

## The Effects of E-Commerce on Business Performance

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*E-commerce improves the performance of small businesses selling to consumers but lowers product quality, as seen in a field experiment with nearly 800 Chinese writing brush producing firms in Jiangxi, China.*

How does e-commerce shape small business activities and performance? Lack of market access is a potentially key friction that constrains the performance of small and medium enterprises (SMEs). E-commerce has the potential to reduce this friction. In this project we conducted a field experiment with nearly 800 firms in Jiangxi province, China, in which we evaluated the impact of training firms to use e-commerce. We find that e-commerce has large and significant effects on the business performance of firms that sell directly to consumers (B2C), but not of firms that sell to other businesses (B2B). We also find that e-commerce worsens product quality, especially durability, a characteristic which cannot be inferred visually. Our results suggest that e-commerce enables market access but reallocates production to lower-quality products.

### Methodology

We work with firms that produce the Chinese writing brush, and study a famous location of production in Jiangxi province, which accounts for the majority of writing brush sales in China. The supply chain of the writing brush has two layers: (1) firms producing intermediate inputs, especially the brush and handle (suppliers); (2) firms assembling and selling the final good (clients). In our baseline data collection, we surveyed essentially all firms, about 800 firms, in our location, and we collected data on both firm performance and the supplier-client network.

In 2019 we introduced an intervention in which we encouraged treated firms to join a new B2B and B2C platform designed for this industry. As part of the intervention, we also provided training, including brochures and videos, on how to use the platform, and smart phones to most treated firms to allow them to transact. We collected four survey waves of data: a baseline in 2018 before the intervention, and follow-ups in 2019, 2021 and 2022.

Take-up, measured as registration on the platform, was 68%. But, unfortunately, partly due to Covid-19, the platform was not successful. They lost subsidies from the government during the pandemic and have been unable to improve services or retain clients.

Nevertheless, as illustrated below, we found significant impacts on take-up of e-commerce more generally and on business performance. Since the platform we originally planned to work with failed, we believe that the results are due to our training being more generally applicable to the use of e-commerce, perhaps in

combination with the impact of the smart phone we provided. Importantly, we provided the smart phone for only a one-year period but observe longer-term impacts, suggesting a learning mechanism.

## Results

We have three main results, firstly- the training induced firms, especially client businesses, to take up and use e-commerce. Figure 1 shows the impact of the e-commerce training on firms' self-reported use of e-commerce, as well as the share of sales they conducted online and the share of transactions they conducted using the phone. There are significant increases in the take-up of e-commerce, which are more pronounced for client than for supplier firms. For example, client firms experience an 18 percentage points increase in the share of their sales conducted online, whereas supplier firms experience a smaller increase of 2 percentage points. This difference is not surprising because it is more common to use e-commerce platforms to buy final goods rather than intermediate inputs. In fact, we hypothesize that much of the online sales conducted by supplier firms are also the sales of final goods, as supplier firms often have the capability to produce final goods as well.

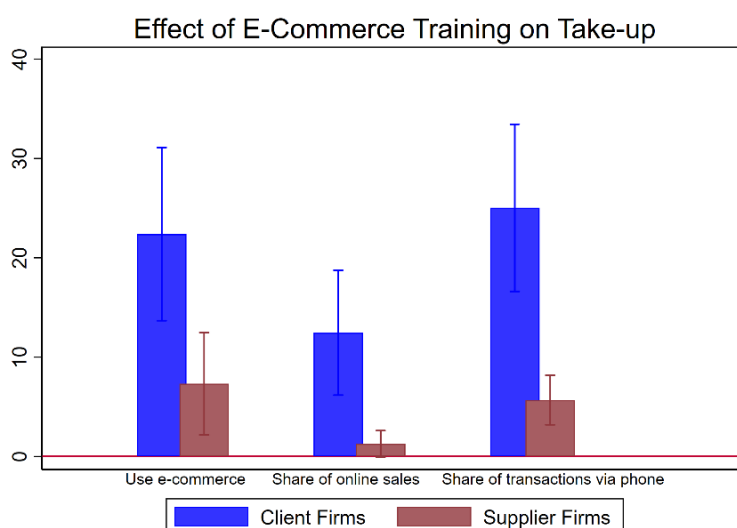


Figure 1

Our second result is that the training led to improved business performance. Figure 2 reports the impact on business performance. For client firms, we see significant and large gains in revenue, profit, the number of workers, and the number of both regular and, especially, occasional clients. For supplier firms the effects are smaller and insignificant. These results imply that e-commerce allowed client firms to substantially increase their scale of operations.

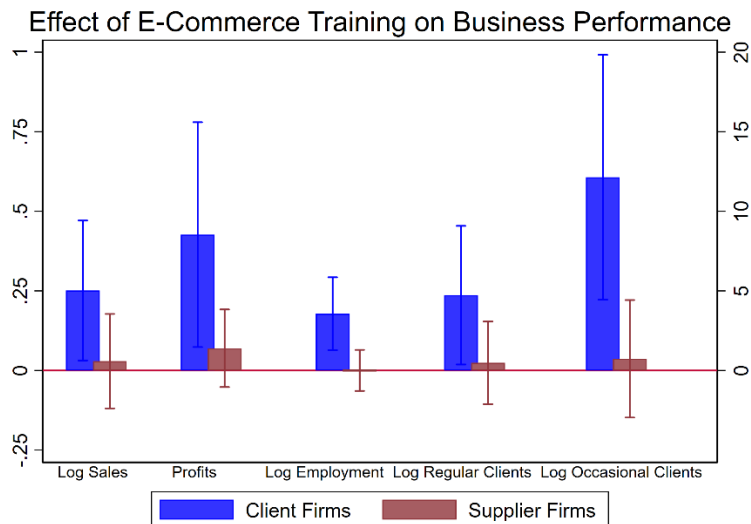


Figure 2

Our third result is that the training led to lower product quality and lower price. Figure 3 reports the impact on quality and price related outcomes. The first two blue bars illustrate that client firms introduced more products and engaged more in quality checks. As with the other outcomes, for supplier firms the effects are muted. We then study product quality, which was evaluated by independent experts in a “blind” procedure on two dimensions, craftsmanship and durability. Craftsmanship can be judged by just visually inspecting the product, but to evaluate durability, the product has to be handled and used, which is possible in a face-to-face transaction but not in an online transaction. We find significant negative effects on durability for client firms, indicating that adopting to e-commerce resulted in producing lower-quality brush. We also find significant negative effects on price.

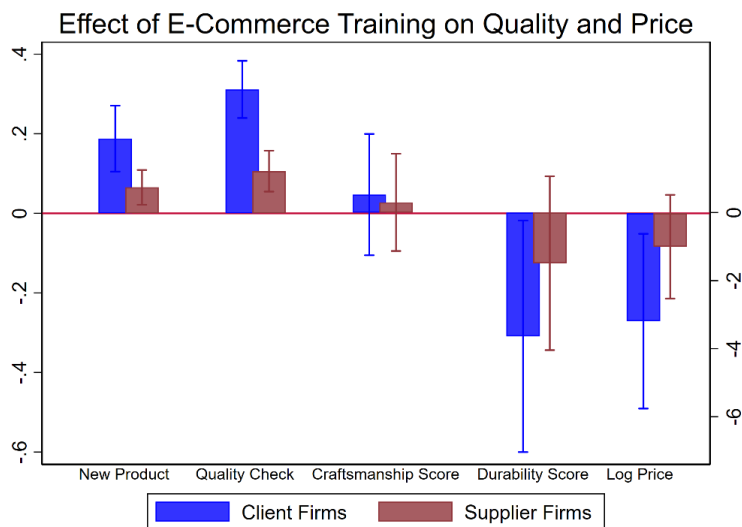


Figure 3

We see two main interpretations of the effects on quality and price. One is that the lack of observability drove firms to produce lower-quality goods which they could sell at a lower price. The other is that consumers buying online value quality less, and firms respond by lowering quality. The lack of an effect on the craftsmanship component of quality seems more consistent with the first explanation.

Overall, our results suggest that e-commerce is an effective way to provide market access to firms directly serving consumers, but that it also changes the product mix of these firms.

### **Policy Impact**

Our results suggest that training firms to use e-commerce can meaningfully improve their performance. E-commerce is beneficial for firms that serve consumers, but not for firms that serve other businesses. The gains from e-commerce come with a reallocation to lower-quality and lower-price products. To the extent that this change is driven by the unobservability of quality in online transactions, quality certification may be a complementary policy that could enhance the gains from the expansion of e-commerce.

### **Further Research**

We see several next steps. (1) We would like to distinguish between lack of observability versus a different value for quality as the explanation for the lower product quality in online sales. (2) We would like to think about welfare effects, accounting for impacts on consumers as well, perhaps by developing a formal model. (3) We would like to explore impacts on the suppliers of clients who adopt e-commerce.

*This note is based on research conducted as a part of PEDL [ERG 7087](#).*