Chapter 5

Coordination for Market Development

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One major body of literature in the application of institutional economics to market development concerns economic coordination. This literature seeks to explain why market systems are structured as they are, thereby revealing fundamental challenges that have to be addressed if efficient markets (for goods and services) are to develop. On a practical level, interest in coordination has risen dramatically as supply chains have become increasingly globalized and have tried to respond to the greater demands placed on them by consumers and regulators. In the agro-food sector, the dramatic rise in the power of supermarkets in many countries (Reardon et al. 2003) is associated with moves away from product sourcing through traditional wholesale markets toward vertically coordinated chains. It is in this context that Jaffee (1995, 25) writes: "In commodity systems analysis, the central focus is on the problems and mechanisms for coordination."

The literature on economic coordination explores the potential for private-market actors to collectively contribute to market development, but it also examines the limitations of this potential, hence suggesting roles for the state that are taken up in Chapter 20. It explores the consequences of relaxing the following assumptions in the perfect-competition paradigm of neoclassical economics:

1. *Perfect information.* As in all economics of institutions, imperfect information makes economic actors vulnerable to opportunistic behavior by others. In this chapter, the implications for investment and the institutional arrangements devised

Eleni Gabre-Madhin made valuable contributions to this chapter. Parts of Section 5.3 draw heavily on Poulton, Dorward, and Kydd (2005).

to provide investment security under conditions of uncertainty are considered, as is the manner in which certain arrangements for economic coordination aid the process of contract enforcement (see also Chapter 4).

2. *Perfectly fungible capital.* In reality, capital is not costlessly transferable between uses. In this chapter, the consequences (under conditions of imperfect information) of the facts that assets are often lumpy, difficult to dispose of, or only realize their full value in the context of specific contracts is considered.

3. *Product homogeneity.* Few products are truly homogeneous, although some (including certain nonperishable agricultural commodities) more closely approximate to this ideal than others. Some of the consequences for agro-food sector organization are considered in this chapter.

4. *Private goods.* Most agricultural goods and services are indeed private goods. However, some support services required by agricultural producers (for example, technical and market knowledge) exhibit public good characteristics.

5. *A complete set of markets.* One manifestation of market failure is the near or complete absence of certain markets. Of most relevance to this chapter is the failure of the market for seasonal finance for agricultural producers. The ways that some actors overcome this problem and the challenge of providing the necessary seasonal financing are considered.

A useful starting point for studying economic coordination is to ask what coordination, if any, occurs in the perfect-competition paradigm of neoclassical economics. In this stylized world, characterized by spot-market transactions and unrestrained competition between atomistic agents, the "invisible hand of the market," operating through the price mechanism, coordinates demand and supply at each level of the supply chain. Markets clear, ensuring that what is demanded is what is supplied at the market-clearing price. However, there is no conscious coordinating activity on the part of any market actors. Rather, they make independent decisions, responding to price signals in pure competition with others.

The essence of the coordination discussed in this chapter is a move away from atomistic competition and spot-market transactions to a range of deliberately structured relationships among market actors that achieve one or more of the following:

- provide incentives for investment when assets are lumpy, difficult to dispose of, or specific to particular contracts (a concept that is explained in more detail below);

- equilibrate ("match") not just the quantity of goods or services that is supplied and demanded but also the quality and timing of supply of those goods or services; and

- assist in the enforcement of contracts (including those with third parties).

It can be argued that the perfect-competition paradigm assumes away these coordination challenges. However, North (1990) offers an alternative perspective: that actors in a stylized perfectly competitively market are able to focus solely on competing—and competing on price alone—because a perfect set of institutions underpins the market, handling all coordination challenges for them. Thus, to imagine an agricultural example, competition can focus on price alone because a set of perfectly functioning institutions determines—and ensures total compliance with—grades and standards for each commodity (hence creating product homogeneity in each product category). Indeed, commodity exchanges, such as SAFEX in South Africa (www.safex.co.za), KACE in Kenya (www.kacekenya.com) and the currently discontinued ZIMACE in Zimbabwe, seek not only to bring together buyers and sellers of particular agricultural commodities but also to ensure that common grades and standards are used in each transaction and transacting parties do not behave in an opportunistic manner. Thus trade on such exchanges can be conducted entirely on the basis of price.

Coordination is described by Poulton et al. (2004, 521) as the

> effort or measures designed to make players within a market system act in a common or complementary way or toward a common goal. This may also require effort or measures designed to prevent players from pursuing contrary paths or goals. Coordination may be undertaken by private agents acting collectively or may be orchestrated by state agents defining the boundaries within which private agents can act.

The SAFEX, KACE, and ZIMACE examples show that some coordination may be initiated, implemented, and even enforced entirely by private actors. However, public support for institutional development may also be required to lessen the coordination problems facing private actors, enabling them to concentrate their energies on market competition.

An additional variant on the concept of private coordination is that, rather than acting collectively, independent private agents may choose to merge ("integrate") their activities, handing all relevant decisionmaking to a single management team to reap the benefits that more effective coordination brings.

If an effective solution to coordination problems is not found, however, the market in question will likely fail to deliver particular goods or services (or deliver

suboptimal quantities of these goods or services), because the incentives for the requisite investment in service delivery are not present.

In the sections that follow, various forms of coordination are examined, which are classified as

- vertical: coordination among actors at different points in a marketing chain;
- horizontal: coordination among actors (competitors) at a given stage of a marketing chain; or
- complementary: coordination among actors providing complementary services to producers at a given stage of a marketing chain.

These concepts are illustrated with reference to service provision for smallholder farmers in Africa, which also brings out:

- the importance of product and process attributes in structuring incentives for investment in service delivery;
- the public good attributes of certain services, most notably extension; and
- the significance of small transaction sizes (hence high per unit transaction costs) in discouraging market development.

In the context of service provision to smallholder farmers in Africa, there is also a clear theoretical role for collective action on the part of producers to

- reduce the transaction costs facing service providers and output buyers, a coordination role that can enhance market access and/or strengthen the competitive position of the producer group in the marketing chain;
- hold service providers (especially state service providers) to account for the types and quality of service that they deliver; and
- facilitate investment in lumpy and intangible assets that these farmers may require to access more reliable or profitable markets.

However, these requirements in turn raise the question of the internal organization and performance of farmer organizations, which is reviewed in the next section.

5.1 Vertical Coordination

In this section the discussion of transaction-cost economics (TCE) literature reviewed in Chapter 2 is expanded, focusing particularly on the work of Williamson and his analysis of the different forms of vertical coordination observed in market chains and how transaction costs determine the nature of these arrangements. Williamson set out to show that many contractual relationships between firms in a supply chain that were considered "nonstandard" by economists trained in the neoclassical tradition—and were thus criticized on the grounds of allocative efficiency—were in fact designed precisely to improve the efficiency of supply chains in delivering certain types of products. In doing so, he shed new light on key challenges to market development. After reviewing the work of Williamson, we consider applications of his theory to agricultural settings, along with criticisms leveled at the theory.

The foundation for analyzing market coordination and structure in terms of transaction costs is Coase's (1937) insight that, although reaching, modifying, and implementing agreements is essential to doing business and creating the conditions for investment, the costs of doing so also restrain the potential gains from trade. Thus in a world of transaction costs the relative merits of different organizational forms depend on a comparison of the costs of transacting.

As illustrated in Chapter 2, transaction costs—the costs of running the economic system—arise because individuals and firms are constrained by imperfect information and bounded rationality. Three types of transaction costs can thus be distinguished:

- Ex ante costs are those of searching for potential trading partners, then drafting and negotiating an agreement. These are mainly fixed costs (that is, they do not change with the volume of the goods being exchanged).

- Ex post costs are those of monitoring an agreement and negotiation when a circumstance arises that is not fully accounted for in the contract. Losses and the risk of losses resulting from a breach of contract are also ex post transaction costs. These, and some of the monitoring costs, increase with volumes traded, introducing a variable cost element to ex post transaction costs.

- "Bonding costs to securing commitment" (Williamson 1985, 22) do not fit neatly into the ex ante or ex post categorization. These costs are further discussed below.

5.1.1 Asset Specificity

TCE considers the most critical dimension of a transaction to be the degree of asset specificity involved. Asset specificity may take a number of forms, the two most

important of which are physical and human specificity. Physical specificity occurs when, for example, a packinghouse invests in packaging equipment tailored to meet the specific requirements (such as pack size or labeling requirements) of a particular supermarket buyer. If the supermarket decides at a future date not to purchase from that packinghouse, then it may not be possible to use the same packaging equipment in supplying an alternative buyer.

Human specificity occurs when, to continue the previous example, supplying a specific supermarket chain may require that staff in the packinghouse are trained in specific procedures required by the supermarket to ensure the quality and safety of produce sold to that supermarket and/or to be able to trace produce back to its original source of supply. If the supermarket later decides not to purchase from that packinghouse, the training and experience in these procedures may not be transferable to another buyer.

Asset specificity can be conceptualized as having two dimensions:

- *Asset fixity* is a measure of the costs of exiting a particular investment (as noted in Chapter 2). Asset fixity can also be thought of in terms of the discount on the use value of the asset that would have to be accepted to dispose of it.

- *Transaction specificity* is the extent to which the use value of the asset is dependent on the continuation of a specific transaction or contract (such as the supermarket contract in the examples above).

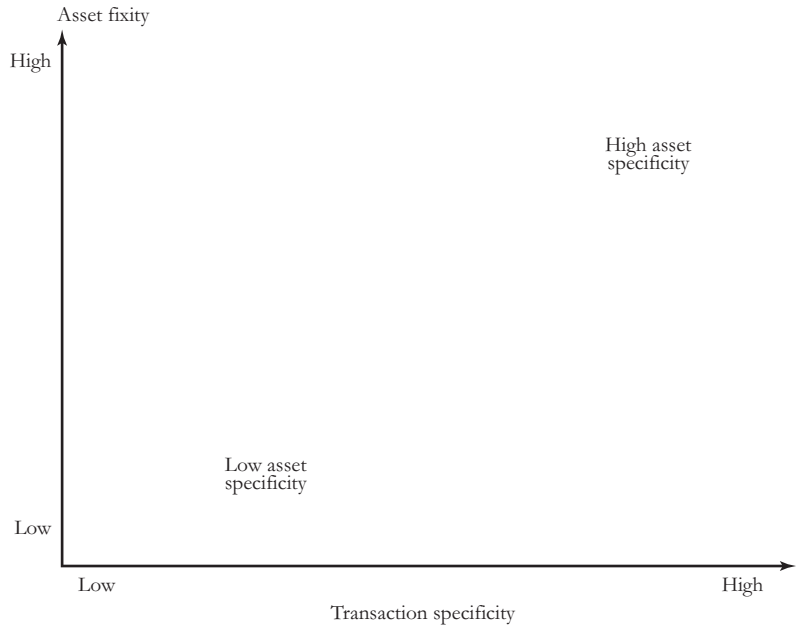
In its strictest form, asset specificity requires that the asset have no alternative use outside of the contractual relationship to which it is specific and that there is no market for sale of the asset should the contractual relationship collapse. However, investment carries a specific risk element even if somewhat looser versions of these conditions hold:

- The asset produces goods for which the number of buyers is limited. Thus refusal by one buyer to buy the goods at a remunerative price forces the asset holder to engage in a costly search and/or negotiation process to start selling to an alternative buyer.

- Markets for sale of the asset exist, but limited numbers of buyers or high transportation costs to an alternative buyer mean that the asset owner would have to accept a discount in asset value if seeking to sell it.

Asset specificity can thus be thought of as a special case of a thin market; conditions prevailing in rural markets throughout much of Africa mean that a wide range

Figure 5.1 Conceptualizing asset specificity



of assets exhibit a degree of specificity. Thus the nature of markets can confer specificity, whereas Williamson's (1985) original concept emphasized the attributes of the asset. Figure 5.1 illustrates the concept of greater or lesser asset specificity in terms of its two component parts. Market conditions are as important as the inherent properties of the asset in determining where a particular asset lies in this diagram.

5.1.2 What Determines Different Transaction Attributes?

Transaction-cost theory thus rests on the two key behavioral assumptions: (1) the bounded rationality and opportunism of humans and (2) asset specificity. It further assumes uncertainty and posits that the incidence of the three factors (bounded rationality, opportunism, and asset specificity) under conditions of uncertainty jointly determines the contracting process.

According to Williamson, the contracting process can take one of four forms (Table 5.1): planning, promise, competition, or governance. The objective of *planning* is to design mechanisms ex ante to cope with all potential opportunistic actions. (In the hypothetical situation of unbounded rationality, it is possible—and economical—to do this.) These mechanisms then kick in if a contractual partner attempts to act opportunistically, such that ex post transaction costs are minimized.[1] The essence of

Table 5.1 Attributes of the contracting process

Behavioral assumptions			
Bounded rationality	**Opportunism**	**Asset specificity**	**Implied contracting process**
0	+	+	Planning
+	0	+	Promise
+	+	0	Competition
+	+	+	Governance

Source: Williamson (1985).

Note: 0, attribute is absent; +, attribute is present.

promise is that contracts based on loyalty are sufficient in the absence of opportunism. This concept links to the discussion on relation-based contracting in Chapter 4: actors trade with few formal contractual safeguards with (a limited sphere of) partners whom they trust not to act opportunistically.

The key idea behind *competition* is that, when no specific assets are involved, actors can safely engage in competitive, spot-market transactions. If other actors in a particular market act opportunistically, the rest can simply shift their investment elsewhere, as assets are fully fungible and shifting investment is costless.

Governance here refers to the creation of a contractual and relational framework to manage trade and associated investment when all three factors (bounded rationality, opportunism, and asset specificity) are present. Planning is thus incomplete because of bounded rationality, promise breaks down because of opportunism, and conscious coordination between partners matters because of asset specificity. Although contracting partners may still depend on third-party (including court) arbitration or conflict resolution, the costs associated with such procedures force them to structure their own bilateral relationships in such a way that the incentives for opportunism are minimized (Williamson 1985).

5.1.3 Spot Markets, Bilateral Contracts, and Hierarchy

The probability of observing more-or-less vertically integrated forms of market organization depends on the underlying properties of contracts: higher asset specificity, greater uncertainty, more complexity, and greater frequency of transactions are associated with greater vertical coordination:

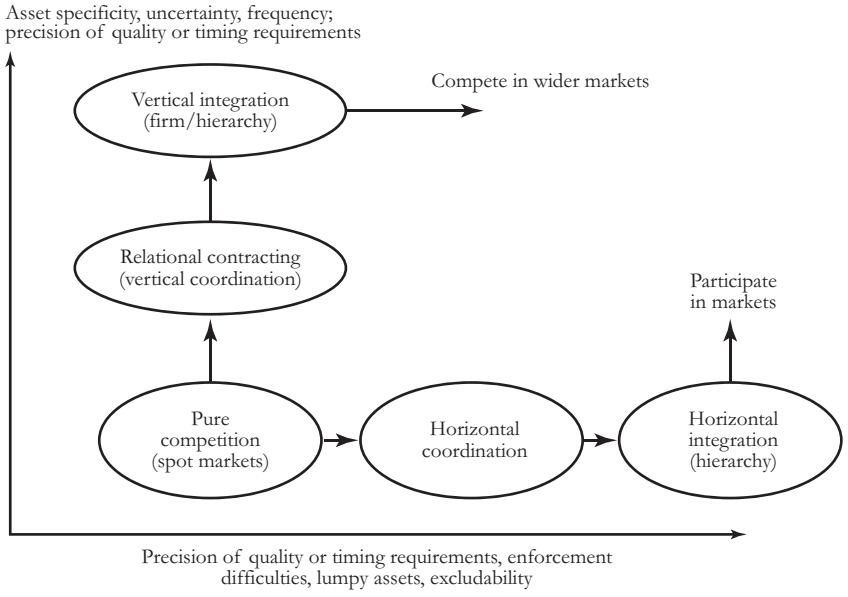
- Greater asset specificity increases the risk of entering into a given contract; hence the party investing in the specific assets is likely to seek reassurances in the terms of contractual relationships that other parties will continue to trade on terms that provide a fair return to the investment made.

- Greater uncertainty and/or complexity make it more likely that contracts will be incomplete, whereas higher frequency of transactions increases the costs associated with ex post negotiation when circumstances arise that are not fully accounted for in the contract. Thus parties are likely to seek to place their contracts in ongoing trading relationships that allow trust to be built and/or provide disincentives to short-term opportunistic behavior when unforeseen or otherwise difficult circumstances arise.

Williamson (1985, 1991) thus posits three main types of contracting relationship between actors at different points in a marketing chain: spot-market transactions, bilateral contracts, and vertical integration or hierarchy (Figure 5.2).

Spot markets. Spot-market transactions are the normal form of transaction in basic neoclassical economics (although applications of neoclassical theory, of course, consider a range of alternative contractual forms, such as futures and options contracts). In spot-market transactions, two contracting parties, who may or may not have contracted with each other before, transact for a specific deal with no necessary expectation that they will transact again (that is, trade is impersonal). In addition, all dimensions of the transaction are completed simultaneously.

Figure 5.2 Vertical and horizontal coordination



In such a situation, there is no conscious or deliberate coordination of economic activity by the contracting parties. However, as noted earlier, third-party institutions (such as commodity exchanges or auctions) may be created to facilitate spot-market transactions. A key insight of neoclassical economics is that, when the density of transactions is sufficient and information flows freely enough to all parties involved, spot markets generate clear price signals to equilibrate demand and supply of the commodities in question.

Even when all dimensions of the transaction are not completed simultaneously but trade is impersonal, price discovery can be efficient (commodity exchanges often also support futures and options contracts). However, in such cases there is also an additional enforcement challenge, as with credit contracts.

Williamson's (1985) central insight—why competition based on spot markets does not always prevail as the governing principle for exchange (see Table 5.1)—is that impersonal contracting in spot markets does not provide sufficient assurance for market actors to make asset specific investments. As the vector of asset specificity, uncertainty, and frequency increases (moving up the vertical axis in Figure 5.2), market actors thus move away from spot-market exchange to relational contracting (vertical coordination) and ultimately to vertical integration.

Vertical coordination (relational contracting). The key characteristic of relational contracting is that a pair of contracting parties enters into an agreement that stipulates the terms of their (often repeated) trading interaction. This agreement may be written or unwritten, but it is explicit. It sets out what is expected of each partner, the rewards for fulfilling these obligations (for example, continued opportunity to interact, perhaps on improved terms), penalties for failing to fulfil them, and the circumstances under which the agreement will continue (or cease to be) valid. Repeated interaction is one mechanism for ensuring contractual compliance, with the foreclosure of future opportunities for profitable transacting acting as a disincentive for contractual default. Thus an urban vegetable wholesaler may offer a rural producer group the promise of competitive prices and a guaranteed market in the face of severe price fluctuations for perishable produce in return for a promise of regular supply of that produce with reasonably reliable quality. A breach of this agreement, except under special circumstances, could result in the termination of the contract and loss of access to the guaranteed market or the assured supply of produce.

Williamson's (1985) additional insight is that relational contracting can provide the security necessary for one or both contractual parties to invest in specific assets. Thus, to take the earlier example of the packinghouse and the supermarket buyer, the packinghouse may only invest in tailored packaging equipment and staff training if it receives some form of assurance from the supermarket that the latter will buy from it on an ongoing basis at prices that will generate an acceptable return to its investment

(Boselie, Henson, and Weatherspoon 2003). Of course, the supermarket buyer may at some point wish to review its portfolio of supply sources and so will not commit to buying from the packinghouse (or even to paying a particular price) forever. However, some form of contractual continuity may be necessary to encourage suppliers to upgrade their facilities in response to evolving market conditions.

Relational contracting therefore seeks to ensure a mutually acceptable balance of costs and benefits between contracting parties. When the burden of investing in specific assets falls predominantly on party A, the onus is on party B to demonstrate their commitment to the contract to provide the necessary security for the investment in specific assets to take place. Depending on the size of the investment and the time taken to recoup it, party B may thus have to commit to buying from party A for a nonnegligible period and perhaps also to give some assurance on the prices that will be paid during this period. If the agreement is not legally binding or the costs of enforcing the agreement through the relevant legal channels are prohibitive, party B may have to undertake additional, costly measures (for example, building up a reputation for trustworthiness in contractual matters by eschewing opportunistic behavior over an extended period) to convince party A that the commitment to the contract is sincere. These are what Williamson (1985, 22) calls the "bonding costs to securing commitment."

Finally (following Williamson), the emphasis in this discussion on relational contracting has been on repeated trading interaction. However, similar principles can be applied to asynchronous transactions (that is, transactions, such as a credit contract, in which one party performs their obligations before the other), even when these turn out to be one-offs. Thus a lender looks for credible commitments from a new borrower (for example, in the form of collateral or the signature of a guarantor) that they will repay their loan before lending to them. Note that, although in one sense this is a straightforward case of contract enforcement, the credit contract can also be interpreted as the lender making an asset-specific investment in a deal with the borrower. In addition, a contract farming company usually has to provide some form of assurance that they will buy the output of contract farmers before the latter will invest their labor in the production process. This is because the products in question rarely have a reliable local market (snowpeas in rural Zimbabwe or Kenya, for example), in which case production involves a transaction-specific investment on the part of the farmer. The size of the transaction-specific investment is even greater if the crop is a perennial, so that the farmer has to commit scarce land and capital for several years before beginning to realize a return.

Firm/hierarchy (vertical integration). Although relational contracting may provide the necessary security for one or both contractual parties to invest in specific assets, there are also situations in which the size of asset-specific investment and/or level of

uncertainty, complexity, or frequency of transactions are too great for a bilateral contract to deliver a sufficient degree of investment security. Under such circumstances, Williamson (1985) hypothesizes that relational contracting will give way to hierarchy, meaning that a contractual relationship between two independent parties will be replaced by the performance of the two activities by a single, vertically integrated firm.

In this case, a trade-off occurs. The management of the integrated firm now exercises full control over both activities. Therefore administrative control replaces the (incomplete) contract between the two independent parties as the means of ensuring that the returns to the asset-specific investment are not undercut by opportunistic behavior. However, the performance incentives facing employees in charge of these activities are likely to be weaker than they would be if the activities were carried out by two smaller firms in which managers also had a major ownership stake. (This logic obviously makes important assumptions about the ownership structures under both scenarios, an issue raised later in this chapter.) The dilution of incentives, according to Williamson (1985, 1991), is what discourages the creation of vertically integrated firms when there are few problems of asset specificity, uncertainty, and complexity, and/or low transaction frequency.

5.1.4 Other Reasons for Vertical Coordination

Although Williamson ascribes primacy to asset specificity as the driver of vertical coordination, there are other factors that also push actors in agro-food marketing systems in this direction. Perhaps the most important of these relate to product quality, that is, relaxing the assumption of homogeneous commodities in the perfect-competition paradigm of neoclassical economics. Two related, but distinct, aspects can be distinguished:

- Some agricultural products are highly perishable. Thus there is a need to coordinate the timing of supply with the pattern of demand, which may well require producers to stagger their planting of such products. Although market price signals may at times be sufficient to encourage producers to stagger plantings, specific investments may also be required if producers are to respond to demand for what might traditionally be considered out-of-season supplies. Examples of such investment include irrigation technology or knowledge of a new pest complex associated with a different time in the year. It may thus be that buyers cannot rely on spot markets to generate the timing of the supply flows that they desire, in which case they may seek to establish bilateral supply contracts with particular suppliers.

- Some buyers (for example, supermarkets) may also have particular quality requirements for food products that spot markets—given the inherent variability in agri-

cultural products—cannot guarantee at all times. Increasingly, as food-safety legislation becomes more demanding,[2] supermarkets require not just reliably high-quality produce but also assurance from producers that the products are safe, along with the means of tracing produce to its original suppliers if any contamination occurs. Food safety (along with organic certification and environmental and animal welfare impacts of production) is a credence attribute—meaning one that cannot necessarily be verified by consumers even after consumption. Thus, given the prohibitively high costs of testing all products for all possible safety threats, assurance can only be provided through monitoring of the production process itself. Investment in such process monitoring can have high specific-asset dimensions. Moreover, the impersonal nature of spot markets militates against buyers knowing the production processes used by sellers. Although particular sellers in spot markets may decide to invest in reputation as suppliers of safe produce, spot markets alone cannot provide the assurances of food safety, environmental impact, and so on that such buyers as supermarkets are increasingly demanding.

5.1.5 Applications to Agriculture

Following a line of thinking similar to that of Williamson (1985, 1991), Binswanger and Rosenzweig (1986) considered how the technological attributes of crop production and processing influence the organization of production. Starting from the position that smallholder households generally enjoy advantages over large-scale agricultural enterprises in the supervision and motivation of unskilled labor (a critical input in most agricultural production in low-income economies), they argued that large-scale enterprises could nevertheless be active (and expected to dominate) in the production of

- crops involving important economies of scale in processing, combined with major coordination problems between harvesting and processing (for example, sugar cane); and

- perennial crops with high maintenance intensity (for example, rubber and tea, the latter combining perennialism with high perishability after harvest).

In the first case large companies become involved because it may prove prohibitively costly to organize numerous smallholder producers to stagger their production sufficiently to provide a year-round throughput of raw material to the processing operation. In the second, smallholders may not have the capital to invest in establishing plantations.

Binswanger and Rosenzweig (1986), however, accepted that other factors are also important in influencing actual sector structure. In particular, they noted

the importance of land tenure and availability. Where large tracts of land are not available for estate production, owners of processing factories may seek to engage smallholder producers in contract-farming schemes, even when the nature of the production and processing steps otherwise favors large-scale production.

Work by Jaffee (1993) on Kenyan horticultural exports sought explicitly to test the predictions of Williamsonian theory in the context of agriculture. Jaffee scored a range of horticultural products on the basis of (1) asset specificity and economies of scale inherent in their postharvest handling and processing and (2) perishability, specificity of quality standards, and seasonal variability of product supply. (In conformity with Williams, Jaffee identifies these as indicators of uncertainty.)

Jaffee found that the combination of these attributes did have some predictive power in explaining the types of contractual arrangements observed in export supply chains for the different crops. In the case of processed products (with the highest asset specificity), a degree of vertical integration was often observed, with a typical arrangement being one whereby a European buyer had a stake in the Kenyan processing and exporting operations, which exported almost exclusively to the single buyer. Among fresh-produce exports, an important category was Asian vegetables. In this case less asset-specific investment was involved, but the highly perishable nature of the products meant that export trade often took place between one family member in Kenya and another in the United Kingdom or elsewhere. Trading within families meant that exporters were dealing with people whom they trusted—an important consideration, given that delays or obstructions in the trading process could lead to the produce being spoiled. In other words, the potential for opportunistic action was extremely high.

The relationships so far discussed were characteristic of large export operations, which sent consignments of produce year-round. Small-scale, occasional operators, by contrast, tended to work on a consignment (spot-market) basis, which highlights the importance of the frequency variable on the vertical axis of Figure 5.2.

However, Jaffee (1993) also found other factors to be important in determining the nature of contractual relationships within horticultural chains:

- patterns of land tenure;
- interventions by the government in land, input, and product markets; and
- resources of participating firms.

In the case of some horticultural crops, a wide range of forms of chain organization were observed, showing that the techno-economic attributes of the crops in question were at best one factor influencing institutional arrangements.

5.1.6 Critiques of TCE: The Issue of Power

One of the major critiques of TCE, as considered in Chapter 2, is that of naivety regarding the issue of power. As described earlier, TCE is built on the assumption that economic organization is driven by a desire to enhance efficiency. Thus an effort is made to minimize costs when aligning transactions that have different attributes with governance structures that have different costs and competencies. Indeed, one of the aims of Williamson's (1985, 1991) work was to defend "nonstandard" contractual forms against allegations (particularly from neoclassical economists suspicious of anything that could be a monopoly) that they were merely an abuse of market power. He did this by showing the transaction-cost economizing of nonstandard contractual forms, such as various bilateral (relational) contracts. However, it is important to remember that his focus on industrial sectors in developed economies, characterized by high levels of competition in final markets, allowed him to downplay the power issue in his theoretical work. The horizontal arrow beside the term "vertical integration" in Figure 5.2 signifies that entire supply chains compete against one another. Hence, firms in these chains seek to develop contractual arrangements that enhance the competitive position of their particular chain through efficiency (transaction-cost) savings. In theory, when greater competitiveness brings benefits to a particular chain, these benefits can be shared equally among the members of the chain. In practice, it is unlikely that such sharing happens, but Williamson did not focus his attention on this issue.

In contrast, critics of the TCE approach studying marketing systems in developing countries have observed that contractual arrangements owe as much to unequal power relations as to transaction-cost minimization (Harriss 1993; Crow and Murshid 1994; Dolan and Humphrey 2000). Unlike the highly competitive final markets assumed by Williamson, the cases cited by the critics clearly feature both market power and vertical coordination through contracts. Thus Dolan and Humphrey (2000) argue that UK supermarkets and their agents offer few contractual guarantees to suppliers of fresh produce in developing countries but expect these suppliers to make significant investments in supply capacity, many of which are of a specific-asset nature. Both they and Crow and Murshid (1994), therefore, argue that contracts can be a way by which powerful actors in a marketing chain pass risk onto weaker actors who are, in fact, less well placed to bear it.

Undoubtedly power does affect the terms of contracts that are negotiated. The disputed issue is, therefore, whether it also affects their form. In other words, even in situations in which one party exercises power in key markets,[3] is the form of contractual relationship (for example, market, relational contract, hierarchy, or hybrid forms) still fundamentally affected by the nature of transaction costs, as posited by Williamson?

There does not seem to be a definitive answer, although it seems germane that it is the more powerful actors in a chain who are likely to exert more influence over both the form and the terms of contracts.[4] When parties to a contract have different preferences for contractual form, the preference of the more powerful party is likely to prevail. Form, therefore, is likely to be transaction-cost economizing first and foremost for them—and may not be for the other party. However, both parties have to believe that entering into the contract is in their interest (that is, it will generate a return greater than that which they would achieve if they did not enter the contract). Otherwise, no contract would take place.[5] Thus the choice of form should confer some benefits even on the weaker party. For instance, in his classic exposition of the institution of sharecropping, Stiglitz (1974) argued that this institution—long criticized for rewarding the tenant with only part of the marginal value product of his or her labor—actually struck a balance between the production incentives offered to the tenant and risk sharing between landlord and tenant in the case of bad years.

The implication of this discussion for researchers and policymakers is that they should look at both the form and the terms of contracts. As we argue in the next section, high levels of system performance generally require some balance to be struck between competition and coordination in a market system.

5.2 Horizontal Coordination

Despite advances in understanding vertical coordination, until recently institutional economics has shared with conventional industrial economics the view that horizontal relationships in supply chains essentially "relate to entry and competitive conditions prevailing at each industry stage" (Jaffee 1995, 24). In other words, actors at a given stage of a marketing chain are either competitors or they collude. This view is simplistic and needs to be modified. Specifically, the importance of horizontal coordination is highlighted and an understanding of horizontal coordination that is similar to the Williamsonian view of vertical coordination is suggested in this section.

5.2.1 Horizontal Coordination among Firms

Hall and Soskice (2001) have demonstrated the importance of horizontal coordination to the comparative advantage of a number of northern European economies (as well as Japan). They suggest that horizontal coordination—like vertical coordination—can assist in creating incentives for asset-specific investment. However, their argument might be recast more persuasively in terms of horizontal coordination assisting in contract enforcement and excluding free riders from the benefits of what might otherwise be common pool goods.[6] Thus one example concerns investment in employee training in German manufacturing (Hall and Soskice 2001). In certain

high-tech manufacturing industries, employee training imparts a mixture of firm-specific skills and skills of sufficient relevance and value to other firms in the same industry that some successful trainees could obtain employment with competitors. Firms, however, only invest in training new workers if they have some confidence of keeping them once the training is completed. There is thus a horizontal coordination challenge in assuring a return on training investment, as competitor firms might be tempted to free ride on such investment by recruiting employees who have completed their training at other firms. To overcome this problem, strong employer and worker associations in Germany negotiate industrywide wage settlements for standard skill grades, such that the incentive for employees to switch firms is minimized (as they will receive essentially the same pay in any firm upon completion of their training). In other words, firms coordinate their activities in labor markets to protect the incentive to invest in human skills, even as they compete in output markets.

As explained by Poulton et al. (2004), the case of African cotton ginners providing preharvest loans to producers is directly analogous to the Hall and Soskice (2001) case. The provision of loans exposes ginners to free-riding actions by cotton-buying competitors. To tackle the side selling of cotton by producers, ginners are likely both to provide incentives directly to the producers (through the terms of the vertical relationship), so that they sell to the firm that provided them with preharvest services, and to seek ways of restraining the actions of competitors (horizontal coordination). Three examples from the cotton industry serve to illustrate how horizontal coordination may be pursued—sometimes successfully, sometimes not—to assist with contract enforcement.

In the years immediately after liberalization of the cotton sector in Ghana in 1985, all actors in the sector agreed to provide a common input package (tractor plowing, seed, fertilizer, pesticide spraying, and extension advice) to all producers. Until 1995 (by which time there were 12 companies in the sector) no explicit charge was made for this package, except for plowing costs. Instead, the per kilo price paid for seed cotton was adjusted downward to recoup the costs of inputs supplied, based on a notional average yield of 600 kg seed cotton per half-hectare unit. The main strength of this so-called free-input system was that, when combined with common pricing by all cotton companies for inputs and seed cotton, it removed almost all incentive for a producer to side sell. As a result, side selling was relatively rare. The two main disadvantages were that the more productive farmers subsidized the less productive ones and, more seriously, that common price setting reduced competition from price formation, so that the price of seed cotton fell steadily after liberalization in relation both to input costs and to competing crops, such as maize and groundnuts. In response, and on the basis of external advice, the sector moved during the mid-1990s to a more conventional system in which an explicit deduction was made

for the inputs received by each producer. Although the intention was to raise effective prices for more productive producers, this change also removed the horizontal coordination that had been provided through the free-input system. As a result, side selling escalated dramatically in the second half of the decade, as producers now had a strong incentive to sell to a company other than the one that provided them with inputs (even though common pricing was retained). This experience led to pressure, by 2000, for a local monopoly system in which the state allocated concession zones to each company in which the latter would have the responsibility to invest in supporting smallholder cotton production but also the exclusive right to purchase the resulting output of seed cotton.

Meanwhile, in Zambia (from liberalization in 1995 to the present) and Zimbabwe (until 2001), two companies have dominated the cotton sector. In both countries the two companies have competed for the patronage of cotton producers, their international connections and ambitions driving them to offer reasonably attractive prices to farmers despite their duopoly positions in their respective national markets. At the same time as competing for the patronage of cotton producers—and offering incentives for the best farmers to stay with them from season to season—the two companies in each country have coordinated informally to ensure that seasonal credit can be recovered in the sector. In this case, coordination has amounted to a "gentleman's agreement" to respect each other's contracts with producers. Thus both countries boast successful credit schemes, with more than 70,000 producers obtaining credit in a given season in each country at their respective peaks. The major caveat to this story, however, is that the number of actors in the Zimbabwe sector increased dramatically after 2001. In the presence of new competitors, the sector's flagship credit scheme has had to be dramatically scaled back due to an explosion of side marketing. The previous informal coordination mechanisms have proven inadequate to the new sectoral composition, but it has so far proven impossible to gain agreement (particularly from the government) on the nature of a new, more formal regulatory system to enforce compliance by all actors in the sector to rules that ultimately should benefit all.

Finally, in the liberalized Tanzania cotton sector, with more than 30 ginners competing to buy seed cotton from farmers, it has proven impossible for individual firms to provide input credit to producers. As a result, an industrywide approach to the input-access problem has had to be adopted, with a leading role played by the state in the form of the Tanzania Cotton Board. Under the passbook system—a forced saving mechanism, rather than a credit system—when producers sell seed cotton, they receive stamps in their official passbooks recording how much they have sold. The buyer pays a levy to the sector-wide Cotton Development Fund per kilogram of seed cotton purchased (and the seed cotton price paid to producers

is reduced accordingly). This money is then used to obtain chemicals that are distributed to producers (free of charge) at the start of the following season, with the quantity of chemicals received by each producer determined by the amount of seed cotton that they sold the previous season, as recorded in their passbooks.

These three cases thus contain examples both of horizontal coordination by private actors—the common adoption of the free-inputs system by all firms in Ghana prior to 1995 and the effective informal coordination between duopolists in Zambia and Zimbabwe (pre-2001)—and of intervention by the state when private firms failed to coordinate—Ghana post-2000 and Tanzania. In the former cases, the private actors continued to compete for farmers' patronage while coordinating on other matters. In the latter cases, in Ghana the effect of the state intervention was to reduce competition (in the interests of coordination), whereas in Tanzania it was to facilitate sectorwide coordination so that individual firms could concentrate on competing in output and export markets.

These cases thus suggest that, as problems of contract enforcement (with third parties) increase—in the cases considered, because of an increasing number of competing actors in the market—firms' first option is to strengthen contract enforcement through horizontal coordination. If this option proves inadequate, they may seek some form of intervention from the state to create the conditions conducive to investment. Thus in Ghana the major firms in the cotton sector successfully lobbied the regional government to introduce the system of local monopolies; in Zimbabwe the major firms in the cotton sector have been lobbying the government to introduce a new regulatory framework governing conduct in the sector, and in Tanzania leading ginners worked with the Cotton Board to devise an industrywide public response to the problem of input supply. We also note, however, that, as with private coordination, success is not guaranteed when firms seek intervention from the state. Although the introduction of the passbook system in Tanzania does seem to have been successful (albeit one with teething problems), the zoning allocations in Ghana were fiercely contested by some farmers and companies. As a result, cotton production fell dramatically and has yet to recover to its prezoning levels. Meanwhile, as of 2003, the Zimbabwe government and the major firms in the Zimbabwe cotton sector have not been able to agree on an appropriate new regulatory framework for the sector, despite private stakeholders drafting a bill for the state to consider.

Although these cases suggest a progression from market competition through horizontal coordination to state regulation as coordination challenges increase, other examples show that private hierarchy can be an alternative solution to coordination challenges. Thus when the three firms in the Tanzania tobacco sector found it impossible to recover input loans, despite the apparently low level of competition,[7] their solution was to create a common company to handle all dealings (input supply,

output purchase, and credit recovery) with smallholder tobacco producers. The three processing companies are all shareholders in this combined venture and share the resulting tobacco leaf for processing on the basis of a mutually agreed formula.

Horizontal coordination can also be driven by the need to provide public (or club) goods in a sector, and the principles observed here are similar to those observed when the focus was on contract enforcement. Thus maintaining grading practices during the marketing of seed cotton (a critical issue if producers are to deliver high-quality seed cotton to ginners over time) has been a major challenge in all sectors so far discussed. In Zambia and (until 2001) Zimbabwe the two dominant companies in each country have again coordinated informally to ensure that comparable grading practices are maintained in the sector, so that producers do not run to the buyer who is willing to offer the highest grade for a given consignment of seed cotton. As a result, both sectors maintained (in the case of Zimbabwe prior to 2001) or established (in the case of Zambia) strong reputations for lint quality on the international market. Post-2001, however, in the presence of new competitors, Zimbabwe's grading system at primary marketing has collapsed. New entrants have offered to pay a standard price for seed cotton, irrespective of quality, in a bid to gain market share, and established companies have found that they must follow suit to defend their position. However, there is evidence that the quality of lint being produced as a result is declining, and the country's reputation for lint quality on the international market is expected to follow suit. (Zimbabwe was famed for the uniform quality of individual lint consignments, as a result of its rigorous grading practices.)

Similarly, in the liberalized cotton sector in Tanzania, it has so far proven impossible for individual firms to impose effective grading standards at primary marketing, as producers prefer to sell to buyers who impose less strict grading requirements.[8] Again, a solution is being considered that involves an active role for the Cotton Board: the establishment of local seed cotton auctions, at which all seed cotton produced in a given area must be sold. Under this system, sellers who attempt to adulterate seed-cotton consignments by adding water or sand risk exposure in front of the whole village, whereas quality-conscious buyers will be able to bid for high-quality consignments.

Another example of a public (or club) good that the industry needs to ensure its long-term competitiveness is an ongoing program of basic research, for example, the breeding of new, improved seed varieties. If the firms in a sector are to pay for this program, however, they need to reach agreement on such questions as: How will the appropriate contribution from each firm be decided? How will decisions about the use of these funds (for example, the priority areas to be researched) be taken? What will be the mechanism by which the firms can hold the researchers accountable for their use of funds? Will farmers also have a say in these matters? The firms, therefore,

need to be able to coordinate on these matters of common interest while still competing in the day-to-day business of acquiring and ginning seed cotton. In a similar way, Harriss-White (1999) has observed that traders in Asian agricultural markets compete fiercely for business with producers, but, confronted by weak states that are reluctant to provide basic infrastructure for market operations (roads, physical market, and storage structures), have to come together to lobby for these matters of common interest.

In the introduction to this section, the argument was put forward that the traditional view of economists—that actors at a given stage of a marketing chain are either competitors or they collude—is simplistic and needs to be modified. However, this criticism does not mean that the danger of collusion should be ignored, especially when the number of firms in a sector is small. With horizontal relationships as with vertical ones, an awareness of transaction costs gives new insights into why relationships are structured as they are. However, transaction-cost minimization is not always the driving force behind economic organization. Relationships may also be structured to facilitate the exercise of power.

Horizontal coordination among (otherwise independent) firms may have positive outcomes in terms of service provision, if, for example, it enables contracts to be enforced, thereby providing incentives for investment. However, in the absence of effective state regulation, such coordination is most likely to be achieved when the number of firms concerned is small. Under such circumstances, there is clearly a danger that coordination among firms could result in collusion, keeping prices down to the detriment of farmers. Although the likelihood of this scenario will be influenced by a number of other factors (for example, the level of capacity utilization in the sector or the strength of demand from related firms down the supply chain), the few examples cited in this section show the potential for horizontal coordination also to be associated with depressed prices for producers. Poulton et al. (2004) therefore argue that the principal public policy objective with respect to major export cash-crop sectors should be to maintain a balance between competition and coordination in the sector. Depending on the circumstances in the sector (the number of actors being a key consideration), this balance may require interventions to facilitate coordination—as in Tanzanian cotton—or to encourage competition—as in Zambian cotton (Tschirley, Zulu, and Shaffer 2004).

Chapter 20 tackles the question of what the state might do to encourage market development. However, for now it is sufficient to note that state capacity may be considerably lower than state ambition. Considering that there is little expertise in the conduct of competition policy in most African governments, particularly not in relation to rural sectors, interventions to encourage competition may look quite different from a conventional competition policy in a developed economy. In the case

of Zambian cotton, the state-funded Cotton Development Trust was given responsibility for administering a Cotton Outgrower Fund. This agency supplies funds to ginners for on-lending to producers, thereby assisting them to increase the number of producers that they are able to serve. The scheme has been administered in such a way as to disproportionately benefit smaller companies (even though, in absolute terms, the largest company in the sector has received the largest allocation), thereby promoting competition in what was otherwise close to being a duopolistic sector. At the same time, smaller companies receiving funds from the Cotton Outgrower Fund gain an incentive to compete responsibly (for example, not poaching seed cotton from outgrower producers served by other companies), as irresponsible behavior could lead to suspension of their access to funds.

5.2.2 Horizontal Coordination among Producers

So far the emphasis has been on horizontal coordination among companies. However, it is also an issue among producers, because the increasing specificity of buyers' quality and timing requirements—and the associated investment requirements (many of which are "lumpy")—can drive horizontal coordination and ultimately integration among small producers. Several results may follow. First, neighboring peri-urban smallholders supplying fresh produce to an urban wholesale market may decide to pool resources to hire a truck to take their produce to market. Second, if they want to negotiate a regular supply agreement with a particular wholesaler, they may instead have to commit to providing a certain minimum quantity of produce (of an acceptable quality) on a regular basis (once per week or perhaps month). This commitment may require some coordination of planting decisions. Third, if they wish to supply a more demanding buyer (say, an upmarket wholesaler) they may also have to exercise peer pressure in the group to ensure that more of their produce achieves higher quality. Fourth, to supply a supermarket chain (and especially to maintain a position as preferred suppliers in a fast-changing market), they may ultimately have to invest in common assets for sorting and handling produce, for cooling it during transport, and perhaps for assuring its quality through process monitoring. They may also have to appoint one of their members to manage their relationship with the supermarket chain. Such a person would inevitably end up telling members what they have to do to satisfy their client's quality and other requirements.

Finally, for many developing countries, such demands are driving smallholder producers—even those in well-organized groups—out of supermarket supply chains (Barham, Carter, and Sigelko 1995; Reardon et al. 2003; Raynolds 2004). Experience in industrialized economies suggests that survival may ultimately require individual members of farmer groups to cede their decisionmaking rights to delegated or hired managers, receiving instead shares in a more centralized enterprise and a production

quota for sale through the new enterprise (which is also likely to specify the quality of produce to be supplied and the timing required). The vertical arrow above "horizontal integration" in Figure 5.2 signals that, although horizontal integration may reduce the number of actors in the immediate market (at first sight appearing to be anticompetitive), for small farmers it may actually be the only way that they can compete effectively in wider markets.

Traditionally, collective action[9] by producers has been seen primarily as a way of exercising countervailing market power against powerful agribusiness interests. Thus during the early 1900s, U.S. farmers, especially those producing perishable products, faced frequent hold-ups in negotiations with large processing companies. Under these circumstances, marketing cooperatives helped farmers to countervail opportunism and hold-up situations. However, the narrative above suggests that transaction-cost minimization may also be a motive for collective action by producers. For African smallholders, collective action on the part of producers can reduce transaction costs facing service providers and output buyers, as well as empower producers to hold service providers accountable for the types and quality of service that they deliver.

Whatever the objective of collective action, the internal organization of the farmer group or cooperative is an important determinant of its effectiveness. The collective action required to establish a viable organization—particularly one with control delegated to an accountable manager—is not costless, and farmer organizations have at best a mixed track record of performance. For example, cooperatives often require subsidies (especially cheap capital) to compete successfully with investor-owned firms (IOFs), such as private and public companies. The costs of collective action influence the likelihood of voluntary participation by farmers. This section focuses on relationships between the performance of farmer organizations and their organizational arrangements. Farmers could, for example, structure their marketing organization either as a private company (that is, an IOF) or as a cooperative. New Institutional Economics (NIE) helps explain why some types of business organization tend to be more successful than others.

In particular, NIE argues that, when (continued) effective participation in markets requires farmers to invest in lumpy assets to respond to the increasingly specific and demanding quality, timing, and process requirements of buyers, centralized management structures may outperform more traditional cooperative models.[10] These centralized management structures can be thought of as examples of horizontal integration, analogous to the Tanzanian tobacco case (among agribusinesses) mentioned earlier.

What then, are the institutional factors that contribute to differences in the performance of these organizations? It is widely accepted that the costs of collective action increase with the size of the group (Olson 1965). Consequently, user groups

that succeed in making and enforcing rules that prevent unsustainable use of common pool resources tend to be relatively small, and those that succeed in making and enforcing more complex rules that encourage members to invest in shared improvements tend to be even smaller. Evidence presented by Olson (1965) suggests that significant investment is unlikely in user groups that have more than 6–10 members. However, if members of the group delegate control to a manager and define their property rights in terms of voting and benefit rights, a larger group may promote rather than constrain collective investment and generate the volume of output needed to enter markets without losing the advantages of decisive management.

Recent NIE literature analyzing the demise of conventional cooperatives and the sudden proliferation of "new generation" cooperatives in the United States explains the relative inefficiency of conventional cooperatives in terms of inadequate property rights (Cook and Iliopoulos 1999, 2000). The distinguishing features of property rights in conventional cooperatives can be summarized as follows:

- Returns to members are proportional to their patronage (for example, the amount of produce that they market through the cooperative) and not to their financial investment.

- Shares cannot be traded at their market value. They are repurchased at par value when a member exits the cooperative.

- Voting rights are egalitarian and not proportional to investment.

These property rights reflect the underlying Rochdale principle that cooperative enterprises should be controlled by their members and not by capital. This concept is quite distinct from an IOF, in which voting and benefit rights assigned to members (shareholders) are directly proportional to their individual investment and may be traded at their market value. Jensen and Meckling (1976), Porter and Scully (1987), Cook and Iliopoulos (1999, 2000), and Sykuta and Cook (2001) explain the consequences of inadequate property rights adopted by conventional cooperatives in terms of the following problems:

The *free-rider problem* discourages member investment because some of the gains from the cooperative accrue to individuals who did not fully invest in developing the gains. These free riders could be nonmembers who patronize an open cooperative, or new(er) members who acquire the same rights as initial investors without paying the appreciated (that is, market) price for their shares.

The *horizon problem* results from residual claims that do not extend as far as the economic life of the underlying asset. Under these conditions, cooperative members

tend to underinvest in long-term and intangible assets (such as market research, product promotion, and brand loyalty) because they are prevented from realizing capital gains by retiring shares at their market value. New members therefore become free riders, as they benefit from past investments without paying fully for them in the form of higher share prices.

The *portfolio problem* results when cooperative members demand a premium on their investment, or underinvest relative to their IOF counterparts, because the cooperative's investment portfolio may not reflect the interests or risk attitudes of any given member. Members cannot trade shares at market prices and are therefore unable to diversify or concentrate their own asset portfolios to fully reflect personal risk preferences. This "forced-rider" problem is compounded by the cooperative principle of equal voting rights, because the portfolio preferred by those members who are willing to risk larger investments in the cooperative is likely to differ from that preferred by a risk-averse majority. In IOFs, voting rights are not egalitarian but are fair in the sense that shareholders receive proportionally more rights as their level of investment in the firm increases.

The *control problem* refers to the cost that members face in monitoring managers to ensure that they make prudent investment decisions and do not shirk or cheat. Although this principal-agent problem is not unique to cooperatives, it is less severe in IOFs, because

- larger investors are able to internalize the benefits of their policing effort (because dividends are proportional to investment),
- managerial performance is clearly signaled by the market or audited value of members' equity shares,
- members can sanction managers by disinvesting, and
- managers are often shareholders themselves and therefore have incentive-compliant employment contracts.

A study of Kenya's coffee cooperatives by Mude (2007) highlights a control problem compounded by flawed electoral procedures after 1998 and by political interference in the period prior to 1998.

Together, such problems have starved conventional cooperatives of equity capital, reducing their ability to finance the investments needed to maintain a competitive edge. Hendrikse and Veerman (2001) further contend that conventional cooperatives are at a disadvantage relative to IOFs when seeking capital from external sources

to finance assets that have specific uses. Specific assets increase the financier's exposure to risk, and lenders find it difficult to predict and influence managerial decisions when numerous small investors hold a majority of votes. This *influence problem* tends to raise the cost of external equity and debt capital to finance assets that have specific uses. For this reason, a switch from cooperative to IOF status may be particularly beneficial when product markets become more differentiated (and hence assets become more specific).

In theory, a cooperative business structure that reduces the efficiency-robbing effects of inadequate property rights would require closed membership and equity contributions that are fully transferable, appreciable, and in direct proportion to an enforceable level of patronage (Cook and Iliopoulos 2000). To achieve these objectives without sacrificing the subsidies still enjoyed by agricultural cooperatives in the United States, new-generation cooperatives have substituted fully transferable and appreciable marketing (patronage) agreements for equity shares. In South Africa, where the deregulation of agriculture removed interest subsidies once enjoyed by agricultural cooperatives, the tendency has been for outright conversion from cooperative to company status (including the high-profile Cape Winegrowers Cooperative). Hendrikse and Veerman (2001) cite cases of leading marketing cooperatives in Ireland and the Netherlands changing their organizational arrangements to resemble that of IOFs by issuing some form of equity with proportional benefit and voting rights or by outright conversion to company status.

This NIE analysis offers exciting prospects for ways of influencing traditional user groups to encourage investment by members. Examples of equity-sharing joint ventures between communities and external investors have emerged in South Africa, especially in ecotourism enterprises, and are blurring the distinction between collective and private action. Renewed interest shown by African governments in conventional cooperatives seems to suggest an appreciation of the benefits of horizontal coordination but perhaps a poor understanding of adequate property rights and good corporate governance by officials when it comes to advising communities and supporting their efforts to organize.

Although the NIE arguments outlined in this section emphasize the importance of making voting and benefit rights tradable and proportional to individual investment, there are a host of other institutions that affect the relative performance of organizations. For example, rules governing electoral procedures and financial audits influence transparency and hence the accountability of managers, and incentive schemes influence the work effort of employees. Rules that provide for secret ballot and independent audit are often prescribed in national law (typically in legislation governing companies and cooperative societies). However, such rules are not always instituted, particularly when organizations are registered as trusts or informally con-

stituted as farmer associations. In such cases, problems that discourage investment are likely to emerge if good institutional arrangements are not widely accepted by members and explicitly written into the organization's constitution. Of course, good institutional arrangements are not a sufficient condition for good performance. Box 5.1 draws attention to the need for training and mentoring.

Box 5.1 Equity-share schemes in South Africa

In South Africa, the recent advent of equity-share schemes in which previously disadvantaged employees acquire shares in the commercial farms on which they work is helping to redistribute wealth and income streams while empowering farmworkers and improving their productivity, retaining quality management, and preserving the creditworthiness of these farming enterprises. A cluster analysis of 35 measures of financial performance, worker empowerment, managerial quality, and organizational arrangements (Knight, Lyne, and Roth 2003) indicated that:

- A successful farmworker equity-share scheme should be operated as, or like, a company with voting and benefit rights proportional to the investment made by each member.

- Workers' interests in an equity-share scheme should not be diluted by a transfer of shares to nonworkers as a result of bequests or sales to outsiders. A unitized trust is sometimes created to warehouse and buy shares from workers who leave the scheme, disbursing the proceeds to the worker or, in the event of death, his or her estate. Only new and existing employees can acquire these shares.

- Although striving for the ideal of fully transferable shares, a temporary moratorium on the sale of shares—particularly by the previous owner—helps to preserve the creditworthiness of the enterprise by preventing sudden outflows of equity capital and managerial expertise. Most successful schemes also commit to a gradual, and therefore predictable, reduction in the proportion of equity held by the previous (white) owner.

- Workers should participate in the design of the equity-share scheme and its operating rules. Such participation is facilitated by training programs

that transfer basic literacy, life, and technical skills to the workforce at large. Moreover, worker representatives should receive ongoing mentoring in financial, administrative, and managerial skills to help them participate meaningfully in policy decisions and perform their duties as office bearers.

- Farming requires decisive and accountable management. For directors and trustees, accountability is facilitated by transparency (for example, reporting externally audited financial statements) but is ultimately ensured by the mobility of capital and the electoral process.

- Successful equity-sharing schemes also tend to operate performance-based remuneration packages for managers and employees, observe a long-term business plan, entrench formal procedures to resolve disputes, and—without exception—have a history of good labor relations.

5.2.3 Summary of Horizontal Coordination

Both the organization of firms and producers may undergo a progression from pure market competition through horizontal coordination to horizontal integration with increasing buyer demand for produce quality or precision timing (often necessitating lumpy investments by suppliers) or increasing difficulties in contract enforcement (see Figure 5.2). Horizontal integration, however, can take two contrasting forms:

- It can replace the imperfectly coordinated actions of independent actors by a more centralized decisionmaking process in a single firm or enterprise. This approach is directly analogous to Williamson's (1985, 1991) hierarchy as the conclusion of vertical coordination in Figure 5.2.

- It can impose state or state-sanctioned regulation on the imperfectly coordinated actions of the same independent actors, so that they are forced to play by a common set of rules that is beneficial for the sector as a whole while remaining competitors in their core activities. Although apparently different from Williamson's private hierarchy, this approach still represents a move to a more centralized decisionmaking process. State hierarchy thus performs a similar function to private hierarchy.

It is also worth noting that a similar progression from market through collective action to private or state hierarchy can be traced in the literature on natural resource

management (Chapter 14). In this case, the factors likely to drive actors to the right along the coordination continuum in Figure 5.2 include the extent of spatial externalities in the management of the resources, difficulties encountered in excluding free riders, and the intensity of public interest in the outcomes of the resource management (for example, because a protected or endangered species inhabits a particular area).

5.3 Complementary Coordination

Complementary coordination is critical for agricultural development in Sub-Saharan Africa but has thus far received insufficient attention. Complementary coordination fits neatly into Jaffee's (1995, 25) general definition of coordination as "a general problem of arranging interdependent activities which require linking the decisions and actions of different technical and ownership units when collective or overlapping tasks are performed."

In addition, the heart of the complementary coordination problem in agricultural development in Sub-Saharan Africa is one of investor "hold-up" in thin markets. There are thus similarities with Williamson's (1985, 1991) analysis of vertical coordination focusing on specific assets.

At a more general level, thinking on complementary coordination can be traced to Rosenstein-Rodan's (1943) arguments for a "big push" to catalyze early economic development. Rosenstein-Rodan argued for a strong role for state central planning in industrial development, so as to capture, through income growth in an essentially closed economy, the benefits of economies of scale in production of various industrial products. Although reaching very different policy conclusions, Hoff (2001, 39) reviews subsequent theoretical advances in institutional economics and recent, non-technological understandings of externalities[11] to argue that "coordination failures abound and are important. Neither the market alone nor government alone can solve them."

For Hoff, externalities (or spillovers) drive the need for coordination and explain why economic systems without appropriate coordination mechanisms get stuck in low-level equilibrium traps. So-called diffuse externalities—when large numbers of actors are affected (positively or negatively) by the actions of others—are the most challenging. When the number of actors affected by an externality is relatively small, the externality may be internalized by negotiation among the actors and/or by mergers among firms. This insight can also be applied to Williamson's (1985, 1991) explanation of vertical integration—two firms merge because the fortunes of each are critically dependent on the actions of the other. It is also consistent with the observation that duopolistic cotton sectors have often managed to solve their key

coordination problems through informal agreement. In addition the insight explains why the three firms in the Tanzanian tobacco sector resolved their coordination problems through the formation of a unified service company handling interaction with smallholders, but the coordination problems in the Tanzanian cotton sector (with more than 30 ginners) have proven much more difficult to resolve.

In this chapter, the feature that distinguishes complementary from horizontal coordination is that it is coordination among providers of complementary services rather than among otherwise competitive providers of the same service(s). As the concept of complementary coordination is applied to the particular case of service delivery to smallholder agricultural producers in Sub-Saharan Africa, it will be clear that there is also a vertical dimension; namely, that the challenge is not only to coordinate the provision of preharvest services but also to ensure that this service provision is coordinated with access to remunerative output marketing opportunities. This particular expression of complementary coordination may thus be thought of as a hybrid between horizontal and vertical coordination. As shown in the next section, it is driven by factors similar to those for vertical coordination (for example, problems of asset specificity in the context of thin rural markets). In addition, complementary coordination problems may in some cases be resolved by private integration (whereby a single private firm provides all the services in question, capturing the positive externalities among them) or in other cases by state intervention. Thus the theoretical framework so far developed to explain horizontal and vertical coordination can readily be extended to cover complementary coordination.

To intensify agricultural production, smallholder households may require access to a range of support services, including improved seeds, inorganic fertilizers, credit, technical advice, market information, and output-market linkages. However, there is complementarity between support services in both their farm production and profitability impacts. Thus, producers' demand for one service depends on their expectation of reasonable (reliable and at acceptable cost) access to the supply of complementary services. Producers' demand for purchased inputs, for example, depends on their access to seasonal finance, and vice versa, and demand for these services also depends on expected access to output marketing services, demand for which in turn depends on prior input purchases. From the service providers' perspective, returns to their investments thus also depend on the availability of complementary services for producers.

Before the development of more intensive production systems in a given area, markets tend to be thin (characterized by low supply and demand). Hence there is limited investment in support services. In some parts of rural Africa key support services—especially seasonal finance, but also supply of improved seeds, fertilizers, and technical advice—are almost entirely absent. Thus pioneer investors face a

dilemma: how will they obtain a return on their investment when complementary services are not available for their (potential) clients? Alternatively, how can the complementary investment decisions of multiple independent service providers (likely to include both private and public sector actors) be coordinated to increase the returns to all? As already mentioned, there is also a potential hold-up problem whereby, if one investor makes clear their desire to invest in a particular service, another can adopt a hard bargaining position before agreeing to put in a complementary investment.

Arguably, the reason that this problem of complementary coordination has failed to attract the attention that it deserves is that it disappears as market densities increase. Once there are several service providers of each type operating in a given area, new entrants can enter the market competitively without concern about complementary actions on the part of others. The challenge, therefore, is one of boosting agricultural production to a certain threshold level in a given area, so that spontaneous competitive investment in service provision will flourish.

The key question is how to overcome the challenge of complementary coordination to support service provision across different types of commodity chains in Africa. This problem serves to illustrate how the product and process attributes of particular commodity chains affect the incentives for investment and hence the institutional arrangements observed in different chains. The argument starts with an outline of the common problems to overcome if cost-effective commercial delivery of services to smallholder producers is to occur:

- *Public good* problems have been discussed briefly above. They arise when service providers are unable to capture the returns to investments in providing nonrival and nonexcludable services, for example, extension advice (Smith and Thomson 1991).

- *Strategic default* is the deliberate, opportunistic failure to complete a contract, for example, by failing to deliver produce or payment in a credit transaction (Poulton, Dorward, and Kydd 1998).

- *Commitment failure* is the corollary of the service complementarity just discussed but is less widely recognized. It is, however, a critical problem that arises from the complementarity among different support services. This feature can be seen at two levels: their farm production impacts and hence also the profitability to the service suppliers themselves. This mutual dependence poses a prisoners' dilemma for the development of new commodity chains that require investments in new sets of complementary services.

- *Specification opportunism* involves parties (having the possibility of) cheating through misinformation in a transaction. Small farmers are often perceived to be the victims of such opportunism, for example, the adulteration of inputs or fixing of scales or measures by traders. However, they can also engage in it, for example, by overstating quality of produce sold. The requirements of supermarket chains for assured safe food means that produce buyers in such chains must take great care to protect against such opportunism.

- *Small transactions* generally exacerbate the problems listed above, as transaction costs in addressing these problems tend to have high fixed costs per transaction or per transaction partner, so that small transactions incur high transaction costs per unit transacted.

These problems all directly reduce the incentives for commercial service delivery to small farmers and/or raise the costs of such service delivery. In addition, because of the interdependencies between services, dysfunctional service delivery or monopolistic pricing by one service supplier (again, in the context of thin markets) can indirectly reduce farmer demand for complementary services from other suppliers. Table 5.2 describes the ways in which different types of coordination may contribute to solving the problems of commercial service development and delivery discussed above. This table distinguishes between three basic types of coordination: vertical coordination along a supply chain, horizontal coordination among competitors performing the same function in a supply chain, and complementary coordination among providers of complementary services in a supply chain. We also identify focal coordination as a particular form of coordination that combines vertical and complementary coordination to facilitate a particular set of transactions supporting a critical link in a supply chain. Coordination mechanisms may be voluntary (soft) or enforced by some strong central coordinating body (hard). Hard coordination (local or extensive) may be initiated and enforced by the state, depending on its interests and capabilities. When this does not occur, establishment of coordinating mechanisms is voluntary, and there must be incentives for actors to invest in these mechanisms. These incentives, however, differ markedly across the three broad categories of commodity chains in Africa: traditional export cash crops, nontraditional exports, and food staples.

In the case of many traditional export cash crops, where buyers or processors need to invest in processing plant and/or downstream relationships, these investments may act both as a barrier to entry to small, undercapitalized traders[12] and, as fixed assets, provide buyers with an incentive to make further investments to increase reliable access to farm products so as to improve capacity utilization. Reliable access

Table 5.2 Coordination mechanisms for addressing service development and delivery problems

Problem	Coordination mechanism
Commitment failure	Complementary and focal arrangements
Monopolistic opportunism	Complementary and focal arrangements (must be strict enough to deal with incentives to renege on agreements)
Specification opportunism	Horizontal arrangements among farmers and among service providers for setting and enforcing standards; vertical, complementary, and focal arrangements to establish trust and compliance incentives (must be sufficiently strict and extensive to deal with incentives to shirk)
Strategic default	Horizontal arrangements (among farmers and/or among service providers) for penalizing defaulters; complementary and focal arrangements to establish trust, interlocking, and compliance incentives (must be sufficiently strict and extensive to deal with incentives to shirk)
Dysfunctional service delivery to farmers	Horizontal arrangements among farmers in bulking service demand; complementary coordination among service providers
Small-scale transactions	Horizontal arrangements among farmers (economies of scale); complementary coordination among service providers for economies of scope
Public goods	Horizontal arrangements among service providers to create club goods (concentrated market systems only); alternatively, complementary coordination among public providers of services with public good elements and private providers of other services
Limited farmer voice	Horizontal arrangements among farmers

Source: Poulton, Dorward, and Kydd (2005).

to farm products may be achieved by vertical integration (investing directly in commercial farm production), by establishing vertical coordination arrangements with large commercial farms, or by investing in service delivery to smallholder producers in exchange for rights to buy the resulting output. Commonly, processing firms provide a full package of preharvest services plus a guaranteed access to output market to smallholders with whom they work. As discussed in some detail earlier in this chapter, horizontal coordination is also needed among the companies concerned, so that they do not undermine one another's investments in service delivery through side buying. The incentives to work with small farmers thus tend to be strongest when output markets are more concentrated, because—in the absence of a strong state to facilitate coordination—horizontal coordination is easier the fewer the number of actors involved.

In the case of high-value, nontraditional products, investments to increase reliable access to farm products may be driven less by the need to achieve high utilization of expensive processing capacity and more by the need to assure consistent supply of high-quality produce as a prerequisite for participation in high-value marketing channels. However, the incentives for working with small farmers may be undermined when products have high credence attributes, as assuring these involves more-or-less fixed transaction costs per producer, posing major difficulties for intermediaries serving small farmers.

For staple food commodities (and some cash crop commodities with very low processing requirements) there tend to be large numbers of small buyers for whom limited capital is a major constraint to expansion, along with limited economies of scale and/or opportunities for value addition in processing. In such situations buyers face weak incentives to invest in service delivery to expand supply or to capture an increased market share of supply. Moreover, the multiple market channels for selling staples, plus the alternative of consuming them on farm, renders the provision of preharvest services on a credit basis unviable.

When the incentives do not exist for output buyers to also provide the full range of preharvest services, the challenge of complementary coordination for a number of (potential) independent service providers looms large. It is thus perhaps not surprising that all cases of successful Green Revolutions in smallholder agriculture in the twentieth century (mainly in Asia, but also several abortive revolutions in African maize) featured major state intervention. Dorward et al. (2004), in a review of policies in successful and partially successful areas of Green Revolution, found that the majority of smallholder agricultural transformations involved a staged process of state investment in institutional and economic development:

- Initial (stage 1) interventions involved basic investments to establish more favorable conditions for productive intensive cereal technologies: investments in physical infrastructure (roads and irrigation), in development of improved technologies, and (where necessary) in land-tenure systems providing smallholders with reasonably equitable and secure access to land. These investments improved access and potential productivity. Basically profitable new technologies would at this point be limited to a small number of relatively wealthy farmers with access to seasonal finance and markets.

- Stage 2 then involved state investment to "kick start" market and service development, enabling farmers to access seasonal finance and input and output markets at low cost and low risk. A common form of intervention was to subsidize the price of key inputs so as to increase market volumes, thereby attracting private service providers into the market.

When farmers became used to the new high-yielding cereal technologies and volumes of credit, and input demand and produce supply had built up, then thicker markets allowed per unit transaction costs to fall so that governments could then (in theory at least) withdraw from service coordination and let the market play an increasingly important role.

This model of state intervention was, however, very costly, and it failed if:

- Stage 1 physical investments did not establish the necessary conditions for intensive cereal-based transformations, such as some minimum level of access and productivity potential (caused, for example, by lack of irrigation, insufficiently high yielding technologies, or low population and road densities).

- Stage 2 institutional investments were ineffective in developing high volume and robust service demand and delivery (caused, for example, by poor political or technocratic management, corruption, or the failure to continue the system long enough for changes to become embedded).

In particular, failures of costly state intervention to stimulate agricultural transformation in much of Africa—and the need to reduce state intervention when it had been successful—contributed to donor pressures for market liberalization and structural adjustment policies. However, it has to be acknowledged that there are no clear-cut examples of smallholder agricultural transformation occurring after market liberalization. Thus market liberalization is a huge experiment. Can institutional arrangements be devised to support smallholder agricultural intensification in Africa in a liberalized market? There are divergent views on this question, which are elaborated in Chapter 20.

Decentralized planning may be one way of overcoming problems of complementary coordination, if multiple stakeholders are invited to make a genuine contribution to local development planning. Planning processes could thus create the deliberative forums in which different service providers develop a degree of mutual understanding and trust, so that they are willing to embark on complementary investments (Hall and Soskice 2001). The likelihood of this occurring would be heightened if local development plans also provided some direct incentives for investment of this nature. However, the reality of administrative decentralization, and with it decentralized planning, currently lags far behind the rhetoric, such that considerable progress will have to be made in most African countries before devolution has any notable impact on the complementary coordination problems afflicting service provision to smallholder producers.

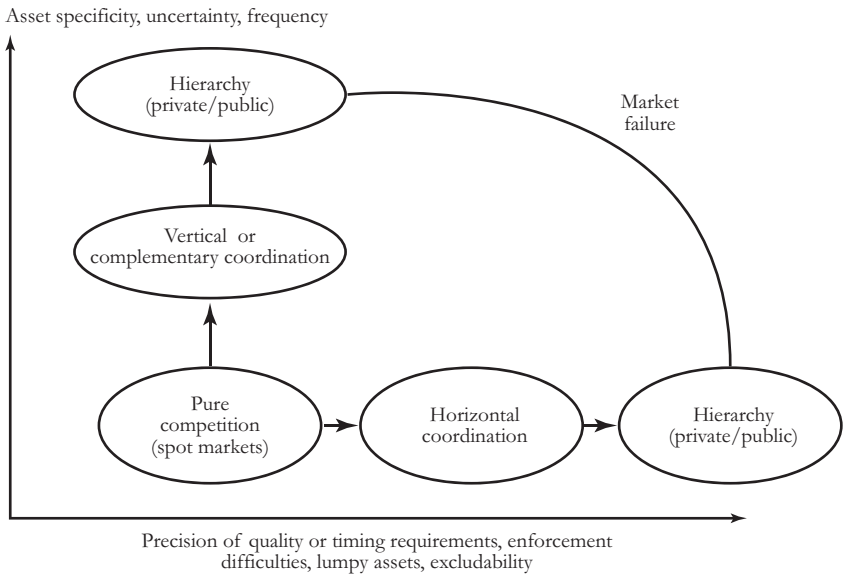
Decentralized planning processes and more direct state intervention (as in many Asian economies in the second half of the twentieth century) are two alternative approaches to the problem of complementary service provision that can be thought of as the complementary equivalents of coordination and integration, respectively (see Figure 5.2).[13] Depending on the severity of the complementarity (externalities)

problem, a facilitative role by the state in encouraging coordinated private activity may be sufficient. However, if the complementarity problem is too great, a directive role for the state may be required, with parallels to the centralized decisionmaking characteristic of vertical and horizontal integration.

5.4 An Integrated Framework for Thinking about Coordination

Figure 5.3 generalizes the insights from Figure 5.2 to encompass all three forms of coordination. The emphasis of the two axes is no longer on vertical and horizontal coordination but instead on the different forces that drive the need for coordination. As the vector of forces becomes stronger (moving away from the origin), first voluntary coordination responses are likely to be observed in response to the problems. However, there will also be cases for which voluntary responses are insufficient and coordination challenges can only be met by integrating previously discrete activities and/or organizations under a more centralized decisionmaking structure. When the number of actors that need to coordinate is few enough, private integration will sometimes occur. At other times, effective coordination will only be achieved through the intervention of an appropriate state agency.

Figure 5.3 Integrated conceptual framework



The new dimension introduced in Figure 5.3 is that, when neither of these responses occurs (perhaps because the state does not have the capacity to play the required coordination role), the outcome is market failure, and goods or services are not supplied to people who need or want them. Such failure is widely observed in the supply of critical services (for example, inputs and finance) to smallholder producers in Sub-Saharan Africa and constitutes an important part of the reason for the poor performance of the agricultural sector across the continent at present. In this chapter we suggest that this result is not the outcome of either market or state failure but of both. Smallholder producers in Africa are caught between the twin problems of poorly developed (and hence thin) markets on the one hand and ineffective states on the other.

Notes

1. This hypothetical case does illustrate some of the distinctions between the concepts of bounded rationality and imperfect information. However, following the logic of the rest of this book, we note that the scope for opportunism is minimized when information is perfect.

2. The increasing stringency of food-safety legislation is primarily a phenomenon of developed economies. However, as supermarket supply chains become first regionalized and then globalized, the same standards are rapidly being applied to producers in developing countries (Henson and Reardon 2005). This process is not advanced in Africa, but these trends will increasingly be seen there even during the lifetime of this textbook.

3. Another possibility is that the wealthier party also exercises some social control over the weaker party (Crow and Murshid 1994).

4. A literature known as global commodity chain analysis (Gereffi 1994; Gibbon 2001) defines a chain driver (the most powerful player in their chain) in large part according to ability to dictate the nature of other relationships in the chain and the terms on which other players in the chain do business.

5. The point beyond which a party will choose not to contract at all, rather than to accept the terms and conditions on offer, is known as the party's reservation position in a bargaining process. A party's reservation position is determined by its options for income or profit generation outside of the bargaining process in question.

6. In the Hall and Soskice (2001) example of employee training in the German manufacturing industry, similar issues would have arisen had all firms been required to pay a levy to fund an industry-wide training program. Had this alternative approach been taken, firms would be free to compete for the resulting trainees, but trainees would not gain the firm-specific element of training that they receive under the current arrangements. Arguably, this is why Hall and Soskice see this example as being about creating conditions for asset-specific investment rather than about contract enforcement or provision of public goods.

7. The difficulties of enforcing contracts in the tobacco sector may owe something to the heavy dependence on purchased inputs in this sector (even greater than in cotton).

8. Although in theory firms that maintain higher quality standards should be able to obtain higher prices for their cotton lint and hence pay higher seed cotton prices to producers who supply them with high-quality seed cotton, there are a number of reasons why this does not happen in prac-

tice. Firms wishing to maintain high quality standards thus struggle to pay more for seed cotton than do competitors who prioritize volume of seed cotton ginned over quality.

9. Modifying the definition of collective action provided by *A Dictionary of Sociology* (Marshall 1998), collective action is defined here as action taken by a group, involving some degree of collective decisionmaking, in pursuit of members' perceived shared interests. This contrasts with decision-making by a state regulator or by the management of a private firm, where responsibility for decision-making is delegated to the manager by the owners, who then have to hold the manager to account for his or her decisions.

10. The argument also holds when farmers want or need to invest in intangible assets (such as product branding) to defend or enhance the share of profits that they capture in rapidly changing market systems.

11. Such externalities can include information externalities, group-reputation effects, agglomeration effects, and knowledge spillovers.

12. This case holds only if players with processing capacity refuse to process on behalf of smaller traders without such capacity and/or if the state refuses to grant trading licences in particular sectors to traders who have not made specified investments in processing capacity.

13. Alternatively, Dorward and Kydd (2004) refer to them as soft and hard coordination, respectively.

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