

CHAPTER 4

PRICE INTERVENTION IN SUB-SAHARAN AFRICAN AGRICULTURE

Can an institutionalist view alter our conception of the costs and benefits?

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INTRODUCTION

The paper discusses the current status of African smallholder agriculture and agricultural policies. The fundamental transactions challenges in agricultural development are identified and analysed and policies which might be able to overcome these are discussed. The general approach is to build on the orthodox (or neoclassical) explanations which focus on market structures, prices and technologies, thereby bringing into view other important factors, which are the costs which agents (e.g. farmers and those who trade with or finance them) face in trying to reduce transactions risks. The risks considered are those of coordination failure, opportunism and rent seeking. It is argued that when these issues are analysed jointly with the matters explored in orthodox analysis, then successes and failures in smallholder development can be better understood. Failures may be due to the existence of 'low level equilibrium traps', which, perhaps, could be overcome by early-stage government action, but presently are not addressed by government, either because this runs counter to the prevailing ideological and policy consensus and/or due to very weak government capacity.

The picture which emerges is one in which successful smallholder development is neither a 'miracle of the market' nor predominantly the responsibility of the state. Rather, early-stage state intervention tends to be needed, not just to supply the well recognized public goods of communications infrastructure, property rights, technology research, and market and technical information. In addition,

governments need to engage in activities described below as ‘extensive coordination’, ‘pump-priming’ and ‘threshold shifting’. This is not because states in poor countries are particularly competent in these activities (they are not!) but because often in the absence of state intervention no other actor will have the combination of scope, resources and incentives to address these critical sources of transactions failure. Ironically as agricultural development occurs, the need for government intervention is reduced, as markets begin to work better without intervention, i.e., ‘thicken’. In developed economies, the emerging roles of government in agriculture tend to be concerned with the protection of consumers, the environment and landscape value. The elements of government intervention in OECD-country agriculture which are controversial, i.e. policies which support producers, can be seen as currently dysfunctional, but perhaps at earlier stages these were appropriate instruments to enable agriculture to develop. In summary, in the process of agricultural development, direct government intervention to overcome market failure is needed most in the early stages when conditions for its supply are least favourable. The policy implication is that we need to understand clearly what is needed from government at each stage of development and then focus research on the implications for politics and governance.

Our arguments concerning the fundamental requirements for early-state agricultural development, an achievement essential for the reduction of extreme poverty, have implications for debates about price intervention in poor country agriculture. Where low-level equilibrium traps are widespread due to very limited investments in the supply chain, then incentives to invest must be increased, and key means to this end are the reduction of the various sources of risk. Sometimes private agents are able to reduce risk without government, although through arrangements which are far from being endorsed by the dominant policy paradigm. The unconventional aspect is that risk is often reduced by interlocking, normally of output market contracts with those for inputs and finance, this being achieved by *de facto* monopolies and/or highly unequal power relations. Post liberalization, these arrangements have emerged for certain cash crops, notably smallholder cotton. But there are a number of critical crops for which private interlocking arrangements are difficult to achieve, so forms of ‘state interlocking’ may be required. It appears that forms of state interlocking (some involving private intermediaries who have direct contact with farmers) have been central to the earlier stages of most smallholder-based agricultural revolutions (e.g., the Chinese and Indian Green Revolutions).

Risks inhibiting investment in supply chains are not only those inherent in market price volatility but also the multiple potential causes of transactions failure. These may call for intervention in certain output markets, e.g. floor prices to limit risks to smallholder producers of marketed surpluses of staple food crops. Furthermore, price intervention is probably unavoidable where state interlocking marketing arrangements are needed.

AGRICULTURAL IN SUB-SAHARAN AFRICA: CHALLENGES OF GEOGRAPHY, GLOBAL MARKETS AND POLITICS

Smallholder agricultural development plays a central role in poverty reduction in Sub-Saharan Africa (SSA) due to the large numbers of poor people in rural areas and the critical role of agriculture in driving growth in poor rural areas. However, the performance of SSA's agricultural sector over the last 30 years has been disappointing. Low rates of growth in the 1970s were followed by increases in the 1980s and 1990s, but per-capita growth has been very low or negative over much of the period and SSA is the only region with agriculture growing at a rate below overall population growth from 1965-1998. This is associated with high incidence and severity of rural poverty, widespread reports of agricultural stagnation, and low use of fertilizers and low crop yields. An issue of particular concern is the reliance of much of SSA's agricultural growth on expansion of cropped areas rather than of crop yields, particularly in cereal production. SSA's increased cereal area is accompanied by a fall in rates of fertilizer use and only a slight rise in cereal yields. This pattern of agricultural change presents a major problem as cultivation extends onto increasingly fragile and vulnerable land (see for example Kydd et al. 2004).

It is widely recognized that SSA agriculture needs a process of 'sustainable intensification' with increased marketed production from greater use of purchased inputs (especially seeds and inorganic fertilizers), often with complementary use of locally available organic inputs (see for example Reardon et al. 1999). Such a pattern of sustainable intensification would provide a sounder basis for future agricultural development, but demands a framework of more complex and effective public and private institutions and faces many challenges. These challenges may be considered under three main categories: (a) arising as a result of agro-ecological and geographical conditions; (b) arising from global economic conditions; and (c) arising from political and historical conditions. Although some technical, social and political developments do offer new opportunities for growth and development, conditions for agricultural development in SSA today are generally more difficult than those that were faced by countries (mainly in Asia) which successfully developed smallholder agriculture in the past.

High on the list of SSA's challenges in agricultural development are geography and agro-ecological conditions. Most of SSA lies within the tropics where soils are often more fragile and less fertile than in temperate zones, whilst pests and diseases are harder to control. SSA also has a very varied agro-ecology with different conditions often existing side-by-side in the same country and demanding different policies, services and technology development. Thus it is difficult to generalize across and even within countries, and policy analysis and recommendations have to be tailored to match differing conditions. Variable rainfall and drought are problematic in many parts of SSA and a frequent cause of crop failure. Water control is also difficult and irrigation very limited. Partly as a result of this there are large parts of SSA where the dominant staples are roots, tubers, bananas/plantains and lower-yielding cereals such as sorghum and millet. Sustainable intensification of these crops, and of extensive livestock keeping which dominates some areas, faces a

range of technical, marketing and economic challenges which are less acute with the 'green revolution cereals' (wheat, rice and maize) on which successful agricultural development was based in Asia (although maize is of course a major crop in SSA, and rice is also important in some areas).

Another major set of policy challenges arises from global economic conditions as compared with those facing countries that successfully achieved significant smallholder agricultural development in the second half of the 20th century. World export crop and food prices have fallen in real terms over the last 30 years with more integrated global markets making import substituting agriculture in SSA increasingly vulnerable to international competition. Furthermore, global markets reward supply chains characterized by rapid information exchange, flexible response, quality control and tracking. This tends to undermine the historic competitive advantages of labour intensive agriculture small farming. Smallholders are perhaps least disadvantaged by these developments in supplying their national markets with tradable and semi-tradable staples and vegetables and fruits. They are also low-cost producers of certain traditional commodity exports (e.g. cotton, cocoa and sugar) but generally face tough conditions in markets which are often distorted by rich-country agricultural support.

Many parts of SSA face particularly difficult policy and political constraints. Formal political structures and institutions tend to be relatively new, with substantial political change since independence. Countries tend to be culturally and ethnically diverse. Patrimonial systems of government and politics are common, diverting resources from broader development goals without effective checks and balances, and without a sizeable and well established middle class providing a strong administrative cadre holding governments to account. Smallholder farmers also tend to be a weakly organized and represented constituency, despite their large numbers.

POLICY CHALLENGES: AGRICULTURAL INTENSIFICATION AND COORDINATION IN SUPPLY CHAIN DEVELOPMENT

The last thirty years have seen dramatic changes in the dominant economic policy paradigms among international organizations and OECD countries, with increasing scepticism as regards the effectiveness of state agencies as economic actors and increasing emphasis on market solutions. A consequence of this reverse in the ideological climate is that pre-liberalization policies which supported some very successful agricultural development in other parts of the world (particularly Asia) in the latter parts of the 20th century have not been available to SSA governments over the last 20 years or so as a result of both their own inability to pursue them without external financial support, and the promotion by international financial agencies of liberalization policies.

Agricultural intensification involves technical change and marketing systems to supply inputs and seasonal finance. Intensification therefore involves the development of supply chains around smallholder farmers¹, with simultaneous and complementary investments in all links in the supply chain. Making these simultaneous investments can, however, pose serious difficulties in poor rural areas,

as a result of transaction costs and risks, which include coordination, opportunism and rent-seeking costs and risks.

Coordination problems in poor rural economies

Poor rural areas within low-income economies are characterized by low total and monetary incomes for most people, with consequent limited consumption and expenditures, a weakly developed monetary economy with a narrow base, and markets (for agricultural inputs, outputs and finance, consumer goods and services, etc.) which are relatively 'thin' (with small volumes traded, although for some items there may be very large numbers of people trading in very small volumes) and prone to large seasonal variability in demand and supply. These conditions normally coexist with poor roads and telecommunications; poor information (particularly in agriculture, on prices, on new technologies, and on potential contracting partners); difficulties in enforcing impersonal contracts; and rent-seeking behaviour by politicians, bureaucrats, criminals and the private sector.

These conditions pose particular problems for the supply chain development needed for agricultural intensification, as this requires significant investments by new players entering the market, investments which carry high risks of transaction failure and (the other side of the coin) high transaction costs involved in obtaining protection against such risk. These risks and costs can be considered in terms of rent-seeking, coordination and opportunism.

- Coordination risks are the risk of an investment failing as a result of the absence of complementary investments by other players in a supply chain.
- Opportunism risks arise when another contracting party, with monopsonistic or monopolistic control over a complementary investment or service, removes or threatens to remove it from the supply chain after a player has made an investment that depends upon its continuing supply.
- Rent-seeking risks arise when powerful government, political, criminal or other agents not directly party to a transaction see associated investments and/or revenue as an opportunity to expropriate or threaten to expropriate income or assets from the investor.

Coordination, opportunism and rent risks (and the costs of protection against them) are closely related, and when these are high as compared with potential returns to investment, then the potential investors required to establish new activities for developing an agricultural intensification supply chain may find the investments too risky, and thus the supply chain may not develop, even if it is potentially profitable (once necessary investments have been undertaken).

This situation is described in a formal economic model in Figures 1 and 2, which describe a situation where all actors face a two-stage investment problem: they must make stage-1 investments in assets specific to a particular supply chain activity in order to reap net revenues in stage 2. Their revenues in stage 2, however, are determined not only by the scale of their own stage-1 investments, but also by the scale of others' stage-1 investments (investments which are not known to them when they make stage-1 investments).

Figure 1 shows the relationship between individual actors' marginal factor costs and marginal value products (on the vertical axis) from seasonal investments, under conditions of different behaviour by other actors in the supply chain, taking smallholder maize production in a poor rural area as an example. This diagram shows that investment in seasonal inputs (stage-1 investments) without complementary investments and transactions (by input sellers, financiers and produce buyers) incurs high marginal factor costs (MFC_0) and a rapidly falling marginal value product (MVP_0). The result is profit maximization around subsistence production (with investment I_0), and only small surplus sales in good and normal years. With complementary investments and transactions by other actors, however, reduced transaction costs and risks lead to a fall in marginal factor costs to MFC_1 , and the marginal value product is maintained for surplus sales and hence higher production (MVP_1). The combination of lower MFC and higher MVP leads to profit maximization at much higher levels of investment (I_1) and net income, with a significant marketable surplus beyond the households' own subsistence needs.

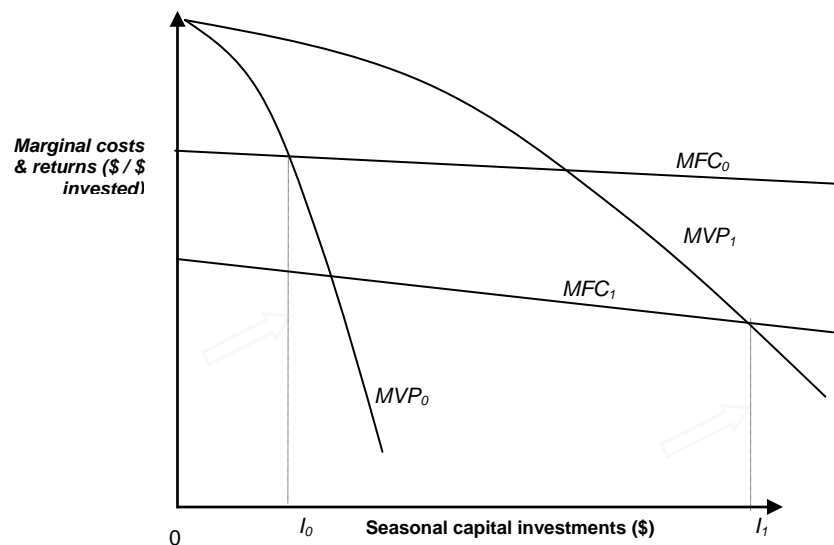


Figure 1. High and low level firm investment equilibria

If a similar situation is faced by the other actors making complementary investments in the supply chain, then there will be two possible system equilibria as shown in Figure 2. This examines marginal factor costs and marginal value products for investment in an industry or commodity supply chain assuming that this is distributed along a complete supply chain. It distinguishes between different

elements of marginal factor cost (MFC). We begin by considering only conventional neo-classical production economics analysis, using a 'Base MFC' line, which is determined by factor prices². Considering only these factor prices, optimal supply chain investment occurs where the Marginal Value Product (MVP) curve cuts the Base MFC line, at E. The shape and position of the MVP curve is determined by the price of the supply chain output(s) and by the technologies employed (higher prices and better technologies both lift the MVP curve, while diminishing marginal returns and falling prices in limited markets both cause MVP to fall at higher levels of investment).

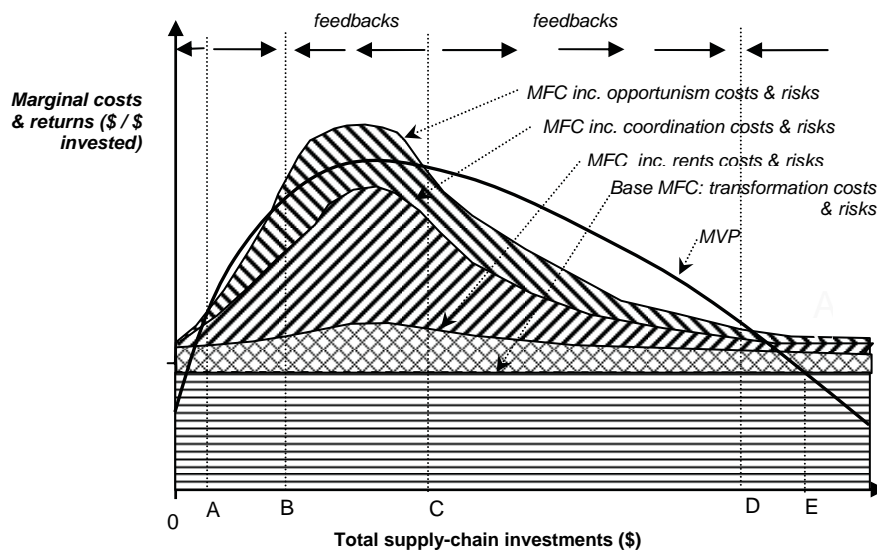


Figure 2. High and low level supply chain equilibria

We now introduce costs and risks associated with coordination failure, opportunism and rent seeking. These are represented in Figure 2 in three bands above transformation costs and risks.

The second cost and risk band in Figure 2 represents rents. There is a long standing and increasing concern about poor governance and opportunities for elites (for example politicians, civil servants or formal or informal groups or individuals) to extract 'rents' in the context of weak or poor and predatory governance systems. These rents may be legitimate tax demands or illegitimate demands for bribes, 'cuts' or 'fines'. Rents can have positive effects (for example financing delivery of public goods and/or accumulation of capital for local investment or redistribution as described by Khan 2004) but these positive effects (where they exist, and in many cases they do not) need to be set against their costs: increased risks, uncertainty and costs in productive activity, with depressed and distorted returns to and incentives for investment. There are no strong *a priori* arguments for a particular relation between total supply chain investment and MFC for rent costs and risks, but one

might expect MFC to decline with increasing supply chain investment (*ceteris paribus*).

The third and fourth cost and risk bands in Figure 2 represent coordination and opportunism risks and costs. The nature of the relation between thin markets on the one hand and risks and exposure to coordination failure and opportunism on the other suggests that large levels of investment in a supply chain should substantially reduce coordination and opportunism costs and risks. Reduced risks of coordination failure and opportunism (and hence falling MFCs) are likely at high levels of investment either through thick markets (as discussed earlier) and/or through efficiencies achieved in large firms (an issue we discuss later)³. Reduced risks mean that less costly counter measures are required, but unit transaction costs also fall with higher volumes, giving a double benefit in cost reduction from greater levels of investment and turnover⁴.

The most obvious impact of adding coordination, opportunism and rent costs and risks to the conventional neo-classical analysis is a shift of the profit-maximizing equilibrium point to the left (from point E to point D), leading to lower levels of investment and production. There is also a very substantial shrinkage of the region where MVP is greater than MFC (between investment levels C and D). If investments in a supply chain are initially below C, then investors have no immediate gains from increased investment (since MFC is greater than MVP) and no incentives to invest – in fact the incentive is to reduce investment as long as MFC is greater than MVP. As drawn, this will cause investment to fall to B, which represents a low-level equilibrium (equivalent to profit maximization around subsistence production)⁵. There is then a critical threshold level of total supply chain investment (point C in Figure 2) below which the marginal returns to investment are negative. The total level of investment therefore has positive (or negative) feedbacks above (or below) this threshold. Below the threshold the supply chain is caught in a low-level equilibrium trap.

This analysis depends upon two conditions: (a) individual players facing different individual MVP and MFC curves depending upon total (balanced) supply chain investment (as shown in Figure 1)⁶; and (b) some institutional coordination failure that prevents players individually or collectively moving to high levels of supply-chain investment. Generally, smallholder farming areas of SSA are characterized by an atomistic market, with many small players but without non-market coordination or significant efforts towards collective action. This analysis explains individual choices around a stable low-level equilibrium: ironically (given the debates about market liberalization) the neo-classical ideal of perfectly competitive markets then provides some of the necessary conditions for coordination failure, and escape from the low-level equilibrium trap requires the development of non-market coordination mechanisms.

Williamson (1994; 1985; 1991) identifies firms, markets and relational contracts (or hierarchy, market and hybrid arrangements) as the three main types of contractual arrangement, with widespread use of hierarchy and hybrid arrangements to deal with problems of asset specificity in developed economies. Hall and Soskice (2001), comparing the relative importance of hybrid and competitive market arrangements in different OECD economies, highlight first the importance of large

firms and hierarchical arrangements in providing coordination mechanisms in all types of market economy and second the comparative institutional advantages of greater reliance on non-market arrangements for coordination between firms in industries where large investments are needed in specific assets⁷. Both these points challenge simplistic prescriptions for the development of markets as a necessary component of efficient economic development.

The observation that large firms and hierarchical arrangements play a major role in all types of developed market economy contrasts with the lack of large firms and hierarchies in many poor economies (Fafchamps (2004) demonstrates this very clearly for SSA economies). It also suggests that the increased coordination required for economic growth and development tends to be delivered by a shift from poorer economies dominated by small atomistic players linked by (weak) market and hybrid arrangements to greater reliance on thicker markets and/or hybrid arrangements linking larger firms in wealthier economies. More developed economies are therefore characterized by increased scale and scope of hierarchical arrangements. This represents an important challenge to neo-classical orthodoxy, as it suggests that the development of larger hierarchy arrangements may be at least as important in economic growth as the development of wider competitive market arrangements. Development should then be characterized not in terms of development of a market economy but as a movement from '*atomistic relational market systems*' to '*market and hierarchy reputational systems*'.

Why do wider hierarchical arrangements often fail to develop to overcome the associated asset specificity and low-level equilibrium trap problems of poor rural areas? Hybrid arrangements are common in poor rural economies, but usually involve relational contracts between individuals or small firms (Fafchamps 2004) and thus tend to be limited in the scale and geographical scope of their activities. A number of factors inhibit both endogenous development of larger firms and inward investment by large urban-based or foreign-owned firms: difficulties in acquiring large areas of land in poor rural areas; particular difficulties in coordination without control over agricultural land and production; a large minimum scale needed to achieve the levels of supply chain investment and activity required to cross the low-level equilibrium threshold (preventing the growth or endogenous development of firms); poor communications infrastructure; weak institutional environment and property rights; limited numbers of people with entrepreneurial skills and local and personal knowledge; costly and difficult access to capital; and high risks and relatively low returns compared to alternative investment opportunities. The last point is particularly applicable to food crops⁸. As a result, although there have been many large-scale inward cash crop investments by large firms, there are very few private investment success stories in smallholder food crop production without substantial public sector support⁹. This observation is of substantial importance as food crops constitute a major and critical part of poor rural economies, and historically their development has provided the initial stimulus to most examples of successful pro-poor growth in poor rural economies.

Policies for overcoming coordination failure in poor rural economies

This analysis of the development challenges posed by thin markets, asset specificity and coordination failure has practical implications for policies promoting market-led pro-poor agricultural growth in poor rural areas as we can use it to consider processes by which a set of actors may escape from the trap (and increase productivity at higher equilibria). We use the broad structure of Figure 2 to identify three broad ‘functions’ of development interventions:

- supply chain coordination (allowing investment decisions to transcend the narrow self-interests of different players in the supply chain);
- pump priming investment (lifting supply chain investments across critical minimum thresholds);
- threshold shifting (which involves changing the MVP and different MFC curves to move or remove thresholds).

The first intervention ‘function’ involves the development of an effective system supporting coordinated, complementary decision making by different players across a supply chain. The major alternative forms of institutional arrangement which such a system may use for achieving this have already been discussed (market, hierarchy and hybrid arrangements) and it is clear that a system relying predominantly on market mechanisms will not be able to provide the coordination necessary to cross substantial thresholds – although market mechanisms may have more of a role where the thresholds themselves can be removed or substantially reduced as part of the broad transition from an ‘atomistic market and relational economy’ to alternative forms of ‘market and hierarchy economy’ discussed earlier.

Kydd and Dorward (2004) classify non-market coordination systems in terms of ‘local’ and ‘extensive’ *scope* of coordination and ‘exogenous’ and ‘endogenous’ *processes* of coordination development. Endogenous ‘local’ coordination systems may develop either through replacement of smallholders by larger-scale (private or state) farms or through local relations linking different local agents interested in investing in different activities in the supply chain, for example through farmer groups or through interlocking arrangements by (generally powerful) traders. In staple crops, where total supply chain profits are likely to be more limited than in cash crops, progress in local investment is likely to be slow (as low returns weaken both the incentives to set up coordinating institutions and the penalties for defection). Eventually, however, if there is sufficient growth in local coordination arrangements then these may in aggregate reach the threshold level of total investment in the supply chain, enabling a transition into a market and hierarchy based coordination system and growth path. Left to itself this process is, however, likely to be slow and fragile, highly path dependent and susceptible to political economy processes of rent seeking and to shocks affecting the total investment threshold.

Exogenous alternatives to slow and fragile endogenous local coordination processes are (a) externally assisted ‘soft’ local coordination processes (for example involving state or NGO support for the development of farmer organizations, for trader associations, or for contract grower, nucleus/ outgrower and other interlocking

systems); or (b) more extensive ‘hard’ coordination where a strong central coordinating body with a mandate from the state ensures investments across the supply chain with highly credible coordinated commitments¹⁰. As discussed later, agricultural parastatals in SSA often attempted to follow this last approach by establishing large hierarchical organizations (large in scale and scope). These large parastatal hierarchies then (with government agencies) took over investments and investment risks for all parts of the supply chain except on-farm production and retail sales (although even here they were sometimes involved), and then tried to establish links with farmers to constitute a major part of a coordinated system for planning and delivery of farmer services (for financial services, and input and output marketing).

The parastatal system is not the only model for pursuing ‘extensive coordination’ but it is a highly instructive one in many ways. Its dramatic failures and achievements highlight both the difficulties facing the development of extensive coordination and the potential for success. Furthermore, where it was successful, it generally involved not only effective action to improve supply chain coordination (the focus of our discussion above), but also action to support the two other ‘escape mechanisms’ discussed earlier and to which we now turn: pump priming and threshold shifting. This reflects a simple conclusion from the relationships illustrated in Figure 2, that the development of coordination mechanisms (through endogenous local mechanisms or through different types of local and extensive exogenous external support) will be easier the closer a supply chain is to its critical threshold (at C in Figure 2), and this situation will arise with a higher investment base and/or higher profits in the supply chain.

The second function for development interventions, ‘pump priming investment’, seeks to provide this higher investment base. It involves government or donor investments attempting to move the level and density of investment in an economy, sector or supply chain to the right and beyond or near the critical threshold at point C in Figure 2. Attention needs to be paid here to types and modes of investment and/or subsidy that are effective in promoting substantial thickening of markets and increases in economic activity. Important challenges concern (a) identifying critical elements of a supply chain where investment will have wider stimulative effects (allowing for complementarity between some of these); and (b) ensuring that pump priming is large enough and continues long enough to cause major and permanent shifts in expectations and structural relations within the supply chain while (c) investing in ways that promote complementary private sector investment rather than crowding it out or inhibiting it; and (d) also establishing strict and clear rules establishing time and fiscal limits to public sector investment. Historically the sustained green revolutions in Asia have been successful with (a), (b) and (perhaps to a lesser extent) (c) above, whereas the more abortive green revolutions in SSA have only achieved the first of these, and have then been forced to discontinue investments for reasons of ideology and/or fiscal constraints¹¹. Establishing time and fiscal limits to public sector investment is almost universally problematic (as the agricultural policies of most OECD countries demonstrate), but the critical challenge for developing countries is to ensure that the costs do not rise so rapidly as to present

a fiscal crisis before major and permanent shifts have been achieved in expectations and structural relations within the supply chain.

Pump priming investment will not have to achieve so much and improving coordination systems will be easier if the critical total supply-chain investment threshold (point C in Figure 2) is lower. Threshold shifting, the third broad development function identified earlier, is represented in Figure 2 by movement of the MVP curve upwards and of the MFC curves downwards so that point C moves to the left (to lower levels of investment) or disappears altogether. Even without any low-level equilibrium trap (i.e. in the absence of point C) upward MVP shifts or downward MFC shifts are beneficial as they will lead to increased supply-chain profitability and higher equilibrium investment with higher production.

An upward shift of the MVP curve may be achieved by technical change (with increases in marginal productivity of investment) or by increases in output price. This represents the focus of part of current policy orthodoxy's emphasis on technical change from agricultural research and extension and better producer prices from structural adjustment. Technological development, however, generally requires coordination between different links in increasingly complex supply chains, with increasing investment by different and growing numbers of players. Complementary action is therefore often needed to simultaneously improve coordination and promote technical change, and this needs to be taken into account in the development and promotion of new technologies.

Downward movement of the MFC curves may be achieved by reduced input prices and costs (reducing transformation costs) or by reducing costs and risks of coordination failure, opportunism or rents. Again current policy orthodoxy emphasizing technical change from agricultural research and extension looks to reduce transformation costs and risks in the base MFC while more recent policy emphasis on promoting institutional and property rights development seeks to reduce the costs and risks of opportunism and rents and implicitly looks to the development of competitive markets to reduce coordination costs and risks (although our arguments suggests that under certain circumstances this reliance on competitive markets to reduce coordination costs and risks may be misplaced).

It is important to note here a useful if not always clear distinction between improvements in overall supply chain coordination (which were discussed earlier and are concerned with development of broader coordinating systems) and specific cost reducing institutional arrangements between different players within such a system. Both are needed, the latter being important for actually delivering different systems' potential reductions in coordination and opportunism costs and risks. Here the detailed structuring of relations is important (for example interlocking of bilateral transactions, or the organizational structures and staff management and incentive systems within hierarchies), echoing an important point made by Omamo (2003) that modalities of how policies are implemented are often more important than the finer points of what policies to implement.

Implications for trade policy

Our arguments have strong implications for international and domestic trade policies. The three categories of development interventions (supply chain coordination; pump priming investment; threshold shifting) imply government intervention.

Measures to promote supply chain coordination may require government agencies (or private agencies contracted to and/or regulated by government) to intervene in markets, sometimes restricting the freedom of agents in the chain. The most obvious example is the requirement to maintain interlocking transactions where monopony may be enforced to counter opportunism and consequent supply chain failure. Pump priming investment may require government funds to provide infrastructure, subsidize services and invest in processing in the expectation of low financial rates of return. Threshold shifting implies price interventions (for inputs and output) which alter the value and cost functions of Figure 2 in order to bring particular areas of smallholder agriculture to the 'right side' of 'BC', the 'zone of market failure' illustrated in the diagram. To the 'right side' of C there is the prospect of dynamic development: as further increases in volume will be profitable for agents in the system and so further expansion will occur. This may stimulate economies of scale and it is possible that the cost function will diminish with scale to an extent much greater than is suggested by Figure 2.

Price interventions could take the form of subsidies to producers, but for administrative and budgetary reasons will probably require a mix of border measures and subsidies. Border measures (tariffs etc) would be required to shift up the MVP of importable, and also to stem a possible flow of subsidized inputs.

A key question is whether SSA countries are prevented by WTO rules and/or donor conditionality from pursuing these policies. Lockwood (2005, pp. 39-44) argues that WTO rules are not as constraining as many NGO campaigns tend to imply. The fault may more with (i) donor ideology and conditionality; (ii) SSA governments' understanding of what has to be done; and (iii) their political will and competence.

WHERE FROM HERE?

This paper has explained why in specified but common circumstances state intervention is needed to enable smallholder development which goes beyond the supply of public goods, conventionally defined. Often, for the most critical crops from the point of view of poverty reduction, semi-tradable staples, government intervention is needed to provide coordination and otherwise reduce risks faced by investors in agricultural supply chains (a category which includes farmers). For example, government may have to provide a framework for, and financially guarantee, state interlocking as a form of 'extensive coordination'. Within the types of arrangement, price floor and possibly price maxima are likely to be unavoidable features.

The paper has not sought to describe in any detail the forms which price intervention might take. Clearly there are huge and well-known pitfalls to be negotiated, including: unacceptable fiscal costs; effects on poor consumers; inefficient resource allocation; rent seeking; and the generally weaker performance incentives which exist in government. In Sub-Saharan Africa borders are *de facto* very open, and any government offering to buy staples at well above the regional price will could end up stockpiling its neighbours' product. Our view is that the challenge is to find models which control and try to minimize these highly undesirable consequences of intervention, rather than to regard them as sufficient reasons in themselves for there to be no forms of price intervention. Our preliminary thinking on these matters has taken us in both micro and macro directions. On the micro-side, is it possible to design interventions which will be relevant to defined areas of production, e.g., where there is a high concentration of smallholders who would benefit? On the macro-side, should African government join together to create regional 'common agricultural policies', for example for Western, Eastern or Southern Africa? Regional CAPs could limit the porous border arguments against intervention, incorporate areas with non-covariant production risks and perhaps somewhat depoliticize (in term of national politics) hard decisions concerned with food security, consumer welfare and farmer incomes.

NOTES

- ¹ There is a large literature about the importance of smallholder agriculture in driving pro-poor growth; see for example Kydd et al. (2004) for a recent discussion.
- ² Where there are returns to scale in purchasing or transport costs then the MFC may be slightly downward-sloping, but otherwise in perfectly competitive markets; the Base MFC should be roughly constant and independent of scale. A supply chain may, however, constitute a substantial share of input markets, and in such circumstances the Base MFC would be expected to rise with increasing supply-chain investments. The slope and shape of the Base MFC are therefore likely to vary between different situations.
- ³ Transaction risks in market arrangements are likely to fall at higher levels of supply-chain investment as more players allow market coordination mechanisms to work and reduce the risks and costs of protection against both coordination failure and opportunism. Larger transaction volumes and/or more frequent transactions also reduce costs and risks in (inherently less risky) hybrid and hierarchical arrangements for exchange and coordination as the fixed costs of establishing these relationships are spread over larger and more frequent transactions, and more frequent transactions themselves facilitate the establishment of these relations and provide incentives for contracting parties and employees to honour them (Williamson 1985; 1991).
- ⁴ Discussion of Figure 2 focuses on declining rent, coordination and opportunism costs at higher levels of supply-chain investment, as this is critical to understanding coordination failure and the low-level equilibrium trap. In some circumstances, however, low levels of investment may support very local or within-household production and consumption chains. In such circumstances increasing investments may face increasing MFCs from risks of coordination failure and opportunism due to the crossing of thresholds from subsistence to surplus production and sales (by individual households and by local communities), leading to the need for widening circles of trade and hence of trading relationships. In the context of a weak institutional environment and thin markets, the establishment of new trading relations carries significant costs and risks. This postulated behaviour of the MFC curve at low investments (as drawn in Figure 2) is not critical to the basic conceptualization of low-level equilibrium traps, it merely explains the existence of *non-zero* low-level equilibria. The high but falling MFC at higher levels of investment is, however, critical to the existence of low-level equilibrium traps.

- ⁵ As noted in the previous footnote, at low levels of investment the MFC and MVP curves may take a variety of different shapes, and relate to each other in a variety of ways. The broader argument for the existence of a low-level equilibrium trap is not sensitive to these shapes provided that with increasing total supply-chain investment MFC moves from a position above MVP to one where it lies below the MVP, before these positions are again reversed. In other words, crossover points C and D are critical to the existence of high and low equilibria. Drawing of crossover points A and B in Figure 2 illustrates ways in which non-zero low-level equilibria may exist, but this is not critical to the coordination-failure arguments developed in this paper.
- ⁶ The differences in Figure 2.1 between MFC and MVP in the presence and absence of assured complementary investments and transactions result from differences in these costs and risks in input and finance markets (for the MFC curves) and in output markets (for the MVP curves) There may also be differences in technology, where a low-input technology is more profitable under high-risk/cost conditions and a high-input technology is more profitable under low-risk/cost conditions. This is particularly relevant for sustainable intensification in smallholder agriculture.
- ⁷ Hall and Soskice (2001) distinguish between liberalized market economies (LME's) and coordinated market economies (CMEs). In the first case liberalized markets provide the main coordinating systems between firms while in the second case coordination is also achieved through significant state activism and/or through membership associations linking different firms engaged in common supply chains.
- ⁸ Many of these problems are less severe for some cash crops needing large but potentially very profitable investments in processing facilities. These investments provide foreign companies with profit incentives to invest in interlocking systems for vertically integrated coordination of seasonal input and finance and other services needed to induce sufficient and reliable smallholder production to make the investment in processing facilities profitable. Critically, however, the need for large-scale investments also makes it easier to develop institutional arrangements protecting investments in seasonal finance delivery against opportunism by farmers and crop traders. This is because large foreign firms have greater ability to access external sources of capital and expertise needed for investments in processing facilities, and this can provide them with a monopoly over crop-processing facilities, and so control over the supply chain.
- ⁹ Even in cash-crop production systems, some government or donor coordination or subsidy has often played a part in attracting foreign investment.
- ¹⁰ This distinction between 'soft' and 'hard' promotion of coordination reflects observations by Hall and Soskice (2001) of differences between CMEs in types of state support.
- ¹¹ Even where fiscal constraints forced policy changes, the prioritization of fiscal cuts often reflected dominant donor ideologies.

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