Agriculture, Structural Transformation, and Growth: Rethinking the Connections

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I. Introduction

Agriculture, structural transformation, and growth: central questions

- What do we know about the agricultural sector's role in generating structural transformation and growth in low-income economies?
  - How much does agricultural technology drive the growth process?
  - Is an agricultural revolution necessary for industrial revolutions?
- How has our understanding changed in recent years?
- What are implications for research and policy?

An old topic

- Understanding agriculture's role in development has long been a focus in the development and growth literature.
- Much literature has posited a singular role: "agriculture's role in development"
  - Reflects a desire to articulate a coherent theoretical framing
- Often linked to something of an advocacy position:
  - "Agriculture is important, and we should prioritize it in development investments."

Some examples of literature

- B Johnston and J Mellor (1961), "The role of agriculture in economic development"

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- D Gollin, S Parente, and R Rogerson (2002), "The role of agriculture in development"

Moving beyond a singular role for agriculture

- But why should we expect that there is a single role for agriculture in development?
  - Geographic contexts matter...
  - Economic circumstances change
- Newer literature challenges us to look deeper and to recognize heterogeneity in many dimensions.
  - Not least: look at the broader economy, beyond the farm.
  - Recognize complexities within the food and agriculture sectors.

Specific questions

Some questions:

- Is agricultural growth a ***necessary*** condition for structural transformation and growth?
  - Is it a ***sufficient*** condition?
- What is the ***spatial scale*** at which agricultural productivity induces transformation?
- Is growth driven by agriculture ***more inclusive***?
- What is "agriculture"?
  - Not all agriculture produces food
  - Not all food comes from agriculture
  - What are the roles of (for example) processing, packaging, distribution, retailing, and food service?
- Are Green Revolutions still possible today?

Some elements to consider

Different contexts may require distinct models. Some key issues to consider:

- Spatial frictions, openness, and trade – within and between countries
- Factor mobility
- Factor-biased technological change
- Dietary changes

$\Rightarrow$ Central argument: need to recognize that agriculture's role varies with these (and other) factors.

$\Rightarrow$ Not a singular role for agriculture: heterogeneity and context-specificity.

$\Rightarrow$ Implications for investments in agriculture

$\Rightarrow$ Implications for research in macro/growth and development economics.

II. Partial Openness

The closed economy assumption

- The closed economy assumption of the Johnston-Mellor story is perhaps a reasonable framework for some economies:
  - landlocked economies with heavily rural populations (e.g., Uganda, Burkina Faso, Bolivia)
  - island economies isolated from major trade routes (e.g., Madagascar, Fiji, Solomon Islands)
- But the experience of many Gulf states and other resource exporters reminds us that agricultural growth is clearly not a *necessary* condition for growth and development.
  - Saudi Arabia, UAE; perhaps also Nigeria?
  - Trade entrepots and service-based economies also seem to grow without (significant) agricultural productivity growth: Singapore, Taiwan, Panama?

The open economy assumption

- If an economy is open and trade is frictionless, then sectoral structure is (in principle) not linked to consumption patterns.
  - Economic structure is determined by comparative advantage (factor endowments and/or technology differences).
  - Non-homothetic preferences and changes in relative prices do not drive change.
- In this world, agricultural productivity growth (in absolute terms) does not necessarily drive structural change.
  - Changes in *relative* productivity may still drive structural change.
  - High levels of agricultural productivity may in fact be detrimental to growth.

Partial openness

- Increasingly, we are recognizing that models of developing economies as either 'open' or 'closed' are inadequate.
- Many economies are effectively open at the border but subject to large internal spatial frictions.
- Old trade literature:
  - Countries are points in space, with costly trade between them.
- New view:
  - Countries are spatially complex; domestic spatial frictions are important.

Spatial frictions and agriculture

- Recent literature asks how spatial frictions mediate the role of agriculture in low-income economies.
- Examples:
  - Donaldson and Hornbeck (2016)
  - Donaldson (2018)
  - Sotelo (2020)
  - Farrokhi and Pellegrina (2023)
  - Pellegrina (2022)

III. Agriculture $\neq$ Food

Disentangling food and agriculture

- Many theories of agriculture and growth have assumed implicitly that agriculture is food.
- But not all agricultural production is 'food', in the sense of these models:
  - Cotton and other fibers
  - Coffee, tea, cocoa, etc.
  - Soya and maize: inputs into industrial animal agriculture
  - Some (though not all) horticulture produces food, but not starch staples
- Similarly, not all food comes (entirely or primarily) from agriculture:
  - Highly processed foods (e.g., soft drinks, snacks)
  - Even with relatively unprocessed foods, the farm share of retail price is small.

Why does this matter?

- Old models linked agricultural productivity increases to declining food prices.
  - But this mechanism may be weak in some of today's low-income economies.
  - Increasing oil palm production may generate export earnings but will not reduce food prices.
  - Urban consumers may face world prices.
    - ★ domestic production increases may have little effect on consumers.
- Conversely, food prices may rise or fall because of changes in prices or productivity of non-food commodities.
  - An increase in the price of *qat* (non-food stimulant crop) in Ethiopia may drive up food prices (through land use changes) without any change in productivity.

Why does this matter? (cont.)

- The existence of non-food agriculture drives a wedge between producers (of agriculture) and consumers (of food).
- What is good for the former is not necessarily good for the latter, and vice versa.
- In the old models, agricultural productivity growth could (with the right elasticities) both lead to higher profits for farmers and lower food prices for consumers.
  - Once we allow for non-food agricultural goods, this becomes less likely.

Changing diets

- A related phenomenon is that urban consumers in low-income countries are undergoing huge changes in diets (e.g., Cockx et al., 2018).
  - Moving away from rural starch staples towards processed and prepared foods (such as pasta, bread, cooking oil).
  - Reflects changes in women's time values.
  - Also reflects changes in household cooking technology and living conditions. (See Senauer et al., 1991)
- Increasing productivity of traditional starch staples will do little to stimulate the economy.

IV. Discussion and Conclusion

Some implications

- Embrace the heterogeneity in agriculture's role in the economy.
- No universal pattern in which agriculture is the sector that drives growth.
  - True in some specific contexts
  - Not true in others
  - Sometimes agriculture leads growth; sometimes it follows.
- We should not approach the data with the idea that we will always find a particular relationship.

Are Green Revolutions still possible today?

- A more nuanced understanding of this relationship can help sharpen the focus of development policy.
- We shouldn't assume naively that we need only to repeat strategies that worked in the 1960s in South and East Asia.
  - No guarantee that these strategies will work in sub-Saharan Africa today.
- Need to adapt policy to recognize that the contexts have changed in important ways.
  - Greater integration of global agricultural markets.
  - Fewer people are as close to subsistence initially.
- Need clarity on both objectives and strategies:
  - Improving smallholder livelihoods may be important as a short-term poverty reduction strategy, but not as a long-term objective in itself.
  - Improving yields of staple crops is not the same as improving productivity or livelihoods.
- Continuing need for multidisciplinary research that brings clarity to this conversation!

V. References

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