AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Governance and Surplus Distribution in Commodity Value Chains in Africa

Johan F.M. Swinnen, Anneleen Vandeplas and Miet Maertens

LICOS Centre for Institutions and Economic Performance
& Department of Economics
University of Leuven (KUL)

Paper prepared for presentation at the 106th seminar of the EAAE

Pro-poor development in low income countries:
Food, agriculture, trade, and environment

25-27 October 2007 – Montpellier, France

Copyright 2007 by Johan F.M. Swinnen, Anneleen Vandeplas and Miet Maertens. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

.

Governance and Surplus Distribution in Commodity Value Chains in Africa

Johan F.M. Swinnen, Anneleen Vandeplas and Miet Maertens

LICOS Centre for Institutions and Economic Performance
& Department of Economics
University of Leuven (KUL)

Draft Version: September 5th, 2007

Abstract

The governance of food markets is a crucial element for efficiency and distributional effects. In this paper, we use a conceptual model to show that this governance itself is endogenous in an environment of weak contract enforcement and imperfect markets, and importantly depends on the value in the chain. We relate the predictions of the theory to empirical evidence on differences in supply chain governance in Africa across different commodity types. In doing so we offer an explanation as why private sector governance systems with interlinked market transactions have emerged for higher value crops but not for staple food crops. We discuss the efficiency and equity effects and the implications for policy.

Paper prepared for presentation at the 106th EAAE Seminar on "Pro-poor development in low income countries: Food, agriculture, trade, and environment." Montpellier, France, October 25-27, 2007.

Governance and Surplus Distribution in Commodity Value Chains in Africa

Johan F.M. Swinnen, Anneleen Vandeplas and Miet Maertens

1. Introduction

Recent policy discussions have emphasized the importance of the staple food crop sector in Sub Sahara Africa to increase farm productivity, to achieve food security and to alleviate poverty (see for example the Summit on Food Security in Africa in Abuja, Nigeria in December 2006). A crucial issue in the debate is how the staples food sector can generate surpluses and how to ensure an equitable distribution of these surpluses.

In this paper we argue that the governance of food markets and commodity chains is a crucial element for efficiency and distributional effects -- including for growth and food security – and that the chain governance itself is endogenous in an environment of weak contract enforcement and imperfect markets, and importantly depends on the value in the chain (and on other commodity characteristics). Supply chain governance – or the way economic transactions in supply chains are coordinated (Gereffi et al., 2005) – is crucial in determining how economic surpluses are generated and distributed along the chain. There is large variation in how food and agricultural commodity chains are governed, with the involvement of the public sector and/or different private agents and varying levels of vertical coordination between those actors. It has been argued and empirically demonstrated that the degree of vertical coordination in supply chains indeed influences economic outcomes, in particular efficiency and equity (Swinnen and Maertens, 2007).

To show how the value in the chain determines the governance of the chain and how surpluses are distributed along the value chain we use a conceptual model, based on the theory developed more formally in Swinnen and Vandeplas (2007). We then compare the predictions of the theory with empirical evidence on governance of different commodity

chains in Africa. In combination, this allows to understanding the constraints on growth in staple food chains and to identify policy implications.

Our approach involves several key aspects. First, we develop a general model of value chains to allow comparisons across different commodity types. To understand what is (not) occurring in the staples food sectors we think it is essential to not focus merely on the staple food crop sector but to relate and compare its characteristics and economic performance to other agricultural subsectors. For this purpose we use a simple classification of low, medium and high-value commodities. This simple classification could be thought of as representing the three types of agricultural markets identified by Poulton et al (2006)[1]: staple food crops, traditional exports, and non-traditional exports. In sub-Sahara Africa (SSA), these three markets represent specific commodities, such as grains (staples food crops); coffee, cocoa, tea, cotton, and tobacco (traditional export crops); and fresh and processed fruits and vegetables (FFV) and fish and seafood products (FSP) (non-traditional export crops). The non-traditional export crops, such as FFV, are often referred to as high-value export commodities (e.g. Aksoy and Beghin, 2005) while the value of grains (per weight) is typically relatively low[2].

Second, we explicitly use an "interlinking market" approach. The literature on supply chain governance (e.g. Kirsten and Sartorius, 2002; Dolan and Humphrey, 2000; Swinnen and Maertens, 2006; Swinnen, 2005) often draws a distinction between market-based governance and contract-based governance[3].[4] However, from our perspective the key issue is

[1] These authors draw heavily on the work of Diao et al. (2003).

[2] Also the perishability of produce varies along these commodity types with grains being least perishable and FFV and FSP the most delicate.

[3] Another form of supply chain governance is that of complete vertical integration, which occurs when activities at different stages of the chain are coordinated completely through ownership integration. This is an extreme form of governance that excludes smallholders from the production stage of the supply chain.

[4] The first typically occurs when produce is traded on a spot market basis with zero degree of coordination. The latter involves vertical coordination, which can take various forms and usually involves some form of contracting between traders (buyers) and farmers (suppliers). Contracts usually specify some form of price and outlet ex ante (sometimes referred to as marketing contracts). In addition contracts can include inputs, credit,

not whether produce is supplied through spot markets or through contracts but whether transactions are made in one single market (the output market) or whether different economic transactions are interlinked[5]. Interlinking[6] occurs when next to the exchange of primary produce, traders and suppliers agree on inputs, credit, extension, etc. to be delivered as part of the contract. We will show that the occurrence of interlinked market governance strongly depends on the commodity value and is positively related with efficiency and equity in agricultural supply chains.

Third, we explicitly integrate two important aspects of the developing country institutional environment into the model: market imperfections and weak enforcement mechanisms. The functioning of markets (highly imperfect in many SSA countries) and the contract enforcement environment (often very weak in developing countries) play an important role in the emergence of specific systems of supply chain governance. These institutional aspects are therefore specifically accounted for. We will show that market imperfections and weak enforcement institutions are important in determining the distribution of surpluses in commodity value chains.

The structure of the paper is as follows. First we describe the development of supply chain governance systems from a historical perspective. Second, we highlight the development of supply chain governance for different types of commodities. Third, we develop a conceptual model that theoretically describes how surpluses are distributed along the value chains depending on the emerging governance patterns and commodity value. Fourth, the theoretical outcomes of the model are confronted with observed patterns of

---

and extension services provided by the contractor, detailed production practices stipulated by the contractor, management decisions taken by the contractor, etc. (sometimes referred to as production contracts).

[5] The phenomenon of "interlinking markets" was first used in the development economics literature to describe a landlord-tenant relation where the landlord act as a financial intermediary between the outside loan market and his tenants. The landlord has better access to credit than his tenants while he can enforce credit repayment from his tenants through this dominant position in the land market (Bardhan and Udry, 1999).

[6] Bell (1988 p797) provides the following definition of interlinking: "an interlinked transaction is one in which the two parties trade in at least two markets on the condition that the terms of all such trades are jointly determined"

governance and surplus distribution in different types of commodity chains. Finally, we specify the policy implications of our findings.

2. A Historical Perspective on Supply Chain Governance

State-controlled governance

Most African countries were characterized by state-controlled supply chains for agricultural and food commodities in the decades after independence from colonial power[7]. Governments heavily involved in agricultural marketing and food processing through the creation of marketing boards, (para-)state processing units, and government controlled cooperatives (e.g. in Tanzania). State-controlled governance was particularly common for basic food crops (most importantly grain) and important export crops such as coffee, cotton, and tea.

State involvement in the production and marketing of staple food crops was most extreme in Eastern and Southern African countries while in West Africa, marketing boards and (para-)state companies intervened heavily in the supply chains of export crops but were less influential in grain markets (Kherallah et al., 2002). Marketing of grain and other basic food crops was controlled by government marketing boards, e.g. in Malawi through ADMARC (Agricultural Development and Marketing Cooperation); in Zambia through NAMBOARD (National Agricultural Marketing Board); in Kenya through NCPB (National Cereals and Produce Board); etc. State governance in the processing and marketing of major export crops was done e.g. in the cotton sector in Cameroon (SODECOTON), Ghana (The Ghana Cotton Development Board), Kenya (Cotton Lint and Seed Marketing Board) and Malawi (Malawi Textile Development Company); the coffee sector in Uganda, Kenya, Zimbabwe and Ethiopia; the tea sector in Kenya (Kenyan Tea Development Cooperation); etc.

[7] This was the case 25 years ago in many low income countries, not only in Africa. State control was most extreme in the Communist world, spreading from Central Asia to East Eurpo, but also in many Latin-American and South Asian countries the state played a very important role in the food chain.

The dominant form of state governance in agro-food supply chains was that of seasonal input and credit provision to small farmers in return for supplies of primary produce. For example, the government marketing boards ADMARC in Malawi and NAMBOARD in Zambia provided seasonal inputs to peasant farmers deducting the value of the inputs from the payment made for marketed output at harvest time. Also parastatal cotton companies such as CMDT in Mali, SODECOTON in Cameroon and the Ghana Cotton Development Board provided credit and inputs to cotton farmers (Poulton et al., 1998). Hence, government marketing organization and parastatal processing companies dealt with farmers through interlinked transactions in output, input and credit markets. Also extension services were often part of these interlinked transactions. For example, the Ghana Cotton Development Board also provided extension services (Poulton, 1998) and the Kenyan Tea Development Cooperation was involved in effective control at all levels of the operation including planting material, production processes, quality control and extension services (Bauman, 2000).

State control in agricultural supply systems was often motivated on political grounds and by the objective of extracting government revenues from the agricultural sector. Until the 1980s there was a strong bias against agriculture in the policies of many SSA countries. Agricultural was viewed as a backward sector that could not take the lead in realizing economic growth. The emphasis was on food self-sufficiency and industrial export growth. Governments intervened in agricultural supply chains and markets basically to directly and indirectly tax agriculture, maximize foreign exchange earnings, and provide cheap food for urban consumers and industrial workers.

The bias against agriculture in government policy has resulted in low agricultural growth rates. The system of state governance in agricultural supply chains led to a situations were government institutions were monopoly buyers of agricultural products (especially basic food crops and important export crops) and the only source of input and credit provisions for

peasant farmers. Consequences for local farmers were very low agricultural prices and little production incentives. Moreover, marketing boards bore high costs of transport (due to pan-territorial pricing policies) and of storage (due to pan-seasonal pricing policies). Marketing boards are often mentioned to have been highly inefficient due to corruption and bureaucracy which led to serious financial problems (Kherallah et al., 2002). Also late payments to farmers and very low credit repayment rates were in general characteristic of state governance systems. However, some studies also point at successful state supply chain governance. For example the contract-farming schemes of the Kenyan Tea Development Authority are referred to as a success story, which is attributed to its extensive form of interlinking (Bauman, 2000).

The fall of state-controlled governance

In many parts of SSA the described system of state-controlled governance in agricultural supply chains collapsed during economic reforms in the 1980s and 1990s. Processes of privatization and liberalization were to remove the state control in agricultural commodity chains, provide competition and ensure efficiency. In most countries, the monopoly status of government marketing boards and parastatal processing unities fell down and private traders were allowed in agricultural trade. Many government marketing boards, cooperatives and (para-)state processing units either collapsed, were privatized or transformed. For example in Ethiopia, the parastatal company Agricultural Marketing Corporation (AMC) which strictly controlled grain trade was transformed into the Ethiopian Grain Trade Enterprise, a government buffer stock scheme. Also in Malawi, the official monopoly of the state agency Office des Produits Agricoles du Mali (OPAM) collapsed and its role was reduced to managing a strategic food reserve, distributing food aid and sales of grain in remote areas. In Nigeria, the Nigerian Cocoa Board collapsed as well as the parastatals for oil, palm, rubber

and peanuts. The coffee marketing boards in Uganda and Tanzania were transformed into the Ugandan Coffee Development Authority (UCDA) and the Tanzanian Coffee Board (TCB) with purely regulatory functions. The Ghana Cotton Development Board was privatized into the Ghana Cotton Company (Kherallah et al., 2002).

Economic reforms have not been complete and in most SSA countries the government still involves in agricultural supply chains in a variety of ways: through parastatal companies and marketing boards or through minority shares in privatized food processing companies, through state-owned banks and government credit schemes, provision of extension services etc. However, in general, due to these economic reforms since the 1980s, there has been a shift away from state governance in agricultural supply chains towards other forms of governance – mainly market-based forms of governance involving private companies and interlinking markets. The degree to which this shift has occurred and the governance systems that have appeared are very commodity specific and are discussed in the next section.

3. A Comparative Perspective on Recent Commodity Chain Governance

In this section we discuss the variation among commodities (and across countries) in the recent governance systems of agricultural supply chains. We consecutively discuss the staple food crop sector, traditional export crops and non-traditional export crops.

Staple food crops

State-controlled governance systems are still most prevalent in the supply chains of staple food crops. Government interventions such as price controls and trade restrictions have been abolished in most countries (except for government price control in Malawi, Tanzania and Zimbabwe; and trade restrictions in Benin, Ghana, Madagascar and Tanzania). However, in most countries, governments marketing boards still exist. They continue to be main players in

the grain markets of a number of countries. In Malawi for example, the Agricultural Development and Marketing Corporation (ADMARC) remains dominant in the maize market despite closure of a number of buying centers. In Mali, parastatal rice milling companies are only slowly being privatized and remain active and influential. In most SSA countries however, the importance of marketing boards and parastatal processing companies in the staple food supply chains has decreased and privatised trading systems have emerged. Liberalisation reforms have prompted large numbers of small informal traders to enter into grain trade in most SSA countries. For example, it was estimated by Negassa and Jayne (1997) that the Ethiopian Grain Trading Enterprise – created form the Agricultural Marketing Corporation – accounts for less than 5% of the cereals marketed by peasants. In Benin only 0.15% of the traded volume maize is controlled by the Office National d'Appui à la Sécurité Alimentaire (ONASA) – created from the parastatal Office National des Céréales (ONA). Also in Ghana, small independent traders dominate the grain market. In Malawi where ADMARC is still dominant in the maize market, small private traders are active but engage mainly in bulking for ADMARC.

The private traders that have merged in the staple food sector generally have limited capacity to innovate, poor access to credit and other resources, and limited storage capacity (Coulter and Poulton, 2001) and tend to rely on social and ethnic-based networks (Fafchamps and Minten, 2001). Private grain traders rely on simple spot market transactions to trade produce. In fact, the private sector operations are characterized by limited capital, a low degree of specialisation, and the absence of long-term investment, including in interlinking market relations. Private sector interlinking is largely absent and the government is still an important source of input and extension provision in many countries. For example, in Malawi ADMARC still distributes 61% of the fertilizer used by small farmers (Minot et al., 2000). Also in Zambia, still over half of the fertilizer is supplied by the Food Reserve Agency at

pan-territorial prices (Jayne et al., 2003). The governance system of grain markets in SSA is characterized by a combination of the remainders of state governance and private simple market governance without interlinking.

The effect of all this on the performance of the staple food crop sector depends in large part on the extent of the changes. In many SSA countries marketing margins in the staple food crop sector remain high (e.g. in Tanzania and Ethiopia). In addition, growth in per capita staple food crop production has been modest in most countries and negative in some countries (e.g. in Tanzania, Zimbabwe and the Gambia). Moreover, the use of inputs such as fertilizers and improved seeds declined in some regions (Kherralah et al., 2002).

Traditional export crops

During colonial periods, cash crops such as coffee, cocoa, cotton, tobacco and tea were mainly grown by smallholders in West Africa and on large industrial estate farms (owned by western settlers) in East and Southern Africa. After independence however, *smallholder cash crop production expanded under state-controlled governance systems and outgrower schemes*. Delgado (1995) estimated since the 1970s at least 90% of traditional export crop production in SSA is carried out by smallholders.

In the past 15 years, there has been a remarkable shift from state governance in the supply chains towards private governance systems organized around private trading and processing companies. The removal of the monopoly status of (para)-state processing companies and government marketing boards, has in most countries and for most commodities resulted in an inflow of private capital into export crop processing and marketing. For example, in Tanzania and Uganda the collapse of the coffee marketing boards resulted in private investment in coffee marketing. By 1997, about 75% of coffee trade, including the best qualities, in Tanzania was handled by private traders. Also in the cashew

nut sector, trade liberalization and the collapse of state owned processing companies, caused an inflow of private traders (mostly selling raw nuts directly into export markets). In Tanzania, private traders accounted for more than 90% of cashew nut trade in 1997 while the 12 state-owned processing factories were completely abandoned. The privatization of the Ghana Cotton Development Board into the Ghana Cotton Company and liberalization in the cotton sector has caused private companies to invest in the sector resulting in increased competition (Poulton, 1998). Also in Tanzania, the majority of cotton (60%) is processed by private cotton gins (Kherallah et al., 2002).

As a result of privatization and market liberalization, state-controlled governance of export crop supply chains gradually reduced and ceased to exist. Instead, supply chains developed around private companies such as traders, exporters and processors. The private forms of governance often involve interlinking markets. E.g. increased competition in the Ghana cotton sector has induced private companies to increase their services to farmers, including timely plowing services, reliable fertilizer and pesticide supplies, prompt payment after harvest and even plowing for farmers' food crops (Poulton, 1998). Sometimes, multi-partite arrangements with government institutions appear. For example, in the coffee sector in Tanzania, the private interlinked market governance involves arrangements with a state cooperative bank. In some sectors state governed and private governed supply chains co-exist (e.g. cotton in Tanzania) but they usually operate in different regions of a country.

While for most crops and in most countries state-controlled export crop marketing and processing is making away for private market-based government, this is not the case for cotton in some West African countries, where parastatal companies remain active, handle the majority of the crop and govern the supply chains. In Mali the Compagnie Malienne pour le Développement du Textile (CMDT) has preserved its monopoly status in cotton processing

and marketing, and remains the sole provider of seeds, chemicals, fertilizer, extension services.

The shift away from government intervention and state-control over export crop supply chains has had major implications. First, it is reported that in the period after the reforms, the production and sale of African traditional exports grew by 30% in volume in the period 1990-1997 (Townsend, 1999). Second, market liberalization and the shift in governance system has improved the availability and the access to inputs and credits (Kherallah et al., 2002). Third, there have been major changes in the distribution of surpluses. Real producer prices for traditional African export crops increased substantially. For example, producer prices for coffee increased with 9.8 % annually in Cameroon and 14.1 % in Senegal in the period 1990-1997. In the same period, real producer prices for cotton increased with 5.9 % in Tanzania. However sectors where the shift away from state-governed supply chains has not yet occurred are worse off. E.g. the annual increase in cotton producer prices was only 2% in Benin and 0.8% in Mali (countries were the cotton sector remains to be state-controlled). Marketing margins for export crops have decreased while the producer's share of the price has increased. For example, producer's share have increased to more than 70% in the coffee and cocoa sector in Cameroon, Nigeria, Tanzania and Uganda. Producer's share remains relatively low for cotton in Benin (37%) and Mali (44%).

Non-traditional export crops

The expansion of a non-traditional export sector is a recent phenomenon. Since the 1980s, the structure of developing country agricultural exports has changed significantly with non-traditional export crops increasing sharply in importance (Figure 1). These non-traditional export crops are typically high-value commodities such as (fresh and processed) fruits and vegetables, and fish and seafood products. These products now account for more than 40% of

total agricultural exports from developing countries while their share was only 21% in 1980[8]. In SSA, these non-traditional exports are important in a number of countries: e.g. in Kenya, Senegal, Madagascar, South-Africa, and Ethiopia.

Non-traditional export supply chains are completely controlled by private companies. Since these supply chains developed only recently – mainly after 1980 when many liberalisation and privatisation reforms had already been implemented – state involvement in these sectors have been much less than for traditional exports. Contrarily to the traditional export crop sector, also large supermarket chains - spread throughout industrial countries and large parts of the developing world, and starting to appear in SSA – play an important role in the supply chains of high-value commodities. In addition *the degree of vertical coordination and the occurrence of interlinking is very high in the supply chains of non-traditional exports*. For example, in Senegal, extensive forms of market interlinking are observed in the export vegetable sector (Maertens and Swinnen, 2006). Exporting companies provide peasant farmers with inputs, credit, and extension and management services in return for timely and high quality supplies of French beans. Also in Madagascar, a private company provides inputs and extension services to 10,000 small horticulture farmers under contractual arrangements (Minten et al., 2006).

The development of non-traditional export sectors in some SSA countries has had major positive welfare implications. Although some authors argue that the poorest and smallest farmers are excluded from these privately governed supply chains (e.g. Reardon et

[8] A number of factors contribute in explaining the increase in non-traditional high-value exports. First, trade and investment liberalization and the change towards export oriented trade policies have played a role in stimulating developing countries to exploit their comparative advantages in the agri-food sector and encouraging non-traditional high-value exports. Second, market conditions have also played a role in the shift to nontraditional exports. Traditional tropical products such as coffee, cocoa and tea became less attractive because of persistent volatility and long-term downward trends in world market prices for these products (Gulati et al, 2005). Third, the increase in nontraditional exports is induced by changing preferences of consumers in high- income countries stemming from health awareness, increasing income levels, and an increased demand for convenience prepared food (Diop and Jaffee, 2005). Moreover, consumer interest in product variety and year-round availability of fresh food has stimulated nontraditional exports from developing countries.

al., 2003) in general farmers are receiving high prices for high-quality products which importantly contribute to rural incomes (Maertens and Swinnen, 2006; Minten et al., 2006).

Summary

There are important variations in supply chain governance among commodity types, as summarized in table 1. First, supply systems for staple food crops are governed through the remainders of state-controlled governance or through simple market-based governance – or, in most cases, a combination of both. Second, for traditional exported commodities there was a shift from state governance to private market-based governance, often with interlinking markets. Third, high-value non-traditional exports have grown over the past 20 years, based on private governance systems with interlinking markets.

In the next sections we will show that the difference in product value (and other characteristics such as the perishability of the products) is key in explaining the observed differences in supply chain governance. Moreover, these differences in governance system are crucial in determining how much surpluses are created and how they are distributed along the value chain.

4. Conceptual Model

In this section, we present a conceptual model to explain the observed differences in commodity chain governance, in particular the (lack of) emergence of interlinking and the distribution of the created surplus along the value chain.

Consider the situation where a local household or farming company – which we refer to as "the *farmer"* – can sell farm products to a trader or a company – which we refer to as "*the processor"*. This processor sells the product (after transporting, processing, retailing, etc) to consumers – either domestically or internationally. Let θ represent the value that is

created by this transaction, net of the "processing" costs. Hence, θ is the value to be distributed between the processor and the farmer, taking into account the farmers production costs.

The production of commodities for the market requires some (specific) input use (e.g. fertilizers, credit, seeds, technology). Assume that to produce one unit of output, the farmer requires specific inputs with a value of I on top of his standard production cost for subsistence production (e.g. labour, land). We assume that these specific inputs are not available to the farmer because of factor market imperfections. This assumption reflects the situation in many developing countries where local producers and households face important factor market constraints. These constraints hurt both farmers and processors: they prevent farmers from producing for the market and constrain access to raw materials for the processing firm.

If the processing firm has access to the required inputs, the processor can act as an intermediary in the input market and provide (sell or lend) the inputs to the farmer. This, again, is a realistic case since the processor may have better collateral, more cash flow or face lower transport or transaction costs in accessing the inputs. If so, the processor will consider offering a contract to the farmer, which includes the provision of inputs and the conditions (time, amount and price) for purchasing the farmer's product. We assume that the processor provides the farmer with the full amount of required inputs I per unit of production, or the processor does not provide any inputs[9].

Note that in such a contract, each agent can hold-up the other agent. On the one hand, the farmer can divert the inputs to other uses, such as selling them or applying them to other production activities; or he may apply the inputs as agreed but then sell the output to competing buyers for a higher price. On the other hand, the buyer may pay a lower price to

[9] Implying that the application of any amount of inputs below the optimal amount of inputs I is resulting in a lack of marketable surplus.

the farmer than was originally agreed on, or simply postpone payment – a common practice in reality (Swinnen, 2007; Kydd and Dorward 2004, Poulton et al. 2006).

In the rest of this section we will show graphically and discuss under which conditions a contract is agreed upon and enforced (implying the creation of surplus) and the distribution of the contract surplus (A formal analysis is in Swinnen and Vandeplas (2007)). The participation constraints of the farmer and the processor and their incentive compatibility constraints play a crucial role here.

Perfect enforcement

To establish a baseline result, we start with assuming perfect (and costless) contract enforcement. Hence, if there exists a contract that satisfies both the farmer and the processor's participation constraints, it will be realized. The participation constraints state that the contract should yield a higher payoff for both agents than the disagreement outcome, where the farmer and the processor do not trade at all.

As enforcement is guaranteed, there is no risk of opportunistic behavior by any of the contract parties. In this case, we assume that the contract surplus is shared equally among both agents[10]. The contract surplus S is defined as the surplus created by the contract over the sum of the initial outside options of the contracting agents: it is the value θ minus the extra production cost I due to the specific inputs. Whereas ΔY denotes the share of the surplus accruing to the farmer, $\Delta \Pi$ is the processor's share. Note that an agent's outside option is crucial in determining his/her payoff. The total payoff is formed by adding each agent's outside option to his share of S.

For $\theta < I$, the quality premium is insufficient to justify the specific inputs cost. Contract formation would be inefficient here. This is what we call *efficient separation*. For

[10] This "equal split" assumption was first suggested by Nash (1953) and later widely adopted by other game theorists (e.g. Diamond & Maskin, 1979; Osborne & Rubinstein (1990), Muthoo (1999) etc.

any value of $\theta \geq I$, contract formation is efficient, and surplus is always created in the case of perfect and costless enforcement.

Costly enforcement

When enforcement is costly, it is no longer certain that contracts will be honored. Opportunistic behavior may emerge. Hold-ups occur if one of the agents has an attractive alternative to contract compliance. First, we discuss the case where the farmer has the opportunity to hold up the processor. In the next section, we also take into account the case where the processor has an opportunity to hold up the farmer. To understand under which conditions contracting will be sustainable and what the impacts are on the total surplus and on its distribution, we will start by considering the extreme situation where there are no external enforcement institutions – which is equivalent to assuming that external enforcement is prohibitively costly.

One-sided holdup

Assume only the farmer can potentially hold up the processor, namely by diverting the received inputs to other uses, such as selling them, or applying them to other production activities (e.g. subsistence food crops); or by applying the inputs but then selling the high-quality output to a competing processor at a higher price. Indeed, if a competing processor values the high-quality product as much as the contracted processor does, the former can still earn more profits on it, as she has not paid for the specific inputs required for producing it.

The farmer's incentive compatibility constraint captures the necessary condition for the farmer to voluntarily comply with the contract. It states that the farmer's income from the contract must at least be as much as his outside option, obtained from breaching the contract and selling elsewhere. Swinnen and Vandeplas (2007) show how this is equivalent to the

concept of *efficiency wages* (Salop 1979), whereas the employer pays a higher wage to his employees to minimize their incentive to quit and seek a job elsewhere, and define the difference between the producer price under costless enforcement and under prohibitively costly enforcement as an "efficiency premium". The higher the specific inputs cost I is, or the higher the price is that competing buyers offer for the farmer's produce on the local market, the higher this efficiency premium must be.

Figure 2 shows how efficient separation occurs for $\theta<I$, where the extra value created by the contract is too small to justify the specific inputs cost. However, for $I< \theta<2I$, contracts break down although they could be profitable for both agents: *inefficient separation* occurs. The reason is that for $I<\theta<3I$, the farmer has an outside option that is more attractive than what he would get under an equal division of the contract surplus S. Indeed, if he would resell the received inputs (instead of using them), he can earn an amount I on top of his disagreement payoff. So this is what the processor should ultimately offer the buyer under the contract as well, by means of an efficiency premium on top of his usual surplus share. Otherwise, the farmer's ICC is not satisfied. This obviously requires that $S \geq I$, for the processor's PC to remain satisfied at the same time. If $I<\theta<2I$, then $0<S<I$, and there is no division of S that allows for simultaneous satisfaction of the farmer's ICC and the processor's PC. Inefficient separation occurs. For $2I<\theta<3I$, the processor is able to pay the farmer an efficiency premium that covers the difference between his equal division outcome and his outside option. The rest of the surplus will then accrue to the processor. Due to this efficiency premium, opportunistic behavior by the farmer is ruled out, and contracting is sustainable.

Hence, over the interval $2I<\theta<3I$, the surplus going to the farmer is constant at $\Delta Y=I$. Notice that without efficiency premium, ΔY would range from $0.5I$ to I. The share going to the processor increases from 0 to I over this interval.

So far, we ignored reputation costs. However, if he breaks a contract, the supplier may suffer a loss in terms of reputation, or social capital, or opportunities for future trade. We denote this reputation loss by φ^s. φ^s may for example be larger if buyers intensively share information on defaulters (e.g. Fafchamps & Minten, 1999). It puts a brake on opportunistic behavior, as the outside options for contract breach are reduced by an amount φ^s. In this case, the inefficient separation interval narrows[11] and the efficiency premium decreases. Note that farmers can benefit from weak contract enforcement institutions, through the efficiency premium, but may lose from inefficient separation.

The actual outcome depends on several factors. In general, the implications for surplus sharing are as follows: farmers will receive a higher income when, ceteris paribus, (a) the value in the chain (θ) is higher, (b) their opportunity costs (of signing the contract as well as of honouring the contract once it has been signed) are higher and (c) when their reputation cost is lower.

Finally, another way to enforce contracts is by engaging third party enforcement, if it is not prohibitively costly. Less inefficient separation will then occur, but the total contract surplus will be reduced. Define M as the cost of hiring a third party. Then the surplus is $S(M)=\theta-I-M$; if $S(M)>0$ and the remaining surplus will be shared equally among the supplier and buyer.[12]

Two-sided holdup

[11] The inefficient separation interval narrows as the condition for contract feasibility becomes $S \geq I - \varphi^s$ instead of $S \geq I$, hence the condition on S becomes weaker.

[12] Examples of third party enforcement are paying for mafia protection, or for supervision. Alternatively, when the most probable destination of delivered inputs is the non-contract, subsistence crops, input diversion incentives may be overcome by offering farmers additional inputs as fertilizers and pesticides for their own food crops (e.g. Govereh et al. 1999)

Apart from the farmer, the processor could as well behave opportunistically, by paying a lower price to the farmer than was originally agreed on, or by postponing payment, as is observed in reality (Swinnen, 2007, Kydd and Dorward 2004, Poulton et al. 2006).

If the processor behaves opportunistically, she can appropriate the contract surplus up to the farmer's outside option at that moment, minus her own reputation loss (φ^p) from breaching the contract. She is more likely to do this if her reputation costs are low and the alternative sales options for the farmer are poor (compared to the value to the processor). Obviously, the supplier will foresee that the processor can act in such way. If the ex-post renegotiated price is lower than the payoff he can gain through input diversion, he will be first to breach the contract.

More general, with opportunistic behavior by the processor, not all contract conditions are credible and the surplus distribution is constrained. This is illustrated in Figure 3 for $\varphi^s=0$ (the reputation cost of the farmer) and $\varphi^p=3I/2$ (the reputation cost of the processor). The maximum surplus share that a farmer can expect to receive equals the reputation cost of the processor.[13]

Notice that what is going on in this case is that (the equivalent of) a *negative* efficiency premium is paid by the farmer to the processor in high value chains to make the contract sustainable.

This model leads us to conclude that opportunistic behavior affects (a) the frequency of inefficient separation and (b) the division rule for surplus sharing. First, when enforcement gets costly, and reputation costs are low, inefficient separation appears. If the value in the chain (θ) is sufficiently high, this can be overcome by paying an efficiency premium (either positive or negative). For lower values of θ, this is beneficial to the farmer. For very high values of θ, this benefits the processor. This is intuitive, as the risk for hold-up behavior by

[13] Now, remember that the minimum surplus share that is required to prevent the farmer from input diversion equals $I-\varphi^s$. Hence, if $\varphi^s=\varphi^p=0$, inefficient separation will occur over the whole domain of θ.

the farmer is particularly high in low value chains, whereas the risk for hold-up behavior by the processor is high for high values chains.

But inefficient separation will still occur (a) if the value θ is low, (b) if reputation costs (φ^s and φ^p) are low and/or contract enforcement is difficult (costly), and (c) if alternative sales outlets are plenty.

Impact of Competition

If other buyers of high-value products enter the market, the contracted buyer will experience competition. First, she will experience competition ex ante, while negotiating with her supplier; this will clearly raise the ex ante outside option of the supplier. The supplier's outside option will be higher, the higher the fixed cost of the buyer to search an alternative supplier, the lower the supplier's cost of searching an alternative buyer, and the lower the supply:demand ratio is.

Second, the buyer will experience competition ex post, when other buyers try to lure away suppliers already under contract. These other buyers may be able to offer higher prices to the suppliers in the case buyer specificity ($1/\gamma$) of the high-value products is not inhibitively high. Indeed, they do not need to charge a price discount for the inputs received on credit. The supplier's ex post outside option will be particularly tempting in the case I is high, γ is high, and φ^s is low. In such a case, to prevent her supplier from breaching the contract, the buyer will again need to offer him an efficiency premium. The higher this efficiency premium is, the wider the interval of θ is where inefficient separation occurs. In general, competition between buyers affects contract formation and rent distribution in the following ways:

First, ex ante competition increases the share of the total output value accruing to the supplier by increasing his ex ante outside option. The value of this outside option depends on

the respective transaction costs that the buyer and supplier face in switching contract partners, and the probability each has to find a new contract partner (i.e. the buyer: supplier ratio).

Second, ex post competition increases the share of the total output value accruing to the supplier by increasing the efficiency premium that a buyer needs to pay her supplier in order to secure their contract. This efficiency premium is contingent on the value of the advanced inputs, the reputation cost of the supplier, and the buyer specificity of the high value product. However, the higher this efficiency premium is, the higher the probability also is that the output value will not suffice to satisfy both the supplier's incentive compatibility constraint and the buyer's participation constraint. If it does not suffice, inefficient separation follows.

Finally, competition between buyers may also have an impact on reputation costs φ^s and φ^p on the quality premium θ in itself, which we had earlier considered to be exogenous to the model.

Indeed, the number of agents operating in the market is expected to negatively affect the penalty for contract breach (cfr. Hoff & Stiglitz, 1998), first because the threat of cut-off from future contract arrangements is less stringent, as there are other contract partners available. This argument is in line with Eswaran & Kotwal (1985), who state that reputation is an effective weapon against moral hazard only for suppliers "of those factors that are in excess supply". With other words, a higher demand for the supplier's produce lowers his reputation cost from breaching a contract.

A second reason why the penalty for breaching a contractis lower with more competition, is that reputation effects are less prevalent in a competitive market, where agents are less likely to coordinate and share information (see also Zanardi 2004). This will make it easier for an opportunistic supplier to find an alternative buyer. Local information networks work less well when the number of agents expands, as it costs more effort, money, and/or

time to let information spread among a larger group of agents. This is easy to see by thinking of the case where sending a message is costly. The more agents there are in the market, the more messages need to be sent around, hence the more expensive it becomes to share information among agents.

Then, the quality premium θ may also be affected: if more competing processors enter the market to seize a part of the rents, consumer market changes may no longer be neglected. As the supply of high-quality products to final consumers increases, the quality premium, and hence the contract surplus, will go down. This will lead to decreased incomes for both the supplier and the buyer.

5. Implications for Commodity Chain Governance and Surplus Distribution

We now apply our theoretical model to provide some hypotheses why, after the agricultural reforms in Southern and Eastern Africa, linkages between input delivery, farm finance, and crop sale have been established for some types of commodities, but not for others. Crucial in this debate is the value of a specific commodity, the structure of the industry (e.g. competition) (see Figure 4), and other commodity characteristics such as perishability (see Figure 5).

We follow Poulton et al. (2006) in distinguishing between three sub-sectors: staple food crops (e.g. maize, rice, wheat, sorghum and millet), traditional export commodities (e.g. cocoa, coffee, cotton, tea and tobacco), and non-traditional agricultural export crops (e.g. fruits and vegetables, cut flowers, livestock, and fish).

Staple food crops

The value in staple food chains is typically low as a quality premium for staple food crops is typically small or non-existent. First of all, staple foods are often not traded and quality standards at the home market are typically low. In this market, low-quality and unprocessed grains easily substitute for higher quality processed products, as processing can be done at home.

Second, staples for the home market and those that can be traded may both face strong competition from the world markets where cheap grains are available, either from industrialized countries (often subsidized) or from developing countries producing at a very low cost (e.g. Brazil).

Third, contract enforcement is quite difficult and hence costly, due to the high number of potential buyers operating in the market. Indeed, many households themselves are involved in staple food marketing, in addition to many, often small, traders (Govereh et al.

1999). Jones (1972) already described the African staple food markets as “chaotic” and displaying a “basic lack of organization”.

Related to this, staples such as grains are relatively easily to store for a while, relatively easy to transport with minimal investments, both enhancing the likelihood of opportunistic sales.

In combination these factors make that accessing inputs and creating surplus is difficult in these staple food chains as the opportunistic sales are relatively easy and the value is too low to sustain interlinked contracts through self-enforcement.

Contract enforcement is only possible when there is external enforcement, such as a state regulated marketing channel.

Traditional export commodities

For traditional export commodities, θ is of an intermediate level. Returns to producing export commodities are typically higher than returns from staple food crop or subsistence farming.

Moreover, these export commodities are often processed industrially; households are therefore less likely to be potential buyers for high-quality produce. This makes contracts easier to supervise. On the other hand, farmers still have more opportunities to find alternative buyers for crops such as cotton and coffee etc which are more easily storable than very perishable crops, such as vegetables.

The likelihood of sustained contracting depends on the structure of the market and (fluctuations in) the demand for the commodity. Contract failure may result where there are many buyers, strongly competing with each other, and in commodities which are relatively easy to store and to transport. In other cases, contracting may turn out to be perfectly viable.

Non-traditional export crops

In the case of non-traditional export crops, θ is high. By using specific inputs, international standards can be achieved, such that the resulting fruits, vegetables and cut flowers can be exported to industrialized countries, where the consumer is prepared to pay relatively high prices for e.g. hand-picked beans from Kenya or roses from Zambia. These are very labor-intensive crops, while local wages are very low. The returns are typically much higher than for subsistence food crops or other alternatives.

Contract enforcement is easier here because first, if households are potential consumers of these products, they are probably not prepared to pay very high prices. What we do observe, is that local households often consume the rejected products. In Guatemala, for example, Glover and Kusterer (1990) mention that rejected cauliflower and broccoli are widely and cheaply available and have become a nutritious staple of the poorest people. Leaves and stalks can be used as animal feed or organic fertilizer for food crops. Secondly, contract enforcement is also facilitated by the perishable nature of the products. Farmers simply do not have enough time to look out for profitable opportunities.

Finally, as the non-traditional export commodities still concern a relatively small and new share of African exports, marketing channels have not had the time to develop extensively yet. Trade does not happen in bulk like for coffee and cocoa at commodity exchanges, but must happen quite fast and efficiently e.g. through pre-agreements with supermarkets or specialized trading companies. As a result, trade is mainly restricted to a few large export firms. They enjoy economies of scale in quality control and export transactions. As a result, there is usually only modest competition for high-quality products of this type.

6. Policy Implications

For the staple food crop sector in SSA to contribute to economic growth and poverty alleviation, it is crucial to realize surpluses in this sector and for those surpluses to be

distributed equitably. We have shown theoretically that supply chain development with private governance and interlinking is crucial in this. Several policy options to assure such supply chain development to take place follow from our findings.

First, supply chain governance is likely to develop if the value of staple food crops could be increased. However, in many SSA countries, poor households are both producers and consumers of staple food crops. As increasing staple food crop value unavoidably means increasing consumer prices, this may not be a valid policy option in these poor countries from a food security and poverty perspective.

Second, our model shows that enforcement institutions are crucial for private governance systems with interlinking and equitable surplus distribution to emerge and be sustainable. Several authors (e.g. Dorward et al., 1998; Poulton et al., 2006) recommend government interventions to directly support interlinking arrangements in the staple food crops sector by shaping the right institutional environment. However, the development of a good institutional environment with strong contract enforcement mechanisms might be very costly in the case of staple food crops. A large number of buyers in the sector (and hence a high degree of competition) might complicate contract enforcement. Moreover, such institutional development might be particularly hard in remote areas where many staple food crops are produced. Therefore costly policies specifically targeted at improving the contract enforcement environment should be carefully deliberated against more general policy priorities, addressing the fundamental problem of factor market constraints.

In fact, attention to the imperfections in input markets is probably the most broad policy option that follows from our findings. If imperfections in input markets could be handled, supply chains for staple foods crops could more easily develop without the need for interlinked contracts. Specific policy recommendations include the implementation of rural

credit schemes, attention to input markets, the development of extension services, the improvement of rural transport and infrastructure, etc.

An important consideration in this discussion is that there might be spillover effects from contract enforcement and the development of sustainable private interlinking in the cash crop sector – which is less costly mainly due to a higher value in this sector. These spillover effects might be direct or indirect. Households engaging in cash crop production through interlinked contract have better access to inputs, credit, extension, management advice, and cash earnings which might indirectly benefit their food crop productivity due to technology spillovers, better skills, and better access to cash. In some cases cash crop production under interlinked contracts directly benefit household's food crops as the contracts provide specific inputs for food crops as part of the enforcement mechanisms. Hence, shaping the institutional environment for cash crop supply chain development might indirectly benefit the staple food crop sector.

Finally, we need to mention one more general inference that follows directly from the analytical results and the empirical observations in this paper. Privatization and liberalization induces competition in agricultural markets and hence increases the likelihood of supply chain development with interlinking and equitable surplus distribution. In several SSA countries government interventions (and especially the lack of transparency and consistency thereof) impede private supply chains from developing, and are therefore a considerable constraint on the positive implications of these developments.

References

Aksoy, M.A., and Beghin, J.C. (eds.) 2005. Global Agricultural Trade and Developing Countries. Washington D.C: The World Bank.

Bardhan, P. and Udry, C. 1999. *Development Microeconomics*. New York: Oxford University Press.

Bauman, P., 2000. Equity and Efficiency in Contract Farming Schemes: the Experience of Agricultural Tree Crops. Working Paper 139, Overseas Development Institute, London.

Bell, C. 1988. Credit markets and interlinked transactions. In: Chenery, H. and Srinivasan, T.N. (eds.) *Handbook of Development Economics, Vol. I.* Amsterdam: Elsevier. pp 763-830.

Coulter, J. and Poulton, C. 2001. Cereal market liberalization in Africa. In: *Commodity Market Reforms: Lessons of Two Decades*. Akiyama, T., Baffes, J., Larson, D.F., and Varangis, P. (eds.) Washington D.C.: World Bank.

Delgado, C.L. 1995. Agricultural diversification and export promotion in Sub-Saharan Africa. *Food Policy*, 20: 225-243.

Diao, X., Dorosh, P. and Rahman, S. 2003. Market Opportunities For African Agriculture: An Examination of Demand-Side Constraints on Agricultural Growth. Washington, DC: IFPRI.

Diop, N., Jaffee, S.M. 2005. Fruits and Vegetables: Global Trade and Competition in Fresh and Processed Product Markets. In: Aksoy, M.A and Beghin, J.C. (eds.) *Global Agricultural Trade and Developing Countries*. Washington DC: World Bank. pp. 237-257

Dolan, C. and Humphrey, J. 2000. Governance and Trade in Fresh Vegetables: the Impact of UK Supermarkets on the African Horticulture Industry. *Journal of Development Studies*, 37(2): 147-76.

Dorward, A., Kydd, J. and Poulton, C. (eds.) 1998. *Smallholder Cash Crop Production under Market Liberalisation: A New Institutional Economics Perspective*. Oxon: CABI Publishing.

Fafchamps, M. and Minten, B. 2001. Property rights in a flea market economy. *Economic Development and Cultural Change*, 49: 229-267.

Fafchamps, M. and Minten, B. 1999. Relationships and Traders in Madagascar. *The Journal of Development Studies*, 35(6): 1-35.

Gereffi, G., J. Humphrey and T. Sturgeon, 2005, "The Governance of Global Value Chains" *Review of International Political Economy*, 12(1), pp. 78-104.

Glover, D. and Kusterer, K. 1990. *Small Farmers, Big Business: Contract Farming and Rural Development*. The Macmillan Press LTD.

Govereh, J., Jayne, T.S., and Nyoro, J. 1999. Smallholder commercialization, interlinked markets and food crop productivity: Cross-country evidence in Eastern and Southern Africa. Working Paper, Michigan State University.

Gulati, A, Minot N., Delgado, C., Bora, S., 2005. Growth in High-Value Agriculture in Asia and the Emergence of Vertical Links with Farmers. Paper presented at the workshop

Linking Small-scale Producers to Markets: Old and New Challenges, The World Bank, Washington D.C.

Hoff, K. and Stiglitz, J.E. 1998. Moneylenders and bankers: price-increasing subsidies in a monopolistically competitive market. *Journal of Development Studies*, 55: 485-518.

Jayne, T.S., Chapoto, A., Nyoro, J., Mwanaumo, A. and Govereh, J. 2003. False promise or false premise? The experience of food and input market reform in eastern and southern Africa. In: Jayne, T.S., Minde, I.J., and Argwings-Kodhek, G. (eds.) *Perspectives on agricultural transformation: A view from Africa*. Nova Science Publishers.

Jones, W.O. 1972. *Marketing staple food crops in Tropical Africa.* Ithaca: Cornell University Press.

Kherallah, M., Delgado, C., Gabre-Madhin, E., Minot, N., Jonson, M. 2002. *Reforming Markets in Africa*. Baltimore and London: The John Hopkins University Press (for IFPRI).

Kirsten, J. and Sartorius, K. 2002. "Linking Agribusiness and small-scale farmers in developing countries: is there a new role for contract farming?" *Development Southern Africa*, 19(4): 503-529.

Kydd, J. and Dorward, A. 2004. Implications of market and coordination failures for rural development in least developed countries. *Journal of International Development,* 16: 951-970.

Maertens, M. and Swinnen, J. 2006. Trade, Standards, and Poverty: Evidence from Senegal. LICOS Discussion Paper 177/2006, Leuven. (http://www.econ.kuleuven.be/LICOS/DP/DP2006/DP177.pdf)

Minot, N., Kherallah, M., and Berry, P. 2000. Fertilizer market liberalization in Benin and Malawi: A household-level view. International Food Policy Research Institute, Washington DC. Mimeo.

Minten, B., Randrianarison, L. and Swinnen, J.F.M. 2006. Global Retail Chains and Poor Farmers: Evidence from Madagascar. LICOS Discussion Paper 164, Leuven. http://www.econ.kuleuven.be/licos/DP/DP2006/DP164.pdf)

Negassa, A. and Jayne, T.S. 1997. The response of Ethiopian grain markets to liberalization. Working Paper No. 6. Grain market Research Project, Ministry of Economic Development and Cooperation, Addis Ababa, Ethiopia.

Porter, M. E. 1979. How competitive forces shape strategy. *Harvard Business Review,* 57: 137–145.

Poulton, C. 1998. Cotton Production and Marketing in Northern Ghana: The Dynamics of Competition in a System of Interlocking Transactions. In: Dorward, A., Kydd, J. and Poulton, C. (eds.) *Smallholder Cash Crop Production under Market Liberalisation: A New Institutional Economics Perspective*. Oxon: CABI Publishing.

Poulton, C., Dorward, A., Kydd, J., Poole N., Smith, L.1998. A New Institutional Economics Perspective on Current Policy Debates. In: Dorward, A., Kydd, J. and Poulton, C. (eds.) *Smallholder Cash Crop Production under Market Liberalisation: A New Institutional Economics Perspective.* Oxon: CABI Publishing.

Poulton, C., Kydd, J. and Dorward, A. 2006. Overcoming Market Constraints on Pro-Poor Agricultural Growth in Sub-Saharan Africa. *Development Policy Review*, 24(3): 243-277.

Reardon, T., Timmer, C.P., Barrett, C., Berdegué, J. (2003), The Rise of Supermarkets in Africa, Asia, and Latin America, *American Journal of Agricultural Economics*, 85(5): 1140-1146.

Salop, S.C. 1979.A Model of the Natural Rate of Unemployment. *The American Economic Review,* 69(1): 117–125.

Swinnen, J. and Vandeplas, A. 2007. Quality, Efficiency Premia, and Development. Licos Discussion Paper 184/2007, Leuven. (http://www.econ.kuleuven.be/licos/DP/DP2007/DP184.pdf)

Swinnen, J.F.M. (ed.) 2007. *Global Supply Chains, Standards and the Poor.* CABI Publishing.

Swinnen, J.F.M. 2005. When the Market Comes to You—Or Not. The Dynamics of Vertical Co-ordination in Agro-Food Chains in Europe and Central Asia. ESSD Report. Washington D.C.: The World Bank.

Swinnen, J.F.M. and Maertens, M. 2007. Globalization, Privatization, and Vertical Coordination in Food Value Chains in Developing and Transition Countries**.** *Agricultural Economics,* forthcoming.

Townsend, R.F. 1999. Agricultural incentives in Sub-Saharan Africa: Policy challenges. World Bank Technical Paper No. 444. Washington DC: World Bank.

Zanardi, M. (2004) Antidumping law as collusive device. *The Canadian Journal of Economics*, 37(1): 95-122.

Table 1: Commodity types, value and supply chain governance

Value of commodities	Type of commodities	Type of governance system
Low value	- staple food crops traded in domestic markets	- simple market governance
		- state governance with interlinking
Medium value	- traditional export commodities	
		- private governance with interlinking
High value	- non-traditional export commodities	

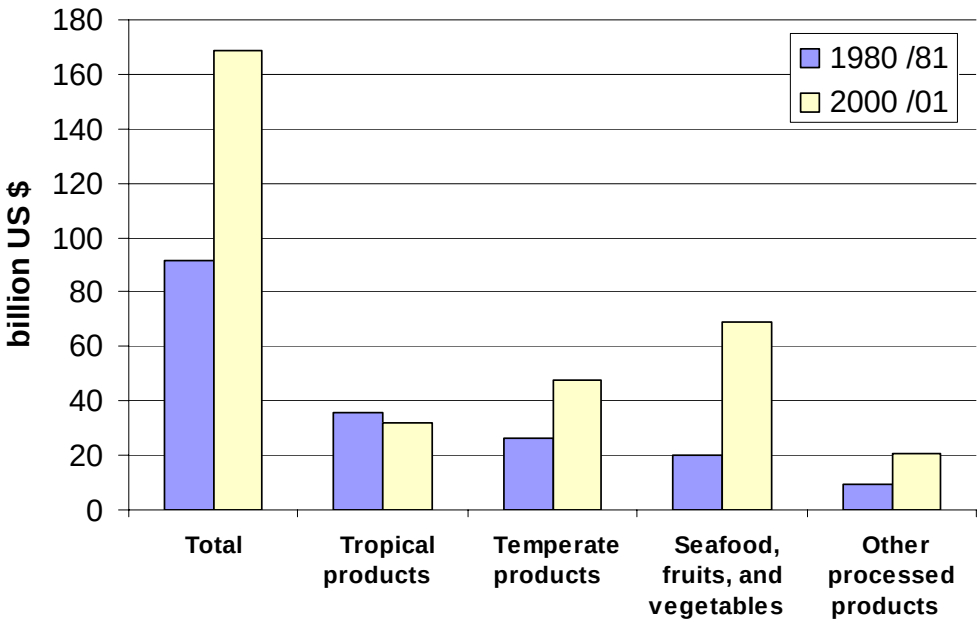

Figure 1: The structure of developing country agricultural exports, 1980 - 2000

Source: Calculated from Aksoy (2005)

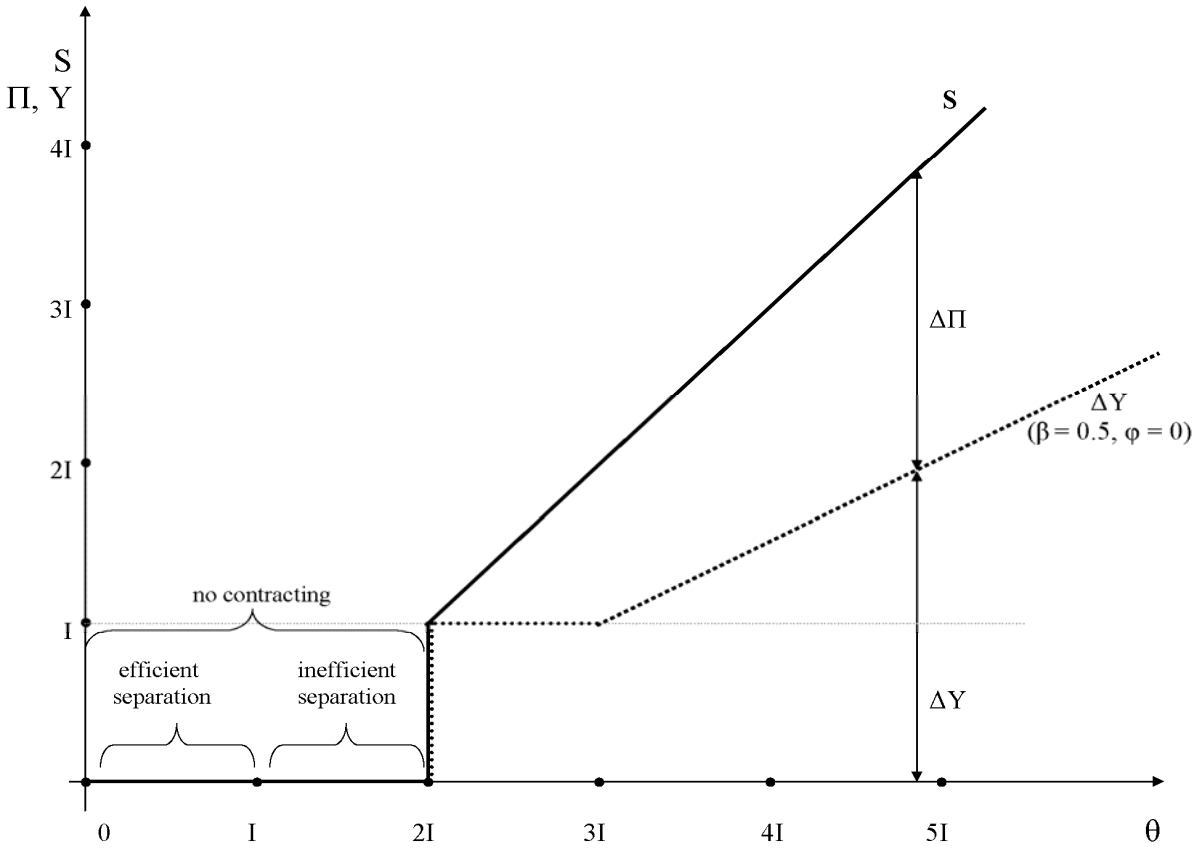

Figure 2: Surplus sharing under prohibitively costly external enforcement

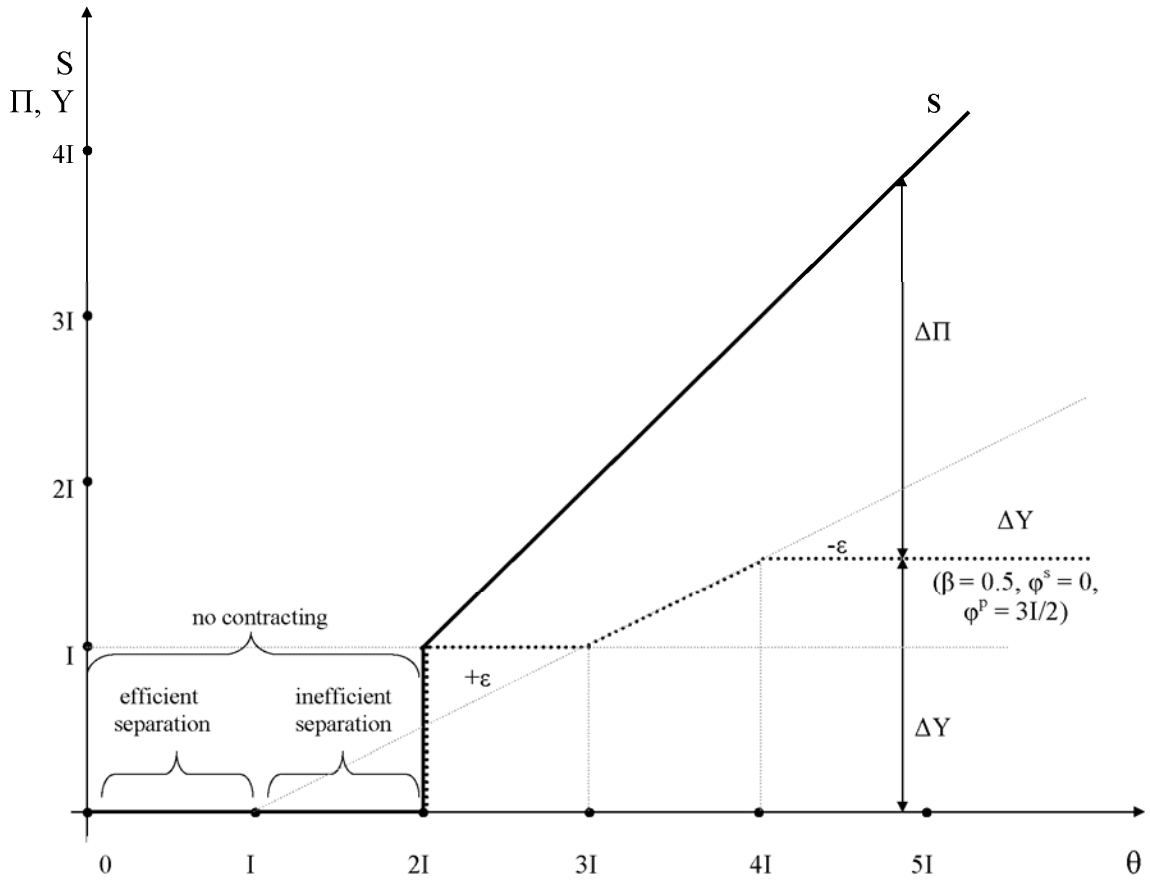

Figure 3: Surplus sharing under two-sided hold-ups

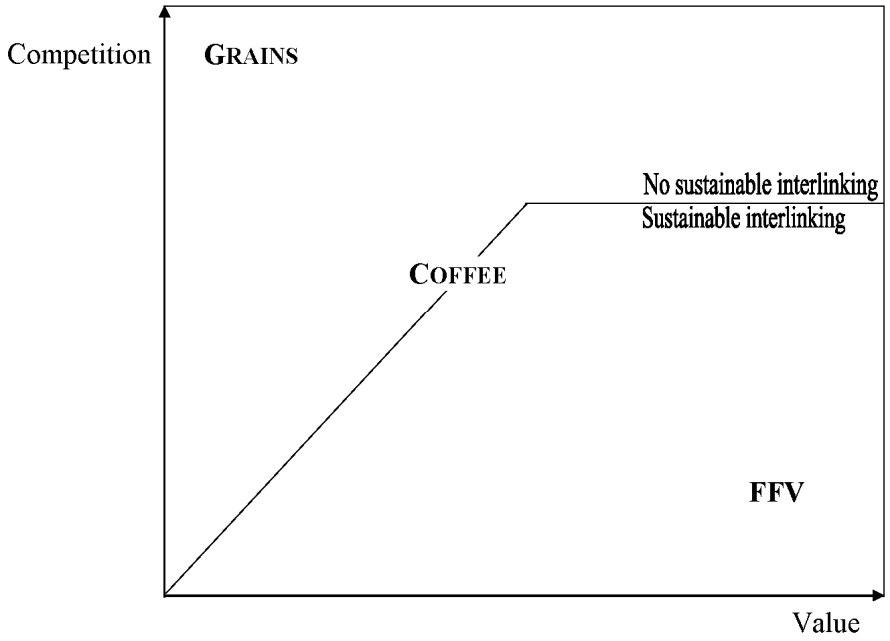

Figure 4: Commodity value, competition and the emergence of interlinking

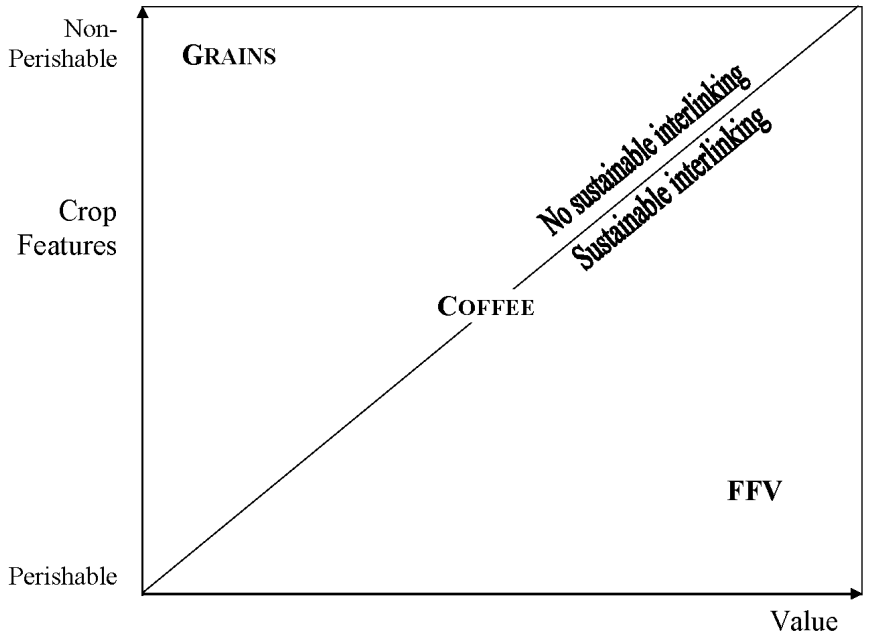

Figure 5: Commodity value and perishability and the emergence of interlinking