# E-Commerce Integration and Economic Development: Evidence from China

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    - Production side: urban market access to raise demand and entrepreneurship
    - Consumption side: evidence of larger e-commerce share in smaller cities.
- Little evidence on economic and welfare effect of e-commerce in developing countries.

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    - What are the underlying economic channels?
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- How we do it:
  - RCT across villages in collaboration with a large Chinese e-commerce firm.
  - New collection of household and store price survey data (3800 households, $\approx 10\text{k}$ local price quotes per round).
  - Universe of transaction records from firm's internal database ($\approx 28\text{m}$ transactions).

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  1. Logistical Barrier: Countryside mostly not serviced by commercial parcel delivery and pick-up.
  2. Transactional Barrier: Villagers not used to or trusting online interfaces & limited access to online payment systems.

# Program in China

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- Program makes two key investments to lift barriers to e-commerce:
  1. Logistical barrier: Build warehouses and fully subsidize transport costs to/from the villages.
  2. Transactional barrier: Install e-commerce terminal in central village location.

- Objectives of the program:
  - Connect 100,000 villages to e-commerce.
  - Provide same e-commerce access in villages as in counties' main city center.

# Field Experiment

# Field Experiment

- Location: 8 counties in 3 provinces: Anhui, Henan and Guizhou.
- Design:
  - For each county, we obtain an extended list of candidate villages ($X + 5$).
  - Randomly select 5 control and 7-8 treatment villages for data collection.
  - Yields a sample of 40 control villages and 60 treatment villages.
- Timing: Baseline data from late 2015 to mid-2016. Endline 1 year after.
- Stratification: Villages with and without pre-existing parcel delivery.
- Median village population≈2500 (800 households).

# Methodology

# Methodology

- Analysis proceeds in 4 steps:
  1. Derive expression of household welfare to guide data collection and analysis.
  2. Use RCT to estimate causal effects on a number of economic outcomes.
  3. Complement survey data with evidence from firm's internal database.
  4. Combine 1-3 for quantification of welfare impact, underlying channels, and distribution.

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- Channels:
  - Effects mainly driven by removal of logistical barrier, not transactional.
  - Direct consumption gains but no production gains, and no impact on local store prices.
- Firms' transaction data confirm our survey result
  - No evidence of larger impact in full sample or past our survey horizon

# On the Menu Today

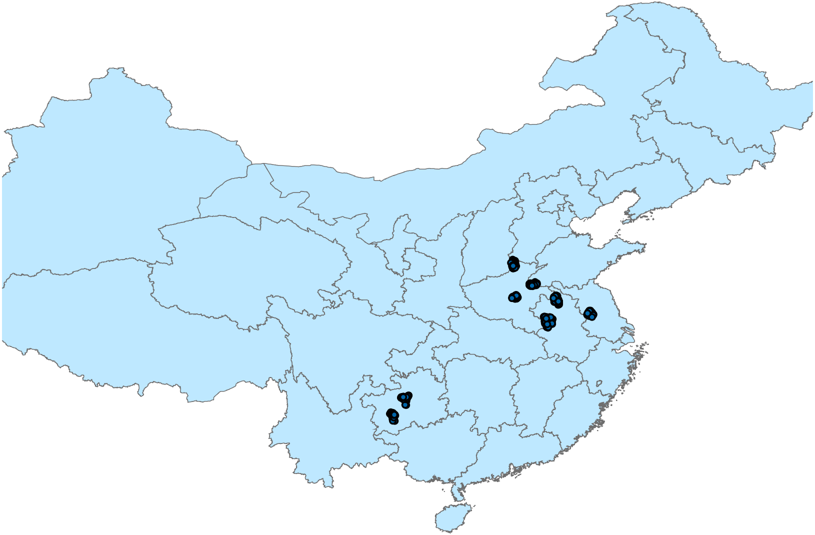
- Related literature [*skip*]
- Theoretical framework [skip]
- Experimental design and data
- Evidence from RCT and survey data
- Additional evidence from transaction database
- Welfare quantification
- Conclusion

# Related Literature

# Related Literature

- Recent literature on trade and development.
  - e.g. Topalova (2010), Donaldson (2014), Atkin, Faber, Gonzalez-Navarro (2017).
- Literature on transport infrastructure and development.
  - e.g. Donaldson (2016), Baum-Snow et al (2016), Faber (2014).
- Literature on internet and trade.
  - e.g. Freund & Weinhold (2004), Lendle et al (2016).
- Literature on internet and development.
  - e.g. Goyal (2010), Hjort and Poulson (2016).
- Literature on gains from e-commerce and cost of living across cities.
  - e.g. Couture (2016), Zhou et al. (2016), Einav et al. (2017).
- Recent literature on sources of rural-urban economic divide.
  - e.g. Young (2013), Lagakos et al (2016), Hamory et al (2016).

# Map of Mainland China



# Sample Villages

# Warehouses

# E-Commerce Terminal


# E-Commerce Sellers

# Descriptive Stats: Households

| | | Full Sample at Baseline | Treatment Villages at | Control Villages at Baseline | P-Value (Treat-Control=0) | Control Villages at Endline |
|---|---|---|---|---|---|---|
| Household Size | Median | 3.000 | 3.000 | 3.000 | | 3.00 |
| | Mean | 3.114 | 3.053 | 3.205 | 0.075 | 2.987 |
| | Standard Deviation | 1.422 | 1.420 | 1.421 | | 1.40 |
| | Number of Obs | 2740 | 1647 | 1093 | | 1405 |
| Household Monthly Income Per Capita in RMB | Median | 350.000 | 339.000 | 375.000 | | 466.67 |
| | Mean | 876.412 | 841.198 | 929.473 | 0.365 | 1028.960 |
| | Standard Deviation | 1717.456 | 1687.169 | 1761.560 | | 2005.31 |
| | Number of Obs | 2740 | 1647 | 1093 | | 1405 |
| Primary Earner Is Peasant (Yes=1) | Median | 1.000 | 1.000 | 1.000 | | 1.00 |
| | Mean | 0.590 | 0.600 | 0.577 | 0.620 | 0.587 |
| | Standard Deviation | 0.492 | 0.490 | 0.494 | | 0.49 |
| | Number of Obs | 2549 | 1531 | 1018 | | 1348 |
| Any Member of the Household Has Ever Used the Internet (Yes=1) | Median | 0.000 | 0.000 | 0.000 | | 0.00 |
| | Mean | 0.368 | 0.354 | 0.390 | 0.249 | 0.427 |
| | Standard Deviation | 0.482 | 0.478 | 0.488 | | 0.49 |
| | Number of Obs | 2739 | 1646 | 1093 | | 1402 |
| Household Owns a Smartphone (Yes=1) | Median | 1.000 | 1.000 | 1.000 | | 1.00 |
| | Mean | 0.526 | 0.509 | 0.552 | 0.153 | 0.551 |
| | Standard Deviation | 0.499 | 0.500 | 0.498 | | 0.50 |
| | Number of Obs | 2731 | 1642 | 1089 | | 1400 |
| Share of Household Monthly Expenditure on E-Commerce Deliveries | Median | 0.000 | 0.000 | 0.000 | | 0.00 |
| | Mean | 0.007 | 0.006 | 0.007 | 0.693 | 0.008 |
| | Standard Deviation | 0.050 | 0.046 | 0.057 | | 0.05 |
| | Number of Obs | 2720 | 1637 | 1083 | | 1397 |
| Share of E-Commerce Sales in Household Monthly Income | Median | 0.000 | 0.000 | 0.000 | | 0.00 |
| | Mean | 0.003 | 0.001 | 0.006 | 0.103 | 0.003 |
| | Standard Deviation | 0.052 | 0.030 | 0.074 | | 0.05 |
| | Number of Obs | 2055 | 1244 | 811 | | 1161 |
| Share of Retail Expenditure Outside of Village | Median | 0.553 | 0.489 | 0.623 | | 0.60 |
| | Mean | 0.500 | 0.470 | 0.545 | 0.193 | 0.531 |
| | Standard Deviation | 0.395 | 0.402 | 0.379 | | 0.38 |
| | Number of Obs | 2720 | 1637 | 1083 | | 1397 |

# Average Effects on Consumption

| Dependent Variables | | Intent to Treat | Treatment on Treated | Log Distance (IV using Treat) |
|---|---|---|---|---|
| Monthly Total Retail Expenditure Per Capita | Treat or Log Dist | -21.93 | -40.92 | 11.15 |
| | | (31.96) | (60.19) | (16.29) |
| | R-Squared | 0.038 | | |
| | First Stage F-Stat | | 43.92 | 42.45 |
| | Number of Obs | 3,434 | 3,434 | 3,434 |
| Household Has Ever Bought Something through Terminal (Yes=1) | Treat or Log Dist | 0.0480*** | 0.0886*** | -0.0241*** |
| | | (0.0169) | (0.0271) | (0.00721) |
| | R-Squared | 0.008 | | |
| | First Stage F-Stat | | 45.56 | 43.80 |
| | Number of Obs | 3,518 | 3,518 | 3,518 |
| Household Has Bought Something through Terminal in Past Month (Yes=1) | Treat or Log Dist | 0.0263*** | 0.0490*** | -0.0134*** |
| | | (0.00981) | (0.0171) | (0.00458) |
| | R-Squared | 0.009 | | |
| | First Stage F-Stat | | 43.93 | 42.23 |
| | Number of Obs | 3,482 | 3,482 | 3,482 |
| Share of E-Commerce Terminal in Total Monthly Retail Expenditure | Treat or Log Dist | 0.00666*** | 0.0124*** | -0.00338*** |
| | | (0.00239) | (0.00434) | (0.00117) |
| | R-Squared | 0.006 | | |
| | First Stage F-Stat | | 44.03 | 42.34 |
| | Number of Obs | 3,434 | 3,434 | 3,434 |

| Dependent Variables | | Intent to Treat | Treatment on Treated | Log Distance (IV using Treat) |
|---|---|---|---|---|
| Share of E-Commerce Terminal in Monthly Business Inputs | Treat or Log Dist | -0.00715 | -0.0154 | 0.00433 |
| | | (0.00778) | (0.0191) | (0.00545) |
| | R-Squared | 0.003 | | |
| | First Stage F-Stat | | 16.46 | 14.96 |
| | Number of Obs | 1,207 | 1,207 | 1,207 |
| Share of E-Commerce Terminal in Monthly Non-Durables | Treat or Log Dist | 0.00536*** | 0.00999*** | -0.00272*** |
| | | (0.00195) | (0.00355) | (0.000956) |
| | R-Squared | 0.003 | | |
| | First Stage F-Stat | | 44.11 | 42.33 |
| | Number of Obs | 3,433 | 3,433 | 3,433 |
| Share of E-Commerce Terminal in Monthly Durables | Treat or Log Dist | 0.0398** | 0.0669** | -0.0188** |
| | | (0.0159) | (0.0261) | (0.00736) |
| | R-Squared | 0.011 | | |
| | First Stage F-Stat | | 52.64 | 41.27 |
| | Number of Obs | 768 | 768 | 768 |

- 9% of households become users, 5% during month of survey (14% with spillovers added).
- Average retail expenditure share on new option is 1.24%, 14% among users.
- Stongest response for consumer durables (6.7% on average, 44% among users).

# Average Effects on Incomes

| Dependent Variables | | Intent to Treat | Treatment on Treated | Log Distance (IV using Treat) |
|---|---|---|---|---|
| Monthly Income Per Capita in RMB | Treat or Log Dist | -7.838 | -14.48 | 3.974 |
| | | (70.78) | (129.9) | (35.61) |
| | R-Squared | 0.038 | | |
| | First Stage F-Stat | | 45.33 | 42.83 |
| | Number of Obs | 3,437 | 3,437 | 3,437 |
| Annual Income Per Capita in RMB | Treat or Log Dist | -45.95 | -85.08 | 23.33 |
| | | (586.9) | (1,080) | (296.3) |
| | R-Squared | 0.046 | | |
| | First Stage F-Stat | | 44.77 | 42.23 |
| | Number of Obs | 3,388 | 3,388 | 3,388 |
| Monthly Agricultural Income Per Capita | Treat or Log Dist | -70.23 | -130.3 | 35.61 |
| | | (140.3) | (257.7) | (70.34) |
| | R-Squared | 0.033 | | |
| | First Stage F-Stat | | 44.23 | 42.33 |
| | Number of Obs | 3,448 | 3,448 | 3,448 |
| Monthly Non-Agricultural Income Per Capita | Treat or Log Dist | -46.65 | -86.06 | 23.55 |
| | | (137.3) | (249.6) | (68.28) |
| | R-Squared | 0.157 | | |
| | First Stage F-Stat | | 45.74 | 43.51 |
| | Number of Obs | 3,441 | 3,441 | 3,441 |

| Dependent Variables | | Intent to Treat | Treatment on Treated | Log Distance (IV using Treat) |
|---|---|---|---|---|
| Weekly Hours Worked by Primary Earner | Treat or Log Dist | 1.008 | 1.879 | -0.516 |
| | | (3.383) | (6.285) | (1.723) |
| | R-Squared | 0.000 | | |
| | First Stage F-Stat | | 43.80 | 41.21 |
| | Number of Obs | 3,310 | 3,310 | 3,310 |
| Member of Household Has Ever Sold through E-Comm (Yes=1) | Treat or Log Dist | -0.00700 | -0.0129 | 0.00353 |
| | | (0.00562) | (0.0104) | (0.00282) |
| | R-Squared | 0.347 | | |
| | First Stage F-Stat | | 45.30 | 42.71 |
| | Number of Obs | 3,504 | 3,504 | 3,504 |
| Share of E-Comm Sales in Household Monthly Income | Treat or Log Dist | -0.00120 | -0.00224 | 0.000614 |
| | | (0.00176) | (0.00330) | (0.000901) |
| | R-Squared | 0.032 | | |
| | First Stage F-Stat | | 41.62 | 38.41 |
| | Number of Obs | 2,830 | 2,830 | 2,830 |
| Member of Household Started a Business Over Last 6 Months (Yes=1) | Treat or Log Dist | -0.00802 | -0.0149 | 0.00407 |
| | | (0.00631) | (0.0120) | (0.00327) |
| | R-Squared | 0.001 | | |
| | First Stage F-Stat | | 44.37 | 42.34 |
| | Number of Obs | 3,468 | 3,468 | 3,468 |

- No evidence of production-side effects.

# Average Effects on Local Retail Prices

| Dept Variables | | Intent to Treat | Treatment on Treated | Dept Variables | | Intent to Treat | Treatment on Treated |
|---|---|---|---|---|---|---|---|
| Log Prices (All) | Treat | 0.0189 | 0.0352 | Store Owner Sources Products Online (Yes=1) | Treat | -0.00145 | -0.00261 |
| | | (0.0142) | (0.0263) | | | (0.0258) | (0.0461) |
| | R-Squared | 0.893 | 0.893 | | R-Squared | 0.000 | -0.001 |
| | First Stage F-Stat | | 41.66 | | First Stage F-Stat | | 23.76 |
| | Number of Obs | 6,877 | 6,877 | | Number of Obs | 341 | 341 |
| Product Replacement Dummy (Not Counting Store Closures) (Yes=1) | Treat | -0.00516 | -0.00983 | Log Prices of Business Inputs | Treat | 0.00229 | 0.00337 |
| | | (0.00947) | (0.0181) | | | (0.129) | (0.186) |
| | R-Squared | 0.000 | -0.002 | | R-Squared | 0.811 | 0.811 |
| | First Stage F-Stat | | 39.82 | | First Stage F-Stat | | 24.86 |
| | Number of Obs | 8,956 | 8,956 | | Number of Obs | 237 | 237 |
| Store Closure (at Product Level) (Yes=1) | Treat | 0.00124 | 0.00236 | Log Prices of Non-Durables | Treat | 0.0211 | 0.0398 |
| | | (0.0294) | (0.0556) | | | (0.0146) | (0.0276) |
| | R-Squared | 0.000 | 0.000 | | R-Squared | 0.860 | 0.860 |
| | First Stage F-Stat | | 39.82 | | First Stage F-Stat | | 40.36 |
| | Number of Obs | 8,956 | 8,956 | | Number of Obs | 6,455 | 6,455 |
| Number of New Products Per Store | Treat | 2.194** | 4.020* | Log Prices of Durables | Treat | -0.0320 | -0.0522 |
| | | (1.073) | (2.278) | | | (0.0711) | (0.115) |
| | R-Squared | 0.277 | 0.212 | | R-Squared | 0.951 | 0.952 |
| | First Stage F-Stat | | 19.69 | | First Stage F-Stat | | 9.753 |
| | Number of Obs | 312 | 312 | | Number of Obs | 185 | 185 |

- No evidence of pro-competitive price effects.
- Some evidence for added new products in local stores.

# Addressing Three Additional Questions with Survey Data

- (1) How does the e-commerce terminal compare with existing stores?
  - Document terminal advantages in prices, variety, travel costs. (Show)
- (2) Could badly managed program implementation affect our result?
  - Find no heterogeneity with respect to terminal manager or other characteristics of implementation. (Show)
- (3) How important are spillovers?
  - Find positive spillovers in consumption usage from nearby terminals, but nothing else. (Show)
  - Estimate tiny fraction of rural market access due to trade with nearby rural markets. (Show)

# Complement RCT with Administrative Data

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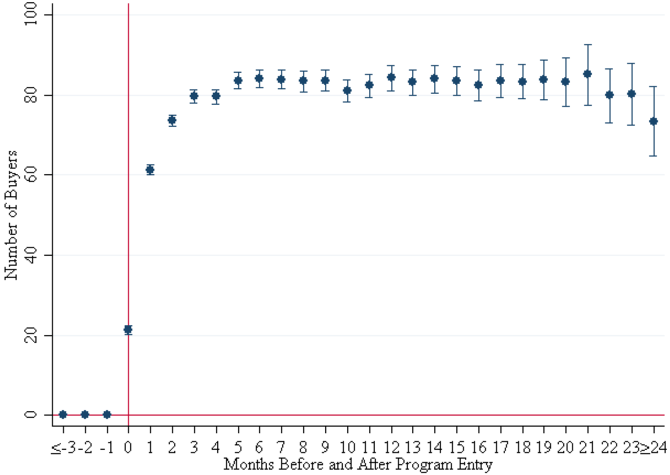
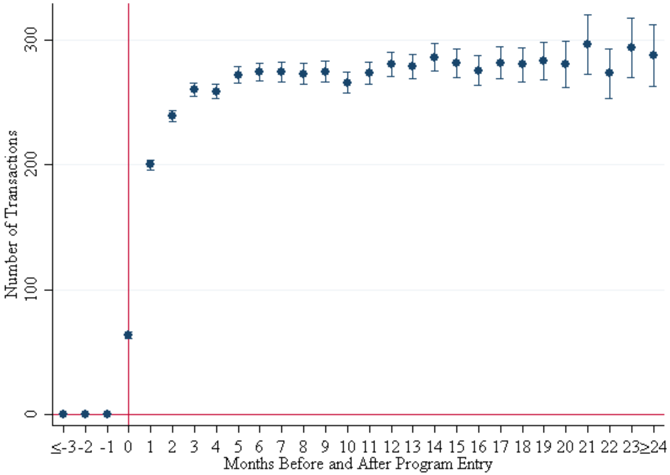
- We use these additional data to answer 4 remaining questions:

  1. Are our 100 RCT villages representative of program villages more broadly? (Show)
  2. Are our RCT effects subject to seasonality in our endline data?(Show)
  3. Is terminal use increasing past our survey's one year window?
  4. Are survey data missing highly successful tail events on production side?

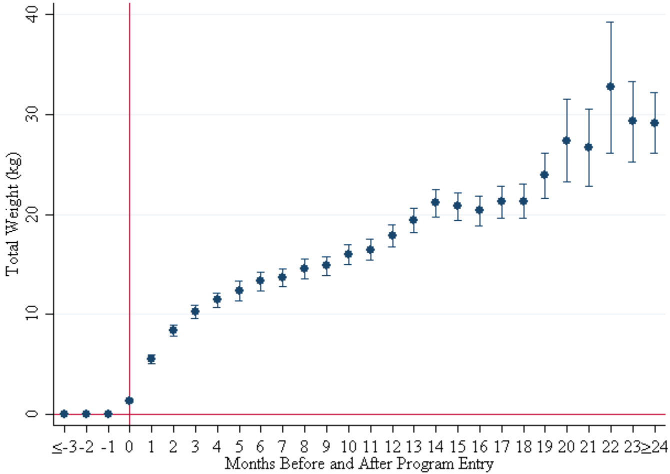
# Q3: Timeline of Adjustment: Number of Buyers



# Q3: Timeline of Adjustment: Number of Purchases



# Q3: Timeline of Adjustment: Village Out-Shipment Weight



# Quantification of Welfare Effect

# Quantification of Welfare Effect

- The "Direct Price Index Effect" (following Atkin, Faber and Gonzalez-Navarro, 2017):

$$\frac{DE}{e(\mathbf{P}_T^{0*}, \mathbf{P}_C^0, \mathbf{P}_X^0, u_h^0)} = \prod_{g \in G} \left( \left( \sum_{s \in S_g^{dc}} \phi_{gsh}^{t1} \right)^{\frac{1}{\sigma_{gh}-1}} \right)^{\alpha_{gh}} - 1$$

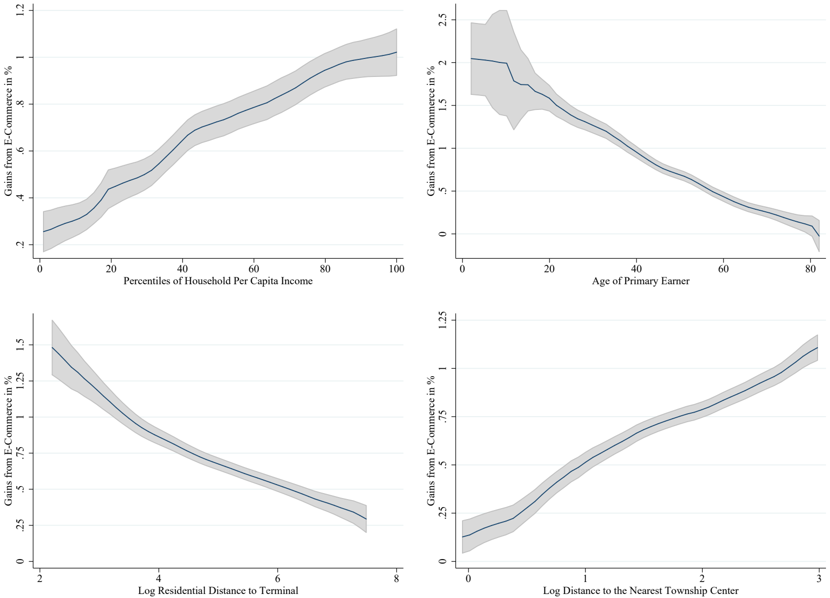
- h = household group
- g = product group
- $\sum_{s \in S_g^{dc}} \phi_{gsh}^{t1}$ = expenditure share on pre-existing retailers after program entry.
- $\sigma_{gh}$ = elasticity of substitution across retailers.
- $\alpha_{gh}$ = Cobb-Douglas share on product group g.

- Boostrap quantification using point estimates for $\widehat{\sum_{s \in S_g^{dc}} \phi_{gsh}^{t1}}$.

# Average Effects

| | Unweighted (Effects in Sample) | | |
|---|---|---|---|
| | Durables Consumption | Non-Durables Consumption | Total Retail Consumption |
| Reduction in Retail Cost of Living for All Households | 3.298%<br>(0.027) | 0.478%<br>(0.004) | 0.812%<br>(0.005) |
| Reduction in Retail Cost of Living Among Users | 19.331%<br>(0.215) | 3.722%<br>(0.029) | 5.464%<br>(0.035) |

# Heterogeneity of Effects



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  2. Some caution regarding claims about transformation of the countryside via rural entrepreneurship in the absence of complementary interventions (e.g. credit, training, promotions, standardization.)

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    3. Investigating how to make local economies thrive under e-commerce is a promising direction for future research!

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  3. Investigating how to make local economies thrive under e-commerce is a promising direction for future research!

- **Thank You!**

# Role of Implementation (1)

| | | | | | |
|---|---|---|---|---|---|
| Could You Have Purchased This Product in Your Village? (Yes=1) | Sample Fraction | 0.380 | Household Living in Village Without Any Durables on Sale (Yes=1) | Sample Fraction | 0.547 |
| | Number Obs | 255 | | Number Obs | 3,508 |
| Log Price Difference between Terminal and Village Retail | Sample Mean | -0.166 | Travel Cost to Nearby Town and Back (RMB) | Sample Mean | 11.85 |
| | Sample Median | -0.154 | | Sample Median | 4 |
| | Number Obs | 95 | | Number Obs | 2,766 |
| Could You Have Purchased This Product in the Nearby Town? (Yes=1) | Sample Fraction | 0.836 | Travel Time to Nearby Town and Back (Minutes) | Sample Mean | 58.14 |
| | | | | Sample Median | 40 |
| | Number Obs | 238 | | Number Obs | 2,366 |
| Log Price Difference between Terminal and Nearby Town Retail | Sample Mean | -0.227 | Travel Distance to Nearby Town and Back (Km) | Sample Mean | 20.71 |
| | Sample Median | -0.182 | | Sample Median | 10.23 |
| | Number Obs | 197 | | Number Obs | 2,773 |

(Back)

# Role of Implementation (2)

| Type of Heterogeneity | | Intent to Treat | Treatment on the Treated | Log Distance (IV Using Treat) |
|---|---|---|---|---|
| | Dependent Variable: Household Has Ever Bought Something through E-Commerce Terminal (Yes=1) | | | |
| Average Effects | Treat or Log Dist | 0.0480*** | 0.0886*** | -0.0241*** |
| | | (0.0169) | (0.0271) | (0.00721) |
| | R-Squared | 0.008 | | |
| | First Stage F-Stat | | 45.56 | 43.80 |
| | Number of Obs | 3,518 | 3,518 | 3,518 |
| Terminal Manager Test Score | Treat or Log Dist | 0.0594 | 0.104 | -0.0297 |
| | | (0.147) | (0.242) | (0.0679) |
| | Treat or Log Dist * Score | -0.000214 | -0.000384 | 0.000114 |
| | | (0.00164) | (0.00270) | (0.000755) |
| | R-Squared | 0.006 | | |
| | First Stage F-Stat | | 8.786 | 8.133 |
| | Number of Obs | 3,042 | 3,042 | 3,042 |
| Terminal Manager Test Score Above the Median | Treat or Log Dist | 0.0314 | 0.0616 | -0.0172 |
| | | (0.0295) | (0.0501) | (0.0136) |
| | Treat or Log Dist * Above Median | 0.0191 | 0.0182 | -0.00504 |
| | | (0.0347) | (0.0583) | (0.0158) |
| | R-Squared | 0.006 | | |
| | First Stage F-Stat | | 8.654 | 7.210 |
| | Number of Obs | 3,042 | 3,042 | 3,042 |
| County Team Without Smooth Planning | Treat or Log Dist | 0.0392 | 0.0656* | -0.0180* |
| | | (0.0247) | (0.0357) | (0.00941) |
| | Treat or Log Dist * Delay Dummy | 0.0167 | 0.0486 | -0.0131 |
| | | (0.0335) | (0.0554) | (0.0149) |
| | R-Squared | 0.009 | | |
| | First Stage F-Stat | | 10.93 | 11.46 |
| | Number of Obs | 3,518 | 3,518 | 3,518 |

(Back)

# Estimating GE Effects (1)

# Estimating GE Effects (1)

- Two approaches:

1. Exploit experimental variation similar to Kremer and Miguel (2004).

$$y_{hv}^{Post} = \alpha + \beta_1 Treat_v + \beta_2 Exposure_v^1 + \beta_3 Exposure_v^2 + \gamma y_{hv}^{Pre} + \varepsilon_{hv}$$

   where $Exposure_v^1$ and $Exposure_v^2$ measure the proximity of village $v$ to other treated villages and to other villages on candidate list of the county.

2. In theory, GE effects should be negligible IF village market access is dominated by trade with urban county centers.
   - Compute share of other villages in rural market access in our provinces (using distances and village-level populations or employment).

# Estimating GE Effects (2)

| Dependent Variables | | Treatment on Treated without Spillovers | ToT with Spillovers: Number of Terminals within 3 km Outside of Village | ToT with Spillovers: Number of Terminals within 10 km Outside of Village |
|---|---|---|---|---|
| Any Member of Household Has Ever Sold through E-Commerce (Yes=1) | Treat Dummy | -0.0129 | -0.0135 | -0.0148 |
| | | (0.0104) | (0.0101) | (0.0101) |
| | Exposure to Terminals Outside the Village | | -0.00142 | -0.00233 |
| | | | (0.0102) | (0.00202) |
| | Exposure to Other Villages | | -0.00335*** | -0.000285 |
| | | | (0.00102) | (0.000363) |
| | First Stage F-Stat | 45.30 | 47.63 | 44.61 |
| | Number of Obs | 3,504 | 3,504 | 3,504 |
| Household Has Ever Bought Something through E-Commerce Terminal (Yes=1) | Treat Dummy | 0.0886*** | 0.0786*** | 0.0862*** |
| | | (0.0271) | (0.0266) | (0.0267) |
| | Exposure to Terminals Outside the Village | | 0.0655** | -0.00611 |
| | | | (0.0311) | (0.00568) |
| | Exposure to Other Villages | | -0.00245 | 0.00252** |
| | | | (0.00538) | (0.00111) |
| | First Stage F-Stat | 45.56 | 48.11 | 44.91 |
| | Number of Obs | 3,518 | 3,518 | 3,518 |
| Share of E-Commerce Terminal in Total Retail Expenditure | Treat Dummy | 0.0124*** | 0.0101** | 0.0119*** |
| | | (0.00434) | (0.00398) | (0.00422) |
| | Exposure to Terminals Outside the Village | | 0.0159* | -0.00128 |
| | | | (0.00834) | (0.000923) |
| | Exposure to Other Villages | | -0.000594 | 0.000506** |
| | | | (0.000523) | (0.000228) |
| | First Stage F-Stat | 44.03 | 46.57 | 43.50 |
| | Number of Obs | 3,434 | 3,434 | 3,434 |
| Log Local Retail Prices (All Prices) | Treat Dummy | 0.0352 | 0.0338 | 0.0386 |
| | | (0.0263) | (0.0258) | (0.0252) |
| | Exposure to Terminals Outside the Village | | 0.00353 | 0.00382 |
| | | | (0.0314) | (0.00562) |
| | Exposure to Other Villages | | -0.00318 | -0.00135 |
| | | | (0.00314) | (0.000950) |
| | First Stage F-Stat | 41.66 | 43.89 | 43.95 |
| | Number of Obs | 6,877 | 6,877 | 6,877 |

(Back)

# Q1: Are Our Sample Villages Representative? (1)

# Q1: Are Our Sample Villages Representative? (1)

- Run following regression using firm database:

$$y_{vm} = \theta_m + \beta \mathrm{RCTSample}_v + \gamma \mathrm{MonthsSinceEntry}_{vm} + \varepsilon_{vm}$$

- v = terminal (village)
- m = month

# Q1: Are Our Sample Villages Representative? (2)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Full Sample | Full Sample | Full Sample | 3 Provinces | 3 Provinces | 3 Provinces |
| VARIABLES | N Users | N Transactions | Sales (RMB) | N Users | N Transactions | Sales (RMB) |
| RCT_Sample | -4.110 | 0.0605 | -6,034 | 0.149 | 12.65 | -3,747 |
| | (7.751) | (25.33) | (4,061) | (7.734) | (25.32) | (4,066) |
| Observations | 125,204 | 125,204 | 125,204 | 100,098 | 100,098 | 100,098 |
| R-squared | 0.037 | 0.047 | 0.029 | 0.031 | 0.046 | 0.030 |
| N Cluster | 11731 | 11731 | 11731 | 8471 | 8471 | 8471 |

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Full Sample | Full Sample | 3 Provinces | 3 Provinces |
| VARIABLES | N Transactions | Weight (kg) | N Transactions | Weight (kg) |
| RCT_Sample | 1.712** | 5.154 | 1.364* | 4.680 |
| | (0.753) | (4.332) | (0.752) | (4.333) |
| Observations | 120,483 | 120,483 | 95,744 | 95,744 |
| R-squared | 0.060 | 0.023 | 0.067 | 0.026 |
| N Cluster | 11904 | 11904 | 8591 | 8591 |

- Sample of RCT villages do not appear to be particular.(Back)

# Q2: Seasonality (1)

# Q2: Seasonality (1)

- Run following regression using firm database:

$$y_{vm} = \theta_v + \beta \mathrm{RCTMonth}_m + \gamma \mathrm{MonthsSinceEntry}_{vm} + \varepsilon_{vm}$$

- v = terminal (village)
- m = month

# Q2: Seasonality (2)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Full Sample | Full Sample | Full Sample | 3 Provinces | 3 Provinces | 3 Provinces |
| VARIABLES | N Users | N Transactions | Sales (RMB) | N Users | N Transactions | Sales (RMB) |
| | | | | | | |
| RCT_Month | 0.893*** | -4.671*** | -1,565*** | 0.568** | -5.290*** | -585.9 |
| | (0.255) | (0.818) | (451.5) | (0.274) | (0.863) | (458.0) |
| | | | | | | |
| Observations | 125,204 | 125,204 | 125,204 | 100,098 | 100,098 | 100,098 |
| R-squared | 0.694 | 0.680 | 0.219 | 0.679 | 0.667 | 0.227 |
| N Cluster | 11731 | 11731 | 11731 | 8471 | 8471 | 8471 |

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Full Sample | Full Sample | 3 Provinces | 3 Provinces |
| VARIABLES | N Transactions | Weight (kg) | N Transactions | Weight (kg) |
| | | | | |
| RCT_Month | -0.387*** | -1.256*** | -0.498*** | -1.407*** |
| | (0.0225) | (0.125) | (0.0261) | (0.138) |
| | | | | |
| Observations | 120,483 | 120,483 | 95,744 | 95,744 |
| R-squared | 0.592 | 0.432 | 0.570 | 0.422 |
| N Cluster | 11904 | 11904 | 8591 | 8591 |

- Point estimates on seasonality very small.(Back)