E-Commerce Integration and Economic Development: Evidence from China

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Motivation

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- The number of people in China buying/selling products online has risen from practically 0 in 2000 to more than 750 million by 2020.
  - Most of growth to date has taken place in cities.
- Chinese government has made expansion of e-commerce to the countryside policy priority to close rural-urban economic divide.
  - Entered partnership with large Chinese e-commerce platform.
  - Growing number of countries with similar programs (e.g. India, Vietnam, Egypt, UNCTAD's "E-trade for all").
- Policies mainly motivated by case studies of successful "e-commerce villages".
  - Focus on production side: urban market access meant to raise demand and unleash entrepreneurship.
  - On consumption side: descriptive evidence that smaller cities have larger e-commerce expenditure shares.
- Still relatively little rigorous evidence on economic effects of e-commerce integration in developing countries.

This Project

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- Aims to provide evidence on the potential of e-commerce integration to foster economic development in the countryside.
  - What is the impact for average local household welfare?
  - What are the underlying economic channels?
  - What is the distribution of the gains from e-commerce across households and villages?
- To this end, we combine:
  - RCT across villages that we implement in collaboration with a large Chinese e-commerce firm.
  - 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.

Bringing E-Commerce to the Countryside

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- E-commerce: ability to buy/sell products online with local parcel delivery or pick-up.
- Bringing e-commerce to the countryside in developing countries is not just about internet access.
  - Smartphones widespread in China (>50% in our sample), and villages already connected to internet.
- Two central barriers:
  1. Logistical: countryside mostly not serviced by commercial parcel delivery and pick-up.
  2. Transactional: Villagers not used to or trusting online interfaces, and limited access to online payment systems.

Program in China

Program in China

- Program aims to connect 100,000 villages to e-commerce.
- 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.
- Objective of the program:
  - Provide same level of e-commerce access in villages as in counties' main city center.

What Is the Treatment?

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- Reduction in trade costs vis-a-vis rest of urban China already connected to e-commerce.
  - Logistical: Reduction in physical trade costs.
  - Transactional: Reduction in information or transaction costs
- Giving village economies urban-equivalent market access through e-commerce terminal.
  - Independent of effect of first-time internet connections more broadly.
  - Only affecting trade through e-commerce, leaving other trade costs unchanged.

Methodology

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- 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.

Field Experiment

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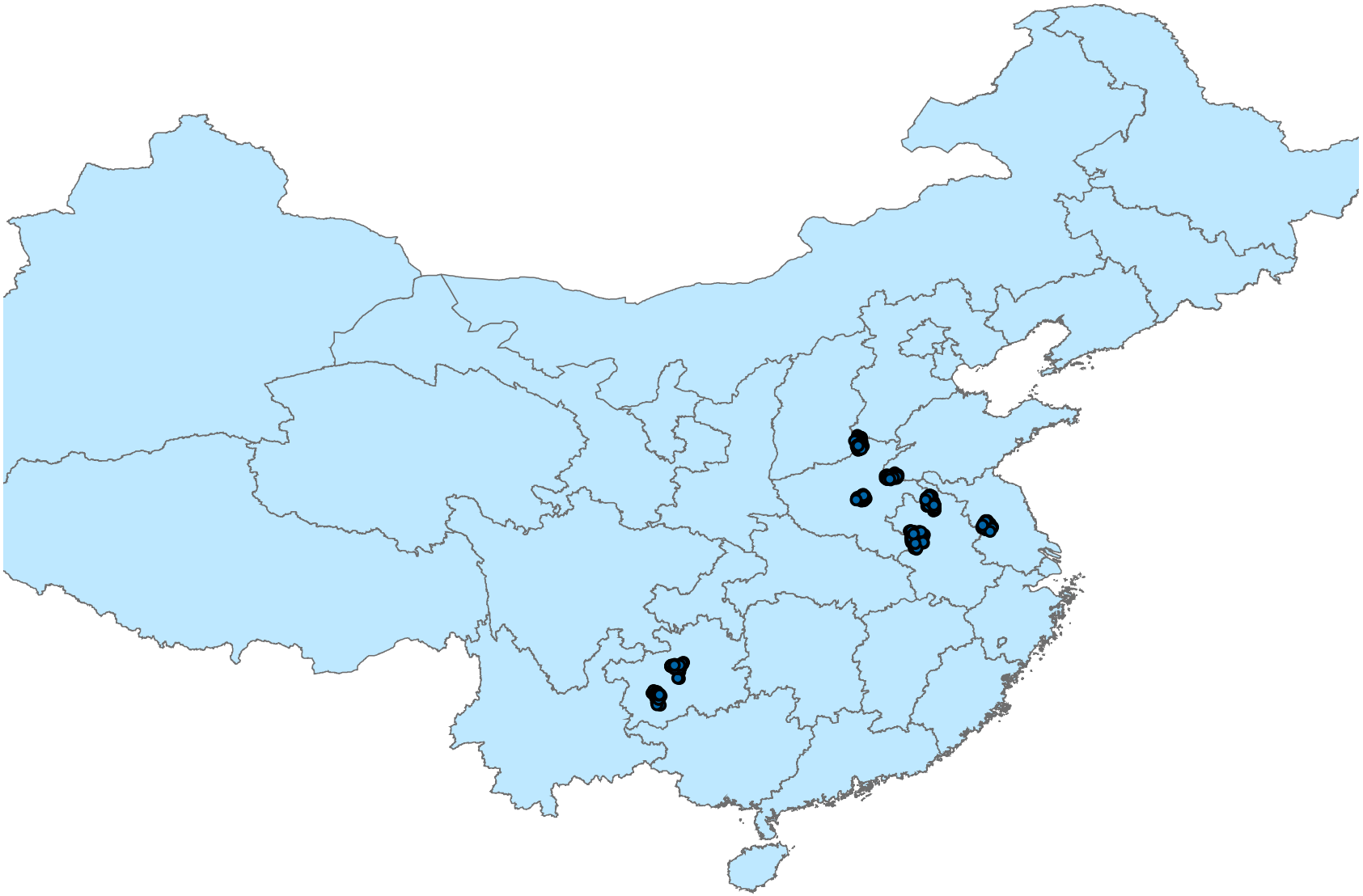
- Location: 8 counties located in 3 provinces: Anhui, Henan and Guizhou.
- Design:
  - For each county, we obtain extended list of candidate villages (54 per county, 432 total).
  - Randomly select 5 control and 7-8 treatment villages for data collection.
  - This yields sample of 40 control villages and 60 treatment villages.
- Timing: baseline data in Dec 2015, Jan/Apr/May 2016. Endline 1 year after.
- Median village population$\approx$2500 (800 households).
- Sample includes both villages with pre-existing parcel delivery and without.

Map



Sample Villages

Warehouses

E-Commerce Terminal

Findings from RCT: Consumption

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- The program leads to sizable shift in expenditures *among users*.
  - These households account for 14% of the village population.
  - They shift 15% of monthly expenditures to e-commerce (45% for durables).
  - But village-level average effect more muted: 1.2% and 7% respectively.
- Significant heterogeneity:
  - Effects driven by villages *without* pre-existing parcel delivery.
  - Users are younger, richer households, living closer to terminals and in relatively more remote villages.
  - No evidence that education, occupation or characteristics of terminal manager make a difference.

Findings from RCT: Incomes and Local Stores

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- No evidence of significant effects on incomes, labor supply, entrepreneurship (neither positive nor negative).
- No evidence of pro-competitive effects on local store prices.
    - Some (more tentative) evidence of new product additions in local stores.

Additional Evidence from Firm's Database

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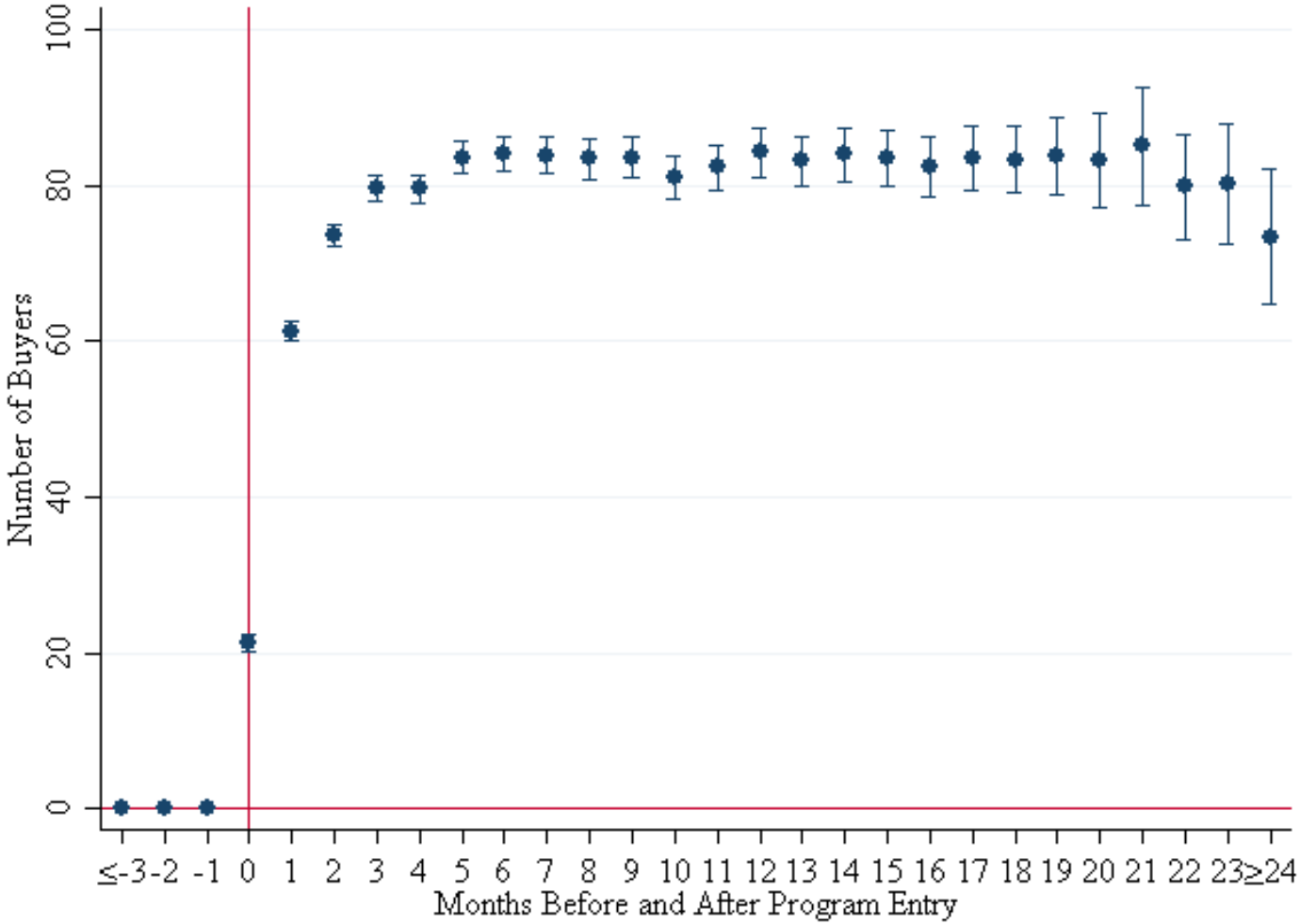
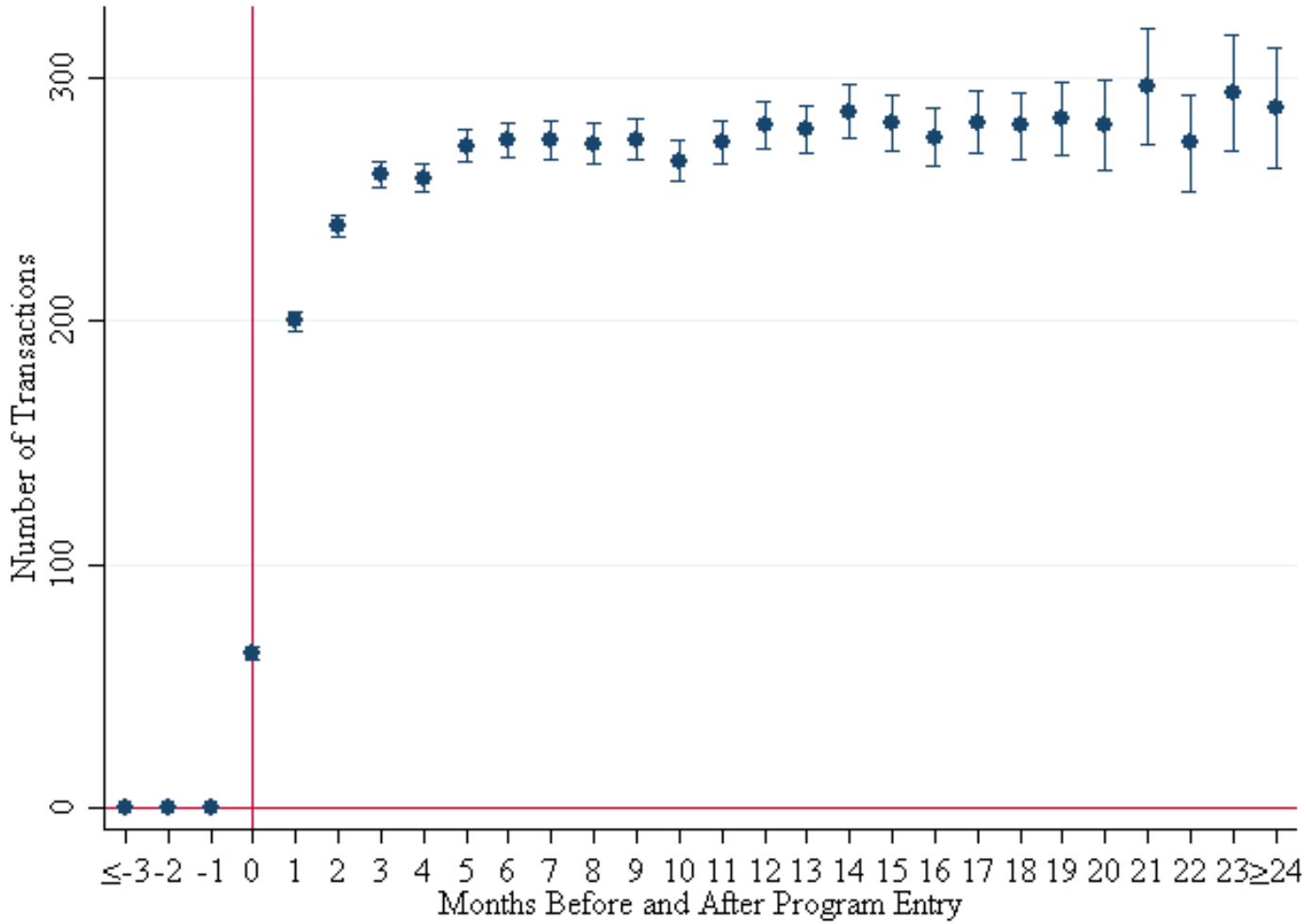
1. 100 villages do not appear to be outliers relative to all villages in 5 provinces.
2. Seasonality not a significant driver of effect sizes.
3. Consumption side: effects materialize 2-4 months post entry.
4. Production side: effects increase steadily beyond 12 months, but remain small.
5. No evidence of rare, but highly successful tail events that would shift the village mean outcomes.

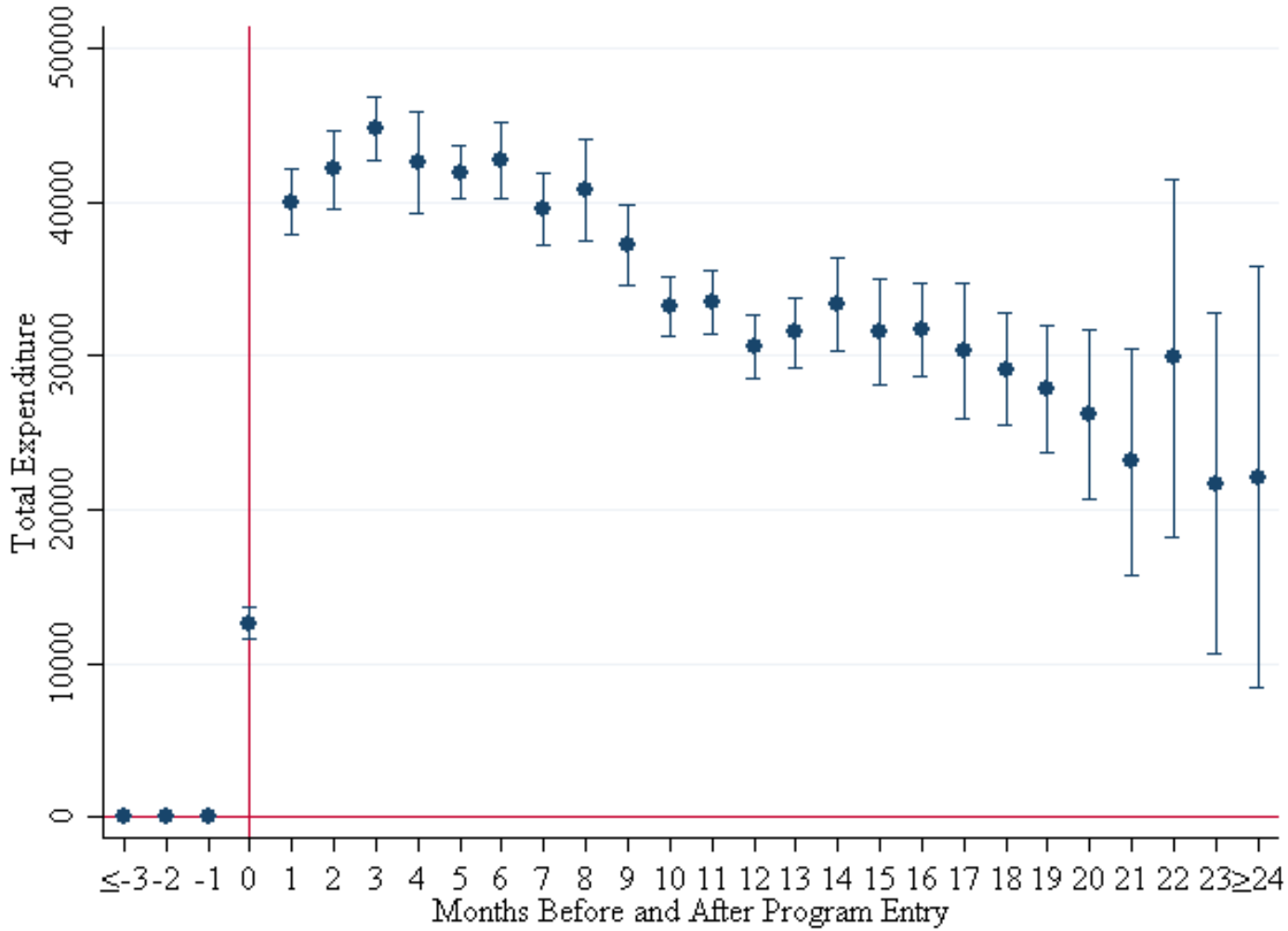
Evidence from Firm Database: Number of Buyers



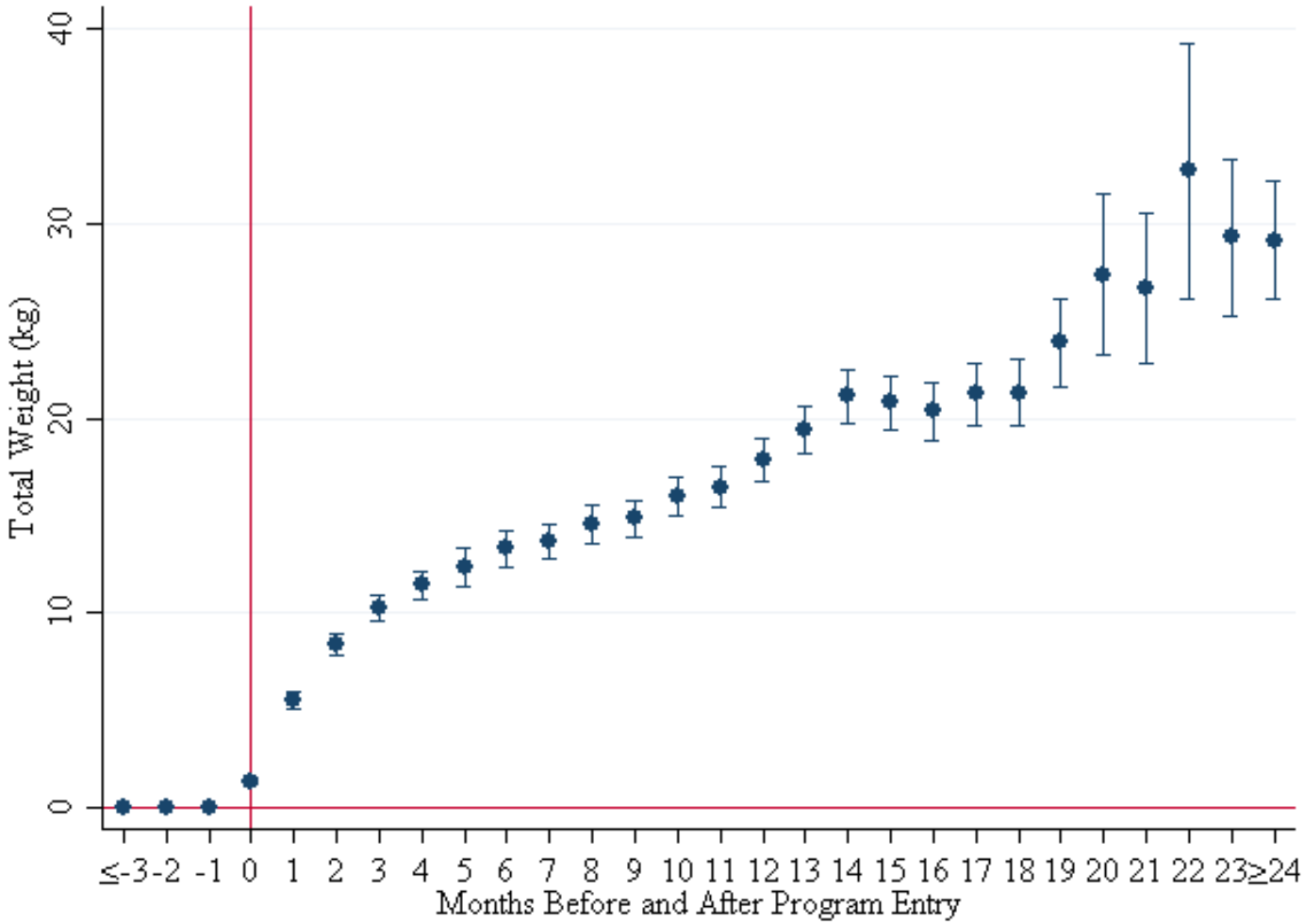
Evidence from Firm Database: Number of Purchases



Evidence from Firm Database: Terminal Sales



Evidence from Firm Database: Village Out-Shipment Weight



Are We Missing Successful Tail Events?

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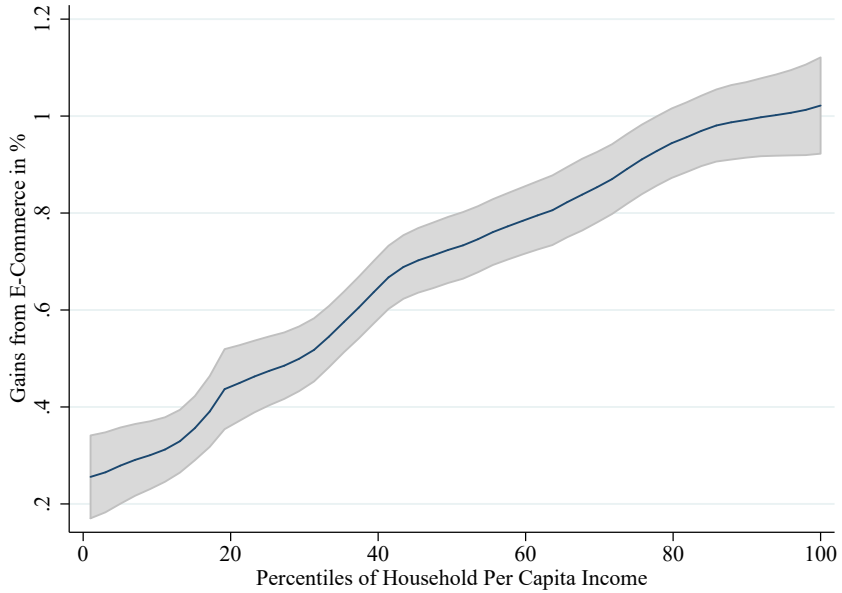
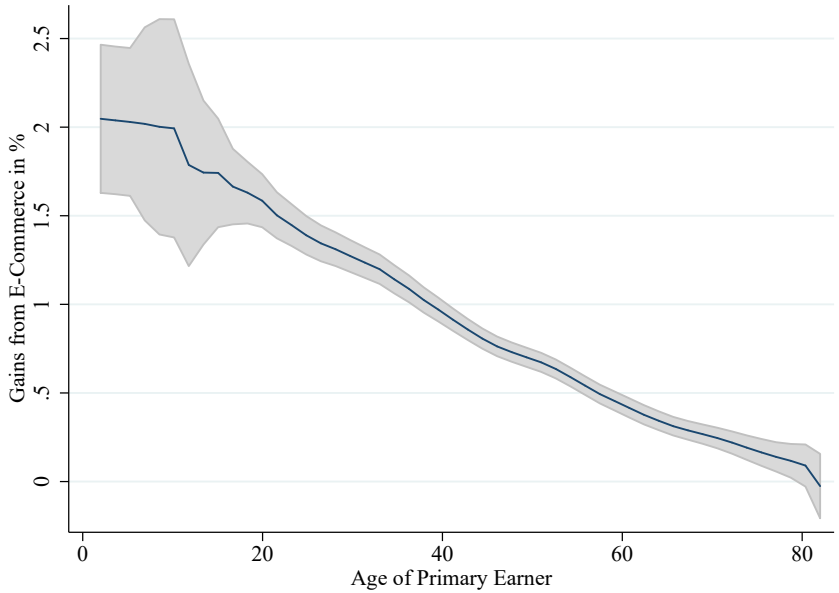
- Bounding production-side effect on local income per capita:
  - Total village average export weight is 30 kg per month after 2 years (assume all of this is pure value added).
  - Apply (upper-bound) unit value from Chinese international export data: RMB66.5 per kg.
- Upper-bound effect on village income per capita: 0.14%.

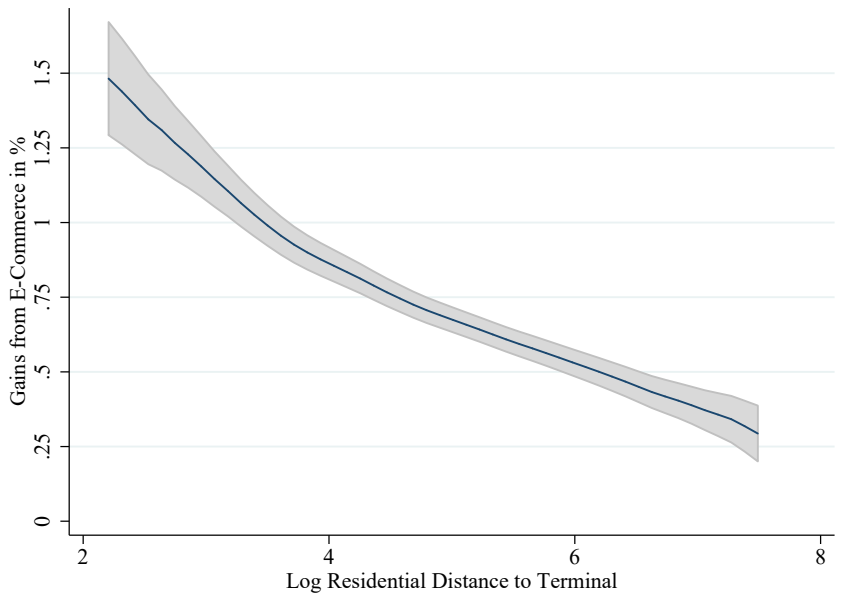
Real Income Effects

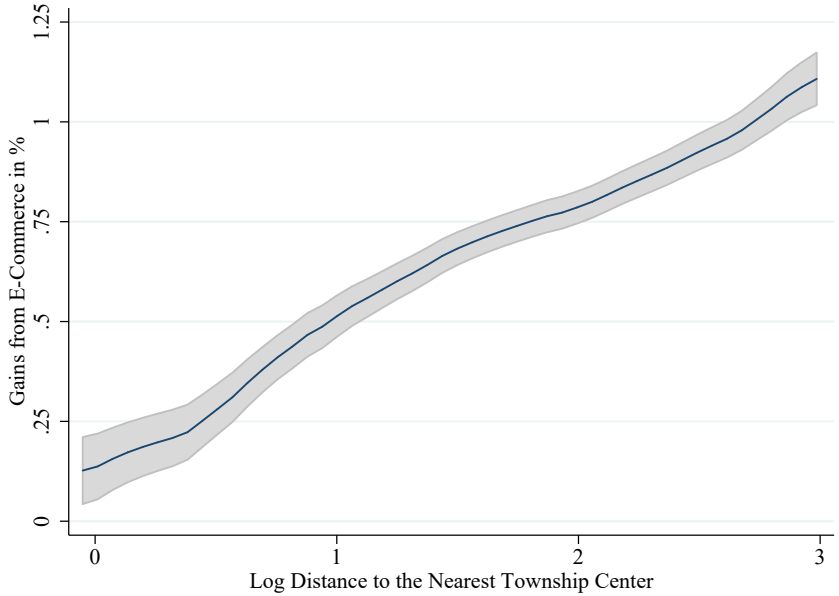
	Unweighted (Effects in Sample)		
	Durables Consumption	Non-Durables Consumption	Total Retail Consumption
Reduction in Retail Cost of Living for All Households	3.298% (0.027)	0.478% (0.004)	0.812% (0.005)
Reduction in Retail Cost of Living Among Users	19.331% (0.215)	3.722% (0.029)	5.464% (0.035)

Heterogeneity of Real Income Effects









Conclusion

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- Findings can provide some initial insights for current policies and future research.

1. E-commerce leads to significant gains for certain groups of rural households, rather than broad-based.
    - Strong heterogeneity of gains.
2. Evidence pointing to quite particular mix of local factors underlying prominent success stories of "e-commerce villages".
    - In absence of complementary interventions (e.g. credit, training, promotions, (?)), large production-side effects unlikely to arise for average rural market place.
3. Understanding the factors that make e-commerce be transformative for rural production side interesting agenda for future research.