, the approved loan credit for female applicants was 7 percent higher than that of male applicants on the Ant Financial microcredit platform.^g

a. Source: AliResearch (2016). Women Study Based on Alibaba's Ecosystem.

b. Source: China, The State Council Information Office (2015), Gender Equality and Women's Development in China White Paper.

c. Source: AliResearch (2016). Women Study Based on Alibaba's Ecosystem.

d. Source: China Association of Employment Promotion (2015), Online Entrepreneurship and Employment Statistics and College Students' Online Entrepreneurship and Employment Research Report.

e. Source: China, Ministry of Commerce (2018), E-commerce in China 2017.

f. Source: AliResearch (2016). Women Study Based on Alibaba's Ecosystem

g. Source: AliResearch (2016). Women Study Based on Alibaba's Ecosystem.

E-commerce-related jobs also reach rural areas. AliResearch (2017c) indicates that in rural areas, in addition to direct job creation, e-commerce indirectly creates jobs like tailors, carpenters, express delivery men, and photographers in the neighborhood. According to AliResearch (2017a, 2018), Taobao Villages alone directly created 1.3 million employments in 2017 and 1.8 million in 2018.

Box 4.2. Case Study: E-Commerce Development and Jobs Creation in Suining County

Dongfeng village in Suining county, Jiangsu province is one of the villages that developed e-commerce in rural China. The rapid growth of e-shops in Dongfeng was accompanied by development of a cluster of related service providers, especially logistics services. Since the first logistics company settled in the village in 2006, the number of companies has continuously increased; in 2014 there were 43 express delivery companies in the e-commerce cluster. E-commerce development has also attracted providers of other services, such as financial services, photography and photo processing, e-shop design, promotion, management consulting, legal services, online business training, and others.^a

The rapid development of e-commerce spread to neighboring villages. As the population in Suining county engaged in e-commerce, the number of e-shops and online sales doubled from 2014 to 2015 and doubled again in 2016. The growth rate of e-shops slowed in 2017, but online sales continued a relatively high growth rate. In the first quarter of 2016, more than 20,000 people worked in e-commerce, and by the end of 2017, Suining had more than 42,000 e-shops and RMB 21.6 trillion in online sales.^b By September 2018, Shaji town alone had 73 logistics express companies, 24 photography companies, 3 e-commerce operation service companies, 70 raw material suppliers, 36 hardware accessories manufacturers, and 14 accounting service companies. Of the 60,000 population, 25,800 individuals worked in jobs related to e-commerce.

This has had a major impact. Once a poor county, Suining saw its GDP per capita increase from RMB 8,159 in 2008 to RMB 31,320 in 2015. Annual per capita net income of rural households grew from RMB 5,452 in 2008 to RMB 10,686 in 2013, and local government revenue grew from RMB 522 million in 2008 to RMB 4,368 million in 2015.^c E-commerce is one of 10 contributors to this growth recognized by the provincial government.^d

Sources: AliResearch

a. See Zeng et al. 2015

b. Data are from Alibaba and government website. <http://www.cnsn.gov.cn/szfmj/201605/58baf41d16eb403db2d7abf3e0f9e2ba.shtml> <http://www.cnsn.gov.cn/szfmj/bmks/201701/34ea64bb6b7547daa0d6806e9a0e9b0d.shtml>

c. Source: China Data Online. GDP per capita is calculated by staff.

d. See <http://www.jsfp.gov.cn/Item/6704.aspx> (江苏扶贫开发信息网 , 睢宁县：“十大扶贫模式”增强精准扶贫工作后劲)

While systematic and comparable national data are not available, case studies provide additional information about the jobs upstream and downstream in the industry chain related to e-commerce development (Box 4.2). Examples in Suining county, Jiangsu province, one of the first rural areas where e-commerce started to boom, show the increase of the number and variety of jobs related to e-commerce and its contribution to the local economy. Similarly, Dazhi village, Shenze county, Hebei province, develops the e-commerce industrial chain for production and sales of fabric products, and integrates fabric design, processing, packaging, sales, and logistics, creating jobs for receiving orders, fabric design, front shop and back factory production, express delivery, and after-sales feedback.⁹

4.2 Initial Conditions

The level of e-commerce development, as measured by the OBI and OSI indicators, varies geographically in China. So, where is e-commerce more likely to develop, and what initial local conditions are more conducive to its development? As discussed in the preceding chapter, identifying causality of the determining factors for e-commerce growth or measuring the impact of improving certain local conditions on e-commerce development requires data that are not currently available. Therefore, this section draws from panel data of about 2,000 counties in China during the period 2013–2017 and the AliResearch OBI and OSI data (see Box 1.1) to examine the linkage between county characteristics and e-commerce development level.

The first step is to build on the existing research and case studies in China to discuss the role of the enabling factors for e-commerce development and draw on the statistics yearbook to discuss the association between several county characteristics and e-commerce development.¹⁰ For example, Dai and Zhang (2015) show the value of e-commerce in lowering barriers to entry and dependence on social capital. Meanwhile, Zhang and Zhu (2015) show that e-commerce develops faster in industrial clusters and reinforces the development of such clusters. It can help upgrade supply chains in rural areas by lowering the costs of trade and increasing market access. Eventually it can also improve services by using big data to tailor production to consumer demand and by leveraging the benefit of digital technology to improve product quality.

As discussed in the preceding chapter, infrastructure and logistics, skills and entrepreneurship, and a conducive business environment are important for e-commerce development.

- Infrastructure is a necessary condition for e-commerce adoption and development. Liu et al. (2018) finds that the condition of the economic, infrastructure, and commercial foundation has a positive influence on rural

e-commerce development in China western areas; economic condition and developed e-commerce in surrounding areas also have a positive impact on e-commerce development, indicating spillover effects; and distance to national roads and highways affects rural e-commerce development as well.

- Human capital, including skills and entrepreneurship, is also an important enabling factor. E-commerce in Junpu village, one of the first Taobao Villages, was brought by a few returned migrants who worked on e-shops in city, and they shared the e-commerce skills and experience with friends and relatives in the village (Zeng et al. 2015). E-commerce development in Dongfeng village, another early Taobao Village, was driven in the beginning by few role models who started e-commerce and reaped success, which made villagers aware of business opportunities in e-commerce (Zeng et al. 2015). Qi et al. (2019) finds that education has a positive impact on Taobao Village formation. Zeng et al. (2019) find that rural people with entrepreneurial and e-commerce training experience are more likely to adopt e-commerce, while previous work experience inhibits their participation in e-commerce business.
- Government support in providing a conducive business environment can play an important role. Guo (2016) states that to promote agricultural e-commerce development in China, government efforts to enhance quality regulation and cooperate with associations and companies to create local brands and enterprise brands are important. Lowrey (2015) claims that credibility and trust; open, transparent, efficient, and accountable finance services; and rules of the game are critical to e-commerce entrepreneurship and innovation.



In addition, local production structure matters for e-commerce adoption. Traditional industry condition is an important factor in the early stage of e-commerce development, including products and human resources, both locally and in surrounding areas (Zeng et al. 2015). Agricultural industry clusters have advantages in rural e-commerce adoption, including that agricultural clusters have more developed infrastructure and logistics than the general rural area; good agricultural industrial bases support rural e-commerce entrepreneurship; and knowledge spillover and network effects promote e-commerce development in a broader area (Chen et al. 2018).

A positive correlation is evident between local GDP per capita and e-commerce development level (Figure 4.2 and Figure 4.3). Broadly, e-commerce is more developed in counties with higher levels of economic development, smaller secondary sectors, larger household savings, and more developed financial sectors. Online shopping also has a positive relationship with population density and fixed asset investment and a negative relationship with size of primary sector. E-commerce is more developed in counties where Taobao Villages emerged, compared to those without Taobao Villages. After controlling for the above mentioned local economic characteristics, the positive association between e-commerce development and initial GDP per capita remained. See Appendix F for technical details of the econometric analysis.

Figure 4.2. Correlation between GDP Per Capita and OBI

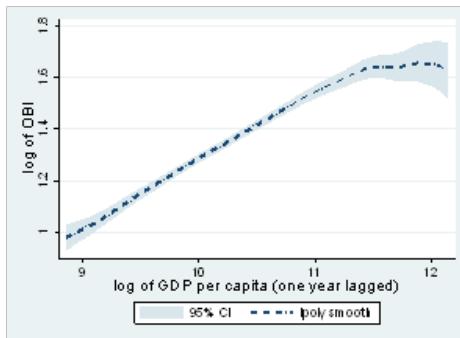
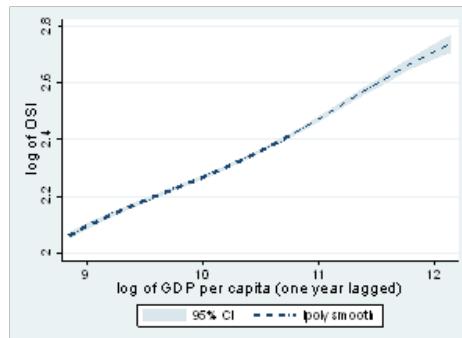


Figure 4.3. Correlation between GDP Per Capita and OSI



Note: The top and bottom 1 percent of OBI, OSI, and GDP per capita are treated as outliers and dropped.

Data constraints prevent examination of the links between e-commerce development and the proxies of human capital (such as skills level of the labor force), infrastructure and logistic development (such as road density or transaction costs), and business environment.

4.3 E-Commerce Development and Economic Growth

This section explores the link between e-commerce, considering it a technology advancement, and economic growth at the county level in China. In the Solow growth model, technology change is treated as a nonrival and nonexcludable public good provided exogenously (Solow 1956). Arrow (1962) makes rate of knowledge accumulation endogenous by assuming that increasing of physical capital inputs can improve knowledge through “learning by doing.” Lucas (1988) also treats knowledge as an unintentional side effect of production process but produced from human capital. Unlike Arrow and Lucas, Romer (1990) distinguishes technology as a nonrival and partially excludable good and points out that technology change can be an intentional outcome raised from investment decisions under profit-maximizing monopolistic competition.

E-commerce can create incentives for technology innovation and increase productivity (Dobbs et al. 2013). Willis (2004) indicates that in the near term, e-commerce leads to a faster pace of innovation and shifts suppliers to a more efficient composition from increasing competition between businesses due to e-commerce expansion, especially at the stage when e-commerce size is not large. In the long run, e-commerce affects growth of the overall economy by improving productivity through cost saving on transactions, inventory holding, advertising, searching, and transportation, benefiting from information technology and labor requirement reduction.

E-commerce accelerates growth in the business sector by reducing transaction costs, allocating resources more efficiently, increasing economies of scale, and improving competitiveness (UNCTAD 2001). Guo et al. (2014) concludes that e-commerce clusters create large external economies and contribute to



productivity increase in other industrial activities as they generate knowledge and expertise spillovers, which simulate efficiency, quality, and specialization upgrade of other inputs. From flower and plant growing industry clusters in Shuyang county, Jiangsu province, Chen et al. (2018) finds that agricultural e-commerce adoption enlarges production scale and further promotes resource relocation that improves efficiency and input-output ratio. It also raises human capital, including labor skills and rural entrepreneurship talent, through learning by doing and knowledge spillovers.

E-commerce can also promote economic growth by increasing market access and integration to value chains, especially benefiting small economies and SMEs. E-commerce enables companies to sell goods and services to a broader market, benefiting especially those once limited to the local markets, and is inclusive to SMEs (Albastroiu 2007). E-commerce can encourage formalization and growth of SMEs and promote their integration into value chains and markets (OECD 2017). Soobramanien et al. (2017) point out that e-commerce simulates development in small countries, especially those remote from markets, in three ways: facilitating the creation of and access to a global market, enabling providing services via the Internet and eliminating the need to travel or establish office branches, and mitigating exclusion and isolation. It also helps diversify economies of small developing countries and even transform them into service economies.

E-commerce supports product flow between remote villages and economically prosperous areas, along with information flow and capital flow (Zhang et al. 2018). This can result in agglomeration of offline service providers and online retailers, which can further promote industrial chain extension and regional labor division. For example, industrial transformation and upgrade are found in Xiaying village, Hubei province, where the villagers take advantage of e-commerce network platform and capital accumulated from kallaite online sales to develop characteristic agricultural products and rural tourism. Chen et al. (2018) state that e-commerce adoption promotes agricultural cluster upgrade through increased demand and product diversity requirement; competition-induced quality improvement and innovation; formation of new supply chain and labor division and specialization; and a more comprehensive service system such as financial and logistics services.

Using panel data at the county level for 2013–2017 the association between GDP per capita growth and OBI was examined, controlling for a series of county characteristics, including the initial level of development (Box 4.3).¹¹

Box 4.3. Panel Analysis of the Links between E-Commerce Development and Economic Growth

The link between e-commerce and economic growth was examined using panel data from 2013–2017 for about 2000 counties in China. The Online Business Index (OBI) was used to measure e-commerce development at the county level.¹² To estimate the association of online business development on local economic growth and remove the potential mutual effects between these two factors from the estimation, an instrument variable (IV)—an unweighted average of OBI in the other counties in the city where the county is located excluding the county in question, is employed to measure development of online business.

The regression model takes year-to-year GDP per capita growth as a dependent variable and OBI IV as an explanatory variable to measure online business development. Building on the growth model, the following control variables are included: GDP per capita, population density, share of GDP in primary sector, share of GDP in secondary sector, ratio of fixed asset investment to GDP, ratio of fiscal expenditure to GDP, and ratio of loan to GDP, as well as a dummy of Taobao Village to identify difference of economic growth rate in counties with and without Taobao Villages.

The results show that GDP per capita growth rate is positively associated with OBI, after controlling for key economic characteristics of the initial year.

Results of the regression show that GDP per capita tends to grow faster in counties where online businesses are more developed. As expected, such growth tends to be higher in counties with lower GDP per capita, smaller share of GDP in primary and secondary sectors, larger population density, larger ratio of fixed asset investment to GDP, larger ratio of public expenditure to GDP, and larger ratio of loan to GDP. GDP per capita also tends to grow faster in counties with Taobao Villages, compared to those without them. The results show that online business is positively associated with local economic growth, especially in coastal areas. Further research is required to disentangle the reasons for the positive association and the variation in magnitude across regions, the results suggest a strong positive link between e-commerce development and economic growth at the county level, including in the least-developed areas.

4.4 E-Commerce Development and Household Welfare

This section examines the relationship between e-commerce development and consumption welfare in China.¹³ It investigates the differential impact of e-commerce on consumption growth by various goods and services (Box 4.4).

Box 4.4. E-Commerce Development and Household Consumption Growth in China

A background paper for this report matches the China Family Panel Studies data, a nationally representative household survey, with county-level e-commerce information obtained from Alibaba, to examine the contribution of e-commerce development on consumption growth at the household level following in spirit of Fan et al. (2016) and Couture et al. (2018). It examines the relationship between e-commerce development and consumption growth across different consumption categories and population groups in China, using Alibaba data to construct a set of new indicators to measure e-commerce penetration, intensity, and market size.

The analysis adds a few new features to the literature. First, matching the two data sets allows direct examination of the impact of e-commerce development on consumption growth at the household level rather than at the aggregate city level as in Fan et al. (2016). Second, the new findings are likely more representative because CFPS covers many more counties than the sample used in Couture et al. (2018). Third, the rich consumption information of the CFPS survey makes it possible to study the heterogeneous associations between e-commerce development and various categories of consumption, which were not discussed in Fan et al. (2016) or Couture et al. (2018).

Source: Luo, Xubei; Yue Wang, Xiaobo Zhang. 2019. *E-Commerce Development and Household Consumption Growth in China (English)*. Policy Research working paper; no. WPS 8810. Washington, D.C.: World Bank Group.

The findings show that e-commerce development is associated with higher consumption growth in China. Due to data limitations, it is not possible to separate total household consumption into online consumption and offline consumption, and therefore impossible to examine the effects of e-commerce development on these two types of consumption separately. According to a McKinsey report by Dobbs et al. (2013), except where it substitutes for offline consumption (likely not a significant factor in remote, rural, or poverty-stricken areas), online shopping generates new consumption. Based on data from 266 cities in China, the report finds that online retail sales promote total consumption (an estimated 2 percent increase in private consumption in 2011 and a projected incremental gain of 4–7 percent by 2020).

The strong association between e-commerce development and household consumption growth can stem from the lower search costs and transaction costs, which result in lower prices. As noted in chapter 3, lower search cost is a key feature of e-commerce because it makes price discovery easier. Lower transaction costs increase the level of specialization in society and create more trade. More competitive prices tend to reduce the cost of living for residents. Couture et al. (2018) show that the expansion of e-commerce to the Chinese countryside is associated with lower cost of living, and for the goods that are available at both the Rural Taobao online terminal and in the village, the median

price from the online terminal is cheaper by 15 percent. Dobbs et al. (2013) finds that e-tailing may have lowered China's average retail price by 0.2 to 0.4 percent in 2011 and 0.3 to 0.6 percent in 2012. Holding disposable income constant, lower cost of living means more discretionary spending power, which implies higher consumption.

The results of the data analysis also show that the relationship between e-commerce development and household consumption growth is stronger for the rural sample, inland regions, and poor households, suggesting that e-commerce development helps reduce spatial inequality in consumption. For people in remote areas with limited access to markets, the saving in search costs and the increase in variety of products accessible online compared with traditional brick-and-mortar stores can be particularly large. E-tailing is not just a replacement of purchases that would otherwise occur but could spur incremental consumption particularly in small cities and towns where there is pent-up demand for goods that local physical stores cannot deliver (McKinsey 2013). Couture et al. (2018) show that 62 percent of goods bought through Alibaba's Rural Taobao platform were not available in the village, which rises to 84 percent for durable goods. Therefore, they likely benefit more from e-commerce development than their counterparts in more populous and developed regions.

The consumption of goods with higher storage costs (such as durable goods that require more resources for stocking for local traders) and in-style goods (such as cosmetics and beauty products, clothes, and entertainment), exhibits stronger growth than the consumption of local services. Startz (2018) finds that the lower costs of travel and contracting associated with enabling traders to locate near producers and sell online, allow sellers to source more frequently and provide more *a la mode* products and greater variety to consumers. If the cost saving is passed through, consumers will also get lower prices. As the importance of stylishness and degree of cost savings from search and contracting frictions vary by goods and services, the impact of e-commerce on consumer welfare is likely to differ by types of goods and services. Consumption growth of goods and services with higher income elasticities, such as travel and dining out, is also higher even though these are not online products or services. Meanwhile, there is some indication that e-commerce development benefits consumers in areas with high travel costs (such as in the interior regions).

Notes

1. Despite the general agreement about job growth associated with e-commerce, as discussed in the preceding chapter, the causality between e-commerce and job creation and the magnitude of impact of e-commerce on job creation and job destruction directly or indirectly, are subject to further studies. More research is needed into how much of that growth may have been due to substitution for employment in offline businesses.
2. According to Ministry of Human Resource and Social Security, there were 775.9 million employments in China in 2018.
3. See China, Ministry of Commerce 2018a.
4. See CIECC 2018.
5. See Xinhua News Agency (2018), Economic Watch: The secret behind China's job creation success http://www.xinhuanet.com/english/2018-07/26/c_137350120.htm
6. Based on online transaction volumes on Alibaba online retail platform and input-output data in China.
7. See Renmin University of China 2019.
8. See Renmin University of China and AliResearch 2016.
9. See Xinhua News Agency 2016.
10. The empirical study of the association between county characteristics and e-commerce development, unfortunately, is constrained by the availability of variables in the statistics yearbook. Therefore, it is only possible to examine the association of select variables.
11. See technical details in Appendix G. The selection of the variables of controlled is constrained by the availability of the data at the county level (from the statistical yearbooks). This association does not mean to suggest causality.
12. The e-tailer information used for the construction of the OBI is solely from Alibaba platform and it does not include e-tailers in other platforms. Therefore, it is only a subset of the e-commerce information in China. However, given the large market share that Alibaba has in the online market in China, OBI can capture to a large extent the e-commerce development level and is the best information available for this study.
13. This section draws from Luo, Wang, and Zhang (2019), "E-Commerce Development and Household Consumption Growth in China," a background paper of this report.

CHAPTER FIVE

Taobao Villages



A fast-growing body of case studies on e-commerce in rural China focuses on Taobao Villages. Numerous cases show the prosperity of Taobao Villages and that people gain wealth and have better lives when they participate in e-commerce. Case studies, such as Shaji in Jiangsu province and Cao county in Shandong province, show many young and talented people, including women, have returned to their rural hometowns, earn incomes similar to or higher than they did as migrant workers in the cities, while enjoying family life with their elders and children. Many have become leaders of e-commerce in their home villages and are role models for fellow villagers. Case studies in Mengjin in Henan province find people are enriched by access to new markets through online platforms for traditional cultural products, such as peony painting and Tang tri-color ceramics. Case studies in Xifeng in Guizhou province show households receive a higher farmgate price for kiwis and therefore have an incentive to increase production through online sales to domestic as well as European markets. Many cases, including poverty-stricken counties in remote and mountainous areas, show that access to an online market allows people in rural areas to enjoy the convenience, variety, and low prices that are enjoyed by people in big cities.¹

Taobao Villages are rural villages where e-commerce is most developed or concentrated (Box 5.1). The rapid expansion and prosperity of Taobao Villages shows that e-commerce is not only a phenomenon of urban areas in high-income countries; with the right conditions, it can flourish in rural areas in developing countries.

This chapter adds value to existing research through its in-depth characterization of Taobao Villages, their e-commerce businesses, and the households, and individuals that participate in that business. The use of a representative sample of Taobao Villages to characterize the households and individuals who participate in e-commerce (rather than case studies) has not previously been done. The analysis draws from the Alibaba data and the Taobao Village Survey to describe the rapid expansion and spatial concentration of Taobao Villages, provide a comprehensive profile of the villages, characterize the households and individuals that participate in e-commerce and the e-shops in Taobao Villages, and examine who participates in e-commerce and benefits from participation in Taobao Villages. The objective is to provide an in-depth view of e-commerce development in Taobao Villages and develop the basis to distill lessons. As Taobao Villages are areas where e-commerce development

Box 5.1. Taobao Villages and Taobao Towns

Taobao Villages are a special phenomenon of e-commerce development in rural China. They are areas where e-commerce is most developed or concentrated in rural areas, specifically, villages where at least 10 percent of households actively engage in e-commerce (or where there are at least 100 active e-shops) with annual online sales of at least 10 million yuan (or \$1.5 million). A Taobao Town is a town, township, or street that consists of at least three Taobao Villages.

is strongest in rural China, survey data gathered from these villages provide a comprehensive picture of these villages, and the households, individuals, and e-shops they include. The information presented draws on responses to a 2018 survey representative of all Taobao Villages as of 2017 and focused on e-commerce activities.²

5.1 Rapid Expansion and Spatial Concentration

The number of Taobao Villages and Towns has increased rapidly and continuously. The number of Taobao Villages grew from 20 in 2013 to 3,202 in 2018 (Figure 5.1) and as Taobao Villages expand, they cluster into Taobao Towns.³ The number of Taobao Towns grew from 19 in 2014 to 363 in 2018 (Figure 5.2). The expansion of Taobao Villages and Towns suggests that e-commerce is booming in some rural areas. Many new Taobao Villages are formed in villages adjacent to existing Taobao Villages, increasing clustering and driving an increase in Taobao Towns. While the majority of Taobao Villages are concentrated in the coastal region, particularly in Zhejiang, Guangdong, and Jiangsu provinces, they have spread to inland areas.

Figure 5.1. Number of Taobao Villages

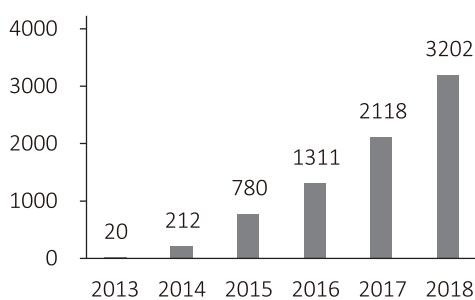
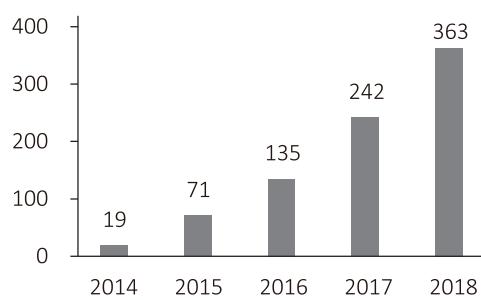


Figure 5.2. Number of Taobao Towns



Source: AliResearch.

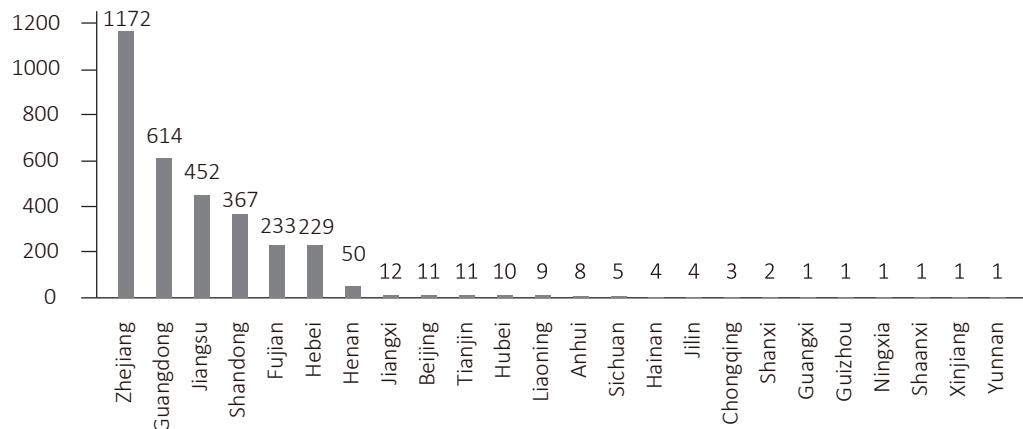
Taobao Villages are mainly in eastern China. Of the 3,202 Taobao Villages in 2018, the majority (3,089, or 96 percent) were in the eastern region.⁴ The three provinces with the most villages in 2018 were Zhejiang (1,172), Guangdong (614), and Jiangsu (452), which together accounted for 70 percent of all Taobao Villages. The northeast had 13 villages and the remaining 100 were in the central and western regions. Zhejiang had the most Taobao Villages, 37 percent of the total in 2018, followed by Guangdong, Jiangsu, Shandong, Fujian, and Hebei.⁵

The number of Taobao Villages grew most quickly in the central regions. From 2014 to 2018, the number of Taobao Villages in the central region

maintained a CAGR of 97 percent. In 2018, the central region had 86 villages, distributed among all six of the region's provinces. Henan province had 50 Taobao Villages and ranked first in the central region. Taobao Villages started to emerge in the northeast in 2015, increasing from two in the first year to 13 in 2018.⁶

Taobao Villages in the western region are few and scattered. The first two villages appeared in 2014, and by 2018 there were 14. Sichuan had five and ranked first in the region in 2018. Six western provinces—Chongqing, Guangxi, Guizhou, Shaanxi, Shanxi, and Xinjiang—each had its first Taobao Village in 2017. The number of Taobao Villages in poor counties is also increased, reaching 45 such villages in 2018.⁷

Figure 5.3. Number of Taobao Villages by Province, Autonomous Region, and Municipality in 2018



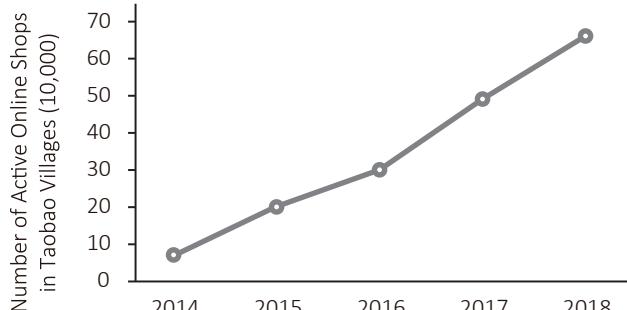
Source: AliResearch.

New Taobao Villages tend to emerge next to existing Taobao Villages. In 2014 there were 193 recognized Taobao Villages, 23 percent of which were in counties that already had them. The share increased to 63 percent in 2015 and 85 percent in 2016. In 2018, 69 percent of newly identified Taobao Villages were in 76 existing Taobao Village Clusters.⁸ Towns where every village is a recognized Taobao Village started to appear in 2015. Xinhe town, Shuyang county, Jiangsu province, was the first of these and it was joined in 2016 by Shaji town and Gengche town, located next to each other in Jiangsu province. In 2017, all 32 villages in Daji town, Cao county, Shandong province, were identified as Taobao Villages. According to AliResearch (2016), clustering mainly occurs where there is a well-developed industrial base and with rapid development of services related to e-commerce. Another factor is the attractiveness of e-commerce success in neighboring Taobao Villages, which drives others to take up e-commerce. In addition, the government has provided active guidance on the formation of e-commerce centers. Some local governments have guided and

promoted the development of e-commerce clusters by building e-commerce incubation parks and e-commerce specialty towns.

The number of active online shops in Taobao Villages rose sharply. Taobao Villages had about 70,000 active online shops in 2014 and more than 660,000 in 2018, a CAGR of 75 percent (Figure 5.4). The number of active online shops ranges between 100 and 300 in most Taobao Villages, though a few have more than 1,000 or even 10,000. Active online shops in Taobao Villages achieved total annual sales of more than RMB 220 billion in 2018, a historic high on the Alibaba retail platform.⁹

Figure 5.4. Number of Active Online Shops in Taobao Villages



Source: AliResearch.

5.2 Top Products Sold in Taobao Villages

Household and personal goods are the products most often purchased from Taobao Villages. In 2018 the top three items purchased were clothing, furniture, and shoes. Household applications, lamps, auto accessories, toys, hardware, luggage and leather goods, and dinnerware were also very popular.¹⁰ According to AliResearch (2016), from September 2015 to August 2016, more than 47 million customers bought T-shirts from online shops in Taobao Villages, 16 million bought toys, 3.5 million bought sunglasses, 2.9 million bought masks, and 7.3 million bought backpacks.

Table 5.1. Top 5 Countries Purchasing Products from Taobao Villages Based on Amount (2017)

Rank	Country
1	Russian Federation
2	United States
3	France
4	Spain
5	Brazil

Source: AliResearch.

Some products are even sold overseas (Table 5.1). In 2017, 785 Taobao Villages sold products to 134 countries and regions outside of China.¹¹

Just as Taobao Villages tend to cluster, there are also distinct concentrations of product types. For example, Taobao Villages along the coast typically focus on labor-intensive manufactured goods, such as clothing, furniture, and shoes. Most of the villages in the west sell specialized local products, such as matrimony vine (*Lycium barbarum*, the source of goji berries) in Ningxia, preserved meat in Guizhou, and black bee honey in Xinjiang.

Some Taobao Villages are trying to produce goods with unique characteristics and high quality and create their own brands to improve competitiveness. For example, Xizhanggu village, Hebei province, produces fashionable cashmeres that are attractive to young consumers. E-tailers in Daji town have their own design team to survey the market and create clothing in new styles. In some cases, new technology and equipment are applied to improve product quality. In Gaozuo village, e-tailers upgraded their furniture from plate-type to steel and wood using more advanced production processes. E-tailers also create brands and apply for patents to enhance competitiveness and protect their innovation. In 2017, more than 3,100 trademarks were registered by online stores in Suining county.

Agricultural products and specialty local handicrafts are becoming signature products in some Taobao Villages, especially since 2016. In 2018, more than 100 Taobao Villages sold agricultural products online, most of them are also the origin of the products. Some well-known agricultural products are flowers from Shuyang, pecans from Lin'an, tea from Anxi, apples from Yantai, hairy crabs from Suzhou, and Longjing tea from Hangzhou. A few Taobao Villages sell handicrafts, most of which have a long tradition and unique cultural characteristics, such as peony painting in Henan, Xuan paper in Anhui, birdcages in Shandong, and silverware in Yunnan.

Some ethnic minority Taobao Villages use their cultural endowments to produce ethnic specialty products for sale online; others sell manufactured goods like those sold by many other Taobao Villages.¹² In Xinhua village, Dali, Yunnan, where many Bai live, 79 percent of the households produce silver crafts with ethnic features, reaching total sales of about RMB 3 billion in 2015, of which RMB 19 million was from online sales (Box 5.3). Jiangtou village, Quanzhou, Fujian, has a large group of Hui people. However, the e-shop business in the village—selling shoes—is not specific to the ethnic culture.



Box 5.2. A Taobao Village Selling Ethnic Specialty Products

Xinhua is known for its long tradition of Bai ethnic silver crafts. Contemporary Bai artists here design and develop their own styles and brands through vigorous innovation, creating almost 100 kinds of silver crafts with more than 10 distinct ethnic styles. In 2015, 79 percent of the village households (987 households) and 2,650 people were engaged in handicrafts production, achieving total sales of about RMB 3 billion.

E-commerce developed rapidly in the village, enabling sales to large cities, including Beijing, Chengdu, Guangzhou, and Shanghai. However, the main sales channel is still local tourism. In 2015, Xinhua had more than 130 households selling silver crafts online, of which 112 were active, reaching online sales of RMB 19 million, and 15 households had e-commerce business income of more than RMB 300,000.

Problems emerged during e-commerce penetration. Infrastructure and transportation conditions in the village had to be upgraded to better meet the logistical requirements of e-commerce. Owing to its location in a remote inland area, the village lacked relevant professional talent, such as e-shop design, management, information collection, and market analysis. Intellectual property infringement has seriously affected innovative enthusiasm and affected product quality and price. Machine-made silver crafts, with production speed, cost, and price advantages, put pressure on the handmade products, particularly when combined with intellectual property infringement. Financing difficulty is also a problem, given the high value of silver and the difficulty of acquiring loans from local financial institutions. In future it will be important to identify the niche for traditional handmade silver crafts in online sales. Drawing from experience in some other Taobao Villages, targeted support from the government, including on infrastructure and logistics as well as regulations specifically supporting e-commerce, as well as measures to facilitate the agglomeration of silver craft production through the formation of e-commerce industrial parks, might help overcome the difficulties.

Source: Li, Xiaohua (2016). Heqing Xinhua Village E-commerce Development Research Report (鹤庆新华村电商发展调研报告).

<http://www.aliresearch.com/blog/article/detail/id/20901.html>

5.3 A Profile of Taobao Villages, E-Tailers, and E-Shops

The following section paints a detailed picture of the villages, individuals, households that participate in e-commerce (e-households), and e-commerce firms (e-shops) using the Taobao Village Survey data (described in chapter 3).



Profile of Taobao Villages

Rural areas with good infrastructure and good access to markets tend to be most conducive to e-commerce, hence, express delivery service in Taobao Villages is well-developed. Nearly all Taobao Villages have package pickup and express delivery services, with a wide range of logistics service providers (Figure 5.5 and Figure 5.6). Forty-eight percent had logistics centers in the village at the time of the survey in 2018, compared to about 25 percent of villages in China that had e-commerce logistic service distribution sites in 2016.¹³ Sixty-two percent of Taobao Villages have more than five logistics or express delivery companies providing services and 27 percent have more than 10 companies; all large Taobao Villages (where GMV larger than RMB 197 million)¹⁴ receive logistics services from at least three companies.

Figure 5.5. Number of Logistics or Express Delivery Companies in Taobao Villages (Percentage)

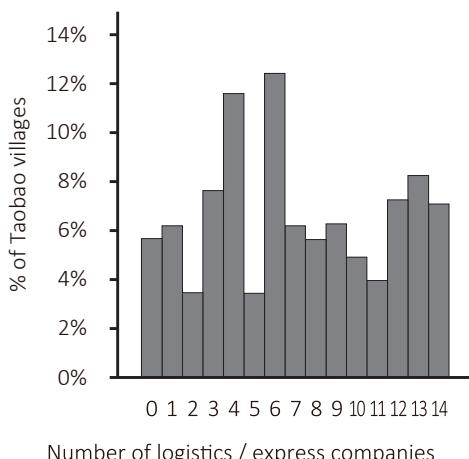
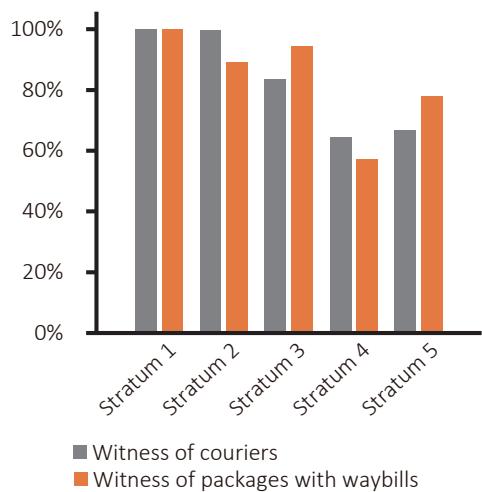


Figure 5.6. Witness of Couriers and Packages with Waybills in Taobao Villages at the Time of Survey



Note: Taobao Villages are divided to 5 strata according to their annual sales. Annual online sales decrease from stratum 1 to 5. See Appendix H for details.

All Taobao Villages have access to broadband Internet and a mobile communication network. Reading news, entertainment, and online shopping are the main uses of the Internet in Taobao Villages (Figure 5.7). About one-quarter of Internet users report work related to e-commerce as a major use of the Internet. Over 50 percent of people in Taobao Villages use the Internet, mostly through smartphones (Figure 5.8). People with higher education are more likely to use the Internet (Figure 5.9).

Figure 5.7. Purposes for Using the Internet

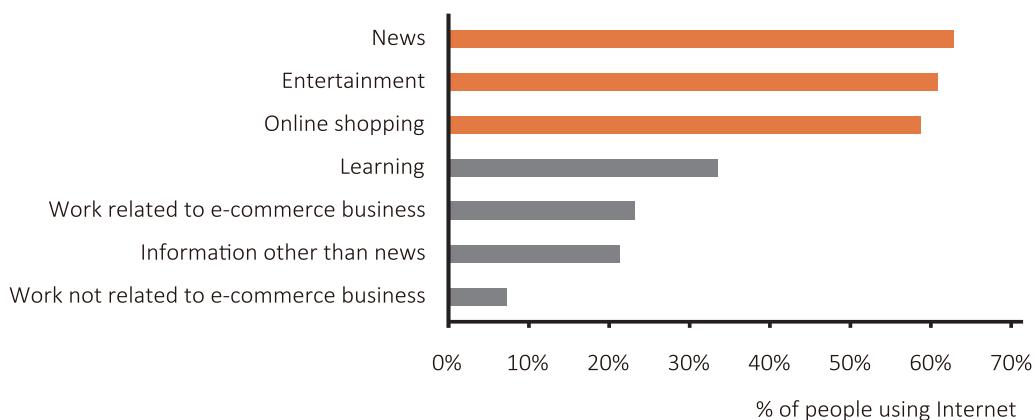


Figure 5.8. Devices to Use the Internet

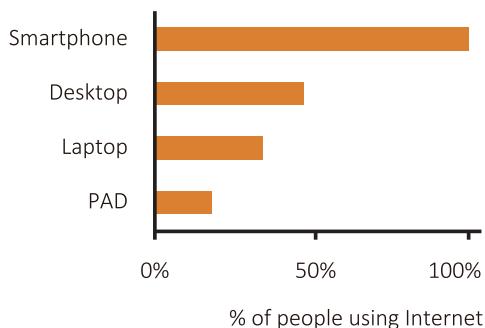
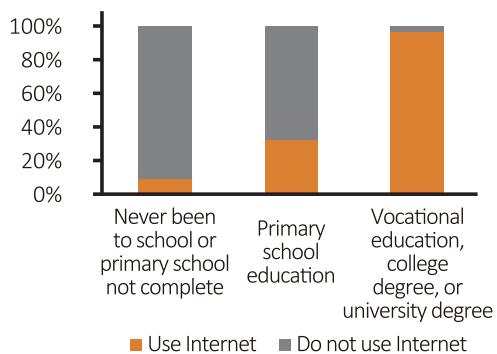


Figure 5.9. Share of People Using the Internet, by Education Level



Most Taobao Villages have good access to preschool education and compulsory education institutions. Figure 5.10 shows the average distance from a Taobao Village to the nearest education institutions, with little difference between the large Taobao Villages and the regular Taobao Villages. Fifty-five percent of Taobao Villages have kindergartens, compared to 32 percent among all villages in China in 2016,¹⁵ while 39 percent of Taobao Villages have primary schools, and 16 percent have junior high schools. Large Taobao Villages are closer to post-compulsory education institutions than smaller Taobao Villages (Figure 5.11).

Figure 5.10. Average Distance to Preschool and Compulsory Education Institutions from Taobao Villages

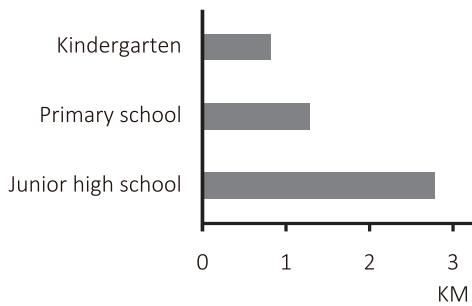
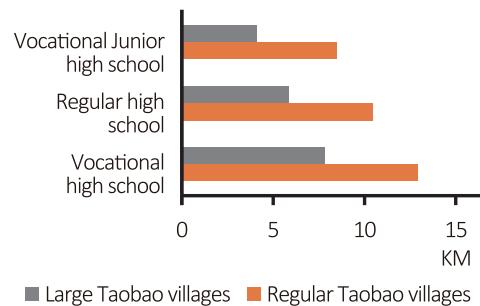
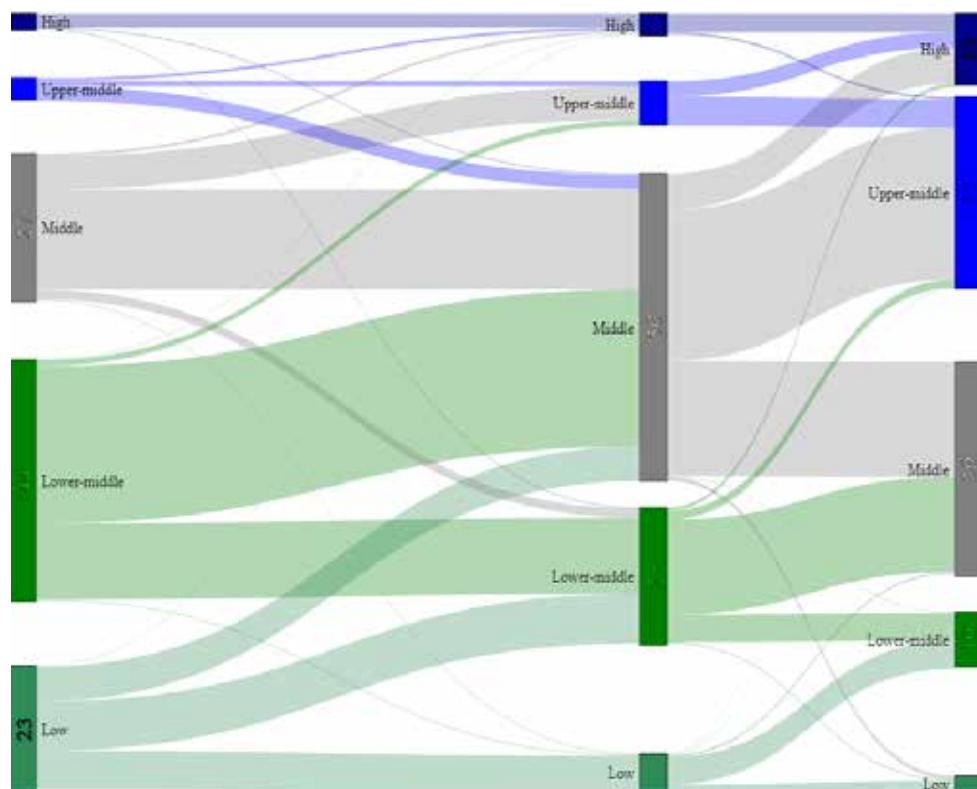


Figure 5.11. Average Distance to Post-Compulsory Education Institutions from Taobao Villages



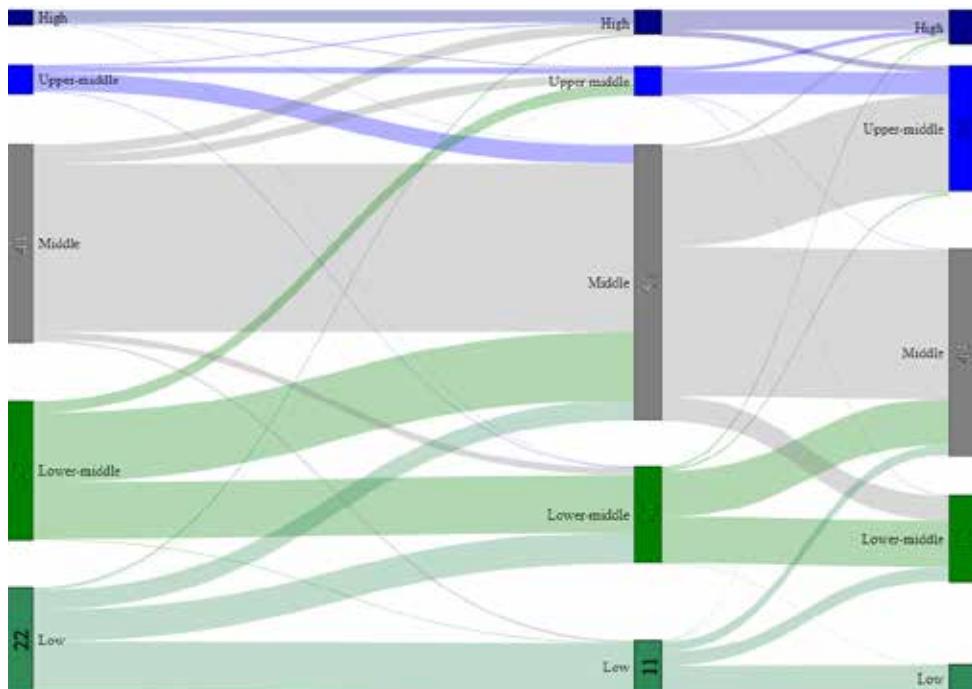
Most people in Taobao Villages perceived their social status as equal to or higher than it was five years ago, and they believe they will have equal or even higher social status two years in the future (Figure 5.12 and Figure 5.13). The charts show not only the direction of change but also the share flowing between the five levels. Of particular note is the significant perceived movement upward, particularly for those at the lowest levels.

Figure 5.12. Self-Rated Social Status Changes in E-Households



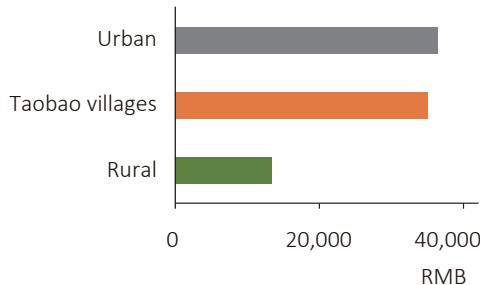
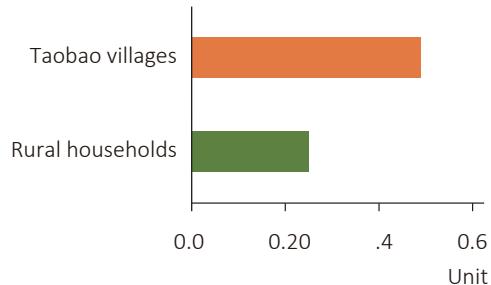
Taobao Villages tend to have a smaller share of emigrant workers than the average in rural China, suggesting that e-commerce may help keep individuals at home. Only about 10 percent of the Hukou registered population in Taobao Villages work outside of the Taobao Villages. In 2017, 21 percent of the rural Hukou population, or 172 million, migrated for work in China.¹⁶

Figure 5.13. Self-Rated Social Status Changes in Non-E-Households

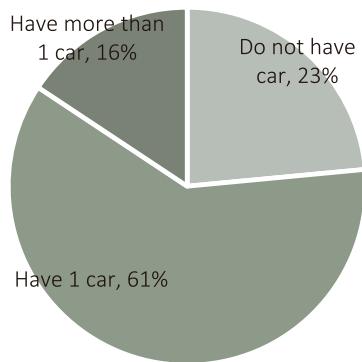
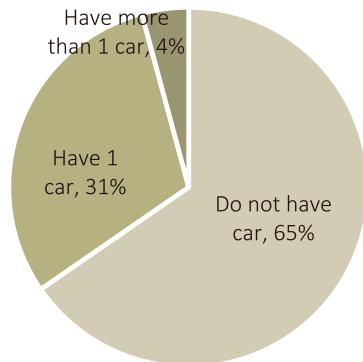


Profile of Households and Individuals Who Participate in E-Commerce

Households in Taobao Villages have income levels similar to those of urban households and much higher than households in rural areas (non-Taobao Villages). Average household per capita income in Taobao Villages (some 35,000 yuan per year in 2017) is nearly three times higher than the rural average in China (13,432 yuan per year in 2017), and close to the urban average (36,396 in 2017) (Figure 5.14).¹⁷ While a majority of the Taobao Villages are in coastal areas with higher income levels, the difference is still notable. In Taobao Villages, car ownership is high (Figure 5.15).

Figure 5.14. Household Per Capita Income in 2017**Figure 5.15. Number of Cars Owned Per Household**

E-households are richer than other households. The per capita income of e-households in Taobao Villages (55,000 yuan) is 80 percent higher than that of other households (31,000 yuan). E-households also tend to have more physical assets, such as dwellings, motor vehicles, computers, televisions, air conditioners, and mobile phones, compared to other households. Three-quarters of e-households have cars compared to one-third of other households (Figure 5.16 and Figure 5.17).

Figure 5.16. Car Ownership in E-Households**Figure 5.17. Car Ownership in Non-E-Households**

Businesses are the main income source for e-households, while salaries are the main income source for non-e-households in Taobao Villages (Figure 5.18 and Figure 5.19). Consistent with household income composition, the main income sources for e-households in Taobao Villages are e-shops and other non-agricultural business, while non-e-households mostly earn salaries from private companies. Operating e-shops is the most important source of income for e-households—67 percent of them count it among their three main income sources. E-households in Taobao Villages get about half of their income from business, including e-commerce, which is higher than both the rural average and

urban average in China (Figure 5.20 and Figure 5.21). Share of business income to total income in non-e-households in Taobao Villages is 25 percent, higher than the urban average but below the rural average. Non-e-households get 56 percent of their income from wages and salaries, much higher than the rural average and close to the urban average, while the share is 36 percent among e-households. Share of property income in e-households is 11 percent, which is close to that in urban households, while non-e-households have a smaller proportion of property income, but still much higher than the rural average. Transfers constitute a small part of household income in Taobao Villages.

Figure 5.18. Income Composition of E-Households in Taobao Villages

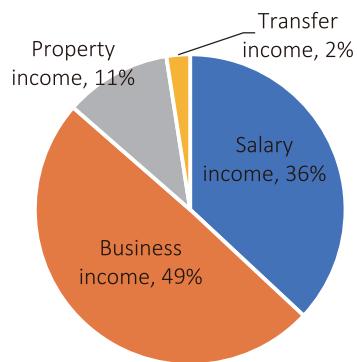


Figure 5.19. Income Composition of Non-E-Households in Taobao Villages

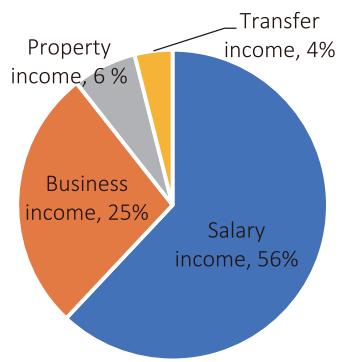


Figure 5.20. Income Composition of Rural Households in China

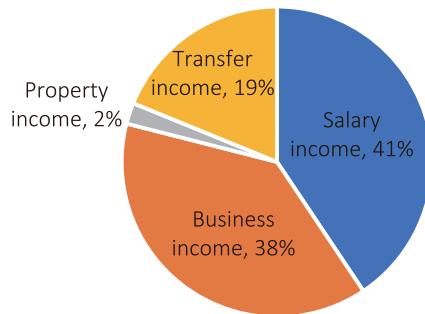
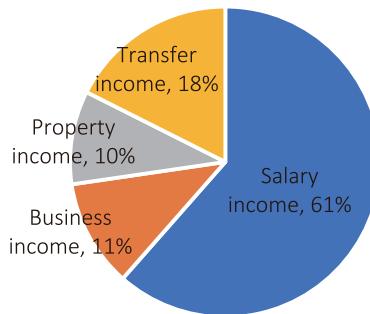


Figure 5.21. Income Composition of Urban Households in China



Note: E-household and non-e-household data are for 2017 from the Taobao Village Survey, rural and urban household income compositions are from official 2016 data provided by China Labor Statistical Yearbook 2017.

About one-third of e-shop owners and nearly half of e-shop workers in Taobao Villages are women. For comparison, one-quarter of entrepreneurs in China are women. In Taobao Villages, 34 percent of villagers who operate their own e-shops and 49 percent of those who do not own e-shops but whose work is related to e-shops are women. A relatively high share of women are in e-shop customer service (49 percent), e-shop photography (48 percent), and express delivery service (43 percent), while men make up a majority of those

who operate e-shops for others (81 percent), work on e-shop data analysis (77 percent), or provide products to e-shops (75 percent).

E-shop owners are younger and more educated than the rest of the population in the village, and many of them are returned migrants (Figure 5.22–Figure 5.24). Fourteen percent of e-shop owners are 25 years old or younger, and 72 percent are between 26 and 35 years old. Forty-one percent of e-shop owners have junior high school education, 31 percent have vocational high school or regular high school education, and 21 percent have college degree or above. Thirty-two percent of local e-shop owners have worked in cities, which suggests that many, if not most, are returned migrants.

Figure 5.22. Age Structure

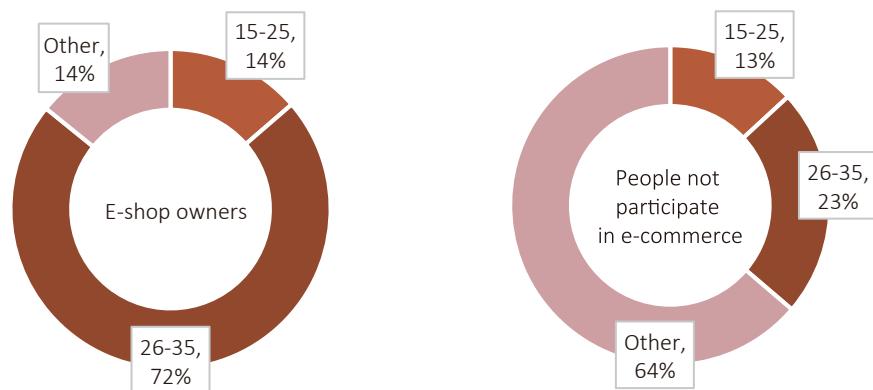


Figure 5.23. Education Structure

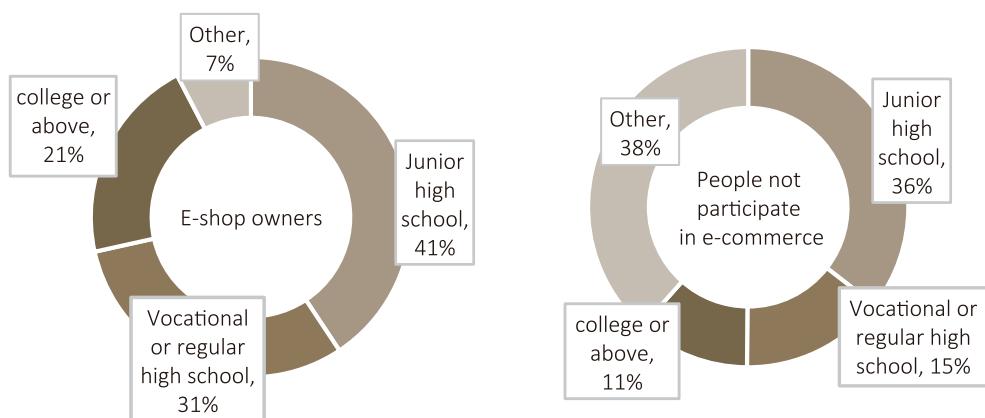
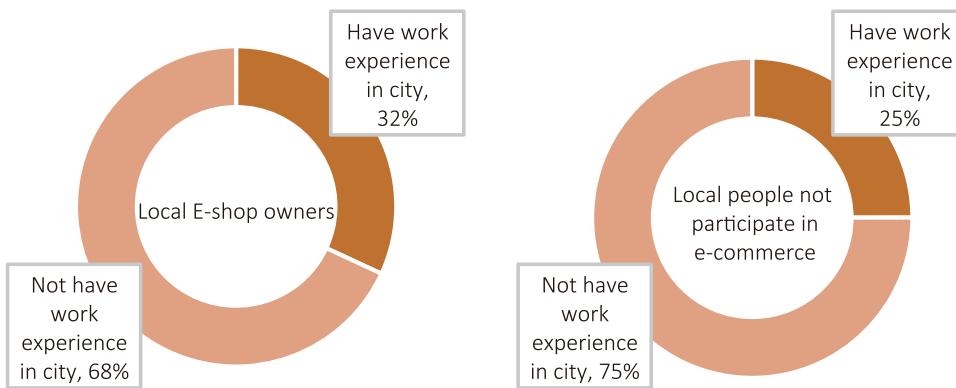
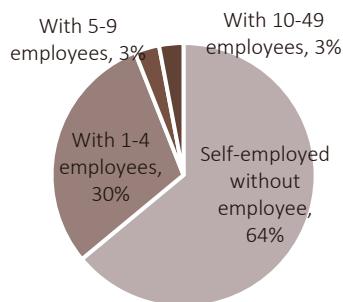


Figure 5.24. Urban Work Experience Structure

Profile of E-Shops

Most e-shops are small. In Taobao Villages, 64 percent of the owners are self-employed without employees, 30 percent have fewer than 5 workers, 3 percent have 5 to 9 workers, and only 3 percent have 10 workers or more (Figure 5.25). When e-owners hire, 56 percent of the employees are family members.

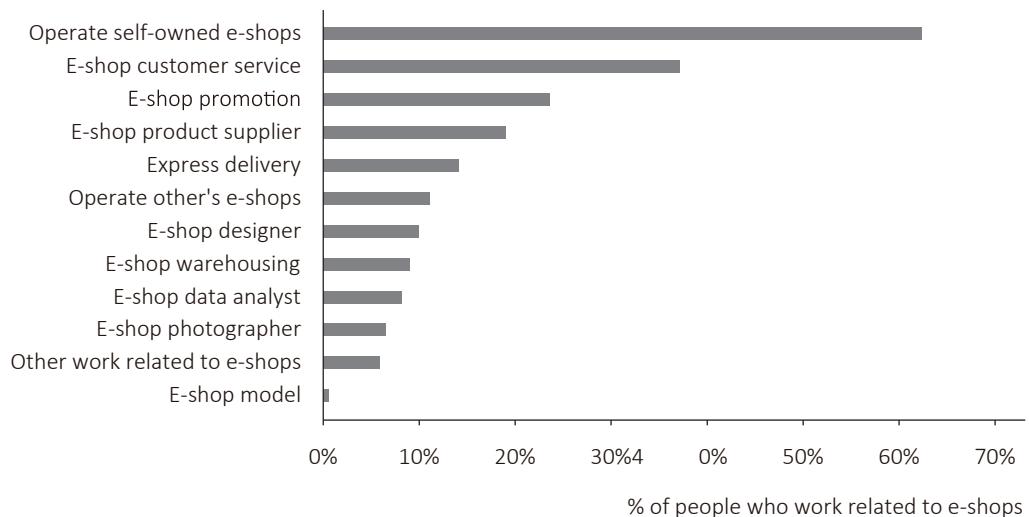
Figure 5.25. E-Shop Scale, by Number of Employments

E-shops generate labor demand in new occupations that would not be



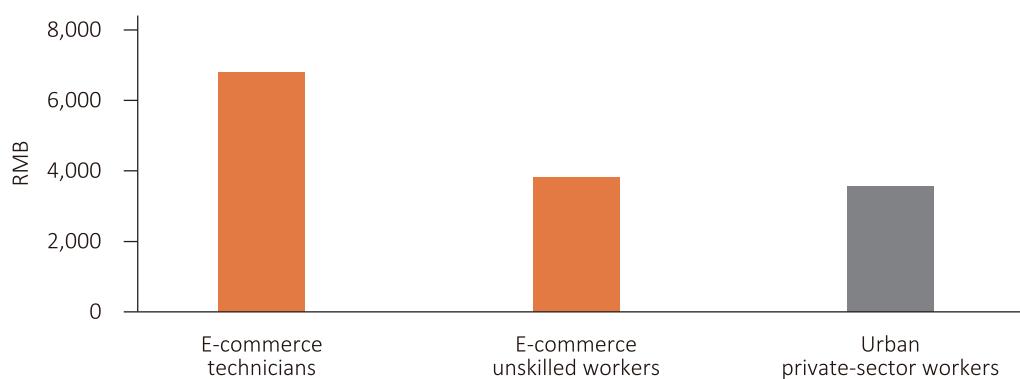
available without rural e-commerce development. Besides operating self-owned e-shops, common work related to e-shops in Taobao Villages includes customer service, promotion, product supply, and express delivery (Figure 5.26). Some villagers provide warehousing services, work as designers, data analysts, or photographers, and a few people are e-shop models.

Figure 5.26. E-Shop Related Work



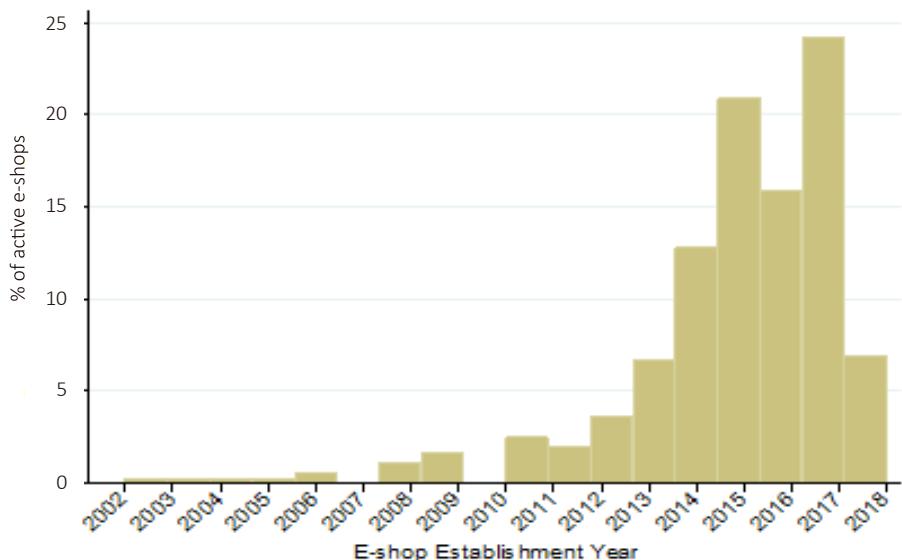
E-shop workers in Taobao Villages have wage levels equal to or higher than workers in urban private industries (Figure 5.27). The average monthly wage workers in e-shops ranged from some RMB 3,800 for unskilled workers to nearly RMB 6,800 for technicians, compared to the national average of RMB 3,569 for urban workers in private industries.¹⁸

Figure 5.27. Worker's Average Wages Per Month



Most e-shops in Taobao Villages are young and are more likely to operate at a loss. Eighty-seven percent of the active e-shops are less than 5 years old (Figure 5.28), and over 30 percent of the e-shops are less than 2 years old.

Figure 5.28. E-Shop Establishment Year



The growth and GMV of small e-shops suggests that survival is difficult, but those that make it through the tough early years are likely to grow. Most young e-shops operate at low levels of GMV. Figure 5.29 shows a strong clustering of young e-shops at very low levels of GMV. Some e-shops that have been in operation for two years or more exhibit strong performance based on GMV, but clearly few survived the earliest years. The risks to young shops are also evident in Figure 5.30, which shows that large numbers of young, low GMV e-shops are likely to close.

Figure 5.29. Establishment Year and Gross Merchandise Values

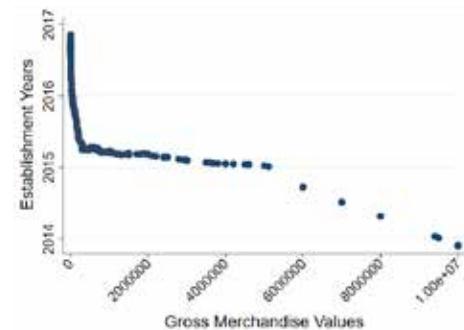
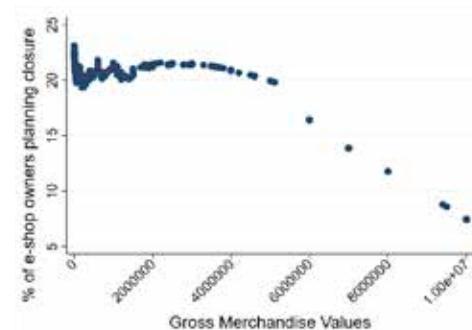


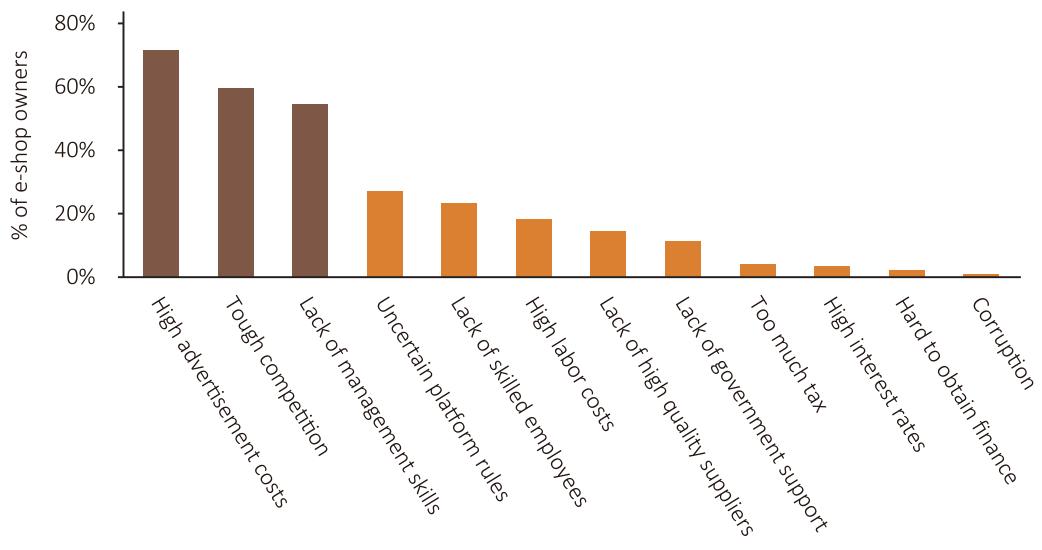
Figure 5.30. Closure and Gross Merchandise Values



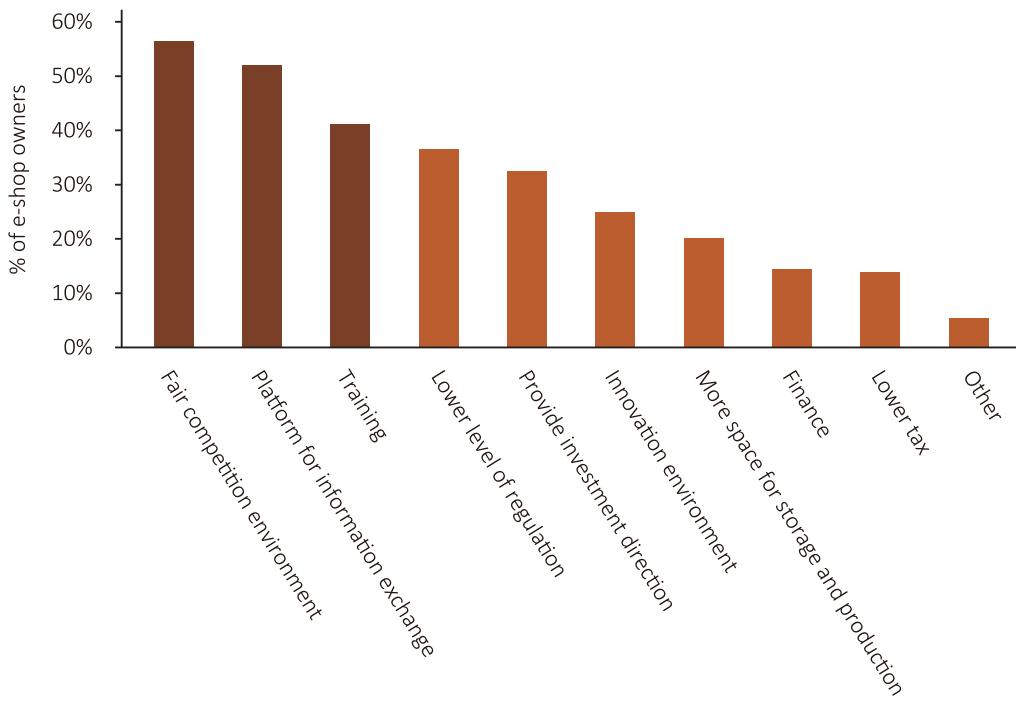
5.4 Obstacles and Supportive Measures

Further development of e-commerce depends on the presence of supportive measures and an ability to overcome obstacles (Figure 5.31). From the Taobao Village Survey, the top three obstacles to developing e-commerce, as perceived by e-shop owners, are the high costs of advertising and promotion, fierce competition, and lack of skills. A perception that necessary skills are lacking is common across e-shop owners, owners of large e-shops are concerned more about the difficulty of getting skilled workers while the owners of small e-shops are concerned more about their own lack of skills needed to operate e-shops.

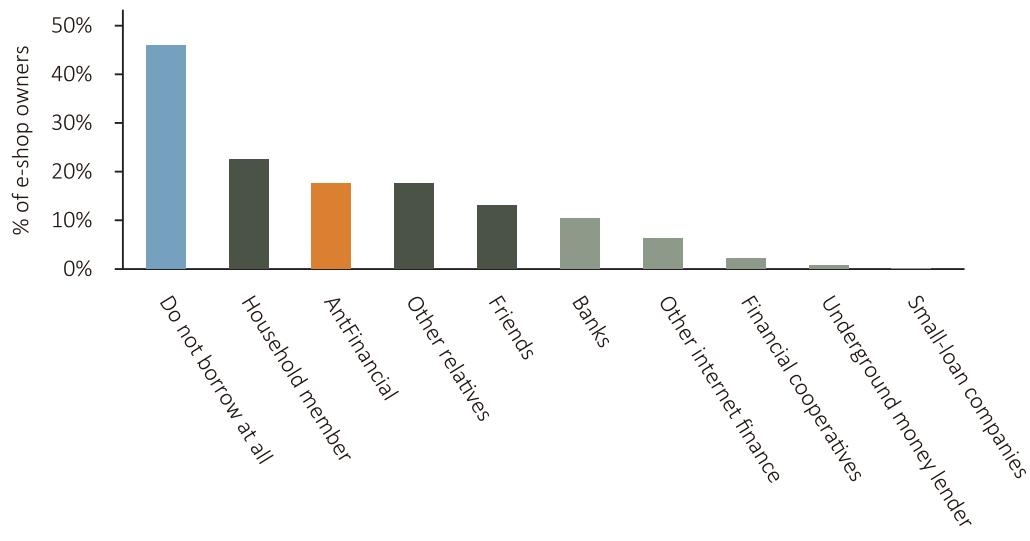
Figure 5.31. Obstacles to Developing E-Commerce



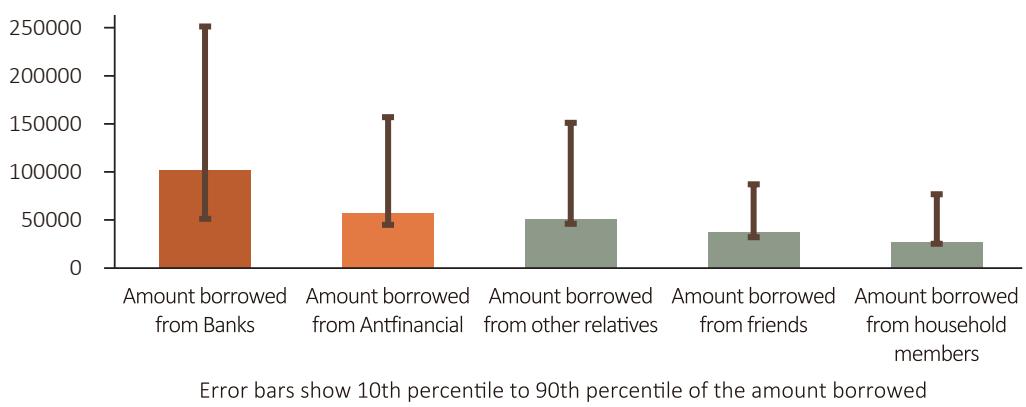
E-shop owners consider government support desirable to improve the platform for information exchange, support fair competition, and provide training (Figure 5.32). Fifty-six percent of e-households consider having a platform for information exchange as one of the top three areas for government support to developing e-commerce, followed by 52 percent for fair competition environment, and 41 percent for training.

Figure 5.32. Desired Government Support for E-Commerce Development

While e-shop owners do not rank access to finance among their major obstacles, it is limited everywhere in China, even in Taobao Villages, which tend to be in better-developed parts of the rural areas (Figure 5.33). Among all e-shop owners, 46 percent have not borrowed for operations since they opened their e-shops. Among the remaining 54 percent that have borrowed, 46 percent borrowed only through informal channels—from household members, friends, and relatives. Eighteen percent of the e-shop owners borrowed from Ant Financial.

Figure 5.33. Sources of Finance for E-Shop Owners

Ant Financial serves as an additional source of financing. Among all e-shop owners that have borrowed, 30 percent borrowed from Ant Financial, the second most important source only after household members (40 percent), which is higher than friends (13 percent), relatives (18 percent), and banks (10 percent). Loan amount from Ant Financial is smaller than banks but larger than families and friends. As shown in Figure 5.34, the average loan amount from Ant Financial is RMB 56,970; this compared to RMB 101,238 from banks, RMB 51,082 from relatives, RMB 37,135 from friends, RMB 26,815 from household members.

Figure 5.34. Loan Amount from Different Sources

The experience in Taobao Villages shows that online sellers in those villages face three main challenges:

- **First, most e-shops sell the same or similar products within their market.** The “one village, one product” model gave many Taobao Villages a focus on the niche products for which they had a comparative advantage. However, as e-commerce continues to develop, replication can result in low-end competition within the same village or with an adjacent village, driving down profit margins or leading to disputes where there are no patents or property rights are unclear for products or process innovations. Moreover, one advantage of e-commerce over traditional offline trade is that it allows producers to observe market changes more quickly and adjust products to consumer demand. This requires e-commerce merchants to be extra vigilant to market signals. The model might be particularly challenging when it is time to upgrade products or change to other products when market demand shifts.
- **Second, most e-shops are small-scale operations.** In Taobao Villages, nearly two-thirds of the e-shop owners are self-employed and have no employees and a third have fewer than five workers. While this allows flexibility of production and may make it easier to change products to meet evolving demand, it limits the ability to scale up or upgrade the technology when demand surges. As an e-shop switches production from “homemade” style to “assembly line” style, different challenges occur. For agricultural produce or products that require a long period to produce (such as a season for fruit or years for tree products) and cannot be outsourced to increase the scale of production, e-shop owners need to manage the supply capacity in line with the demand and not accept more orders online than they can reasonably fulfill given their production capacity.
- **Third, an online market provides low-cost entry for small businesses, but it is also important to support the continuing growth of “winners” to generate employment for other villagers.** Support is also needed for upgrades to the value chain, exploration of clustering and agglomeration to achieve economies of scale, and continuation of innovation. Many e-shop owners are women and youth, who often have difficulty accessing finance, and for women, have more responsibility taking care of the family. Targeted support that helps them continue to grow, including providing equal-opportunity access to resources, is important.

5.5 E-Commerce Participation and Household Income Growth

This section describes who is more likely to participate in e-commerce and who is more likely to benefit from the participation. The available data are not

sufficient to establish a causal relationship between e-commerce participation and income change. The association between the two is explored, as are the patterns across households and individuals of different characteristics (Box 5.3). The results indicate an association between developing e-commerce in rural areas and household income increase, which may also contribute to shared prosperity. Investments in technical and vocational training, including in senior high school and junior college, as well as tailored training and exposure to e-commerce, can help improve e-commerce participation and the potential gains.

Box 5.3. E-Commerce Participation and Household Income Growth in Taobao Villages

Based on data from the Taobao Village Survey, e-commerce participation is not random. The difference in income between e-households and non-e-households arises from three sources: e-commerce participation, observed differences between e-households and non-e-households, and unobserved differences between e-households and non-e-households. The latter two confound the true impact of e-commerce on income. Luo and Niu (2019) uses Taobao Village Survey 2018 and propensity score matching techniques (Rosenbaum and Rubin 1983) to reduce the selection bias due to the observed differences between participants and non-participants. To construct a better counterfactual comparison, e-households and non-e-households are matched according to their propensity score—the probability of receiving treatment conditional on covariates. A broad set of covariates from the Taobao Village Survey 2018 on the levels of village, household, and individual are used to estimate the propensity scores. Future research that further controls for the unobserved differences between e-households and non-e-households will help to yield the unbiased estimate of e-commerce impact on income.

Source: Luo, Xubei; Niu, Chiyu. 2019. *E-Commerce Participation and Household Income Growth in Taobao Villages*. Policy Research working paper; no. WPS 8811. Washington, D.C.: World Bank Group.

For individuals and household heads, education is positively related to e-commerce participation, but the positive effects peak with technical school education and then level off. This indicates that e-commerce participation requires some education to get started, and technical school education seems a better fit than general education. E-commerce is not attractive to university graduates, who tend to have higher opportunity costs for participating. Immigration from a different province than the Taobao Village is also positively and significantly related to e-commerce participation. Having knowledge of e-commerce through urban work experience increases the probability of e-commerce participation. Household heads who are less risk-averse are more likely to participate in e-commerce, which is still relatively new to rural areas and inherently riskier than farming.

Households with more family members are more likely to participate in e-commerce, probably because they can take advantage of economies of scale and division of labor as well as risk diversification. Household composition also matters: the larger the share of members age 15 to 35, the more likely the participation. This also indicates that it is easier for younger people to participate in e-commerce. Land ownership, agricultural or otherwise, does not have a significant impact on e-commerce participation even though it is important to rural residents, perhaps because land is not a direct source of capital or necessary condition for e-commerce operation.

People living in villages that are farther away from a train station are more likely to participate in e-commerce. As distance to a train station serves as a proxy for market access, the farther away people are, the higher their costs of accessing traditional markets. This indicates that e-commerce reduces transaction costs by connecting sellers and buyers online and becomes a substitute for traditional markets. Similarly, people who live in villages that are in the suburbs of a big city are less likely to participate in e-commerce, either because they are closer to traditional markets or it is easier for them to engage in urban labor activities. However, other local characteristics are not significant in determining e-commerce participation. For example, village population, which usually signifies local market potential, is not associated with e-commerce participation. Social protection policies, such as Dibao, and medical services indicators, such as proximity to hospital, are not significant determinants of e-commerce participation, potentially due to relatively high average level of social protection and services in Taobao Villages. Distance to a logistic center is not statistically significant, which might be because the samples are limited to Taobao Villages, all of which have high levels of logistic services with little difference.

E-commerce participation is associated with higher household income, with some indications that participation has a strong positive relationship with household incomes. E-commerce participation appears to increase household income by up to 100 percent. This is the upper bound for direct impact of e-commerce participation on household income growth for three reasons. First, e-commerce engagement is higher in Taobao Villages than elsewhere, so the contribution of e-commerce participation is likely to be higher than the average for rural areas in China. Second, the potential earnings in e-households in the world without e-commerce are likely to exceed earnings from other productive activities in the village, which are likely to be lower than the potential income of the e-commerce participants who have migrated to other areas.¹⁹ Third, the contribution of e-commerce participation in household income is biased upward because of factors such as rate of time preference, openness to new experience, entrepreneurial ability or orientation, and personal drive and because most of these unobserved qualities are likely associated with higher income whether or not an individual is engaged in e-commerce. Meanwhile, e-commerce development may contribute to income increase indirectly and create demand for related offline industries in the ecosystem, such as express delivery and

specialized website design.

E-commerce appears to yield benefits broadly and equitably shared among participants in Taobao Villages. Among households engaging in e-commerce, while the wealthy gain more in absolute terms, the less wealthy experience higher income growth in relative terms. While younger individuals with technical training, knowledge of e-commerce, and migrant experience are likely to have higher income increases in absolute terms through e-commerce participation, those older, with less education, knowledge, or migrant experience have the potential to benefit more in relative terms (Figure 5.35–Figure 5.38).²⁰

Figure 5.35. Relative and Absolute Gains from E-Commerce Participation by Wealth Level

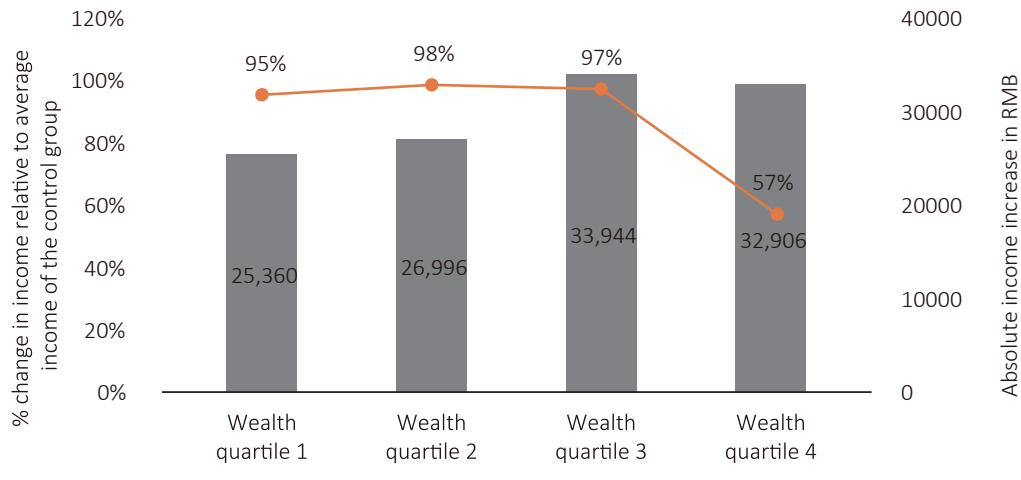


Figure 5.36. Relative and Absolute Gains from E-Commerce Participation by Age of Household Head

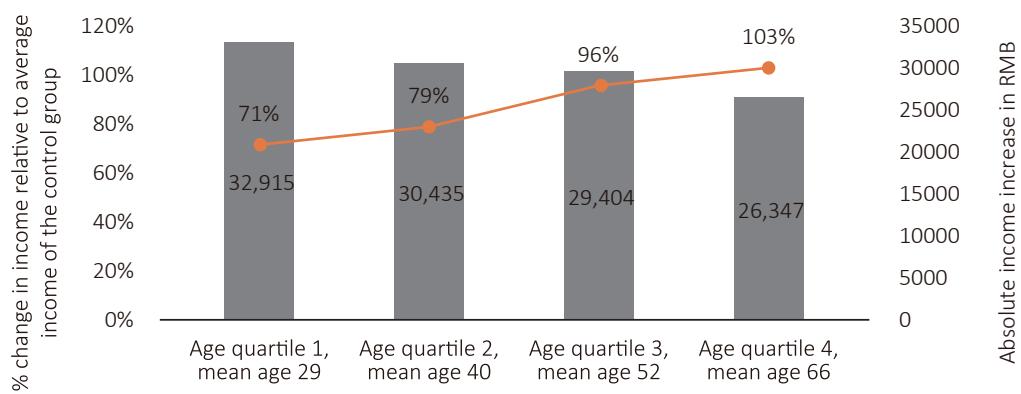
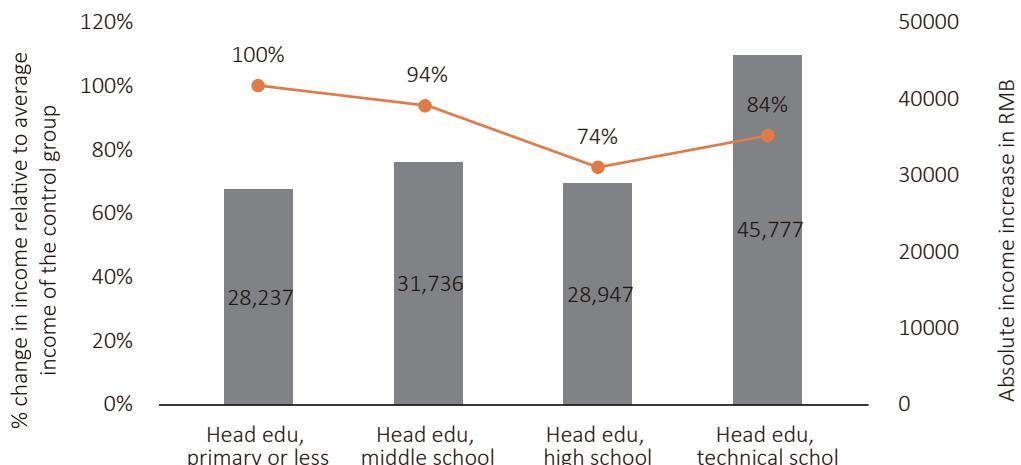
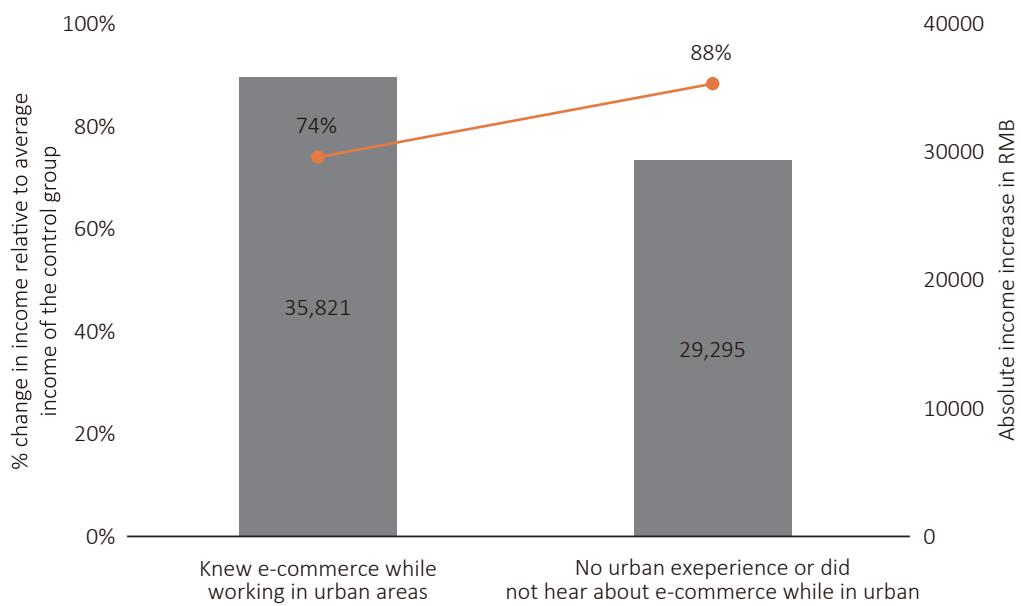


Figure 5.37. Relative and Absolute Gains from E-Commerce Participation by Education of Household Head



Note: Small sample for household heads with college, university, or above education.

Figure 5.38. Relative and Absolute Gains from E-Commerce Participation by Knowledge and Urban Experience of Household Head



Notes

1. See more details in AliResearch 2017a.
2. The World Bank–Alibaba joint research team, in collaboration with Peking University and Nankai University joint research team, conducted a survey in rural China, covering 1,400 households and 80 villages significantly engaged in e-commerce (Taobao Villages). See Appendix H for details on the Taobao Village Survey.
3. See Alizila 2016.
4. According to National Bureau of Statistics of China, the eastern region includes Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan. The central region includes Shanxi, Anhui, Jiangxi, Henan, Hubei, and Hunan. The western region includes Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang. The northeastern region includes Liaoning, Jilin, and Heilongjiang. http://www.stats.gov.cn/ztjc/zthd/sjtjr/dejtjkfr/tjkp/201106/t20110613_71947.htm
5. See AliResearch 2018.
6. See AliResearch 2014, 2015, 2018.
7. See AliResearch 2018.
8. AliResearch has defined the Taobao Village Cluster as one county, district, or county-level city with 10 or more Taobao Villages.
9. See AliResearch 2018.
10. See AliResearch 2018.
11. See AliResearch 2017a.
12. Among the 80 Taobao Villages covered by the survey, two have large ethnic minorities—Xinhua village and Jiangtou village.
13. Third National Agriculture Census.
14. Large Taobao Villages have total GMV larger than RMB 197 million, and the rest are regular Taobao Villages.
15. Third National Agriculture Census.
16. Statistical Communiqué of the People's Republic of China on the 2017 National Economic and Social Development.
17. Rural average and urban average numbers are from Statistical Communiqué of the People's Republic of China on the 2017 National Economic and Social Development.
18. Staff calculation based on China Population and Employment Statistics Yearbook, 2017.
19. A high share of returned migrants was found in Taobao Villages. Absent opportunities to participate in e-commerce, some of the individuals and households currently in Taobao Villages would have migrated in pursuit of better employment opportunities.
20. In Figure 27–Figure 30, the vertical axis on the left shows the percentage change in income relative to the average income of the control group, and the vertical axis on the right shows the same income increase but in absolute terms. The control group is defined as the non-e-households that match with the e-households according to their propensity scores, and additionally, are comparable with the e-households in terms of observable attributes of the household heads, household composition, and village of residence. Assuming there is no difference in unobserved attributes between the matched e-households and non-e-households, the average income in the control group can be treated as the counterfactual income for the e-households if they did

not engage in e-commerce. Under the same assumption, the relative and absolute change in income compared to the control group can be interpreted as the gains from e-commerce participation on income.

Part III

Conclusions



CHAPTER SIX

Ingredients for Success

This chapter identifies ingredients for successful development of e-commerce that might be applicable to other middle- and lower-income countries, which are rapidly catching up with developed countries in online participation. The chapter has four sections. First, it summarizes the main findings and contributions of the report. Second, it draws on the China experience to identify enabling conditions for e-commerce development and for strengthening its contribution to employment creation and inclusive growth. Third, it discusses the risk and challenges in the e-commerce ecosystem. Finally, it points out areas for further research.

6.1 Main Findings

More rigorous research would be needed to support specific lessons or recommendations. However, the main findings from the experience of China, now accounting for the largest share of global e-commerce and among the fastest growing e-commerce markets in the world, provides useful pointers for supporting e-commerce development that promotes job creation and inclusive growth.

With the rapid expansion of Internet penetration and development of digital payment services, the share of households purchasing online as well as the amount spent online has increased sharply. This rapid growth has not just been confined to the high-tech sector but is now also providing employment opportunities for semi-skilled workers. In recent years, for example, express delivery and logistics have become one of the fastest growing sectors.

Relying on the Internet, information technology, “Internet plus logistics,” and “Internet plus finance,” e-commerce enables more flexible forms of entrepreneurship and employment. While the total (or net) impact of e-commerce on job creation needs more research, emerging evidence, including the firsthand information collected in the Taobao Village Survey and case studies for this report, suggests that many of the new employment opportunities can meet people’s needs for more diversified and personalized opportunities. A large share of the expanded opportunities benefits women, youth, and other groups (including people with disabilities) whose options were more limited in the past. The ratio of women to men entrepreneurs in e-commerce is at or near parity on the Alibaba platforms, compared to 1:3 in all business in China. Three out of four rural e-tailers are in their twenties.

Pairing stores and workshops to markets through online-offline integration makes hometown employment a possibility for many. In that way, e-commerce can help to restore the social fabric torn by outmigration. Many successful e-merchants are returned migrants. For women, who often have childcare and

eldercare responsibilities, e-commerce provides new forms of employment with flexible working schedules, which will allow them to start and run an online business, thus improving quality of life for their families and creating a sense of satisfaction for themselves.

Emerging evidence suggests e-commerce is positively associated not only with expanded employment opportunities but also with higher growth, increased consumption, and improved welfare. On welfare, the development of e-commerce in China has been accompanied by household consumption growth, including in less-developed areas and among less-affluent populations, helping to reduce consumption inequalities. Participation in e-commerce has also been associated with higher household incomes in Taobao Villages, in some cases with a strong positive effect on those incomes. E-commerce seems to yield benefits that are broadly and equitably shared among participants in Taobao Villages.

Digital technology and e-commerce platforms have the potential to benefit smallholders and large firms alike by breaking down geographic and transaction barriers and connect rural areas to the national market, enabling participation in value chains. While large-scale firms might gain more from such connections in absolute terms, market access through e-commerce platforms has major benefits for small producers and enterprises as the transaction costs for small quantities of niche products can be prohibitive in traditional markets. The rapid growth of small producers, the “gazelles,” has strong potential for creating more and better jobs in rural areas.

The experience in rural China shows that the benefits of digital technology are not limited to high-income countries and urban areas. With the right conditions, it can flourish in developing countries and in rural areas and can be a powerful instrument for rural vitalization and poverty reduction. While e-commerce is more developed in China’s urban areas—nearly three-quarters of online stores and Internet users are in urban areas—online sales in rural areas have grown much faster than the national average. An increasing share of households in coastal as well as inland regions, urban as well as rural areas, make purchases online and the amount spent online has grown rapidly. The online sales amount increased across regions, including in poverty-stricken counties. The potential for e-commerce to reach consumers in less-developed countries who otherwise have limited access to markets is clear and, although it may start at a lower level, it will grow quickly in coming years.

6.2 Readiness for E-Commerce Development

Developing e-commerce requires digital infrastructure beyond just access to the Internet. It requires most of the same facilitating factors that enable traditional

offline trade. But it also requires a platform ecosystem that benefits all parties—sellers, buyers, and platform companies (Box 6.1).

Box 6.1. Readiness Checklist for E-Commerce

- **Skills and entrepreneurship**, including the skills needed to use the Internet for operations, provide customer service, and develop online products. A capacity for training followed by incubation services. The presence of an entrepreneurial spirit with a willingness to take risks and flexibility in pursuit of new opportunities in a digital economy.
- **Infrastructure and logistics**, including access to the Internet and an e-commerce platform, access to roads and a logistics network, and access to finance and a mobile payment system.
- **Enabling business environment**, including all traditional factors as well as factors specific to e-commerce: direct subsidies, logistics, training, and online product services and incubation services, improved roads and regulations to make it easier to do business.

The rapid development of e-commerce in rural China has built on tremendous improvements in recent years, including in human capital (including compulsory nine-year education as well as the experience and entrepreneurial spirits the returned migrants bring home), as well as in logistics and transport infrastructure. The government, in partnership with private sector companies, has provided important targeted support to e-commerce development, including in the less-developed counties and rural areas.

But e-commerce is not suited to all locations, all households, or all products and should be deployed with care. Considering local conditions and drawing on the existing and latent comparative advantages are important for selecting e-commerce as an instrument for poverty reduction and inclusive growth. The available data are not sufficient to quantify the effects of e-commerce development on local economic development. More research is needed on the cost-effectiveness of the targeted interventions and the causal relationship between e-commerce participation and improved lives and to identify the channels through which such benefits are realized. Where e-commerce is a suitable tool, policymakers and development partners need information about policies that can be considered to support e-commerce development in rural areas and enhance its effects on job creation and inclusive growth.

Practical Skills and Entrepreneurial Spirit

Practical skills and entrepreneurial spirit are crucial for success in business,



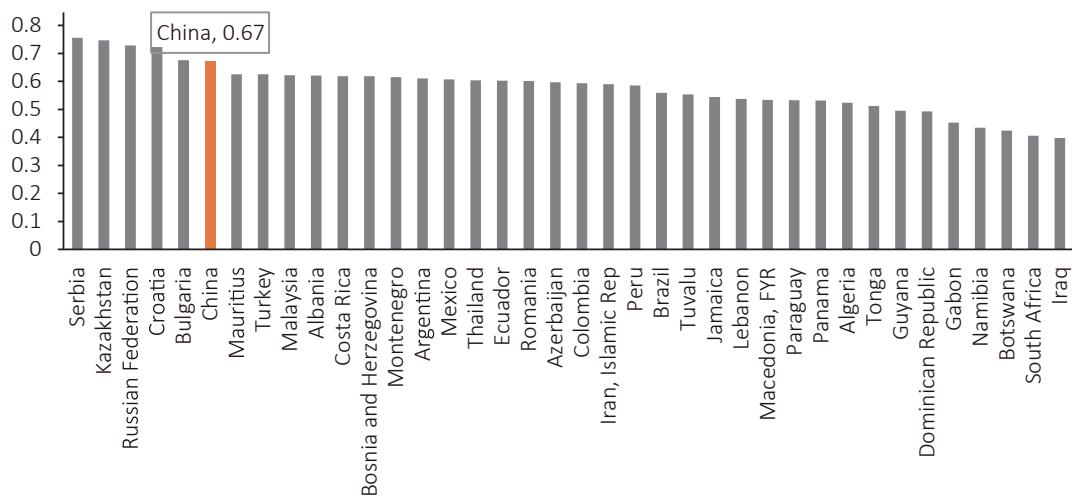
particularly e-commerce. In China, massive migration flows—millions of people migrating from inland rural areas to coastal urban areas, moving out of agriculture and into labor-intensive manufacturing or service jobs—have created a tremendous talent pool. Many migrant workers are young and entrepreneurial, with knowledge of their hometowns and strong kinship ties, and have valuable experience working in large factories on assembly lines or working in retail or wholesale and other services areas with exposure to technical and business managerial skills. The combination of local knowledge and acquired skills and experience provides migrant workers with a strong basis to start their own businesses when they return to their hometowns. Many of them will start e-businesses given the low entry cost and the potential access to a large market. Their successes can demonstrate to other villagers that conducting e-commerce in rural areas is feasible and that it can provide a steady income and even potential wealth. Many less-developed countries have similar migrant dynamics and talented people they could tap to develop e-commerce.

Digital technology does not necessarily mean high-tech, and its benefits are not limited to the highly skilled. The products sold online in rural China (clothes, furniture, and shoes) typically do not have high technical content and the skills required to operate e-shops (or conducting business both online and offline) are of the practical sort. Most of them are labor-intensive with high potential to provide more jobs to the semi-skilled. The availability of digital technology and e-platforms helps reduce the skills threshold to participate in e-commerce, making it particularly beneficial to the rural labor force.¹ Local business owners, through knowledge sharing, demonstration, and special affinity (particularly among women), often inspire more workers (particularly other women) in the neighborhood to find employment opportunities, including part-time jobs. With well-developed e-commerce platforms, individuals with primary or secondary education can perform routine activities with basic training specific to e-commerce, such as printing shipping labels, packaging products for shipment, and answering customer questions online.

Subsidized training offered through the public-private partnership, together with appropriately targeted support, can provide villagers with essential e-commerce-specific skills and experience. Such training typically includes how to register an online business and use the basic functions of the platform, as well as sharing the experiences of successful e-shop owners. Post-training support, often very important to successful incubation, includes services for the new or potential e-shop owners that are tailored to their businesses, such as website design, packaging and branding, and initial sales monitoring. This equips the villagers with the skills and knowledge they need as well as helping nudge them toward starting a business.

Human capital development in China compares favorably with international benchmarks. In 2017, China was in the top 30 percent for human capital, with a Human Capital Index (HCI) rank of 46 out of 157 countries. Among upper-middle income countries (UMICs), China ranked in the top 15 percent, 6th out of 38 countries (Figure 6.1). Human capital is measured in three dimensions. The rate of survival to age 5 in China was 57th in the world and 12th in UMICs. China's quality of education, measured by harmonized test scores, ranked 54th in the world and 12th in UMICs. The quantity of education, measured by expected years of school, was at 38th in the world and 5th in UMICs; however, after learning outcome adjustment, it dropped to 47th and 6th respectively (Figure 6.2). On health dimensions, measured by rate of adult survival to age 60 and by healthy growth among children under age 5, China ranked 38th in the world on adult survival and 3rd in UMICs and on health growth of children it ranked 20th out 109 countries in the world and 10th out of 31 UMIC countries (due to missing data in some countries).

Figure 6.1. Human Capital Index in UMICs, 2017

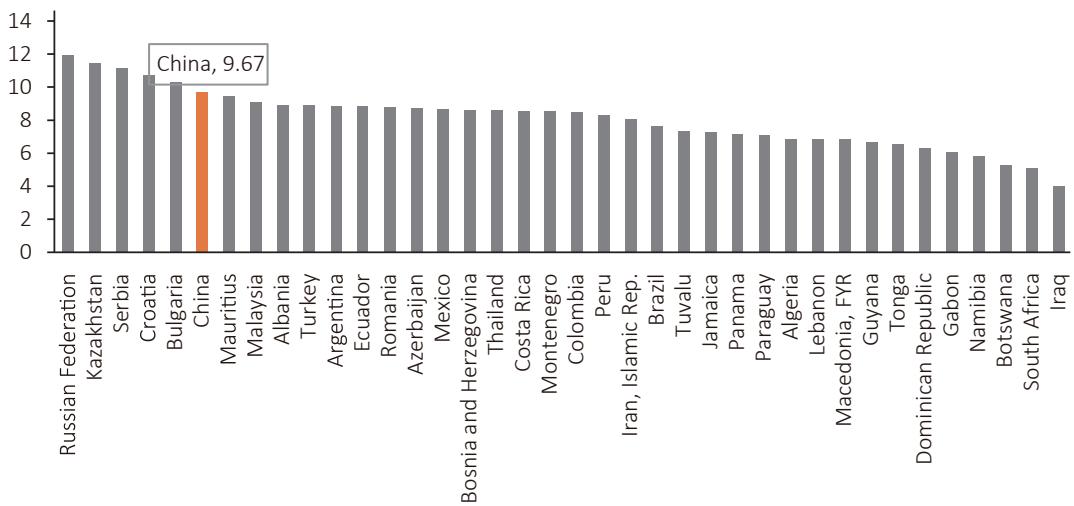


Note: The HCI ranges between 0 and 1. The index is measured in terms of the productivity of the next generation of workers relative to the benchmark of complete education and full health. An economy in which a child born today can expect to achieve complete education and full health will score a value of 1 on the index.

Source: The World Bank <https://development-data-hub-s3-public.s3.amazonaws.com/ddhfiles/144347/hcidataoctober2018.xlsx>

A key challenge for developing e-commerce in rural areas is to help entrepreneurs identify the products suitable for online sales that will have a market. Typically, this means aiding a specialized focus on niche markets where rural areas may have a comparative advantage. The e-platform companies can help in this to some extent using their big data and the offline information collected by local agents. Fundamentally, though, the success or failure of e-commerce development in a specific location or for a particular product will depend on market forces.

Figure 6.2. Learning-Adjusted Years of Schooling in UMICs, 2017



Compared with traditional offline business, e-commerce provides access to a much wider market with many niche markets. Consumers in these wider markets, besides buying standardized goods, may shift to accessing customized services (or servitized products). This allows SMEs and smallholder farmers to participate in the long-tail market expanding their possibility to carry out trade to meet latent demand. Supporting measures that lower entry costs and the costs of failure for farmers and small enterprises is particularly helpful in these situations. Such support requires consideration of the participants' special characteristics—high fixed costs to invest in anything new as a proportion of their total sales or profit but high flexibility in changing their production in response to market demand.

The lessons from the targeted interventions and public-private partnership show that, lowering the entry barriers and transaction costs, addressing the information asymmetry, allowing the new entrants to participate, can be helpful to launch e-commerce in less advantaged areas. In local cultures where female participation in business and labor is particularly challenging, additional targeted support is necessary to ensure equal opportunity. Successful cases of

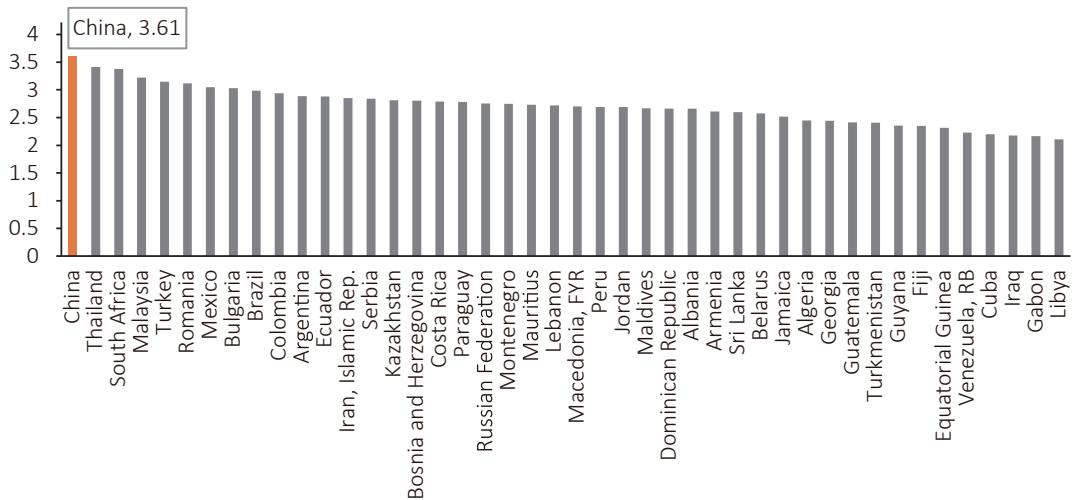
applying digital technology to improve productivity (especially quality and standardization of agricultural products) and the use of e-platform resources to create and match potential effective demand can be one way to enable the upgrade of local products and integrate them into the online market.

Infrastructure and Logistics

As for all commerce, infrastructure development helps power business, lower transaction costs, improve market access, and improve the efficiency of other productive factors, it is also essential to upgrade overall economic structure to aid technology-enabled business participation in value chains. The rapid development of infrastructure in China in past years, including both roads and other built infrastructure as well as logistics networks, has been fundamental for connecting rural areas to the regional and national markets. This provided a foundation for e-commerce development, as it did for overall economic development. Such development improves productivity and widens the range of products that can be traded in domestic and international markets. The rapid development of network logistic platforms and express delivery services enables efficient delivery of goods and services, and availability of online payment enables transactions through online platforms. Most Taobao Villages, for example, locate in areas with easy access to logistical facilities and broadband services. However, not all parts of rural China or other developing countries have the same level of access. As of 2017, 54 percent of the Chinese population used the Internet. Out of 204 countries where Internet usage data were available, the Internet penetration rate of China ranked 112th. Overcoming the digital divide and transportation connectivity challenges are crucial first steps to develop e-commerce.

China performs well on trade logistics and is outstanding among upper-middle-income countries. In 2018, China ranked number 26 out of 160 countries worldwide on the World Bank Logistics Performance Index (LPI). On international shipments it ranked number 18 out of the 160 countries, for infrastructure 20, logistics quality and competence, tracking and tracing, and timeliness all number 27, and customs number 31. China's performance is outstanding compared with 41 upper-middle-income countries, ranking first for overall performance, as well as for each of the six measured dimensions (Figure 6.3).



Figure 6.3. LPI Score in UMICs, 2018

Note: The LPI is an interactive benchmarking tool created to help countries identify the challenges and opportunities they face in their performance on trade logistics and what they can do to improve their performance. LPI 2018 ranks countries on six dimensions of trade and uses standard statistical techniques to aggregate the data into a single indicator that can be used for comparisons across 160 countries.

Source: The World Bank. https://lpi.worldbank.org/sites/default/files/International_LPI_from_2007_to_2018.xlsx

In less-developed areas, logistics is often weakest at the last mile, the final link to the consumer or e-shop. This “last mile problem” requires specific attention. Targeted efforts to make last mile connections through public-private partnerships have helped to jumpstart e-commerce development in remote areas. Such support addresses the binding constraint of high transport costs and provides opportunities for e-commerce to blossom in targeted areas. In China, the regular post, though it serves the entire country, is slow in reaching remote areas and commercial delivery services otherwise might not offer service. The government’s Rural E-Commerce Demonstration Program provided subsidies to lower the delivery costs in collaboration with China Post and commercial logistics companies. Alibaba’s Rural Taobao Program has tackled logistical constraints in collaboration with the Cainiao network using more than 20 local logistics providers to deliver packages from counties to villages and significantly reducing delivery times. By connecting the “last mile” for online purchases to the villagers and the “first mile” for online sales from villages, the reduction in transportation and logistical costs starts a virtual circle of “lower transport costs—more online transaction; more online transaction—lower transport costs,” providing a foundation on which to build the e-commerce ecosystem.

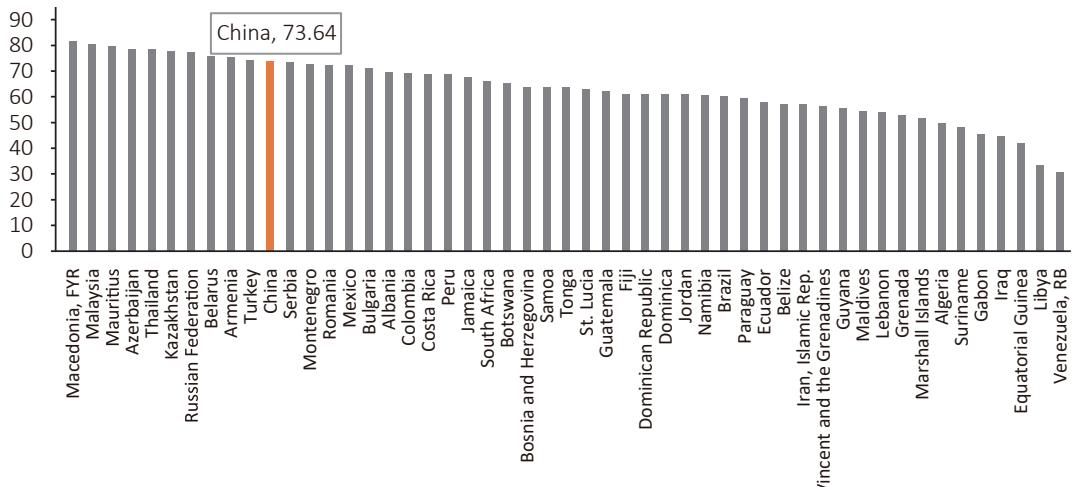
The requirement for infrastructure, including technology infrastructure, can be manageable and adapted to local conditions, particularly through local agents. For example, when supporting farmers to grow fruits, it does not need to get every farmer a smartphone with access to broadband, but with proper arrangement get the contract farming in place with technical support through local agent to get the ideas across at the start.

The penetration of e-commerce into rural areas in China, especially remote locations, is aided by a network of county and village agents, who facilitated online purchases and online sales. These networks build “incubators” by developing e-commerce partners at the village level. In the Alibaba Rural Taobao Program, for online purchases, these partners introduce the Alibaba online platforms to villagers, help them navigate the e-commerce platforms to select products and services. The partners also use their online payment account to place orders for villagers and collect payment when villagers are satisfied with their purchases. This arrangement helps reduce villagers’ anxieties about buying online, which can significantly increase online purchases, especially in the early stages of development. For online sales, the partners help villagers to set up online sales, including creating a website for the villagers if they wish or helping them to sell directly from an existing website. This reduces the villagers’ need for technical skills and reduces the threshold for e-commerce participation. This public-private partnership helps expand the e-commerce market access to less-developed areas.

A Conducive Business Environment

For e-commerce, as for traditional business, an enabling business environment is essential. China performs well overall in Doing Business metrics, but some lagging indicators need improvement. In 2019, China ranks in top quarter (46 out of 190) economies in the world in terms of ease of doing business and in the top 20 percent (11 out of the 51) among upper-middle-income economies, after Malaysia and Thailand in the East Asia and Pacific region (Figure 6.4). China performs well in enforcing contracts (6th worldwide, 2nd among UMICs), getting electricity (14th and 4th), registering property (27th and 6th), and starting a business (28th and 5th). China’s performance in resolving insolvency (61st worldwide, 17th among UMICs), protecting minority investors (64th and 18th), trading across borders (65th and 15th), and getting credit (73rd and 23rd) are fairly good. The areas most in need of improvement are paying taxes (114th worldwide and 31st among UMICs) and dealing with construction permits (121st and 37th).



Figure 6.4. Ease of Doing Business Score in UMICs, 2019

Note: The Doing Business project provides objective measures of business regulations and their enforcement across 190 economies. Economies are ranked on their ease of doing business, from 1–190. The rankings are determined by sorting the aggregate scores (formerly called distance to frontier) on 10 topics, each consisting of several indicators, giving equal weight to each topic.

Source: The World Bank. <http://www.doingbusiness.org/content/dam/doingsBusiness/excel/Historical-data---complete-data-with-scores.xlsx>

The experience in China suggests that e-commerce development can be eased with government involvement in improving the business environment for e-commerce and providing targeted support to address binding constraints for business. Data on the cost-effectiveness of government support are not available, limiting what can be said about them. However, case studies in China indicate that in addition to supporting logistics, subsidies for training to build human capital and post-training support to help develop online branding, as well as providing incentives and awards for high-volume online sales can help propel e-commerce development. Case studies in the Arab Republic of Egypt suggest that government support, including tax breaks, subsidized training, subsidized access to technology can encourage SME owners to participate in platforms (Badran 2014).

Important components of government support in China have included:

- Collaborating with e-platform companies and logistics companies.
- Subsidizing logistic costs for packages to and from targeted poor areas.
- Providing subsidies and incentives to households and individuals, including:
 - Free or subsidized e-commerce training;
 - Free or subsidized e-commerce post-training support through e-commerce service firms;
 - Incentives and awards for high volume of online sales.

The experience in China suggests that private sector e-platform companies can use digital technology and e-platform resources to support efficient rural vitalization and poverty reduction. The effort includes supporting an easy start for opening an e-shop (Box 6.2) as well as providing a fair and supportive trading environment. Using the resources and expertise of the private sector can lower transaction costs and connect people to markets, as well as improve product quality and help tailor product offerings to consumer demand. Activities by private sector participants can include:

- Using expertise to develop a fiscally sustainable ecosystem and cultivating a virtuous cycle.
- Supporting participation in local, regional, and global value chains through e-commerce platforms and adding value by developing comparative advantages and economies of scale and agglomeration.
- Ensuring the inclusiveness of e-commerce by providing all with equal access to the e-commerce ecosystem, including in less-developed areas and for women, youth, and other disadvantaged groups.

Box 6.2. Lower Barriers and Enable Entry to Get Started

Getting started is often challenging. The ease of starting an online shop and the low cost of selling online can encourage people to start online businesses. Lowering the initial cost can enable the creation of many online shops. The main requirement for opening an e-shop is free online registration, with no need to even leave home.² To register an e-shop on Taobao.com an entrepreneur only needs a national ID and other basic information and a small deposit, which is refunded if the owner decides to close the e-shop. Most e-shops in Taobao Villages are household-based, and therefore pay no rental for a physical store. The proximity of e-shops to producers, or clusters of producers, as in Taobao Villages, and the rapid development of the logistic network lowered the need to hold large inventory, which further reduce the needs for starting capital. The Taobao.com zero-transaction fee (no commission is taken) also helps reduce the behavioral or psychological barriers that might deter people from engaging in e-commerce.

While not all e-shops succeed, the easy start allows producers or traders to offer their products on the market at low transaction cost. Competition is fierce in the online marketplace, but the geographic barriers and search and transaction costs are minimized. Most e-shops are small, which makes them particularly suited to produce small batches of product in a short period and gives them flexibility to adapt to consumer demand. Still, many e-shops get too few orders for their products, and many become inactive or close. However, the churning and turnover allows the market to “select winners;” only products with effective market demand survive and prosper. The natural attrition of products with low demand and the e-shops that provide them maximizes the consumer and producer gains. In a large online market (much larger than the local market typically available to rural producers), even a small margin of profit can be scaled up, which can start a virtuous cycle for investment and further growth.

While initial subsidies might be large, if e-commerce development continues to accelerate, those subsidies might result in valuable productivity gains for the economy in the long run and improved living standards in remote areas. Take logistics support as an example, as experienced in the Alibaba Rural Taobao Program, according to Alibaba, their subsidies per package have started to decline as businesses grow, the number of packages increases, and two-way trade starts to develop.

6.3 Risks and Challenges

As e-commerce continues to prosper and becomes more important in the economy, new risks and challenges arise. While technology transformation and platform economy increase market efficiency, the accompanied disruption brings risks to sellers and buyers, as well as to e-commerce ecosystem. The sun is rapidly setting on the “wild frontier days” of Internet development and a new phase of policy making and regulation has begun. These new policies and regulatory regimes will need to be tested and assessed for effectiveness and impact on the market and on human welfare. New institutional arrangements, from business registration to tax administration, must be developed or strengthened to meet evolving needs. On the regulatory side, critical issues need to be addressed, such as how to regulate the platform providers to ensure a level playing field for comparable digital services, protect consumers, and ensure fairness between online and physical vendors. Care is required to ensure that e-commerce does not displace the offline businesses that help provide tax



revenues for local government, which could erode essential local public services. It is therefore essential to continue serving e-merchants as well as supporting cross-fertilization with traditional offline businesses. To scale up success where e-commerce is already in place and enhance its effect on people's living standards, continue upgrading the value chain and increasing the value added of online product sales, as well as supporting expansion of the "winners" (selected by the market) and the entry of more e-shops.

Online sellers face tough competition. The resulting low profit margins are a challenge for the survival of online shops, though it might produce efficiency gains for the sector as a whole. As information asymmetry is reduced in the online market, customers can instantly search for products from many sellers and compare prices at virtually zero cost. The "one-click-away" nature and "just-in-time" delivery requirement can make it difficult for sellers to determine the right level of stock required to maximize profits (and still quickly respond to market demand) and minimize risks (due to large stocks of unsellable products).

Online sellers also face several risks. First, they face risks from counterfeit products in the marketplace. Because transactions online are remote—consumers make purchases before seeing or touching the real product—counterfeits can reduce the value of a product (or diminish the likelihood it will sell at all). Second, they face risks from the platforms. While online sellers have the convenience of opening an online shop in a few minutes, the reliability of the platform (including all technical issues) as well as the terms set by the platforms also present risks. As discussed later, if a platform sets or changes terms in their own favor or manipulate the market using their market power, sellers will be operating in a challenging position. Regulation and rule of law to support the level playing field, including providing space for SMEs and new entrants, are key.

Online buyers also face risks, including cyber security, privacy, fraudulent or defective products, and technical concerns regarding electronic payment. E-commerce transaction data includes purchasers' financial information, such as payment information, which makes consumers vulnerable to fraud. The protection of confidentiality, integrity, and availability of data and assets used by e-commerce platforms is important for cyber security (Schatz et al. 2017). The protection of private information includes regulation governing the use of data about individuals, groups, or institutions and allowing them to determine for themselves when, how, and to what extent their information is communicated to others (Westin 1967). Extra efforts are also required to prevent the sale of counterfeit products on e-commerce platforms.

Addressing such risks and concerns requires rule of law and business commitments to the consumer relationship. The OECD (2016), as an example, laid out a framework for strengthening consumer protection in the Internet economy in 2016. It recommended that businesses "protect consumer privacy by

ensuring that their practices relating to the collection and use of consumer data are lawful, transparent and fair, enable consumer participation and choice, and provide reasonable security safeguards.” It also recommended that businesses “provide consumers with easy-to-use payment mechanisms and implement security measures that are commensurate with payment-related risks, including those resulting from unauthorized access or use of personal data, fraud and identity theft.”

Large platform companies can generate significant network effects and generate high user values, but they also carry some risks. As these companies gain popularity and get more consumers, a positive spiral kicks-in and they grow even larger.³ This can benefit consumers by lowering prices and providing better access to more data-driven services. It can also benefit sellers by providing more efficient services and opening-up larger markets. However, the literature cautions against overreliance on this model. As data gains more value, existing large platform companies have significant advantages over new entrants online. For example, particularly in developing countries where access to finance is binding, smaller platforms, which may have economic and social values to customers (particularly, specific segments of customers) may have difficulty developing or getting started in the first place (Moreau 2017). In the literature, a “preferred customers” clause⁴ may give the dominant platforms monopoly power and allow them to continue increasing their dominance in the market. While this can be efficient and socially beneficial, it might also result in undesirable market manipulation, for example, through higher fees or stricter terms on sellers or using buyers’ personal data to take further control of the market. If this happens, such behaviors can eventually damage the online marketplace.

The literature on the dynamics of the platform economy is far from conclusive. A London Business School article by Barwise (2018) argues that “once a tech company achieves market dominance, mutually reinforcing factors make it almost impossible to displace” as mutually reinforcing factors drive these companies’ market dominance and an INSEAD article by Choudary (2017) argues that “predatory business development practices could cause risks for the platform ecosystem” by taking out the competition as “their powerful network effects risk guaranteeing their winner-take-all position.” Ruutu et al. (2017) suggests three potential models of platform economy, the “chicken-and-egg” model where no platform achieves dominant mass, the “winner-takes-all” model where a dominant player deters the entrance of new ones, and the “winner-takes-some” model where several platforms coexist through collaboration and competition in a balanced competition. A Harvard Business Review article by Evans and Schmalensee (2017) argues that “winner-takes-all” does not apply to the platform economy for two reasons. First, the network effects, which drive the equilibrium toward benefiting the dominant player, are not as durable as they used to be. This is because “modern technology, fueled by software, the Internet, and the cloud, makes it possible for a challenger to enter the market at minimal cost” and “it is a lot easier to start an online platform than it was to build a

telephone network.” Second, the network effects can also work in reverse and the shift of traffic can destroy value and the dominance of the existing players with explosive speed. Eferin et al. (2019) conducted a case study in the Russian Federation to test the “winner-takes-all” versus the “winner-takes-some” models in digital platform competition dynamics. Their results show that a healthy competition between national and foreign multi-sided platforms can lead to the emergence of an equilibrium, where local platforms were able to retain a significant, often majority, share relative to foreign and global platforms.

With the rising new challenges and opportunities in the platform economy, a regulatory and policy framework needs to be adapted to support the healthy development of the ecosystem, providing level playing ground and protection to all parties, including sellers and buyers, as well as platform companies.

6.4 Future Research

While the China experience suggests ways to support e-commerce that fosters entrepreneurship and supports inclusive growth, more research will help refine lessons that may be applicable to other countries. Addressing research questions related to causality using experimental design and data collection, as well as questions about the efficacy and efficiency of targeted public and private programs using cost-benefit analysis, will be particularly helpful for ensuring that policies designed to support e-commerce development for poverty alleviation are evidence-based. Some areas that merit attention are:

- Distilling the causal effect of the various enabling factors on e-commerce development, including the complementarity and substitutability among these factors. More work—including experimental design and data collection—is needed to tease out the role of enabling factors, their interactions, and the possible policy interventions to support the development of the enabling factors in the first place.
- Quantifying the impact of e-commerce development on employment creation, economic growth, and social welfare improvement and identify the channels through which these work for various segments of the population in areas with differing development levels and characteristics. Understanding the magnitude of the impact of e-commerce on the economy, including the potential additionality or substitutability between e-commerce and traditional brick-and-mortar business, as well as its distributional impact or inclusiveness is key to devising more conducive policies to strengthen the beneficial impact of e-commerce on development.
- Drawing lessons from targeted interventions by the government and private

sector companies in supporting e-commerce for poverty alleviation and rural vitalization. Further understand how developing infrastructure and logistics help—including last-mile connection, training provision, rural financial services, as well as establishing the local agent network to incubate e-commerce behaviors. More understanding is also needed regarding the efficiency and effectiveness of targeted interventions in areas facing different challenges, and their impact in the short and long terms. Close monitoring and evaluation (and potentially experimental design of project evaluation) can be helpful in distilling lessons of what works well under what conditions for replication or scaling up.

- Understanding the dynamics of the platform economy and the potential risks and opportunities for producers and consumers, as well as for the platform companies and the ecosystem. A further question to explore is, as technology continues to advance, how will consumer differentiation be affected and what network effects will apply to the sustainability of the different dynamics of the models, particularly the implications for “winner-takes-all” or “winner-takes-some” in the new markets. Understanding what is known and what is not known about the development of the platform economy, its pattern and evolution, is an important starting point for policy making that supports the development of e-commerce that supports inclusive growth and employment generation.

Notes

1. See more in Luohan Academy 2019.
2. For e-shops in Taobao.com, commission fee is zero. [http://tradeontaobao.com/
opening-a-taobao-store/](http://tradeontaobao.com/opening-a-taobao-store/)
3. See Choudary 2017.
4. A “preferred customers clause,” or “most-favored-customer clause” is a contractual arrangement between vendor and customer that guarantees the customer the best price the vendor gives to anyone. See more in Gürkaynak et al. 2016.

Appendix A. Definition of E-Commerce Indicators

The e-commerce indicators used in this report are mainly from four sources: official data from China government (Ministry of Commerce, National Bureau of Statistics and their yearbooks); China Family Panel Studies (CFPS) administered by Peking University; Taobao Village Survey by the World Bank–Alibaba joint research team, and Peking University in collaboration with Nankai University; and county-level aggregated e-commerce transaction data in poverty-stricken counties provided by Alibaba. Table A.1. shows the definitions of e-commerce indicators used and their sources.

Table A.1. Definition of E-Commerce Indicators		
Source	Indicator	Definition
Ministry of Commerce of China, National Bureau of Statistics of China	Total e-commerce trade volume	E-commerce trade volume refers to the transaction amount achieved through online orders, regardless of payment methods (online or offline payment). It also includes transactions by B2B and foreign trade enterprises reached on e-commerce platforms. The total e-commerce trade volume is the simple average of e-commerce purchases and e-commerce sales, including goods and services. ¹
	Online retail sales	Refers to the sum of retail sales of goods and services through public online trading platforms (including self-built websites and third-party platforms). Goods and services include physical goods and non-physical goods (such as virtual goods, service goods, etc.). ²
China Family Panel Studies	Online shopping expenses	The survey questionnaire asks the question “in the past 12 months, how much did you spend on online shopping (including paying online)?” ³
Taobao Village Survey	GMV [online sales]	The survey questionnaire asks the question “what is the total sales amount in your online store in 2017?”

1. Source: China. Ministry of Commerce 2014, 2015.

2. Source: National Bureau of Statistics of China. http://www.stats.gov.cn/tjsj/zxfb/201611/t20161114_1428445.html

3. Source: Institute of Social Science Survey, Peking University. China Family Panel Studies 2016 Full Questionnaires.

Alibaba, poverty-stricken county data	Gross Merchandise Value (GMV)	GMV is the value of confirmed orders of products and services on Alibaba marketplaces, regardless of how, or whether, the buyer and seller settle the transaction. Unless otherwise stated, GMV in reference to Alibaba marketplaces includes only GMV transacted on Alibaba China retail marketplaces. Alibaba's calculation of GMV for Alibaba China retail marketplaces includes shipping charges paid by buyers to sellers. As a prudential matter aimed at eliminating any influence on our GMV of potentially fraudulent transactions, Alibaba excludes from the calculation of GMV transactions in certain product categories over certain amounts and transactions by buyers in certain product categories over a certain amount per day. ⁴
	Online sales value	Total online sales GMV of a given location, as per the addresses of the sellers.
	Online purchase value	Total online purchase GMV of a given location, as per the addresses of the buyers.
	Number of packages sent	Number of packages sent for transactions between buyers and sellers on Taobao/Tmall platforms of a given location. Location is identified by the shipping address of the sellers. One package may include multiple items.
	Number of packages received	Number of packages received for transactions between buyers and sellers on Taobao/Tmall platforms of a given location. Location is identified by the shipping address of the buyers. One package may include multiple items.
	Number of online sellers	Number of online stores on Taobao/Tmall platform of a given location. The location is identified by the addresses of the sellers.
	Number of online buyers	Number of online buyer accounts on Taobao/Tmall platform of a given location. The location is identified by the addresses of the buyers. One buyer account may be shared by multiple buyers (for example, husband and wife may have only one buyer account).

4. Source: Alibaba. <https://otp.investis.com/clients/us/alibaba/SEC/sec-show.aspx?FilingID=12879202&Cik=0001577552&Type=PDF&hasPdf=1>

Appendix B. Definition of Online Business Index (OBI) and Online Shopping Index (OSI)

The OBI and OSI were developed by Alibaba to reflect local e-commerce development level, based on data from Alibaba's platform and national census data. As mentioned in chapter 1, according to eMarketer.com,¹ Alibaba has a large share (58 percent) of the total retail e-commerce sales in China in 2018. The value of the two indexes range from 0 to 100, the higher the value, the more developed the online business and online shopping. Each indicator is comparable across years. The construction of OBI and OSI includes two steps:

First, OBI and OSI are calculated as a weighted average of a density component and a scale component:

$$\begin{aligned} \text{OBI} &= \text{density of e-tailers} * 0.6 + \text{transaction score} * 0.4 \\ &= (\text{number of e-tailers} / \text{population}) * 0.6 + (\text{number of e-tailers with annual transaction volume over RMB 240,000} / \text{number of e-tailers}) * 0.4 \end{aligned}$$

$$\begin{aligned} \text{OSI} &= \text{density of online buyers} * 0.6 + \text{consumption score} * 0.4 \\ &= (\text{number of online buyers} / \text{population}) * 0.6 + (\text{number of online buyers with annual consumption over RMB 10,000} / \text{number of online buyers}) * 0.4 \end{aligned}$$

Second, OBI and OSI are then normalized by using:

$$\text{Normalized value} = \text{value generated in previous step} / \text{standard value} * 100$$

where standard value is the maximum expected value. The maximum expected values for each of the factors are shown in Table B.1. Both the construction of the two indexes and the maximum expected values are set by Alibaba.

The normalized OBI and OSI are the data available to this report, while the components—density of e-tailers, transaction score, density of online buyers, and consumption score—are not accessible.

1. See Kwok 2018.

Table B.1. Maximum Expected Values in Normalization of OBI and OSI

	Maximum expected	Value
Density of e-tailers	80% of entrepreneurs in China start their business on Taobao / Tmall platform	$16.84\% * 80\% = 13.47\%$ Note: According to Tsinghua University's report "Global Entrepreneurship Watch China Report (2002-2012)", 24% of population between 18-64 years old are entrepreneurs, and by applying the age composition, 16.84% of population are entrepreneurs.
Density of online buyers	80% of adults in China purchase on Taobao / Tmall platform	$79.07\% * 80\% = 63.26\%$ Note: According to the 2010 Population Census of China, the share ratio of population above 18 years old is 79.07%.
Transaction score (share of e-tailers above designated size)	100%	
Consumption score (share of online buyers above designated size)	100%	

Appendix C. Definition of National Poverty-Stricken County

According to State Council Leading Group Office of Poverty Alleviation and Development, China has 832 poverty-stricken counties, 592 of which are Key Counties for National Poverty Alleviation and Development, and the remaining 240 of which are non-Key Counties, but within the 14 contiguous destitute areas.¹

The Key Counties were first defined in 1986, targeted to rural areas, with different rural income level as poverty lines for different kinds of counties: RMB 150 per capita as the poverty line for farming counties, RMB 200 per capita as the poverty line for pastoral counties, and RMB 300 per capita as the poverty line for counties in old revolutionary base areas. A total of 331 counties were identified as Key Counties for National Poverty Alleviation. A small adjustment was applied in 1994, raising the number of Key Counties to 592, still identified according to rural income level. Counties with rural income higher than RMB 700 per capita were removed from the list, while those with rural income lower than RMB 400 per capita were added. In 2001, all Key Counties in coastal areas were removed from the list and more counties in central and western regions were added, along with all counties in Tibet. Since then, the Key Counties are called Key Counties for National Poverty Alleviation and Development. The current list of 592 Key Counties was set in 2011 based on the list in 2001, and the poverty line was set by each province individually. The criteria can include indicators such as financial income, rural income per capita, and the like.

The 14 contiguous destitute areas were identified in 2011 and refer to poor counties with geographical connection, sharing a similar natural environment, traditional industries, cultures, and factors causing poverty. The poverty line was set based on GDP, rural income, and fiscal revenue between 2007 and 2009, and is lower in minority counties and counties in old revolutionary base areas and border areas.

1. See China, The State Council Leading Group Office of Poverty Alleviation and Development 2013.

Appendix D. Uneven Development of E-Commerce in Poverty-Stricken Counties

The rapid development of e-commerce in poverty-stricken counties masks disparities between counties. Where they occur, e-commerce activities, particularly online sales, are highly concentrated, and appeared to be increasingly so. Some poverty-stricken counties experienced a decline in e-commerce activities, especially online sales and number of packages sent, and the number of these counties has been increasing. In 2014, 21 percent of poverty-stricken counties saw a decrease in online sales amount compared to the preceding year; in 2016, the share that experienced a decline increased slightly to 25 percent. Similarly, an increase in the number (or share) of poverty-stricken counties saw declines in the number of packages sent over the period, from a 13 percent decline in 2014 to 21 percent in 2016.

On the consumption side, the sharp increase masks disparities between counties. The decline of e-commerce activities is mainly in the number of online buyers. In 2014, the number of online buyers decreased from the previous year in 21 percent of the counties and in 2016 they decreased from the previous year in 25 percent of the counties. Four percent of poverty-stricken counties saw declines in online purchase amounts in 2016 compared with 2015, compared to only 0.5 percent (4 counties) for 2013 and 2014. Very few of the counties (1 in 2013 and 6 in 2016) saw decreases in the number of packages received.

E-commerce, especially online sales, is spatially concentrated among poverty-stricken counties and the degree of concentration is steady. From 2013 to 2016, the top 25 percent of poverty-stricken counties accounted for 90 percent of the online sales amount and packages, as well as 70 percent of online stores. Measured by Gini coefficient, this is 0.8 for online sales amount and packages sent and 0.6 for online stores.

Few poverty-stricken counties, most of them in the central and coastal regions, achieved very large online sales. In central and coastal regions, only Heilongjiang, Jilin, Hebei, and Hainan have poverty-stricken counties. In 2016, six counties had online sales amounts exceeding RMB 500 million and jointly accounted for 31 percent of online sales amount in poverty-stricken counties: Nankang district (RMB 3.78 billion, in Jiangxi), Pingxiang county (RMB 2 billion, in Hebei), Zhenping county (RMB 1.15 billion, in Henan), Shucheng county (RMB 918 million, in Anhui), Danfeng county (RMB 632 million, in Shaanxi), and Quyang county (RMB 509 million, in Hebei). Of the six counties, four also rank at the top in number of packages sent. Eight of the counties had more than 2.5 million packages sold, accounting for 24 percent of packages sold by poverty-stricken counties: Pingxiang county (9.31 million, in Hebei), Shucheng county (5.11 million, in Anhui), Shangrao county (3.15 million, in Jiangxi), Lixin county (2.95 million, in Anhui), Xiushan county (2.93 million,

in Chongqing), Zhenping county (2.75 million, in Henan), Nankang district (2.65 million, in Jiangxi), and Guangshan county (2.64 million, in Henan). Six counties had more than 3,000 online shops, jointly accounting for 11 percent of online shops in poverty-stricken counties: Zhenping county (8,888, in Henan), Pingxinag county (8,351, in Hebei), Nankang district (6,641, in Jiangxi), Quyang county (4,223, in Hebei), Hua county (3,685, in Henan), and Guangshan county (3,018, in Henan). Of the six counties, five also rank at the top in online sales amount and number of packages sent.

Online purchases are also concentrated spatially, but much less so compared with online sales (and the counties that have large online sales are not those with large online purchases). From 2013 to 2016, a quarter of the poverty-stricken counties represented 60 percent of the online purchase amount, packages received, and online buyers, with a Gini coefficient of 0.5. Most poverty-stricken counties reporting large online purchases were in urban areas close to big cities (districts and county-level cities). Counties with very large online purchases are mainly in the southwest. In 2016, six of the counties had online purchases exceeding RMB 1.5 billion, 5 percent of the total for poverty-stricken counties: Wanzhou district (RMB 2.2 billion, in Chongqing), Chengguan district (RMB 1.98 billion, in Tibet), Enshi city (RMB 1.76 billion, in Hubei), Xixiu district (RMB 1.71 billion, in Guizhou), Nankang district (RMB 1.65 billion, in Jiangxi), and Qixingguan district (RMB 1.59 billion, in Guizhou). Of the six counties, five also rank at the top for number of packages received. Six counties received more than 7 million packages, again 5 percent of the total for poverty-stricken counties: Wanzhou district (12.7 million, in Chongqing), Xixiu district (8.69 million, in Guizhou), Enshi city (8.54 million, in Hubei), Qixingguan district (7.71 million, in Guizhou), Nankang district (7.27 million, in Jiangxi), and Yu'an district (7.18 million, in Anhui). Nine counties had more than 150,000 online buyers, representing 6 percent of online buyers in poverty-stricken counties: Wanzhou district (312,689, in Chongqing), Enshi city (188,089, in Hubei), Xixiu district (187,794, in Guizhou), Qixingguan (179,828, in Guizhou), Chengguan district (169,335, in Tibet), Hanbin district (162,040, in Shaanxi), Hua county (160,394, in Henan), Nankang district (157,152, in Jiangxi), and Kaizhou district (153,803, in Chongqing). Of the nine counties, five are also at the top for online purchases amount or number of packages received.

Online sales in the poverty-stricken counties of the western region are smaller, and the growth rate is slightly lower, compared to others. The slower growth of e-commerce in the western region is to be expected. The region has the largest number of poverty-stricken counties and they are generally poorer than the national average for such counties. About 20 percent of the online sales amount and packages sent are from the western region, which is small considering that the region accounts for 68 percent of the poverty-stricken counties and 54 percent of the Hukou population in such counties. It is worth noting that the western region accounts for 38 percent of online shops in poverty-stricken counties, implying that online shops in those western region

counties achieve smaller sales or are less active compared to those in other poverty-stricken counties. Growth of online sales in poverty-stricken counties in western region is slightly lower, resulting a small decrease in the share of online sales achieved. From 2013 to 2016, the western region's share of online sales in poverty-stricken counties decreased from 25 percent to 23 percent, and packages sent dropped from 21 percent to 18 percent. This was despite an increase in the western regions' share of GDP in poverty-stricken counties from 51 percent to 56 percent between 2013 and 2015.¹

1. Staff calculation based on 2013 and 2015 data from China Statistical Yearbook (County Level).

Appendix E. Targeted Programs to Support E-Commerce Development for Poverty Alleviation

This appendix describes in detail three targeted programs, one by the government of China and two by Alibaba, that support e-commerce development. These experiences with e-commerce to support growth and expand employment opportunities have sparked strong interest among researchers, policymakers, and the private sector, and have encouraged them to explore the use of e-commerce as a tool for poverty alleviation and rural vitalization. Exploring what works and what needs to be improved in such programs is crucial for the successful harnessing of digital technology for those ends.

China Rural E-Commerce Demonstration Program

The Ministry of Finance and Ministry of Commerce launched the Rural E-Commerce Demonstration Program in 2014 with a goal of helping to reduce rural poverty and modernize rural areas through the promotion of e-commerce. This was to be accomplished by establishing and improving rural e-commerce public services, fostering rural e-commerce supply chains, promoting connectivity between agriculture and commerce, and enhancing training for e-commerce entrepreneurs.

Objectives and Targets

The objective of the program, as of 2018, is to make progress in online sales of rural products, to increase employment and income among poor households, and to grow online access to public services. The objectives evolved between 2014 and the present. The original 2014 objective was to promote e-commerce policies and systems in demonstration counties. This was supplemented in 2015 with an objective to promote poverty alleviation. Two objectives were added in 2016: to establish rural e-commerce public service systems and to promote online sales of agricultural products.

The objectives were accompanied with specific targets. At the start, the program targeted a 30 percent increase in e-commerce trade volume in demonstration counties, raising the share of total retail consumer goods sales, reducing e-commerce logistics costs, and modernizing circulation in rural areas. The focus of the program shifted from the county level to the villages in 2017, when the program targeted 50 percent coverage of e-commerce services in qualified registered poor villages.¹ Other targets included 20 percent growth

1. Qualified registered poor villages are approved by the county Poverty Alleviation and Development Office and their general information, development level, infrastructure

of rural online retail sales and 30 percent growth in online sales of agricultural product. In addition, 3,000 people per year were to receive e-commerce training. The focus on logistics systems was dropped in 2017.

Implementation and Funding

Overall program planning is the responsibility of the Ministry of Finance, Ministry of Commerce, and State Council Leading Group Office of Poverty Alleviation and Development. Oversight of the program is entrusted to provincial governments, while city and county governments are responsible for implementation of the program.

Funding for the program is from the central government and is held in a Financial Fund established for the purpose and administered by the Ministry of Finance. The fund started with RMB 1.1 billion in 2014 and increased incrementally to RMB 3.9 billion in 2017. The funds mainly help to promote online sales in rural areas, improve rural public service systems, and conduct rural e-commerce training. Before 2017, they were also used to support logistics systems. Allocation of funds at the provincial level includes performance targets for each demonstration county. Provincial administrative departments also organize, supervise, and inspect the implementation; evaluate the performance of demonstration counties, and report progress to the central government.

Selection Criteria

Demonstration areas are selected annually by the Ministry of Finance, Ministry of Commerce, and State Council Leading Group Office of Poverty Alleviation and Development. Criteria for selection include the level of economic development, e-commerce basis, and regional balance of the provinces considered. Also considered are the priorities of the demonstration counties within those provinces, as well as the number of new counties selected in each demonstration province. Provinces independently determine the conditions required for inclusion of counties in the program using data on logistics, Internet connectivity, and characteristic industries as criteria.

conditions, production and living condition, public services, and poverty alleviation assistance are recorded. An administrative village that is identified as poor has a poverty incidence more than double that of the province, a per capita net income of farmers that is 60 percent below the provincial average in 2013 and does not have collective economic income. The number of qualified registered poor villages in a province is limited to about 15 percent of total number of administrative villages in an eastern province, 20 percent in a central province, and 30 percent in a western province. http://www.cpad.gov.cn/art/2014/4/11/art_624_14224.html

The selection of demonstration counties has gradually shifted toward a focus on poorer areas. In 2014, each demonstration province was required to choose seven or fewer demonstration counties. In 2017, each demonstration province was asked to include in their selection poverty-stricken counties (defined at the national level) and underdeveloped counties as a third to half of their demonstration counties. In 2018, new demonstration counties were limited to poverty-stricken and underdeveloped counties.

Program Activities

Online sales. The bulk of program funds—at least 50 percent—supports market connections for rural products. Among the activities supported are creation of a diversified supply chain for rural e-commerce; strengthening the grading, packaging, and marketing of agricultural products; and accelerating the construction of infrastructure for processing and distribution. The program also promotes comprehensive service systems for rural products, including standardization, quality certification, brand cultivation, and quality traceability. It also supports the construction of logistics and distribution systems to serve online sales at the county, township, and village levels.

Public service systems. Less than 15 percent of program funds supports the construction of e-commerce public service centers in counties and rural e-commerce service sites in villages. These mainly serve qualified registered poor villages and poor households. Among the services available are authorized collection and payment, authorized purchase and sale, microfinance, and convenience services. Other activities include improving the role of public service center as a hub to coordinate regional rural e-commerce operation, logistics, training, and poverty alleviation.

E-commerce training. E-commerce training is supported for government officials, cooperative members, returned migrant workers, rural entrepreneurs, and others. Training for villagers focuses on qualified registered poor households and is combined with support for rural innovation and entrepreneurship and poverty alleviation, as well as strengthening skills related to online product sales, such as packaging, design, promotion, and marketing.

Logistics and distribution systems. Until 2017, not less than 30 percent of the program funds were used to solve the issues related to logistical services, particularly at the “first kilometer” and “last kilometer.” These activities combined the coverage advantages of the China Post—synthesis of logistics, capital, and information, and universal service—with a market-based approaches to building out a rural e-commerce logistics system. This involved not only the China Post but also supply and marketing cooperatives, third-party logistics providers, and local logistics providers.

Achievements

By 2018, the program had supported 1,016 demonstration counties, covering 737 poverty-stricken counties (89 percent of the total), including 137 counties with extreme poverty (41 percent of the total). The share of poverty-stricken counties among demonstration counties increased from 27 percent in 2014 to 45 percent in 2015 and 65 percent in 2016, while in 2017 and 2018, more than 90 percent were poverty-stricken counties with the rest as underdeveloped counties. By the end of 2016, the program had created 120,000 jobs for poor households benefited impoverished areas (Box E.1). Online stores registered in rural areas grew from 8.17 million in 2016 to 9.86 million in 2017 and resulting in employment for 28 million.

Box E.1. Expanding Job Opportunities through E-Commerce

Min County, Gansu Province, has explored the use of “e-commerce cooperating poor households” to develop online sales of products from the local traditional medicine industry, resulting in increases in annual per capita income of 4,100 poor households by RMB 600.^a Liuhe County, Jilin Province, has achieved RMB 60 million in online sales of agricultural products, RMB 4 million of which was from 35 poor villages, where per household annual income increased by RMB 400 for more than a thousand poor households.^b Xixiang County, Shaanxi Province, sold 690 thousand pieces online in 2017 with sales of RMB 41 million, increasing income for 1,190 poor households by an average of RMB 865.^c

Source:

- a. China, Ministry of Commerce. 2016c. “Regular Press Conference of Ministry of Commerce (December 29, 2016).” December 29.
- b. China, The State Council Leading Group Office of Poverty Alleviation and Development. 2018b. “Jilin:Unblocking thr poverty alleviation channel (吉林： 畅通脱贫攻坚血脉通道)”. Jilin Daily, August 16.
- c. China, The State Council Leading Group Office of Poverty Alleviation and Development. 2018c. “Shannxi: A combination of approaches of industry poverty alleviation in Xixiang (陕西: 西乡县打出产业扶贫 “ 组合拳 ”)”. Office of Poverty Alleviation in Shannxi, July 20.

E-commerce enterprises have accelerated their penetration into rural areas and cooperate with demonstration counties to help implement the Rural E-Commerce Demonstration Program. At least 15 e-commerce companies have joined the effort to reduce poverty in rural areas using market-based solutions to provide logistics services (Box E.2).

Box E.2. Improving Logistics Using Market-Based Solutions

Private sector e-commerce and logistics companies have provided improved logistics services to rural areas, including remote and disadvantaged villages. By 2018, the logistic platform company Cainiao delivered 60 percent of packages from county to village the same day and 99 percent by the next day. By the end of 2016, JD had set up county service centers and “JD Help” shops in more than 1,700 counties and cultivated over 300,000 rural e-commerce promoters, covering 440,000 administrative villages, and helping people to purchase household appliances by providing services including authorized purchase, order delivery, installation, maintenance, and exchange and return. Suning has established 1,770 direct-sale stores and more than 10,000 authorized service sites in more than 1,000 counties. Demonstration counties actively cooperate with big e-commerce platforms to promote sales of their agricultural products online. Hunan has opened provincial agricultural product pavilions on the e-commerce platforms of Alibaba, JD, and Suning, as well as 13 pavilions for its cities and prefectures and 20 for its counties. The provincial Department of Commerce and Alibaba jointly launched the “rural revitalization and poverty alleviation” program in the province and set up service stations in 18 counties, promoting online sales of agriculture products from poverty-stricken areas.

Source: China, Ministry of Commerce. 2016c. “Regular Press Conference of Ministry of Commerce (December 29, 2016).”
 China, The State Council Leading Group Office of Poverty Alleviation and Development. 2018a. “Hunan: E-commerce poverty alleviation achievements in the past 3 years (湖南：电商扶贫行动3年硕果摇枝).” Hunan Daily.

Alibaba Rural Taobao Program

Alibaba launched its Rural Taobao Program in October 2014 aiming to give rural residents increased access to a variety of goods and services and help farmers to sell agricultural products directly to urban consumers using online platforms. The program started with an ambitious goal to establish an e-commerce service system covering 100,000 administrative villages in 1,000 counties across China. The company committed to investing RMB 10 billion over three to five years in the program, in collaboration with the local governments.

The program evolved through three stages of development, Rural Taobao 1.0, 2.0, and 3.0. Early efforts to establish a rural e-commerce system focused on developing familiarity with online shopping among villagers. During Rural Taobao 1.0, village partners worked part time to help villagers to make online purchases. As the program grew and e-commerce became more familiar to villagers, commitments began to expand, and during Rural Taobao 2.0 some partners began to work full time, in some cases supported by part-time partners, further developing the village service stations.

Starting in 2016, Rural Taobao 3.0 expanded into a comprehensive rural online service system. In this stage the focus shifted to helping villagers to sell agricultural products online. A team of about 100 agricultural experts focused on building local agricultural brands. The team provided technical support to farmers and developed the “Tao Yum supply chain,” a local branding effort. Harnessing the power of the cloud, the team built an intelligent agricultural infrastructure platform to improve agricultural product quality and productivity. The team also used big data to develop new sales models, including “pre-sales,” “contract-farming,” and “central warehousing,” to increase farmgate prices and reduce price fluctuations. During this stage of program development village-level service stations were upgraded to provide higher-quality services to rural villages.

The program has pursued four main objectives and areas of activity. These are:

- Establish an e-commerce service network for counties and villages that will be a new source of rural employment.
- Improve logistical connections for villages and promote two-way circulation of goods and services.
- Provide training in e-commerce and promote entrepreneurship.
- Provide rural financial services to support e-commerce.

Establish an e-commerce service network for counties and villages. This objective and activity seeks to build “incubators” to develop partners in e-commerce, including suppliers and providers of logistics and services. The main vehicle is the creation of “Rural Taobao partners,” or Taobao shop assistants at the village level (“CunXiaoEr,” full time) and “Taobao aides” (“TaoBangShou,” part time) who support them. These assistants introduce the Alibaba online platforms to villagers, help villagers navigate the e-commerce platforms to select products and services online, and use their online payment account to place orders for villagers and collect payment when villagers are satisfied with their purchase. By 2018, tens of thousands village-level service stations had been established in more than 1,000 counties in 29 provinces, autonomous regions, and municipalities, and more than 30,000 rural shop assistants had been recruited along with nearly 30,000 aides.

Improve logistical connections for villages and promote two-way circulation of goods and services. Although the China Post covers all of China, deliveries to remote areas can take several days. Commercial express delivery companies, by comparison, provide logistic service mainly only to counties and large towns. As a result, villagers in remote areas often need to

collect their packages in county or town centers, as the cost of shipping them the “last kilometer” can be prohibitive, especially when the number of packages is small and delivery vehicles are returning empty. The Rural Taobao Program seeks to address this problem through “two-stage delivery,” building out the Cainiao network using the existing commercial local logistics providers to deliver packages from counties to villages. Alibaba works with more than 20 local providers across the country provide secondary distribution and warehouse services, as well as subsidizing cooperatives that run distribution from the county level to villages. As of 2018, according to the Alibaba Group, the Rural Taobao network was delivering 60 percent of the goods on the same day (from county to village) and 99 percent within the next day in more than 30,000 villages covered, a significant improvement over the previous average delivery time of two days. Besides connecting the “last-kilometer” for online purchases, the Cainiao network also helps connect the “first kilometer” for online sales from villages (mainly agricultural products, such as oranges and apples) to develop the e-commerce ecosystem.

Provide training in e-commerce and promote entrepreneurship. Taobao University has built 11 e-commerce training bases across the country and has produced a series of online e-commerce training courses for self-learning by entrepreneurs. By the end of 2017, the training bases had conducted 133 training sessions.

Provide rural financial services. This activity and objective uses the capabilities of Ant Financial, a subsidiary of Alibaba, to provide an array of financial services to rural areas in support of e-commerce development. The program uses the company’s digital platform to provide small loans to villagers, including e-merchants, farmers, and consumers. Borrowers are qualified for loans by drawing from online transaction data and credit records as well as online and offline “insider” information collected by Rural Taobao partners. The company also provides agriculture financing to farmers and cooperatives through the agricultural supply chain and through collaboration with local government and local leading enterprises.

Another service provided by Ant Financial is online payment support. For these services Rural Taobao partners can help villagers to pay utility bills, buy travel tickets, as well as provide online payments for some governmental and medical services. The company also offers online insurance support (Box E.3). Ant Financial, in collaboration with local governments and insurance companies, provides insurance to breadwinners in qualified registered poor households in poor counties to help cover out-of-pocket costs beyond basic medical insurance and disability insurance in case of major illness, accidental injuries, disabilities, deaths, and property damage.

Box E.3. Technical System Improves Efficiency of Poverty Alleviation Insurance Operation

Ant Financial offers a special poverty alleviation public welfare insurance grant to women in poor counties that provides support for services such as education and health care. Simple process and fast claims are highlights of this insurance. Claims payment can reach a client's account within 72 hours of a formal request. The timely payment has helped poor girls return to school, given mothers extra protection during pregnancy and childbirth, and provided women more choices for important life decisions.

The efficiency of the operation is ensured by its technical systems. Alipay provides the front-end platform and user portal, while Ant Financial offers blockchain and artificial intelligence technical support. The Poverty Alleviation Fund is responsible for operation and management, the insurance company is responsible for promotion, and government poverty alleviation offices help with cooperation. Within the network, as long as one person in a village has Alipay on a mobile phone, everyone covered by the insurance in the village can have the insurance claims settled smoothly. Donors can also check their donation on Alipay, enabling them to know how their money was spent and who was helped.

Source: Alibaba. https://mp.weixin.qq.com/s/-v_oqdtFGp8rOrxBVZgxgw

As of the end of 2017, according to Alibaba Group, Ant Financial had provided rural financial services to 816 national poverty counties and underdeveloped areas (98 percent of all of the national poverty counties and underdeveloped areas) and provided RMB 11.2 billion in loans through the Rural Taobao Program.

Taobao Entrepreneurs

The new service system established by the Rural Taobao program aims to support the creation of a diversity of e-commerce service suppliers, including local e-commerce service enterprises and specialty service providers. The program has provided jobs for Rural Taobao partners, Taobao aids, and other e-commerce entrepreneurs, many of whom are returned migrants.

Rural Taobao partners deliver services based on the level of service established and help farmers use network services and join the online economy. The Rural Taobao partner has become the first choice for young people who return to their hometowns to start a business. The Rural Taobao program recruits, trains, and evaluates these young people (Box E.4). At the end of 2016, nearly 30,000 Rural Taobao partners earned an average monthly income of RMB 2,500–3,500 nationwide. Their income will continue to rise as agricultural products gradually come online. According to Taobao statistics, 35

percent of the partners are female, 88 percent are aged below 35, and 47 percent hold a junior college degree and more.

Box E.4. E-Commerce Cultivation in Yuncheng County, Shandong Province

Since the Rural Taobao Program was introduced in Yuncheng County in July 2015, 165 service stations have been set up in towns and villages. Shop assistants for the service stations were fully trained by the end of 2015. Among the e-commerce successes is Xiong Fei, a university graduate who returned to her hometown to establish the Aishang Feather Product Co., Ltd. The e-commerce store she set up recorded sales revenues of more than RMB 20 million in January–September 2015. Thirty-four farmers have also returned to their hometowns in Zhangying and launched 54 e-shops for seedling sales that have achieved annual sales revenue of RMB 800 million.

The county has improved service functions and associated facilities for the operation centers, Rural Taobao partners, and the Rural Commerce Express outlets under the Rural Taobao Program. It has also delivered professional services, including planning, training, agency shopping, prepayment, and customer service for returned migrant workers when they open and operate online stores.

By the end of 2016, the county had established more than 60 e-commerce associations; developed more than 20 personalized processing, manufacturing, planting, and other industrial clusters; cultivated two Taobao Villages; and sold RMB 160 million worth of agricultural products. More than 80 percent of the e-commerce platforms, online shops, and online businesses established in 2017 were founded by college graduates and a new generation of migrant workers.

Source: AliResearch

Taobao aids help Rural Taobao partners deliver agency shopping, agency sales, and various life services to villagers. To become a Taobao aid, a villager must register online and pass a written examination, preliminary examination, and interview. After several months of probation and achieving established sales targets, they become Rural Taobao partners for their village. By the end of 2018, the program had about 60,000 Rural Taobao partners and Taobao aids.

Stimulating Consumption Demand

Growth in e-commerce has helped to stimulate online sales of consumer goods in poverty-stricken regions of China. Awareness of the Internet and opportunities for online purchasing may be growing more rapidly in rural areas than elsewhere.

Data from the Ministry of Commerce show that in 2016, rural areas were responsible for online sales revenue of RMB 894.5 billion. Data from the Rural Taobao Program indicate that the most commonly purchased items among villagers are high-value home appliances, agricultural materials, women's apparel, cars, and mobile phones.

The Rural Taobao Program has particularly focused on boosting online demand for high-quality, low-cost agricultural production materials such as seeds, fertilizers, and farming equipment. In 2016, the program sponsored a month-long spring plowing campaign that helped farmers from 14,000 villages in nearly 300 counties of 27 provinces place nearly 10 million orders for agricultural production materials, saving them an estimated RMB 100 million. Other products that farmers purchase online include aerial drones, electric scooters and similar devices, and other new technological products.

Building Agricultural Supply Chains

The Rural Taobao Program started building the Tao Yum supply chain system in 2017 with the aim of transforming the agricultural supply chain for the online age (Box E.5). The Tao Yum brand sells high-quality agricultural products for consumers, improving production and planting standards, product positioning and brand, product specifications, and sales channels. The products are sold through Tmall supermarkets, Rural Taobao service stations, and retail and other channels. By the end of 2018, Tao Yum covered 27 provinces, municipalities, and autonomous regions, and sold 372 products from 171 counties.

A similar program, Agriculture Revitalization and Poverty Alleviation, targeted sales of high-quality agricultural products in poverty-stricken areas. By the end of 2018, this initiative had opened county-level stations in 22 provinces, involving 484 counties including 181 state-level poverty-stricken counties, and served about 14,780 poor households.

Box E.5. Case Studies of Tao Yum Supply Chains

Case Study: Bachu Muskmelon

Xinjiang has rich resources, but it had an old and degraded transportation network. The consequent low incomes of its farmers resulted in impoverishment of the province. In 2016, the Rural Taobao Program joined with the government of Bachu County to create a marketing campaign for Bachu muskmelon. Demonstrations of the power of the Internet helped to enhance brand awareness. In consequence, Bachu county sold 536 tons of muskmelons worth RMB 10 million in 2016, raising the income of local farmers from RMB 400/mu to RMB 1,500/mu. The sales area for the muskmelons subsequently expanded to Lukeqin County and Tuokexun County of Turpan city as well as other towns in Bachu County of Kashgar City and Yiwu County of Hami City. The branding has benefited 1,500 farmers, sold 2,500 tons of muskmelons, and created sales revenues of RMB 50 million.

Case Study: Yuanyang Red Rice

In Yuanyang, Yunnan Province, the Rural Taobao Program started a poverty alleviation program in 2017. The initiative extended the Tao Yum supply chain to the county. On the day of the launch, more than 15,000 packages of rice were sold, equivalent to the output of 70 mu of terraced fields and the annual income of 30 farmers. The brand has since been fully established online and the original red rice production line is being upgraded to satisfy the quality, service, and output required for sales in the Rural Taobao Program. The local grain bureau has increased the standard and raised the purchase price from RMB 3.3 to RMB 6.8, which has helped farmers increase their income by RMB 680.

Case Study: Zhaoyuan Rice

Zhaoyuan County, Heilongjiang Province has a unique production area for high-quality grain production suited to Zhaoyuan Rice, a high-quality product with original flavor. The Rural Taobao team has offered professional advice on planting, harvesting, sale, distribution, and other aspects, in cooperation with the local government. This has helped to tap into the domestic market for the rice, while developing branding, increasing farmgate prices, and improving farmer incomes. In May 2016, 2,074 farmer households with 436-mu of land benefited from a sales campaign resulting in more than 3,800 orders. Online and offline brand building increased the size of orders for the rice from 30,000 tons in 2015 to 300,000 tons in the first four months of 2016, and sales volume grew tenfold. Zhaoyuan Rice quickly went from zero brand awareness to brand value of RMB 8.9 billion.

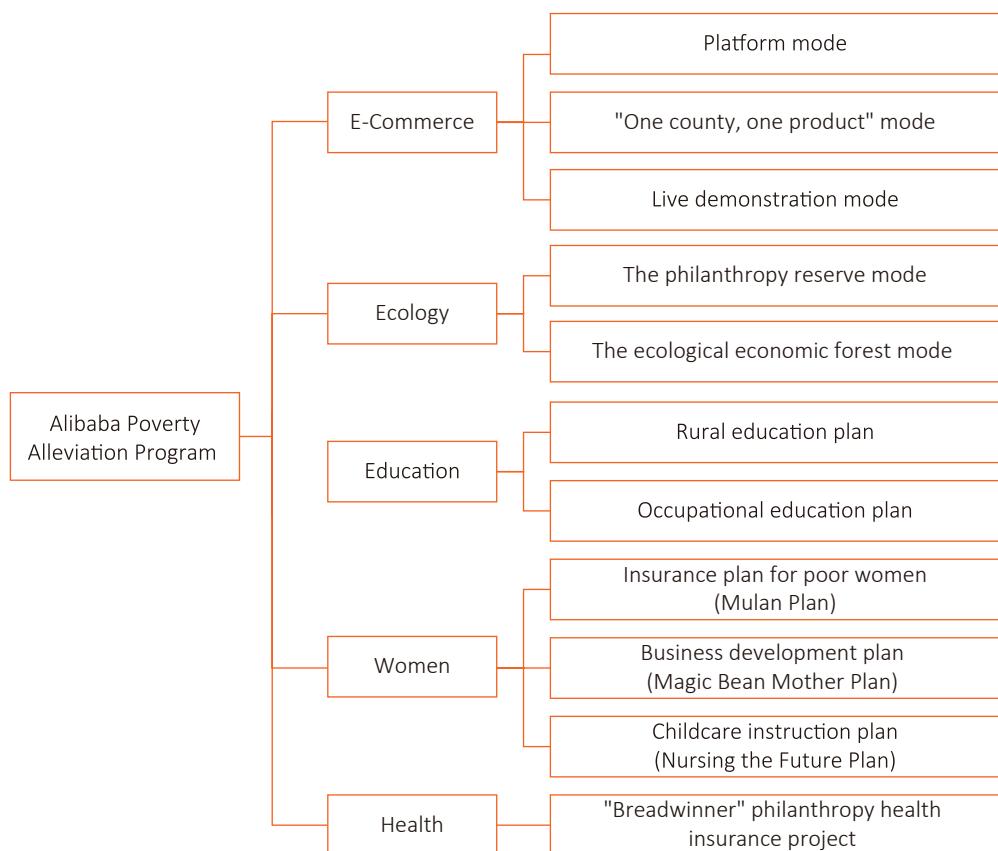
Source: Alibaba Poverty Alleviation Fund 2019

Alibaba Poverty Alleviation Fund

Alibaba launched its Poverty Alleviation Program in December 2017 with the aim of using the company's various platforms and subsidiaries to assist in the reduction of rural poverty in China. Funding for the program is provided by

Alibaba, which has committed RMB 10 billion to the effort over a five-year period. The program has five focal areas: e-commerce poverty alleviation, ecological poverty alleviation, education poverty alleviation, women's poverty alleviation, and health poverty alleviation. Each of these initiatives operates through several modes or approaches (Figure E.1).

Figure E.1. Elements of the Poverty Alleviation Program



With its focus on poverty-stricken areas of China, in early 2018 Alibaba identified 20 counties for its program. It selected ten poverty-stricken counties for e-commerce,² two for ecology,³ five for education,⁴ four for women's

2. Fengjie of Chongqing, Yuanyang of Yunnan, Lixian of Gansu, Bachu of Xinjiang, Jimunai of Xinjiang, Changting of Fujian, Helong of Jilin, Aohan Banner of Inner Mongolia, Leishan of Guizhou, and Jinzhai of Anhui.
3. Pingwu of Sichuan and Heshun of Shanxi.
4. Qinglong of Hebei, Xunwu of Jiangxi, Liping of Guizhou, Zhenxiong of Yunnan, and

empowerment (one of which was also among those selected for e-commerce),⁵ and 66 poor counties in 12 provinces for the “Bread-Winner Insurance” for health.⁶

E-Commerce Poverty Alleviation

The initiatives for poverty alleviation through e-commerce seek to help poverty-stricken regions build on their natural endowments to incubate and develop industries that sell high-quality agricultural products online. The targeted counties get assistance with building a sales platform, arranging resource support, implementing the incubation mechanism, and helping to sell products through three modes of operation: platform mode; one county, one product mode; and live demonstration mode.

Under the platform mode, Alibaba helps the selected counties to build a sales platform, arrange resource support, and incubate businesses, with the aim of helping the county identify, develop, and brand competitive agricultural products that are unique to their area. Resources from local governments, supplemented by Alibaba are used to provide research, marketing resources, industrial standards, and consumer data to help enhance the competitive strengths of identified products. The county also gets assistance with training, marketing, and brand communication. Since January 2018, Rural Taobao, the main mechanism used in this mode, has worked with 435 counties in 22 provinces and autonomous regions, including 151 poverty-stricken counties, and incubated 2,532 products.

For the one county, one product mode, the Tao Yum platform introduces direct supply and direct sales. The Tao Yum supply chain provides technical support, supply chain connections, and brand building services. These include technical innovations that improve planting standards and optimize product quality, build quality control systems and increase logistic efficiency, and improve and build brands. Among the products developed using this mode are the Fengjie Naval Orange, Bachu Melon, Yuanyang Red Rice, Jimunai Flour, Aohan Millet, and Jinzhai Kiwi.

Lu'anping of Hebei.

5. Yuanyang of Yunnan (also a model county for e-commerce), Ningshan of Shaanxi, Badong of Hubei, and Dangshan of Anhui.

6. See Wang 2017.

Box E.6. Development of the Fengjie Naval Orange

Fengjie County, in Chongqing Municipality, Qinba Mountain Area, has 135 impoverished villages and 35,024 registered impoverished households with a total of 134,882 people. Fengjie introduced the Rural Taobao platform in September 2015 and Tao Yum in 2016 and became one of the first poverty-stricken counties to open a Specialty Pavilion. Since 2016, the Fengjie Naval Orange has been promoted on the Internet, resulting in rapid growth of sales revenues and a quadrupling of the number of active merchants. Fengjie has introduced soil testing and fertilizer supply, irrigation and fertilizer integration, the agricultural Internet of things, and plant protection technologies for its navel orange production. By using data on topography, climate, soil, irrigation, and fruit varieties, it has produced technical solutions to optimize planting and improve the level of quality control and crop management.

The Tao Yum supply chain assists production and processing through the application of product requirements, including size, sweetness, and acidity of each orange as well as the size of orange seed, all of which enhances the brand image. Supply chain management has also resulted in uniform planting standards and consistent quality, which also helps increase revenues. Alibaba has also helped to enhance supply chain capacity including circulation, sales, transport, and storage of the oranges with uniform brand, service, quality, and logistics. Low-cost loan services available through Rural Taobao and Ant Financial contribute to the effort by helping local enterprises and rural households to expand production.

Source: Alibaba Poverty Alleviation Fund 2019

Through its live demonstration mode, the Poverty Alleviation Program incubates individual farmers to serve as community models in poverty-stricken counties. For this mode, Alibaba's Taobao Live Channel provides online and offline skills training to help merchants master essential sales skills and new marketing methods (Box E.7). Alibaba also provides resources to support the establishment of mutual trust between consumers and agricultural producers.

Box E.7. Using Celebrities to Introduce Products on Taobao Live

Using Taobao Live to introduce and spread information about products has helped boost some products. One such event, the “Philanthropic Live Ceremony for Poverty Alleviation Campaign,” was jointly hosted by the Central Committee of the Communist Youth League of China, Alibaba, and Sina Weibo on December 5, 2018. The event featured local celebrities who used a variety of novel approaches to introduce 102 agricultural product varieties from 50 poverty-stricken counties over four hours. The show attracted more than 10 million viewers and helped counties sell agricultural products worth over RMB 10 million.

Xiangcheng County has natural advantages for growing apples—long periods of sunshine and variations in daily temperatures. However, when it introduced several new apple varieties in 2015, the county’s remote location in the Ganzi Tibetan Autonomous Prefecture, Sichuan Province, and high transportation costs severely limited sales of the apples. In October 2018, Alibaba began to help the county publicize and sell its apples. Over a three-day period, nearly 300,000 viewers—seven times the population of the county—watched celebrities make presentations about the apples on Taobao Live. This resulted in the sale of 35,000 kilograms of apples, benefiting more than 700 impoverished households.

Source: Alibaba Poverty Alleviation Fund 2019

Ecological Poverty Alleviation

The initiatives devoted to ecological poverty alleviation seek to generate wealth through the use of natural endowments in poverty-stricken counties. Through these efforts the Poverty Alleviation Program helps impoverished regions explore ways to use local resources in a manner that ensures a balance between ecological conservation and economic development. These initiatives rely on the Ant Forest platform, which was launched in 2016 (Box E.8) and consists of two modes of operation: the philanthropy reserve and the ecological economic forest.

Box E.8. Ant Forest: Carbon Credits for Trees

Ant Forest is an app launched on Alipay mobile client by Ant Financial. It is a personal carbon account, which converts carbon emissions saved through individual behaviors, such as walking instead of driving or making online payments, into carbon credits called “green energy” that are used to grow virtual trees on the platform. At maturity, those virtual trees are then converted into real trees on plantations or the protection of equivalent forested area. Through December 2018, Ant Forest had nearly 400 million users worldwide who had reduced carbon emissions by 3.08 million tons and safeguarded 69,000 acres of philanthropy reserves. The program had also planted 55.52 million real trees covering over 760,000 acres and controlled a desert area of more than one million acres. In addition, the program had created 180,000 green job opportunities and realized a labor service income of RMB 27 million.

Source: UN Environment (2017): According to UN Environment, behavior changes through the app have avoided 150,000 tons of CO₂ emissions; and over 1 million trees planted. <http://unepinquiry.org/news/ant-financial-app-reduces-carbon-footprint-of-200-million-chinese-consumers/>

In the area of ecological poverty alleviation, Alibaba combines online sales of products in poor counties with high biodiversity (or broadly areas that are under the national or provincial protection) with natural area protection. For this initiative, Ant Forest customers use their “green energy” to “adopt” forestland in the select counties, and Alibaba invests in protecting that area. In this way, Ant Forest customers gain familiarity with these protective areas, as well as the products they produce (typically, marketed as green products). Since most of these areas produce relatively small quantities of their product, such as honey, the customer must pre-order the product, which helps protect farmers from price fluctuations at harvest time (Box E.9).

Box E.9. Generating Sales Using Forest Reserves

Pingwu County, Sichuan, is a national poverty-stricken county with nature reserves inhabited by giant pandas, golden monkeys, and other animals. But the nature reserves prevent traditional forms of development. By connecting Pingwu and its nature reserves with Internet Alibaba helped users to protect the environment while also developing local e-commerce.

Pingwu's nature reserves were connected to Ant Forest on Alipay, where users can exchange "energy" with their daily low-carbon behavior. In May 2018, the Pingwu Reserve, covering an area of 18.23 million square meters, was launched on Ant Forest and quickly had 11.79 million users. Seeing the strong potential, Alibaba helped local artisans to develop honey products in the nature reserves and supported branding, packaging, traceability, and testing. In August, Pingwu announced presales of honey and sold 10,000 bottles within an hour. A month later, the second batch of 10,000 bottles was sold within several minutes.

Another reserve, Heshun Reserve was launched on the Ant Forest platform in December 2018, and 14.02 million users claimed the land covering 20.16 million square meters. A day after their launch, gift packages containing Heshun Original Vinegar and local crafts, resulted in orders from nearly 30,000 users. The entire year's output of local embroidery workers (all women) was sold, increasing their monthly income by almost RMB 2,000.

Source: Alibaba Poverty Alleviation Fund 2019

The ecological economic forest mode involves planting forest trees that are of economic value and therefore combines ecology preservation and economic benefits. This mode has been applied in central and western impoverished regions. The ecological economic forest mode aims to promote "local adaptation," as well as participation by impoverished households in planting and harvesting the economic forest. Although it is very new, this mode unveiled its first economic tree variety in November 2018 when a *Hippophae* forest of 23,500 acres in Inner Mongolia was subscribed by 3.14 million users on the Ant Forest platform. *Hippophae* combines environmental benefits such as wind prevention, sand fixation, and soil conservation, while also providing fruits that are high in vitamin C and can be used to make fruit wine. Part of the revenue from online and offline sales of *hippophae* will be used to fund local ecological forestation and aid impoverished households.

Education Poverty Alleviation

Recognizing that education plays a decisive role in poverty reduction and alleviation, the Poverty Alleviation Program has two plans to enable and improve rural education: the Rural Education Plan and Occupational Education Plan.

The Rural Education Plan aims to help improve rural education through a focus on teachers, headmasters, students, and boarding schools in rural areas. According to the Alibaba Poverty Alleviation Fund, these activities will do the following:

- The Rural Teachers mode will award up to RMB 10 million and three years of career support for 100 qualifying rural teachers every year.
- The Rural Headmasters mode will apply about RMB 200 million to support excellent rural headmasters over 10 years and provide an RMB 500,000 development fund for qualified headmasters.
- The Rural Student mode will be funded for at least RMB 300 million over 10 years to identify promising college graduates that will become rural teachers, providing them financial support and professional development opportunities.
- The Boarding School mode seeks to improve boarding school life through piloting innovative after-school activities and family-like dormitory life management, as well as establishing training management and incentive systems for teachers.

The Occupational Education Plan focuses on cultivating occupational talents required for the development of rural areas using two modes: Occupational Skills Training and Occupational School Talent Cultivation. The skills training mode provides occupational training for people in impoverished regions who are employed or self-employed in e-commerce and cloud computing. In 2018, more than 260,000 people were trained, and 9 e-commerce training bases were opened in poverty-stricken counties. The talent cultivation mode seeks to boost development and growth of occupational education in rural and impoverished areas through such techniques as dual teacher teaching and on-the-job training on location.

Women's Poverty Alleviation

Alibaba initiatives assist impoverished rural women through three operational modes: insurance, business development planning, and childcare instruction. The insurance activity, called “You, Me, and Him,” is based on a philanthropic model using the Ant Financial platform. Online donors are matched with recipients who can draw on those donations to help pay for schooling or medical services. Claims for the insurance are easy to submit and are reimbursed within about five days.

The business development effort, called “Magic Bean Mother,” provides entrepreneurship and employment training to help impoverished women become cloud customer service specialists or to start an e-commerce business or get

employed in e-commerce.

The “Nursing the Future” initiative seeks to block the intergenerational transfer of poverty through attention to the development of children aged 0 to 3. For this purpose, the Poverty Alleviation Program builds nursing centers in impoverished regions and provides instruction in the care of children aged 0 to 3 for their families. The center recruits and cultivates local women to become caretakers who continuously provide one-on-one instruction and other services for infants and caretakers from nearby villages. The caretaker position also creates a new occupation and opportunity to help rural women become economically independent.

Health Poverty Alleviation

The Breadwinner (or *Dingliangzhu*, in Chinese) Insurance Project, a partnership between Alibaba Philanthropy, Ant Financial Philanthropy, Ant Financial Insurance, and China Foundation for Poverty Alleviation, provides free health insurance to impoverished areas using donations gathered online (Box E.10). The project collaborates with merchants, consumers, governments, enterprises, media, insurance companies, and other social forces to maximize involvement in poverty alleviation through health. It targets registered impoverished villagers aged 18 to 60 in poverty-stricken counties that participate. Donations, insurance, claim settlement, and other information is available online in real-time. Claims are reviewed and paid through via the Alipay app on a cellular phone supported by blockchain. According to Alibaba Group, by December 2018, the project had received 2.7 billion donations totaling RMB 136 million from 360 million members of the public and 1.12 million merchants, and the project has insured 4.25 million people in registered impoverished households from 66 poverty-stricken counties in 12 provinces and autonomous regions, including 17 counties with deep poverty and 7 in the “Three Regions and Three Prefectures.”^{7,8}

7. The Three Regions are Tibet, the Tibetan regions of four provinces, and four prefectures in South Xinjiang. The Three Prefectures include Liangshan Prefecture of Sichuan Province, Nujiang Prefecture of Yunnan Province, and Linxia Prefecture of Ningxia Autonomous Region.

8. See Alibaba Poverty Relief Fund 2018.6. See Wang 2017.

Box E.10. Social Protection and Insurance (Dingliangzhu)

The “Breadwinner” health insurance program provides reimbursements for hospital fees of breadwinners in low-income families. It benefits individuals who are 18–60 years old in families officially registered as impoverished. Initiated in July 2017, the program has already covered more than a million Chinese people in poverty. In the next three years, 10 million people in about 100 counties are expected to be covered.

The program is coordinated closely by Alibaba and the government (China Foundation for Poverty Alleviation, CFFPA). Alibaba provides technical support for the online charity platforms and the processing of insurance claims. The CFFPA manages the charity funds collected by Alibaba, and coordinates with insurance companies to generate insurance contracts.

Source: Alibaba Poverty Alleviation Fund 2019

Appendix F. Association between E-Commerce Development and Economic Characteristics

To estimate potential effect of economic characteristics on online business and online shopping, OBI and OSI are set as dependent variables, respectively, and economic characteristics, including GDP per capita, population density, share of GDP in primary sector, share of GDP in secondary sector, ratio of fixed asset investment to GDP, ratio of saving deposit balance to GDP, and ratio of loan to GDP are explanatory variables, as well as a dummy of Taobao Village to capture the difference of e-commerce development in counties with and without Taobao Villages. All explanatory variables, including the Taobao Village dummy, are lagged by one year, considering that economic characteristics can gradually, rather than immediately, affect e-commerce development, and to avoid potential mutual effects problem, which means that, in this case, economic characteristics may affect e-commerce development, while e-commerce development possibly has impact on economic characteristics as well.

A panel of county level data from 2013 to 2017 is used, with nearly 2,000 observations each year, where OBI and OSI numbers are between 2013 and 2017, taken from Alibaba, and other economic data are between 2013 and 2016, from China Statistical Yearbook (County Level). The definition of each variable¹ is shown below.

Definition of variables:

- GDP per capita: GDP divided by population with permanent household registration.
- Population density: population with Hukou registration over administrative area.
- Share of GDP in primary sector: GDP in primary sector over GDP.
- Share of GDP in secondary sector: GDP in secondary sector over GDP.
- Fixed asset investment: the investment in construction projects with a total planned investment of RMB 5 million and over by enterprises of various ownerships, institutions, administrative units and urban self-employed individuals, and the investment in real estate development in both urban and rural areas.
- Saving deposit balance: sum of urban and rural residents' local (RMB) and foreign currency saving deposits in banks and other financial institutions.
- Loan: total amount of loans provided by banks or other credit institutions to enterprises, individuals, etc.

1. See Appendix B for definition of OBI and OSI.

- Dummy of Taobao Villages: equals to 1 if the county has at least one Taobao Villages; otherwise equals to 0.

Fixed effect estimation is applied to control unobserved time-invariant factors that have impact both on e-commerce development and economic characteristics, such as local geographical features, in an attempt to reduce estimation bias. The regression model is shown as below:

$$\begin{aligned}
 Y_{it} = & \beta_0 + \beta_1 \log(\text{per capita GDP})_{i,t-1} + \beta_2 \log(\text{population density})_{i,t-1} \\
 & + \beta_3 \text{share of GDP in primary sector}_{i,t-1} \\
 & + \beta_4 \text{share of GDP in secondary sector}_{i,t-1} \\
 & + \beta_5 \log(\text{ratio of fixed asset investment to GDP})_{i,t-1} \\
 & + \beta_6 \log(\text{ratio of saving deposit balance to GDP})_{i,t-1} \\
 & + \beta_7 \log(\text{ratio of loan to GDP})_{i,t-1} + \beta_8 \text{dummy(Taobao Villages)}_{i,t-1} \\
 & + \alpha_i + \varepsilon_{it}
 \end{aligned}$$

$$Y_{it} \in [\log(OBI)_{it}, \log(OSI)_{it}]$$

where i is the index for county, t is for year, α_i is a time-invariant error term, and ε_{it} is a time-variant error term.

Regression results imply that, with other variables controlled, one percent of increase in per capita GDP is associated to 1.07 percent increase in OBI, and the association is slightly higher in coastal area (1.17) than in inland area (1.08). One percent increase in per capita GDP is related to 1.01 percent increase in OSI, and the association is slightly higher in inland area (1.05) than in coastal area (0.97).

E-commerce development, both OBI and OSI, also shows positive associations with saving deposit balance and loan, and negative correlations are observed with share of GDP in secondary, while OSI also positively associated to population density and fixed asset investment and negatively associated to share of GDP in primary sector. Specifically, one percent increase in ratio of saving deposit to GDP is observed correlating to 0.26 percent increase of OBI and 0.2 percent increase of OSI. The correlation of saving deposit with OBI is not significant in coastal area, while with OSI, it is higher in inland area than coastal area. One percent increase in ratio of loan to GDP associates to 0.14 percent increase in OBI and OSI. The association between loan and OBI is mostly driven by coastal area (0.3) and is not significant in inland area, while the association with OSI is higher in coastal area (0.24) than in inland area (0.11). One percentage point decrease in share of GDP in secondary sector associates to 2.06 percent increase of OBI and 1.93 percent increase of OSI, with slightly larger correlation found in inland area, where the associated increases are 2 percent in OBI and 1.87 percent in OSI, compared to 1.92 percent and 1.83 percent in coastal area. One percent increase in population density is

associated with 0.3 percent increase in OSI, while the association is larger in coastal area (0.47), compared to inland area (0.3), and the association with OBI is observed only in coastal area (0.68). One percent increase in ratio of fixed asset investment to GDP correlates to 0.06 percent increase of OSI, with 0.03 observed in coastal area and 0.08 in inland area, while the correlation with OBI is not significant. One percentage point decrease in share of GDP in primary sector is found associating to OBI only in inland area, which is 1.3 percent of increase, and associating to 0.65 percent increase of OSI national wide and 0.85 percent increase in inland area, while in coastal area it is not significant.

Significant difference in e-commerce development is found between counties with and without Taobao Villages. The difference of online business development in inland area is more than twice that in coastal area, while in terms of online shopping, the difference is slightly higher in coastal area than in inland area. Specially, when other variables are held constant, OBI is 6.69 percent higher in counties where Taobao Villages emerge, compared with those without Taobao Villages, and the difference is 9.95 percent in inland area and 4.06 percent in coastal area. OSI is 4.73 percent higher in counties with Taobao Villages, and 5.29 percent within coastal area and 5.05 percent within inland area.

Table F.1. Regression Result of Association between Economic Characteristics and Online Business

	Log of Online Business Index		
	Overall	Coastal area	Inland area
Log of per capita GDP, lagged by one year	1.073*** (0.0740)	1.174*** (0.108)	1.075*** (0.0935)
Log of population density, lagged by one year	0.114 (0.103)	0.679*** (0.263)	0.0147 (0.0969)
Share of GDP in primary sector, lagged by one year	-0.624 (0.514)	0.639 (0.688)	-1.301* (0.683)
Share of GDP in secondary sector, lagged by one year	-2.057*** (0.280)	-1.922*** (0.354)	-1.996*** (0.362)
Log of ratio of fixed investment to GDP, lagged by one year	0.0305 (0.0261)	0.0608 (0.0387)	0.0239 (0.0340)
Log of ratio of saving deposit balance to GDP, lagged by one year	0.256*** (0.0676)	0.199 (0.122)	0.276*** (0.0735)
Log of ratio of loan to GDP, lagged by one year	0.142*** (0.0449)	0.299*** (0.0903)	0.0727 (0.0493)
Dummy of Taobao Villages, lagged by one year	0.0669*** (0.0176)	0.0406* (0.0211)	0.0995** (0.0502)
Constant	-8.246*** (0.901)	-8.877*** (1.311)	-8.376*** (1.130)
Observations	6250	2103	4147
R ²	0.248	0.384	0.213

Robust standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Table F.2. Regression Result of Association between Economic Characteristics and Online Shopping

	Log of Online Business Index		
	Overall	Coastal area	Inland area
Log of per capita GDP, lagged by one year	1.009*** (0.0263)	0.971*** (0.0688)	1.048*** (0.0270)
Log of population density, lagged by one year	0.301* (0.154)	0.467* (0.255)	0.303* (0.172)
Share of GDP in primary sector, lagged by one year	-0.654*** (0.197)	-0.169 (0.361)	-0.852*** (0.243)
Share of GDP in secondary sector, lagged by one year	-1.931*** (0.126)	-1.826*** (0.259)	-1.871*** (0.139)
Log of ratio of fixed investment to GDP, lagged by one year	0.0570*** (0.0115)	0.0272* (0.0163)	0.0783*** (0.0147)
Log of ratio of saving deposit balance to GDP, lagged by one year	0.196*** (0.0373)	0.146* (0.0812)	0.199*** (0.0400)
Log of ratio of loan to GDP, lagged by one year	0.139*** (0.0186)	0.236*** (0.0582)	0.113*** (0.0182)
Dummy of Taobao Villages, lagged by one year	0.0473*** (0.0110)	0.0529*** (0.0134)	0.0505** (0.0245)
Constant	-6.254*** (0.370)	-6.104*** (0.891)	-6.520*** (0.420)
Observations	7374	2173	5201
R ²	0.698	0.618	0.735

Robust standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Appendix G. Link between E-Commerce Development and Economic Growth

To estimate the potential impact of online business development on local economic growth and remove the potential mutual effects between these two factors from the estimation, an instrument variable (IV) is employed to measure development of online business. The IV of OBI is defined as:

$$IV_OBI_{it} = \sum_{\substack{n=1 \\ n \neq i}}^N \frac{1}{N-1} OBI_{nt}$$

where i indexes the county, n the other county in the same prefecture-level city, and t year. Specifically, this OBI IV is an unweighted average of OBI in the rest counties (excluding itself) in the prefecture-level city where the county locates. It proxies the county's exposure to online business, in other words the online business development in surrounding area, and minimize the potential mutual effects by taking out the county's own online business development level.

The regression model is designed by taking year-to-year GDP per capita growth as dependent variable and OBI IV as explanatory variable to measure online business development. Building on the growth model, we include the following control variables: GDP per capita, population density, share of GDP in primary sector, share of GDP in secondary sector, ratio of fixed asset investment to GDP, ratio of fiscal expenditure to GDP, and ratio of loan to GDP, as well as a dummy of Taobao Village to identify difference of economic growth rate in counties with and without Taobao Villages.

The same panel data at county level as shown in Appendix F is used in this estimation. The GDP per capita growth numbers are taken from 2014 to 2016, while the OBI IV lagged by one year and control variables are from 2013 to 2015. GDP per capita growth is generated at a year-to-year basis. Fiscal expenditure includes expenditure for general public services, public security, education, science and technology, culture, sport, and media, social security and employment, health care, environment protection, urban and rural community affairs, agriculture, transportation, and others. The explanatory variable and other control variables are as what clarified in Appendix F.

Similarly, fixed effect estimation is used to control unobserved time-invariant factors at the county level. All variables on the right-hand-side, including OBI IV, lagged by one year, in the initial year of GDP per capita growth, to control for endogeneity. The regression model is as below.

$$\begin{aligned}
\text{GDP per capita growth}_{it} &= \beta_0 + \beta_1 \text{IV_OBI}_{i,t-1} + \beta_2 \log(\text{GDP per capita})_{i,t-1} \\
&\quad + \beta_3 \log(\text{population density})_{i,t-1} \\
&\quad + \beta_4 \text{share of GDP in secondary sector}_{i,t-1} \\
&\quad + \beta_5 \text{share of GDP in primary sector}_{i,t-1} \\
&\quad + \beta_6 \log(\text{ratio of fixed asset investment to GDP})_{i,t-1} \\
&\quad + \beta_7 \log(\text{ratio of fiscal expenditure to GDP})_{i,t-1} \\
&\quad + \beta_8 \log(\text{ratio of loan to GDP})_{i,t-1} + \beta_9 \text{dummy(Taobao Villages)}_{i,t-1} \\
&\quad + \alpha_i + \varepsilon_{it}
\end{aligned}$$

Regression results in Table G.1 shows that, as expected, GDP per capita in the initial year is negatively correlated with the GDP per capita growth rate. One percent increase in GDP per capita is associated to 0.36 percentage point decrease in GDP per capita growth rate. The negative correlations are also found in GDP per capita growth with share of GDP in primary and secondary sectors. One percentage point increase in share of GDP in primary sector associates to 0.26 percentage point decrease in GDP per capita growth rate, and one percentage point increase in share of GDP to secondary sector is associated with 0.25 percentage point decrease in GDP per capita growth rate. Economic growth is correlated with population density, fixed asset investment, fiscal expenditure, and loan in a positive manner. One percent increase in population density, ratio of fixed asset investment to GDP, ratio of fiscal expenditure to GDP, and ratio of loan to GDP each associates to 0.07, 0.03, 0.02, and 0.02 percentage point increase in per capita GDP growth rate, respectively.

Online business development is positively associated to economic growth. Specially, one unit increase of OBI IV¹ associates to 0.88 percentage point increase in annual GDP per capita growth rate, and the association is larger in coastal area (0.84), compared to inland area (0.71). If for the poverty-stricken counties only, the coefficient is 1.01.² The OBI value increase over time, with the simple average OBI value at county level increasing from 2.68 in 2013 and 3.12

-
1. From 2013 to 2017, the minimum value of OBI is 0 and the maximum is 45.17. As per the definition of OBI by Alibaba, one unit increase of OBI means an increase by a scale equals to 1 percent of the maximum expected OBI value, which is taken from 13.47 percent of population being e-tailers on Taobao/Tmall platform and all e-tailers achieving annual transaction volume over RMB 240,000.
 2. Most of the 832 national standard poverty-stricken counties are located in inland area, except for a few in Hebei (5.4 percent), Hainan (0.6 percent), and Guangxi (3.9 percent) provinces.

in 2014 to 3.54 in 2015, 4.20 in 2016, and 5.01 in 2017 (or an annual increase of 0.58 during the four-year period of 2013-2017). Others being equal, a coefficient of 0.71 at the national level shows that, the increase in OBI is associated with 2.05 percentage point increase in GDP per capita growth over the 4-year period, or roughly 0.51 percentage points per year. In coastal area, the county-level average OBI value increased by of 0.86 per year (from 4.18 in 2013 to 7.62 in 2017). With a coefficient of 0.84, it is associated with a 2.89 percentage point increase in GDP per capita growth rate over the 4 years, or 0.72 per year. In inland area, the county-level average OBI value increased by 0.47 per year (from 2.06 in 2013 to 3.93 in 2017). With a coefficient of 0.71, it is associated to 1.33 percentage point increase in GDP per capita growth rate over the 4 years or 0.33 per year. In poverty-stricken counties, the county-level average OBI increased by 0.38 per year (from 1.68 in 2013 to 3.19 in 2017). While the increase in OBI value in poverty-stricken counties are smaller than non-poverty-stricken counties, with a coefficient of 1.01, it is associated with a 1.53 percentage point increase in GDP per capita growth rate over the 4 years, or 0.38 per year, near the national average.

Others being equal, economic growth is faster in counties where Taobao Villages locate, compared to those without Taobao Villages. When other variables are held constant, annual GDP per capita growth rate is 1.58 percentage point higher in counties with Taobao Villages, a national average. The difference is larger within inland area, where 3.68 percentage points higher of GDP per capita growth is found in counties with Taobao Villages, and the difference between poverty-stricken counties is 3.07 percentage points, while the difference is insignificant within coastal area.

Table G.1. Regression Results of Association between Online Business and Economic Development

	Year-to-Year per capita GDP growth (%)			
	Overall	Coastal area	Inland area	Poverty-stricken counties
OBI IV, lagged by one year	0.875*** (0.155)	0.835*** (0.232)	0.706*** (0.207)	1.009*** (0.261)
Log of per capita GDP, lagged by one year	-36.45*** (1.767)	-40.15*** (3.576)	-35.88*** (1.948)	-37.10*** (2.194)
Log of population density, lagged by one year	7.496* (4.010)	16.67** (6.528)	6.338 (4.086)	3.337 (3.785)
Share of GDP in primary sector, lagged by one year	-26.03*** (9.986)	-47.40** (20.35)	-20.03* (11.52)	-11.31 (12.18)
Share of GDP in secondary sector, lagged by one year	-25.33*** (4.977)	-12.27 (9.156)	-26.31*** (5.553)	-32.87*** (7.315)
Log of ratio of fixed investment to GDP, lagged by one year	3.149*** (0.725)	4.622*** (1.228)	2.535*** (0.813)	3.224*** (1.221)
Log of ratio of fiscal expenditure to GDP, lagged by one year	1.634 (1.481)	9.507*** (1.860)	1.066 (1.098)	0.989 (1.075)
Log of ratio of loan to GDP, lagged by one year	1.800*** (0.555)	1.838* (1.078)	1.700*** (0.600)	1.970*** (0.687)
Dummy of Taobao Villages, lagged by one year	1.578*** (0.428)	0.595 (0.521)	3.679*** (0.812)	3.068*** (1.021)
Constant	409.9*** (19.71)	471.9*** (39.91)	400.0*** (21.88)	393.2*** (23.81)
Observations	5517	1582	3935	2278
R ²	0.259	0.307	0.259	0.266

Robust standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Appendix H. Taobao Village Survey

Taobao Village Survey. The Taobao Village Survey is a collaboration between the World Bank, Alibaba Group, and Peking University and Nankai University joint research team. To our knowledge, this survey is the first of its kind on rural e-commerce clusters, which covers the characteristics of the Taobao Villages, detailed household-level information such as demographic characteristics, assets and income, risk aversion and social attitudes, e-shop operations and employment, as well as subjective constraints and supports needed for e-commerce development.

The survey, conducted between August and September 2018, is representative of the universe of 2,118 Taobao Villages in 2017. The sample covers 1,371 households in 80 villages across eight provinces (including Beijing, Hebei, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Yunnan), of which, 616 households own e-shops (e-households) and 755 do not (non-e-households).

The survey uses a stratified random sampling design with villages as the primary sampling units, which are stratified by the GMV of the villages' online sales in the Alibaba platforms, including Taobao.com and Tmall.com. The secondary sampling units are the cell grids over the satellite image of the village maps, where a specific number of grids are randomly chosen according to the estimated number of households within each grid. The tertiary sampling units are households stratified by e-commerce participation status (whether the household owns an e-shop or not).

More specifically, in 2017, 2,118 Taobao Villages were reported to exist in China. The Taobao Village Survey uses a stratified sampling design to obtain a nationally representative sample of 100 villages. The 2,118 villages are first ranked according to their annual sales, then divided into five strata, and within each stratum 20 villages were selected randomly. Specifically, the strata are defined as follows:

- Stratum 1 includes the 20 Taobao Villages with the highest annual sales. All 20 villages in this stratum are selected with certainty.
- Stratum 2 includes 80 villages that rank from the 21st to the 100th Taobao Villages in the annual sales ranking. Within these 80 villages, 20 villages are selected randomly.
- Stratum 3 includes the next 200 villages in the annual sales ranking. Twenty villages are selected randomly, each with probability of 0.1.
- Stratum 4 includes the next 500 villages in the annual sales ranking. Twenty villages are selected randomly, each with probability of 0.04.

- Stratum 5 includes the remaining 1,318 villages. Twenty villages are selected randomly, each with probability of 20/1318.

After the first round of listing, due to refusal of interviews and inability to get in contact, 14 villages (8 in stratum 2, 3 in stratum 3, 2 in stratum 4, 1 in stratum 1) are further selected into the sample as replacements. At the end, 80 villages complete the interviews, 12 villages from stratum 1, 18 from stratum 2, 18 from stratum 3, 14 from stratum 4, and 18 from stratum 5.

The area of each selected village was then divided into a grid with equal sizes and estimated number of households within each grid. For large villages, we randomly select grids to do households listing. For small villages, all households are listed. Ten e-households and 10 non-e-households are randomly selected from the listing.

Sampling weights are calculated as the inverse of the product of non-response rate and the probability of being selected from the population.

References

- Abebe, Gumataw K, Jos Bijman, Ron Kemp, Onno Omta, and Admasu Tsegaye. 2013. "Contract farming configuration: Smallholders' preferences for contract design attributes." *Food Policy* 40:14-24.
- Albastroiu, Irina. 2007. "Contribution of the E-Commerce to the Economic Development." International Conference on Business Excellence, Brasov, Romania.
- Alibaba Poverty Alleviation Fund. 2019. Alibaba Poverty Alleviation Fund Annual Report 2018 (阿里巴巴脱贫工作报告).
- AliResearch. 2014. China Taobao Villaged report 2014 (中国淘宝村研究报告 2014).
- . 2015. China Taobao Villaged report 2015 (中国淘宝村研究报告 2015).
- . 2016. China Taobao Villaged report 2016 (中国淘宝村研究报告 2016).
- . 2017a. China Taobao Villaged report 2017 (中国淘宝村研究报告 2017).
- . 2017b. E-commerce, Poverty Alleviation, and Inclusive Development Report (电商减贫与普惠发展研究报告).
- . 2017c. Inclusive Growth of E-commerce: China's Experience (电子商务普惠发展:中国实践).
- . 2018. China Taobao Villaged report 2018 (中国淘宝村研究报告 2018).
- Alizila. 2016. "An introduction to Taobao Villages." January 17. <https://www.alizila.com/an-introduction-to-taobao-villages/>
- Americo, Alberto and Antonio Veronico. 2018. "The Effect of E-commerce on Employment in Retail Sector."
- Arrow, Kenneth J. 1962. "The Economic Implications of Learning by Doing." *The Review of Economic Studies* 29 (3):155-173.
- Astuti, Novika Candra, and Reza Ashari Nasution. 2014. "Technology readiness and e-commerce adoption among entrepreneurs of SMEs in Bandung City, Indonesia." *Gadjah Mada International Journal of Business* 16 (1):69-88.
- Atkin, David, Benjamin Faber, and Marco Gonzalez-Navarro. 2018. "Retail globalization and household welfare: Evidence from mexico." *Journal of Political Economy* 126.1: 1-73.
- Badran, Mona Farid. 2014. "Young people and the digital divide in Egypt: an empirical study." *Eurasian Economic Review* 4 (2):223-250.
- Bai, Xue, Kala Krishna, and Hong Ma. 2017. "How you export matters: Export mode, learning and productivity in China." *Journal of International Economics* 104:122-137.
- Bajari, Patrick, and Ali Hortacsu. 2003. Economic insights from internet auctions: A survey. National Bureau of Economic Research.
- Bakos, Yannis. 2001. "The Emerging Landscape for Retail E-Commerce," *Journal of Economic Perspectives*, 15.1: 69-80.
- Barwick, Panle Jia, Shengmao Cao, and Shanjun Li. 2017. Local protectionism, market structure, and social welfare: China's automobile market. National Bureau of Economic Research.
- Barwise, Patrick. 2018. "Nine reasons why tech markets are winner-take-all."

- London Business School Review* 29 (2):54-57.
- Basker, Emek. 2005. "Job creation or destruction? Labor market effects of Wal-Mart expansion." *Review of Economics and Statistics* 87 (1):174-183.
- Boston Consulting Group. 2017. Year 2035: 400 million job opportunities in the digital age.
- . 2019. *How online marketplaces can power employment in Africa*. <https://www.bcg.com/publications/2019/how-online-marketplaces-can-power-employment-africa.aspx>
- Brown, Jeffrey R, and Austan Goolsbee. 2002. "Does the Internet make markets more competitive? Evidence from the life insurance industry." *Journal of political economy* 110 (3):481-507.
- Brynjolfsson, Erik, and Michael D Smith. 2000. "Frictionless commerce? A comparison of Internet and conventional retailers." *Management science* 46 (4):563-585.
- Brynjolfsson, Erik, Astrid A Dick, and Michael D Smith. 2010. "A nearly perfect market?" *QME* 8 (1):1-33.
- Brynjolfsson, Erik, Yu Hu, and Michael D Smith. 2003. "Consumer surplus in the digital economy: Estimating the value of increased product variety at online booksellers." *Management Science* 49 (11):1580-1596.
- . 2010. "Research commentary—long tails vs. superstars: The effect of information technology on product variety and sales concentration patterns." *Information Systems Research* 21 (4):736-747.
- Chava, Sudheer, Alex Oettl, Manpreet Singh, and Linghang Zeng. 2018. "The Dark Side of Technological Progress? Impact of E-Commerce on Employees at Brick-and-Mortar Retailers."
- Chen, Yongfu, Huliu Fang, Yiwu Zeng, and Hongdong Guo. 2018. "The mechanism of e-commerce promoting the upgrading of agricultural industry cluster: a case of flower and wood industry cluster in Shuyang County, Jiangsu Province." *Zhejiang Social Sciences* (10): 65-70+78+157. (陈永富 , 方湖柳 , 曾亿武 , 和 郭红东 . 2018. " 电子商务促进农业产业集群升级的机理分析——以江苏省沭阳县花木产业集群为例 ." 浙江社会科学 (10):65-70+78+157.)
- China, Ministry of Commerce. 2011a. Guidance on the Establishment of National E-commerce Demonstration Base (商务部关于开展国家电子商务示范基地创建工作的指导意见).
- . 2011b. The Guiding Opinions on the Development of E-commerce at the 12th Five-Year Plan (商务部 “十二五” 电子商务发展指导意见).
- . 2011c. The Third-Party E-commerce Transactions Platform Service Specification (第三方电子商务交易平台服务规范).
- . 2014. E-commerce in China 2013 (中国电子商务报告 2013).
- . 2015. E-commerce in China 2014 (中国电子商务报告 2014).
- . 2016a. E-commerce in China 2015 (中国电子商务报告 2015).
- . 2016b. The e-commerce 13th Five-Year Plan (电子商务 “十三五” 发展规划).
- . 2016c. "Regular Press Conference of Ministry of Commerce (December 29, 2016)." December 29.
- . 2017a. 13th Five-Year Development Plan for E-commerce (电子商 务

- “十三五”发展规划).
- . 2017b. E-commerce in China 2016 (中国电子商务报告 2016).
 - . 2018a. E-commerce in China 2017 (中国电子商务报告 2017)..
 - . 2018b. “Regular Press Conference of Ministry of Commerce (January 25, 2018).” January 25.
 - . 2018c. “Year-end review of e-commerce work in 2018 – 10 (2018 年商务工作年终综述之十).” December 29.
 - . 2019. E-commerce in China 2018 (中国电子商务报告 2018).
- China, Ministry of Finance and Ministry of Commerce. 2014. Notice by the Ministry of Finance General Office and the Ministry of Commerce General Office on launching the comprehensive demonstrative work of e-commerce in the countryside (财政部办公厅商务部办公厅关于开展电子商务进农村综合示范的通知).
- . 2015. Notice on launching 2015 comprehensive demonstrative work of e-commerce in the countryside (关于开展 2015 电子商务进农村综合示范工作的通知).
- China, Ministry of Finance, Ministry of Commerce, and the State Council Leading Group Office of Poverty Alleviation and Development. 2016. *Notice on launching 2016 comprehensive demonstrative work of e-commerce in the countryside* (关于开展 2016 电子商务进农村综合示范工作的通知).
- . 2017. *Notice on launching 2017 comprehensive demonstrative work of e-commerce in the countryside* (关于开展 2017 电子商务进农村综合示范工作的通知).
 - . 2018. *Notice on launching 2018 comprehensive demonstrative work of e-commerce in the countryside* (关于开展 2018 电子商务进农村综合示范工作的通知).
- China, State Post Bureau. 2017. 2016 Express Market Regulation Report (2016 年度快递市场监管报告).
- China, The State Council Leading Group Office of Poverty Alleviation and Development. 2013. “Identification of Key Countries for National Poverty Alleviation and Development and contiguous destitute areas (国家扶贫开发工作重点县和连片特困地区县的认定).” March 1. http://www.cpad.gov.cn/art/2013/3/1/art_50_23734.html
- . 2016. *Guidance on promoting precise poverty alleviation for e-commerce* (关于促进电商精准扶贫的指导意见).
 - . 2018a. “Hunan: E-commerce poverty alleviation achievements in the past 3 years (湖南：电商扶贫行动 3 年硕果摇枝).” *Hunan Daily*, September 28.
 - . 2018b. “Jilin:Unblocking the poverty alleviation channel (吉林：畅通脱贫攻坚血脉通道)”. *Jilin Daily*, August 16.
 - . 2018c. “Shannxi: A combination of approaches of industry poverty alleviation in Xixiang (陕西：西乡县打出产业扶贫“组合拳”)”. *Office of Poverty Alleviation in Shannxi*, July 20.
- Choudary, Sangeet Paul. 2017. “The Dangers of Platform Monopolies.” <https://knowledge.insead.edu/blog/insead-blog/the-dangers-of-platform-monopolies-6031#jw4PATGfLBsUm3M5.99>
- CIECC (China International Electronic Commerce Center). 2018. China rural

- e-commerce development report (2017-2018) (中国农村电子商务发展报告).
- CNNIC (China Internet Network Information Center). 2019. The 43rd statistical report on the development of China's Internet (第43次中国互联网络发展状况统计报告).
- Couture, Victor, Benjamin Faber, Yizhen Gu, and Lizhi Liu. 2018. E-commerce integration and economic development: evidence from China. National Bureau of Economic Research.
- Dai, Ruochen, and Xiaobo Zhang. 2015. "E-commerce Expands the Bandwidth of Entrepreneurship." Peking University School of Development, online available at file:///C:/Users/264659c/Downloads/EcommerceExpandsTheBandwidthOfEntrepreneurship20(1).
- Deloitte. 2016. *China E-Retail Market Report 2016*. <https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/cip/deloitte-cn-cip-china-online-retail-market-report-en-170123.pdf>
- Dobbs, Richard, Yougan Chen, Gordon Orr, James Manyika, and Elisie Chang. 2013. *China's E-tail revolution: Online shopping as a catalyst for growth*: McKinsey Global Institute.
- Eferin, Yaroslav, Yuri Hohlov, and Carlo Rossotto. 2019. "Digital platforms in Russia: competition between national and foreign multi-sided platforms stimulates growth and innovation." *Digital Policy, Regulation and Governance* 21 (2):129-145.
- Evans, David S, and Richard Schmalensee. 2016. "Why Winner-Takes-All Thinking Doesn't Apply to the Platform Economy." *Harvard Business Review* 4.
- Fan, Feifei. 2017. "E-commerce industry set to boost traditional enterprises." *China Daily*, January 3. http://africa.chinadaily.com.cn/business/2017-01/03/content_27842478.htm
- Fan, Jingting, Lixin Tang, Weiming Zhu, and Ben Zou. 2018. "The alibaba effect: Spatial consumption inequality and the welfare gains from e-commerce." *Journal of International Economics* 114:203-220.
- Financial Times. 2017. *Amazon is creating more jobs than it destroys*. <https://www.ft.com/content/cf98680c-738f-11e7-aca6-c6bd07df1a3c>
- Fine, Charles, and Daniel Raff. 2001. "Automotive Industry: Internet-Driven Innovation and Economics Performance." *The Economic Payoff from the Internet Revolution*:62-86.
- Forman, Chris, Avi Goldfarb, and Shane Greenstein. 2005. "How did location affect adoption of the commercial Internet? Global village vs. urban leadership." *Journal of Urban Economics* 58 (3):389-420.
- Garicano, Luis, and Steven N Kaplan. 2001. "The effects of business-to-business e-commerce on transaction costs." *The Journal of Industrial Economics* 49 (4):463-485.
- Gebeloff, Robert, and Karl Russell. 2017. "How the growth of E-commerce is shifting retail jobs." *The New York Times*, July 6.
- Goldman Sachs. 2017. "China E + Commerce, Shopping Re-Imagined" *Goldman Sachs: Asia*: 1-71.
- Goldmanis, Maris, Ali Hortaçsu, Chad Syverson, and Önsel Emre. 2009. "E-commerce and the market structure of retail industries." *The Economic*

- Journal* 120 (545):651-682.
- Goolsbee, Austan D, and Peter J Klenow. 2018. "Internet rising, prices falling: Measuring inflation in a world of e-commerce." *AEA Papers and Proceedings*.
- Gorodnichenko, Yuriy, and Oleksandr Talavera. 2017. "Price setting in online markets: Basic facts, international comparisons, and cross-border integration." *American Economic Review* 107 (1):249-82.
- Guo, Guihang, Liang Qian, and Guangfan Luo. 2014. "Effects of Clusters on China's E-Commerce: Evidence from the Junpu Taobao Village." *International Journal of Business and Management* 9 (6):180.
- Guo, Hongdong. 2016. "Approach and strategy to promote "Internet + Agriculture." *China Co-operation Economy* (6): 68-69. (郭红东 . 2016. " 中国淘宝村 : “互联网 + 农村” 典型模式 ." 经理人 (3):68-69.)
- Gürkaynak, Gönenç, Ayşe Güner, Sinan Diniz, & Janelle Filson. 2016. "Most-favored-nation clauses in commercial contracts: legal and economic analysis and proposal for a guideline." *European Journal of Law and Economics*, 42(1), 129-155.
- Hazell, Peter, Colin Poulton, Steve Wiggins, and Andrew Dorward. 2010. "The future of small farms: trajectories and policy priorities." *World Development* 38 (10):1349-1361.
- Hjort, Jonas, and Jonas Poulsen. 2019. "The arrival of fast internet and employment in Africa." *American Economic Review* 109 (3):1032-79.
- Hong, Han, and Matthew Shum. 2006. "Using price distributions to estimate search costs." *The RAND Journal of Economics* 37 (2):257-275.
- Hortaçsu, Ali, F Martínez-Jerez, and Jason Douglas. 2009. "The geography of trade in online transactions: Evidence from eBay and mercadolibre." *American Economic Journal: Microeconomics* 1 (1):53-74.
- Houngbonon, Georges Vivien, and Julianne Liang. 2018. "Broadband Infrastructure and Income Inequality." Available at SSRN 2963860.
- Jo, Yoon J, Misaki Matsumura, and David E Weinstein. 2019. "The Impact of E-Commerce on Prices and Welfare."
- Kumar, Sameer, and Palo Petersen. 2006. "Impact of e-commerce in lowering operational costs and raising customer satisfaction." *Journal of Manufacturing Technology Management* 17 (3):283-302.
- Kwok, Sharon. 2018. "Alibaba tops e-commerce market share while facing fresh competition in China." November 7. <https://www.marketing-interactive.com/alibaba-tops-e-commerce-market-share-while-facing-fresh-competition-in-china/>
- Lapidus, Gary. 2000. *Gentlemen, Start Your Search Engines*. New York: Goldman Sachs Investment Research.
- Lawrence, Japhet Eke, and Usman A Tar. 2010. "Barriers to e-commerce in developing countries." *Information, society and justice journal* 3 (1):23-35.
- Levin, Jonathan D. 2011. The economics of internet markets. National Bureau of Economic Research.
- Li, Xiaohua. 2016. Heqing Xinhua Village E-commerce Development Research Report (鹤庆新华村电商发展调研报告).
- Lieber, Ethan, and Chad Syverson. 2012. "Online versus offline competition." In *The Oxford handbook of the digital economy*, 189. Oxford University Press

- Oxford, UK.
- Litan, Robert E, and Alice M Rivlin. 2001. "Projecting the economic impact of the Internet." *American Economic Review* 91 (2):313-317.
- Liu, M, J Huang, Q Zhang, and S Gao. 2018. "What drive the development of e-commerce in rural China---the empirical evidence from the emergence of Taobao Villages."
- Lowrey, Ying. 2015. "Growing-by-Unleashing Grassroots Entrepreneurship and Alibaba Innovations." In *Achieving Dynamism in an Anaemic Europe*, 231-250. Springer.
- Lucas Jr, Robert E. 1988. "On the mechanics of economic development." *Journal of monetary economics* 22 (1):3-42.
- Luo, Xubei, and Chiyu Niu. 2019. E-Commerce Participation and Household Income Growth in Taobao Villages. The World Bank.
- Luo, Xubei, Yue Wang, and Xiaobo Zhang. 2019. E-Commerce Development and Household Consumption Growth in China. The World Bank.
- Luohan Academy. 2019. *Digital Technology and Inclusive Growth*. https://gw.alipayobjects.com/os/antfincdn/DbLN6yXw6H/Luohan_Academy-Report_2019_Executive_Summary.pdf
- Maguire, James. 2003. "Case Study: Dell. com." *ecommerce-guide. com*.
- Mandel, Michael. 2017. "How Ecommerce Creates Jobs and Reduces Income Inequality." *Progressive Policy Institute*:3.
- Markelova, Helen, Ruth Meinzen-Dick, Jon Hellin, and Stephan Dohrn. 2009. "Collective action for smallholder market access." *Food policy* 34 (1):1-7.
- McKinsey. 2017. Digital China: powering the economy to global competitiveness. McKinsey Global Institute.
- . 2018. *The digital archipelago: How online commerce is driving Indonesia's economic development*. <https://www.mckinsey.com/featured-insights/asia-pacific/the-digital-archipelago-how-online-commerce-is-driving-indonesias-economic-development>.
- Molla, Alemayehu, and Paul S Licker. 2005. "eCommerce adoption in developing countries: a model and instrument." *Information & management* 42 (6):877-899.
- Moreau, Bastien. 2017. "Why is Konga worth 'only' \$35 m and Jumia \$1 billion?" <https://www.linkedin.com/pulse/why-konga-worth-only-35m-jumia-1-billion-bastien-moreau>.
- Morgan Stanley Research. 2015. "China's E-Commerce Revolution," March 13. <https://www.morganstanley.com/ideas/china-e-commerce-revolution>
- Nyame, Gabriel, Francis Ohene Boateng, Nana Kwame Gyamfi, and Nana Yaw Asabere. "ICTs and Supply Chain: The Competitiveness of Small and Medium Scale Enterprises (SMEs)."
- OECD (Organisation for Economic Co-operation and Development). 2016. *Consumer Protection in E-commerce: OECD Recommendation*. OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264255258-en>
- . 2017. Harnessing E-Commerce for sustainable development, in Aid for Trade at a Glance 2017: Promoting Trade, Inclusiveness and Connectivity for Sustainable Development, OECD Publishing, Paris, https://doi.org/10.1787/aid_glance-2017-10-en.
- Oxley, Joanne E, and Bernard Yeung. 2001. "E-commerce readiness: Institutional

- environment and international competitiveness." *Journal of International Business Studies* 32 (4):705-723.
- Poncet, Sandra. 2003. "Measuring Chinese domestic and international integration." *China Economic Review* 14 (1):1-21.
- Qi, Jiaqi, Xiaoyong Zheng, and Hongdong Guo. 2019. "The formation of Taobao villages in China." *China Economic Review* 53:106-127.
- Rahayu, Rita, and John Day. 2015. "Determinant factors of e-commerce adoption by SMEs in developing country: evidence from Indonesia." *Procedia-Social and Behavioral Sciences* 195:142-150.
- Remin University of China and Ail Research. 2016. New Employment Research Report under the New Normal of the New Economy (新经济新常态下的新就业研究报告).
- Renmin University of China. 2019. Alibaba retail platform employment opportunity estimation and research on platform employment system (阿里巴巴零售平台就业机会测算与平台就业体系研究报告).
- Romer, Paul M. 1990. "Endogenous technological change." *Journal of political Economy* 98 (5, Part 2):S71-S102.
- Rosenbaum, Paul R, and Donald B Rubin. 1983. "The central role of the propensity score in observational studies for causal effects." *Biometrika* 70 (1):41-55.
- Rugaber, Christopher. 2017. "Why the explosive growth of e-commerce could mean more jobs." *Fox Business*, October 29.
- Ruutu, Sampsaa, Thomas Casey, and Ville Kotovirta. 2017. "Development and competition of digital service platforms: A system dynamics approach." *Technological Forecasting and Social Change* 117:119-130.
- Saffu, Kojo, John H Walker, and Robert Hinson. 2008. "Strategic value and electronic commerce adoption among small and medium-sized enterprises in a transitional economy." *Journal of Business & Industrial Marketing* 23 (6):395-404.
- Schatz, Daniel, Rabih Bashroush, and Julie Wall. 2017. "Towards a more representative definition of cyber security." *Journal of Digital Forensics, Security and Law* 12 (2):8.
- Scupola, Ada. 2006. "Government Intervention in SMEs' E-Commerce Adoption: An Institutional Approach." In *Global Electronic Business Research: Opportunities and Directions*, 158-178. IGI Global.
- Secretariat, Commonwealth. 2017. "E-Commerce Development: Policy Considerations for Small Developing Countries." *Emerging Trade Issues for Small Developing Countries*:111-138.
- Sinai, Todd, and Joel Waldfogel. 2004. "Geography and the Internet: Is the Internet a Substitute or a Complement for Cities?" *Journal of Urban Economics* 56 (1):1-24.
- Smith, Michael D, and Erik Brynjolfsson. 2001. "Consumer decision-making at an Internet shopbot: Brand still matters." *The Journal of Industrial Economics* 49 (4):541-558.
- Solow, Robert M. 1956. "A contribution to the theory of economic growth." *The quarterly journal of economics* 70 (1):65-94.
- Startz, Meredith. 2016. "The value of face-to-face: Search and contracting

- problems in Nigerian trade." *Available at SSRN 3096685.*
- Terzi, Nuray. 2011. "The impact of e-commerce on international trade and employment." *Procedia-Social and Behavioral Sciences* 24:745-753.
- UNCTAD (United Nations Conference on Trade and Development). 2001. *E-commerce and development report 2001*. United Nations Conference on Trade and Development.
- . 2004. *E-commerce and development report 2004*.
- . 2015. *Information economy report 2015-unlocking the potential of e-commerce for developing countries*. New York and Geneva: United Nations.
- Uzoka, Faith-Michael E, Alice P Shemi, and Geoffrey G Seleka. 2007. "Behavioral Influences on E-Commerce Adoption in a Developing Country Context." *The Electronic Journal of Information Systems in Developing Countries* 31 (1):1-15.
- Wang, Xiaodong. 2017. "Insurance protects a family's 'economic backbone'." *China Daily*, December 3. http://www.chinadaily.com.cn/china/2017-12/03/content_35179378.htm
- Westin, Alan F. 1967. "Privacy and freedom Atheneum." *New York* 7:431-453.
- Willis, Jonathan L. 2004. "What impact will e-commerce have on the US economy?" *Economic Review-Federal Reserve Bank of Kansas City* 89:53-68.
- World Bank. 2016. *World Development Report 2016 : Digital Dividends*. Washington, DC: World Bank. World Bank.
- . 2019. *World Development Report 2019 : The Changing Nature of Work..* Washington, DC: World Bank. World Bank.
- Xinhua News Agency. 2016. "Taobao Villages made textile arts to big business (淘宝村将小布艺做成大生意)." *Xinhua Net*, October 25. http://www.xinhuanet.com/politics/2016-10/25/c_1119779952.htm
- . 2018. "Economic Watch: The secret behind China's job creation success." *Xinhua Net*, July 26. http://www.xinhuanet.com/english/2018-07/26/c_137350120.htm
- Zeng, Yiwu, Dongmao Qiu, Yiting Shen, and Hongdong Guo. 2015. "Study on the formation of Taobao village: taking Dongfeng village and Junpu village as examples." *Economic Geography* 35 (12): 90-97. (曾亿武 , 邱东茂 , 沈逸婷 , and 郭红东 . 2015. "淘宝村形成过程研究 : 以东风村和军埔村为例 ." 经济地理 35 (12):90-97.)
- Zeng, Yiwu, Fu Jia, Li Wan, and Hongdong Guo. 2017. "E-commerce in agri-food sector: a systematic literature review." *International Food and Agribusiness Management Review* 20 (4):439-460.
- Zeng, Yiwu, Hongdong Guo, and Songqing Jin. 2018. "Does e-commerce increase farmers' income? Evidence from Shuyang County, Jiangsu Province, China." *Chinese Rural Economy* 2: 49-64. (曾亿武 , 郭红东 , and 金松青 . 2018. "电子商务有益于农民增收吗 ?——来自江苏沭阳的证据 ." 中国农村经济 (2):49-64.)
- Zeng, Yiwu, Yongfu Chen, and Hongdong Guo. 2019. "Previous experience, social capital and smallholders' e-commerce adoption." *Journal of Agrotechnical Economics* (03): 38-48. (曾亿武 , 陈永富 , and 郭红东 . 2019.

- "先前经验、社会资本与农户电商采纳行为." *农业技术经济*(03):38-48.)
- Zhang, Jie. 2017. "JD.com adds C2C business model," ChinaDaily.com.cn. Octobrt 26. http://www.chinadaily.com.cn/business/2017-10/26/content_33734519.htm.
- Zhang, Xiaobo, and Wu Zhu. 2015. "The spatial patterns of e-commerce in China." *Paper presented at the annual Allied Social Science Associations January 3:5.*
- Zhang, Yingnan, Hualou Long, Li Ma, Shuangshuang Tu, Yurui Li, and Dazhuan Ge. 2018. "Analysis of rural economic restructuring driven by e-commerce based on the space of flows: The case of Xiaying village in central China." *Journal of Rural Studies*.



E-COMMERCE DEVELOPMENT: EXPERIENCE FROM CHINA