

Risky Agriculture, Farm Earnings, and Development (Preliminary title of preliminary slide presentation)

by Antonio Ciccone (ICREA-UPF)
10 February 2008

What the slides try to show:

Farm earnings may be low compared to manufacturing in (very) poor countries because farming involves insurance against high food prices in years of very bad harvests.

Hence, the slides try to show how food quantity risk in the farming sectors may get transformed into food (price) risk that has to be borne by manufacturing workers in some circumstances.

The slides also examine how aggregate agricultural risk may matter for the transition from agriculture to manufacturing.

There are quite a few instances in the economics literature where people argue that farming pays less than manufacturing in poor economies. There are several plausible explanations for this. For example, measurement. Maybe identical people are paid exactly the same in the two sectors and earnings differentials only arise because of imperfect measurement. Another explanation is that there are barriers that prevent farmers from moving into manufacturing.

The slides explore a perspective I have not seen in the literature. Very briefly, high food prices in years of bad harvests—very bad times in countries that are already poor in the best of circumstances—are more harmful to manufacturing workers than farmers. Could it be that this results in an earnings premium for manufacturing workers in equilibrium?

Assumptions:

(A1) Households are identical ex-ante and can choose freely whether to become farmers or manufacturing workers.

-- The goal is to show that identical people who can choose freely in which sector to work may have different average earnings depending on the sector they end up in. So this assumption seems to make sense.

-- The cost of this assumption is that all manufacturing workers will sometimes be worse off than all agricultural workers. With individual heterogeneity, this would only be the case for people at the margin between the two sectors.

(A2) Households are very averse to the risk of low food consumption.

-- This appears to make sense as everybody is aware of the fact that survival requires a minimum calorie intake.

(A3) The share of income households allocate to food decreases as their incomes rise.

-- There is ample empirical evidence supporting this.

(A4) Households have to work in either farming or manufacturing.

-- Without this (minimum) amount of increasing returns there would be no need for trade/markets. Every household could retreat to autarchy and simply produce the amount of food and manufactures consumed.

(A5) Markets are competitive. There is no insurance market.

-- Very low farm earnings relative to manufacturing earnings are mainly observed in very poor countries. It doesn't seem too big a stretch to assume a lack of insurance markets there (especially as such insurance markets require quite a bit of institutional infrastructure for ex-post enforcement of insurance contracts). In any case, the point of the paper is to argue that the lack of insurance markets only turns into a problem when agricultural productivity levels are low. When agricultural productivity is high, equilibrium allocations will be Pareto efficient even without insurance markets.

Main result:

(R1) When agricultural productivity in the worst case scenario is above some threshold, the competitive equilibrium is Pareto efficient and farmers and manufacturing workers earn the same in expectation.

-- Hence, and maybe surprisingly, Assumptions (A1)-(A5) do not necessarily imply that farming has an element of self-insurance against high food prices in times of bad crops. In this equilibrium everybody gets the same amount of food in all states and there is no risk of a food shortfall that would require a compensating earnings premium.

(R2) When agricultural productivity in the worst case scenario is strictly below some threshold, the equilibrium is Pareto inefficient and farmers earn less in expectation than manufacturing workers.

-- Hence, low agricultural productivity is necessary for the equilibrium allocation to be Pareto inefficient and manufacturing workers to earn a risk premium to compensate for high food prices in years of bad harvests.

-- Why is it that, in this case, there are not enough farmers in equilibrium to keep food prices relatively low even in the worst case scenario (to ensure the same amount of food for everybody in all states)? Intuitively, what happens is the following. The first-best number of farmers cannot be decentralized as a competitive equilibrium because (i) low food prices in years of good harvests keep earnings of farmers low (this was also the case under the conditions of (R1)) and, moreover, (ii) low agricultural productivity in the worst case scenario implies that farmers earnings are not sufficiently high in times of bad harvests either. As a result, the equilibrium number of farmers is less than first best, food prices in years of bad harvests are relatively high, and manufacturing workers require a wage premium to be compensated for the food shortfall in years of bad harvests.