Discussion of "Are There Too Many Farms in the World? Labor-Market Transaction Costs, Machine Capacities and Optimal Farm Size," by Foster and Rosenzweig

Diego Restuccia
University of Toronto
and NBER

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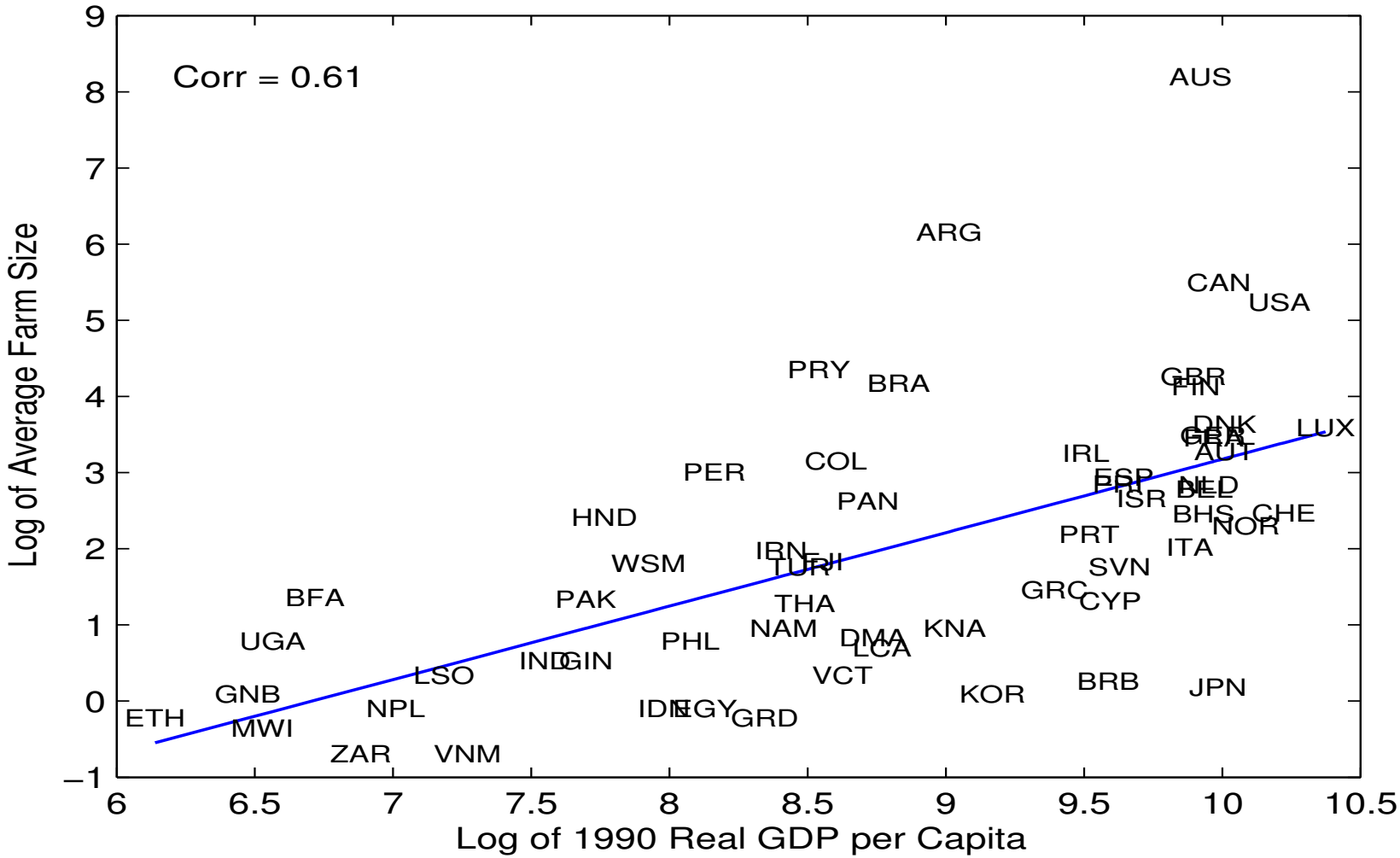
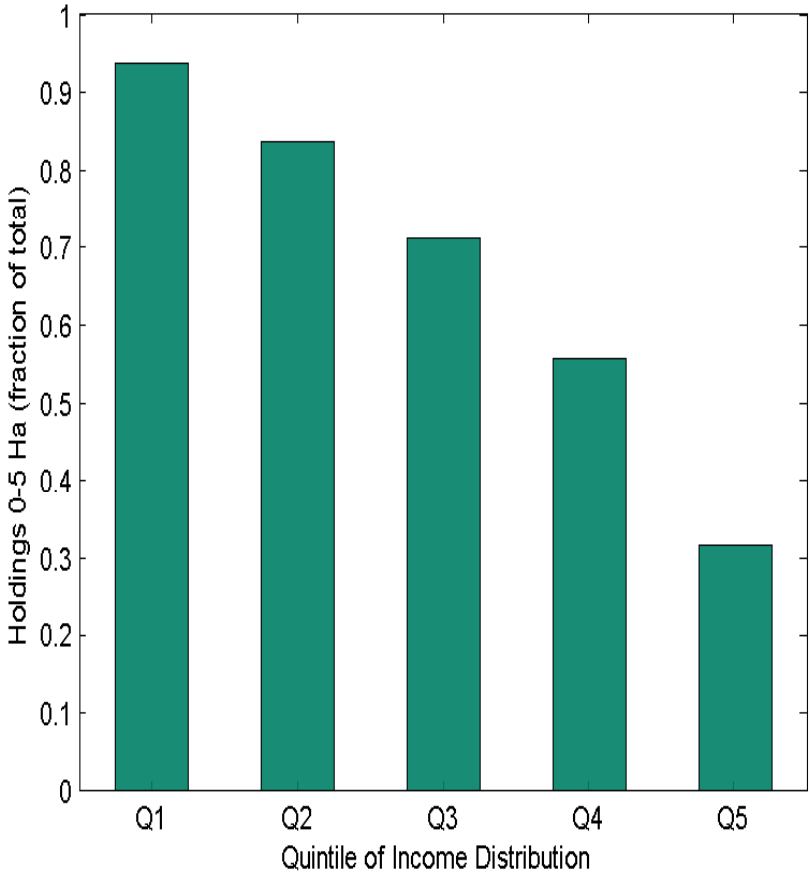
Average Farm Size across Countries



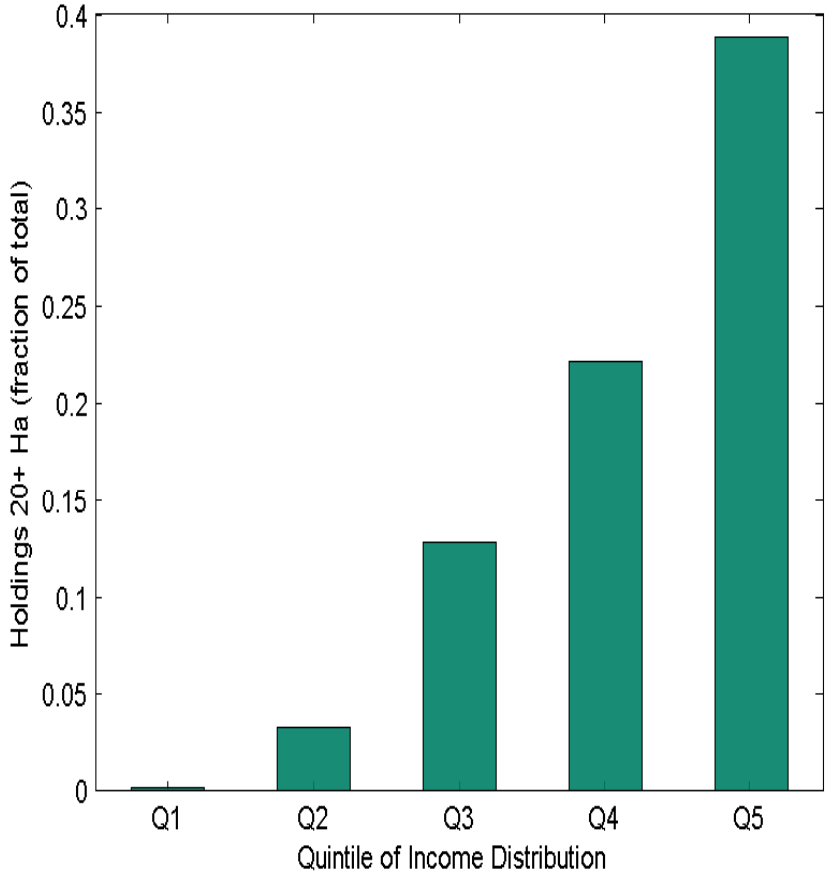
- Source: Adamopoulos and Restuccia (AER 2014)

Size Distribution of Farms across Countries

Small (< 5 Ha)

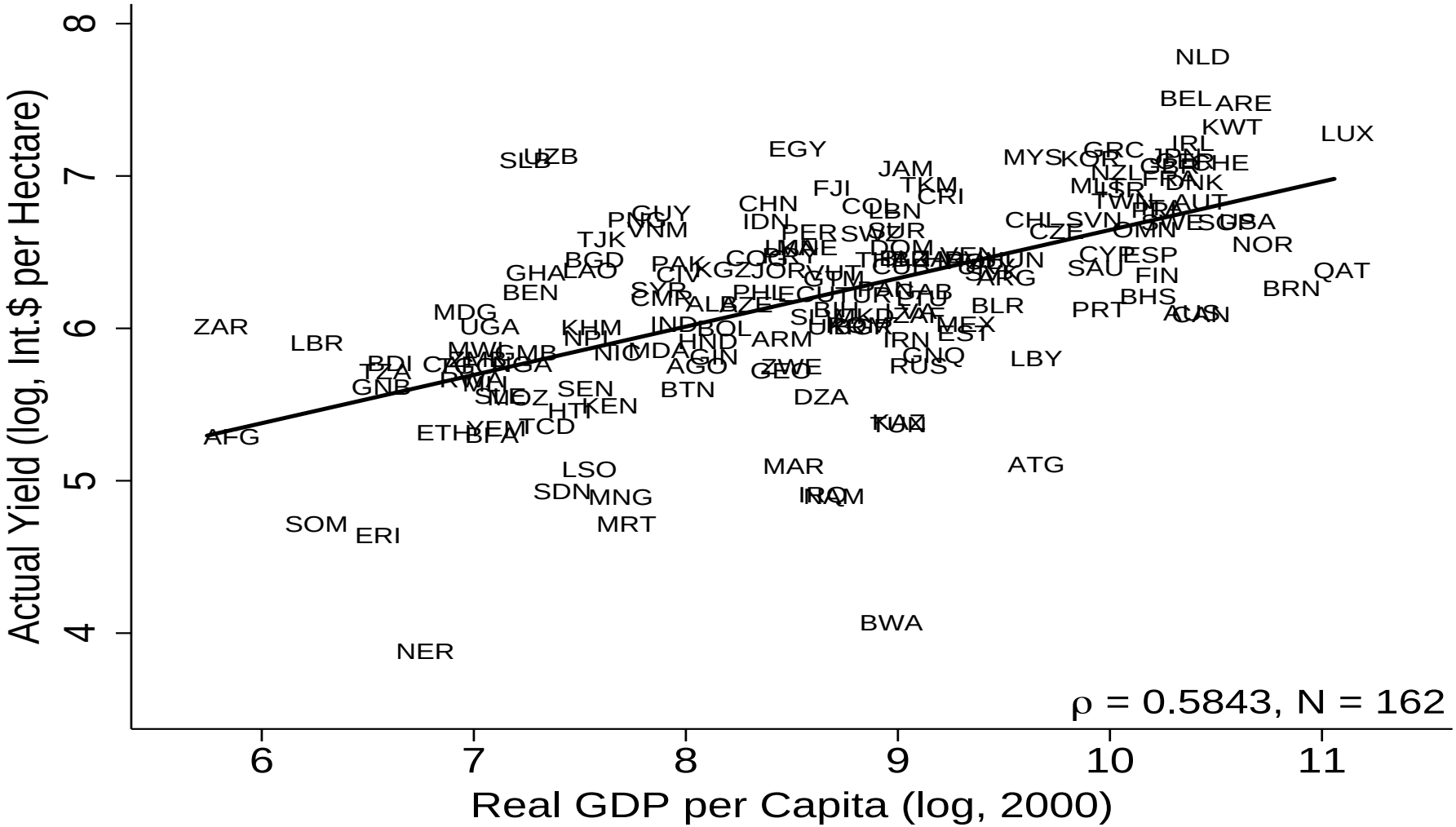


Large (> 20 Ha)



- Source: Adamopoulos and Restuccia (AER 2014)

Land Productivity in Agriculture



- Source: Adamopoulos and Restuccia (NBER WP 2018)

This Paper

- Focuses on documenting U-shape relationship between farm size and productivity using micro data from India
- Transaction costs in the labor market and machine capacity are key channels
- There is little to disagree with their analysis and conclusions: the world is littered with policies attempting to exploit the inverse size-productivity relationship with dismal results
- My discussion: provide a macro perspective into the main factors driving small farm sizes in poor countries

(1) Productivity and Farm Size

- Small farm size is a symptom of low productivity in poor countries
- Simple framework: Standard two-sector model of agriculture and non-agriculture
- Non-homothetic preferences: minimum consumption requirement of agricultural goods $\bar{a}$, and only care to consume $\bar{a}$, hence, $c_a = \bar{a}$
- Normalize population and productive time to 1
- L units of total land
- Aggregate production function: $Y_a = A\kappa L^{\gamma} N_a^{1-\gamma}$

(1) Productivity and Farm Size

- Implications: $c_a = Y_a = \bar{a}$
- Solve for labor allocation in agriculture

$$N_a = \left(\frac{\bar{a}}{A\kappa L^{\gamma}} \right)^{\frac{1}{1-\gamma}}$$

- Average farm size is roughly proportional to

$$\frac{L}{N_a}$$

- Low average farm size is a productivity problem in poor countries
- Quantitatively, differences in aggregate factors (A, L) only account for small portion of farm size differences between rich and poor countries (Adamopoulos and Restuccia, AER 2014)

(2) Distortions, Productivity, and Farm Size

- Farm size and productivity are deeply confounded by distortions
- Back to simple framework: Incorporate production heterogeneity
- Build on Lucas-Hopenhayn establishment-size theory
- Production unit is a farm: requires the labor and managerial ability of farmer and land input

$$y_i = A s_i^{1-\gamma} l_i^{\gamma}$$

where l_i is operated land and s_i idiosyncratic productivity

- Assume farmer operates facing idiosyncratic output distortions τ_i in competitive markets (catch all to rationalize operational scales, convenient for counterfactuals)

(2) Distortions, Productivity, and Farm Size

- Farmer problem

$$\max_{l_i \geq 0} (1 - \tau_i) A s_i^{1-\gamma} l_i^{\gamma} - q l_i$$

- From FOC, farm size is

$$l_i = \left[\frac{\gamma A (1 - \tau_i) s_i^{1-\gamma}}{q} \right]^{\frac{1}{1-\gamma}}$$

- Farms of same size could have very different productivities
- In this context, farm size is just not useful for categorization
- Distortions lower productivity in agriculture (misallocation), implying small farm sizes in poor countries

(3) Yield and Productivity

- Yield not necessarily a useful measure of productivity at the farm level, relationship affected by distortions and technology
- Back to simple framework: From FOC, yield is

$$\frac{y_i}{l_i} = \frac{q}{\gamma} \frac{1}{(1-\tau_i)}$$

- With no distortions, yield should be the same across farmers with different productivities s_i
- Yields track productivity well with extreme distortions, e.g. when l_i fixed and equal across farmers

(3) Yield and Productivity

- Technology can confound yield and productivity relationship
- CES technology, capital and land more substitutable than Cobb-Douglas, land augmenting productivity
- Even without distortions, yield higher in small farms where productivity is low
- However, this property of technology not key for cross-country farm-size implications (Adamopoulos and Restuccia, AER 2014)