

Primary Commodity Dependence and Africa's Future

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Abstract

Until recently virtually all developing countries were heavily dependent upon exports of primary commodities. Globally, this gave rise to three severe problems. First, because commodity prices are highly volatile, countries had to cope with large shocks, both positive and negative. Evidence suggests that the largest of these shocks were poorly managed, with negative shocks causing substantial contractions in output. Second, for various reasons, the rents generated by primary commodities have been associated with poor governance. Third, primary commodity dependence is associated with a substantially higher risk of civil war. Given these problems, diversification seems desirable, and indeed on average over the past two decades developing countries have massively diversified their exports so that such dependence is a thing of the past. Africa has not experienced this diversification and remains heavily dependent upon primary commodities. Does this indicate that Africa has an immutable comparative advantage in primary commodities?

The paper argues that Africa's current comparative advantage in primary commodities is often due, not to its intrinsic endowments or location, but to a poor investment climate that is policy-related. This most handicaps those activities that are intensive in transactions. Globally, manufacturing and agricultural processing have a high share of non-factor costs in total costs compared to agriculture, natural resource extraction and services. It discusses how it may be feasible to lower these costs in a coordinated way, through EPZs and so become competitive in manufacturing.

However, for the next decade, even if Africa embarks upon effective diversification, it will have to live with primary commodity dependence. Hence, there is an urgent task of reducing the problems that have to date been caused by such dependence. Many of the policies that could be effective require action by developed countries. The paper suggests a range of such policies, including making aid flows contingent upon commodity prices, and greater transparency in corporate payments of primary commodity rents to governments.

* The findings, interpretations, and conclusions expressed in this paper are entirely those of the author. They do not necessarily represent the views of the World Bank, its Executive Directors, or the countries they represent.

1. Introduction

Most African countries are highly dependent upon exports of a few primary commodities. Globally, such primary commodity dependence generates some serious problems. The problem which is most familiar is coping with the volatility of world prices. More recently, research has accumulated showing that primary commodity dependence is associated with various dimensions of poor governance and some routes have been analyzed through which this association may be causal. Most recently, research has found an association between dependence on primary commodity exports and the risk of civil war. Africa has not escaped from these global relationships. Its economies are indeed shock-prone, governance is on average poor, and there is a high incidence of civil war. While these problems have multiple causes, primary commodity dependence is a credible part of the explanation and in Section 2 I briefly review the evidence.

The core of the paper accepts the proposition that dependence on primary commodity exports has been problematic, and considers what can be done about it. Basically, there are two options, diversifying away from primary commodities, or learning how to live with them better. In Section 3 I explore the option of diversification. During the past twenty years, as part of the latest wave of globalization, the structure of developing country exports has changed profoundly. In 1980 three quarters of developing country exports were primary commodities. Now around 80% are manufactures (Collier and Dollar, 2001). Developing countries as a group are thus no longer dependent upon primary commodities. Africa has not been part of this transformation. It has not broken into the global market for manufactures and remains highly dependent upon primary commodities. Does this persistent reflect something intrinsic in Africa's comparative advantage? In Section 4 I consider how the international community can make it easier to live with primary commodity dependence. My overall argument is that Africa should adopt differentiated strategies. For many countries diversification is in principle feasible, but has not occurred because dependence has certain trap-like features that make it persistent. For some countries diversification cannot be a credible strategy, and for these countries it is vital that the international community takes the actions that would improve their chances of successful poverty reduction.

2. Three Problems with Primary Commodity Dependence

Price shocks

The world prices of primary commodities are highly volatile, producing both booms and crashes. Most African countries are dependent upon a very narrow range of commodities and this exposes them to severe macroeconomic shocks. For other developing regions such shocks are largely a thing of the past due to export diversification.

Globally these large shocks are problematic for exporting countries. Typically, booms do not translate into sustained increases in income – they are missed opportunities – whereas crashes produce devastating and long-lasting declines. It is particularly useful to test this within the now-conventional framework that analyzes the relationship between aid and

growth. Together with Jan Dehn I have investigated how very large shocks in the country-specific index of primary commodity exports effect growth during the four-year periods considered by Burnside and Dollar (Collier and Dehn, 2001). We focus on the most severe of these shocks – the 2.5% tails of the distribution of annual price changes. For negative shocks the typical event is for a year-on-year price fall of 44%, with a direct loss of income for given export quantities of around 7% of GDP. Such shocks are massive relative to the shocks that are encountered by developed societies, whereas the capacity to withstand them is far more limited because there is less liquid wealth. Take for comparison, a recent adverse shock to a developed country that rightly received massive media coverage, namely, the epidemic of foot-and-mouth disease among cattle and sheep in the UK. This was rightly seen as a devastating shock for British farmers and had wide repercussions for the rest of the economy. Yet the entire British agriculture sector accounts for only 2% of British GDP. The sort of shocks that are hitting those developing countries which are dependent upon a narrow range of primary commodities are analogous only to the great depressions of the 1930s.

In the case of the typical large negative export shock, directly costing 7% of GDP, the shock then triggers a cumulative contraction in the economy over the next two or three years, leading to an additional loss of output of around 14% of initial GDP (Table 1, column 1). Hence, there appears to be a Keynesian-type multiplier by which each dollar of direct loss from large terms of trade shocks ends up costing the economy \$3.

There are various reasons why large booms might often be missed opportunities. The most obvious reason, for which there is considerable case study evidence, is that large windfalls tend to destabilize the government budget. Schuktnecht, (1999) provides clear evidence that coffee booms tended to lure governments into unsustainable increases in expenditures and find themselves locked into them as revenue falls again. A second set of reasons concern regulations or institutional weaknesses that make it difficult for the private sector to transform the windfall into productive investment. A third set of reasons concern transfer mechanisms that inadvertently disguise the source of windfall income,

Table 1: Dependent variable: GDP growth rate per capita

Regression no.	1	2
Variable name	Burnside-Dollar (full sample) and shocks	Shock*Aid
Initial Income	-0.59 (0.55)	-0.77 (0.59)
Ethnolinguistic Fractionalisation	-0.41 (0.74)	-0.38 (0.78)
Assassinations	-0.40 (0.27)	-0.37 (0.29)
Ethnolinguistic Fractionalisation*Assassinations	0.68 (0.46)	0.63 (0.48)
Institutional Quality	0.64 *** (0.17)	0.67 *** (0.19)
M2/GDP	0.01 (0.02)	0.02 (0.02)
SSA	-1.76 ** (0.77)	-2.05 *** (0.73)
EASIA	1.29 ** (0.60)	1.21 * (0.64)
Policy	0.69 *** (0.20)	0.82 *** (0.19)
Aid	-0.09 (0.16)	-0.20 (0.13)
Aid*Policy	0.21 *** (0.07)	0.10 * (0.06)
ed3	-0.26 (0.59)	1.31 * (0.71)
ed4	-1.42 ** (0.66)	0.53 (0.69)
ed5	-3.34 *** (0.62)	-1.32 ** (0.64)
ed6	-1.17 ** (0.55)	0.62 (0.55)
ed7	-2.03 *** (0.67)	
Negative shocks	-0.03 *** (0.01)	-0.03 ** (0.01)
Positive shocks	0.02 (0.01)	0.00 (0.01)
Negative shocks*change in aid		0.04 *** (0.01)
Positive shocks*change in aid		0.00 (0.02)
Negative shocks*lagged level aid		0.01 (0.00)
Positive shocks*lagged level aid		0.02 ** (0.01)
N (countries)	56	56
N (observations)	275	234
F	15.530 ***	15.030 ***
Rsqr		

so that recipients lose the vital information that the additional income is unlikely to be sustained.

Because Africa is much more exposed to these shocks than other regions, even if its performance in coping with them was average, it would face major problems. However, not only is Africa atypically exposed to these shocks, it is atypically bad at coping with them. African governments have less technical economic expertise. Their polities are more fractionalized into rival ethnic groups, and so may find it more difficult to reach agreement on how to apportion large abrupt changes in aggregate income. African firms and households have fewer assets with which to buffer shocks and less access to credit.

Governance

I now turn to the second, and perhaps more important adverse consequence of primary commodity dependence, namely worsened governance. The association between primary commodity dependence and poor governance can be due to various routes (Sachs and Warner, 1995; Auty, 2001, Pritchett et al., 2001).

A route stressed by political scientists is that government finance tends to become detached from broad-based taxation. Primary commodities typically generate high location-specific rents which governments can tax heavily without killing the activity. African governments have relied disproportionately for revenue upon the taxation of primary commodities, either directly through export taxes, or indirectly, through taxing the imports that such exports finance. Globally, the origins of representative government have been that governments conceded representation in return for taxation. The electorate then used the power of representation to scrutinize the use of its tax revenues. Africa has not been through this process and so African governments face less domestic scrutiny than most other governments.

Alternatively or additionally, the high rents from primary commodities might require the public sector to administer more resources than it can effectively manage relative to the size of the economy. Rents are seldom directly transferred back to households. Usually, they are spent through the provision of public services, or accumulated as publicly owned and operated capital.

We can get some quantitative evidence on this from the related phenomenon of the absorption of aid which, like resource rents, accrue to the government. Together with David Dollar, I have investigated the limits of the contribution of aid to growth (Collier and Dollar, 2002). Our simple regression model of the relation between aid and growth finds diminishing returns to aid, dependent upon policy as measured by the Bank's CPIA index:

$$G = a + bA + cP + dAP - eA^2. \quad (1)$$

From this regression the point at which the economy is saturated with aid, and by analogy, with natural resource rents, follows as:

$$dG/dA = b + dP - 2eA = 0 \quad (2)$$

so that the saturation point is reached at a level of resources as a share of GDP, measured at purchasing power parity, of:

$$A^s = (b + dP)/2e. \quad (3)$$

Empirically, we find that the coefficient b is approximately zero, and d/e is around 2.5 and the conversion from purchasing power parity to prevailing market exchange rates is around 2.5. Hence, the saturation point is reached when resources are around six times the policy score. Natural resource dependent economies tend to have poor policy scores of around 2.5, so that, if natural resource rents function like aid, the typical country would reach the saturation point when rents were around 15% of GDP. Beyond this point, according to our growth model, rents would actually become dysfunctional, reducing growth. Many natural resource economies are well beyond this point. For example, Nigeria, has oil resources equal to around 40% of GDP. In effect, the first half of the oil resources are contributing to growth and the second half are undermining growth.

Further, there are some routes by which natural resource rents worsen economic performance that do not apply to aid, so that the analogy with aid absorption may flatter primary commodity dependence. For example, Hoff and Stiglitz (2002) suggest why primary commodity dependence might reduce the constituency for the rule of law. Starting from a weak rule of law, they let agents choose between illegal asset-stripping and legal investment. They argue that the larger is the natural resource endowment of firms relative to other sources of income, the more attractive will be illegal asset-stripping relative to investment. As a result of this, a larger proportion of the population finds that it has an interest in the persistence of a weak rule of law. Finally, given this expectation that lawlessness will persist because it is in the interest of so many, investment becomes even less attractive. Their analysis does not depend literally upon a majority of the population opting for asset-stripping, but rather that a sufficient proportion of the elite has such an interest that efforts to establish the rule of law can be blocked.

If primary commodity dependence tends to produce poor governance it is particularly serious because countries with large primary commodity exports are more in need of good governance than other countries. The social benefits from primary commodity rents depend upon the government being able to use these resources effectively. Rents get taxed, and indeed should get taxed, because otherwise it may be difficult for the rents to be distributed equitably. Yet this places a great responsibility on government to function fairly and effectively. Hence, poor governance in Nigeria has a much higher social opportunity cost than poor governance in a society that does not need the state to redistribute primary commodity rents.

Rebellion

The final problem generated by dependence upon primary commodities is greater exposure to the risk of civil war. Together with Anke Hoeffler I have investigated the causes of civil war in Africa and globally (Collier and Hoeffler, 2001). We take all the civil wars initiated between 1960 and 1999 and estimate a logit model of the initiation of conflict during each five-year sub-period, explained by characteristics at the start of the sub-period, testing for whether Africa is distinctive (Table 2). We investigate a comprehensive range of possible causes, political, social, historical, geographical, and economic. Of these, three economic variables turn out to be the most important. The risk of conflict is strongly related to the level and growth of income, and to its structure as reflected in the dependence upon primary commodity exports. The risk arising from primary commodity exports is substantial. At the mean of other variables, a country without primary commodity exports would have a risk of civil war of only around one percent over a five year period, whereas with primary commodity exports at 30% of GDP the risk rises to around 20%. Hoeffler and I find that if primary commodity dependence is very substantial the risks begin to decline again, perhaps because the state has so many resources that it can both defend itself and placate opposition.

Thirty years ago Africa had a lower incidence of civil war than other developing regions. Over the past thirty years it has had a rising incidence whereas other regions have had a declining incidence (Figure 1). Now Africa has a higher incidence of civil war than other regions. We find that the behavioral relationships governing conflict are not statistically different from the global relationships. The divergent trends in the incidence of war are well-predicted by the divergence in economic performance. In other regions the radical reduction in primary commodity dependence, accelerated growth and hence cumulatively higher incomes, have all contributed to a virtuous circle of more peaceful societies. The predicted divergent trends are shown in Figure 2.

Thus, Africa's continued dependence upon primary commodities, in contrast to patterns in other developing regions, both directly, and indirectly through its connection to poor growth performance, appears central to its problem of civil war. We have also investigated whether the risk differs as between broad types of primary commodities. We find that only oil has a significantly different pattern of risk – the risk rising more slowly with oil dependence, but continuing to rise for longer before it peaks.

Regression analysis is not well-suited to understanding why primary commodity dependence has such adverse effects. However, case study evidence suggests that an important route is that the rents from primary commodities can be looted to make rebel organizations financially viable. Such looting can be thought of as a special class of criminal activity with distinctive requirements of violence. Although crime is a major sector of the economy, it is unusual in its very low degree of concentration. Evidently, in most crime there are no economies of scale so that small firms prevail. Rebel organizations are the exception to this pattern, typically having at least 500 full time employees. Large rebel organizations such as UNITA, RUF, and SPLA have many thousands of employees. Perhaps the reason for this exceptionalism is that the predation of primary commodities requires the control of large rural areas for significant periods of

Table 2: Is Africa more prone to Civil War than the Rest of the World?

	1	2	3
ln GDP per capita	-0.950 (0.245)***	-1.053 (0.289)***	-0.965 (0.244)***
(GDP growth) t-1	-0.098 (0.041)**	-0.1027 (0.042)**	-0.098 (0.042)**
Primary commodity exports/GDP	16.773 (5.206)***	16.691 (5.175)***	15.989 (5.218)***
(primary commodity exports/GDP) ²	-23.800 (10.040)**	-23.532 (9.958)**	-22.942 (10.023)**
social fractionalization	-0.0002 (0.0001)***	-0.0002 (0.0001)**	-0.0002 (0.0001)**
Ethnic dominance (45-90%)	0.480 (0.328)	0.449 (0.331)	0.431 (0.330)
peace duration	-0.004 (0.001)***	-0.004 (0.001)***	-0.004 (0.001)***
Ln population	0.510 (0.128)***	0.473 (0.137)***	0.5473 (0.130)***
geographic dispersion	-0.992 (0.909)	-0.994 (0.907)	-0.775 (0.933)
Sub-Saharan Africa dummy		-0.370 (0.526)	
French Sub-Saharan Africa dummy			-0.885 (0.791)
N	750	750	750
Pseudo R ²	0.22	0.22	0.23
log likelihood	-146.84	-146.50	-146.1 0

Notes: All regressions include a constant. Standard errors in parentheses. ***, **, * indicate significance at the 1, 5 and 10 percent level, respectively.

time and for this there are scale economies in violence. Rebellion is the organizational form that criminal activity must take if it is to be effective in predation of primary commodity exports. Note that crime need not be the motivation for the rebellion. Rather, rebel organizations may be not-for-profit enterprises for which financial viability is merely a constraint rather than an objective.

The experience of the Democratic Republic of the Congo (DRC) provides an example. When Laurent Kabilla was marching across the DRC (then called Zaire) en route for Kinshasa, he was interviewed by a journalist. He reportedly said that in Zaire rebellion was easy – all that was needed was \$10,000 and a satellite phone. His explanation neatly exemplifies Africa's proneness to civil war – \$10,000 was enough to hire a small army, while with a satellite phone it was possible to start making deals on mineral extraction. Kabilla apparently reached \$500m of mining deals before reaching Kinshasa. Africa is atypically prone to civil war because of its atypical opportunities for rebellion – unusually low costs, and unusually high revenues.

Primary commodity dependence thus directly increases the risk of conflict because it provides means of financial viability for rebel groups. It may also increase risk through its adverse effects on governance as discussed above. Further, to the extent that primary commodity dependence reduces growth, as I have suggested, then it further increases conflict risk, since both growth itself, and the level of income, are risk factors. Civil war is heavily concentrated upon low-income countries, dependent upon primary commodity exports, and in economic decline.

These conflicts have obvious and substantial adverse economic effects. For the country concerned, economic growth is on average reduced by over 2% per year. In extreme cases such as Sierra Leone which has suffered from very lengthy conflict, per capita income is now only one third of its level of the 1960s. There are also growth spillovers to neighbors (Murdoch and Sandler, 2002). Finally, there is a conflict trap: once a country has had a conflict it is considerably more likely to have a further conflict. Perhaps this is because during the conflict rebellion-specific capital has accumulated while other capital has decumulated, so that, by a process analogous to that in the Hoff-Stiglitz model, the incentive for the peace, and hence its likelihood, are both reduced.

Summary

I have suggested that primary commodity dependence has three powerful adverse effects on an economy and a society. We would expect a country dependent upon primary commodities to have slower growth, worse governance and more violent conflict than one which was not. Africa has become more distinctive relative to other developing regions in each of these dimensions and this has coincided with a marked divergence in the extent of primary commodity dependence.

3. Why has Africa not diversified out of primary commodities?

Thirty years ago Africa was like other areas of the developing world in being dependent upon primary commodity exports. Over the past thirty years all other developing regions have diversified their exports. Indeed, since 1980 the share of primary commodities in the exports of developing countries has come down from around 75% to around 20%. Many countries have broken into the global market for manufactures. Africa has not followed this pattern; it is approximately as dependent upon primary commodity exports as it was thirty years ago. Africa has thus recently revealed a strong comparative advantage relative to Asia in primary commodities. The question is what is the source of this advantage.

Two established theories

Two theories each offer an account as to why Africa has failed to break in to the market for global manufactures.

The first theory is the extension of the Heckscher-Ohlin theory developed by Adrian Wood (Wood and Mayer, 1998). He proposes that because Africa is better endowed than Asia with natural resources, while being less well-endowed with human capital, it has an endowment-based advantage in primary commodities. In essence, this theory explains Africa's lack of manufacturing by Dutch disease – abundant land raises real incomes and so makes Africa uncompetitive relative to land-scarce regions. At some stage this mechanism might well determine Africa's trade pattern. But currently Africa has the lowest income in the world. Few African countries have been priced out of manufacturing by resource abundance. Even a resource-rich country like Nigeria should not have been precluded from industrializing by Dutch disease. For example, Indonesia was able to establish a large labor-intensive manufactured exports sector despite its oil endowment. Nigeria's problem was not that it had oil, but that its costs became too high for other reasons. Some African countries are not resource abundant, while being well-located, yet they have still not industrialized – examples being Tanzania, Ghana and Mozambique.

The second theory is based on the introduction of transport costs and is due to Redding and Venables (2002). They argue that the key comparative advantage is proximity to market and to suppliers, since this economizes on transport costs. The need to minimize transport costs gives rise to powerful forces for agglomeration and provides a massive comparative advantage to those countries that industrialize first. A few countries in the developing world have recently managed to overcome these agglomeration economies because of a massive wage differential. The initial differences among developing countries that enabled some to break in to manufacturing may have been modest and even ephemeral. However, once some low-income countries started to industrialize, they began to benefit from agglomeration economies and so became far more competitive than those countries that were left out. Agglomeration economies imply that manufacturing activity will always be concentrated in a relatively few locations. Those locations such as Africa that have not yet industrialized may have permanently missed out. Industry may

therefore be viable in Africa only to the extent that it serves the local market and benefits from the natural protection of high transport costs.

Transport costs are obviously prohibitive for manufacturing exports for those countries that are landlocked. However, coastal West Africa is the low-income area most proximate for OECD markets. The high costs of transport to coastal Africa reflect shipping cartels, port inefficiencies, and the simple lack of scale. For example, Mauritius was initially very badly located for manufacturing because shipping routes ignored it, but routes changed in response to the rise in exports. Further, there is new evidence that the costs of transport are themselves changing, with end-costs falling relative to distance-costs (Brun et al., 2002). This should favor West Africa relative to Asia, since its distance-to-market should be shorter than for Asia.

Comparative Advantage as the by-product of political economy

I now suggest a simple theory in which comparative advantage is determined neither by factor endowments nor by distance-related transport costs, but by political economy.

The World Bank now emphasizes the importance of the investment climate. By this is meant the costs and risks of doing business. The three consequences of primary commodity dependence – prevalence of macroeconomic shocks, poor governance, and a high incidence of civil war, - all adversely affect the investment climate. Ultimately, these effects depress the risk-corrected incomes of factors of production.

However, factors of production differ greatly in their ability to resist reductions in income. Capital is fairly mobile internationally so that the return on capital cannot diverge too sharply in one region from another. Capital is evidently not sufficiently mobile to eliminate differences in endowments between the north and the south. However, it is sufficiently mobile as between different southern locations that risk-corrected expected returns among developing countries are probably broadly equalized. This is partly the result of a pool of risk capital that is willing to locate anywhere that returns are satisfactory. More importantly for Africa, it is the result of capital outflows from countries with limited investment opportunities. Together with Anke Hoeffler and Cathy Pattillo I have estimated the proportion of private wealth held abroad. We estimate that for Africa, even by 1990 this was 40%. The political economy consequence of this mobility is that capital has strong bargaining power relative to the immobile factors which I will consider to be land and labor. Hence, the burden of poor governance is shifted more or less fully to these immobile factors.

Although the ultimate incidence of poor governance, shocks and civil war falls on the immobile factors, the routes by which their incomes are reduced are largely indirect. As an approximation, I will suppose that poor governance raises costs, whereas shocks and civil war expose firms to additional risks.

Poor governance includes both sins of commission and sins of omission. Probably the primary route for sins of commission is through increased prices for imported inputs.

Imported inputs are directly subject to tariffs and to the costs of delay. However, since both of these are to an extent at the discretion of quite lowly government officials, actual tariffs paid and delays experienced will be *ex post* of payments extracted to moderate threatened levels. An important route for sins of omission is deficient public service delivery. I will simplify by assuming that a poor investment climate raises the costs of doing business through these routes in a manner that uniformly raises the cost of non-factor inputs. These high costs can be thought of as 'unsmart' predation. That is, the predation is not directly attached to the rents in factor returns. If predation were targeted so as to extract rents it would not kill off an activity. 'Unsmart' predation is analogous to the competitive, and therefore uncoordinated predation that Shleifer and Vishny (1993) have shown to be more damaging for economic activity than monopolistic, and therefore targeted predation. In their analysis competitive predation eliminates the activity, whereas monopolistic predation retains it. Here indirect predation raises the cost of non-factor inputs transactions to all activities equally.

Macroeconomic shocks and civil war increase risks. Again, although these risks must ultimately reduce the returns to the immobile factors, exposure is indirect. An important route by which shocks and insecurity affect risk is through increasing the unreliability of supply by other domestic firms (Fafchamps, 1996). Macroeconomic shocks create episodes of widespread bankruptcy and credit shortage. Insecurity not only interrupts supply, it provides an alibi for a failure to meet contractual conditions. The firm surveys conducted under the auspices of the World Bank's Regional Program for Enterprise Development in Africa, found both a high incidence of default on contractual terms and that defaults were very largely forgiven. For example, a Ugandan firm producing mattresses faced default from a retailer. The retailer argued that its stock in the north of the country had been looted due to civil war. The firm heard unofficially that this was probably untrue, but the climate of uncertainty created by the conflict provided an effective alibi. Evidently, a problem for one firm creates a chain of unreliability through the system. Exposure to this risk is approximately proportionate to the share of non-factor inputs in total costs.

I have suggested that the incomes of immobile factors must be depressed to cover the costs and the risks that are caused, indirectly, by primary commodity dependence, and that the incidence of these costs and risks is approximately in proportion to the share of non-factor inputs in the total costs of an activity.

Activities differ substantially in their dependence upon non-factor inputs and in their reliance upon immobile factors, and these two features combine into a political economy theory of comparative advantage. Table 3 shows the world average total cost structures for different activities with data from GTAP.

Consider, first, differences in the share of non-factor inputs in total cost. The sector least intensive in non-factor inputs is natural resource extraction, with a share of only 37%. Agriculture also has a low share - only 44%. By contrast, manufacturing is much more

Table 3: Global Cost Structures by Sector

(percentages)

	Inputs	Land	Labor		Capital	Scope for Compression
			Unskilled	Skilled		
Agriculture	45	15	25	1	15	91%
Ag Processing	72	0	9	3	16	17%
Nat. Resources	37	20	11	3	29	92%
L Manufacturing	65	0	16	5	15	32%
K Manufacturing	68	0	13	7	12	29%
Services	40	0	20	14	26	85%

Source: GTAP.

intensive in non-factor inputs, with a share of between 65% and 68% depending upon the industry group. Interestingly, agricultural processing, which is often held up as Africa's next step in comparative advantage, is the sector most intensive in non-factor inputs, with a share of 72%.

Next, consider the share of the immobile factors in total costs. Again, natural resource extraction and agriculture are the sectors that are well-placed, with shares of 34% and 41% respectively. By contrast, agricultural processing is the sector with the lowest share – only 12%.

To see what this implies, consider two activities, one in labor-intensive manufacturing, and one in natural resource extraction. Suppose that the combined effects of poor governance, exposure to shocks and conflict risk, is equivalent to an $x\%$ surcharge on intermediate inputs. How large can x get before the returns on the immobile factors get driven to zero? In part this depends upon the scope for substitution between factors in production. However, for simplicity I will abstract from this substitution.

In manufacturing total value-added is only 35% of total costs, and nearly half of this is mobile, so that those factor returns that can be reduced without the factors leaving the country account for only 21% of total costs. On this small base of costs that can potentially be reduced as factors are forced to accept lower returns than available elsewhere in the world, there is the mountain of 65% intermediate inputs. Thus, each one percent surcharge on the cost of non-factor inputs raises total costs by around 0.65%, requiring an offsetting reduction of around 3% in the payments to immobile factors. By the time that the surcharge has reached 32%, the amount available for payment to immobile factors has been driven to zero. By contrast, in natural resource extraction the scope for compression is much larger. The surcharge on non-factor inputs can reach 92% before the returns to immobile factors are compressed to zero. Obviously, the activity ceases to exist well before the return to the immobile factors is driven to zero, but the key

point is that if the costs and risks of non-factor inputs are significantly above the world average, there is a wide range over which manufacturing is unviable, but natural resource extraction and agriculture remain viable, as indicated in the final column of Table 3.

Thus, poor policy locks a country in to primary commodity dependence because that is the only export activity that remains viable. Collier and Hoeffler (forthcoming) test this proposition. The effect of policy upon primary commodity dependence is difficult to establish empirically because causality also runs in the other direction: primary commodity dependence tends to worsen policy. To control for this we investigated the effect of policy in a panel of countries, including country fixed effects. The dependent variable is the log of the share of primary commodity exports in GDP during a five-year period. This is explained on the CPIA score, which proxies the policy and institutional environment (the same index as used above), the level of income, and the level of aid, all measured as averages during the preceding five year period. Testing the specification of the model confirms the need for the country fixed effects. Hence, controlling for differences between countries, we are testing whether changes in policy, sustained over a five-year period, effect the degree of dependence upon primary commodity exports. The regression results are¹:

$$\text{Ln (primary commodities)}_{it} = 3.696 - 0.90\text{Policy}_{i,t-1} - 0.012\text{Aid}_{i,t-1} - 0.737\text{lnGDP}_{i,t-1}.$$

(3.81) (2.02) (2.43) (5.64)

As predicted, poor policy is found significantly to increase dependence upon primary commodity exports, controlling for aid and the level of GDP.

So is Diversification Feasible?

Can Africa break into manufactures?

Whether Africa can break into manufacturing, is, I think, as yet undecided. Primarily, it depends upon whether there can be sufficient political impetus behind the radical reform of the investment climate. Usually, the macro-level reforms, such as tax rates and exchange rates, have already been adopted. This is easy to do by fiat. The reforms that remain are largely at the micro-level and these are much more difficult. Getting ports and other utilities to work efficiently is both highly politicized and requires behavioral change of thousands of people. Preventing those officials who have power over firms, such as tax collectors and regulation enforcers, from abusing their power poses severe principal-agent problems and trade-offs between competing objectives.

In addition to the usual problems of bureaucratic self-interest, reform of the investment climate faces two political economy problems. The first is a coordination problem. If many different aspects of the business environment are potentially constraining, the returns to fixing any one problem are modest. Manufacturing cannot develop until many

¹ T-ratios in parentheses. N=345, F-test for the joint significance of the country-specific effects: F(104,237), p=0.00.

deficiencies have been addressed. In the limit, the return on reform of the investment climate is zero until the last impediment has been removed, so that there is no incentive to undertake piecemeal reform. The second problem is that the existing manufacturing firms may survive because, rather than despite deficiencies in the investment climate. That is, deficiencies may provide protected market niches. The activities that are most damaged by a poor investment climate simply do not exist. Africa's domestic markets for manufactures are so small that for Africa to industrialize it will need to rely substantially upon export markets. Yet empirically, manufacturing plants that do not export within the first two years of their establishment seldom switch into exporting. Hence, Africa's current manufacturing firms may have little to gain from reform. They are very largely organized to serve the domestic market, and their management has expertise in surmounting problems that, for a firm to be competitive globally, should not exist in the first place. Sometimes, management solutions, such as carrying large inventories to guard against unreliable channels of supply, have created habits that would need to be unlearned were these firms to find themselves in an environment in which they could be globally efficient. There is also evidence that, unlike firms in other regions, if a firm does export it experiences substantial learning effects (Bigsten *et al.*, 1999). This suggests that there is a substantial productivity gap between firms oriented towards the domestic market, and world productivity levels. A few firms manage to break into world markets and then get on a productivity escalator, but for most firms the productivity gap will simply preclude initial entry.

Hence, Africa is in a double trap: dependence upon primary commodities tends to worsen the investment climate, and there is little domestic impetus for reform. To break the impasse on reform, Africa needs both a coordinated reform effort by government and the entry of new private actors.

A simple way to coordinate policy reforms to improve the investment climate is to focus spatially. Export Processing Zones (EPZs) have usually failed in Africa but this may be because they have been conceived as providing compensating tax exceptions for a hostile investment climate. The approach of compensation makes viability dependent upon political patronage and so further threatens governance and may heighten risk. However, EPZs do not have to be conceived as compensation arrangements. Rather, they can be local zones for good public service delivery and even for good governance, as proposed by Shin Jin Wei (2000).

EPZs also have some potential for the coordinated entry of new, export-oriented firms. A useful supplement is for Africa to get preferential access to OECD markets through initiatives along the lines of the Africa Growth and Opportunity Act, which gives African manufactures some preferential access to the US market, and the European Union offer of negotiating REPAs. These may help to overcome the problem that international manufacturing firms know little about Africa as a production location and see no reason to incur the costs of improving their information.

Can Africa move up from agriculture to agro-processing?

It is often suggested that Africa's dynamic comparative advantage is to move up from primary commodity exporting to the processing of primary commodities. The evidence of Table 3 suggests that this is unrealistic. Even on the criterion of factor proportions agro-processing is on average intensive in capital and uses little unskilled labor. However, if the decisive aspect of cost structures is the share of non-factor inputs, as I have suggested, then agro-processing is highly unsuited for Africa. Agro-processing is the sector with the highest share of non-factor inputs to total cost.

Can Africa break into services?

A striking implication of Table 3 is that the services sector has a very similar cost structure to the natural resources sector. Both have very low dependence upon non-factor inputs. The major difference is that natural resources are intensive in land, whereas services are intensive in unskilled labor, but Africa is now abundant in both of these factors. Hence, given its current high costs of non-factor inputs, Africa should have a comparative advantage in services exports. To date, any such potential has not been realized. Partly, this may be due global impediments to trade in services - very high transport costs and regulatory barriers. However, recent developments in global telecommunications have radically brought down the cost of trading many services. For example, the US health insurance company Aetna is now starting to process some of its paperwork in Ghana, creating 3,000 jobs. The potential for this sort of work is enormous. Africa has both time zone and language advantages over Asia. Especially landlocked African countries might concentrate on a services strategy. Partly, the impediments to African entry into the emerging global trade in services may be due to deficiencies in two domestic policies that are differentially important for services. First, transport costs in the new trade in services are highly dependent upon good communications infrastructure and competitive pricing of services. Some African countries have lagged in introducing a competitive telecoms sector. Second, as shown in Table 3, the services sector is uniquely intensive in skilled labor. Just as the manufacturing sector may benefit from EPZs, new export-oriented service activities may benefit from business parks located by universities.

4. Living with primary commodity dependence

I have suggested that parts of Africa may have a future other than as dependent upon primary commodities. However, for the present Africa must live with dependence upon primary commodities, and for parts of Africa this is the only likely future. It is therefore imperative that the problems posed by primary commodity dependence be addressed. I will concentrate upon what can be done by the international community, since for all three of the problems I have discussed, there are important neglected policy options.

Cushioning Primary Commodity Price Shocks

I have already described the effect of severe falls in the price of primary commodity exports on domestic activity. Recall that Dehn and I find that each dollar of direct income loss from lower prices causes a further two-dollar loss through a contraction in output.

African producers face many risks. However, export price shocks are particularly important because they are systemic, affecting all producers at the same time without being offset by gains elsewhere in the society. It is therefore more difficult for societies to make insurance arrangements in respect of such shocks than for shocks that are largely idiosyncratic, such as ill-health where even local community insurance might be able to reap most of the potential benefits of risk pooling. Export price shocks need to be insured internationally.

Most low-income countries receive aid inflows, and this provides a potential mechanism whereby they can benefit from international insurance. The flow of aid to a country could be contingent upon its export prices. Dehn and I investigated whether contingent aid can prevent the output contraction generated by large adverse price shocks (Table 1, column 2). Specifically, we add to the growth regression terms for the interaction of the shock and changes in aid inflows. For the large negative shocks we find that the interaction with changes in aid inflows has a statistically and economically significant effect on growth. If aid happens to increase during those four-year growth episodes in which there is a large adverse price shock, then each additional dollar of aid raises output by approximately two dollars over-and-above its normal effects on growth. Thus, additional aid works equivalently to additional export income, reducing the output contraction. Aid can thus be super-effective if it is well-targeted to coincide with such shocks.

We also investigate whether aid has indeed tended to cushion these large price shocks. Historically, we can find no significant relationship. For most aid this is not surprising – project aid is highly unresponsive to short term macroeconomic conditions, and even program aid requires relatively long lead times for negotiation and decision. However, until 2000 the international community had two schemes specifically designed to provide compensation for export price falls, the Commodity Compensatory Financing Facility of the IMF, and the Stabex scheme of the European Union. The CCF was virtually unused for the simple reason that it provided only non-concessional loans, whereas at the onset of a negative shock of uncertain duration, governments would be most unwise substantially to increase such debt. The Stabex scheme disbursed aid through specific types of projects. As a result, the lags between entitlement and disbursement were so long that the disbursements actually became pro-cyclical. Both schemes were rightly abandoned in 2000. In a sense, this has made it easier for the international community to respond to the need for shock compensation appropriately. There is no longer even an appearance that these needs are being met.

How might contingent aid work? The overriding need is for a response mechanism which is fast, and therefore arrangements must be automatic. One simple such mechanism would be for debt service to be contingent upon export prices, being suspended for a period if prices dropped sharply. A further arrangement would be to have a component of programmatic aid contingent upon the same price triggers. Clearly, no arrangement should aim to provide a permanent cushion around a particular level of export prices. Rather the aim would be to provide transitional finance. Contingent aid would not address many of the problems generated by large external shocks. However, it has the potential to

make shock-induced recessions less severe. Since the social costs of shocks probably rise more than proportionately with the severity of the shock, even modest reductions in their amplitude might be very valuable.

Improving the Governance of Primary Commodity Revenues

Now consider how the international community can help to break the link between primary commodity dependence and poor governance. I will focus upon oil as the most important single commodity. There are real limits to the ability of the international community to improve the governance of natural resource rents. If a democratic country chooses to spend its own resources inefficiently, this is its prerogative. However, in many societies with high oil rents the preconditions do not currently exist for informed decisions about resource use. In extreme cases, payments by oil companies are made to entities which are not subject to scrutiny, and from which revenues are transferred to improper uses. For example, some 34 oil companies are making payments to the government of Angola, but there is a serious lack of transparency as to what happens to these payments. Many appear not to reach the Angolan budget. In 2000 British Petroleum became sufficiently concerned about this state of affairs that it decided to make public its payments, a move that was strongly resisted by the Angolan authorities for undisclosed reasons. The authorities put pressure upon the other 33 oil companies operating in Angola not to adopt this policy of transparency, and to date none has done so.

This incident demonstrates both a possible way forward, and the limits of independent private-sector action. As in the case of resistance to bribery, unless all companies act together, there are high costs to behaving honestly. The coordination problem evidently cannot be solved by oil companies alone. In the case of resistance to bribery, the OECD came in as the coordinating agency, reaching agreement among its governments that they would all introduce national legislation making bribery of foreign officials a criminal offence. A similarly coordinated approach is needed in respect of oil revenues. One simple possibility, proposed by the NGO Global Witness, is for transparency in payments to governments to be made a requirement for achieving a stock market listing in OECD countries. Apparently, the reporting burden would be minimal, and this would have the added advantage of not singling out any particular revenue-receiving government.

Transparency in payments is the first necessary step towards reasonable governance of primary commodity rents. Unless it is publicly known what revenues are, it obviously cannot be determined how they are used. However, the international community can also be instrumental in the second step which is building adequate domestic institutions for scrutiny of expenditures. Evidently, the ideal is for the normal system of parliamentary scrutiny of the budget to be effective, with reliable budget numbers and democratic representatives with the ability and motivation to hold the government to account. In the absence of such institutions, partial solutions are better than none. The alliance of the donor community and international companies was effective in enable parts of civil society to scrutinize the use of revenues from the Chad-Cameroon pipeline was a pioneering effort that has been partially effective.

Reducing the Risk of Conflict Generated by Primary Commodity Dependence

The global community has considerable scope both to reduce the risks associated with primary commodity dependence and to offset them.

There is scope for better global governance of those primary commodities that are most commonly used by rebel groups to raise funding: diamonds, timber and drugs. The new Kimberley initiative in the diamonds industry has led the way. The industry has introduced a certification process which is intended to create a deep discount for illicit diamonds relative to legally produced diamonds and a consequent curtailment in volumes. The scale of this discount is relatively simple to observe, somewhat analogous to discounts in some currency markets and so over time the efficacy of the arrangements can be assessed.

Improved governance in the diamonds industry is very recent: UNITA has been earning revenues from diamonds for around thirty years. Yet diamonds are in some respects an easy natural resource to regulate. The industry is highly concentrated, with a product that is highly image-sensitive. Hence, the major firms in the industry have a realistic chance of overcoming the collective action problem, and have a strong incentive to prevent contamination of the image of the product. In these circumstances there are reasonable prospects that self-regulation will work. The regulation of timber is more problematic because the industry is much less concentrated and the product is less image-sensitive. The most difficult conflict-related commodity is drugs. To date, the dominant policy has been for developing country governments to enforce production bans, whereas the penalties for consumption in developed countries have been relatively modest. This combination has permitted high demand while eliminating legitimate supplies and so has produced very high prices. These high prices have in turn created a high demand for territory outside the control of recognized governments on which drugs can be cultivated: in effect, rebel organizations can be *rentiers* of land for drug production. There are alternatives to present policies. For example, for many years Britain operated a policy of legal supplies for registered addicts. In turn, legal consumption permits legal production and so avoids a premium for territory outside the control of governments. Obviously, drugs policy in developed countries cannot be set solely, or even primarily, with a view to its effect on the risk of conflict in developing countries. Its primary purpose is to curtail addiction. However, it is worth noting that during the period of legal consumption by addicts addiction rates were far lower than under subsequent policy regimes.

Finally, I consider the extent to which aid can be used to offset the high risks of conflict that Africa faces from primary commodity dependence. The scope for using aid to reduce conflict risk arises because conflict risk is reduced by growth, while in many countries aid can accelerate growth. On average, each one percentage point increase in growth rates reduces conflict risk by around a tenth for the typical developing country. However, aid can be much more effective than this suggests because aid effectiveness in the growth process is atypically high in a class of country where the risk of conflict is atypically high, namely post-conflict countries.

Post-conflict societies face extraordinarily high risks of repeat conflict. Hoeffler and I find that risks gradually fade if peace is maintained, but that immediately after the end of a conflict there is over a 50% change that conflict will recommence during the first decade. Hoeffler and I have investigated the efficacy of aid in the post-conflict growth process. Such societies have atypical needs and so it is quite possible that aid plays a distinctive role. We find that for the first three years post-conflict aid is no more effective than in other societies: perhaps exceptional needs are fully offset by exceptional difficulties of aid absorption. However, for the subsequent four years aid is exceptionally effective. Table 4 reproduces the core result (Collier and Hoeffler, 2002). The dummy variable for the post-conflict period is statistically significant and substantial when interacted with aid. Aid is far more effective in raising growth than in other societies: returning to the concept of the saturation point, saturation occurs at double its level in other societies. Historically, aid allocations have not responded to the needs and opportunities of post-conflict societies, especially in Africa. Aid has typically not been higher during the first decade post-conflict, and even where it initially increases, it is usually being phased out by the fourth post-conflict year.

Table 4: Aid and Growth Post Conflict

	(1)	(2)	(3)	(4)
Initial per capita income	0.718 (0.627)	0.715 (0.621)	0.717 (0.618)	0.712 (0.617)
Governance (ICRGE) capita	0.196 (0.160)	0.197 (0.157)	0.198 (0.157)	0.172 (0.155)
Odacpiac (ODA/GDP) ²	0.991 (0.397)**	0.991 (0.396)**	0.988 (0.390)**	1.021 (0.392)***
South Asia	0.134 (0.066)**	0.134 (0.066)**	0.134 (0.065)**	0.127 (0.064)*
East Asia	-0.028 (0.012)**	-0.028 (0.012)**	-0.028 (0.012)**	-0.028 (0.012)**
Sub-Saharan Africa	2.614 (0.644)***	2.611 (0.639)***	2.619 (0.625)***	2.662 (0.620)***
Middle East/North Africa	2.891 (0.663)***	2.889 (0.660)***	2.884 (0.660)***	2.880 (0.660)***
Europe/Central Asia	-0.440 (0.821)	-0.442 (0.817)	-0.442 (0.816)	-0.366 (0.809)
post-conflict 1	1.590 (0.568)***	1.591 (0.567)***	1.589 (0.567)***	1.606 (0.563)***
post-conflict 1 x CPIA	-0.400 (1.059)	-0.402 (1.056)	-0.403 (1.054)	-0.365 (1.053)
post-conflict 1 x (ODA/GDP) ²	1.385 (3.237)	1.445 (3.073)	0.913 (0.755)	
post-conflict 1 x (ODA/GDP) x CPIA	-0.186 (1.011)	-0.180 (1.019)		
Observations	0.168 (0.330)	0.141 (0.042)***	0.139 (0.041)***	0.186 (0.046)***
p.-conflict obs.	344	344	344	344
R ²	13	13	13	13
	0.38	0.38	0.38	0.38

Note: Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions include time dummies which are jointly significant.

5. Conclusion

Africa has stayed dependent upon primary commodity exports over a period in which other developing regions have diversified to a spectacular extent. Evidently, Africa currently has a strong comparative advantage in such activities. Unfortunately, globally, primary commodity dependence creates severe problems and Africa has not escaped from this pattern. I have suggested that either the continent needs to diversify, as other regions have done, or it needs to be able to live better with continued dependence. I have considered both of these options. In a sense, however, these are not alternatives.

Regardless of whether the continent eventually succeeds in diversifying, it is important that the global patterns that have linked primary commodity dependence to shocks, poor governance and conflict be changed. Since these are global relationships, it seems unlikely that the solutions will come solely from within Africa, and so I have focused on how international policies can improve the consequences of dependence upon primary commodities. For each of the three problems there are relatively simple strategies that have not, to date, been adopted. I hope that as our awareness of these opportunities increases, the global institutions will take action.

Regardless of whether the consequences of primary commodity dependence can be improved, it is sensible for some African countries to attempt to diversify into manufactures or services. Some of the coastal countries, such as Nigeria, simply lack the land and natural resources to support their large populations at a reasonable living standard other than by diversifying into manufactures. A landlocked, urbanized economy such as Zambia, faced with the imminent exhaustion of its copper reserves, would be well-advised to look to services. For such countries, my argument that they have been trapped in a vicious circle in which primary commodity dependence has created problems that permit only primary commodities to be competitive carries a hopeful message. By coordinated policy improvement it may be possible to improve the investment climate sufficiently to break out of the trap. Alternatively, relatively simple policy changes may enable Africa to break into the new trade in services, a sector that, like natural resources and agriculture, may be relatively insensitive to the problems generated by primary commodities.

Figure 1: Trends in the Incidence of Civil War

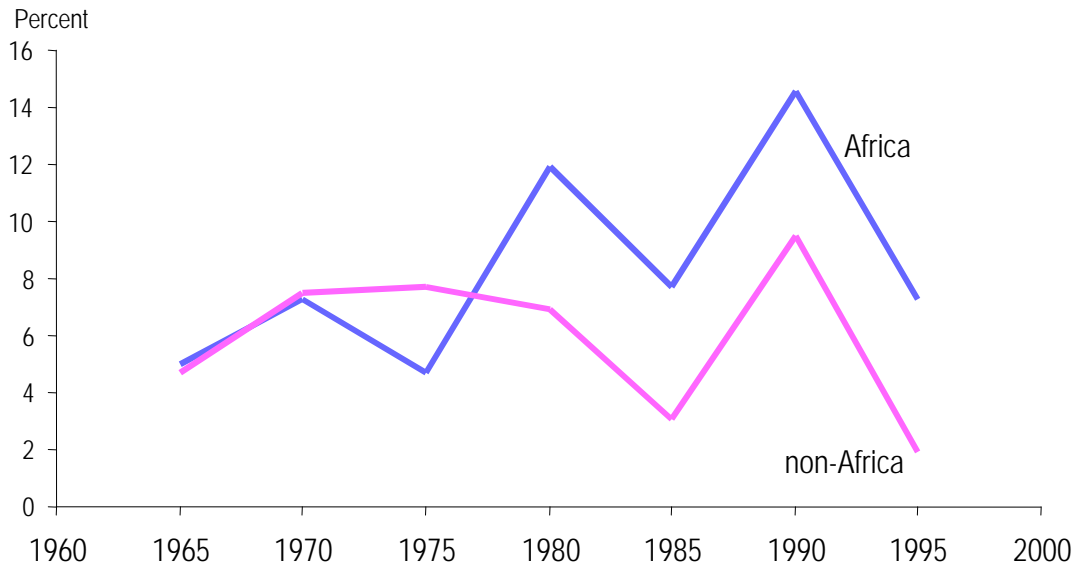
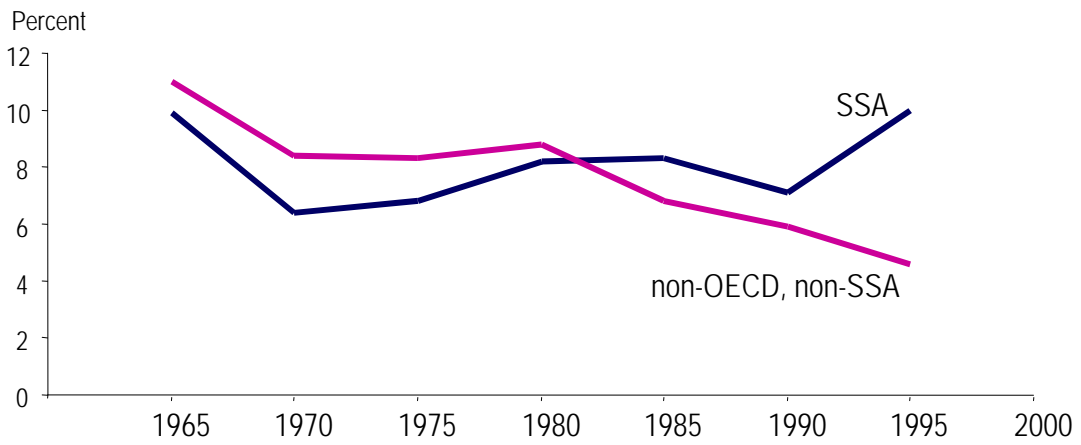


Figure 2: Predicted Incidence of Civil War



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