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Methodological Issues Concerning Vertical Coordination
within the Subsector Framework:
Insights from some French and American Experiences

by

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I. RESEARCH PROBLEM

1.1. Problem Position

Paris, 1987. Following a worrying decline in cotton world-prices, a debate takes place about the prospect of cotton subsectors in Francophone Africa. Central object of divergence in the World Bank and French official positions, the organization of the filière is questioned. Less government? More integration? Price stabilisation? More private sector? All those key words appeared as limited parts of a broader question, concerning the food system: How best to design vertical coordination patterns, within a given commodity subsector? And, more generally, how to improve our mode of inquiry and design better frameworks for articulating preferences? What role do the notions of process and long-term sequencing play in implementing vertical coordination changes?

This first set of questions introduces the general focus of this paper. 1) It looks at the food and agricultural system, and 2) emphasizes the notion of vertical coordination. The latter notion, with the heterogeneous perceptions of what it means and entails, constitutes the object of this paper. As an introduction, let us suggest some elements of definition: Shaffer presents vertical coordination as "a special problem of preference articulation. The issue is the effectiveness of coordination of supply decisions with demand." [1980, p.317] This definition introduces the concept of matching supply and demand through some processes. At the same time, it is broad enough to enable the inclusion of various notions, such as equity, power, etc. To be more concrete about what coordination refers to, let us also introduce Haggblade and Matthew's definition: "Coordination describes the linkages among firms active in the subsector. It examines how policies and regulations influence market access and interaction, and how insiders regulate product flows within the system." [p.3] Lacking in this definition is the notion that coordination also involves linkages within firms, especially vertically integrated ones.

1.2. Objectives

This paper is most of all methodological in nature. It includes a cognitive dimension: how have different people conceptualized the notion of vertical coordination? More particular attention will be paid to the definition of what economic agents perceived as an incentive to adopt a given strategy. Approaches will be tested concerning their ability to help design adequate coordination patterns.

This paper also includes an applied dimension, regarding the monitoring of coordination change. Monitoring refers here to something broader than the usual definition of project monitoring and evaluation. The notion includes the notion of an ongoing diagnosis of the agricultural system performance. The paper attempts to underline the advantages of two methodological elements: the notion of system and the notion of process. This paper argues that to include those two dimensions into a research scope facilitates the understanding of interdependences and the design of realistic and successful coordination patterns.

1.3. Methods

1.3.1. Subsector approach: a useful method to analyze food systems.

To circumscribe the previous focus, a first restriction has been applied. It is embedded in the choice of a subsector scope to assess such coordination performance. Defined as "the vertical set of activities in the production and distribution of a closely related set of commodities"[Shaffer, 1969:3], a subsector approach allows for analysing preference articulation patterns and processes, across stages, and throughout the commodity subsystem. It constitutes a methodological compromise between what is significant and what is manageable. Note that the word *filière*, which will sometimes be used, is a French equivalent to commodity subsector.

1.3.2. Taking advantage of some French and American experiences.

The second restriction led to analyzing the use of a subsector approach undertaken within the context of either American or French organizations. Indeed, the original intention of this paper was to compare the subsector approaches of scholars in both countries. It turned out, however, that variability within each country appeared greater than across countries and that a comparison across approaches would be more fruitful than a comparison across countries. The original theme was therefore abandoned for the current one. nevertheless, the confrontation of selected American and French studies is still meaningful regarding our theme for two different reasons:

- 1) The French have developed some original theoretical frameworks applied to subsector analysis, which may broaden the American litterature on the notion of vertical coordination.
- 2) At some point, French and American official positions were (and still are ?) fairly conflicting, regarding ways to get development in Africa. This is what we will observe through a case study of the cotton subsectors in sub-saharan Africa, for which perceptions regarding coordination were conflicting in the mid 80s, a decade of the structural adjustment and falling cotton prices.

1.3.3. Organization of the paper

The method relies on two main elements:

1. A conceptual scope : A literature review of selected paradigms will be presented so as to synthesize different conceptual approaches to vertical coordination within the subsector framework and thereby indicate the high degree of heterogeneity that exists within this framework. A brief analysis of the impact of specific paradigms on policy recommendations will also be undertaken.
2. An applied scope: The analysis of cotton subsectors in Africa will be undertaken through three different scopes: a) A rapid description of the conflicts in 1987 concerning the perceptions of the problems facing the subsector, to underline some of the main questions concerning the way coordination should be approached. b) A synthesis of some findings concerning the strengths

and weaknesses of various coordination patterns in the cotton subsector. c) An historical perspective stressing evolution in the coordination patterns observed in the subsector.

II. ECONOMIC THEORIES BEHIND VARIOUS SUBSECTOR ANALYSIS : A

SELECTIVE LITERATURE REVIEW

This chapter on theories has two objectives : one is to broaden the usual American literature on foreign theories by referring to some French frameworks. The other is to illustrate how the variety of theoretical development about issues of coordination underlines much of the current debates about how to manage vertical coordination. In particular, the review stresses how behavioral, institutional, and organizational assumptions or scopes are linked with the way vertical coordination is observed.

For each theory, this chapter presents: 1) a description of the main concepts and paradigms; 2) an analysis of their potential impact on the way vertical coordination is approached and on the research questions and methods; and 3) an illustration with a representative subsector study. Finally, a comparison of the distinguishing features of the different schools of analysis will be undertaken.

While reviewing different theories, the following questions have been considered :

- What is the nature of the exchange being analyzed ?
- What are the vertical-coordination performance-criteria taken into account ?
- What is the time frame for coordination processes to emerge (instantaneous, historical...) ?
- With regard to agents taking part in the transaction, how are their behavior and rationality approached?
- How are organizations approached ?
- What are the role and place of institutions in the vertical coordination analysis ? Are they considered as given, as mistakes, as emerging from an historical process ?

This synthesis relies on a literature review drawing from both the French and American worlds. This constitutes a particularly difficult task due to the incredible variety of theoretical approaches.

It is to be stressed that this chapter is far from representing all the current tendencies in French and American views.

2.1. Insights from Standard Neoclassical Theory and Industrial Organizational Theory.

2.1.1. Standard Neoclassical Theory

Given its various extensions, much would need to be said about neoclassical theory and its many variations. In this section central tendencies will be stereotyped.

Standard theory is based on the following elements: 1) individuals are rational, maximizing their expected profit or utility; 2) under certain conditions, the market allows for Pareto-optimality. This is the state where no one may be made better off without lowering someone else's utility. It corresponds to situations where firms equate expected marginal cost and marginal value product and consumers maximize their utility subject to a budget constraint. For all this to happen however, many further assumptions are needed: perfect competition (with numerous firms), perfect information, decision-units efficiently using their resources; the system is assumed without rigidities, allowing producers to reallocate resources both efficiently and instantaneously in response to any market-signal change. Also, situations such as prisoners' dilemma are not considered.

In this framework, price coordination is the essential coordination pattern. For it to be Pareto-efficient, market competition needs to be preserved by maintaining a large number of firms, (condition for the anonymous market to achieve market-clearing). Also, government has to avoid interfering in the allocation pattern. The constant reference to firms indicates that organizations are not excluded from the scope of analysis. However, with regard to coordination of activities, only what occurs outside the organizations is accounted for, their internal coordination patterns being reduced to the black box of their assumed rationality.

As stressed below, institutional economists criticize the standard framework, for it draws recommendations based on counterfactual assumptions.

2.1.2. The Industrial-Organization S-C-P Framework

The Structure-Conduct-Performance framework was first introduced at the level of industry studies. It has been adapted to subsectors and may be formulated as follows: it states that subsector structure strongly influences firms' behavior, which in turn affects subsector performance. In its traditional sense, market structure entails such characteristics as the number of firms, entry and exit conditions, degree of product differentiation, etc; that is, features altering the firms' competitive behavior [Dembélé, 1994]. Performance criteria take into account notions such as matching supply and demand in quantity, quality, time and location; technical and operational efficiency; food safety; and progressiveness. However, although performance criteria seem broad, focus has mainly been on the barriers-to-entry and collusive-practices.

Note that this framework is primarily a pragmatic method of inquiry, even though its implementation within a neoclassical scope may seem predominant. Indeed, some have seen in it a way to deal with the issue of power and market concentration, within a predominantly neoclassical framework.

2.1.3. Application to market analysis: the NC117 Program.

In the 1970s, the North Central 117 research program was implemented, so as to understand better recent evolution in the U.S. food system. After some seminars to design the program objectives and methods [USDA ERS, 1986], a comparative analysis of various subsectors was undertaken (see for instance Ward and Kilmer, 1980, for citrus; Hayenga et al., 1985, for pork; Cook et al., 1978 for dairy). Findings were then synthesized [Marion, 1986]. It is mainly on Marion's synthesis that this section is based, although the other documents mentioned were also consulted to broaden the perception on this program.

Although fairly innovative in its use of the S-C-P paradigm, this analysis also kept referring to neoclassical performance criteria: economic and coordination performance are assessed through a comparison with a purely and perfectly competitive market. Performance of the system of vertical coordination refers to the welfare-economics concept of "maximizing social satisfaction" [Marion, 1986]. Emphasis on price-discovery mechanisms is fundamental, with the grounding assumption that, in a market-economy, pricing constitutes the fundamental instrument for information transmission. It is therefore viewed as the main coordination mechanism. Pricing mechanisms are described and criticized depending on the distortions they may create [Marion, p.51-110]. Price and cost analyses are also used in order to assess potentially excessive margins, and market segmentation. Along the same line, economic failures are explained as a market working imperfectly and the existence of rigidities in the market-place. In particular, most institutions supporting collective action resulting in outcomes different from those of a competitive market are considered as barriers preventing the market from performing perfectly. At the same time, if government is mainly exogenous to the system, current policies are generally viewed under their high-cost and distortionary aspect without any further analysis. Also, considerations about agents' strategy or behavior is absent.

Despite this major tendency, various vertical coordination patterns are analyzed: terminal markets, direct marketing, electronic markets, contract coordination, future markets and cooperatives. Also, other issues are considered, such as temporal coordination, which refers to the process of regulating the quantity supplied during different periods so it is consistent with consumer preferences and willingness to pay [Marion, p.187]. Indeed, this issue is viewed by some NC117 researchers as the overriding coordination problem. Also, some authors suggest to work on workable competition patterns [p.186], rather than to always refer to perfect competition. It is also mentioned that the question of "who has the control over strategic decisions in a subsector" [p.51] is of major importance. This clearly refers to the distribution of rights, and to the notion of power. A corresponding example is the analysis of farmers' cooperative bargaining as a mean to "establish

terms of trade at a stage interface characterized by unequal numbers of buyers and sellers" [Marion, p.88] It is to be noted, however, that this concept is still quite limited to the traditional neoclassical approach in terms of market concentration.

In this perspective, recommendations are oriented toward improving competition, through investment in information or transportation systems, or regulation of market-share concentration to maintain or enhance competitiveness (anti-trust laws).

2.2. Neoinstitutionalism or Contract Theory : Williamson's Contribution.

Williamson's contract analysis follows from the work of R.H. Coase, who first explained a firm's existence as arising from a transaction-cost saving concern : exchange among individual agents in the market-place is costly (in particular, information provision). A firm may therefore be analyzed as a set of individual contracts coordinated by an entrepreneur.

Williamson's approach suggests that firms derive optimal coordination patterns by assessing transaction costs such as information and search costs. The principal dimensions on which transaction cost economics relies are "(1) the frequency with which [transactions] recur, (2) the degree and type of uncertainty to which they are subject, and (3) the condition of asset specificity." [Williamson, 1989:142] The unit of analysis is the transaction, not prices, as in standard neoclassical theory. The market-place appears as a bilateral-contract network, in which specific individual cooperation occurs and not only as a price system. Firms are regarded "as a governance structure rather than as a production function". [Williamson, 1989]

Williamson's framework is based on two behavioral assumptions. First, agents' bounded rationality is assumed: Because collecting information is costly, full information is not obtained and decisions are made under uncertainty. Second, contract theory refers to agents' opportunism: individuals tend to act in their own interest and are not reliable. They are still viewed as

individualistic maximizers.

Although Williamson's recent articles open the transaction-cost scope to other concerns (such as how to implement a program of adaptative and sequential decision making (1989)), his analysis has mainly relied on a static microeconomic efficiency-criterion : how to design a contract such that efficient measures are selected. Efficient pricing remains a key criterion (and assessment tool).

Neo-institutionalism therefore completes more than modifies neo-classical theory. As Williamson states, "the main differences between market and internal organization are these: (1) markets promote high-powered incentives and restrain bureaucratic distortion more effectively than internal organization; (2) markets can sometimes aggregate demands to advantage, thereby to realize economies of scale and scope; and (3) internal organization has access to distinctive governance instruments." [Williamson, 1989:150]

Note that whenever the notion of governance is mentioned, it refers to the "private governance", with efficiency as a performance criterion. Indeed, as Dembélé stresses, referring to Schmid, one of the "limitation[s] of the transaction-cost theory is its insistence on lowering transaction-cost as sole criterion for institutional choice. However, whose cost counts depends on the structure of property rights." [Dembélé, 1994:37]

As an example, Aldridge's analysis [1992] of the information subsector belongs mainly to the transaction cost theory. Her work suggests various coordination mechanism schemes for implementing a market information system and evaluates transaction costs and therefore efficiency for each of them. Note, however, that her analysis goes beyond a simple application of Williamson concepts. In particular, she emphasizes notions such as adaptative efficiency through time and adds more behavioral elements to her analysis.

2.3. Convention Theory

2.3.1. Its goal : Analysing the interpenetration of market and non-market phenomena.

The research goal of convention theory consists of conceptualizing the interpenetration of market and non-market phenomena [Chevasus-Lozza and Valceschini, 1992] and thereby explaining some situations which do not fulfill the assumptions of standard theory, without reducing them to "market imperfections". The concept of rules is perceived as central because it allows for conceptualizing both organization (a rule system) and market, which is institutionalized through a "constitutive convention". [Chevasus-Lozza and Valceschini, 1992] Convention is defined as "the collective non-contractual rules, which allow a group of people, through a collective learning process, to reach some global objectives as defined by some minimum efficiency standard." [translated from Favereau, 1989]

2.3.2. Convention as a procedure for managing uncertainty and bounded rationality

Accounting for uncertainty is a central concern in convention theory analysis [Chevasus-Lozza and Valceschini, 1992]. Besides stationary hazards (such as climate variability, with a relatively constant distribution function through time), it considers that radical uncertainty (arising from hazards that are neither predictable nor imaginable) makes statistical computation of uncertainty infeasible. Besides, potential future states are so numerous that agents cannot take all of them into account. (This is the incompleteness concept). According to such a bounded rationality assumption, agents cannot simply be utility-optimizers, but have strategies to overcome their cognitive limits. In that sense, conventions are seen as mechanisms allowing for knowledge economies. [Favereau, 1989] Once established, an inter-individual convention is taken as given, as a superior logic level. However, for transactions to be actually implemented, such a reference needs to rely on some trust.

2.3.3. Rules as collective cognitive devices.

1. According to convention theory, no agreement among individuals is possible without a common framework, a constitutive convention. This common framework is not the result of an original contract like contract-theory suggests, but is viewed as a paradigm, a cognitive model or an information structure. This theory thereby differs from the neoclassical framework because it is more explicit and more analytical concerning the underlining social convention. Actually, neoclassical analysis implicitly takes the existing rules and distribution of rights as given, and then analyzes transaction within that framework.

2. This approach emphasizes the economic-agents' behavior. It does not deny methodological individualism, although it denies the notion of a simple opposition between holism (society completely determines individuals' behavior) and individualism : a convention is to be approached both as the result of individual actions and as a framework constraining individuals [Dupuy et al., 1989]. It is a regularity which emerges from some social interactions and which agents consider as accepted conventional wisdom once it has emerged (at least so long as it is not challenged by some instability). Therefore, convention theorists call attention to agent behavior under certain recognized rules and processes leading to rule creation and destabilisation.

Convention theorists agree with Simon when he advocates a procedural view of rationality [Simon, 1986a and b]: The standard approach of rationality is substantive. Indeed, neoclassical economists typically assume decision-making processes are given, and only look at the resulting choices. Procedural rationality, on the other hand, is concerned with the decision processes that shape individuals' perceptions, focus of attention, and, as a result, choices.

3. A large number of convention analyses introduce some temporal phenomena that are not consistent with the spontaneous equilibrium notion (e.g., procedural rationality, irreversibility, learning processes). Actually, the starting point of such work seems to be that firms are engaged in durable relations with their input providers, clients or employees. This relative stability has been perceived through notions such as "industrial structure", "filère" or access-barriers. Such an

approach is relatively incompatible with the standard neoclassical approach in which flexibility plays a dominant role (with the notion of adjustment to price-changes.) [Chevasus-Lozza and Valceschini, 1992]

4. Referring to neoinstitutionalism, convention theory criticizes the extreme representation (no / full control over the design of institutions), for this perception does not represent what is actually a continuous reality. Indeed, with regard to rules, contract theory considers only two levels of control: Some rules are considered as exogenous, such as national laws or the rules of the game. Organizations are supposed to have no influence over such institutions. Rules are therefore considered as exogenous, or what Favereau calls "constraint-rules". For some others, an infinite degree of control is assumed, characterized by the maximization procedure: "Contract-rules" result from the perfect control (that is, without external interference) that two contracting agents have over the choice of the rules. In addition, despite its bounded rationality assumption, Williamson's theory is still based on the substantive rationality notion.¹ This is contradictory with the conception that any rule, even a very stringent one, enables or summarizes a learning process, the acquisition of new knowledge. [Favereau, 1989] Note however that Favereau himself recognizes contract rules and the corresponding substantial rationality perception as useful for instrumentalist purposes.

As a conclusion, what the convention theory suggests is to consider rules as collective cognitive devices². Convention theory is built on the procedural rationality assumption (as Simon defined it). With regard to vertical coordination, it assumes that understanding what happens within organizations is important to understand what happens outside. Firms are not seen as black boxes,

¹ This does not apply so much to the decision as to the decision process (optimization of contract-nature)

² Note that such an approach is quite close to Cyert's and March's pioneering work emphasizing the standard operating procedures concept. "In order to reduce transaction costs in decision making, the group develops SOPs." [Shaffer, 1980: 313] Also see Heiner, "Origin of Predictable Behavior".

but also through their own allocation mechanisms. The market is not the universal analysis framework, nor prices the only resource allocation mechanism.

2.3.4. Conceptualization of Coordination Patterns: Les Economies de la Grandeur.

Boltanski's and Thévenot's (1987) goal consists of understanding the consequences of two apparently contradictory assumptions: 1) it is possible to base coordinated actions on a common principle, 2) there exists several such principles.

1. These authors distinguish several common superior principles (or grandeurs): market, civic, industrial, and domestic principles. Each of them constitutes a potential basis for a general coordination of behaviors. For this to happen, each of these worlds provides a frame of reference, a form of generality.

Let us take the example of the market "grandeur"³: the pure and perfect market perspective constitutes the superior common principle allowing for conduct coordination. Various individuals set agreements on the basis of the same common reference, viz goods endowed with prices. The main coordination pattern is the market exchange. People also are classified according to their competence (rationality) and their grandeur (wealth). Security that others will justify their action through this common principle leads to a "price-grandeur" economy. Whenever this grandeur is accepted as a common principle, this economy is able to decentralize the price system, and this decentralization process allows for coordination of participants' conduct. According to this principle, coordination does not entails no temporal reference (transaction decisions are supposed to only refer to insatantaneous prices but neither to past agreements nor to future collaboration between the contracting parts), and actions and actors identity does not matter (anonymity and a-spatial).

³ The best English equivalent could be a "unit" for a given dimension, or a common superior principle.

Other principles, according to Boltanski and Thevenot, rely on different principles, and lead to different coordination patterns. Let us refer briefly to the other coordination patterns [partly translated from Valceschini, 1993 and Boltanski and Thevenot, 1987]:

- The domestic coordination pattern is governed by principles of confidence and authority. Those principles rely on reputation and fidelity to customs, as well as on personal relations or esteem. The temporal and spatial orders determining the way coordination occur are based on the past and proximity.

- Industrial coordination is based on the productivity made possible by work division of labor and by the standardization of products and production processes. Contrasting with a market coordination, where transaction takes place in an instantaneous time frame, continuity between present and future prevails in an industrial coordination. There is an identical reproduction of actions and products, independently from people's individual characteristics.

- Civic coordination relies on collective solidarity. Unity is built around a common general interest or around a common superior objective which transcends individual interests. Relations are based on commitment, debates and delegation.

For this to appear more concrete, it may be useful to look at Table 2.1.. According to the convention coordination classification, Hugon built a table reporting agents' behavior, economic coordination patterns, and accumulation characteristics. This table was constituted for an African context.

Construction of such dimensions arises from the existence of uncertainty. Each principle allows for economizing complex speculations about uncertain behavior of other individuals. For instance, in the market world, certainty is attached to universal knowledge of the goods and their prices. There is still some natural uncertainty (e.g., particular desires people have to obtain a given good), but, those may be worked out. More problematic, however, is the existence of critical uncertainty. For instance, in the market dimension, there may be some difficulty in defining goods' quality, and therefore the unit price is not sufficient to achieve an effective coordination pattern. This is the

case, in instances of adverse selection or moral hazard. Such phenomenon may distort market behaviors, suggesting the need to refer to several principles to restore predictable behaviors.

For instance, take an agricultural product sold on the market place. The coordination pattern would be primarily of a market type. If the evaluation of quality is difficult, implementing some grades, standards and controls to facilitate the evaluation might prevent adverse selection to occur. Such norms as grades and standards are noted in the convention typology as industrial coordination devices. Norms become rules, once people trust the new information system (grades and standards) and refer to it to, when transacting with each other. Referring to a common principle allows for the saving of some information costs.

Consider, now, an African household willing to sell its farm products. As has been stressed by Jayne et al. (1993), due to market price instability, relying on market may appear as an unbearable risk, if the household's food security is at stake. Internalizing transactions within a personalized relation network may therefore appear as a profitable device to stabilize access to resources. Certain rules are learnt, within a tribe or a rural organization, allowing for a certain confidence to develop among the transacting partners. There may still be a market organization (rural markets). However, they would not only be governed by the market coordination principle with a unique reference to prices, but also by some relations of solidarity among the members of a personalized system of exchange (that is, a domestic coordination pattern in the convention typology)..

2. Critical tensions among several dimensions and the notion of compromise

In reality, reasonable action is settled in a universe composed of several principles, because people refer to different principles. When people do not refer to the same principles, problem arises due to a critical inversion of the value granted to various principle: what is important according to a given principle is not taken into account at all according to another. For instance, people referring to principle A (say voting as a civic act) are denounced by those referring to principle B (from a market view point, voting, when your own vote is marginal, is a naïve attitude). On the other hand,

attitude based on principle B (not voting) is judged as unacceptable (greedy) by those referring to principle A. This suggests that conflict, compromise, or anything in between might occur. In the common perception, compromise is an arrangement among people. It has a limited validity and involves only those directly involved in it. In Thévenot's perception, compromise also refers to an "action submitted to stronger constraints looking for being justifiable - or reasonable - and for fitting in a global equilibrium" [Thévenot, 1989:177]. It is therefore one of the convention theorists' goals to see how tensions across principles are solved, how evolutions from one world to another occur. (see example 2.3.5.)

As a conclusion, this "analysis framework invites one to abandon the utopia of a universe with only one nature, without leading to a continuous denunciation of the merchant order nor to a renunciation to the common good that it constitutes. It maybe enables one to be clear-sighted about the structural difficulty met within [such a perspective], and to be thoughtful about the critical opening implied by a game with several natures, and about the diversity in the learning patterns and political-bond forms that it enables." [translated from Thévenot, 1989:193]

2.3.5. An example : Processed-vegetable Subsector in France.

As an illustration, let us refer to Valceschini's analysis (1993) of the processed-vegetable subsector. Referring to Boltanski's and Thévenot's model, the author emphasizes the necessary transition from a civic kind of coordination to a more market-oriented one.

The author first describes the structure of the subsector. Performance of processing industries highly depends on the technological and hedonic qualities of the vegetables produced at the farm level. Delivery timeliness helps smooth the entering flow of raw products. At the same time, due to product perishability, producers and processing industries have to be close to each other. Because vegetable production is atomistic, processing industries might face a high heterogeneity in the product quality and irregularity in product delivery. Due to an asymetric information structure,

processing industries face a risk of moral hazard (farmers' technical abilities are not known a priori) and of opportunism (vegetable production only represents a small share of the farming activities). On the other side, farmers are confronted to risks of adverse selection, because their products outlet is completely depending on processing industries. In addition, they usually know very little about the market conditions for processed vegetables. Once seeds are planted and once they invested in the required specific assets, vegetable producers are in an irreversible position.

In this case, as Williamson would suggest as well, the notion of transaction goes beyond a simple sale/purchase scheme on the market place. Some contract specifications are needed prior to production. Because of these filières characteristics, transactions between vegetable producers and processing industries has long been operated using production contracts.

In 1961, transactions became more codified in an interprofessional agreement, renewed regularly through collective negotiations. The so-called "interprofession" is a centralized organization based on specific legislation. Valeschini considers the coordination pattern as civic, due to the internal negotiation rules and voting procedures, implemented each time regulations of the subsector are to be renewed. Also, a commission composed of vegetable producers and processors agree upon and sign some specific contracts at a more local level. Contracts deals with such characteristics as technological norms and specifications, area planted, harvest dates, minimum prices, stock management practices or rules for controlling contract fulfillment... The nature of the decisions is both strategic (value-added allocation in the subsector) and operational (technological specifications). The filière is no more considered as a simple exchange place (market) but as a real productive structure. This somewhat integrated structure is what makes Valeschini describes the coordination pattern as "civic/industrial". Note that competition in the subsector took place not at the producer but at the processing-industries level: industrial investment policy and production costs determined the competitiveness of a given channel. This coordination clarified and lowered the risks suggested above (like opportunism). It accelerated the industrialization process in the 1960s and enabled a high level of progressiveness. At the same time,

concentration occurred at the processing industry level. It led to storage costs that would have been unbearable if inflation had not smoothed their financial cost. Also, the pricing method was closely linked with the Common Agricultural Policy regarding cereals. This suggests that the relatively high producer price did not result only from the subsector coordination structure.

In the 1980s, some market transformations took place. On the supply side, competition was enhanced due to the apparition of new processing technics such as frozen products; also, european competition became stronger. In particular, lower quality standards and, as a result, lower production costs, made the Belgian subsector gained a large share of the French market. At the same time, demand became less homogenous, with the development of many niche markets. In addition, the former pricing methods were no more relevant due to changes in the cereal subsector.

As a result, the centralized decision structure became more and more criticized during the 80s and was dismantled in 1990. Now, quality is no more defined at a national level but its determination is let to the market. Pricing as well is more decentralized. Valeschini suggests that a cooperative structure (or co-management) is replacing unions (claims). Therefore, coordination refers less to civic principles and more to industrial or cooperative ones. "Interprofession" still exists but only as a research and control structure. The unsolved problem identified by Valeschini is that of increased uncertainty. Although the new structure is better adapted to the new market environment, some problems arise from a lack of mutual confidence and risks of incomplete contract fulfilment. Certainly, "complete contracts", as conceived before, are no more relevant, and the speed of learning processes and flexibility has to be increased. Therefore, the author suggests that some kind of intermediary (no more national) negotiation structure needs to be designed.

2.4. Regulation theory: The problem of order

2.4.1. An historical analysis of the emergence of economic regularities

The French concept of regulation must first be defined. Regulation refers to that which gives order to the relationship among actors. Boyer (1992) defines regulation as the conjunction of institutional devices creating an environment with a given stability in which some organizations can reproduce. The term "regulation" does not exactly correspond to the English sense of the word, which refers specifically to concepts such as control and law. Neither does it particularly refer to a strong state intervention. Its intention is to better understand processes explaining variability over time and space of the economic and social dynamics. The concept focuses on an historical and regional analysis of the institutional structures and processes which give order to economic transaction.

1. The notions of structural or institutional forms (any codification such as money-use, industrial relations, competition patterns) are central to the theory.
2. Theorists intend to formalize some dynamic systems, called accumulation regimes, where investment takes place, profit is realized, capital is formed, employment is affected, etc. These systems are both considered under 1) their "static" characteristics or structure (Who has the right to produce, what are the rules of the game, what are the interdependences in the system?) and 2) through their internal dynamism (what are the accumulation processes? How do they affect other parts of the system?)
3. By linking accumulation regimes and institutional forms, the regulation approach analyzes accumulation processes within their institutional environment. Its assumption is that institutional forms build regularity in the accumulation processes. A crisis is the sign that the ongoing regulation pattern has been challenged by increased contradiction in the accumulation pattern. Contradiction refers both to a deregulation of the former accumulation process and to a change in perception of what the accumulation pattern should be (change in preferences). Accumulation regimes and their stability have been conceptualized mainly for societies where the

production pattern is dominantly capitalist. It seems that the goal of regulation theory is to realize some sort of a typology to understand different regulation patterns.

4. Referring to Marxist theory, Boyer stresses that emphasizing social relations as a starting point for analyzing society is a valuable alternative to the methodological-individualism approach. According to Boyer, an holistic approach, such as Marxists use is relevant whenever social cohesion is perceived as a major issue. Meanwhile, according to the regulation school, the starting point for analysis is the impact of the set of social relations on economic regularities.

5. The fundamental economic policy issue is one of helping an adequate regulation pattern to emerge and working out what is judged to be adequate. Regulation patterns are therefore distinct from both the general-equilibrium concept and the Marxist and structuralist reproduction notion. Actually, reproduction in the Marxist sense suggests a certain fixity in the regulation pattern: A given logic of actors, a given power structure constantly dominate, determine the rules, and, in turn, the regulation patterns, so as to reproduce their privileges. Regulation theory, however, is concerned both by the continuity and changes in the regulation patterns, in the power structure (whose preferences count). It seems therefore closer to the American "institution crafting" approach, in the sense that it is an adaptative view of institution-building. However, it adds to this approach more emphasis on social relations and on the historical macroeconomic context. Some concepts of regulation theory seem really close to what Samuels (1993) would call the resolution of tensions such as "freedom and control" or "continuity and changes" [Schmidt, 1987]. Focusing before on the analysis of regularities and reproduction logic, it has integrated interactions between structures; behavior, innovations, morphogenetic individualism (individuals build rules), or imperfect holism (conventions alter individuals' behavior). Although close to the convention school, it diverges from it through the analysis of historical processes, conflicts and revolutions. [Hugon, 1992]

As a conclusion, the regulation school suggests that, in economic analysis, institutional-arrangement particularities are to be taken into account, and placed within their historical context.

Such an historical scope allows one to understand the forces and processes behind institutional formation and "deformation" (due to conflicts and disequilibrium) [Hugon, 1992]. As represented in Figure 1, its assumption about the causality relations in a given development process is the following : 1) a given institutional configuration produces 2) some "regulation" patterns which in turn produces 3) various accumulation regimes. Those three aspects characterize the development pattern.

2.4.2. Application to subsector analysis

The regulation framework has also been applied at the subsector level, although its more common dimensions are macroeconomic and national. A subsector regulation pattern is the combination of a given accumulation regime (a dynamic genesis of production, revenue, distribution and demand) and some institutional devices (norms, rules, organizations producing them and at the same time orienting economic regimes). The regulation pattern is viewed as a process and not as fixed state. For such a subsystem analysis to be coherent, however, some restrictions must be fulfilled [Bartoli and Boulet, 1990]:

1. The accumulation-regime notion cannot be thought of only at the subsector level because of the existence of some global institutional devices and of interactions across subsectors; however, the subsector dimension is inescapable, for analytical purposes. Therefore, two extremes must be avoided a) a mechanical transposition, where the general regulation pattern is simply applied to subsector, disregarding the subsector specific characteristics; and b) an extensive emphasis on subsector particularities.

2. The subsector boundaries must be meaningful. They are not exogenous but arise from a process that has to be analyzed: why is the given subsector partly autonomously organized and institutionalized? Such a differentiation across subsectors arises from complex phenomena, especially due to the three factors: their economic evolution (growth and decline), the conditions for their social expression, and the professional representation pattern.

From subsector analysis to global economy

Regulation theory is above of all pragmatic: it intends to build a new framework for accumulating knowledge. It appears in this paper that this approach may help understand the diversity of development patterns, within a given social structure. To some extent, such concerns may be compared to the NC 117 procedure: subsector analysis is a tool to better understand global economic processes. At the same time, however, commodity subsectors are each unique. Boyer suggests synthetic approaches combining knowledge arising from the analysis of global regulation-patterns and from subsector analysis, emphasizing interactions between institutional devices and economic regime. (See appendix 1)

2.4.3. Analysis of the Wine Subsector in France.

Bartoli and Boulet (1990) base their analysis of the wine subsector in France on regulation theory. They stress the sociological, political and economic processes through which differentiation between the "A.O.C." wine-production (high prestige wine with an Origin-Controlled Appellation, A.O.C. in French) and common or "V.C.C." wines (Vin de Consommation Courante) has been institutionalized. They have selected therefore a one-century historical scope and shown the dynamic interaction between institutional formation and decline processes, on the one hand, and economic crisis and relative stability, on the other.

In France, the wine production channel becomes a subsector institutionally by the end of the XIX century. Since the Middle-age, the question as to who has access to production and commercialization networks had been a highly conflicting issue. Local authorities (Seigneurs or King) established multiple rules to constrain and control the expansion of wine production. This history led to the establishment of a hierarchy among vineyards.

In the XIX century, lower transport costs, urbanization, and the emergence of a working class made wine consumption more popular. Wine expansion occurred in Languedoc (the Southern part of France). Also, protectionism was diminished. This should have led to an important transformation in

the wine economy (in particular in Languedoc). However, the expected transformation occurred only partly due to some strategies designed to protect former rents.

At the end of the XIX century, major disequilibrium occurred. After the phylloxera epidemic, new and more productive wine varieties were developed. Colonies such as Algeria became important producers. At the same time, demand price-elasticity was low. In addition, no market organization existed. A "capitalist" solution could have emerged from such a crisis. It might then have led to industrialization and increased. What happened, however, was the introduction of a very restrictive regulation and an administrative control over the market. Rules consisted in strict specification of wine production techniques, arguing for "natural" production patterns, and preventing industrialization from occurring. Languedoc was the region where industrialization was the more susceptible to occur and a Southern union was constituted.

Two institutional logics emerged from this conflictual period.

1. One led to a market organization (called "Statut Viticole") which targeted mass consumption. This organization was subject to chronic shocks.
2. The other led to the design of some "appellations", in 1935, and to the constitution of rents in reputed vineyards. Those appellations are called AOC, that is origin-controlled appellation.

The state did not (and still does not) play the same role in each organization. In the first one, the state controlled and financed the market organization. In the second, only producers and processors manage the organization and the regulations such as the conditions of access to labels.

As a result, these organizations led to very different economic regimes. For ordinary wines, supply is undifferentiated. Consumers remained the ones inherited from the XIX-century working-class. The unicity of the outlet did not induce progressiveness in terms of quality. Vinification in cooperatives maintained small-scale production structures and prevented scale economies from being realized. At the same time, competition among farmers was prevented using some quantitative production limitations.

For "appellation" wines, supply was (and still is) highly regulated. The rents that derives from the appellations led to product differentiation. Meanwhile, wineries were in monopolistic situations and heterogenous structures could be maintained. Wine processing (chaptalization) could still be handled at the castle level, that is, using small-scale structures. Market has been expanding.

From this analysis, the authors could derive some future prospects for the wine subsector. They underline the increased competition that derives from the European organization and the need to adapt to it. Also, European consumers are maybe less attached to wine traditions and reputations than the French are. As a result, regions, that were previously considered as producing "ordinary" wine, have a chance to attract European consumers. To do so, however, they have to overcome previous psychological and structural (from the power structure) sources of rigidity. The authors conclude with some feasible transformations in the wine subsector.

As a conclusion, Bartoli's and Boulet's analysis stresses that two subsector regulation patterns, clearly different, have developped throughout centuries. These regulation patterns led to completely different accumulation patterns. The following institutional insights emerge from their wine subsector analysis [as underlined by Boyer, 1990] :

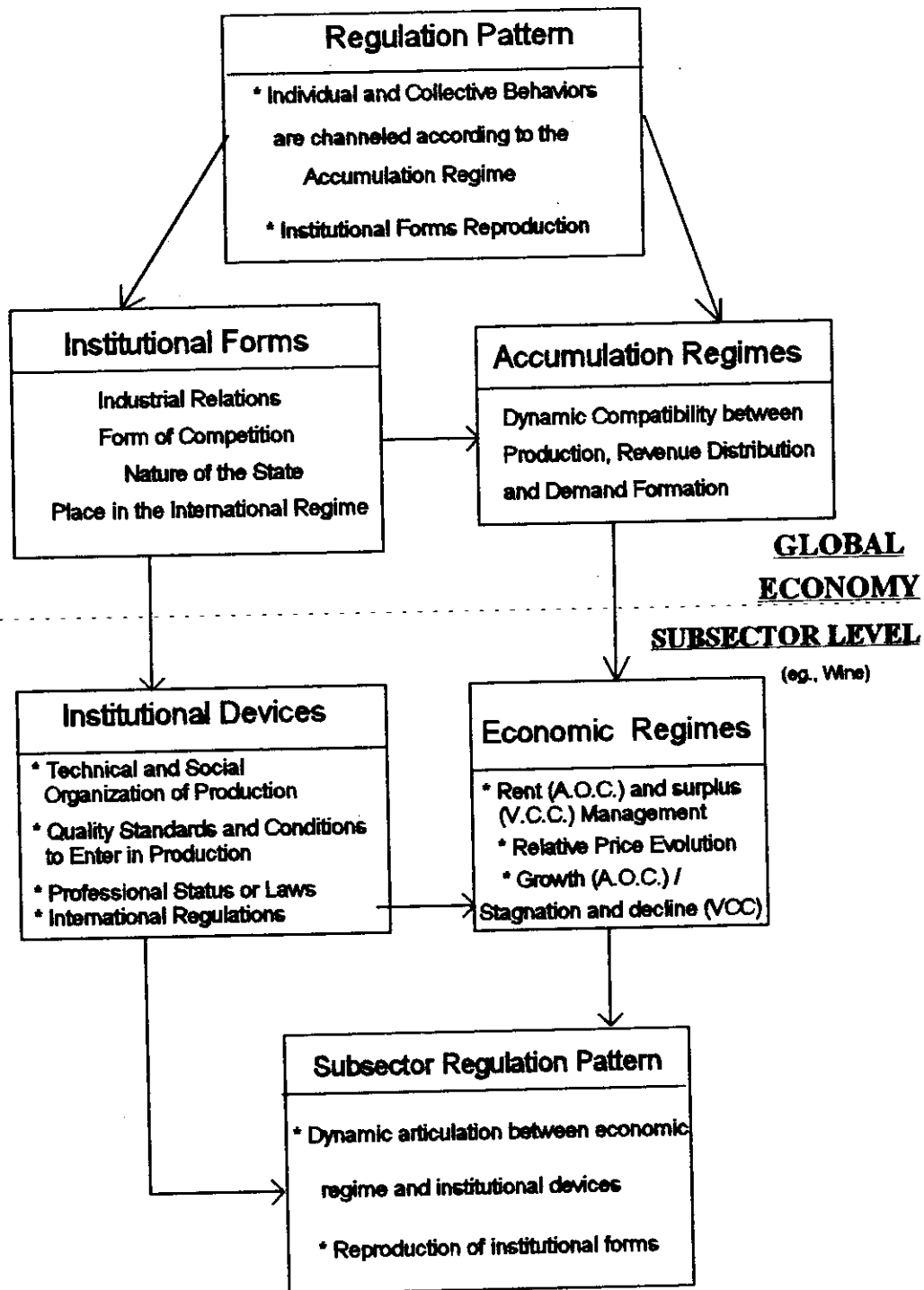
1. Institutional devices and regimes are socially built and such constructions may have some long-term impact on the dynamism of a given subsector. In this case, the institution of different labels has proven particularly resistant to economic instabilities and strongly influenced the economic development path.
2. Subsector institutional devices craft regulation patterns, as shown by the incredibly different economic development between AOC and VCC wines.
3. Organizational forms tend to entail strong hysteresis, which means that the path through which they arose is not reversible due to inertia, and implies that once rights have been granted, they are hard to challenge and remove.
4. Institutional regimes often emerge from structural crisis. In a long time range, two main periods may occur: 1) a phase of coherence between institutional forms and the conjunction of

accumulation regime and regulation pattern, where economic dynamism strengthens the existing institutional forms, 2) a phase of structural crisis during which economic evolution destabilizes the former institutional system.

5. The expansion of the productive forces may get stuck for a long period because of institutional compromises. This is an implicit criticism of the Marxist approach, which considers only one part of what regulation theory considers as an interaction: not only may the production dynamic-forces determine social relations, but also institutionalized compromises may channel technical changes.

Note that these findings also illustrate what Samuels calls the legal-economic nexus: "The legal-economic nexus is the sphere in which the context for the control and use of government and economy is conducted". [Samuels, 1989:1573] Analysing the processes and consequences behind such a concept, may be considered as of major concern for regulationists.

Figure 1: Various notions of regulation theory at the subsector and global levels



Source: Translated from Boyer, 1990, p.53, adaptation from Bartoli and Boulet, 1990.

AOC: Origin-Controlled Appellation; VCC: Wine of Current Consumption.

2.5. Institutional Meso-Economy

2.5.1. Methodological foundations

The relevance of meso-analysis arises from a methodological assumption: Analysis at the intermediate-level (that is between the basic decision-units [firms, households] and global economy levels) are necessary to explain the operating and dynamic characteristics of reality. [Lauret and Perez, 1992] Such an intermediate level, constituted of individual agents, corresponds to some sub-system of the productive system, and has been called a "dynamic meso-system". More than a theory, it is a pragmatic approach considering the system as a whole [Hugon, 1992]. The issue consists of understanding the variety of actors, and their strategy and coordination patterns within a given socio-historic environment, characterized by a given institutional configuration.

2.5.2. System definition

A meso-system is a sub-system of the overall economy. It may be defined around a given commodity, or through other criteria. In any case, for the subsystem to be relevant as a research object, the constituting agents have to be linked through market and non-market relations and the given system must have relative autonomy vis-à-vis the rest of the economic system. As Lauret and Perez state, it is a non-neutral representation of reality because it codifies behavior, organizes relations and looks at strategies in a certain way. Actually, the basic units taken into account belong to one or several meso-systems which constitute the basic units' social, technical, and economic reference-milieu. A meso-system operates through a common culture, an information system, solidarity and some group actions, and a collective organization (either explicit or implicit).

An agricultural meso-system may be defined as "a productive sub-system, integrating production, transformation and consumption, according to different coordination patterns [market, contract, rules, regulations...] and to institutional configurations that are historically determined

through a specific space/time relation" [Hugon, 1994, p.89]. In the short run and at a local scale, such analysis would emphasize more specifically agents' adaptation to the external environment and organizations that condition agents' actions. Within a longer run scope and at an international scale, agents are also seen through their strategic attempts to modify institutional structures and configurations. The vertical representation of productive linkages helps locate agents and understand their strategy in the horizontal dimension (from the rural community to the overall international market.)

Concerning the levels of analysis, although the intermediate level is preferred (the meso-system as a coherent unit), two other levels are relevant: 1) the behavioral analysis of the individual agents participating in the meso-system, 2) the analysis of the relations across meso-systems and of their articulation. This latter part of the analysis aims at generating a better understanding of phenomena characterizing the overall economy.

2.5.3. Theoretical background

Originally, meso-analysis in the LDCs evolved from Perroux's structuralist school, according to which macro-units exert asymmetric relations in terms of their influence and domination on the other economic units. According to this approach, organizations are in conflict or cooperation, and economic phenomena may be approached through analyzing the relations between micro and macro units [Hugon, 1992].

Recent work based on the meso-system benefits from the convergence of three approaches :

1. It first takes advantage of the technical criteria of an engineer kind of approach. Filière is seen as a technical channel for product processing. The corresponding analysis takes into account technologies, the various operations to be proceeded, agents and technical constraints.
2. Out of the regulation theory, it uses the macrodynamic development-patterns analysis. Filières are viewed as organized. Regulation patterns are analyzed at different levels (micro, national, international). Accumulation patterns may be analyzed, through surplus redistribution

within or out of the filière. [Hugon, 1992:13] Operators taking part in the filière determine rules and contracts, notably with regard to the distribution of value-added. Some organizations or development operations embody a leading role.

3. As in the convention theory, decisional micro-analyses are approached in terms of organizations. Attention is paid to agents' strategy and behavior with regard to the filière but also to the rest of their economic environment (potential activities...).

2.5.4. Main assumptions

Lauret and Perez [1992:4] underlined the basic meso-analysis features:

- Agents are assumed to show a procedural (and not substantive) rationality, and their behavioral logic is characterized by its variety. While in accordance with individuals goals, behaviors are conditioned by society. Behaviors therefore stem from a logic that neither corresponds to the methodological individualism assumption nor to an holistic pattern.
- This theory assumes the existence of some general economic principles but accepts the idea that variety in regulation and development patterns that stem from different historical contexts.
- Technological paths (what North would call path dependence), enterprise evolutionary trajectories, mesosystem and macrosystems are diverse.

As Hugon suggests [1992, p.13], meso-analysis supposes a representation of the given sub-system (notably agricultural ones) that is:

- hierarchical : it includes phenomena such as technological, financial or commercial domination
- fitting in a specified geographical space
- dynamic: actors have innovation or routine strategies; technologies for a given commodity are stationary or evolving. Agents also act in an institutional context that is potentially adaptable. Note that the selection of a time-frame is more a function of the technological

innovation processes than of cycles of growth and recession. It differs in that sense from regulation theory.

- **diversified** : agricultural filières are of many natures, depending on the commodity, region, period, and coordination pattern (in the convention sense, that is market, industrial, domestic coordination patterns).

These features are illustrated in Hugon's table concerning African agricultural subsectors (table 2.1). This table was originally realized to better understand changes in urbanization and the food dependency to which it leads. The general goal was to simulate the effect of different policies on different group of people, those in the so-called "domestic" (row 2), those more in a "market" sub-filière (row 3)... However, the identification of these different categories was to have a general value, that is to fit several commodity subsectors.

In table 2.1, "Hierarchical" is mentioned in column 7 which identifies dominating actors. Spatial characteristics are suggested in column 5. Dynamic is mentioned concerning technology (1st column) with particular references to traditional (row 2) or changing (row 5) features, with reference to time frame (e.g., in the 6th column, row 5, Hugon mentions the existence of medium and long term strategies) or to the regulation patterns. Also, a dynamic approach may be undertaken when one is concerned with evolutions from one coordination pattern to another, as in convention theory [Valeschini, 1993]. The fact that a given subsector is diversified is illustrated by the co-existence of several logics and coordination patterns from domestic to capitalist (column 1).

2.5.5. Data collected and examples of research questions.

Diverse elements are accounted for to characterize agricultural subsectors [Hugon, 1992:13]. As represented in table 2.1, the research addresses:

- Technologies : traditional, handcrafted, industrial... (2nd column)
- Geographical reference spaces : local, regional, national, world. (5th column)

TABLE 2.1: TYPOLOGY OF AFRICAN FOOD AND AGRICULTURAL FILIÈRES.

	Production Pattern	Circulation Pattern	Utilization Pattern	Space	Time frame	Dominating actors	Regulation Pattern	Objectives
Domestic	Traditional technology. Codified social relations	Redistribution (barter, gifts) stock	Goods symbolic-signification (ban, customs) Self-consumption	Family and local (village, district)	Production hazard. But circulation and utilization control.	Families: the eldest, "notables" Self-consumption units	Codified rules. "Regulation" instruments (storage or witchcraft)	Intergenerational reproduction
Market	Craft, local or imported technology. Control directly operated by producers (patriarchal relations)	Expensive exchanges through multiple operations and agents. Essential intermediation function (speculative stock)	Transformation of the food products into human energy (symbolic meaning)	Local, regional urban/rural markets	Production, circulation and utilization uncontrolled. Adaptation and mobility vis-à-vis a non controlled time frame.	Small merchant producers. Intermediate actors (no state control, role of the domestic units)	Official or parallel market prices. Competition on the local markets (mutual-aid and solidarity rules)	Urban working-force reproduction. Access to monetary revenues and to urban markets
State	Imported industrial technology. Salaried employees. Bank administrative framework	Constrained. Contract or integrated relations (for merchant relations). Stabilization funds	Urban food consumption with medium and high revenues (parallel markets)	Urban, and national markets	Medium and long term planning in an internal and international random universe.	State apparatus and national capitalist firms. Cooperatives.	Administered prices. Monopolistic networks. Protectionism. National stabilization stocks	Food security. Import or export substitution. Farm surplus mobilization. State reproduction.
Capitalist	Technological revolution. Agribusiness. Industrial relations	Firms' integration relations. State/Firm agreements. Oligopolistic competition at the international level (future markets).	Food products unifying consumption patterns. Working force reproduction.	International	Hazard management through information control and organization systems. Medium and long term strategies.	MNC and nation States.	Oligopolistic international markets. Inter-firm integration relations.	Increased capital accumulation. Social regulation through surplus flows. MNC reproduction. Technical innovation and learning

Source: Translated from Hugon, 1985, p. 26.

- Coordination patterns : market prices, contracts, hierarchy...
- Actors' logic : security behavior, speculator (e.g., column 9)
- The competition regimes : monopolistic, duopolistic, workable competition (column 8).

As an example, Lauret and Perez pick some current world issues and suggest the way a meso-analysis approach would deal with such questions [1992:10]:

1) Some various world issues:

- a) How to assure food security in regions with high population growth rates ?
- (b) How to quickly adapt the food system in countries evolving toward a market-economy?
- (c) How to evolve toward a less intensive agriculture in western Europe ?
- (d) How to promote more balanced nutritional patterns and how should agricultural systems adapt to such concerns ?

Note that those issues were purposely picked by the authors to be very general, and to suggest the broad range of questions for which meso-analysis may constitute a useful framework of analysis. One of their common points is their reference to needed evolutions in the food system. The theory is focusing on dynamic systems and provides insights on change processes.

2) Indeed, the following theoretical questions were suggested by Lauret and Perez as the kind of problems meso-economy would give insights about:

- (a) How do short-term crises, cyclic fluctuations, and structural crises generate meso-system food-system dynamics? How are technologies generated and introduced in such dynamics ?
- (b) How do institutions reproduce , how do changes in agricultural policy take place and how does a new food policy emerge?
- (c) How do we move from one regulation pattern to another?
- (d) How do institutional devices, professional or other organizations and the state articulate regulation patterns ?

2.5.6. Researcher attitude

The following recommended meso-analyst behavior is translated from Lauret's and Perez's article.

1. A permanent interaction between observed (perceived) and conceptualized (or abstract reference devices) phenomena. Proximity to observed facts is a constant concern.
2. Sensitivity to social demand for understanding reality. The willingness to stress actual working patterns and dynamics is more important than an aesthetic mathematical model.
3. Reality is to be represented through open, complex and overlapping systems and through a combination of interdependent actions. Causality relations are not linear.

2.6. Distinguishing features : Brief Synthesis.

2.6.1. A variety of ways to approach vertical coordination.

This section briefly synthesizes the main distinguishing features of the theories presented above. (See also the summarizing table in Appendix 2). Let me one more time stress that the paradigms presented are not intended to be exhaustive but to suggest the existing variety of ways to analyze vertical coordination. Indeed, from the selective review of some theoretical frameworks, it appears that this concept has been approached through different angles: In the standard theory, exchange is viewed as an issue of matching supply and demand. The fundamental coordination mechanism relies on prices, and the market-clearing concept is a necessary condition for productive and allocative efficiency, the fundamental performance criterion. Neoinstitutionalism takes transactions across adjacent production activities and stages as its unit of analysis. Its criteria for designing coordination patterns depend on the degree of risk and uncertainty, of asset specificity, and on the frequency with which the transactions occur. In convention theory, rules, viewed as collective cognitive devices, appear as the fundamental coordination mechanism. Convention theory emphasizes more specifically individuals, at the micro-level of analysis and is concerned with the various principle to which agents refer so as to hedge against risks whenever a transaction occurs.

Regulation theory is driven by the concept of institutions as an engine for structuring coordination patterns. It deals more with groups at the macro-level. Institutional meso-economy borrows from the former approaches. By allowing several approaches to give some insights on coordination issues, it becomes a cumulative framework.

Note that the French intention in developing such schools stems from an attempt to develop innovative approaches to look at economic systems. Their contribution therefore goes along with what Shaffer advocates: "More comprehensive, empirically based paradigms of institutional evaluation and change are needed to contribute to more useful policy analysis." [1994:7] This is because of the "very limited capacity we have for understanding and predicting the behavior of such a complex system." [1980:318]

Beyond the internal logic of each school (or meta-paradigm), single assumptions (such as behavioral ones) also influence the way vertical coordination is approached. This is what will be emphasized next through the analysis of the influence of behavioral and organizational assumptions. (Assumptions are summarized in Appendix 2)

2.6.2. Influence of behavioral assumptions on vertical-coordination approach.

With regard to behavioral aspects, two main distinctions occurred in the presentation.

1. Contrast between methodological individualism and holism.

As seen in frameworks such as convention theory, regulation theory, and institutional meso-analysis, many different intermediate degrees exist between the extremes of methodological individualism and holism. For instance, "indivi-holism" is a primarily microeconomic view of individuals, who are considered to be partly influenced by the social context: individuals build society. On the other side, "holi-individualism" refers to the macro-economic dynamic and to the overall society dimension, although individuals are not considered as fully determined by it. Approaches in terms of "indivi-holism" and "holi-individualism" are not contradictory. However, their scope is different and their questions and recommendations are different .

As soon as we stray from the methodological-individualism assumption, social considerations need to be introduced in the subsector description, so as to understand the jump from considering individual decisions to their social aggregation. Vertical coordination recommendations will not only be concerned with financial incentives (coordination through price with competition enhancement) but also with notions such as identification factors, prestige, and sensitivity to group pressure. This means that at the micro-level, a set of incentives will be designed by giving more attention to the complexity of factors affecting agents' motivation.

2. Contrast between substantive and procedural rationality.

When procedural rationality (in Simon's sense) is assumed, the set of incentives will be designed so as to take into account the learning process behind any production change. This has some impact in terms of changes implementation: adaptation is not automatic and, therefore, reform timing will play a role in providing an adequate environment for each step of change.

2.6.3. Influence of institutional and organizational assumptions.

1. Taking internal organization into account: a first level of difference.

In the standard neoclassical theory, organizations are assumed as the black boxes of methodological individualism, with its assumptions of homogeneity, optimization, flexibility, etc. Within the theories which believe what happens within the organization matters, organizations are approached along two different streams: The first stems from the standard theory and includes some actors' behavioral elements. It refers in particular to imperfect-competition, imperfect-information, game or contract theories. Competition appears as the standard paradigm, and notions of equilibrium and economic optimum prevail. The second approach, characterized by its variety, is expressed in terms of system and process. Although fairly different, both approaches build an intermediate analysis-level through a reasoned aggregation of basic units (a subsector constitutes such an aggregation)[Galliano, 1992].

If procedural rationality is further assumed, then the characteristics of the decision-making processes will also be taken into account both at the individual level and within organizations. Therefore, articulating preferences in a subsector will not only target coordination occurring among organizations (this is what Favereau [1989] calls the external market) but also be concerned with what happens within the organization structure (the internal market). Note that the frontier between internal and external is sometimes difficult to draw (continuum).

2. Descending / Constructivist approach

The notions of organization and institutions have been approached along two main methodological orientations [Ménard, 1990]: In the overall (or "descending") approach, the methodological procedure to analyze the economic system starts with the macrolevel characteristics, then analyzes subsectors' characteristics, and look at elementary units from a subsector perspective. On the other side, call it "constructivist", one starts with an understanding of the elementary organization-units' internal mechanisms and analyzes from there inter-organizational relationships and economic system behavior. This contrast distinguishes regulation school from the convention school. The regulation approach emphasizes more notions such as the emergence of group action, and the manifestation of power in changing general rules of the game, and is concerned with long-term impacts of regulations on the vertical coordination system (hysteresis effects). The convention approach emphasizes more micro-level constraints (on organizations such as households, and firms) and analyzes the composition of an adequate set of incentives at a higher level.

2.6.4. Static vs dynamic theories.

Although neoinstitutionalism tries to explain the emergence of new institutions, it appears that standard theory and neoinstitutionalism are mainly optimizing and fairly static theories. However, if neoclassicism leads to an overall optimization (e.g., in the case of standard theory, through the pure and perfect competition), such a theory may also be helpful on a step-by-step basis, when conditions are less than perfect. For instance, in both standard theory and Williamson, there has

been some development for dealing with risk and uncertainty. As the risk environment evolves, recommendations based on these theoretical approaches also evolve.

In convention theory and meso-system analysis, there is more to see than a simple description of how people behave. Actually, dynamism and processes are emphasized at different levels :

1) Through the assumption of procedural rationality, these approaches emphasize that making people change their behavior is not only an issue of changing the set of incentives but also of changing the collective representation people have of their opportunity set.

2) These frameworks suggest broad categories of coordination and organizational patterns based on different principles, collective rules and subsequent accumulation patterns. Such approaches may be helpful for identifying the critical variables to be modified, when one goes from one organizational structure to another. This was the case in the processed-vegetable example, where the author was concerned with managing confidence in the system, when moving from civic coordination (through respected forward-contracting) to the better-performing industrial coordination pattern.

3) Note that these theories may also help identify manageable evolutions. For instance, when markets are far from being reliable in the first place, it may be easier to deal with the confidence variable by evolving from domestic to industrial coordination rather than directly to merchant coordination.

4) On the static side, convention theory helps assess the distributional impact of a given institutional change, by stressing which coordination pattern, and, in turn, which group of people using a given coordination pattern, would gain or lose through any institutional change.

5) However such work so far has more been conceptual framework than an actual basis for designing changes. Those theories would certainly need some important empirical testing in order to become more useful.

Finally, regulation theory really focuses on processes and the inertia of historical evolutions. This theory emphasizes the importance of the path, certainly in terms of the technology used but, most of all, in terms of the power structure (distribution of rights) and its impact on the accumulation pattern. The issue with such a theory is that it is still at a descriptive stage and may not be developed enough to actually prescribe changes. It constitutes more a reminder to be cautious about the less-than-perfect reversibility of changes made today and of their impact on tomorrow's power-structure and its eventual rigidity.

2.6.5. Assumptions and vertical coordination conception : the interactions.

As briefly discussed previously, the paradigms on which a subsector analysis relies are not neutral vis-à-vis the recommendations that will be provided. This observation should constitute an incentive 1) for remaining critical regarding the theory we rely on; none tells us the whole story and, for a given field of analysis, the understanding of the local economic processes and specificities is needed (This certainly argues for a complementarity between use of metaparadigms and of what Shaffer [1994] calls "theories of the case"), and 2) for enriching our palette of theories when, for instance, assessing coordination performance. There is maybe some complementarity to be seen between optimizing, static theories such as neoclassical frameworks, and some "path-enlightening" approaches. Also, there is a constant need for assessing and improving the performance of theory through empirical work -What is each theory's domain of validity ? When does each appear to have good diagnostic or predictive abilities?- If this paper does not argue against any particular theory, it is because the paper is driven by the perception that theories are neither true nor false in any absolute sense, only more or less useful. The following case study constitutes both an opportunity to learn more about vertical coordination, and to confront some theoretical approaches with facts.

III. COTTON SUBSECTOR-ANALYSIS IN SUBSAHARAN AFRICA : CONTEXTUAL AND METHODOLOGICAL ISSUES IN APPROACHING VERTICAL COORDINATION

3.1. Methodology, sources and context

The objective of a case study relies on the perception that it helps conceptualize what is at stake when looking at vertical coordination. Obviously, a case study cannot illustrate all the issues that are important for designing vertical coordination patterns, because the study is embedded in a given context, with its own economic, behavioral, institutional and social particularities, and deals with a given commodity, with its technical production and transformation particularities. However, such an analysis may be insightful precisely because of its embeddedness: it constitutes an opportunity to test theories, their applicability and domain of validity, and to open or suggest the need for new perspectives.

Why was cotton in Sub-saharan Africa selected for a case?

1. The cotton subsector has been the object of a divergence between the World Bank and French approaches on the way to deal, in the 1980s, with two major challenges : a drop in the world cotton prices, and the structural adjustment context. In particular, in 1987, a debate on the future prospects for cotton in Francophone Africa was launched by the French Ministry of Cooperation, in order to find some remedies to the ongoing cotton crisis (with periods of low prices). This experience constitutes an opportunity to analyze a conflict of perception, often caricatured as the "market vs integrated" view of vertical coordination. It raises questions about what should be the respective roles of the private sector and government. It also leads us to stress, in accordance to the previous chapter, how theories influence the way vertical coordination is approached.

2. Cotton constitutes one of the first commodities in Sub-saharan Africa to have involved economic subsector analysis. Mali cotton development also has been seen as a success story in terms of getting agriculture moving, contrasting with the poor performance of cotton in Eastern Africa and with other development projects such as the OHV (Opération Haute Vallée) in Mali. It therefore provides us with an opportunity to identify some of the successful ways of dealing with vertical coordination.
3. An historical perspective on the Malian experience illustrates that different coordination patterns are maybe less to be seen as incompatible than as potentially following one another. It is insightful to look at the evolutionary coordination path made possible by the CMDT ⁴and CFDT involvement in Mali, to learn about ways to deal with issues of timing and sequencing. This will give us some insights about a strategic performance criterion for vertical coordination: the concept of adaptative efficiency, and about the following questions: What is the right mix of continuity and change in the way coordination is handled and perceived? How to integrate flexibility in the organizational structure, while also making the structure strong enough for incentives to be effective and stable? How to monitor changes to get such a mix?

The case study is organized as follows:

1. A rapid description of the 1987 debate to underline some of the main questions concerning the way coordination should be approached.
2. A synthesis of some comparative findings from different studies concerning the strengths and weaknesses of various coordination patterns in the cotton subsector.
3. An historical perspective stressing evolution through time in the coordination patterns in a given zone and the rationales for such variations.

⁴ CMDT: Compagnie Malienne de Développement des Textiles; CFDT: Compagnie Française

4. A summary of the main findings concerning a) vertical coordination, b) the relevance of various subsector analysis methods, c) the implications for monitoring functions, defined here as the ongoing diagnosis of the subsector performance.

3.2. Contrasting approaches to vertical coordination.

This section presents an introduction to three main questions regarding vertical coordination: Which pattern? Who decides about the performance criteria? How fast to change coordination patterns?

Addressing the first issue involves referring to the simplistic but basic opposition between two perceptions : the "market" vs "integrated" views about coordination. This enables us to briefly comment on 1) their theoretical base, 2) their perception of the economic situation, 3) and their approach to the timing issue. Such a development will be based mainly on the publication of the discussions arising from the first round-table on African cotton in 1987, which brought together representatives of several organizations, including the World Bank and the French Ministry of Cooperation.

The second step draws upon all the propositions and references made about various potential coordination patterns at the different levels of the subsector. This entails the construction of a matrix constituted of functions (credit, transportation) and coordination patterns (contract, public service). Some of their pros and cons or conditions will be discussed in the next section.

3.2.1. The 1987 debate and the conflicting perceptions about vertical coordination.

Before discussing two selected issues, the financial mechanism of price stabilization and the filière organization, reasons for disagreements between the World Bank and French Research Organizations will be briefly summarized. They stem from three identified (official?) and partly

correlated factors:

3.2.1.1. The theoretical variable

As a first approximation, World Bank officials seem more convinced by the neoclassical perception of a self-organizing market. They consider more involvement of the private sector as a better alternative than a costly single organization. The Francophone conception is more institutional and interventionist. Given the level of risk and uncertainty, it is perceived as unrealistic to privatize most of the functions of cotton production. This theoretical disagreement appears in the debate through contrasted use of references to privatization, comparative advantage, free trade and "getting the price right" on the one side, and to integration and price stabilization on the other side. Note, however, that the points of view expressed on this occasion might not represent the organizations themselves. (As an example, the World Bank has financed some research on institution building.)

3.2.1.2. The performance criteria variable

The previous picture would be very incomplete without underlining the performance criteria behind such theoretical references. The World Bank was concerned with macro-imbalances in terms of debt, the perceived unsustainability of the whole production process and the generalized prevalence of rent-seeking behavior. Particularly targeted was the CFDT's high financial cost associated with its monopoly operations. Another criticism was the alleged bias against food crops. Indeed, it is to be noted that during the period of low prices, no country, public or private firms could maintain a profitable production. This was particularly true for Cameroon and Senegal, with respective production costs of 820 and 800 F CFA/kg compared to a sale price of 318 and 366 F CFA/kg in 1986! Mali also encountered a deficit (130 F CFA/kg difference between cost and sale price) (Ministere, 1991).

The French organization had more of a structuralist approach dealing with overcoming bottlenecks of badly performing markets and the impact of their subsequent risk on agents' behavior. Performance criteria were more based on the technical ability to effectively promote production increases, while reaching an effective demand, than on its financial sustainability at the macro-level. They were also concerned that the spillover effect on rural development (food crop production, schooling, market integration, etc.) might be lost if periods of deficit were not tolerated.

3.2.1.3. The sequencing variable

Even among those arguing in favor of some liberalization, French participants sounded more gradualist in their approach compared to the still fairly radical approach promoted by officials of the World Bank. The latter recognize a need for progressive change but push for it to occur quickly! The former argue for a more gradual approach because of the perceived dangers of political instability and economic chaos that such a reform could cause if no new dynamism replaced the previous one.

3.2.2. **The issue of price stabilization**

Prior to 1987, a stabilization mechanism was supposedly assured by government. Taxing the cotton subsector when world cotton prices were high, it was supposed to reconstitute some funds (subsidies) when prices were low, so as to provide farmers with a fairly stable price. However, reserves constituted during the good years (the 70's up till the mid 80's) ended up being insufficient for financing the large price drop in the mid 80s. This is because money was invested elsewhere (or diverted) and because neither national nor international stabilisation funds (e.g., STABEX) could support such a price reversal. (For instance, between January 1980 and December 1982, prices were oscillating between 84.1 cents per pound and 100.6 ¢/lb, and between May 1984 and August 1986, they ranged between 37 ¢/lb and 54.6 ¢/lb.) [Ministère, 1991:98]

Facing such a situation, representatives of the World Bank insisted that African cotton producers take more risks. Their arguments were twofold: 1) Shouldn't it be food crops that benefit from protection instead of cash-crops? 2) If government were to take money from the cotton sector during good years, it would seem a natural strategy to invest it and not to save it for the bad years. Therefore, producers and cotton firms should be the ones to take risks, while states should constitute a very last resort. Bank officials actually argued for a withdrawal of governments from the stabilisation and risk-taking functions and for its replacement by organizations such as cooperatives. Besides, Bank representatives did not encourage a real price-guarantees but recognized the need for some devices for lowering price variability.

On the other side, French representatives stressed the fact that cotton is subject to high fluctuations in world prices, and they strongly encouraged some national (or regional) price stabilisation scheme. They argued that if cotton is to play an important role in the future African economy, it seems hazardous to make farmers assume most of the risk. They also underlined the difficulties African countries have in facing the modern economy: many western producers live in a state of quasi-permanent protection. In contrast, African producers do not have either the class structure or a state well-qualified in economic management and negotiation techniques to make farmers' concerns be heard. Therefore, regarding prices, the French seem to have a preference for what Hugon might call state-coordination: in Table 2.1., he indeed mentions stabilization funds as a "state" circulation pattern. The Americans, on the other hand, would be more in favor of a market solution (noted as speculative stocks in Table 2.1.).

Other participants to the round-table suggested that there is no dogma to determine whether stabilization should be assured by the state or the private sector. Pragmatic solutions were to be found depending on whether organizations were able to assume such a function in a given country.

3.2.3. Filière organization

This section only reports a few suggestions arising from the debate.

World Bank agents argued for a flexible approach to development and therefore recommended a larger transfer of responsibility and autonomy to the private sector. This is perceived as particularly important for the production and marketing functions. They recognize, however, the need for a gradual approach. At the same time, they suggest a larger role be played by governments in research for agricultural diversification, with the private sector advising government about strategic directions to follow.

The French perspective on coordination emphasizes more strongly the technical parts of the question: The cotton subsector requires a fairly integrated transformation pattern given the product characteristics : it is a technical product requiring a well-connected "research-development-extension- input provision" framework. Also the product is hard to transport and store, suggesting transformation close to the production area and connected to it in a timely way. Note French representative emphasized that integration does not mean organic fusion and administered coordination pattern but rather functional connection.

Also, French stressed other types of interdependancies. For instance, the private sector will not accept to take over input distribution, as long as states do not guarantee some access to the foreign currency needed to buy them. If village associations are recognized as less expensive than heavy administrative structures, in terms of monitoring costs, French representatives also argue that wherever such associations do not exist, farmers cannot endorse responsibilities over financial and technical marketing. There, privatization is not manageable. They consider that the private sector is all the more likely to develop, if government helps firms to survive crisis periods. This will not happen, however, if cotton prices were to go on decreasing.

3.2.4. Partial Conclusion

Three comments arise from such a discussion

1) There was, in 1987, quite a different perspective between those in favor of more private sector and less government and those thinking that such a change was too early and too radical an approach.

2) Also, the impression arises that people do not really know how to deal with all the interactions of such a complex system. They think of some part of the system, in a scattered way, which makes their proposals multidirectional (e.g., cost of a given coordination pattern, ineffectiveness of current market system). But it is hard to see either a big picture, or a path toward a new accumulation pattern.

3) This discussion also illustrates that metaparadigms seem weak and partial in dealing with such a complex set of interactions. This is why participants were often referring to various case-studies to support their arguments. Also, they were often advocating a case-by-case approach.

Given the variety of proposals and organizations, it is useful summarize the options in a table (table 3.1). A given coordination pattern will emerge from a combination of choices for each function. For instance, a filière may be completely State coordinated (first column) with research (1st row) undertaken by the National Research Centers, products and production-factors marketing (2nd, 3rd, 7th, 8th... rows) coordinated by some marketing boards. The filière may also have a mix of coordination patterns, with research (1st row) and extension (2nd row) planned by the State (1st column) and with other stages from sale (7th row), to processing (8th row) and export (10th row) more integrated within an industrial channel (2nd column), or depending, at each stage, on transactions occurring on the market place (4th column).

Some combinations of coordination patterns would appear as irrelevant. Others, however, might appear as meaningful, depending on the external context and preferences of system participants. Note that the matrix-columns are inspired from the various coordination patterns of

convention theory. The matrix cells could have been of various types. Emphasis was put here on the "nature" of the agents taking part in the filière. However, other syntheses might have been relevant, such as a descriptive approach of the coordination mechanisms. For instance, the nature of an arrangement may vary and affect, say, price, date, quality, etc. and would have different consequences on coordination performance. Also, organizational characteristics have been simplified (e.g., a cooperative entails a lot of variety) as well as the function variety (e.g., when we refer to price stabilization, there are more or less flexible methods). Besides, reference to the legal environment is missing. Nevertheless the matrix helps represent some of the arguments in the next section, both in the cross country comparison and the historical evolution.

Table 3.1.: Variety in the Coordination Patterns. A representation based on the participating agents.

	State coordination	Industrial coordination	Cooperative coordination	Market coordination	Civic or donor participation
Research	NARS Centers	R & D		Biotech. firms	CGIAR, Regional centers
Fertilizer Provision	Marketing board or State firm	Cotton firm	Farmer cooperative	privatized	
Seed Provision	Marketing boards or State firm	Cotton firm	Farmer cooperatives	Private distribution	
Investors	Development project at the national level	Cotton firm	Management by farmers' organization	Contract by individual farmer	
Credit providers	State Bank	Stock-holders	Credit union	Privatized, Bank or individual agents (tontines)	Donor fundings NGOs
Extension	Public services	Firm services	Service provided by the cooperative	Farmers hiring technical agents	Donor funding of extension
Farm Gate Purchasing	Integrated. Farmers = state employees	farmers = firm employees, or contracts	Contract with groups of farmers Cooperative	Spot market	
Processing	State complex	Cotton firm	Cooperative Unions	Private firms	
Transport	State services or contractors	Internalized	Farmers association (primary transport) or cooperatives	Private contractors	
Export Marketing	Government agency : sale by commissioned agents	Sale through a specialized filière	Export Cooperatives	Trading societies	Multilateral or bilateral Agreements
Price stabilization	Government guaranteed price	Firm contract price	Farmers collectively bear part of the risk	No mechanisms, Future market or	International stabilization agreements
Analysis and Monitoring	Centralized at the national level	Marketing function of a firm	Trade Association	At each level (decentralized computations)	Commodity outlook, FAO, other countries...
Lobbying	By government or group of governments	Firm lobbying	Cooperatives lobbying		Geopolitical issues

3.3. Cross country comparison of the performance of the African cotton subsector

This section follows the previous one in its intention to analyze some trade-offs between alternative organizational arrangements for cotton subsectors in Africa. It will also draw upon chapter 2 to see which theories are consistent with which findings.

Observing that cotton production increase in the Francophone countries has been higher to that of Anglophone countries (except Zimbabwe) since the early 1970s, and that part of the explanation is due to organizational factors, this section looks at the determinants of such an evolution. Also, considering, in Mali, the success of the CMDT system (Compagnie Malienne de Développement des Textiles) compared compared to that of OHV (Opération Haute Vallée), it analyzes some of the key determinants of what constitutes an incentive, and what is the an effective way to get actors' commitment to improvement of subsector performance. Issues of the cost of coordination will be tackled later.

This section draws mainly upon the following studies:

1. A MADIA study (Managing Development in Africa, financed by the World Bank) that involved the analysis of six African countries: Kenya, Malawi, Tanzania, Cameroon, Nigeria and Senegal. Lele et al. (1989) undertook an analysis of the cotton subsector, comparing various countries' performance, and then drawing some conclusions about what makes a coordination pattern successful for cotton.
2. Dioné's dissertation, in which the comparison between the CMDT and the OHV performance appeared insightful concerning coordination linked with the farm level (1989).
3. The analysis resulting from the work of a group including members of the French Ministry of Cooperation, of the CCCE, CIRAD, CFDT and SEDES⁵ [Ministère, 1991]. Their goal

⁵ CCCE : Caisse Française de Coopération Economique; SEDES : Société d'Etudes pour le Développement Economique et Social; CFDT : Compagnie Française pour le Développement des Fibres Textiles.

was to analyze the current situation and future perspectives of the Central and Western Africa cotton-subsector.⁶

4. Hugon's outline (1989) indicating some potential insights from a meso-system analysis.
5. Bosc's and Freud's analysis (1994) of technological innovation in the cotton zone.

The organization of this section is as follows:

1. The first subsection is a short description of some differences, across countries and through time, in the organization of the cotton subsector.
2. The next subsections are concerned with the following question: What factors explain the strength of the CMDT model? Six aspects will be analyzed: a built-in professionalism, the price-incentive factor, the technological-structure, marketing management aspects, investment promotion, and the integration of cotton into a larger rural development framework. Emphasis will be on understanding the incentive and enforcement structure, notions assumed as critical for a coordination pattern to be successful.
3. Then an historical perspective on coordination in Mali will be suggested as a way of showing processes, accumulation mechanisms and evolutionary adaptation behind such coordination.
4. It is under this dynamic angle that criticisms of the CFDT system, reported in the previous subsection, in terms of its cost and its centralization will be reviewed. What are the new challenges and recent evolutions? What are the limits of an integrated system? What are new perspectives on the nature of the social contract between organizations such as the CFDT and the state?

⁶ The corresponding countries are : Bénin, Burkina Faso, Côte d'Ivoire, Mali, Niger, Sénégal, Togo, Cameroon, Central Africa Republic, and Chad

3.3.1. Some brief organizational description.

3.3.1.1. An extreme variety of arrangements across countries

Lele et al. have underlined a striking diversity of arrangements, in terms of the various roles played by public institutions, in the organization of the cotton subsector across African countries. Also, different degrees of integration have been observed: Cameroon and Senegal represent one extreme, with public-sector organizations dominating the entire channel from farm gate to processing and export. Tanzania and Kenya are on the other side. Let us describe two situations.

Cameroon has an integrated structure organized around SODECOTON. This is the only public service dealing with the cotton channel, besides IRA (Institut for Agronomic Research), which undertakes research jointly with the former French IRCT (Institut de Recherches du Coton et des Textiles Exotiques, which is now included in CIRAD). The other dominant actor is CFDT, the French parent company of parastatals such as SODECOTON. It is a semi-private enterprise, and its participation relies on the equity it invested in the parastatals (30% in the case of SODECOTON). It earns a commission of 6 percent on the value of cotton exports from the former French Africa, and has therefore substantial interest in increasing cotton sales. It also provides technical assistance and consultant services to parastatal agents. In 1986, 38 expatriate CFDT agents were still subcontracted to SODECOTON in an advisory management role. [Lele et al.] This figure is larger than in any other Francophone country

The Tanzanian organization, on the other hand, is the least integrated among the MADIA countries, with different organizations in charge of extension, credit, marketing, ginning, and exporting [Lele et al., p.25], as shown on Table 3.2.. Cooperatives have played a major role, although they were frequently challenged by institutional changes (e.g., union-cooperative dissolution in 1976 and institution of village cooperatives; additions to their productive roles, such as ginneries and primary marketing functions in the mid-80s).

Table 3.2: Parallel representation of the Cameroon and Tanzanian coordination patterns

This table is based on the more explicit representation in table 3.1. Shading indicates what kind of agent is in charge of a given function (lines). Within a given column (which corresponds to the various coordination patterns identified by meso-analysis: state, industrial, cooperative, and civic coordination), different colors indicates that different actors handle different functions. For instance, in the case of Tanzania, the Ministry of Agriculture is directly in charge of research and extension; TCMB (Tanzanian Cotton Marketing Board) is in charge of seed provision, part of the transport and export, and two different public institutions deal with processing and credit.

	Cameroon					Tanzania				
	State	Indus	Coop	Mark	Civic	State	Indus	Coop	Mark	Civic
Research	IRA					MOA				
Fertilizer										
Seed provision										
Investors										
Credit										
Extension						MOA				
Purchasing										
Processing										
Transport										
Export market										
Price stabilisation										
Monitoring										
Lobbying										

Besides, most of the actors are public, from the Tanzanian Cotton Marketing Board (TCMB), in charge of cotton seed distribution and some of transport and export, to different public services for research, extension, fertilizer provision, and export. Credit is provided through different public and cooperative channels, while the private sector intervenes in functions such as transport and ginning.

These two organizational descriptions will be completed below with details concerning the contracts and arrangements existing among actors in the cotton subsector.

3.3.1.2. An evolution in the organization over time

Although an historical approach will be undertaken in the next part, let us here suggest that the current organizational structures grew out of a past rich in events and evolution in the coordination patterns: In Francophone Africa, there was an evolution from the colonial top-down structure, to a transfer of responsibility to African countries after independence, followed by more emphasis on rural development and by an increasingly participatory system with more private sector involvement. In Anglophone Africa, benefitting from initial colonial investment in research, the structure subsequently relied on scattered private-sector initiatives to stimulate cotton production. Attracted by other more stable productions, such as food crop production or other cash crops, farmers in the Anglophone countries have kept cotton production at the stage of a side activity.

3.3.2. **A built-in professionalism.**

Referring to the CFDT system, Bosc and Freud state that "one of the distinctive characteristics of the cotton projects is that cotton companies have been able to maintain the high level of professionalism needed to translate the objectives into action."(p.19) Three questions arises from such an assertion : What are the signs of such a professionalism? Where does it come from? What were the set of incentives and obligations that help maintain it?

3.3.2.1. CFDT's own incentives to make profit

At the base of the system success is a set of appealing incentives, among them, price incentives, and effective coordination. But the origin of the design of a cost effective system is certainly CFDT's own incentives to make profits, related directly to the volume of exports. CFDT constantly pressured the system to make it adopt varieties, agronomic practices, transformation methods, etc. compatible with an effective demand and that would lead to increased competitiveness of the African cotton subsector.

3.3.2.2. A monitoring approach concerned with subsector competitiveness.

In Francophone Africa, the cotton subsector was among the first to employ agricultural economists and to undertake systematically some calculation of costs and profitability [Bosc and Freud, 1994]. Recently, more complete filière approaches were undertaken so as to manage the transition after the price crisis of the mid 1980s. This is the case of the study undertaken by the Ministère de la Coopération (1991): the approach used to prescribe changes includes some strategic analysis similar to those suggested in business competitiveness or strategic planning studies. What are the opportunities in the external environment (future markets forecast)? What are competitors' comparative costs at various stages, for all the exporting countries (farmer price, assembly, training, transformation for different channels, transportation, etc.)? What are the African countries' strengths and weaknesses? What strategy should be adopted and changes be implemented, to take advantage of opportunities? This procedure is also fairly close to that adopted by Boughton for the maize subsector in Mali [Boughton, forthcoming]: It starts with demand, emphasizing market prospects in the short and medium term and concludes with an analysis of African future perspectives and challenges. It deduces from this analysis the production issues in terms of reducing production costs, enhancing the value of the by-products, and reducing the fiber production costs. It then goes to the implications for cotton research, and agronomic system analysis. The ongoing diagnosis is compatible with Hugon's table (table 2.1) describing the

"capitalist" system: they have medium and long-term strategies and have built information units for such strategic planning.

The previous description therefore seem to argue that an integrated structure may have a built-in capacity to respond to world demand and prices. For this to happen, however, internal organization of the firm matters. This would be consistent with neoinstitutionalism and convention theory approaches.

3.3.2.3. A global approach to rural development and a stable involvement that generates actors' commitment.

Since 1949, the date of its creation, the CFDT has been involved in Africa. Through cotton promotion among farmers, CFDT succeeded in getting motivated producers. At the same time, parastatals like the CMDT got involved in rural development. Not only could they more effectively get people committed (by taking into account issues such as food security) but they also could extend the benefit of a strict cotton management to an effective rural development. For instance, while developing the rigor necessary to repay credit, deliver production on time, apply technical recommendations, become more autonomous and take initiative, participants of the system became actors in it and not simply patients to whom a medicine is prescribed. This suggests the existence of learning processes. Also, as stressed by Israel (1987), concerning subsistence farmers, "the higher the proportion of their production that is marketed, the higher will be their exposure to competitive forces."

3.3.3. An effective price-incentive system.

3.3.3.1. Relative profitability matters

The MADIA study stresses that relative prices are what affects the incentive structure. For instance, Nigeria and Tanzania faced disincentives due to macroeconomic policies, which led to a rising price of food crops relative to cotton, the adverse incentive effects of extreme shortages of

consumer goods (in Tanzania), and the increased cost of labor (in Nigeria). In terms of absolute cotton prices, however, things are much less clear. Indeed, although absolute prices in Kenya, Malawi and Nigeria were higher than those in Cameroon and Senegal for much of the period, sometimes by as much as 50%, production increases in the latter countries was higher. However, the study also suggests that "productivity differences across countries may be more important than producer price differences in explaining the relative profitability, and hence the performance, of cotton in the various MADIA countries" [p.17]. Productivity entails many factors : yield, access to inputs in timely maner, etc. This entails both issues of physical endowment (soil fertility) and technology. Such findings confirm the neoclassical emphasis on relative prices as an effective incentive.

3.3.3.2. But institutions make prices effective.

Actually, some institutional factors bear directly on the profitability of cotton through their effect on price factors. This is the case for prompt payment, stability of the price received by the producers, timely input-delivery at predictable price, and secure credit for input purchases. Such aspects have determined the effectiveness of output and input price supports and the subsequent profitability of growing cotton. For instance, all six MADIA governments provided free seeds and subsidized pesticides, fertilizers and credit. (Lele et al.) However, modern inputs were widely used only in Cameroon and Senegal, where delivery systems operated effectively. In Kenya, Tanzania and Nigeria, on the other hand, it used to take six to nine months for farmers to be paid; seeds were distributed in an unpredictable way, in terms of date, quantity and quality. Other inputs were often unavailable. In addition, in Kenya, cooperatives in charge of providing interest-free credit to farmers were characterized by corruption.

3.3.4. An integrated system approach to face technological challenges.

3.3.4.1. An R & D approach to promote production targeting effective demand.

As underlined previously, researchers in the CFDT system are really tied to developing technologies that have great chances of becoming commercial success. Also, in the CFDT system, varieties are selected according to a hierarchy of criteria coming from the various stages of the filière (production issues, transformation concerns, market demand) [Ministère, 1991].

3.3.4.2. An international, integrated research environment.

After World War II, both Great Britain and France had established fairly effective cotton research systems, for variety breeding, seed multiplication and information. In France, however, the basic structure, which relied on a close collaboration between IRCT (Institut de Recherche du Coton et des Textiles Exotiques) and CFDT, has remained since African independence and been reinforced by a close cooperation with African research centers such as IRA in Cameroon and CMDT in Mali. This continuous involvement and its subsequent know-how made a difference in terms of constantly adapting varieties and agronomic methods. Indeed, "CFDT research and technical assistance has promoted a huge gap in yield between Francophone and Anglophone countries, with the former being three to four times higher than the later." (Lele et al., p.10) Lele's observations are consistent with the notions of learning process. They are also compatible with some characteristics of the capitalist filiere identified by Hugon: emphasis on technological innovation is fairly high, and this within an international dimension.

3.3.4.3. A long-term involvement enhancing technological know-how.

Through a long-term involvement, knowledge is accumulated : knowledge about genetic material for plant-breeders, about the environment in which it is grown for soil scientists, agronomists, pest-specialists, etc., about farmers' behavior for extension agents, and, maybe most of all, technological

know-how by farmers. The latter is all the more important because the farmer adoption rate plays a crucial role in determining the success or failure of a given research program. [Crawford et al.]

3.3.4.4. A close interaction between research and extension.

Research and extension have been interrelated.

In a top-down sense, extension agents in the Francophone zone promoting new technologies interacted closely with researchers and producers. For instance, the CMDT administration developed a very intensive extension service, with each extension agent well-equipped with transportation means. The professional quality of its extension staff has also been continuously enhanced through training programs [Dioné, 1989]. Besides, with the progressive evolution of research results and the diversification of selected crops in the CMDT zone, the extension network was able to develop and maintain personal contact with 86% of the estimated 100,000 farms of the Mali-Sud zone. [Dioné, 1989]

In a bottom-up sense, extension agents were close enough to the field to make farmers' needs or observations be taken into account by researchers. For instance, the issue of soil-depletion in Togo started with an understanding of practices leading to fertility loss. It was then possible to design more sustainable rotations (Faure et al., 1990). Also, research programs were often carried out through local testing networks, often by the farmers. This helped visualize the various consequences of technical solutions, and select the one that would both suit technical performance criteria and be accepted by farmers [Braud, 1989].

What seems astounding in this situation is the contrast with other systems where communication barriers among researchers, extension personnel, and farmers may become insurmountable. This is certainly linked with some system of reward (such as receiving special training) or due to a common commitment to cotton success. Also, the involvement of CFDT consultants may have helped maintain communication lines, and enhanced professionalism. Other organizational schemes might have led to unmotivated or less market-oriented agents such as plant

breeders of remote public institutions, or extension agents without facilities to visit farmers. As a contrasting example, let us refer to Dioné's observation about the situation in the Malian OHV zone: "In the absence of appropriate technical packages for food crops, and despite the lack of significant investment in cotton production since 1978, the OHV extension services still encourage farmers to adopt the same rotations between cotton and coarse grains that evolved in the CMDT zone as a result of the expansion of cotton production and applied cropping systems research. "Besides, extension agents "do not have even a bicycle to contact farmers in the four out of six villages assigned to them. In fact, in the absence of a useful message to convey, no incentive exists for these extension agents to keep a close contact with farmers." [Dioné, p.291]

If we refer one more time to Hugon's classification (Table 2.1), it therefore seems that the capitalist coordination pattern (row 4), with an emphasis on risk management through information control (column 5), seems to have been extended to public structures. This is certainly linked to the CFDT profit-motivated pressure on the parastatals to improve performance. This illustrates the convention theory approach: It first considers a coordinating principle (e.g., productivity and standardization). Then the procedure suggests which agent represents this principle the best (in our case, industries). This does not mean, however, that (1) this is the only actor who handles coordination according to this principle; nor that (2) this agent always behaves according to this principle. In the cotton case, although state agents (the parastatals) play a major role in the West-African cotton subsector, they respond to a mix of principles, some characterized as typical state principles (according to the convention theory); others more industrial. In the cotton case, the coordination structure (with the CFDT playing a major role), makes state organization integrate industrial principles, objectives and practices.

3.3.4.5. Marketing institutions influences the adoption of new practices by farmers.

The following section, drawing from the MADIA study, confirms the point we already made that changes in the CFDT system occurred because of effective joint coordination: "While intercropping

with food crops is a rational producer response to relative input scarcities and to an environment of risk and uncertainty, it also keeps cotton yield low because of competition for moisture and (if the other crop is tall) for sunshine. In the Francophone countries, research and extension services have provided farmers with the seeds, fertilizers, mechanization, and farming techniques to undertake single cropping. In Kenya, however, the interface between research and extension has been so weak that intercropping is probably increasing, particularly in western Kenya." [Lele et al.,p.27] This example underlines the role played by institutions in avoiding risk-averse behavior and promoting decisions leading to profit maximization. It most of all illustrates the importance of an effective systems approach to overcome various bottlenecks and poverty traps. This suggests a need for devoting greater attention to the role of agricultural research and, most of all, to its linkages with agricultural extension, input credit, and the marketing system.

If we refer to convention theory (or to Hugon's table), this paragraph suggests a potential conflict between domestic performance criteria, such as food security (and its subsequent consequences on coordination patterns), and capitalist coordination requirements. This, however, may be overcome, by integrating food security concerns into the capitalist coordination. Improving the coordination system may therefore require an understanding of the logic from which we start (in this case, the domestic coordination), so as to design institutions that provide an effective transfer from one coordination system to another.

3.3.4.6. Issues of enforcement of the technical recommendations and food-crop/cash-crop complementarity.

As reported by Bosc and Freud, "farmers 'underdose' their declared cotton areas, channeling part of their chemical inputs to their food crop fields (or selling a portion when the product can be sold for a higher price on the market or when the farmer needs cash before the harvest)." This suggests an inescapable complementarity between food and cash crops: technical recommendations were all the more easy to enforce if a certain level of transfer between cash-crops and food crops was tolerated.

This suggest that the matrix in Table 3.1. (with functions in rows and actors in columns), which was so far conceptualized for a single commodity, is really to be seen approached with a third dimension in mind: the various commodities, so as to take into account horizontal interdependencies.

3.3.5. A timely and adaptative marketing management.

Marketing management issues have already been discussed through their impact on technology adoption and on the effectiveness of a price-incentive system. Other notions emerge from the various studies undertaken.

3.3.5.1. Effective temporal coordination

Due to the technical characteristics of cotton (it is hard to transport, and to store), a need for processing close to the production area and connected with it in a timely way has been stressed [Ministère, 1991]. Therefore, coordination patterns have to account for downstream activities and the quality of their realization, such as reliability of the supply to the ginneries and speedy processing of the raw cotton. Also, from the production side, timely application of pesticides seems important to get both optimal quantity and quality of raw cotton.

The concern about temporal coordination was already mentioned in discussing the NC117 studies, in chapter 1. Also, the SCP framework of Industrial Organization introduced such issues in its approach. It might therefore be useful, when designing institutions to deal with temporal issues, to refer to other case studies undertaken using such frameworks, even if they were undertaken in different countries and about different commodities.

3.3.5.2. Having a reliable outlet: a condition for getting producers to invest

MADIA analysis underlines the fact that a vertically integrated research-production-marketing apparatus may be necessary in order to promote production of a commodity in a high-risk/low-

return environment. This observation is confirmed by the success of cotton production in Zimbabwe, where the cotton subsector is also an integrated structure. This suggests that the presence of the CFDT per se, if it may have helped, is not the only factor explaining the performance of the coordination structure. The same conclusion was drawn by Dioné, when comparing performance in the CMDT and OHV zones: "more than 70% of the farmers in each of the survey subzones perceive cash crop production and the use of fertilizer as two basic factors conditioning the profitability of animal traction. (...) The strongly perceived need for cash crop production clearly indicates that output markets play a central role in farmers' capacity and decision to invest in draft animals and equipment." (Dioné, p. 242) This refers to an issue previously stressed: a well-designed coordination might require more than just price incentives, to help farmers quit their former coordination and corresponding accumulation patterns to adopt a new one.

Note that reliability may also be needed in other markets. For instance, for farmers to have invested in animal traction in Mali, a reliable supply of animal feeds and timely availability of veterinary products and services had to be accessible in the first place. This supposes either a well-functioning market (which is probably not the case due to the market thinness) or the promotion of such markets in order to reach a demand size leading to economies of scale. Some kind of joint decision or promotion might therefore need to be taken. Regional development of improved practices certainly helped reaching this critical mass. Such issues as the role of economies of scale has been part of the emphasis of the Industrial Organization theory.

3.3.5.3. An issue of planning and monitoring

What emerges from the previous examples is that dealing with commodity development is a really complex matter: many factors are interconnected and, when markets are not effective (e.g., input market is not developed, processing constitutes a bottleneck, or product markets are thin and price variation unpredictable), it is really challenging to get agriculture moving. Any change in one part

of the system affects the rest of it, sometimes with unpredicted feed-backs. For instance, in Tanzania, in 1986-87, due to excellent weather and improved prices to which producers appeared to be fairly responsive, an important increase in cotton production occurred. However, TCMB, the Tanzanian cotton marketing board, purchased less than two-thirds of the crop due to "lack of funds, transportation problems, and weaknesses of the cooperatives. Even then, the purchases far outweighed the ginning capacity of the aging mills, causing delays of several months in the payments for cotton purchased." (Lele et al., p.25) Would a better planning have prevented such an important cost to the economy, both financially and in terms of farmers' commitment to a system proven less than secure?

This does not mean that a perfect monitoring should be undertaken. However, some monitoring certainly avoids major mistakes. It is after having observed such past errors, that SEDES, a French consultant agency, suggested to systematically include a filière impact assessment to any ex-ante analysis for rural development projects. This was intended to assess both the distributional impact of the development project and its feasibility (financial profitability at different stages and the need to design eventual complementary investments).

3.3.5.4. Power and collusion help improve marketing options.

Hugon [1992] stresses some international institutions and asymmetric relations with which the African cotton system has to deal. Of particular importance is the dynamic behind the confrontation/cooperation relations of various national policies (USA, EEC, China protection regulations) and MNCs policies, and the regulation pattern created by some international agreements such as STABEX with the EEC. Such an international environment (which is far from the market-clearing prices of a free-market) is certainly of major importance in determining the optimum coordination pattern at the national and regional levels.

African countries produced between 6.6 and 8.7% the cotton world production between 1980 and 1988, while Francophone Africa accounted for between 1.4 and 2.8%. Their export share,

although somewhat higher, was also negligible (Ministere, 1991). Therefore, African countries are price takers in the world cotton market. It has been suggested that the 1984-86 and 1991-93 low prices crises corresponded to a phenomenon of surplus liquidation and not to prices reflecting production costs [Hugon, 1992]. If this is so, African countries have to prepare themselves to face more than a competitive market: They have to cope with some power games. Although not enough material was gathered to understand such constraints borne by the system, we may suggest that this imposes on Francophone Africa a need to act collectively rather than individually to defend their position and improve their marketing options. This note does not so much apply to the world market as to specific agreements. In particular, due to agreements with the EEC, Francophone African countries could contribute to one fourth of the cotton imported by France and the United Kingdom. This is maybe why the Ministère's study indicates that the existence of the CFDT was helpful in avoiding competition among African countries. (1991) Actually, an integrated structure might appear as stronger to face geopolitical challenges (and subsequently, economic challenges). Other solutions might entail targeting niche markets partly disconnected from the world price variations. Note that this discussion does certainly not suggest that competitiveness is an unimportant matter. Indeed, it is probably the card Africa has to play to remain credible and heard. However, it stresses the importance of paying attention to the power structure in the analysis of coordination patterns, as would regulation theory and meso-analysis suggest. Other paragraphs below will also refer to the role played by power in designing an "adequate" institutional environment.

3.3.6. A strong incentive structure for investment and repayment.

3.3.6.1. Investment/Disinvestment, Low repayment rates/Disappearance of the credit institutions: Overcoming vicious circles

Various studies emphasize the role played by effective credit institutions in the adoption of modern technologies. However, as clearly illustrated by Dioné in Mali, the investment/disinvestment

phenomenon is a major risk faced by farmers seeking to improve their production capital. Actually, whenever they invest in, say, animal traction, they take the risk to be forced to disinvest. The repetitiveness of the disinvestment phenomenon is related to both the natural environment (e.g., drought) and the institutional context. The problem arises from the low recovery rate over the capital disinvested (e.g., sale of the animal). The consequence is that farmers take the risk to be forced back to a lower equipment status. This strongly affects the farm household capacity to cope with various hazards, either natural or policy-induced. How to then overcome the poverty circle and get farmers to invest for a more secure future ? How to also give credit institutions some security concerning their ability to recover their loans? Those issues have been successfully managed within an integrated framework.

3.3.6.2. Secured outlet: an institution alleviating farmers' risks and facilitating loan recovery

In the past, credit organizations preferred to lend to cash-crop producers, because 1) outlets and farm-gate prices for cash crops were guaranteed by the government, therefore minimizing price risks, and 2) the marketing of cash-crops through official channels offered the most effective way for credit organizations to recover their loan [Dioné, 1989]. This was perceived and reinforced by CMDT, which imposed a strict credit discipline: No farmer with unpaid credit due was eligible for a new loan except for proven cases of crop failure caused by natural calamities. Besides, credit repayment was enforced through a deduction from the proceeds of the farmers' sale [Bosc and Freud, 1994]. Indeed, thanks to increased cotton income, CMDT had an outstanding record of loan recovery (never below 90% between 1980/81 and 1987/88), especially after increased farmers' involvement in their associations (97% in 1986/87 and 97.4% in 1987/88) [Dioné, 1989]. In contrast, the failure of the rural credit organization (the Société de Crédit Agricole et d'Équipement Rural, SCAER) in enforcing repayment was partly due to the lack of direct contact with farmers. As credit intermediaries, the rural development agencies (Opération de Développement Rural) took no risk and had no particular incentive to improve the performance of

the credit system. One more time, we observe a case of a public credit structure benefitting from a capitalist coordination patterns, for other functions in the subsector.

3.3.6.3. The market power of maintaining stable institutions.

Relative to the other agricultural zones of Mali, the CMDT zone has always benefitted from more stable credit provision. (This was also true for inputs.) Whenever erratic evolution occurred in the credit organization. Only other zones had to undergo unfavorable changes. For instance, when SCAER collapsed in 1980 (due to low interest rates and low recovery rates), the structure that replaced it (BNDA, or Banque Nationale de Développement Agricole) required "an adequate level of production of a cash crop that is sold through an official marketing channel" as a prime condition for loan approval. This clearly favored investments in the cotton zone. To compensate, OHV obtained an extension of the USAID credit program in 1981. However, "USAID's assistance to the OHV credit program was blocked from December 1981 to March 1984", mainly due to the "OHV's failure to comply with the new credit conditions and terms proposed by USAID (e.g., full-cost pricing, 12% interest rate on all loans, and respect of USAID procurement regulations), which diverged from government's overall credit policies"[Dioné, p.303]. This suggests that a powerful structure such as the CMDT system is able to overcome critical institutional instabilities. This may not have been the case of more decentralized structures that would have to cope with any change in the system.

3.3.6.4. The power of negotiating more favorable financial policies.

Due to its strong results in terms of loan recovery, banks were eager to extend credit to CMDT farmers. Therefore, not only could they benefit from the existence of more numerous credit institutions and loans (68% of the BNDA loans in 1985-1986 reached CMDT farmers through their association) but farmers or their associations also could negotiate loan length and conditions. For instance, compared to the government's policy and to credit rights in the OHV zone, CMDT

managed to borrow a higher amount of money, for a longer period of time, and to extend it to draft animal purchases. [Dioné, 1989] Negotiations were also possible regarding tax collection conditions. For instance, the CMDT was favored by the administrative provision preventing taxes from being collected before the opening of the cotton marketing season, whereas OHV farmers had to cope with tax payment before the end of the dry season. This led to early sales of coarse grain, at low prices, preventing farmers from taking advantage of the yearly price variations [Dioné, 1989].

3.3.6.5. The issue of power and commitment for getting regional loans.

Francophone countries appear to have been much more strongly committed to their cotton subsector than Anglophone countries, in ensuring adequate funding of the sector. One reason may lie in the consistent presence of the CFDT in one form or another since independence, and its influence among donors and decision-makers. For instance, it has been an influential link between donors and SODECOTON, helping design the \$ 25 million loan to the Northern Province Rural Development Project (Lele et al., 1989). CFDT has also enhanced the stability and coherence needed for the development of a viable sector strategy, and had the political influence to promote government commitment to the subsector. This indicates that vertical coordination goes beyond matching supply and demand. It also involves power to influence donor's policies and improve local factor endowments, and involves some ways to get agreements between firms (such as CFDT) and state.

3.3.7. A commitment to rural development.

Cotton in Francophone Africa represents more than a simple filière; it actually constitutes one of the successful engines of rural development. This adds to the perception of vertical coordination the interaction between horizontal aspects of the economy and vertical ones. This constitutes first a way to take advantage of interdependancies and lower production costs in both directions (e.g.

through adequate crop rotations, risk reduction, and economies of scale for rural investments). It may therefore increase farmers' responsiveness, because they are facing a more adequate set of economic incentives. Second, it changes the nature of the incentives: farmers are no more only a stage of a vertical system; they also perceive themselves and are perceived by others as the central component of the horizontal one. Does such a behavioral observation make any difference? This is what we will discuss in the next section dealing with an historical overview of coordination in Mali.

3.3.7.1. Increasing farmers' responsiveness by promoting integrated production systems.

Food crop and cash crop complementarity has been emphasized (e.g., through maize development) because it was perceived that farmers' risk aversion was higher whenever food production was reduced. Besides, cotton monocropping was not a sustainable practice, and the following crops in the rotation also became targeted for varietal improvement. Cotton income also enabled investment in cattle production. This constituted not only an additional source of revenue but also a source of fixed capital to alleviate or overcome risk on a long-term basis.

3.3.7.2. Upgrading human capital

This aspect will be more thoroughly emphasized below. Let us note, however, that through large investment in extension, education, literacy programs, special technological training for extension agents, investment in health services, etc. human capital has been constantly enhanced. This also occurred through some "learning by doing" procedures such as implementing technological changes in production methods, and fulfilling contract requirements. This is even enhanced in countries like Mali where farmers obtained more responsibility through farmer' associations for managing credit repayment, record-keeping, etc. This successful case of local governance improvement certainly constitutes a favorable condition for further skill enhancement. Such a structure would be at the frontier between 1) domestic coordination (with reference to traditional, codified social relations, family and local dimensions, emphasis on the traditional structure (eldest,

and notables) and intergeneration reproduction as a goal), 2) cooperative coordination, and 3) the rest of the economic structure, which is more capitalist (or industrial) in its organization.

3.3.7.3. Indirect and multiplier effects: a potential for improved coordination patterns?

In order to develop cotton, investment in roads and other infrastructure was undertaken. That investment constitutes a long-term benefit to rural activities and enhances market integration for other products as well. Also, cotton development entailed a positive impact on other sectors as well, either directly for sectors such as transport, or indirectly, through income-multiplier effects in rural areas. If such facts might not have implication on coordination patterns in the short term, they might have some in the longer run due to more integrated markets, and in turn, a potentially higher reliance on them. This observation would belong to an evolutionary view of vertical coordination.

3.3.8. Conclusion

This conclusion stresses the link between coordination patterns, behavior and outcomes, referring thereby to Shaffer's paradigm: institutions influence economic agents' behavior, which in turn lead to a certain performance [1980]. In our case study, "institution" refers to the set of arrangements and regulations leading to a certain coordination pattern. Within this partial conclusion, and although this is a partial approach, we will only refer the operating performance of the system: (Do we get agriculture moving through the implementation of this or that coordination pattern?) Here and there, we have underlined the key question about who gains and who loses. This will be approached more thoroughly in the next paragraph.

3.3.8.1 Convergence of supply-push and demand-pull approaches: a step toward sustainability

The reason for the success of the CFDT system certainly relies on a development centered around a promising commodity, with an incentive to remain competitive. Indeed, this experience is not isolated, as confirmed by the case of Kenya with flowers and green bean production, of Malaysia in rubber and then fruit production, Thailand in export rice, and New Zealand in Kiwi.

3.3.8.2. An effective strategic planning

As previously described, dealing with commodity development is far from a straightforward matter in countries where markets are not well integrated. Many factors may constrain the expansion of the subsector. This is particularly true for issues leading to risk of various types: weather variability; lack of certainty concerning delivery or payment timeliness, at any stage; uncertainty concerning the enforcement of credit contracts, and the like. Besides, when a large number of people is needed to develop a marketing channel from scratch, potential bottlenecks are numerous. Indeed, this study seems to indicate that, at some stage of the development process, changing people's behavior involves integration of the production process. Certainly, whenever the input market exists, is accessible and predictable, then the input is only taken as 1) a variable in the agronomic research, 2) a cost in economic research, but not as a coordination issue for a researcher in the cotton subsector. Actually, in this setting coordination operates through market coordination, that is, consistently with the neoclassical perspective. However, how do we deal with the same kind of issues when such markets do not exist, or do not work well?

The CFDT approach has led to the development and extension of technology and assured the availability of inputs, marketing and processing facilities. In particular, it has ensured adequate financing of the cotton sector, making possible, among other things, timely payments to farmers. But more than that, the approach to cotton development in Francophone Africa involved an effective strategic planning, allowing for identifying the weak links, leverage points, and system

interdependencies, and to set institutional arrangements, so as to take advantage of potential cost reductions. As an example, note the way cash crop / food crop interactions were worked out, both in terms of lowering farmers' risks, managing agronomic rotations, and gaining in economies of scale for making investment profitable. This has also been the case for the interaction between secure outlets for agricultural outputs and credit availability, and between the CMDT's need for know-how and power and the CFDT's financial interest. This is also a way to identify actual incentives. When we think about the ease with which the cotton subsector got stuck in Eastern Africa, it seems to argue for a fairly well monitored approach to cotton marketing. Four comments need to be noted however:

- 1) integrated coordination does not mean centralization, as the path toward autonomy followed by farmers indicates;
- 2) strategic planning does not mean perfect control over all the participants in the system;
- 3) within an integrated perspective, many variations have been found, such as
 - a) a very integrated pattern in the case of Mali,
 - b) some filières where production and commercial functions are separated (like in Burkina Faso),
 - c) a case where production and industrial processing are separated from the commercialisation and stabilisation roles (e.g., Benin).

The analysis of the Ministère de l'Agriculture seems to indicate a difficulty in distinguishing the respective adequacy of those alternative forms, given that countries differ in their overall public organization.

4) Even if a given framework seems adequate at a given moment, this does not mean that it is adequate in the future. All those four comments, especially the fourth one, will be further illustrated by the historical perspective of the next section.

3.3.8.3. A few comments on the concept of incentive

Let us briefly list the findings concerning the issues of incentives and enforcement.

1. Price incentives are important but insufficient, because what matters is 1) the relative prices, 2) even more than that, the relative profitability, 3) and at the condition that institutions make those prices effective.
2. A secure promising output constitutes an incentive for many actors of the system: farmers, accepting to take more production risks; credit providers; government accepting to commit itself in the cotton subsector, by financing some investments or passing oriented regulations; development agencies, considering in it a profitable investment; etc.
3. So far we have suggested that the participants in the cotton subsector are strongly committed to this subsector. We may wonder if, beyond the notion of profitability and the financial reward that this constitutes, the notion of belonging to a subsector has also not altered the set of incentives. This entails two dimensions, that would need further investigation. The first is about less tangible factors than the financial ones, such as the prestige of belonging to a growing sector for some public structures (e.g., CMDT, international research centers such as IRCT), the credibility on the market place with regard to donors (in the case of CFDT), and rewards such as training for extension agents. Another incentive may be a perceived fear that if some part of the system start leveling off, the whole system might go bankrupt. Therefore, individuals may have integrated the performance of the system as a whole as part of their own performance criteria. Although some authors mentioned the potential role played by such incentives (Lele et al., 1989; Ministere, 1987), this would require further analysis.
4. Incentives and enforcement gain in being worked out jointly: developing a rigor for, say credit repayment, when expansion takes place, is a way to build in confidence in the system and to face crisis.
5. Making sure that the right set of incentives are provided to participants in the system, in order to fulfill some long-term goal, requires the power to protect the system against adverse short-

term instability, which may destroy both the short-term incentive system and the longer-run confidence of participants in the system. Given that confidence in the market is critical to get people to specialize, this issue of stability seems important. Also critical is the issue who has the right to decide whom to protect in the system. In the case of OHV and CMDT, it was clear that CMDT had the power to protect its farmers from credit instability, but the development agencies of other zones did not.

6. A related issue concerns the management, at the national level, of investment in coordination: if it seems that a well-managed coordination around a commodity has some spillover effects in terms of economies of scale, increased confidence, and entrepreneurial behavior, it also has distributional impacts at the country level. This was the case in Mali between the OHV region and the CMDT region, cotton and other cash crops. Should there rather be investment in a promising area, with expectation that, in the longer run this might also benefit others, or rather have a more equal system but with the risk of creating no new dynamism? This question obviously involves both a technical assessment of the outcome of different schemes, and, most of all, some value judgement about who gets what, and when in the development process.
7. Finally, it is to be noted that the process through which an institutional change is designed may interfere with the perception people have about it. For instance, in Mali in the mid-70s, farmers fought for increased autonomy. Once they got it, it was certainly perceived as a victory, as well as a sign of social recognition. Beside the fact that their request started from a perceived need, such less tangible rewards may have helped make farmers' associations work and farmers become committed to it. On the other hand, top-down attempts to promote such farmer involvement between the 1920s and the 1960s appeared to be a failure. This was maybe due to the spirit with which it was done. However, the more difficult start of farmers' associations in the OHV zone (which were promoted by development agencies and not stemming from farmers' initiative) suggests that it is not only the institutional form that matters, but also the moments and patterns through which it is implemented.

3.4. Designing coordination as a process: A 50-year perspective on cotton development in Mali.

This section is concerned with the evolution in coordination patterns in a given subsector. It will therefore test the insights that evolutionary and historical perspectives such as regulation theory may provide to policy analysts. For instance, one might go from a completely integrated scheme to one where farmers have more autonomy, to another where the research and extension functions are separated from the rest. This is a fairly trivial assessment! Less trivial, however, is the implication it entails for conceptualizing vertical coordination. Through which path do we get improvement in the food system? What are the conditions for going from one stage to another?

To give some insights to these questions, this section will first synthesise the evolution of vertical coordination in the Malian cotton subsector. With concepts fairly close to those of regulation theory, particular attention will be paid to accumulation patterns, not only physical accumulation but also in terms of human capital (know-how, health) and institutional capital (reliability, credibility of the institutions). (Environmental capital will not be emphasized, although sustainability constitutes one of the major issues in the cotton area's future). Also, emphasis will be on how coordination adapted to change in preferences, in economic context, and in the level of accumulated resources. What characterizes the transition from one stage to another (group action, crisis and stability)? To facilitate the understanding of the evolution in the coordination patterns, three representations based on table 3.1. have been included (see table 3.3). Shading represent the actors taking part in it, as in Table 3.2.). They use the same framework (columns for the coordination patterns, lines for the various functions), and cells content would be the same than in table 3.1. Three periods have been reported, corresponding to the three following sections: before

independence (in 1960), between 1960 and the mid-1970s (when farmers obtained more autonomy), and after the mid-1980s.

Then, in order to see what such a temporal scope might allow us to see, some perspectives and elements of a scenario will be proposed concerning how to deal with the challenges ahead.

3.4.1. The colonial period : a top-down, coercive perspective.

In the Francophone African zone, after centuries of traditional production for local clothing, projects for increasing cotton exports toward France were implemented beginning in the 1920s.

Actually, cotton was imposed as a commercial crop through a coercive program, such as peasant settlements and organization, and the existence of sanctions imposed on those refusing to grow it [Fok, 1993]. Also, as noted by Jones [1976], "most administrators considered their administratees so indolent that they could be induced to produce crops for market only by imposition of head taxes and establishment of quotas of cash crops to be grown by villages at the direction of chiefs who cooperated with new regime" [cited by Dioné, 1989]. The French had a low opinion not only of indigenous producers, but also of the existing trading networks. They therefore selected coercion rather than market incentives to induce farmers to adopt the selected crop. The example of coerced Sudanese traders, replaced by either French commercial companies or Lebanese traders, is in that sense meaningful. Actually, "the Sudanese traders, who were once vital actors in the pre-colonial trans-Saharan trade, were faced with the alternative of either collaborating with these foreign traders by playing subsidiary roles in domestic markets or fleeing the area altogether." This underlines "(1) the anti-market, anti-merchant bias, (2) the perception of the agricultural incentive system, and (3) the propensity for direct state interventionism and monopolies that prevailed in Sudanese political circles by 1959, i.e., at the eve of Mali's independence." [Dioné, 1989]

Table 3.3: Evolution of coordination pattern in the Malian cotton subsector.

1920-1949	Colonial state	Industrial	Cooperative	Market
Research				
Fertilizer Seed				
Investors				
Credit providers				
Extension	Top-down			
Purchasing				
Processing				
Transport				
Export Market				
Price stab.				
Monitoring				
Lobbying				

1960-mid 70s	State	Industrial	Cooperative	Market	Donor
Research					
Fertilizer and Seed		Transfer			
Investors					
Credit providers					
Extension					
Purchasing					
Processing	?	?			
Transport	?	?			
Export Market	Joint-Venture				
Price stab.					
Monitoring					
Lobbying					

Mid 70s & after	State	Industrial	Cooperative	Market	Civic
Research					
Fertilizer and Seed					
Investors					
Credit providers					
Extension					
Purchasing					
Processing					
Transport					
Export Market					
Price stab.					
Monitoring					
Lobbying					

In the same time, however, the French were willing to enhance farmers' technical ability, and several top-down approaches had been undertaken to develop human capital between 1910 and 1960. Officially, the resulting pseudo-cooperative aimed at stimulating farmers' capacity to defend their interests. In reality, however, this sounded more like a control system: membership was compulsory, and political interference high.

After a few decades of very slow growing export toward France, and of stagnant productivity, the CFDT was created and officially charged to promote rainfed cotton production (Dioné, 1989).

3.4.2. Independence: a progressive transfer of responsibility.

The actual development of cotton started after independence [Bosc and Freud, 1994]. Organizational transition between pre and post independence had been fairly smooth regarding cotton: in Mali, the government signed a ten-year agreement with CFDT to continue the cotton development program. The effort relied mainly on intensification through use of fertilizers and high-yielding varieties, and they resulted in tripling cotton yields. Coordination was still fairly top-down and administrative. Actually, until the mid-1970s, all formal credit matters were provided by the Rural Development Operations (ODRs), designed by governments and parastatals, with very little farmer participation: "The determination of farmers' needs for equipment and the seasonal inputs, the approval of individual loan applications, the distribution and the recovery of these loans, all occurred in an administrative process where the principal client was perceived as a passive entity." [Dioné, p.272] Given such a decision structure, the massive aid sent by international donors was conveyed through states. Certainly, the private sector was neither really constituted nor able to take over complete economic sectors. However, the role played by African states certainly led to some ambiguities because governments confused their role as entrepreneur, investor, economic accountant and political leader [Ministère, 1987]. An effective "coordination mix" (according to the convention approach) was found so as to prevent public entities from developing rent seeking behaviors.

Although this ten-year period still emphasized an administrative approach, it was also the beginning of a new perception of rural actors. CFDT's scope of action was broadened to include other rural development strategies, such as the promotion of other crops, and an emphasis on rural literacy programs. Also, the cotton sector started getting more autonomy and a clearer status: a joint venture was created in 1974 between the government of Mali and CFDT, the Compagnie Malienne de Développement des Textiles (CMDT) [Dioné, 1994]. CMDT then began to obtain some funds from various international donors to promote rural development.

3.4.3. Toward more participation.

Mali constitutes the leading country for increased farmer participation in the cotton producing zone. This started because "frustrated by their lack of control over some critical cotton marketing operations (particularly weighing and valuing output) arbitrarily performed by CMDT buying agents, farmers of a few villages required that these functions be entrusted to literate villagers. This is the kind of phenomena that regulation theory would consider as a crisis situation in terms of accumulation and coordination patterns perceived as inadequate by the participants in the system. This proposal was well received by the CMDT administration, which perceived this new strategy as an effective way of ensuring payment of delinquent loans contracted by farmers during the drought periods of the early 1970s, through a shift of credit responsibility from individuals to farmers' associations." [Dioné, p. 336] This clearly shows that this change was pushed by farmers' group action and not suggested by CMDT. And, indeed, farmers, especially the poor ones, have certainly been the main winners: "The acceptance of a group solidarity as sole guarantor of credit allows a higher level of risk-sharing, which enables the association to extend formal credit eligibility to individual small farm households that would otherwise be excluded" [Dioné p. 273].

Tasks such as the organization of purchasing operations, record-keeping and book-keeping were decentralized, which constituted an opportunity for enhancing rural human skills. This

transfer made possible by some support provided to increase villagers' literacy and bookkeeping skills [Fok, 1993]. Also, incentives for record-keeping and loan-repayment were tied to output sales. This transfer of right not only implied more autonomy on the one hand and lower costs on the other hand; it also constituted an important source of enhanced confidence of other economic agents in their ability to enforce contracts with farmers. Indeed, "CMDT village associations (950 in 1986) have developed to become the most-preferred agricultural credit intermediaries for BNDA as well as for major final distributors of farm inputs and implements and primary assemblers of marketed output for CMDT" (Dioné, p336). This shows the importance of the notion of confidence emphasized by convention theorists. In this case, not only safe market outlet was a source of confidence (with the corresponding reference to industrial coordination) but also group solidarity and civic involvement in local communities (which would be at the frontier between civic, cooperative, and domestic coordination patterns).

During the same period, the cotton system became a more credible subsector for other contractors. It could therefore influence public agencies in order to preserve a stable environment. For instance, it successfully negotiated the withdrawal or alleviation of some regulations, hedging against institutional instability in markets such as input and credit markets.

3.4.4. Successful but... Crisis and the need for change

Between the mid-1970s and 1983, a period of high cotton prices, the cotton system had been close to economic sustainability, without accounting for spillover effects on food production, infrastructure, and human capital building. However, with the two periods of low prices (1984-1986 and 1991-1993), no country of the Francophone zone could maintain its production. This is why the 1987 debate on cotton was organized. What were the findings and changes made afterward?

3.4.4.1. A rationalization procedure for cutting costs.

Francophone countries went through a reform process, succeeding in cutting the costs by one-quarter to one-third. Such reductions affected first funding to dispensaries, road construction and maintenance, and subsidies to food crop promotion. Also, input subsidies on fertilizers and pesticides were removed. Producer prices were maintained after the first crisis, but they were cut during the second crisis. The research system adapted by selecting less input-demanding varieties, and suggesting other agronomic practices. Costs were also lowered at the processing level and through a better coordination of transport. (Bosc and Freud, 1994) This potential for cost reduction suggests a few comments:

a) Regarding reduction of operating costs (such as those in cotton processing), this tends to suggest that this state/industrial coordination may have been slow in removing some unprofitable practices or production units. Although Bosc and Freud suggest that too many of such units have been closed (with some of them potentially profitable in the longer run, or with an impact in terms of economies of scale in the food system), it seems the set of incentives created by such coordination patterns did not take full advantage of some cost-saving opportunities.

b) Removing fertilizer subsidies would be consistent with the neoclassical concept of efficiency. However, this might not be consistent with an institutional view of technological innovation. For instance, it appeared that Asia used fertilizer subsidies to achieve the green revolution. Isn't there some spillover effects to be gained from such strategic expenses in improved technologies?

c) The impact of the reduction of farmers' cotton prices is ambiguous. A first step of analysis would suggest an expected cost reduction (and an increased competitiveness) in the cotton subsector. However, what will be the impact of decreased prices on farmers' decisions and, in turn, on the quantity produced? What would be the subsequent impact on (lost) economies of scale, on institutions, credit stabilisation, on the former multiplier effect on rural dynamism? More detailed analysis would be needed, to assess the various outcomes. However, suggesting a mechanical adaptation of the system to such price-changes (as a neoclassical framework would suggest) might be misleading.

d) Decreased expenses on dispensaries also suggests another issue which should be a constant concern, but which, in this case, is more straightforward to underline: not only does such a cost reduction have an impact on human capital (health), but it also suggests that such a decision may only be judged with a certain set of performance criteria in mind. For example, who should have access to medicine, and how much of such a good should be provided publicly?

Mali and Burkina Faso successfully recovered competitiveness. For Cameroon, however, although cotton production was very profitable at the farm level, its viability at the national level seemed a key challenge. SODECOTON's organization and its high cost of operation appeared clearly as the weak link of the cotton subsector. Part of the problem is due to the more diversified agriculture in Cameroon. Therefore, system interactions become even more complex to analyze. Also, transaction costs for implementing changes are higher due to the increased number of people and interests involved. As Israel (1987) stresses, the higher the specificity of a public institution, the higher the traceability of employees effectiveness. According to this statement, we may expect SODECOTON, which deals with more diversified production systems than CMDT, to be less effective in monitoring the behavior of SODECOTON employees. Besides, farmers' associations were implemented more recently in Cameroon than in Mali. Cameroonian farmers assumed fewer functions and are not as used to take initiatives. As a result, the coordination pattern did not take advantage of the cost reductions linked with decentralization (as shown by the Malian experience). Also, farmers cannot be expected to take over many functions quickly.

3.4.4.2. A rationalization through decentralization.

Reliance on producers' associations for the organization of purchasing operations continuously increased since its initiation. With the second crisis, however, producer associations were pressured to take on additional functions, such as input purchases and associated credit risks. Even in Mali, where the producers have become increasingly well organized, there has been strong producer resistance to taking on these risks.[Bosc and Freud, 1994] What about countries where

associations are more recent and result from administrative decrees, and where even record keeping for cotton sale is already unsatisfactory? Understanding (or making assumptions about) learning processes would be needed to assess what functions may be managed by farmers, in what time frame.

Governments have also been under pressure to break up the cotton companies. Certainly, the private sector has become more successful in functions such as contracting transportation services. However, "the problems arise if reforms either push associations into responsibilities for which they are not ready, or break up the links within the subsector which allow it to perform vital functions such as input credit" [Bosc and Freud, p.25]. Indeed, what the historical analysis so far suggested is that changes involve agents' reliance on a new "mix of coordination principles" (as convention theory would call it). This suggests that in any situation, removing institutions that lead to outcomes perceived as inadequate (in this case, breaking up the integrated structure considered to be too costly) is not enough. We also need to make sure that creation of a new dynamism effectively occurs, either by promoting it or by making sure that conditions are created for it to spontaneously emerge.

A more fundamental issue has to deal with the relevance of the recommendation in favor of breaking up the integrated cotton structure. Indeed, this is a very important issue from a strategic growth perspective. After the economy starts to grow as the result of an integrated approach, is there eventually an advantage to promoting more independent markets for inputs or outputs? Or should one continue an integrated approach, arguing that those markets don't exist? Beside neoclassical standard theory (while really suggests reliance on more atomistic organizations), other theories suggest that for such complex systems such as agricultural commodity subsectors, there is no clear-cut solution.

3.4.4.3. What comes next?

a) Among the concrete challenges that were suggested was the issues of agricultural diversification. Actually, this seems an attractive way to protect a national economy from relying on unstable markets (as in the case of Mali, where a single crop represents 45% of the export earnings). Such diversification might have some implications for the power structure. For instance, farmers would no more be in a situation of monopsony, whenever they want to market cash crops. At the same time, when the agricultural system becomes more diversified (in terms of marketed production), it becomes more costly to coordinate functions in a centralized way, and CMDT's prevailing role might be challenged. Indeed, the example of Cameroon and Senegal seems to indicate that a slightly more diversified structure increases administrative costs. Does it mean that to be successful, diversification needs to rely more on decentralized decisions? Does it suggest that farmers' autonomy needs to be further enhanced? How can a country go from a stage of enhanced technical management skills to one of creating entrepreneurship in a risky environment?

At the same time, there are some economies of scale arising from increased agricultural dynamism. Those two phenomena (increased administrative costs and economies of scale) might make profitable the connection of certain functions from the main structure. This has already been observed about transport, for which CMDT increased contracting with private agents, instead of carrying out this function. The same might also be the case of inputs such as fertilizers, which are needed for various types of food and cash crops. However, pragmatism should be the basis for devising whether decentralization effectively helps the economy grow. This issue suggests that the matrix we used (see Table 3.1.) and so far considered under a single commodity perspective, is really to be approached with a third dimension: the various commodities. Keeping this dimension in mind, while undertaking a subsector analysis, would help take into account horizontal interdependencies.

b) Another issue that would need to be worked out is the separation between cotton marketing and rural development, as this might lead to lower administrative cost for the cotton

subsector. This would at least entail a role clarification across various public agencies, so as to avoid redundancy.

c) An issue that may also become strategic is the respective roles of government and cotton subsector members in monitoring changes. This is the whole issue of who has the right to decide regarding the distribution of rights to productive resources, across regions, and across commodities. Who will get the right to have access to credit, to benefit from donor' funding, and from direct private investment? Those questions constitute a legal, political and economic challenge: How would a new contract between CFDT and the state be structured, so as to avoid disincentive for foreign investments but still allow the state express its perspectives on national development? What should be the mix of freedom and control? This question is all the more relevant in countries like Mali, where the government is developing its monitoring capacities by undertaking a strategic planning process to appraise the performance of different agricultural commodities and identify the need for changes. So far, cotton has not been included in its analysis. Should it stay separated?

3.4.5. Vertical coordination as a process

We started the case study with a reference to the common dichotomy between integrated vs market coordination patterns. It appears from this historical perspective that the "Francophone perspective" indeed was a constantly evolving one.

This section reviews the previous historical facts by emphasizing accumulation patterns, and the way previous accumulation guides future accumulation. This is the notion of path dependency. The notion of vertical coordination is directly linked with such paths, both because it determines current accumulation patterns, and because change in vertical coordination patterns occurs notably because of former accumulation. By accumulation we refer to growth in physical, human and institutional capital.

During the first decades of cotton production, coordination was a fairly pure example of an administered pattern. Given that market incentives were either non-existing, due to poorly working information systems, or existed but were considered as unacceptable because of some value judgement, coercion became the only perceived way to create incentives. Also, cotton production was certainly considered more as a "mining activity" for short-term profit than within a long-term investment strategy, as some truly industrial coordination might entail. In particular, investment in physical or human capital was largely neglected.

The creation of the CFDT and the IRCT began a period of a proactive and powerful vision of product development. This tendency became even stronger with independence. Investment in research, infrastructure and people were the signs of this new development strategy. There was a market to develop, and a technological basis to increase production. This could no longer be done without actors having increased skills. Participation, however, did not yet mean autonomy. It was more of an industrial perspective, in terms of its search for competitiveness, its integrated pattern, and its coordination logic driven by the product characteristics (and by the actors' strategies).

With farmers' increased human capital (technical skills and literacy) and physical capital, farmers had become more secure and powerful: they were becoming more valuable factors in the CMDT scheme, and their request to become more autonomous had become credible. Besides, CMDT needed such a cost reducing evolution. The nature of the interdependence between farmers and the marketing board had changed. A top-down approach was no more relevant, because farmers also could express the will that their preferences be taken into account. Increased reliance on farmer organizations led to incorporating farmers' own initiatives in the identification of priorities and in the design and the implementation of rural development activities. Among those preferences was the improvement in poorer farmers' access to credit, input and loans. At the same time, because of the secure outlet for their outputs, institutional capital was enhanced: trust was increased between borrower and lender.

Given these previous endowments (human, physical, institutional capital), investment in coordination through ownership is less needed: transport may be done on the basis of contract and not as an administered CMDT function.

3.4.6. Methodological consequences of the historical approach.

This section draws upon the historical view to suggest briefly three methodological issues:

3.4.6.1. Managing continuity and change in the vertical coordination pattern.

a) Adaptation to changing market opportunities: the notion of adaptative efficiency.

Effective demand is constantly changing both quantitatively and in terms of its quality requirements. Also, national economic opportunities are constantly evolving. This has recently been the case of input subsidy withdrawal, of CFA Franc devaluation, of enhancement of farmers skills, and of processing capacity. From the stand-point of "society", the notion of successful vertical coordination notion, is more than just developing a commercial success. (In the LDCs, however, commercial success is basic condition for sustainability).

b) Growth with stability

CMDT has benefited from continuity and gradual evolution in its goals, priorities and strategies since the early 1950s. In contrast, OHV has not been able to build systematically on its past efforts to move one step higher at each of its development planning stages. It seems that strong political commitment greatly helped build and maintain domestic institutional capacity.

c) Building human capital

Enhancing human skills seems to have been an important element of continuity and change in the cotton subsector. Indeed, this corresponds to what Eicher would stress as one of the major issue. "Rural development should aim more at investing for agriculture than investing in agriculture. For farmers to become the true engine of agricultural development, substantial direct investment should be made to train them in order to facilitate and promote the emergence of their own organizations,

which should be allowed to participate increasingly in the design and the management of rural development activities." (Dioné, p.343, partly referring to Eicher)

3.4.6.2. Monitoring change

It seems that, little by little, the cotton subsector in Francophone Africa has been evolving toward a more decentralized coordination pattern, with more autonomy for individual participants. Although this process might have occurred faster, a certain progression was needed to go from one coordination pattern to another, with some key factors being built up (e.g., more confidence among actors, increased human capital, or changed power structure). If we go back to the initial debates, it seems that there was a double source of divergence: which optimum coordination pattern for the subsector and how fast a transformation? As an example, a fairly protected system allowed farmers to accumulate wealth and undertake risk-management investment (such as cattle production). Maybe such a step was needed for them to cope with a more liberalized situation, and take advantage of market opportunities without falling back into the vicious circle of investment/disinvestment. Another example involves the organization of public agencies: as stressed above, when cash-crop diversification occurs, administered coordination becomes very expensive, and the structure needs to evolve. Given the complexity of commodity-system interactions and their partly unpredictable evolution through time, much pragmatism is called for, as well as a long-term involvement in monitoring changes. This is because changes need to be both sequential and effective. The monitoring has therefore the double tasks of 1) designing realistic changes, and 2) enforcing them.

3.4.6.3. Identifying some coordination combinations.

As has been noted about the cotton subsector, the overall coordination pattern was made of different categories of coordination patterns (with reference to the convention theory perspective). This means that vertical coordination is not to be approached with a monolithic perspective but

rather as a complex mix responding to complex set of interdependencies in the food system. Indeed, if convention theory identified several principles (and following coordination patterns), theory also argues that real situations refer to a mix of these dimensions. If the subsequent variety in various combination calls for understanding of the given situation, it may also be useful to better understand the interaction between mix of coordination devices and performance. Case studies in that sense may be useful in providing experiences about which mix of coordination patterns is adequate at such stage of economic development, or to promote a certain set of performance criteria.

IV. GENERAL CONCLUSION. SOME METHODOLOGICAL ISSUES.

The focus of the conclusion emphasizes the methodological implications of the previous analysis.

4.1. Various subsector approaches for various goals

While analyzing the cotton filière, we came across different subsector approaches, notably in terms of their ways to deal with vertical coordination.

1. SEDES used to undertake many filière analyses linked with development projects. As noted above, these consisted in assessing the market potential for absorbing, say, increased production at the farm level, or to react to some technological changes. The subsector assessment is one step of the ex-ante feasibility study. There was eventually some evaluation of coordination. The studies also emphasized actors' strategies, notably through a systematic sociological approach at the farm level.

2. In the subsector analysis funded by the Ministry of Agriculture in 1991, five main aspects are found: 1) A market appraisal to assess the demand side; 2) A technical evaluation, which shows the prospects for technological changes and concerns in many different disciplines (crop breeding, pathology, agronomy, and food processing technology); 3) Financial and economic assessments, so as to measure the filière's competitiveness; 4) An organizational assessment, with reference to internal organizational and management issues, policies and their impact on incentives; and external analysis in terms of the nature of the contract and relations between various organizations; 5) Issues of rural development were also tackled. This analysis entailed different perspectives: a business strategic analysis, and an approach to developmental issues. Note, however, that organizational issues were analyzed from the point of view of the organizations involved in the cotton subsector

(those organizations have also some rural development mission), rather than from the point of view of the country as a whole.

3. The MADIA study would probably not be considered as a subsector approach. Within the filière framework, however, it focused on organizational aspects at each stage of the subsector, and level of the subsector as a whole. The comparative framework helps to differentiate the outcome of various organizational schemes.

4. Dioné's dissertation is clearly not a subsector analysis. However, a farming-systems approach may also be helpful to design vertical coordination mechanisms. This is because of the system nature of such a problem (parts are functions of wholes, and wholes are functions of the parts). Indeed, in a country where industrial transformation is not developed very much, the farm still appears at the crossroads of many coordination issues. This is because many functions are directly connected to the farm level (research-extension, input provision, credit, farm-gate purchases, primary transport, eventually, initial processing, etc.). Like other industry studies, a farming-system approach constitutes a good complement to subsector analysis which, on the other side, allows for tackling issues of transforming agricultural production into a commercial success.

5. Hugon's short introduction to a meso-analysis of a cotton subsector involves other characteristics. With less emphasis on marketing approaches and competitiveness issues (which he considers as an inseparable step of his meso-analysis), he focuses on analyzing: 1) accumulation processes under various coordination patterns, and 2) power nodes, as factors determining which transformations, in the coordination system, are manageable. As previously stressed, such an approach may be useful in understanding processes, and dealing with transition. Besides, by focusing on the issue of power it underlines other factors to take into account in order for a coordination pattern to be adequate (e.g., to maintain a strong structure, to protect interests in international negotiations).

All those different approaches underline the potential and flexibility offered by subsector analysis as a tool.

4.2. Designing an accumulative framework

From this study, two methodological observations may be drawn: 1) Dealing with a commodity system is very intricate. Indeed, every level of a subsector is an individual system interacting with many other systems; and each stage of the subsector is both connected and autonomous. Any change directly affecting one part of the system will also indirectly affect many other parts of it. 2) In addition, this system is evolving over time. If, at a given period, some changes affect the outcome positively, it might not be the case at some other period. This is because behavior (tastes, entrepreneurship, task sharing) is changing with market opportunities at the same time as new behavior (learning processes, commitment) has an influence on the way a market performs. Incentives come both from market opportunities and social reinforcement of entrepreneurial behavior.

How to deal with such complex and evolving systems ? One first answer was to let the market take care of it. This statement is controversial in two ways, however: 1) When coordination is left "to the market", the outcome may not be the socially most preferred. This might have been the case, for instance, if credit had been completely liberalized, and would have only benefitted the already rich and secure CMDT zone. 2) When the market does not work very well (e.g., if transactions do not occur because of high risk, for instance), then the probability is high that bottlenecks will prevent accumulative evolution from occurring. This therefore calls for some monitoring at some level of the system.

4.2.1. Designing a cumulative and dynamic research framework.

While looking at different subsector analyses, it appeared that each time a new scopewas adopted (e.g., an historical view; a comparative approach; a classification of coordination patterns (like the meso analysis); a macroeconomic approach, such as some of the World Bank officials; a technical approach), new interactions were discovered between different parts of the system. Therefore, the

big picture was always somewhat missed by considering individually each piece of research. It sounds therefore misguided to see subsector analysis as an individual analysis, and not as a cumulative framework and a learning process. Meanwhile, the question "how to improve our modes of inquiry" seems to have encountered two broad, related questions: the theoretical part of the problem (what are the key processes, elements, relations of causality) and the implementation characteristics (how to make various analyses complement each other). Then the next question was: what makes a research program helpful and successful? Is it the accuracy of the paradigms used or the ability to organize human agents in accumulating knowledge and participating in the research program on the subsector development process? My assumption is that both matter, and in an inextricable way.

For policy analysts, recommendations stemming from this paper are to make research frameworks both cumulative and dynamic. Cumulative refers to increasing the amount of knowledge about a given system context and commodity, for those implementing policy analysis. It also refers to increasing knowledge for those in charge of more cognitive research. Cognitive refers to basic research intended to increase understanding of economic processes (say, behavioral responses to a certain set of incentives) and of the interdependences in a given system, independent of policy concerns. Accumulative also refers to the obvious interaction (and even confusion!) between those two groups of researchers, undertaking applied and cognitive research. Dynamic refers to the cognitive loop-process according to which we take advantage of the implementation feed-backs for improving the accuracy of our paradigms. It also refers to the perception that context is constantly changing either through new preferences or new economic challenges. Also the case study indicated that such a mode of inquiry entails a potential learning process for both agents and analysts taking part in the economic system. As such, it may enhance monitoring ability. If well designed, it may also lead part of the system to become more autonomous, thereby simplifying the monitoring task.

4.2.2. Theory: a necessary but dangerous tool if used in isolation.

As stressed in the theoretical chapter, vertical coordination has been approached from fairly different angles. At the same time, through the case study, it appeared that different angles could enhance knowledge about how the system works. For instance, neoclassical tools have certainly been useful for cotton in underlining the danger of unsustainable practices, with increased debts and rent-seeking behavior. On the other hand, reference to more institutional paradigms has been important in avoiding theoretical ideology and in making reform manageable and constructive. This paper is certainly not criticizing the usefulness of paradigms in approaching reality. Indeed, as Simon notes it, "the first step in rational action is to focus attention on specific (strategic) aspects of the total situation, and to form a model of the situation in terms of those aspects that lie in that focus of attention. Rational computation takes place in the context of this model, rather than in response to the whole external reality." [Simon, 1991:37] This suggests that theory constitutes an inescapable step in the cognitive process. I would, however, argue (along with Simon), that it is only a very incomplete part of the cognitive process, gathering empirical evidence being its corollary. Carrying out case studies is one of the possible empirical testing processes.

4.2.3. Long-term involvement in monitoring. A condition for adaptative effectiveness?

If time plays such an important role in changing people's perception about how the system works and in helping reaching a higher accumulation stage, this has some consequences for the analyst's agenda. This might be interpreted as a need to 1) get involved for a long period of time in a given context, on a continuous basis (for, say, 20 years so as to make agents autonomous and take more proactive initiatives in response to context changes), or 2) to reinforce an indigenous structure able to analyze and monitor changes in the system. This is valid for direct foreign investment, in which case the issue becomes one of giving foreign firms incentives to stay long enough to take full advantage of the continuous process.

4.2.4. Monitoring: An issue of power.

The monitoring function is both about vertical coordination and part of vertical coordination. We might actually distinguish two coordination functions: 1) one of production, which entails the issue of coordination across stages, and 2) the issue of detecting market opportunities and helping achieve a more effective match of supply and demand. Obviously, if we were in a perfectly competitive market with perfect information and flexibility, and with the classic efficiency concept of performance, this distinction would not make sense. Because we are not, and because preferences change over time, there is room for strategic planning. Indeed, this is certainly all the more needed if the market does not "work" well (in the structuralist sense of the existence of bottlenecks).

Note also that monitoring is critical in designing who benefits and who loses from changes in the vertical coordination structure. Throughout this paper, the role played by power in selecting who has access to the resources appeared as essential (e.g., credit markets, prices on the international scene) Meanwhile, who is monitoring such processes is critical in determining the distribution of rights to produce, to have access to services, and as a result, of the outcome.

1. If an MNC (Multinational Corporation) is the one which monitors productive changes in the structure, we might expect some more thorough search of professionalism. Indeed, the CFDT has been really successful in making the cotton subsector remain competitive through frequent analysis of future market prospects. The CFDT's approach constituted a certain guarantee that the subsector and the corresponding technological innovations would become a commercial success. Would it, however, be an economic success ? CFDT maybe constitutes an outlier in terms of its involvement in getting agriculture moving (not only cotton growing!). At the same time, however, the influence of MNC association with the CMDT has been clear when we look at the regional imbalances in growth, tax and investment privileges. Nevertheless, if a company is in position to monitor changes, the CFDT example is helpful in showing how interactions, through the development of cross-interests, may help part of the value added stay in the country.

2. Donors: As stressed previously, monitoring needs to be relatively stable and continuous conditions. On the other hand, external evaluation analysis (such as cross-country comparison) may be really helpful in providing some reference criteria.

3. Reinforcing local monitoring capacity; Utopia or reality?

The transfer of competence from CFDT to CMDT has been a successful case of increased local autonomy. Also, the emergence of local governance allowed for the decentralization of part of the monitoring function. It seems to me essential to evolve toward more reliance on national monitoring. Several reasons were so far addressed: the fact that local institutions remain more continuously involved in their country (except when major conflicts occur), and the effect on increased human capital that such a learning process entails. This appears to me most of all as an issue of sovereignty. Indeed, who monitors changes influences the outcome of an analysis. Therefore, are external public agencies legitimate for undertaking such functions? Legitimacy may be justified in the short term, due to actual lack of local monitoring competence. But what about the longer run? Isn't it time to invest in local monitoring capacities?

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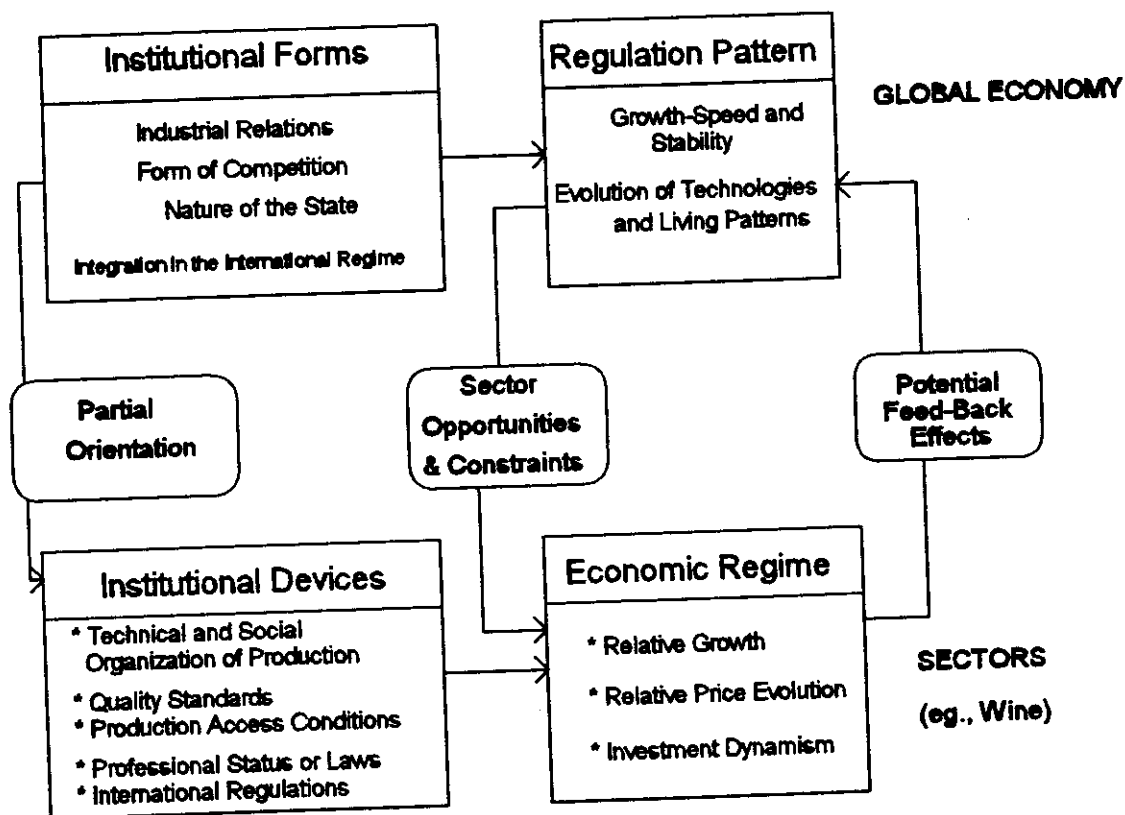
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APPENDIX 1 : ARTICULATING GLOBAL- AND SUBSECTORS- REGULATION : A SYNTHETIC APPROACH.



Source: Bartoli and Boulet, 1990.

APPENDIX 2 : THEORETICAL SYNTHESIS

	Behavioral Elements	Institutional aspects	Organization	Government	Coordination modalities	Example
Standard neoclassical Theory	Substantive rationality Individualism	Exogenous.	Only external markets	Exogenous. Often criticized for the distortions it generates, except when enhancing competition or dealing with externalities.	Prices as the only market coordination mechanisms. Emphasis on matching supply and demand and on the allocative efficiency notion.	NC117 (+transacti on cost)
Contract Theory	Substantive rationality Individualism	Contract (fully intentional or constraint rules) (exogenous)	External and internal markets	Exogenous	Different contractual arrangements, from external (market) to integrated, analyzed through the scope of relative efficiency. The desired vertical-coordination patterns (or governance structure) depend on the degree of risk and uncertainty, of asset specificity, and on the frequency with which transactions occur.	Aldridge : MIS in Mali
Convention Theory	Indivi-holism		Internal and ext. Micro-economic decisions in terms of organization (households..)	Depends on the focus	Rules as collective cognitive devices. Conventions as a reciprocal expectation system among individuals. Market is not the only coordinating mechanisms (Law, rules and regulation compromises, system of common values)	Velteschi- ni: Processed Vegetables in France
Regulation Theory	Procedural rationality. Holi-individualism	Historical analysis of institutional structures		Endogenous. Close to Samuels' notion of a legal-economic nexus	A given institutional configuration produces some regulation patterns, which in turn produce various accumulation regimes Attention paid to development patterns	Bartoli and Boulet : Wine in France
Institutional meso-economy	Procedural rationality		Internal and external Relations among organizations in terms of conflict/cooperation.	Endogenous	Asymmetric relations between macroeconomic entities and other economic units in terms of influence and dominance.	Hugon : Cotton in Africa