I. Introduction: Up to now we have taken structure in the I-O and subsector approaches to be largely exogenously determined by things like scale economies and the nature of the regulatory framework.

A. Given a certain structure, we have assumed that firms seek to optimize.

B. When they attempt to modify the structure, we have assumed that it is to gain market advantage (e.g., market power)

C. Transaction-cost approaches attempt to make structure endogenous to the model of economic optimization. I.e., it argues that the market structure that emerges may be the result of social economic optimization, not just private optimization—that is, competitive forces may lead to the emergence of forms of economic organization that minimize total costs of production and exchange in the economic system.

1. Note the contrast with the traditional I-O model that argues that deviations from atomistic competition reflect “imperfect competition” and may lead to inefficient pricing and output.

2. TCE argues that market structure evolves in a way to minimize costs of production and transactions and hence represents attempts to gain efficiencies.

D. More broadly, what transaction costs economics seeks to do is to include analysis of the costs of exchange (as well as “production”) into the study of how economic activities are organized. It argues that much of the structure of the economy (S in
the SCP framework) can be explained by looking at the nature of transaction costs in society.

E. This approach has become increasingly important over the past 20 years as structure of the economy (and food system) has evolved away from exchange through impersonal markets for commodities to personalized exchange for highly specific products (needed to assure quality). Big focus on structure of contracts (writ large) and how to make them efficient. How to align incentives in contract to get good performance. Very much tied to principal/agent problem. How does owner of one resource write contract to make user of that resource (agent) behave in a way consistent with desires of the owner?

F. We will examine:

1. How to Explain the Large Number of Ways of Vertically Organizing Transactions within a Subsector?
   a. Alternative Ways of Linking Stages of Production
   b. Why are there firms? (Coase)
      (1) Defining transaction costs
      (2) Range of vertical integration from spot market to total vertical integration, based on TCs.
   c. Williamson's analysis (huge literature beyond Williamson, but take him as starting point)
      (1) What gives rise to transaction costs?
(2) How do the different types of transaction costs and their allocation influence subsector organization?

(3) Role of bounded rationality and opportunism.

2. Factors Affecting Transaction Costs
   a. Uncertainty
   b. Externalities
   c. Asset specificity

3. Uses of Transaction Cost Approach in Analyzing in the Food System

4. Limits to Transaction Cost Analysis

5. Illustration of approach in examining contracts

II. Basic Arguments of the Transaction-Cost Approach
   A. Definitions:

1. *Transaction* = exchange of rights for a claim on the use of some resource (within socially defined limits. For example, hiring someone to work on a farm or agreeing to pay someone to help raise your chickens in her/his facilities. In exchange for money (claim on other resources), employer has some claim on the time and physical/mental energy of that employee, within socially defined limits. Hence, a transaction is:

   a. Shift in property rights in a broad sense
   b. A contract in a broad sense.
2. **Transaction costs** = Costs associated with carrying out a transaction—Note, these are NOT costs of changing space or form utility (transformations), such as transport or processing costs, although some author’s (mistakenly) include them in transaction costs.

   a. *Ex ante TCs*

   (1) Cost of gathering information about the potential transaction

   (2) Costs of processing that information

   (3) Costs of coming to a decision

   (a) Within an organization (internal negotiation)

   (b) Between transaction parties (external negotiation).

   (c) Note that there may be third-parties that are indirectly parties to the transaction that also must be involved--e.g., government regulatory agencies.

   b. *Ex post TCs*

   (1) Cost of monitoring performance (*measurement*)

   (2) Costs of *enforcement* of the agreement, including costs of dispute resolution.

   c. Hence, the principal/agent issue we discussed earlier has a significant element of transactions costs in it (illustrate).

   *Principal/agent problem* (see reading by Caswell and Cotterill)
Note that simple micro theory of profit-maximizing firm is implicitly built upon model of entrepreneurial 1-person firm. Entrepreneur's goals are identical with firm's, so we can speak of "the firm seeking to maximize profits.

In reality, in most economic enterprises/undertakings, ownership is to some degree separated from control.

E.g., in corporation:

(a) Separation achieved through dispersed stock ownership and inside directors

(b) Nominal control through the board of directors may not be effective.

(c) This separation $\Rightarrow$ management having some scope to follow its own goals if firm possesses some degree of monopoly power. *Principal/agent* problem. Incentives facing manager (agent) may not be consistent with goals of principals (stock owners). Possible alternative goals of the agent:

i) Firm growth/sales maximization

ii) The quiet life (perks), combined with empire building
iii) Some assurance of job security through the cultivation of organizational slack (X-inefficiency).

(d) This leads to models of satisficing, where firm managers sequentially try to meet minimally acceptable levels of behavior on a series of performance measures--Use of SOPs to guide day-to-day behavior. (Cyert and March, Behavioral Theory of the Firm).

3. Limits to shirking behavior.
   a. Degree of product and input market competition, including competition from imports (NB most work on satisficing, etc. was developed in late 60s and early 70s, when US faced much less import competition).
   b. Capital market--i.e., stock prices and their link to:
      (1) executive compensation (stock options)
      (2) Market for managerial talent
      (3) If the stock price falls, potential for:
          (a) Action by the board of directors (rare)
          (b) proxy fights (rare)
(c) takeover bids--more common, especially in 1980s and early 90s--Restructuring to take out middle management (slack?)

(4) Much of agency theory stresses the role of these other (internal) markets in disciplining the firm.

c. Outside of corporation, have increasing use of contracting, e.g., in poultry. How does integrator make sure agent takes good care of resource.--General solution--Movement away from 1-part payment (proportional on output) to 2-part payment--Proportional and lump sum, with lump sum dependent on “good stewardship” of resource.

d. Note that the origin of all TCs is human interdependence, in the sense that they arise only when people have to work together to benefit from:

(1) Specialization and trade
(2) Capturing economies of scale through cooperation
(3) Because such cooperation is necessary to capture economies of size in new technologies, it is often difficult to clearly separate “transaction costs” from other production costs, as social cooperation is one of the prerequisites for adopting many forms of production technology.
(4) As interdependence goes up, so do transaction costs as a percent of total costs. But this is offset (hopefully) by decreases in per-unit production costs brought about by technologies requiring greater interdependence.

4. Institutions
   a. Rules under which society (economy) operates. The rules of the game. Includes:
      (1) Culture & Custom
      (2) Formal law
         (a) constitutional
         (b) common
         (c) statute law
      (3) Standard business practice
      (4) The preceding 3 in turn define:
         (a) Structure of property rights (needed to distinguish ownership from theft)
         (b) Rules of contract
      (5) Note that these differ across societies, so that same transactions may be handled differently in different societies. This calls for sensitivity in doing business cross-culturally.

(Role of Social Capital)
b. Need to distinguish institutions, as rules of the game, from organizations (such as “savings institutions”, etc.). Organizations are manifestations of people organizing to pursue their own goals under the existing institutions (rules of the game). Analytically, they are distinct entities.

B. The transaction cost approach goes back to Ronald Coase, who in 1937 asked the question, “Why are there firms?”

1. I.e., why are some resources allocated by fiat and others by the market.

2. Given the assumptions of the Arrow-Debreu world, i.e., the simplest neoclassical model of perfect competition, with its perfect knowledge and no externalities, then everything would be allocated by markets. The firm as a resource allocator would not exist. That is, the firm would have no internal organization. It would just be a production function, as portrayed in the simplest neoclassical models.

3. Coase’s answer for the reasons firms exist was transaction costs – i.e., the costs of using markets to allocate resources sometimes exceed the cost of allocating those resources by fiat. In those cases, a firm arises, and the boundary of the firm is determined by the point where it becomes more economical to allocate certain resources by the market than by fiat (e.g.,
due to diseconomies of size in management). This is the essence of firms “make or buy” decisions.

4. By logical extension, the question of which type of coordination tools is used and how they are linked becomes a function of the transaction costs involved in using each. (Illustrate with overhead on the organization of the beef subsector from Marion).

III. **Williamson**, since the 1960s, has been building on Coase’s observations to analyze:

A. What factors give rise to TCs--e.g., the characteristics of the investments necessary to produce a particular good (often a function of the characteristics of the good itself).

B. How different types of TCs and their allocation among different economic actors (who bears them) influence the type of organization that arises to mediate a transaction (IOF, co-op, spot market, etc.). He calls these different tools to mediate transactions “governance structures.”

C. Williamson investigates a whole gamut of governance structures that handle the relations among economic actors, from spot market through various forms of contracting to vertical integration via a hierarchy.

1. In Williamson’s perspective, there exists no dichotomy between the market and a hierarchy (or the market versus a corporation or the state), but rather a range of organizations. Which type develops depends on the level and type of TCs it generates. In this view:
a. TCs can be viewed as “friction” in an economic system, which tend to reduce exchange.

b. In this sense, “market failure” is simply a case of prohibitively high TCs. (To what extent is this a “failure” of the market? It is a market that does not arise because the costs of trade exceed the potential benefits.)

c. The type of governance structure that minimizes the sum of production and transaction costs will have an economic advantage and hence tend to dominate that activity.

(1) Thus, institutional design (the design of governance structures) becomes part of the process of economic optimization, rather than an exogenous process.

(2) E.g., it is no mistake that collection of milk from farmers in many countries is organized by farmer co-ops rather than IOFs (investor-owned firms). But there exist few cooperative steel mills. We can explain that by examining the nature of the TCs involved in producing and getting milk to consumers as compared with those involved in producing and distributing steel.

(3) Note the link to New Institutional Economics. There is an analogy to natural selection here: the existing institutions
arose (evolved) because they were more efficient than the alternatives. At its worst, Social Darwinism.

(4) In this approach, the boundary of the “firm” (i.e., what constitutes a firm) becomes fuzzy. Economics moving towards an analysis of contracts writ large.

(a) E.g., where is the boundary of the firm in a farmer-owned cooperative?

(b) It is more useful to discuss how individual entities negotiate and develop coalitions with others, which leads to analytic approaches such as game theory and agency theory.

2. Williamson’s analysis makes two basic assumptions about how people behave:

a. **Bounded rationality** (from Herbert Simon) - People have limited information and limited ability to process it. Cf. the perfect competition model, which assumes perfect rationality. (Note the work of Stiglitz, which in a neoclassical framework also assumes imperfect information, but does not assume opportunism).

b. **Opportunism** - “Self-interest seeking with guile” - i.e., when conflict arises between what someone wants to do and what s/he has promised to do, s/he will act in own self interest if it is costly
for others to know his/her behavior (note link to agency problem).

Includes:

1. Strategic lying, disguising information, not revealing information

2. Honest disagreements over promised performance.

c. The combination of bounded rationality and opportunism imply that you have to protect yourself against potential exploitation by your trading partner in an exchange. You can’t anticipate all contingencies and if unexpected contingencies arise, your trading partner may try to take advantage of them to your disadvantage.

D. Three major factors that affect TCs (e.g., the costs of relying on markets):

1. **Uncertainty** - The greater the level of uncertainty surrounding a transaction, ceteris paribus:

   a. the less efficient and the more costly it is to rely on the spot market to mediate the transaction

   b. the greater the incentive to move to some form of contracting or integration (produce the goods yourself rather than trade for them).

   (1) E.g., circle of poverty of farmers in many poor countries.

   {DeJanvry and Sadoulet}
(a) Markets for inputs and outputs (including food) are highly risky due to the thinness of the market and fluctuating S&D.

(b) Other TCs of using markets are high (lack of standard weights and measures, poor enforceability of contracts, etc.)

(c) These combine to discourage specialization and its gains, and hence the household remains integrated in a very diverse set of activities.

(d) This integration in turn reinforces TCs by leading to small lots of highly dispersed production of individual products and hence:

i) High per-unit assembly costs

ii) Local markets that support only a few traders, which can lead to monopsony and hence high TCs.

(e) Lack of specialization leads to poverty. Cf. industrialized countries like the US, where only about 10% of the value added in food derives from the farm.
(f) These conditions both show the potential gains to market reforms if markets can be made more reliable in these countries, and the limits to such reforms unless one focuses on the basic causes of uncertainty in these markets. Simply saying “let the private sector handle it” won’t work if the basic causes of uncertainty remain unaddressed.

(2) Second example--Need for an assured supplies in a marketing/distribution system where there are specialized assets at risk (e.g., plant that needs throughput). Riskiness over assured supplies may lead to movement away from reliance on spot markets (See Bakema, Drabenstott, and Cook).

2. **Externality Principle** - The greater one party to a transaction can impose intended or unintended externalities on another party, the greater the incentive to move from spot markets to some other structure, such as vertical integration.

a. E.g., creation and vertical integration of Sunkist Growers in the early 1900s to help assure quality of delivered citrus to Eastern markets, at a time when shoddy handling was hindering the ability to build demand for this “new: product.
b. Role of cooperatives in the US in the 1920s “open labeling” movement to assure quality fertilizer and animal feed.

c. Increased vertical coordination (and in some cases integration) in the US pork subsector to assure a consistent quality for specific niche markets.

3. **Asset specificity** - (See Klein, Crawford, and Alchian). The greater the transaction involves assets that are specific to a particular transaction, the less likely the transaction is to be efficiently mediated by spot markets.

a. Asset specificity = value of an asset in its transaction-specific (“specialized”) use is greater than its use in alternative activities.

   (1) E.g., a milking parlor

   (2) Difference between value in specialized use and its next best use is called a *quasi-rent* (Marshall).

   (3) Asset specificity is the essential condition or inducement for *teamwork*. The value of assets of different participants are greater if they work together than the sum of their value in use separately.

      (a) E.g., value of a milking parlor + milk processing plant are greater when they work together than separately ==> teamwork between dairy farmer and milk processor (e.g., via a co-op).
(b) Cf. the value of two separate milking parlors on separate farms. There is much less mutual interdependence, so we see much less horizontal integration farming operations.

b. Types of asset specificity (see Masten)

(1) Physical capital

(a) Specialized use

(b) Site-specific

(c) Temporal -e.g., due to perishability of the product produced by the asset

(2) Human capital, e.g.:

(a) Specialized skills

(b) Access to benefits from current institutions--e.g., one’s position in a bureaucracy may grant the individual to certain benefits (rents). This explains the reluctance of people in such positions to institutional reform.

c. Incentive for non-spot-market governance of such transactions arises from the tendency of at least one party to a transaction to act opportunistically to try to appropriate the quasi-rent generated by
his partner’s specialized assets (see Klein, Crawford, and Alchian).

This expropriation can take the form of:

1. **Holdup** - e.g., situation of farmers investing in fruit trees for processing based on a promise by the processor to pay price $X$ by the processor.

   (a) Once the trees are in production, if farmers don’t have other market outlets (a function of the relative scale of fruit farming and of processing, and the perishability/transport costs for the raw product), the processor can extract some of the quasi-rent accruing to the fruit trees by reducing the price offered farmers to a level below $X$.

   (b) Some of the reverse type of exploitation is possible, especially if the processor also invests in training farmers and providing them with specific capital (e.g., new varieties) and if the farmers have alternative markets. The farmers may accept the processor’s training and capital to produce specialized products and then sell to a competing processor.
(c) This creates an incentive to move towards more long-term contracts and vertical integration, especially where the commodity is perishable (and hence scope for holdup is greater).

i) Cf. annual crops, especially storable ones that are not produced for a specific niche market (and hence for which there are more potential buyers).

ii) In the U.S., there is much more co-op activity in processed fruits and vegetables than in grains. Co-ops are also prevalent in dairy, where milk perishability makes farmers particularly vulnerable to short-term holdups.

(d) Failure to devise mechanisms to deal with this problem can lead to nobody making what otherwise would be a socially useful investment. This is a key development problem (some would say the development problem) in some low-income countries.
(2) **Moral hazard** - Arises when one party relies on the behavior of another to realize the full return to a specific asset and that behavior is costly to observe and monitor (part of the principal/agent problem)

(a) Temptation of user of the asset to use it to pursue her/his own goals--e.g., empire building by managers of firms or cooperatives.

(b) Agent may simply not have incentive to maintain the asset or operate it in a way that minimizes costs (e.g., use of a piece of equipment by an employee).

(c) Need to devise either ways of monitoring behavior of the agent (e.g., boards of directors) or incentive structures that reduce moral hazard (e.g., stock options, role of ideology and cultural norms).

IV. Examples of applications of TC economics to agriculture: 4 main uses.

A. The approach is still relatively new. Its analysis is more qualitative than quantitative, although quantitative analyses are increasing (see Masten; Nabli and Nugent).

B. 4 main uses of the approach:

1. *Explanation* of types of governance structures that are likely to arise in situations involving certain types of transactions.
a. See examples above regarding when co-ops are likely to have advantage over investor-owned firms (IOFs). Need to weigh these advantages against the TCs of internal decision making of different types of firms.

b. Analysis of anti-trust issues. This has been a big use of this approach in the US. (In fact, Williamson did some of his early work while working for Bell Labs). Are given market structures evidence of monopoly practices or efficient ways of reducing TCs. E.g., U.S. court decisions on legality of typing arrangements and exclusive dealerships.

c. Note that different mechanisms/institutions are used in different societies to handle certain transaction costs. Hence, the cultural background and legal environment may lead to different types of institutions evolving, which can affect the competitiveness of different societies in the world economy. Cf. the relative reliance of the US and Japan on the legal system to resolve disputes.

2. By focusing on asset specificity, this approach helps explain rigidity of certain institutions and the unwillingness of some to adapt to changes in, for example, consumer demand. (Thus addresses the issue of subsector adaptability or progressiveness).
a. Cf. the rigidity of dairy marketing for many years to respond to decreasing consumer demand for butterfat in the U.S. with the flexibility of agriculture in responding to increasing demand for fresh vegetables or the declining demand for buckwheat.

b. Implications for research?

(1) Dangers of fostering overly specialized assets in an uncertain world? Need to see:

(a) Tradeoffs between reduction in per-unit costs and loss of flexibility.

(b) Who in the system bears the risk of asset obsolescence?

(2) Need for research on how to make assets (especially human assets) more redeployable. (E.g., the shift in what is stressed now in education--from specific job skills to more general problem-solving skills).

3. **Helps to guide the design or redesign of food system institutions.** Look at the nature of transaction and the types and degree of mutual dependence that arise in different types of transactions and their implications for appropriate institutions to mediate transactions:

a. E.g., look at how mutual dependence among members of a co-op change as members become more diverse and certain members have
more options (more redeployable assets). May necessitate change in pricing rules from equal pricing for all members to differential pricing. Game-theoretic analysis can help determine "stable": rules that don’t induce defection.

b. Design of new marketing institutions in developing countries that are undergoing market reforms. E.g., what are sustainable ways of reliably supplying farmers with inputs?

(1) What sorts of organizations and institutions are most apt to offer "credible commitments" of performance? Spot markets, franchise arrangements, contracting??

4. **Analyzing how changes in technology may affect TCs and hence change the most appropriate governance structure.** Prediction of the nature of institutional change and the performance of new institutions.

a. E.g., the rise of computer technology leading to the possibility of electronic markets in forward deliverable contracts, and attempts to model their performance using system simulation (e.g., Kaufman dissertation)

b. Role of pressure tester for apples in leading to broader bargaining for produce. Similar analysis for "apple computer" to designate where produce is damaged in transport and handling.

c.
V. Limits to Transaction Cost analysis

A. Allows important insights, but still our knowledge and predictive ability to relate
types of TCS, many of them commodity-specific, with different types of
institutions remains fairly weak.

1. We usually can make plausible explanations for that which already exists.

2. Much less work done in making predictions of how institutions will change
with a change in transactions cost. This is an area for future research.

B. Focus by Williamson on lowering TCs as the sole criterion for institutional choice

1. Whose costs does the system take into account? Is the private calculus
always the social optimum. (Gets back to how one interprets the Coase
rule).

2. Focus is primarily on bilateral contracting ("private governance") rather
than third-party effects.

3. At its worst, this approach can serve as a "scientific" justification of the
status quo.

4. Cf. "Old institutionalism’s" perspective on this (e.g., Commons). Whic
costs get counted depends on the institutional setting, so you can’t turn
around and ust that result as a justification for changing the institutional
setting or for arguing what is, is most efficient. The argument is circular.