FDI and Alternative Supply Chain Design

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overview

- Recent development in agriculture
- The growth of agribusiness
- Land leasing
- Supply chains and FDI
- Contracting vs. vertical integration
- The benefits and costs of FDI

Transition of agriculture triggers FDI

For 100 + years farmers produced commodities to mass markets- **but this is changing-**

- Transition from commodities to differentiated products
- Transition from sales to markets to contracting and vertical integration.
- Adjustments to environmental concerns &regulations
- Some processes continue
  - Industrialization of production. especially in livestock.
  - Increase in farm size and decline in #of farms-in developed countries and some developing ones
  - Increased importance of purchased inputs
  - **Globalization-pursuit of international markets & alliances**

The Forces Shaping the Agricultural Economy

- Supply and production
  - High rates of technological change-resulting from public research (mostly biological), private innovation (mechanical). spillovers from other sectors (power)
  - Yield/person increased globally by 12% since 1950 total acreage be 25%
  - Population productivity growth outpaced population growth (till recently)
  - But research productivity is declining
  - Less investment and heavier regulations
  - Growing demand for opportunities to expand production

Demand

Policy responses to the farm income problem 20 century ag policies

- Subsidization- policies that support income by raising prices, payment for land diversion etc.
- Protectionism-limits on certain food export (Sugar)
- Subsidies are exercised by U.S, Europe and Japan
- They harm developing countries ($300 Billions/year worth of protection)
- High food prices in 21 century reduce subsidies and open borders

Policies shaping 21st century ag

- Biofuel and energy security policies
  - Mandate to produce renewable fuels – with some environmental protection
- Food security policies
  - Virtual storage, food security reserve
- Climate change policies
  - Subsidization for climate change mitigation (carbon sequestration)
- Climate adaptation policies
- Resource transfer policy=partially adaptation for climate change
  - Large dams
  - Over sea development initiatives
    - That ‘s what China is doing (north south ; Africa/Brazil)

The Emergence of agribusiness

Private strategies to enhance food sector income-product differentiation

- Generate products to meet specific consumers needs and desires, including
  - Time saving -Precut meats, packaged salads
  - Enhanced taste -Tree ripen fruits, exotic varieties
  - Health benefits -foods fortified with nutrients
  - Preference for Specific production processes-Organic, range free, Kosher, etc -
  - Branding labeling local food- encouraging unique traditional
- Diversity requires knowledge and capital
- There are gains from network externality

Private strategies to enhance farm income-Expand availability of products

- off season -Price of fruit at the beginning and end of the season may be three times the price of the same quality fruit in the midst of the season. Production is expanded (through direct investment or contracts) to locations that allow expanding the season
- Throughout the year-adoption of Kiwi by consumers was enhanced by its year around availability.
  - Year around supply of veggies based on US Mexico Chile
- To new locations - New shipping and information technologies, and varieties with longer shelf lives allow physical expansion of markets and better response to opportunities

- Lead to need for global partners
- Requires human capital and skills
  - Opportunities for new network

Private strategies to enhance farm income- new products and marketing technologies

A movement for a global strategy

- Increase in demand for food in Asia and food security concerns leads to investment in developing new regions in Latin America and Africa
- Increase in energy prices led investor to consider developing of supply in Africa
- Favorable conditions- low labor cost, climate, lead to investment in high value crops- flowers
- Unique environments in developing countires lead to investments in recreation activities
- Investment intensive ag and resource technologies require supply chains that rely on
  - Contracts
  - Vertical integration

Land transactions-a conceptual approach

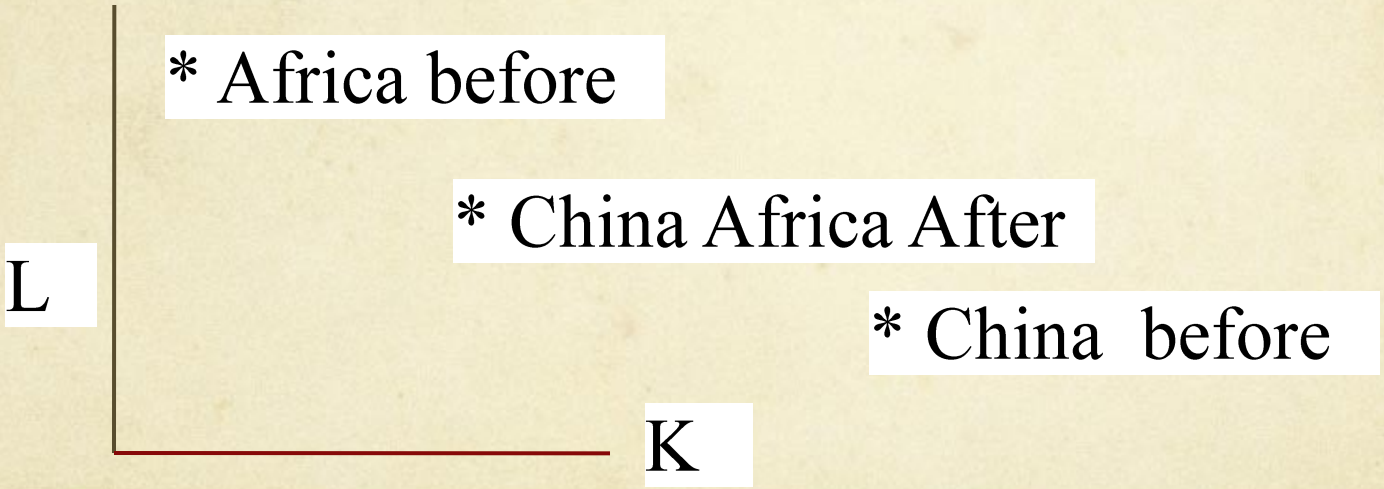
- Food security and other consideration leads external firms or a country to invest in development and utilization of natural resources– land in another country.
- Conceptually we have to distinguish between a
  - -Investing country (China)
  - Land leasing country (Africa)
- Basic Considerations

  Efficiency

  Environmental impact

  Distributional implications

Lessons from basic trade theory
Hecksher Ohlin



More detailed implications

- Trade can move outputs and inputs
- If you can move capital- you do not need to move goods
  - We have factor price equilibration
- Price of land in Africa goes up- in China goes down
  - Africa land owners benefits
- Price of Capital in Africa goes down in China it goes up
  - Chinese capitalist benefit
- African produce more machine- export less ag product
- Chinese produces less capital good imports less food more food security

Some realism: more reasons for gains from FDI

- The assumption of identical technology does not hold
  - In reality the investing country may have a better technology- so the utilization of land in the leasing country improves
- Multiple goods- the investing country may produce intermediary goods and infra structure (China Builds roads) that benefit Africa
- Multiple inputs/multiple countries- China may provide labor which may be scarce in some parts of Africa – but it may reduce wages in other places
  - In other cases- the investor may investor may add capital and higher and train locals – increasing their wages
    - The gain in Human capital is one gain of FDI including in ag
- There is still trade after FDI (Heterogeneity). The Investing countries have access and knowledge of markets that contribute to agricultural exports of Africa

What can go wrong

- Some view land leasing agreements as “land grabs” for several reasons
  - Failure to consider/enforce environmental and other laws
  - The land is mismanaged from environmental/ economic/social perspective
    - Soil and water resources are depleted
    - Suboptimal crop selection
    - Mistreatment of small holder indigenous population
    - Tolerance of criminality on leased land
  - Bad contract terms (market power, incompetence or corruption)
  - Employment and human capital building opportunities do not materialize
- Bad contracts are likely to be results of bad governance
- It is important to assess the contract and its implementation both ex ante and ex-post

FDI- to expand supply chains: Contracting, integration and product differentiation

- FDI in agriculture involve investing in providing production or service capacity to international supply chains
- Differentiated products are innovations that require investment in product design and marketing
- They require investment in consumer education-about the product and broader issues (nutrition, environment)
- Investors are concerned with having sure supplies of the new agricultural products- and reduce supply uncertainty by vertical integration (produce the product themselves) or contracts.
- Differentiation is likely to increase contracting and integration and reduce production by farmers to final markets

More about ag contracts

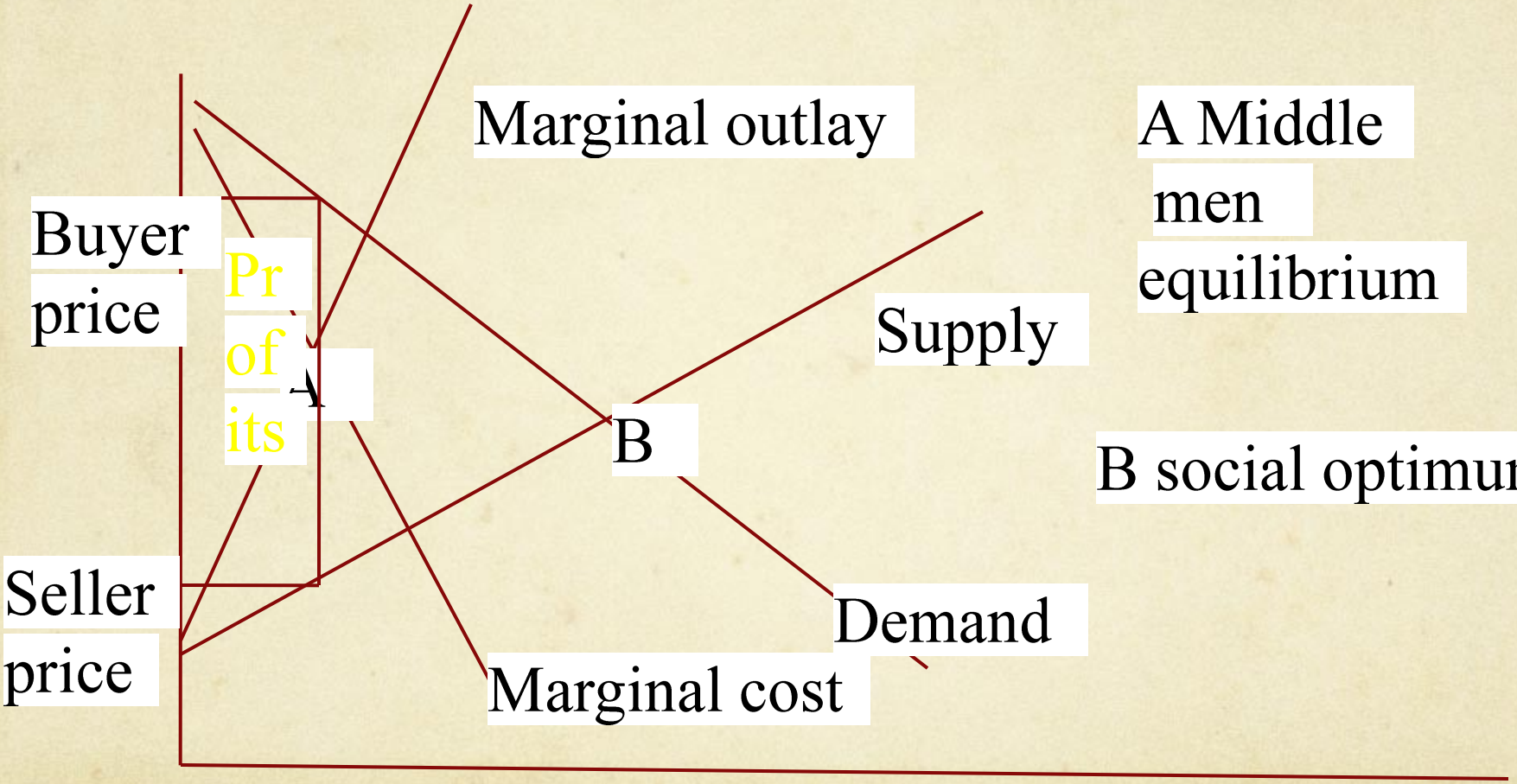
- *Contacting-where an integrator provide some inputs to farmers, orders output and then sells it- is useful mechanism to*
  - *Introduce new innovations quickly*
  - *Assure product quality*
  - *Meet detailed marketing obligation.*

- *In most modern industries subcontractors play a major role in generating supply ,that start occurring in agriculture.*
  - *Much of than fruits and vegetables are sold through contracts arrangements*
  - *The young Broiler industry grew fast because of contracts (no one wanted to grow birds without a contract from a buyer), and contracting in swine increases 50% of production.*
  - *There is increase in contracting for uniquely specified products (organic pork, rare flowers or herbs)-here the internet helps.*
  - *All new segments use contracting-from biofuel and fine chemical*
  - *Contracting essential to agrotourism*

Contracting promise and problems

- *Contracting plays similar role to franchising- it allows the fast spread of a new practice, and take advantage of economics of scale in purchase of inputs, research and marketing*
- *For most parts rates of return of integrators is higher than those of farmers-but*
  - *We do not observe the integrators that did not make it*
  - *Integrators reap most of the return for risk and entrepreneurship*
- *Farmers may complain about contractual arrangement, but the queues to get a contract are long*
- *Contract arrangements are ignored in environmental regulations- integrators, who dictate much of the farms activities are not liable for its pollution- and they should.*

The integrators as middle men; monopoly for buyers monopsony for sellers



Foreign direct investment may be very profitable- but you need skills and creativity

A long term perspective

- Contracts do not last forever- as the power and human capital of local industry increases it get better terms
- “Monogamy” is not always good for farmers who are subject to contractual agreement- having suitors improve our deal
  - Industry may start by one firm- but others may enter later and offer better contracts
- On the other hand a buyer may have both contract and vertical integration arrangements
  - Contract increase financial leverage
  - Vertical integration allows hands on experience
    - Protects against defections

Design issues

- When a development agency plans to introduce a new industry (biofuel, flowers for export) they may have design choices
- In case of processed products (biofuel, cotton)– should they have
  - an integrated plantation and processing plants (refinery, gin)
  - Or cooperative provide feedstock to refinery
- How much support / tax exemption government provides to investors
- What infrastructure to build and who will build it- it affects the terms of the deal
  - Rich government invest in infra structure
  - Poor government – lease resources to developer and investor in return for royalties and public good
    - US used leases to build the rail roads when poor (19^{th} century)
    - Government build highway when rich (20 century)

Some cases and questions

- Brazil benefited from FDI to support the Sugar and soybean industry. As government got stronger
  - Invested in research – gotten more control of direction of development
    - Private parties do the investing
- Mozambique consider a biofuel sector
  - Should the encourage large corporate refineries and plantations or
  - Migration of small holders and cooperatives
- US had a homesteading act- you develop the land you gain ownerships- It encouraged migration- investment and new technologies- can homesteading work in some regions in Africa?
- To what extent privatization will be used to develop water resources and free ways
- In case of a draught who will flower grower have right to buy water – thus having priorities over small holders?

Research opportunities

- Theory optimal design of Investments
  - Economics of supply chain
  - Trade in differentiated agricultural products
  - Mechanism design to design alternative contract
  - Environmental (local and global) and other regulation design
- Historical /econometric analysis of
  - Who is behind FDI in various countries (family networks, corporation) and how it affects activity selection and outcome
  - FDI performance at various levels
  - Spatial socio economic aspects of FDI efforts and eprformace
- Experiments how will farmers/investor respond to contract offers