The Microeconomics of African Growth, 1950-2000

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Thematic Paper for the AERC Collaborative Research Project on
'Explaining African Economic Growth, 1950-2000',
revised, May 18th 1999

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1. Introduction

This paper reviews African growth from the microeconomic perspective, focusing on the incentives and constraints facing key agents in the economy. To reduce the scale of the task we consider only the two most important types of agent: rural households and manufacturing firms. For most African economies rural households and manufacturing firms are the two agents whose behavior is most important for the understanding of the growth process. As of 1950 a large majority of Africans lived in rural households and depended upon them not only as social units but also as enterprises which generated the bulk of their income. The slow growth performance of these enterprises was therefore an important part of the explanation for the lack of broad-based poverty reduction over the past half-century. During the period 1950-2000 much of the developing world industrialized and this raised the demand for labour and reduced poverty. Africa largely missed out on this process. Our focus on African rural households and manufacturing firms is intended to increase our understanding of these two weaknesses in the growth process. Obviously, this focus on farms and firms can provide only a partial explanation, since it will omit the general equilibrium and macro-economic context provided by other papers in the study.

African economies have, of course, other types of agent of considerable importance: banks, mines, commercial farms, traders, urban households and the government in its various roles, involving regulation, redistribution, production and provision of public services. In some countries one or other of these agents will be more important than rural households or manufacturing firms. Individual country authors will need to make a judgment as to which types of agent are central to their story.

Before we consider the growth process, it is useful to view the production problem from a static perspective. How is the African environment distinctive, and how has this shaped the production strategies which rural households and manufacturing firms have adopted? This we do in Section 2. In Section 3 we turn to dynamics. What are the sources of growth at the micro-economic level and what constraints have these agents faced? Section 4 concludes.

2. The Static Decision Problem facing Rural Households and Manufacturing Firms

The African economic environment is distinctive in its climatic and geological conditions, in having high risks, high transport costs and trade barriers, poor infrastructure, low levels

[1] This paper draws on Collier and Gunning (1999).

of education, limited financial markets and high regulation. We first describe how agents have adapted their income generation processes to this environment. We show that similar forms of risk-sharing are found by means of state-contingent contracts in village credit markets, in inter-firm goods markets, and in formal labour markets, but only when social institutions have enabled high observability in the context of long term relationships. We argue that rural households have been more successful than manufacturing firms in developing institutions which reduce the costs of operating in this environment.

2.1 The environment facing households

The pre-colonial African rural economy was in a land-abundant, high-risk, near-subsistence, low-asset equilibrium. Population was limited by wars and poor nutrition. Social institutions reflected the needs of this stationary economy, with lineage groups regulating inter-generational transfers and providing risk pooling, but not usually creating marketable property rights or securing long-distance trade.

African land ecology is in many ways distinctive (Voortman *et al.* ,1999).Volcanic and alluvial soils (the soils on which the Green Revolution was introduced in Asia) are relatively rare and basement soils are relatively common.[2] Similarly, large parts of the continent have short or unreliable growing periods. The correspondence between population density and these geographical features is remarkably close: the population is concentrated in areas with relatively favourable conditions for agricultural production. Similarly, crop choice has been carefully matched to soil types and growing conditions. Voortman *et al*. stress that there is enormous scope for yield increases through the use of external inputs, in part because the soils currently are good in retaining added nutrients . However, this requires fine tuning. Blanket recommendations for the use of macro nutrients (NPK) can have little effect or can indeed be counterproductive. Conversely, small and cheap applications of micro nutrients can under certain conditions give very large yield increases.

Under colonial rule the population began to increase partly as a result of peace and basic public health measures, leading to land scarcity. Peasant agriculture became commercialised both by the introduction of export crops and by the imposition of taxes and the sale of labour, often on forced terms. New crops and breeds of livestock were introduced. Of these three processes, population growth gradually accelerated during the century, largely due to continuing improvements in public health, propelling the economy from land abundance to land scarcity in a remarkably short space of time. Commercialisation and opportunities for innovation slowed and were sometimes even reversed post-Independence, reflecting anti-agricultural policies.

Social institutions needed to adapt to these changes and gradually did so. An important issue is whether the pace of adaptation has been so slow that social capital is radically

[2] The Green Revolution technology in Asia relied on a simple fertilizer strategy. Voortman *et al*. (1999, p. 14) indicate that the responsiveness of yields to macro nutrients (NPK) reflected reserves of other nutrients in the particular types of volcanic and alluvial soils. In Africa such a response would not be feasible on the more common soil types.

deficient and so a serious drag on growth.

High Risk and Volatility

Under semi-arid conditions with few investment opportunities and consequent low population density, agriculture will take the form of autarky (production for own consumption) without a market for permanent labour (Binswanger and McIntire, 1987). Farmers face strikingly greater risks in Africa than elsewhere. In around 15 countries agriculture depends upon a length of growing period of under 150 days, which makes it vulnerable to even minor climatic fluctuations. For example, in some areas of Ethiopia, Zimbabwe and Tanzania near total crop failure has a probability of about 10%.[3] The high degree of price volatility due to a lack of market integration is a further source of income risk. As a result, crop income is highly variable. For example, in Burkina Faso the coefficient of variation is 67% for the Sahelian zone and 52% in the Sudanian zone (Reardon *et al.*, 1992). A further source of risk is morbidity. Rural surveys provide evidence on the prevalence of illnesses and in some cases on the extent to which illnesses make work impossible (see Appleton, 1999; anthropometric evidence is available for e.g. Ethiopia, Uganda and Zimbabwe). This effect may be strong. Appleton reports estimates of the effect on income ranging from 5% (Mauritania and Cote d'Ivoire) to 10% for Ghana.

However, the combination of moral hazard, covariance of the risks and geographic isolation precludes insurance. Credit markets cannot be based on collateral: land has little value since it is abundant and animals are vulnerable to sickness and theft. Hence credit must be based on high observability instead of collateral. Where this is not feasible agents can protect themselves against shocks both through *ex ante* responses, such as diversification, and *ex post*, through consumption smoothing, and the choice differs widely both within and between societies.

In diversifying to cope with shocks, the household sacrifices the gains of specialisation in favour of spreading risk over multiple income-generating activities. A striking stylised fact about African rural households is that they have highly diversified economic activities, many of them non-agricultural. One measure of this is that African farmers spend a much smaller fraction of their working hours farming than Asian farmers who face less risk because of the widespread use of irrigation (Cleave, 1974). The first large scale rural household survey in Africa, conducted in 1974-75 in Kenya, found that smallholders derived only half their income from farming their own holding, the rest coming from wage employment, non-farm enterprises and remittances (Kenya, 1977, p. 54). In West Africa, a series of studies in eight countries found an average share of non-farm income of 39% (Reardon *et al.*, 1994, p. 210). In addition, farming operations themselves are highly diversified. Many households choose to fragment their holdings into many plots and nearly all households combine food growing with livestock, cash crops or wage employment. That diversification is partly a response to climatic risk is shown by differences in the extent of crop diversification between ecological zones: in the humid forest areas where rainfall is reliable households often are highly specialised, growing only one or two crops. Similarly, households living in the Sahelian zone in West Africa are more diversified than

[3] See Webb and Reardon (1991) and Kinsey *et al*. (1998).

households in areas with more reliable rainfall.[4]

However, diversification is of course costly. Fragmentation of the holding to reduce risk increases travel time. Similarly, when multiple cropping is adopted as a response to risk,[5] it has both static and dynamic costs. In static terms the household engages in activities even if they offer only low returns as long as they are either safe or have risks uncorrelated with other activities. Dynamically, the household reduces its scope for learning-by-doing.

Now consider the other risk-coping strategy, consumption smoothing. Potentially, consumption smoothing can be done either through credit markets or through asset markets. However, in Africa the former is fairly rare. For example, even in the extreme circumstances of the Zimbabwean drought of 1991/92 credit played virtually no role. The accumulation of realisable assets enables the agent both to cope with shocks and to smooth consumption over the lifecycle. However, in the traditional African economy there were few liquid assets other than livestock (and in tse-tse infected areas even this option was largely closed).[6] Also, the strategy of accumulating liquid assets can be constrained by the capacity to defend them: there can be a trade-off between security from economic shocks and from violence.[7] Nevertheless, consumption smoothing by means of assets is important. Farmers in Côte d'Ivoire and Nigeria accumulated assets in years preceding (anticipated) negative shocks. Conversely, during positive shocks smallholders have high savings rates: during the 1975-77 boom when coffee prices temporarily trebled, the marginal savings rate for Kenyan coffee-growing households was approximately 65%.[8]

Although consumption smoothing is common, the main assets used for it, livestock and food stores, are ill-suited to the purpose.[9] The unreliability of food markets implies that at least part of the asset smoothing must be done directly by holding substantial food stores but this is costly due to losses from spoilage and vermin.

In summary, farm households are exposed to large risks. Their responses include self-insurance through diversification, both within agricultural activities and between agricultural and non-agricultural activities. They also accumulate assets for consumption smoothing.

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[4] See Bevan *et al*. (1989), Eicher and Baker (1982) and Reardon *et al*. (1988, 1994).

[5] There are, of course, other reasons for multiple cropping; e.g. cereals may be underplanted with legumes to provide nitrogen.

[6] Deaton (1992, 1994) demonstrates consumption smoothing on data for the Côte d'Ivoire, Udry (1994) does so for Nigeria, and Dercon (1997) for Tanzania.

[7] Most pre-colonial African societies had not created an institution with a monopoly of violence over a secure territory. In such a social environment income is reduced: each agent has an incentive to devote resources to violence (such as stealing cattle) and to defend against the violence of others. Since asset accumulation increases the risk of violence, security can be sustained through poverty. Hence, `peace is purchased at the cost of poverty' (Greif and Bates, 1995).

[8] See Kinsey *et al*. (1998) on Zimbabwe, Deaton (1992) on Cote d'Ivoire, Udry (1994) on Nigeria, and Bevan *et al*. (1989) on Kenya.

[9] During a drought animals are liable to die and cattle prices will fall. During the 1984 drought in Niger livestock prices halved (Fafchamps *et al*., 1998).

A Lack of Rural Social Capital

There has been a major shift in economists' perception of traditional African society. The early literature saw its individuals as economically irrational and its institutions as economic impediments. For example, the absence of private property was seen as giving rise to an acute `tragedy of the commons'. By the 1980s traditional social institutions came to be seen as efficient solutions to economic problems.

Africa's traditional societies evolved institutions which lowered the costs of moral hazard and adverse selection. These institutions were the household, the village and the kin group. Membership of the kin group was based on birth and hence was non-elective, thus solving the problem of adverse selection. Membership of the household was either by birth or by marriage which enabled reciprocal obligations to be created between villages. There was little privacy in traditional society. Living in close proximity reduced information costs and so reduced moral hazard. There is evidence of intra-village insurance as a result of this virtually complete information, repayment of credit being state-contingent.[10] Clearly, however, intra-village insurance has limitations since people living close together are likely to be subject to highly covariant risk. Migration to urban areas has opened up further opportunities for income diversification as long as the household can retain control over its members working in cities. Thus, households have become geographically dispersed in response to risk. Lineage rules of inheritance enforced inter-generation transfer payments. The kin group was able to enforce adherence to each particular rule through the threat of exclusion from the entire package of benefits.

In addition to providing insurance and inter-generational transfers, traditional social organisation largely solved the problem of the management of common pool resources. Because the use of common pool resources occurred in the context of frequent interaction and easy observation it was relatively straightforward for societies to regulate their use.[11] This was, however, not recognised (one of the major mis-perceptions of economic policy towards traditional agriculture); policy makers saw the solution to the supposed `tragedy of the commons' as individualisation and registration of land rights.

The endogeneity of Africa's social organisations to its material circumstances is illustrated by the difference between lowlands and highlands. The lowlands are commonly semi-arid with high climatic risk and low population density whereas the highlands have more reliable rainfall. In the lowlands, because of the greater need for insurance, people have invested in lineage groups. These are used for insurance, giving their participants access to geographically dispersed crops and livestock. The dispersion reduces the covariance of the returns on the lineage group's assets. By contrast, people living in the coffee/tea areas with reliable rainfall, such as the Kikuyu in Kenya, had less need for insurance, and instead developed private property. They shared within the household but not within the lineage

[10]See Posner (1980) and Platteau (1994) for an economic interpretation of African social institutions, and Udry (1993) for evidence of insurance in a Nigerian village.

[11]Bates (1983) and Baland and Platteau (1996) describe how the `tragedy of the commons' was avoided in stateless societies.

group.[12]

Thus agents in the traditional economy of largely succeeded in devising the social mechanisms necessary to cope in an environment of high risk and few suitable liquid assets. These organisations were costly: agents had to forego gains from specialisation, had to save for consumption smoothing, or had to abstain from accumulation in order not to attract violence. These costs can be seen as an implicit insurance premium, their high level reflecting the combination of risk and the factors which precluded the development of an explicit insurance system. In this sense stagnation can be seen as a response to risk.

Governments became concerned about the potential loss of output and the stagnation which they saw as the consequence of traditional social institutions. One approach was titling and settlement schemes, in which the government conferred marketable property rights, overriding traditional rights. This proved ineffective. A comparison of land transactions over a thirty year period in a land registration area of Kenya and a communalised area of Tanzania found that the rate of land transactions was the same in the two countries and unaltered over the period. In Kenya land titling and land marketability were largely unrelated: only a quarter of the parcels that could be sold by the current operator were titled, and only a quarter of the parcels with land titles could be sold. In Tanzania, Mali, Niger, Nigeria and Ghana land sales were common even when illegal. The land rights conferred by traditional social institutions thus proved more robust than governments had anticipated.[13]

Government belief in scale economies proved unfounded: the spontaneous sub-division of the large plots assigned on settlement schemes turned out to be economically efficient. Traditional land rights also proved to be less economically damaging and more capable of evolution than had been believed. Government concern about insecurity of traditional tenure also proved unfounded. Land rights rapidly evolved from allocation by chiefs to heritability between generations within the same household. This secured household property rights on land-specific investments, although, as we will show, it actually compounded the problem of inter-household resource allocation. Land rights also evolved towards marketability. One mechanism by which this happens is in response to investment in tree crops.[14] Thus, investment in tree crops and property rights are inter-dependent, each promoting the other.

However, land rights have not yet evolved to the point where they provide efficient support for investment. Most land in Africa is still not readily marketable. Thus, the adaptation of social institutions has been too slow. If the main mechanism for the evolution of rights is tree crop investment, then the high taxation of tree crops which has been common must have delayed marketability. Thus, the concern that traditional structures of land rights would discourage investment and hence reduce growth were correct.**

[12]See Bates (1990) and Shipton (1985).
[13]See Pinckney and Kimuyu (1994) and Migot-Adholla *et al*. (1993).
[14]This was originally proposed by Bruce (1988) and subsequently tested econometrically by Besley (1995).

Land rights affect inter-household resource allocation. With population growth and heritability of land the land-labour endowments of households will rapidly become dispersed. This will give rise to an inefficient dispersion of marginal products unless offset by market mechanisms: either specialisation in production according to household comparative advantage, or trade in factors. Specialisation in production is unlikely to be sufficient to cope with the very large differences in factor proportions which have emerged between households.[15] Trade in factors can be either by land-scarce households trading-in land, or labour-scarce households hiring-in labour.

Land rights have not yet evolved to the point at which land-scarce households can purchase land on a scale sufficient to offset the effects of differential inheritance. Bevan *et al.* (1989) show on Kenyan survey data that inter-household differences in factor endowments (land and family labour) are enormous and that, while these *ex ante* differences are reduced substantially through factor market transactions (the hiring in and out of labour and land) the *ex post* differences are still very large. Whether this generalises beyond Kenya is not yet clear. Where rural household surveys are available country authors should attempt to measure the functioning of rural factor markets by comparing *ex ante* and *ex post* differences in factor proportions.

Potentially land rental might suffice to achieve trade in land. Unfortunately, traditional tenure rights are probably less suited to evolution to rental rights than to evolution into rights of sale. This is because the basis for traditional rights is usage: sale keeps usage and ownership intact, whereas rental requires their separation.

Regulation and Taxation

Africa has been distinctive in the extent to which rural households have been subject to government intervention, although there has been much variation across the continent. Intervention has taken three forms: taxation and monopoly marketing organisations, price controls and production controls.

Taxation has been heaviest on export crops. The form of taxation has varied, sometimes being predominantly through explicit export taxes, but more commonly through exchange rate overvaluation, over-funded price `stabilisation' schemes, and wide marketing margins taken by monopoly purchasing organisations. The best measure of overall taxation is the comparison of the farmgate price converted to dollars at the parallel exchange rate, with the price on international markets. So measured, the rate of taxation has varied considerably over time: for example, in Tanzania tax rates were much higher during 1975-85 than either before or after. They have also varied across countries: for example, the rate of taxation on cocoa has usually differed considerably between Ghana and Cote d'Ivoire. The effect of high taxation has been partly to alter the composition of production and partly to depress incomes. An example of the former effect is Dercon's (1993) study of the effect of cotton taxation in Tanzania. He shows that in the absence of taxation cotton production would have been 50% higher. The reduction in incomes brought about by export taxation

[15] In Kenya the land-labour ratio is 11 times as high in the top quintile as in the bottom quintile (Bevan *et al.*, 1989).

constitutes a transfer to other social groups. It was often thought that such transfers would be progressive because export crop farmers were taken to be among the most prosperous farmers. This was indeed the justification in some countries, such as Tanzania, for high taxation. However, Appleton (1998) finds that by the late 1980s Ugandan coffee farmers were poorer than the average Ugandan household so that high crop taxation was regressive. This suggests that the distributional consequences of crop taxation can differ markedly both between countries and over time.

In some countries and in some periods, governments introduced wide-ranging price controls on both crops and consumer goods. Where these were effectively enforced they again had effects both on production choices and on the level of real income. The most radical effect on production choices was to reduce the incentive to produce for the market, since expenditure was constrained by the rationed availability of consumer goods. For example, this occurred in Tanzania during the early 1980s, and in Angola and Ethiopia for longer periods. Other forms of price control actually increased the incentive to produce for the market. For example, in Zambia the pan-territorial pricing of both agricultural inputs and maize made it profitable for farmers in remote areas to produce maize for the market. When these price controls were lifted, it became more profitable for these households to switch into subsistence. Price controls on basic foods also had distributional consequences, although the households which probably benefited most were low-income urban households.

Some governments have imposed planting, production or sales targets for particular crops, a style of intervention which goes back to the colonial era. The most substantial such intervention was probably Ethiopia during the Derg. Such controls were a form of implicit taxation.

African rural households tend to have a higher proportion of subsistence production than other regions. This is partly due to greater isolation, reflecting lower population densities, and partly due to the above policies.

Credit Constraints and Lack of Financial Depth

Rural credit markets are very underdeveloped. In contrast to Asia there are no specialised money-lenders, and in Eastern and Southern Africa inter-household credit is negligible. In West Africa there is more informal credit but this is confined to short term lending.

The lack of credit is partly due to the lack of collateral. Even land titling does not lead to land-secured loans, in sharp contrast to Asia.[16] Potential substitutes for collateral are either inter-linking credit with other transactions, as in Asia, or high observability. The former is constrained by the limited extent of land and labour transactions and so credit has depended upon high observability. Informal loans usually occur only where there are no informational asymmetries: typically the lender and the borrower live in the same village

[16]For example, land was used in only 3% of the loans in Nigeria (Udry, 1993, p. 96). On African land titling see Pinckney and Kimuyu (1994) for Kenya and Bruce (1988) and Migot-Adholla *et al*. (1993) for eight country studies.

and know each other very well.

This lack of credit has consequences for both consumption smoothing and for activity choice. A consequence of the absence of credit is that hysteresis is important: households which have had bad luck for a number of years will have low assets and therefore little scope for consumption smoothing. For example, in Western Tanzania only the richer households were able to smooth consumption effectively. However, in more prosperous environments most households appear not to need credit for consumption smoothing. A natural experiment is provided by `resettlement farmers' in Zimbabwe who received their holdings in the early 1980s. In a 12-year period this group built up a mean herd size of 10 head. As a result, even during the 1992 drought livestock sales were modest relative to the herd size.[17]

Specialisation reappears at high levels of income as entry barriers to the high return activities are surmounted. Households have less need of the risk-reduction which the safe, low return activities provide, partly because they have higher incomes and partly because they have entered activities which are themselves risk-reducing such as wage employment and livestock. This suggests a non-monotonic relationship between household wealth and diversification. Poor households are undiversified because they have not yet been able to overcome indivisibilities in investment. At a higher level of wealth households can enter into activities other than food crop growing and maintain a diversified portfolio of economic activities to deal with risk. At still higher levels of wealth households have access to activities which are both relatively safe and remunerative (such as off-farm wage employment in Kenya) or which involve the holding of liquid assets. In the one case income becomes less volatile (so that specialisation involves insurance), in the other the household relies on consumption smoothing rather than income smoothing.

The institutional solution to indivisibilities in investment in the absence of a credit market is the rotating savings and credit association (ROSCA). These exist in West Africa and Ethiopia but have yet to become universal. Just as the policy-induced low returns on agricultural investment have delayed the emergence of marketable property rights, so they might have delayed the emergence of ROSCAs.

2.2 The environment facing firms

Like rural households urban firms have also faced a very risky environment. This is partly from natural causes: climate, mortality and morbidity, and commodity prices.[18] A further source of risk is the difficulty of enforcing contracts. In the now-developed economies the foundations of the modern economy were laid in the emergence of social institutions which reduced the costs of contract enforcement and the other transactions costs of negotiation

[17]Deaton (1990) models consumption smoothing under a borrowing constraint. For Tanzania see Dercon (1997) and for Zimbabwe see Kinsey *et al*. (1998).

[18]Drought causes problems for firms because it causes coordinated declines in expenditure and so demand shocks. For example, during and immediately after the Southern African drought of 1991/92 industrial output declined in Zimbabwe by 23%. Survey data for industrial workers suggest a high rate of illness-related absenteeism and AIDS-related deaths have been rising rapidly.

and of weighing and measuring. However, African firms have not been very successful in this respect: on an index of contract enforceability normalised on the OECD average, Africa scores only 0.66, lower than other developing countries.[19]

Contract default can reflect either unwillingness (opportunistic behaviour) or the inability of firms to adhere to contract terms. The root cause of high default is that African firms are exposed to large shocks while being peculiarly ill-equipped to cope with them. Few risks are insurable because of severe problems of asymmetric information. For example, the financial accounts of firms are less trustworthy than in most other regions because of the smaller size of firms and the weaker state of the accountancy and audit professions. Further, African firms are on average very much smaller than elsewhere and are consequently much less diversified. Being uninsured and undiversified, they are more exposed to shocks. In addition to unavoidable financial distress, firms may be physically unable to honour contracts. Operating in economies with poor transport networks, firms can only reliably meet orders by holding large stocks of inputs and outputs.[20] When firms are financially distressed or stocks are insufficient, late payment or late delivery is passed from one firm to the next. African firms indeed hold very large stocks: they are far removed from `just in time' production systems.[21]

Since African firms face an environment of high risk and poor contract enforcement, there would appear to be an incentive for firms to be large, or at least linked together into conglomerates as found in East Asia. By being large a firm is both more diversified and faces fewer problems of contract enforcement because more transactions occur within the firm. This would be analogous to the creation of large households, extended families and kin groups in the rural economy. Yet African firms are typically much smaller than those elsewhere. Evidently, some disadvantage of size offsets the above incentives.

One possible reason why African firms tend to remain small is that in this way they may be able to reduce their exposure to taxation and government corruption. This is a common explanation for the distinction between the formal and the informal sector, namely that being small the firm is less visible. In countries where the accounting profession cannot be relied upon to produce honest audits, tax demands are in practice based not upon audited accounts, but upon visible assets. Hence, in effect, corporate taxation is levied on investment rather than upon profits. This suggests that variations in the standards of the accountancy profession may indirectly effect whether firms have an incentive to grow.

A second reason why firms may stay small is because the market is small. African domestic markets are often very small, but the extent to which this limits the size of the market for the firm depends upon trade policy. If policy is anti-export biased, firms must depend upon the domestic market. The most extreme example in Africa of this phenomenon was Zimbabwe pre-1991. With imports suppressed, the domestic market structure was highly monopolistic so that firms were exploiting economies of scale only to the extent

[19] Derived from Knack and Keefer (1995).
[20] Fafchamps *et al*. (1998) present evidence for Zimbabwe that large stocks are a response to contractual risk.
[21] On contract enforcement see Fafchamps (1996b).

permitted by the domestic market. Further, because they were monopolies, they had an incentive to restrict output so as to raise prices.

Finally, the small size of Africa firms may be a defensive response to predation by kin groups. Because kin groups create obligations for their members, managers in African firms are subject to pressures to honour these obligations by hiring and promoting their kin. Collier and Garg (1999) show that this is a significant problem in the Ghanaian public sector, where workers earn a 25% wage premium if they belong to the locally dominant tribe. Such patronage clearly undermines the incentives for effective work and so intensifies the principal-agent problem. They find no such effect in the private sector: evidently, in order to defend profitability, firms have devised strategies which enable them to resist kin group pressure. One such strategy might be to remain small. By staying small a firm reduces pressure in two ways. First, it appears less rich and so reduces the incentive for lobbying. This is analogous to the strategy of rural households to use poverty as a means of achieving safety from predation as proposed by Bates and Greif. Secondly, as in any firm, the principal-agent problem is more severe as size increases and this offsets economies of scale. The optimal size of the firm thus balances the costs of intensifying the principal-agent problem against the technological benefits of scale. In Africa the strength of kin group claims makes the principal-agent problem more serious absolutely, and so more serious relative to scale economies. Thus, the optimal firm size is smaller than it would be in the absence of kin group claims.

Regulation of firms has been pervasive although the content has differed between countries. Governments have been able to affect firm performance through licensing investment, through discretionary tax incentives, and through discretionary changes in trade policy. Because there have been so many points for discretionary intervention, the main political risks facing firms were probably not at the level of the sector or industry, but were firm-specific. This made group-based lobbying less important relative to individual lobbying. Firms have thus been atypically dependent upon maintaining good individual relations with government. In several countries governments chose to favor non-indigenous ethnic minority businessmen (such as the Asians in East Africa and Lebanese in West Africa). One reason for this was that such people were not in a position to challenge the government politically. Thus, a patron-client relationship could be forged in which the government dispensed both favours and protection to individual businessmen in return for financial support which by-passed the tax system, but which helped the ruling party to maintain power. By contrast, if indigenous businessmen became rich they could potentially pose a political threat to the government. A further common feature of regulation policy has been the absence of `competition policy'. Indeed, governments have often favoured high levels of industrial concentration. For example, at one stage the Kenyan government had a policy whereby importers had to obtain a `letter of no objection' from domestic producers. In such an environment it was easy for producers to operate informal cartel agreements.

Until recently research on African firms was hampered by a lack of comparable survey data. A major change has been the Regional Program on Enterprise Development (RPED) in which panel data for a sample of approximately 200 manufacturing firms in each of eight African countries were collected over the period 1992-96 under the coordination of the

World Bank. This forms the basis for much of our evidence on firms. It is useful to summarise as stylised facts the evidence from the surveys.

First, the average size of firm is much smaller than that in other regions. In particular, there are few large firms.

Secondly, firms tend to restrict their business to a small number of partners with whom they have long term relationships. This appears to reflect the difficulty of enforcing contracts with new partners. In turn, this tends to make business less competitive even than implied by aggregate levels of industrial concentration, since many firms cannot in practice trade with each other.

Thirdly, firms are on average not growing very rapidly despite making high profits. They are neither expanding employment nor their capital stocks. The annual gross investment rate was only 6% of the value of the capital stock and amounted to only 11% of value-added, suggesting that net investment was negative. There are two possible explanations. One is that the risk corrected rate of return may not be high. That is, high returns simply reflect a high risk premium. We have seen that there is indeed evidence that firms are operating in a high-risk environment. The other is that while average returns might be high, the marginal return might only be normal. This could be because firms have considerable market power. This might reflect not only the small size of the domestic market, but the inability of the firm to change is market share. As suggested above, firms might be reluctant to take on new customers because of the difficulty of enforcing contracts.

Fourthly, there is a very large dispersion in technical efficiency. When measured by the mean distance from frontier production functions, most firms were very far from the frontier as defined by productivity in the best firms. This suggests that knowledge is not being transferred very effectively between firms.

Fifthly, firms rely heavily upon internal finance. The proximate reason for this is that firms do not usually need much finance in order to maintain their existing level of business. As we have already indicated, firms have low rates of investment and the evidence is that this is not due to financial constraints: when firms have higher retained earnings, the effect on investment is minimal. However, this does not imply that financial markets work well: were investment demand higher, firms might well face financing constraints.

3. The Growth Process for Rural Households and Manufacturing Firms

At the aggregate level, growth is commonly decomposed into that due to factor accumulation and that due to an increase in total factor productivity. At the microeconomic level each of these requires a further distinction. Aggregate factor accumulation can occur both through the entry of new agents and through the accumulation of existing agents. Aggregate factor productivity can rise both because the most productive agents expand their activities at the expense of the less productive, and because some agents innovate and aggregate productivity rises as their innovations are adopted by other agents.

There are thus four potential sources of growth and we consider them in turn. At the outset we may note that the last two sources of growth - the processes of concentration and diffusion - appear to pose a puzzle in the case of Africa.[22] In the case of rural households survey evidence suggests that more productive households do not grow noticeably faster than other households. A possible explanation is that rural labour markets work imperfectly so that there is little scope for the more productive households to grow by hiring labour from other households. We have already noted that in Kenya very large differences in factor proportions persist in the smallholder economy as a result of factor market imperfections. Similarly, while studies of firm growth typically reject Gibrat's law (which postulates that growth rates are independent of firm size) there is, again, little evidence of concentration. In either case the question arises why more successful agents are not growing relative to other agents. Indeed, this appears to be one of the few respects in which farms and firms are similar. Evidence on diffusion is scant. There are some indications that both rural and urban agents limit the exchange of information to relatively small groups (Burger *et al.*, 1994, Barr, 1996).

3.1 Rural Households

Factor Accumulation

During the period, rural Africa has accumulated labor and human capital more rapidly than other continents and physical capital less rapidly. In most countries the land frontier was already reached by 1950. Hence, the important questions may appear to be why did the labor force and human capital grow so rapidly, and why, despite this, did the capital stock grow so slowly. The rapid growth rate of the educational endowment is explained by the very low initial level of education. However, in absolute terms, the educational endowment of African households increased much less than that in other regions. Hence, despite the rapid growth of education, the feature to be explained is why parents chose to have large numbers of children and provide them with very low levels of education.

The increase in the numbers of children per household reflects a fall in the mortality rate not matched by a decline in the birth rate. Children offer parents the prospect of a future income stream, and this is particularly important given the dearth of assets. However, parents face a choice between having fewer, well-educated children, or more less-well educated children. In Africa parents have gradually chosen higher levels of education, but in comparison with other regions, their choices are heavily skewed in favor of large numbers of children and away from education. One explanation for this is that given the high risk environment discussed above, parents may rationally choose to have many children in order to diversify their sources of future income.

In deciding whether to send children to school, parents will be influenced by the expected economic return to education. The highest private returns to education are in the urban labor market. Generally, in this market private returns exceed social returns (because the

[22] Note that we here consider concentration only within the group of rural households or urban firms. Concentration can, of course, also take the form of rural-to-urban migration. Indeed, that process is central in the earliest development theories on growth (e.g. Lewis) and distribution (e.g. Kuznets).

more capital-intensive firms tend to employ more educated labor), whereas in the rural economy social returns exceed private returns (because of the scope for copying the farming decisions of well-educated agents). Hence, perceived job opportunities in the urban labor market may powerfully influence the parental decision. The lack of growth of urban wage employment makes the strategy of investing in the education of a single child highly risky, since there are few job opportunities.

The low accumulation of education had important consequences for agricultural growth. Based on ten African studies, Appleton (1999) estimates that four years of primary education raises the agricultural production of the household by 10%. This is greater than for other developing regions, where the average is 6%. He also finds evidence of large informational externalities: having educated neighbors raises farm productivity. Hence, the lack of parental investment in education has reduced agricultural growth: investment in education has been less than in other regions, whereas the return on it is higher.

The low level of education has been self-perpetuating in two ways. First, parents may underestimate the private returns to education. Since all households must make similar calculations, there is the potential for information cascades as parents in part base their decision on the observed decisions of other households. Jones (1997) finds such a neighborhood copying effect in Ethiopia. Hence, the low level of school enrolments in Africa generates hysterisis at the aggregate level: because other households opt not to educate their children, parents infer that education is not a wise investment. Secondly, the lack of education for girls raises fertility rates when they are adults. This is partly because education raises the opportunity cost of women's time in child-raising.

What are the savings and investment rates of rural households, and what determines them? In section 2 we have identified several characteristics of rural households which may have adversely affected savings and investment. First, the main responses to risk appear to be diversification (both between agricultural activities and between agriculture and non-farming activities) and the holding of liquid assets for consumption smoothing.
Secondly, land rights systems may have made rural investments unnecessarily illiquid. However, the solutions attempted by governments to deal with this (through titling) were ineffective, while inadvertently, by discouraging tree crop investment, public policy slowed what would otherwise have occurred spontaneously. Thirdly, we noted in section 2 that rural households may be deterred from entering high-risk activities by considerations of risk. Poor households might also be constrained from entering higher return activities even though they are safe, if the activities are more capital-intensive and there are indivisibilities in investment which cannot be financed, such as may apply to livestock and tree crops. For example, the returns to livestock are typically high but the cost of a single cow may be high relative to household income. The combination of risk and lack of credit for investment may thus confine poor households to low return, capital-extensive activities so that despite being more risk-averse they are less diversified. Cross-section evidence typically shows the poorest households to be more specialised than middle-income households in the growing of food crops for own consumption. The implied dynamics have been investigated by asking households how they would spend a hypothetical windfall, distinguishing between investments which would simply change the scale of existing

activities and those which would introduce new activities. In Ethiopia, Tanzania and Zimbabwe households would invest substantially in livestock suggesting that they are constrained in reaching their optimal capital stock.[23]

Where survey data are available these responses can be quantified. It is important to stress that economic liberalisation will affect only some of the manifestations. E.g. if households are insufficiently specialised because food markets are unreliable then improved food marketing may reverse diversification and increase incomes. Conversely, where diversification in the form of using different species and varieties with different growing length are used in zones with short and unreliable growing periods (Voortman *et al.*, 1999) liberalisation will have no effect on diversification and hence on mean incomes.

Within the context of radically simplifying assumptions, the incentive to save is given by the difference between the rate of return and the rate of time preference, as in the Ramsey model. In growth theory this has the implication that out of the steady state the growth rate is a function of the distance from the steady state. In cross-country growth regressions the coefficient on a country's initial level of income is therefore interpreted as a measure of the speed of convergence. Where investments typically involve indivisibilities, it may be necessary to accumulate savings temporarily as cash. Thus, the overall rate of return on savings is an average of the return on real assets and the return on cash. In Africa the return on cash has varied enormously depending upon the rate of inflation. In the Franc Zone and Ethiopia inflation rates have generally been very low, while in the rest of the continent there have usually been episodes of very high inflation. While in applied work on economic growth the unit of observation is typically a country, it is becoming feasible to run growth regressions on household survey data. Work in progress on a unique panel data set of resettlement farmers in Zimbabwe (Gunning *et al*., 1999) provides evidence of strong convergence. Descriptively this is found by comparing change in the household income distribution over the period 1984-97; this indicates that inequality was substantially reduced, the incomes of poorer households growing much more rapidly over the period. This result is confirmed by a growth regression (which makes it possible to control for other determinants of growth) in which the effect of initial income is substantial, negative and significant. As yet the Zimbabwe data set is the only one on which such calculations have been performed. The sample is peculiar in that the resettlement farmers quickly achieved livestock ownership at a level in which consumption smoothing was feasible even in the face of quite large shocks (Kinsey *et al*., 1998). One possibility to be tested is that at high levels of risk growth is dualistic, poorer households having no incentives to invest. Conversely, if the Zimbabwe evidence generalises then once risk is reduced (or households have built up adequate defenses) the relation between growth and distribution becomes benign, convergence ensuring catch-up. At present this is largely speculation but it may be noted that while growth in Zimbabwe appears to be equalising evidence for Uganda suggests uniform growth across income deciles (Appleton, 1998).

Once the simple assumptions of the Ramsey model are relaxed, there are several other potential influences on savings. As we have discussed, movable wealth may attract violence. Hence, households may choose not to accumulate assets other than land in order

[23]See Dercon and Krishnan (1996) and Kinsey *et al*. (1998).

to increase their safety. Relatedly, the obligations created by membership of the extended family or kin group, may face high-income individuals with high rates of implicit income taxation. There may thus be a trade-off between the type of social organisation appropriate for insurance and that appropriate for growth. Insurance requires a large network of obligations for income sharing, but such income-sharing may reduce the incentive for accumulation. Generally, in Africa household size and income are positively related. High income individuals might choose to build larger households for several reasons. Larger land holdings will require a larger labourforce, and family labour more efficiently overcomes the principal-agent problem. A larger family may also confer both status and insurance so that increased income is spent on enlargement of the household. However, it is possible that the larger the household and thus the greater the network of obligations, so that the implicit rate of income tax would be higher for higher-income households. This is an example of an effect for which the best evidence may be in anthropological literature: both the level and progressivity of informal income taxation may vary greatly between societies. Finally, part of the motive for saving is to enable inter-generational bequests. Attitudes to bequests may differ between societies. For example, it appears to be common for small non-agricultural businesses in Africa to die with their owner rather than be handed on to heirs. This could reflect either something about the business environment, such as the importance of individual relationships, or a low desire to make bequests. Each of these three complications on the Ramsey model could potentially cause reduced rates of household savings.

The investment rates of African rural households have also been depressed by the lack of social capital discussed in Section 2. The lack of marketable property rights in land has made investments in agricultural improvements such as the planting of tree crops highly illiquid, and so reduced investment in them (Besley, 1995). A further reason for low investment rates is that most households face implicitly high tax rates. A corollary of social networks organized for insurance is that visibly successful households are put under social pressure to redistribute their income. An indication of this is that households which plan for success attempt to escape from their social network. For example, many of the households which opted to join the resettlement schemes in Zimbabwe gave as their reason the desire to evade parasitic relatives.[24]

Partially offsetting these effects, the lack of credit may force higher savings rates as households need to accumulate assets to cushion shocks instead of relying upon borrowing. However, since these assets would tend to be held in liquid form, they may not lead to higher levels of investment.

Productivity Growth

Potentially, growth in smallholder productivity can arise from the reallocation of factors from less-efficient to more-efficient farmers, from the inefficient learning from the efficient, from learning-by-doing, and from innovation.

[24] We are indebted to Bill Kinsey for this point.

The first of these processes is unlikely to have been substantial in Africa. The limited extent of land, credit and labor markets implies that the main mechanism for such reallocation would be through differential saving and fertility rates. Indeed, the lack of markets suggests that far from productivity rising through resource reallocation to the more efficient, resources may gradually be getting less efficiently allocated. Heritability of land in the context of weak land markets will gradually create increasing divergences in factor endowments: land-labor ratios will become more dispersed. As this happens, the static inefficiency costs mount, thus reducing the growth rate, both directly and (by depressing investment) indirectly.

Now consider the second process, whereby the less-efficient learn from the more efficient. Survey evidence on the adoption of innovations suggests that factor endowments are less important than access to information through social learning mechanisms.[25] In turn, of the informational mechanisms social learning is more important than either the extension service or the household's educational endowment. Although the main rural social network is the kin group, more modern networks also have economic benefits. In Tanzania a variety of non-traditional, and largely extra-kin, social groups such as churches have a large pay-off. An increase of one standard deviation in the Putnam index of social capital raises village expenditure by around a quarter, the diffusion of agricultural techniques is more rapid, there is substantially more use of credit and the quality of local public services is enhanced (Narayan and Pritchett, 1996).

Households in rural Africa have chosen to develop small, intense networks, partly because they faced low population density and high transport costs, and partly because to fulfill an insurance function the social network require near-complete information about behaviour. Social networks are not just spatially small, they also encounter barriers within the village. For example, the peer groups in which social learning occurs are sometimes segmented by gender.[26] Thus, the small and intense networks of rural Africa may have had a high opportunity cost.[27]

Now consider the third mechanism, learning-by-doing. As Adam Smith suggested, specialisation and the division of labour accelerates the pace of learning-by-doing. Instead of learning efforts being diffused over a wide range of disparate activities they can be focused upon a single activity. African farmers are at the extreme of the range of non-specialisation and so are likely to have slower pace of learning. As suggested by Schultz, traditional agriculture may be `poor but efficient', that is, over a sufficiently long period even a slow pace of learning is sufficient to reach the frontiers of available knowledge.

[25] For example, Bevan *et al*. (1989), Burger (1994), and Burger *et al*. (1996), show that the adoption of coffee, tea and improved livestock in Kenya is more strongly influenced by informational variables than by endowments.

[26] Burger *et al*. (1996) find that male-headed households which adopt innovations are copied only by other male-headed households, while female-headed households copy only other female-headed households.

[27] There is some evidence that kin group networks are weakening as a result of agricultural commercialisation. In Côte d'Ivoire, for example, 'under the pressures of export crop production, Dida lineages began to fragment as brothers split into separate families and sons kept their wages for their own nuclear families rather than turning them over to their fathers or the head of the lineage' (Ensminger, 1995, p. 10).

However, if the environment is rapidly changing, for example because of new products or altered relative prices, then slow learning has high costs. Both the rapid changes in factor proportions in African agriculture due to population growth, and the changes in relative prices resulting from changes in government policy imply that learning should be important.

Finally consider the fourth mechanism for productivity growth, innovation across the population. There is indeed reason to believe that there are unexploited opportunities for innovation in rural Africa (Voortman et al., 1999). Yields in African agriculture compare very unfavourably with those achieved elsewhere even allowing for poorer soils. For example, cocoa and palm oil yields are typically only half those recorded in Asia and yields are also relatively low for livestock and for food crops.

Probably the main reason for the lack of innovation is the weakness of the extension services. First, they have often given inappropriate advice. Extension services in East Africa have long been hostile towards the traditional practice of intercropping, yet research shows that there are many advantages: maize-bean mixtures offer better protection against poor rains than pure stands. Secondly, services have been badly organised with only weak incentives for extension agents to be productive. Governments even demolished extension services: in Tanzania after the 1967 Arusha declaration farmer training colleges were converted to institutes for political education and visits by extension officers to individual households were ended.[28] Even when there have been discoveries, they have not been well-promoted. For example, in Zambia new maize varieties were developed in the 1980s which could double smallholder yields but adoption rates remained low because the research was not carried far enough: the new techniques added to peak labour demand and the new varieties did not meet farmers' preferences as consumers. Overall, agricultural research has not resulted in anything equivalent to the Asian green revolution.[29]

In a few African economies generalized price controls created severe shortages of consumer goods in rural areas, examples being Angola (Azam *et al.*, 1994), Tanzania (Bevan *et al.*, 1987, 1991) and Ethiopia. In others, crop markets became severely disrupted due to war (Uganda, Mozambique). In both circumstances rural households shifted production back into subsistence. At initial prices this would appear as a substantial decline in productivity. In particular economies such episodes of productivity decline are an important phenomenon for study.

Income growth of rural households can be measured, if at all, for only short periods. Appleton (1998) considers a 4-year period for Uganda, Demery and Squire compare survey data for six (check) African countries, over periods ranging from x to y years. Appleton finds a 17% increase in mean consumption per adult equivalent, suggesting substantial factor productivity growth. As in the case of the evidence in the Demery and Squire paper this is more likely to represent a one-off effect of structural adjustment than a long-run growth effect. In addition, Appleton shows that almost half of the income increase can be attributed to the (temporary) rise of coffee prices in the period. Panel data allowing

[28] On intercropping see Fisher (1979) and on extension see Leonard (1977).
[29] See Oehmke and Crawford (1996), Celis *et al*. (1991) and Byerlee (1993).

a survey based analysis of a substantial period exist only for Zimbabwe (the Kinsey data set which covers a fifteen year period).

We will therefore have to rely largely on non-survey data sources. In some countries National Accounts will allow a long run analysis. Bevan *et al.* (1993) using Kenyan National Accounts data (in which agricultural production by smallholders is shown separately) find evidence that measured factor productivity growth reflects the gradual diffusion (through copying) of innovations (like the growing of coffee) in the smallholder economy.

3.2 Firms

In section 2 we stressed five characteristics of the environment facing urban firms: risk, lack of openness, lack of social capital, poor public services and lack of financial depth. We now consider the implications for growth.

Consequences of a High Risk Environment

Investors rate Africa as highly risky and we have seen that African economies are subject to a high degree of volatility. Firms are faced with a forecasting task for which they have no accumulated expertise. This translates into a high degree of price risk at the level of the firm and causes allocative inefficiency as firms optimise against different expected prices. For example, even in Zimbabwe, a country with relatively sophisticated financial information, a survey of exchange rate expectations found that while 21% of firms expected a devaluation of at least 20% within a year, 27% expected appreciation or stability.[30]

Such risks are more important in Africa because investment is more difficult to reverse than is the case elsewhere. One reason for this is that equipment once purchased is difficult to sell since markets in second hand capital are weak. This weakness is revealed both in the quantity of transactions and in their price. Very few firms in the RPED surveys use second-hand equipment. Where the market is used, equipment sells at a deep discount. The weakness of second hand markets for capital goods reflects the high degree of oligopoly which characterises most African manufacturing due to protection and licensing.[31]

A second reason for irreversibility is that the market in firms as going concerns is also very limited. This is due to a combination of lack of finance and severe problems of asymmetric information in the absence of reliable audits. As a result, a large majority of African firms do not survive their owners.

These irreversibilities make African investment very illiquid, whereas the price risks associated with recent and insecure liberalisations create a premium on liquidity. This has discouraged investment. There is evidence for Ghana that the effect of uncertainty on the rate of investment is negative and that this effect is considerably stronger for firms facing irreversible investment decisions (Pattillo, 1998).

[30] Calculated by the authors from the Zimbabwe RPED survey.
[31] In Zimbabwe new capital goods sell at a discount of around 50% (Gunning and Pomp, 1995).

Firms also faced unreliability in their supplies from other domestic firms. In Zimbabwe firms responded by carrying large stocks, on average three months' worth of supplies. Firms also respond to risks by using state-contingent contracts. The period for the repayment of trade credit, while being agreed beforehand, is frequently renegotiated: in Kenya more than half of trade credits were extended and delaying payments was the most common form of dealing with unexpected liquidity shocks.[32] Both responses are likely to be costly in terms of growth: carrying stocks because of its opportunity cost in terms of fixed investment and the use of state-contingent contracts because it forces firms to invest in small networks which, as we have noted, is likely to be costly in terms of information acquisition.

Lack of Openness: Regulation and Taxation

Firm-level evidence suggests that lack of openness has depressed investment. The expectation of both trade liberalisation and exchange rate depreciation were found to be significant determinants of Zimbabwean manufacturing investment.[33] In extreme cases, such as Tanzania, foreign exchange controls interacting with price controls changed the very nature of firm activity from manufacturing to hoarding. Firms which anticipated liberalisation had an incentive to import whatever inputs were permitted, while selling as few of them (incorporated into output) as possible. However, inevitably, the firm-level evidence understates the growth-reducing effects of the control regime. Firms are unlikely to perceive constraints on activities in which they are not engaged, so that those activities most damaged by controls will be underrepresented.

At the aggregate level there is evidence that in some countries during the 1990s there has been substantial liberalisation of these control regimes. The firm-level evidence bears this out. For example, in Zimbabwe the proportion of firms finding competition a problem rose from 2% to 37% in the period 1992-4 and inputs and spares which had been licenced at the beginning of this period could be could be readily imported at the end of it..

An important but unresolved question is whether if Africa liberalizes its trade its manufacturing sector will decline or expand. Wood and Mayer (1998) argue that Africa is intrinsically uncompetitive in manufactures because of its large endowments of natural resources small endowments of human capital per worker. The alternative proposition (Collier, 1998) is that Africa's lack of competitiveness in manufacturing reflects the high cost of transactions, power, and other inputs in which manufacturing is intensive. The implication is that these high costs are the result of policy rather than being intrinsic endowments. Collier argues that if natural resources were the explanation for uncompetitiveness then African real wages would have been bid up by high income levels

[32]Biggs *et al*. (1996), Biggs and Srivastava (1996), Fafchamps (1996), Fafchamps *et al*. (1998), Bigsten *et al*. (1998).

[33]This is shown in Gunning and Oostendorp (1996). Roberts and Tybout (1997) provide possible microeconomic foundations for the result. They explain the decision to enter export markets in an intertemporal optimisation model in which exporting involves fixed start-up costs. An increase in expected future profitability raises the option value of investing in the ability to export in the current period.

to the point at which manufacturing was uncompetitive, whereas in fact income levels in Africa are now below those of its major potential competitors. Given the high transactions-intensity of manufacturing, no reductions in real wages can make African manufacturing competitive. The two theses have opposite implications for policy towards manufacturing. Wood's argument implies that since manufacturing can never be competitive, policy makers should focus their attention on other objectives. Trade liberalization will kill off African manufacturing, although this is not a serious loss since it can only be sustained as a parasitic sector. On the alternative thesis, there is a high pay-off to the reform of trade policy and service delivery. Trade liberalization is a necessary but not sufficient reform to make African manufacturing competitive internationally.

Lack of Social Capital: Contract Enforcement and Learning

Social capital contributes both to contract enforcement and to social learning. There is evidence that both functions are important for African manufacturing firms.

Recall that firms face high risks of contract default. Many of these breaches are unavoidable but often they reflect weak social enforcement mechanisms. One reason for a high rate of opportunism is that the African courts generally work less reliably than those elsewhere. Only about a quarter of African lawyers consider the judiciary fully independent of the executive. The legal process often involves long delays and most judicial officers appear to be only moderately knowledgeable about the law. African courts therefore often fail as an instrument of reliable contract enforcement. As a result, in most African countries the courts are little used for conflict resolution. In most African countries a lawyer is hired in only around 10% of disputes whereas in Zimbabwe, where the courts are somewhat more reliable, the proportion is around 30%.[34]

The high rate of unavoidable default itself facilitates opportunistic behaviour since excuses become more credible unless victims invest in further information to distinguish between avoidable and unavoidable defaults. However, were victims to assume that all defaulters were opportunistic they would rapidly lose business opportunities. Firms therefore continue to do business with a high proportion of defaulters; in Ghana over 90% of defaulters are forgiven. Three quarters of defaults were attributed to inability to pay and in these cases the supplier was effectively sharing risk with his customer. Frequently this is reflected in incomplete (in fact state-contingent) contracts, no payment date being specified. Similarly, in Zimbabwe very few of the reported supply problems occur with new suppliers: where problems occurred the business relation had an average duration of over fifteen years. That supply problems are largely unavoidable rather than opportunistic is supported by the fact that in 90% of the cases the business relation continued.[35]

[34]The underlying data for the judicial reliability index were gathered by Business International. Mauro (1995) utilised them and we would like to thank him for making his data available to us. On the opinions and competence of African lawyers see Widner (1998). On the use of the courts see HEC (1993) for Cameroon, Fafchamps (1996) for Ghana, University of Leuven and University of Burundi (1994) for Burundi, University of Gothenburg and University of Nairobi (1994) for Kenya, Fehr *et al.* (1994) for Zambia and Gunning (1994) for Zimbabwe.

[35]See Bigsten *et al.* (1998).

Because of the small scale of the formal sector credit-rating agencies have not developed. Hence firms are forced into the more expensive process of gathering for themselves the information needed to distinguish between avoidable and opportunistic defaults. The method they use for this is the social network. [36]

In the absence of adequate state-provided enforcement mechanisms, the appropriate social institution is the kin group. Manufacturing firms, just as farm households, have adopted this as the basis for their social networks. However, in the urban economy this places an ethnic minority kin group at a considerable advantage since all its members are confined to urban private sector activities.[37] By contrast, most of the members of an African kin group of the same size will live in rural areas, and most of those in urban areas will be employed in the public sector. Since few members of the African kin group will own manufacturing firms, the group is likely to be too small to form the basis for an entrepreneurial social network. In Kenya, Asian-owned firms are at an advantage over African-owned firms. To screen new applicants for trade credit African-owned firms rely overwhelmingly on direct observation of the candidate's premises whereas Asian-owned firms rely on `asking around', suggesting strong information networks. As a consequence Asian-owned firms have much better access to trade credit: small Asian-owned firms had almost the same access to credit as large firms, whereas small African-owned firms were disadvantaged. Similarly, 80% of Asian-owned firms were able to share risks through state-contingent repayments in contrast to only 33% of African-owned firms.[38] Again, this restricts business to the small group of firms known to the network.

Poor Public Services

Many of the weaknesses in public service provision disproportionately impinge on manufacturing. This is borne out by comparable firm-level evidence for seven countries in which firms were asked to score problems among fifteen identified choices. Two of the fifteen related to infrastructure: a general category `lack of infrastructure', and `high utility prices'. Aggregating across the seven countries, these ranked as the fourth and fifth problems respectively, after `lack of credit', `lack of demand' and `high taxes' (Biggs and Srivastava, 1996).

Turning to specific components of infrastructure, because electricity supply is unreliable, firms must rely on private generators. In Nigeria 78% of firms have stand-by generators, the high fixed costs of which bear particularly on small firms, accounting for a quarter of the value of their equipment (Lee and Anas, 1991). Inadequate telephone services were

[36] Social networks are potentially useful for two distinct purposes, learning about the trustworthiness of other firms and learning about new techniques and market opportunities. Since networks appropriate for the former are likely to be smaller and more homogeneous than those appropriate for the latter, the size of the network is restricted by the need for close observation of business partners (Barr, 1996). The cost of this is likely to be that social networks are to small to be effective channels for social learning, e.g. about export markets. If a lack of foreign social networks is an important constraint then foreign-owned firms should out-perform domestic firms in export markets and this is indeed the case (Bigsten *et al*., 1997)

[37] In many countries the colonial authorities made it illegal for Asians to acquire agricultural land.

[38] See Biggs *et al*. (1996) and Biggs and Srivastava (1996).

identified by 47% of Zimbabwean firms as their most serious problem. One export firm in the survey had to make a thirty mile journey in order to make a telephone call. There is as yet no convincing econometric evidence linking infrastructural problems - as reported by firms - to firm growth. Indeed, attempts to establish such links are inherently flawed: unavoidably the firm's assessment of the problem will be endogenous, reflecting how serious the problem is in restraining the firm's growth.

Africa is badly endowed with educated labor and Wood has suggested that this is part of the explanation for Africa's lack of competitiveness in manufacturing. A comparison of the rate of return to human and physical capital in African manufacturing across five countries finds that the returns to human capital are systematically much lower than to physical capital (Bigsten *et al*., 1998b).

Low productivity is often attributed to a poorly educated labour force. This is not supported by recent survey evidence. The ISA group, using data on the educational endowments of a firm's workers, finds that an additional year of education (for the entire labour force) raises productivity by about 3% (Bigsten *et al*., 1998b). This is remarkably similar to what Appleton (1999) reports for rural households (a 10% increase for four years of education).

A survey of 28 studies of workers finds a Mincerian return to primary education of around 5%. For both types of agent the effect is on the level rather than the growth rate of income. Returns to education appear to have fallen rapidly over time (Appleton, 1999, p. 9); social returns are now low but private returns are still substantial.

Lack of Financial Depth: Investment and Finance

Formal financial markets are much more limited in Africa than in most other developing regions. However, it does not necessarily follow that this has been an important constraint upon investment.

There is fragmentary evidence that in firms without internal funds the lack of credit constrains investment. First, there is econometric evidence for Ghana and Zimbabwe that firms which report `access to credit' as one of their major problems are less likely to invest. Secondly, firms make little use of credit to finance their investments. In Zimbabwe and Kenya firms were asked for the sources of finance for the last major acquisition of equipment. Both these countries have well-developed financial markets by African standards. Nevertheless, in Zimbabwe bank loans accounted for less than 2% of the total value of the investment and in Kenya only 15%. Thirdly, there are systematic differences in investment rates between firms which might plausibly be related to differential access to credit: investment is much higher in large firms and pooled panel data indicate that this is because large firms tend to invest more rather than that firms with high investment rates have grown large. Fourthly, investment is systematically related to changes in profitability: there is a significant positive effect of innovations in profitability on investment rates, suggesting that changes in the liquidity of the firm matter and hence that investment is

liquidity-constrained.

However, investment is very likely to be more constrained by factors other than finance. Although profitability is significant for investment the effect is quite weak: a doubling of profits would raise the investment rate from 6% only to 8%.

How much of the growth in manufacturing employment is due to the growth in the size of existing firms? The presumption (popular with donors) that micro enterprises grow very rapidly appears to be wrong. Evidence for five African countries suggest that in fact most micro enterprises do not grow at all (Mead, 1994). Using the Ghana RPED data Teal (1999, Table 1) finds some support for Gibrat's law, firms of different sizes growing at the same rate.

This evidence suggests that the growth of manufacturing firms is neither characterised by catch-up (which would imply convergence, the smallest firms growing fastest) nor by concentration (which would imply divergence, the largest firms continuing to grow at the expense of smaller ones). It also indicates that one of the sources of growth (concentration) does not apply. It will be important to establish whether this Ghana result generalises. Teal shows that *within a sector* productivity is stagnant and that there are large sectoral differences in productivity, which are not explained by skill differences. An extreme implication of these findings would be that aggregate productivity growth can occur only through compositional changes, with relatively faster growth in high-productivity sectors. However, the Ghana data also show that growth rates do not differ by sector so that compositional change does not occur. This may, of course, be an artifact of the period of the survey data (1991-95) in which there was very little investment.

Evidence for Ethiopia (Mengistae, 1998) suggests a different story. One prominent explanation for why Gibrat's law is typically rejected (both for developed and developing countries) is that there may be inherent productivity differences between firms, possibly reflecting differences in entrepreneurial ability, and that these differences are not known at entry but become gradually known through "passive learning" (e.g. Lippman and Rumelt, 1982, Jovanovic, 1982). This has two implications. First, it implies a natural limit to convergence of productivity levels through copying. If cost functions are idiosyncratic it may in fact be unwise to copy the decisions of other entrepreneurs. Secondly, firm growth would depend inversely on firm size and age as firms with an inherent cost advantage gradually come to learn this advantage and hence to grow more than others. Such age and size effects on firm growth have been found in US and UK data sets and Mengistae finds similar results for Ethiopia. However, the Ethiopian data suggest that passive learning applies for only relatively short periods of up to six years.

In the passive learning model firm growth is exhausted when the firm has acquired reliable information about its cost structure. Anecdotal evidence suggests a very different reason for firm growth ending. Beyond a certain firm size growth may be unattractive if firms

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See Gunning and Pomp (1995) and Bigsten *et al*. (1996) on access to credit; Free University and University of Zimbabwe (1995) and University of Gothenburg and University of Nairobi (1994) on bank loans and Bigsten *et al*. (1996) on investment and profitability.

which are more visible are more heavily taxed. The Ghana RPED data indicate that entrepreneurs may prefer to set up new firms rather than expanding existing firms. It should be possible, using Industrial Census data to establish whether manufacturing growth takes the form of growth of existing firms or of an increase in the number of firms. Obviously, the distinction matters in the case of economies of scale; the tax regime might then lower productivity by encouraging entrepreneurs to keep their firms small.

The assumption of the passive learning model that cost functions are idiosyncratic is probably too extreme, ruling out productive exchange of information in networks. Barr (1996) combined production function estimates with data on the networks to which entrepreneurs belonged. She shows that networks are productive and argues that they fulfill two different functions: exchange of information and joint contract enforcement. There is a trade-off between these two functions since contract enforcement is best achieved in small networks (in which the actions of other members can easily be observed) while information acquisition is increasing in the size of the network. It is possible, but can at this stage not yet been demonstrated, that diffusion is hampered by the need for entrepreneurs to deal with contract enforcement problems by investing in small networks, thus undermining the scope for information exchange.

Returning to the process of concentration as a source of growth we should note that this requires labour market flexibility. We have already noted that this is likely to be a problem in the rural economy. For industrial firms this seems to be true as well. Mengistae (1998, ch. 7) finds that changing jobs significantly raises marginal productivity (controlling for skill and experience) so that there appears to be significant scope for increased productivity through better job matching. This suggests that labour market imperfections constrain both types of agents.

Nevertheless, concentration does occur.[39] Figures on mean productivity growth can be very misleading. For example, Mengistae and Zeufack (1999, Table 2) show that the RPED sample of Ghanaian firms registers little productivity growth. However, this is the net outcome of a substantial group of firms registering negative productivity growth while about two-thirds of the sample experienced positive productivity growth. In either case the growth rates were substantial: about 1% per year. Firms for which productivity grew increased their capital stock and output both in absolute terms and as a percentage share of the sample total. While employment in these firms fell. In Ghana firms in which productivity grew, increased their share of the total value added of the sample from 56.6 per cent in 1991 to 77.2 per cent in 1993. At the same time their share in the total capital stock of the sample increased from 61.1 per cent to 82.2 per cent, while their share in the total employment figure of the sample dropped from 77.1 per cent to 73.6 per cent. The same pattern was observed for other countries Cote d'Ivoire, Cameroon).

Clearly, causation can run in either direction: investment can respond to differences in productivity growth (so that the capital stock is reallocated in favour of firm with high productivity. Alternatively, a higher growth rate of labour productivity is the result of higher investment. In order to rule out this second explanation we needed to demonstrate

[39] What follows is based on Mengistae and Zeufack (1999).

that greater productivity in the past led to higher investment. Mengistae and Zeufack (Table 4) rule out the second possibility with a regression of the growth rate of capital stock on the log of beginning-of-period labour productivity and the log of beginning-of- period capital stock per worker. The result support the view that the observed association reflects the reallocation of capital stock from low productivity firms to high productivity firms, This is particularly the case with the Ghanaian and Ethiopian samples for which the coefficient of initial labour productivity is positive and statistically significant and the coefficient of initial capital per worker is negative and statistically significant.

Authors may not be able to investigate firm growth with survey data. However, what can be established (using National Accounts and Industrial Census data) is the extent of productivity growth, the extent to which it reflects concentration (i.e. relatively rapid growth of sectors with high labour productivity) and whether mean firm size is growing.

4. Conclusion

In this paper we have focused on two key agents: rural households and urban manufacturing firms.

The rural economy still reflects some of the characteristics of pre-colonial African society: a land-abundant, high-risk, near-subsistence, low-asset economy with population limited by wars and poor nutrition. Social institutions reflected the needs of this stationary economy, with lineage groups regulating inter-generational transfers and providing risk pooling, but not usually creating marketable property rights. We have noted that the need to deal with risk (e.g. through diversification and consumption smoothing) has been costly in terms of growth. Geography has also hampered rural growth. African land ecology is in many ways distinctive: the types of soil where simple fertilizer can be successful and which made the Green Revolution in Asia possible are relatively rare in Africa. There is substantial scope for productivity increases in African agriculture but this requires combinations of macro and micro nutrients which are carefully designed for local circumstances, rather than standard (NPK) packages. In many countries extension services are not up to the tasks of designing and distributing such packages.

Parental investment in education has been low, possibly in part much of its effect on productivity occurs through externalities. Growth in the rural economy occurs largely through diffusion (of new crops and techniques) rather than concentration (more productive households attracting factors from other households), the latter being hampered by factor market imperfections. Property rights are developing but possibly too slowly to prevent large and inefficient divergences in factor proportions between rural households. The long period in which governments heavily taxed tree crops may have contributed to this process. The process of diffusion has been hampered both by the ineffectiveness of extension services and by the effect of risk on social capital: rural households have built networks in which risks can be shared but which are less suitable as channels for information diffusion.

The constraints on firm growth are similar to those facing rural households: high risk, poor public services, and lack of social capital.

Firms face high risks and have a limited capacity to bear them. Risks are inflated by the lack of publicly provided contract enforcement, by poor infrastructure, and by the vagaries of the macroeconomic environment, including policy. Their investments are difficult to reverse, largely because of trade and licencing restrictions. Their strategies for responding to this environment have been partly to reduce the risks and partly to accommodate them. To reduce risks firms hold large inventories to guard against unreliable suppliers, devote a substantial share of investment to generators to guard against public power interruptions, and restrict business relationships to those firms which they know well. To accommodate risk firms reduce investment and enter into state-contingent contracts. Both strategies impose costs. The recent liberalisations are reducing some of these costs. However, they are also reducing the protection from which existing firms benefited.

Appendix: Survey Data on Households and Firms by Country

The availability of survey data should be one consideration in the choice of countries for study. Sometimes it will not be efficient for a country author to undertake solo analysis of the survey data, and provision should be made for collaboration between the country author and scholars familiar with the data. For example, several of the household data sets are already being analyzed as part of the AERC Poverty project and most of the firm surveys are being analysed by the ISA group. Detailed information about the household surveys listed here can be found on http://wbln0018.worldbank.org/dg/povertys.nsf

Country	Household Survey	Firm Survey
Angola	yes	
Benin	yes	
Botswana	yes	
Burundi	yes	yes
Cameroon	yes	yes
Cape Verde	yes	
Central African Rep	yes	
Chad	yes	
Congo (Braz)	yes	
Congo (Dem Rep)	yes	
Cote d'Ivoire	yes	yes
Ethiopia	yes	yes
Gabon	yes	
Gambia	yes	
Ghana	yes	yes
Guinea	yes	
Guinea-Bissau	yes	
Kenya	yes	yes
Lesotho	yes	
Madagascar	yes	
Malawi	yes	
Mali	yes	
Mauritania	yes	
Mauritius	yes	yes
Mozambique	yes	yes
Namibia	yes	
Niger	yes	
Nigeria	yes	
Rwanda	yes	
Senegal	yes	
Sierra Leone	yes	
South Africa	yes	prospective
Tanzania	yes	yes
Togo	yes	

Uganda	yes	yes
Zambia	yes	yes
Zimbabwe	yes	yes

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