

Prospects for Commodity Exporters: Hunky Dory or Humpty Dumpty?

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1. Introduction

Those low-income countries that export non-agricultural commodities are in the midst of a resource transfer. It is undoubtedly the biggest opportunity for transformative development that these societies have experienced, dwarfing both aid and previous commodity booms. To get it in proportion, in 2004 commodity exports from Sub-Saharan Africa accounted for 146 billion US dollars or 28 percent of the region's GDP, while aid amounted to 5 percent of GDP. Compared with the boom of the 1970s many more countries are beneficiaries: the push to diversify sources of supply has resulted in exploitable discoveries in places that were previously political no-go areas. Further, whereas the boom of the 1970s was conjured up by the OPEC cartel, this one is grounded in Asian growth and so is intrinsically less precarious. In this paper we draw on a range of new research that provides a prognosis of prospects, a diagnostic of likely problems, and prescribes an agenda for international action. The paper is organized around these three objectives.

2. Prognosis

Our prognosis concerns the *consequences* of high commodity prices rather than a forecast of the path of prices. However, the consequences cannot entirely be separated from some view as to how prices will evolve. The statistical analysis of non-agricultural commodity prices finds it difficult to reject the random walk hypothesis that prices will gyrate around their present levels. Although there is also some evidence of mean reversion, in view of the spectacular growth of Asia there seems little reason to expect that in the near term prices will significantly decline. In what follows we assume that on average prices remain at present levels but that they continue to be highly volatile. A major advantage of this assumption is its neutrality: our prognosis for the prospect of commodity exporters is not driven off any forecast change in prices. To the extent that the reader has priors on the likely path of prices that differ from the neutrality assumption the implications can readily be factored into the subsequent analysis.

Our prognosis of the consequences of the recent rise in commodity prices is based on statistical analysis (Collier and Goderis, 2007). Ours is not the first statistical analysis but it is the first to deploy the modern technique of co-integration. The two most influential previous studies were by Sachs and Warner (1995, 2001) and Deaton and Miller (1995). Sachs and Warner based their analysis on a cross-section comparison of average growth rates. Using this approach they claimed to find a 'resource curse', a result that echoed much of the case study literature. However, the cross-section approach faces severe limitations and is treated with considerable scepticism by many economists. As if to reinforce the doubts of the sceptics, Deaton and Miller's time series analysis reached precisely the opposite conclusion: the effects of commodity booms looked to be entirely benign. However, an acknowledged limitation of the vector auto-regression (VAR) technique deployed by Deaton and Miller is that it cannot investigate long term effects: the horizon of the analysis is around six years following the price shock. An advantage of the co-integration technology is that it enables us to tease out both the short term relationship between commodity prices and growth, and the longer term relationship

between commodity prices and the level of income. This advantage turns out to be decisive. In fact, we are able to reconcile the apparent contradiction between the Deaton and Miller results on the one hand, and the Sachs and Warner and case study results on the other: both are correct, but within different time frames.

Our statistical analysis includes all the countries in the world for which there are data and covers the period 1970-2004. We subject our results to a wide range of statistical tests and demonstrate that they are robust. However, in this paper we do not attempt to discuss our statistical methods in any detail. As with all statistical analysis our results are likely to be qualified and improved upon by other researchers, but we are confident that our key results described here will prove robust. For a detailed discussion of our methods the reader is referred to our technical paper.

We find that in the short-term commodity booms have positive effects on growth in commodity exporting countries. Figure 1 depicts the consequences for the growth of constant price GDP in the typical commodity-exporting country. It shows the short-term effect of a shock to our index of commodity export prices (solid line) and the 95% confidence interval of our estimate (dashed lines). The contemporaneous effect of the price shock is to increase the growth rate by 0.016 percentage points for each percentage point increase in prices. Thus, if prices were previously constant and now increase by 10%, real output will increase in that year by 0.16%. Most of the growth effect occurs with a lag: by three years after the price shock these lagged effects have cumulated to around 0.5% of GDP. Of course, these effects on real output are the icing on the cake of the price increase, since the predominant short term effect will be through the income gain from the improvement in the terms of trade. For example, for a country with commodity exports worth 10% of GDP the 10% price increase will yield a one percentage point direct increase in real income over-and-above any gains in real output. Hence, in the short-term commodity booms are benign both in terms of output and income, a finding that is consistent with Deaton and Miller.

We also investigate the long-run effect of commodity booms for three different types of commodities: oil, non-oil non-agricultural commodities, and agricultural commodities. We allow this long-run effect to be proportional to a country's exposure. In other words, countries with relatively higher shares of commodity exports in GDP are likely to experience stronger effects of commodity prices. Figure 2 shows the long-run effects. Panel A illustrates the effect of higher oil prices on long-run GDP levels for different shares of oil exports in GDP. The effect is negative for all countries with exports of 3% of GDP and higher and is substantial. For a country like Nigeria, which has net oil exports of 34 percent of GDP, the results predict a long-run elasticity of -0.5. In other words, a 10 percent increase in the price of oil leads to a 5.0 % lower long-run level of Nigerian GDP per capita. For a country like Angola, with net oil exports of 64 percent of GDP, the effect is even more severe: a 10 percent increase in the price of oil leads to a 9.9% lower level of GDP per capita. Figure 2, panel B, shows the long-run effect of higher non-oil, non-agricultural commodity export prices. The results are similar to the results for oil. We again find evidence of a significant adverse effect of commodity prices on long-run GDP. Examples of countries that depend on this class of export commodities

are Mauritania (22% of GDP) and Zambia (34% of GDP). For Mauritania, the results in panel B of Figure 2 predict a long-run elasticity of -0.80. In other words, a 10 percent increase in the price of non-oil, non-agricultural commodities, causes an 8.0 percent lower level of per capita GDP. These results clearly suggest the existence of a long-run “resource curse”, consistent with the results of Sachs and Warner. We test whether the resource curse also applies to agricultural commodities but find that this is not the case. Figure 2, panel C, shows that the long-run effect of higher agricultural commodity prices is positive, although statistically insignificant. Hence, the resource curse is confined to non-agricultural commodities.³

In the process of establishing the relationship between commodity prices and the growth of commodity-exporting countries we investigated whether Africa has differed from the rest of the world. We find that there has been no significant difference: Africa is distinctive in being more dependent upon commodity exports than other regions bar the Middle East, but the consequences have been the same. This enables us to apply our results directly to a simulation of the consequences of the recent increase in non-agricultural commodity prices for Africa’s fourteen major commodity exporting countries (Figure 3). This price increase far exceeded the 10% price increase that we used in the examples above. Between 1996 and 2006 the price of oil more than tripled and the price of other non-agricultural commodity exports of these countries on average more than doubled (Figure 4). The consequences of these increases are both important in themselves and are a convenient way of grasping the implications of the more general results of our analysis.

We find that in the short term the commodity booms have added considerably to the growth rate of Africa’s commodity exporters. By 2009 the *constant price* GDP of these countries will be around 10% higher than had prices remained at their levels of the late 1990s. Of course, incomes rise by much more than this: the 10% gain is a quantity effect and onto this must be added the terms of trade gain. For a country that was initially exporting 30% of GDP, a doubling of export prices directly adds 30% to income, so that the combined quantity and price effects amount to around a 40% gain relative to counterfactual. Thus, in the short term the prospects are decidedly hunky-dory.

But in the long term the story is entirely different. The adverse effects of the commodity boom set in only slowly, but by 2024 constant price GDP is *down 25%* relative to counterfactual. That is, setting counterfactual GDP at 100, by 2009 it is 110, but by 2025 it is only 75. Again, the constant price story is only part of the overall effect on income: as long as prices remain high there is still the 30% gain due to the terms of trade, so that income is 98% of its counterfactual (75×1.30). So, as long as the boom lasts it does not significantly impoverish: incomes are just two percent lower than they would otherwise have been. But the inconsequential net effect on income glosses over a growth disaster: far from a developmental transformation, the commodity boom massively contracts economic activity.

³ Our dataset includes the following non-agricultural commodities: aluminum, coal, copper, gasoline, ironore, lead, natural gas, nickel, oil, phosphatrock, silver, uranium, urea, tin, and zinc.

This, then, is the prognosis: the resource curse hypothesis is correct. If global history repeats itself, far from the present commodity booms delivering on the unprecedented opportunity for transformative development, they will prove disastrous. It is thus of first order importance that history should not be repeated. The first step in avoiding a repetition is to understand the mechanisms by which past opportunities turned to dust.

3. Diagnosis

There is no shortage of contending explanations for the resource curse. Our approach enables us not only to generate a prognosis but to discriminate among competing diagnoses. The first contender we consider is perhaps the most familiar to economists: Dutch disease. A boom in commodity exports will inevitably appreciate the real exchange rate and there is now reasonable evidence that an appreciated real exchange rate dampens growth. At least qualitatively, Dutch disease therefore looks a likely explanation. It is a simple matter to test it by adding the real exchange rate to our analysis. While it is indeed sometimes statistically significant, the scale of the effect is trivial relative to the scale of the resource curse: Dutch disease is not the explanation for what goes wrong.

One clue to the key mechanisms comes from the comparison of the effects of agricultural and non-agricultural commodity price booms. Both types of commodities have large price shocks, but the long term consequences of the agricultural price shocks are benign. The resource curse is entirely confined to the non-agricultural commodities. One key difference between agricultural and non-agricultural commodities is the scale of the rents generated by production. Because agricultural commodities can be produced in many different locations rents are competed away, whereas the extraction of non-agricultural commodities depends upon where they can be found and so is consistent with high location-specific rents. Rents are something that governments can, should and do tax. Hence, revenues from non-agricultural commodities largely accrue to governments, whereas revenues from agricultural commodities largely accrue to farmers. This at least suggests that the resource curse might be connected with something that is specific to the public management of revenues.

We are able to test this suggestion more formally by adding a measure of the quality of governance to our analysis. Governance is, of course, a slippery concept to measure. We rely upon the International Country Risk Guide (ICRG), which is a commercial rating done annually and sold to international companies. That the ICRG has survived for many years as a business suggests that the ratings that it sells have some informational content. We find that, so measured, governance really matters. Essentially, if a country starts out with really strong governance then far from there being a resource curse, the long run effects of high commodity prices reinforce the short run effects. The resource curse is confined to countries that start from weak governance. How strong is 'strong', and how weak is 'weak'? The boundary is around the sort of governance that Botswana has had. Despite being routinely held up as Africa's shining example of good governance,

Botswana is rated as falling well short of OECD levels of governance. For example, although the country has many democratic features, there has never been an alternation of power. However, Botswana is indeed on many dimensions better governed than other low-income commodity exporters. It is one of the very few commodity exporters to have harnessed the revenues for growth: it has transformed itself from an impoverished landlocked desert, to mainland Africa's most prosperous society. So, on this diagnosis, it is initial differences in governance that account for why oil has enhanced the Norwegian economy while wrecking the Nigerian economy.

But 'governance' remains a very imprecise concept. By what routes does poor governance dissipate the opportunities provided by resource revenues? Again, our statistical approach enables us to track down answers. We add controls for possible mechanisms until we find mechanisms that are themselves significant and which collectively eliminate the significance of governance. We find that the key mechanisms work through excess public and private consumption, and insufficient investment. There is also evidence that dependence upon natural resource exports increases the risk of violent conflict, something currently evident from the Nigerian Delta. The connection between natural resource exports and proneness to civil war is indeed already well-established both through manifest examples of resource wars (Klare, 2002), and statistically (Collier and Hoeffler, 2004). Although consumption and investment largely 'account' for the governance effect in the statistical sense, they are not exhaustive. It is difficult to build good empirical proxies that are available for many countries over many years, and so our statistical approach is inevitably highly constrained. Most probably, the measurable routes proxy other processes that are correlated but not measurable. For example, we are not able to incorporate redistributions to favoured groups.

If poor governance is the key to the resource curse, is history likely to repeat itself? One potentially very hopeful difference between Africa now and Africa during the resource boom of the 1970s is that following the fall of the Soviet Union it became considerably more democratic. Quite possibly, democratization has increased government accountability and so improved governance. This hypothesis is tested in Collier and Hoeffler (2006). Specifically, the paper investigates whether democracy improves the economic performance of resource-rich countries. Unfortunately, it finds that on the contrary, democracy appears to worsen performance, an effect which is entirely confined to those countries which are resource-rich. Collier and Hoeffler suggest that what happens is that with large resource revenues governments do not need to tax and so avoid provoking their citizens into scrutiny. Instead, electoral competition merely drives governments into the politics of bribery and patronage. Consistent with this, they find that when democracy is decomposed into electoral competition and checks and balances, the former is detrimental in resource-rich countries whereas the latter are beneficial. Resource-rich democracies need atypically strong checks and balances, but usually they actually get atypically weak ones: governments have little incentive to build restraints upon themselves and citizens are not provoked by taxes into demanding them. 'No taxation without representation' translates into 'no accountability without taxation'. Vicente (2007) analyzes a remarkable 'natural experiment' for the impact of an oil discovery in a low-income African democracy. His approach is to compare two West

African islands, Cap Verde and Sao Tome, both formerly Portuguese, and both democratic. He tracks the impact of the discovery of oil in Sao Tome, using Cap Verde as a natural control, and shows that following the oil discovery corruption rapidly increased in Sao Tome relative to Cap Verde.

Consistent with both Collier and Hoeffler and Vicente, although Africa has become more democratic, its average ICRG corruption rating has not improved: that for 2004 was the worst for twenty years. Hence, reliance upon Africa's recent progress towards democracy to deliver decisively better management of the resource revenues appears to be misplaced.

As noted in the Introduction, the thrust for diversification away from the Middle East has led to a rush of resource discoveries in the most weakly governed societies since these were precisely the locations where resources remained unexploited. Not only does this not augur well for the management of the resource booms in these societies, a study by Chauvet and Collier (2006) suggests that it risks chilling incipient efforts at reform. Chauvet and Collier investigate the process of reform of policies and governance in those low-income societies where both are initially very poor. They use two measures for policies and governance, one being the ICRG and the other the Country Policy and Institutional Assessment (CPIA) of the World Bank, which is also an annual rating system. They focus upon situations in which modest improvements are already happening and investigate what happens if at this point the country's commodity exports experience a price boom. They find that there is a large and highly significant 'reform chilling' effect. Commodity booms derail reform, presumably by removing the need for the elite to accept change.

History can be presumed to be liable to repeat itself unless there is something that systematically induces different behaviour. So far, we have suggested that recent democratization is not likely to provide this systematic change, and that the undoubted reform efforts that are underway in many African societies risk being derailed. However, there is one reason to expect systematically improved behaviour: learning from past mistakes. This depends upon Africans themselves drawing the right lessons. Indeed many have done so: for example, in the graphic words of former Nigerian finance minister Ngozi Nkonjo-Iweala spoken on global television: 'last time we messed up; this time we're not going to'. However, such learning depends upon sound analysis. It is easy for citizens to misread the lessons of mismanaged commodity booms because the chickens only come home to roost long after the mistakes have been made. For example, most Nigerians blame their continued poverty not on the mismanagement of the 1973-86 oil boom, but on the 'Structural Adjustment Programme' launched by the World Bank as a response to the crisis of 1986 when the crash in oil prices ended the borrowing spree that had reinforced the price boom. This misjudgement is unsurprising: during the much trumpeted reform programme, though not of course due to it, living standards virtually halved.

The need for learning is not confined to the societies that are directly confronted by the resource windfalls. The international community also needs to learn from the past

spectacular failures in the policy advisory process. It is not that the international community in general and the international financial institutions in particular gave seriously wrong advice. There were most surely mistakes in the content of advice, partly because the basic theory of successful management was only in the process of being worked out by the academic community. However, the vital mistakes were not in content but in style of delivery. Advice was ad hoc, and it was discreet. As such it could be easily ignored. What was missing was a public 'template', a set of public guidelines, standards and codes that a government could readily accept as international best practice, and that if it ignored it would know would mean publicly flouting those accepted standards before its peers and its own citizens. What is needed, urgently, is not a *rule* – that would clearly produce indignant reaction – but a set of voluntary guidelines which would form the basis for sensible choices. And so we turn from diagnosis to prescription.

4. Prescription

Consider a newly resource-rich low-income country with initially fairly poor governance. All around West Africa there are examples of such countries: for example, Chad, Mauritania, Cote d'Ivoire, Guinea, Angola, and Sao Tome and Principe. What are the critical decisions that it must get reasonably right in order to harness the revenues for growth?

The first step is that the rents from the resource extraction must be properly captured by the government. This involves both the initial sale of the rights to extraction and the tax regime. At present the norm is for rights to be sold in a climate of secrecy, with the negotiations conducted by individual ministers with individual companies. Manifestly, this is a recipe for the government to achieve a highly disadvantageous deal. Individual ministers can be bribed into accepting bad terms for individual gain, and are unlikely even to be aware of how disadvantageous the deal is because of the lack of transparent competition. To give an extreme example of the scale of the problem, the transitional government of DRC sold rights to resource extraction that is estimated to be running at around \$200m per year. In 2006 the government budget received royalty payments of a mere \$86,000.

Clearly, the proper way for a government to maximize its revenues is for it to sell rights through some form of auction. The precise design of the auction needs to be tailored to circumstances, although Cramton proposes that a 'clock-proxy' auction is often likely to be appropriate (Cramton, 2007). Of course, an auction is no stronger than the integrity with which it is conducted. The international financial institutions could usefully provide both guidelines on how to design an auction and a verification process for certifying its probity analogous to the long-established system of international verification for elections. How else are reformers expected to know what to do during their moments of influence, and how else are citizens going to know enough to hold their government to account? Similarly, tax regimes are currently often quite spectacularly inappropriate. For example, the government of Zambia is getting virtually nothing out of the current copper boom. The British government has adjusted the tax regime on North Sea oil every couple of years for the past thirty years: there is simply no basis in international practice for

governments to remain committed to acutely disadvantageous tax regimes that were often introduced in circumstances of corruption and ignorance.

The second step is transparency in the reporting of revenues: citizens must be able to find out what revenues are being paid to whom. This is the domain of the Extractive Industries Transparency Initiative (EITI), which has just become a fully-fledged international organization with a secretariat based in Norway. This was the right place to start efforts to prevent history repeating itself, though it would be the wrong place to stop.

The third step concerns the savings decision. There is currently real confusion as to what is the appropriate model to follow. Some low-income commodity exporters such as Timor Leste and Chad are trying to follow the Norwegian-Kuwaiti 'future generations fund' model in which savings are accumulated as financial assets in New York, others have investment booms, and others consumption booms. The Norwegian model is likely to be doubly inappropriate for low-income countries with weak governance. It is an error in economic terms since, unlike Norway, low-income countries need to accumulate real capital within their economies. It is a political folly since the chances of a liquid fund held in New York surviving to a future generation rather than being held up by a successor government are slim indeed. However, there is a clear need for a medium-term expenditure smoothing rule in the face of continued price volatility. A simple example is to link spending to a moving average of the world price.

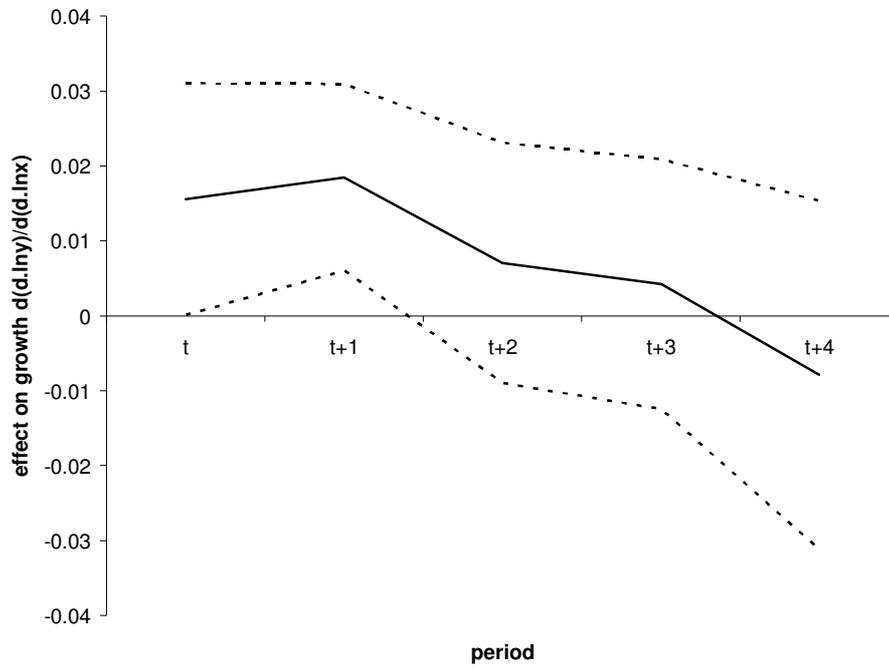
The fourth step concerns the processes for managing public investment. Typically, spending is neither honest nor efficient. When the reform team in Nigeria introduced compulsory competitive tendering for public contracts costs fell 40%. But honesty is not enough. Without sound technical assessment of rates of return and a political mechanism for taking decisions guided by these assessments money can be poured into populist glamour projects that land the society with a long term liability. Africa is littered with such monuments to poor decision taking.

Would guidelines, standards and codes on these four issues help? When Timor Leste became independent in 2001, the new government swiftly recognized the severe limits to their knowledge of how to manage prospective resource revenues and so had already sent a team to learn from a more experienced government. Their criteria for selecting a tutor government were that it should have significant oil revenues and that it should speak the same language. Sensible though these criteria sound, since the language in question was Portuguese the consequence was that the team was sent to Angola. Had a set of international guidelines already existed the new government would most probably have been willing to adopt it. After all, in the end they decided to copy Norway rather than Angola, a decision which though not optimal was certainly preferable. Guidelines can be ignored, but often they won't be. Its time we had some. This does not mean a thousand page technical manual, which satisfies the intellectual aspirations of IFI staff, but a short paper, perhaps combined with a simple on-line toolkit, that both civil servants and civil society can reasonably aspire to master. Would it be perfect? No? Would it be an improvement on a repeat of history? Decidedly.

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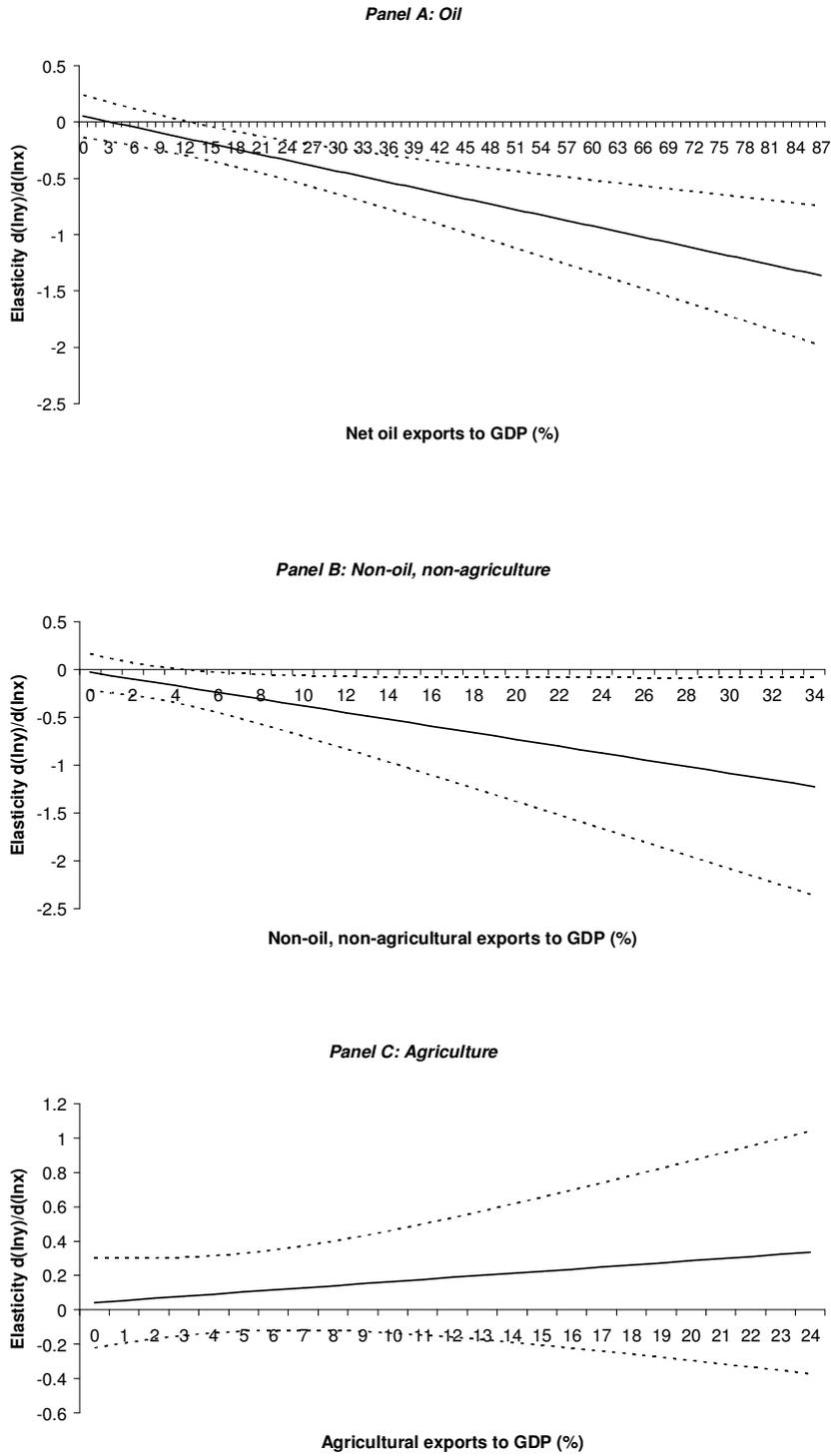
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Figure 1: The short-run effect of commodity export prices on gdp per capita



Source: Collier and Goderis (2007)

Figure 2: The long-run effect of oil, non-oil non-agricultural, and agricultural commodity export prices on gdp per capita



Source: Collier and Goderis (2007)

Figure 3: Commodity exports in 14 major Sub-Saharan African exporters

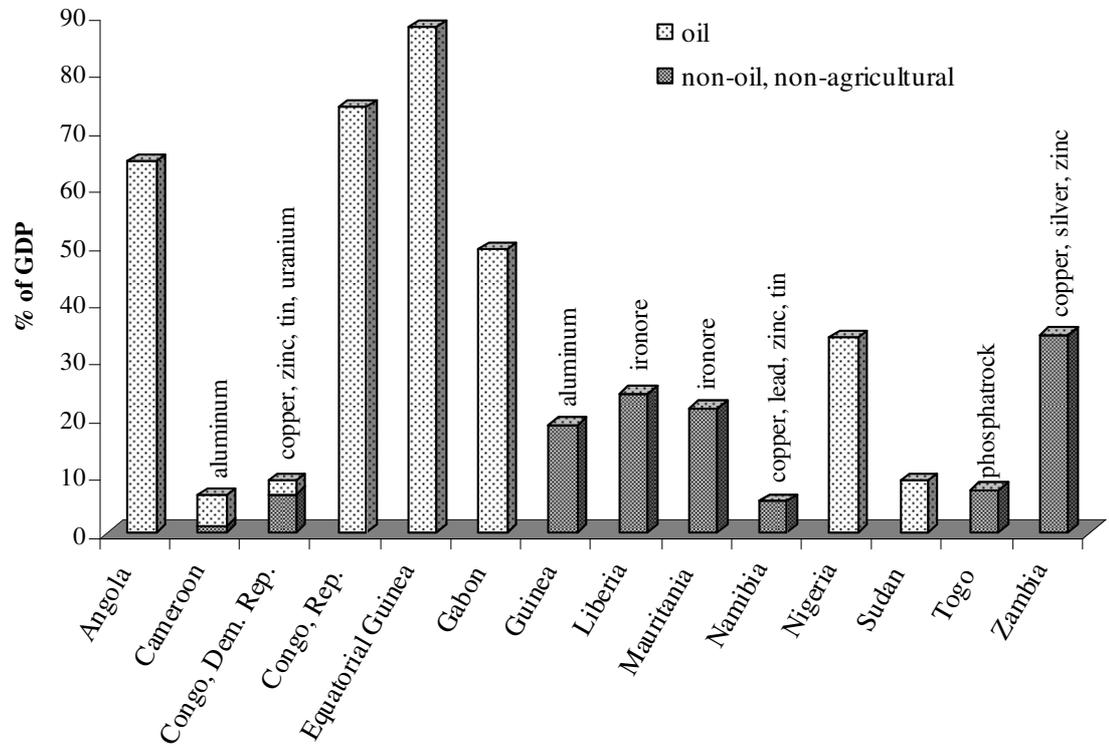


Figure 4: The current commodity boom in Africa

