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Lee Robinson* and **Alice N. Sindzingre****[1]

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Abstract

The spectacular growth of China has induced major changes for developing countries, in particular low-income Sub-Saharan African economies. Most of these economies heavily depend on primary commodities for their exports, and China's demand for these commodities, especially oil and metals, has contributed to a long cycle of increase in commodity prices (the 'supercycle' of the 2000s), but also to increased price volatility. China has also become a significant trade partner of Sub-Saharan African economies, and invested significantly in Sub-Saharan Africa. A theoretical question is therefore whether these changes may generate structural transformation and trigger sustained growth paths in Sub-Saharan countries. The paper shows that the transmission channels of China's impact on growth prospects in Sub-Saharan African economies are multiple, both direct and indirect, and underscores the ambivalence of these impacts: i) high commodity prices have the potential to improve fiscal space, creating opportunities to catalyse diversification and structural transformation. Moreover, Chinese investments occur not only in the commodity sectors but also in industrial sectors and infrastructure; ii) however, higher and more volatile commodity prices, driven by China, can result in negative effects (e.g., Dutch disease). Furthermore, China's demand may lock African economies into their century-old pattern of dependence on primary commodities. Large Chinese investments (especially in infrastructures) may also have lock-in effects, as they are organised by original contracts that exchange investments for commodities; iii) it is particular commodity and industry factors that affect an individual country's ability to harness opportunities created by high commodity prices, which is demonstrated via the case study of Zambia.

Keywords: China; Sub-Saharan Africa; commodities; trade; foreign direct investment

JEL Classification: 01; 053; 055; F14.

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1. Introduction[2]

The spectacular growth of China has induced major changes for developing countries, in particular low-income Sub-Saharan African economies. Firstly, most of these economies heavily depend on primary commodities for their exports, and China's demand for these commodities, especially oil and metals, has contributed to a long cycle of increase in commodity prices (the 'supercycle' of the 2000s) - but also to increased price volatility. Secondly, China has become a significant trade partner of Sub-Saharan African economies – often offering preferential trading concessions. Thirdly, China has also invested significantly in Sub-Saharan economies not only via its multinationals, but also via a great number of locally based medium-size enterprises. A theoretical question is therefore whether these changes may generate structural transformation and trigger sustained growth paths in Sub-Saharan countries.

The paper shows that the transmission channels of China's impact on growth prospects in Sub-Saharan African economies are multiple, both direct and indirect, and underscores the ambivalence of these impacts. The ambiguous Chinese impact on global trade and price dynamics is firstly presented as the broad context for an exposition of the ambiguous impact of China' trade and investment at the local level:

i) Sustained high commodity prices have the potential to improve fiscal space, creating opportunities to catalyse diversification, industrialisation and structural transformation. Moreover, Chinese investments occur not only in the commodity sectors but also in industrial sectors and infrastructure, which are likely to have a positive impact on growth and fiscal balances - as infrastructure is a key determinant of growth.

ii) However, higher and more volatile commodity prices, driven substantially by China, can result in negative effects (e.g., Dutch disease) in the context of weak institutions. Furthermore, China's demand may lock African economies into their century-old pattern of dependence on the export of primary commodities. Chinese imports from Sub-Saharan Africa are mostly commodities, whilst its exports to Africa – and indeed, the World – are manufactures. To African commodity producing countries, this represents colossal competition in a route out of traditional export structures. So through its demand and its competition, China potentially reinforces existing market and export structures. In addition, large Chinese investments (especially in infrastructures) may also have lock-in effects, as they are organised by original contracts that exchange investments for commodities (coined as the 'Angola model').

iii) In this context, it is particular commodity and industry factors that affect an individual country's ability to harness opportunities created by high commodity prices: these factors determine bargaining power over the price of resources, which ultimately determines how much of the country's endowments in primary resources is channelled domestically into long term growth. This is demonstrated via the case study of Zambia –

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[2] A fist version of this paper was presented at the Annual Conference of the Chinese Economic Association (UK/Europe), 23rd CEA (UK)/4th CEA (Europe 'The Chinese Way of Economic Reform and Development in the Context of Globalization', Department of Financial and Management Studies (DeFiMS) and Centre of China Studies (CCS), School of Oriental and African Studies, London, 2-3 April 2012. Elements were also presented at the 4th European Conference on African Studies (ECAS 4), Nordic Africa Institute, Uppsala, 15-18 June 2011; CoReach Workshop, University of Nottingham, 12-13 September 2011; and 4th Congress of the Asia and Pacific Network, Paris, 14-16 September 2011.

an oft-cited focal point for Sino-African relations: because of the large asymmetry of power between the Zambian government and the incoming investors when the copper sector was privatised, the windfalls of the copper price boom are largely appropriated by foreign multinationals, Western and Chinese, due to attractive taxation and regulatory terms. At this local level too there is ambivalence regarding China's impact, apparent in how bargaining with the main Chinese mining multinationals yielded a different outcome than bargaining with Western multinationals. Chinese multinationals have a poor record in reinvestment of mineral wealth into wages and human capital upgrading. However, they may have facilitated transforming Zambia's mineral wealth into structural growth determinants more than Western multinationals.

The paper is structured as follows. Firstly, it presents the key characteristic of Sub-Saharan African countries, i.e. a specific export structure that is based on a very limited number of commodities. Secondly, it analyses the intensification of China's trade and investment relationships with Sub-Saharan African countries and reveals the ambiguity of their effects. Thirdly, it demonstrates via the example of Zambia that the channels and impacts of China are *in fine* shaped by recipient country specific characteristics. Its conclusion synthesises the argument regarding the ambivalence of China's impact: the impact of China on commodity dependent countries cannot be categorically defined as solely positive or negative.

2. A key characteristic of Sub-Saharan African countries' export structure: commodity dependence

2.1. Commodity dependence in Sub-Saharan African countries

Sub-Saharan African (SSA) economies display a key characteristic, which explain the specificities of these countries' relationships with China: their market and export structures are heavily dependent on primary commodities, which is a central factor of SSA disappointing growth performances due to commodity prices' inherent volatility.

Growth performances of many SSA countries since the second half of the 2000s onwards are mostly driven by commodity prices movements and such performances therefore remain fragile. Moreover, earnings volatility strongly contributes for the formation of poverty traps.

The composition of exports of Sub-Saharan African countries: prevalence of commodities, narrow industrial sectors

A characteristic of Sub-Saharan African economies is a specific market and export structure, where exports include an important proportion of raw materials, be they fuels, minerals and agricultural, South Africa obviously being a special case.

Before one even considers the problems stemming from commodity price dynamics (considered below), it can be noted that specialisation in raw materials offers fewer growth opportunities than specialisation in more complex products. Elementary trade

theory predicts all round gains from trade when countries specialise. For many SSA countries, resource and land endowments mean their comparative advantage is in raw materials. Yet these have relatively little value added compared to manufactures or processed commodities. Whilst preferable to autarky, exporting raw materials is still a low income activity and all countries that have grown rich have experienced structural changes in their economy that have shifted their comparative advantage to include sectors with higher value added.

At a global level, SSA has specialised in the export of commodities. The share of commodities in total exports is the highest in SSA in comparison with other regions (Canuto and Giugale, 2010).

According to the World Bank's *World Development Indicators* (2004, 2011, table 4.4), in SSA, in 2009, fuels represented 37% of total merchandise exports; manufactures, 31%; ores and metals, 15%; food, 14%; and agricultural raw materials, 3%. This export composition is remarkably stable – but, significantly, with a decline in manufactures and an increasing share of fuels -: in 2001, manufactures represented 33% of exports, fuels, 31%, food, 16%; ores and metals, 8%; and agricultural raw materials, 6%.

Table 1: Structure of merchandise exports of Sub-Saharan African countries, 1995-2009

	Food (% of total)		**Agricultural raw materials (% of total)**		**Fuels (% of total)**		**Ores and metals (% of total)**		**Manufactures (% of total)**	
	1995	**2009**	**1995**	**2009**	**1995**	**2009**	**1995**	**2009**	**1995**	**2009**
Low- and middle income SSA countries*	**18**	**14**	**7**	**3**	**36**	**37**	**8**	**15**	**28**	**31**
Memo items										
Low-income countries	31	25	10	8	2	3	11	14	44	50
East Asia and Pacific	11	8	4	2	6	8	2	2	74	80
Latin America and Caribbean	20	18	3	2	15	20	7	8	55	51
South Asia	17	11	2	1	1	11	3	5	76	68
SSA low-income countries§										
Burkina Faso	25	27	69	60	0	0	0	1	6	12
Burundi	91	67	4	5	0	2	1	5	3	21
Ethiopia	73	77	13	12	3	0	0	1	11	9
Guinea	8	2	1	5	0	2	67	59	24	32
Kenya	56	44	7	13	6	4	3	2	28	37
Madagascar	69	29	6	5	1	5	7	3	14	57
Malawi	90	87	2	4	0	0	0	1	7	9
Mali	23	28	75	42	0	6	0	1	2	22
Mozambique	66	23	16	3	2	17	2	4	13	12
Niger	17	18	1	4	0	2	80	69	1	7
Rwanda	57	42	16	2	0	0	12	32	14	19
Tanzania	65	35	23	10	0	1	0	25	10	25
Togo	19	16	42	9	0	0	32	13	7	62
Uganda	90	63	5	6	0	1	1	2	4	27
SSA lower-middle income countries§										
Côte d'Ivoire	63	48	20	6	10	30	0	0	7	15
Ghana	58	63	15	9	5	2	9	6	13	19
Mauritania	57	12	0	0	1	22	42	60	0	0

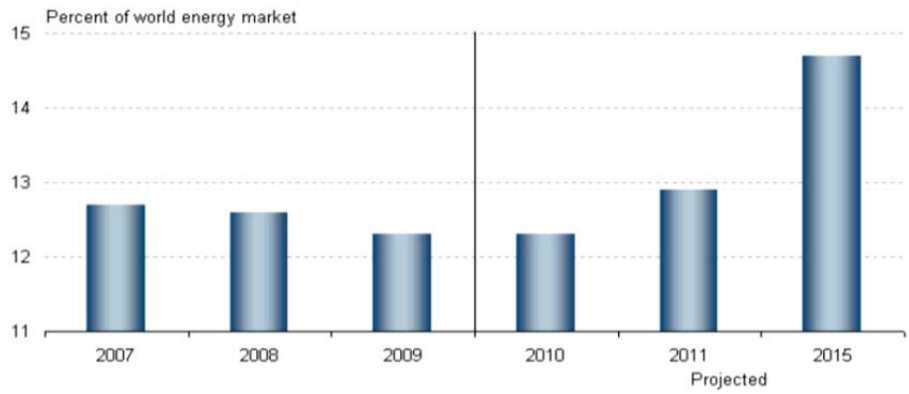
Nigeria	2	5	2	1	96	90	0	0	1	4
Senegal	9	30	7	1	22	24	12	3	48	41
Zambia	3	8	1	1	3	1	87	81	7	8

Source: adapted from World Bank World Development Indicators 2011, table 4.4. *: all SSA countries except Equatorial Guinea. §: data missing for most other countries. **Food**: SITC sections 0 (food and live animals), 1 (beverages and tobacco), and 4 (animal and vegetable oils and fats) and SITC division 22 (oil seeds, oil nuts, and oil kernels). **Agricultural raw materials**: SITC section 2 (crude materials except fuels), excluding divisions 22, 27 (crude fertilizers and minerals excluding coal, petroleum, and precious stones), and 28 (metalliferous ores and scrap). **Fuels**: SITC section 3 (mineral fuels). **Ores and metals**: SITC divisions 27, 28, and 68 (nonferrous metals). **Manufactures**: SITC sections 5 (chemicals), 6 (basic manufactures), 7 (machinery and transport equipment), and 8 (miscellaneous manufactured goods), excluding division 68.

An associated characteristic is the narrowness of the industrial base in SSA, with the exception of a few countries, notably South Africa and Kenya. Still according to the World Bank's *World Development Indicators* (2006, 2007, 2011, table 4.2), the structure of output in SSA was the following: in 1990, industry represented 34% of GDP; in 2005, 32% of GDP; in 2009, 30%. Manufacturing represented: in 1990, 17% of GDP; in 2005, 14% of GDP; and in 2009, 13% (with industry including mining, manufacturing, construction, electricity, water and gas).

An important point is that SSA is progressively becoming an oil–producing region. As mentioned above, fuels represented 37% of SSA exports in 2009. SSA oil producers are Angola, Cameroon, Chad, the Republic of Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, and Nigeria. As shown by the figure 1 below, SSA is expected to represent about 15% of global oil exports by 2015. Gas exports have also increased, with three significant exporters in SSA, Nigeria, Mozambique and Equatorial Guinea – in 2008 (from zero in 2004), in Equatorial Guinea, gas exports represented 10.5% of total exports, and in Mozambique, 36% (AfDB, 2010).

Figure 1: Africa's share of global oil market



Source: Wetherill (2010). Africa includes North Africa.

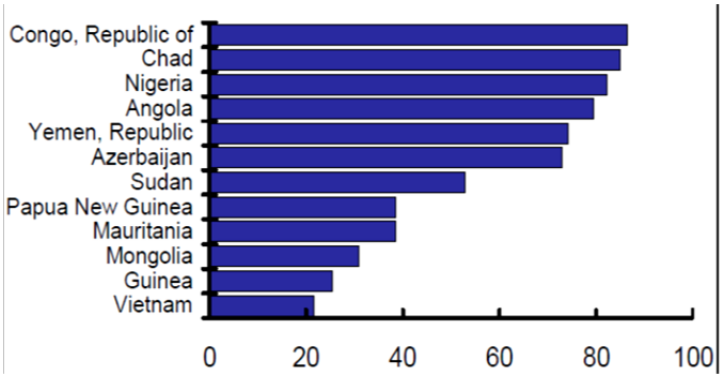
Given the specificities of oil markets in terms of price formation, financialisation – the trading of oil as a financial asset - and global political economy, this progressive transformation of SSA export structure towards the export of fuels has significant

consequences. As shown by a vast literature, oil-based export structures are typically prone to generate Dutch disease effects, with their well-known negative consequences on the non-booming sectors, in particular domestic agricultural and industrial sectors, i.e. deindustrialisation (Corden and Neary, 1982; Gelb *et al.,* 1988).

Moreover, an important issue is not only SSA countries' distorted export structure, which is based on a very limited number of unprocessed products, but also their fiscal structure. In SSA, fiscal revenues typically rely on the taxation of external trade, and most commodity–based economies, especially oil producers, rely on these few commodities for the largest part of the earnings, which make them very vulnerable to terms of trade shocks and commodity price volatility.

Figure 2 demonstrates this excessive dependence of government revenues on the export of commodities, with oil-exporting countries (Republic of Congo, Chad, Nigeria, Angola) being associated with high levels of fiscal dependence.

Figure 2: Commodity revenue to total revenue, 2008 (ratio, percent of total revenue)



Source: IMF (2009b).

Furthermore, the ease of administering these taxes also acts as a disincentive to develop a broader fiscal architecture which, in turn, reduces a government's accountability otherwise demanded in return for personal and company taxation (Isham *et al,* 2002). This can give rise to corruption, patrimonial politics and rent seeking that diverts entrepreneurial talent. The negative growth effects of corruption are well documented and inform the new conditionalities among IFIs and donors for 'getting governance right'.

The problem: Sub-Saharan African countries' disappointing growth performances

Sub-Saharan African countries are characterised by low levels of income and growth rates, and it is precisely the research question that is the subject of a large literature and heated debates: what are the common features of the growth trajectories of Sub-Saharan countries, and what are their determinants?

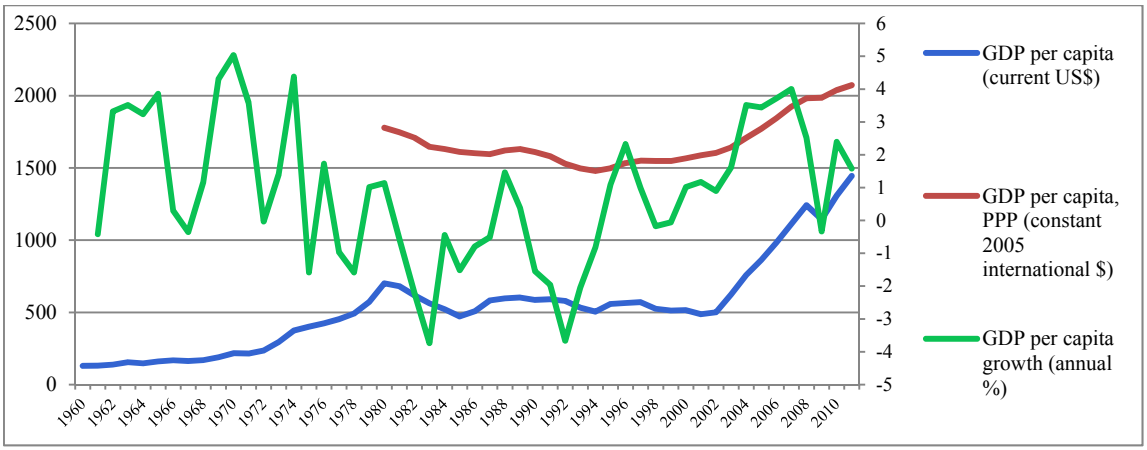
Assessments of the growth trajectories of SSA countries, however, depend on the time period analysed, as trends, cycles and salient facts may differ in the short- and the long-run (secular scale). According to Smits (2006), SSA economies did well during the

colonial era, and over the 20th century SSA exhibits more a 'rise and fall' growth pattern rather than permanent stagnation.

In addition, growth performances significantly vary across countries – growth profiles differ, for example, between oil exporters and oil importers, countries heavily relying on food imports and the others, landlocked and coastal countries, among others.

However, SSA is characterised by commonalities, in particular low incomes per capita and volatile growth rates: in 2011, most countries were classified by the World Bank as low-income (GNI per capita of 995$ or less) or lower-middle income economies (GNI per capita between 996 and 3945$) – only Botswana, Gabon, Mauritius, Namibia and South Africa being classified as upper-middle income economies[3].

Figure 3: GDP per capita (current and PPP constant 2005 US dollar) (left axis) and GDP per capita annual growth rate (right axis) in Sub-Saharan Africa, 1960-2011



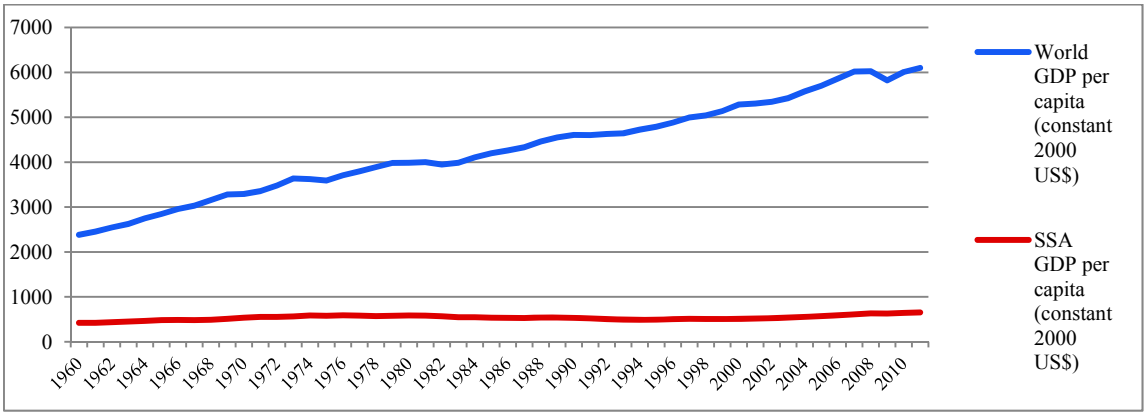
Source: World Bank World Development Indicators database, August 2012. PPP: purchasing power parity. For a similar graph underscoring the low level of GDP per capita and growth rates volatility, see Arbache and Page (2007).

Indeed, some SSA countries not only exhibit disappointing growth performances, but may possibly diverge vis-à-vis other regions and be locked in trapping processes: although Easterly (2005) argues that SSA growth rates have been positive in the second half of the 20th century, the combination of commodity dependence, poor infrastructure and weak institutions, however, may generate cumulative process and reinforce the ingredients of 'growth traps', i.e. self-perpetuating vicious circles of underdevelopment (Matsuyama, 2009; Sindzingre, 2009).

During the second half of the 20th century SSA countries' growth performances appear to diverge vis-à-vis other parts of the world.

[3] See the World Bank's country classification http://data.worldbank.org/about/country-classifications/country-and-lending-groups

Figure 4: GDP per capita, Sub-Saharan Africa vs. the world, 1960–2011 (constant 2000 US$)

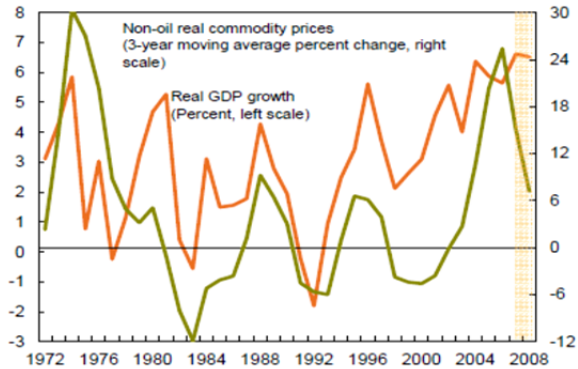


Source: World Bank, World Development Indicators database, August 2012.

Sub-Saharan African economies' growth performances mainly driven by commodity prices

It may therefore be argued that the growth performances that have characterised many SSA countries in the 2000s have been driven by commodity prices and their 'supercycle', as is the case for the rapid resumption of pre-crisis growth rates exhibited by many of them after the 2008-10 global crisis. As is shown by the following graph, growth rates in SSA countries closely follow the fluctuations of commodity prices.

Figure 5: Sub-Saharan Africa: growth and commodity prices



Source: IMF (2008).

Commodity-dependent SSA countries' growth rates are thus driven by factors that are external to these countries and beyond the scope of their domestic policies, i.e. the movements of international commodity prices and their multiple determinants, on which SSA domestic government policies have limited influence – typically since the 2000s, interest rates, level of inventories, speculation, increasing linkages and integration of global commodity markets compounded by their financialisation (Nissanke, 2010a;

Frankel, 2008; Mayer, 2009). This growth appears therefore to be intrinsically fragile and based on distorted factors rather than sound economic fundamentals.

Recurrent arguments, however, underscore the increasing demand from emerging countries (China, India and others) for SSA exports and deduce from it reasons for optimism; they also insist on the resilience of the region after the 2008-10 crisis. These arguments have been put forward for example by the IMF (IMF, 2010) and the World Bank (Canuto and Giugale, 2010).

Yet the same World Bank and IMF emphasise the sensitivity of world trade to global economic conditions, for example the fragility of the rebound in world exports after the 2008-10 crisis (World Bank, 2011). The IMF also expresses warnings regarding the sensitivity of SSA countries to global business cycles, and hence the inherent risks of its export structure, and underscores that in many low-income countries, a large share of export receipts are generated by just a few commodities (IMF, 2006).

2.2. Volatility as a crucial characteristic of commodity prices and its negative effects on commodity-dependent countries

Commodity dependence as an explanation of Sub-Saharan Africa's economic stagnation: the decline and volatility of commodity prices

Of course, Latin America or the Middle East also export primary commodities. A specificity of SSA countries, however, is the association of this export structure with low levels of incomes. There are a few exceptions: SSA includes oil countries, which for some of them have reached the categories of middle-income countries, such as, for example, Gabon, Angola, and now Ghana (with Equatorial Guinea even being a high-income country). Likewise, Botswana is classified as an upper-middle income country, although its economy strongly depends on the export of one primary commodity, i.e. diamonds.

The key problems of the exporting of commodities, oil and non-oil, are the characteristics of their prices - notably volatility -, the determinants of price formation - in particular the linkages between commodity markets and their increasing financialisation -, and the negative consequences of this price volatility, i.e. government' earnings volatility and its detrimental impact on a key determinant of growth, i.e. investment.

The debate on the long-term decline in commodity prices

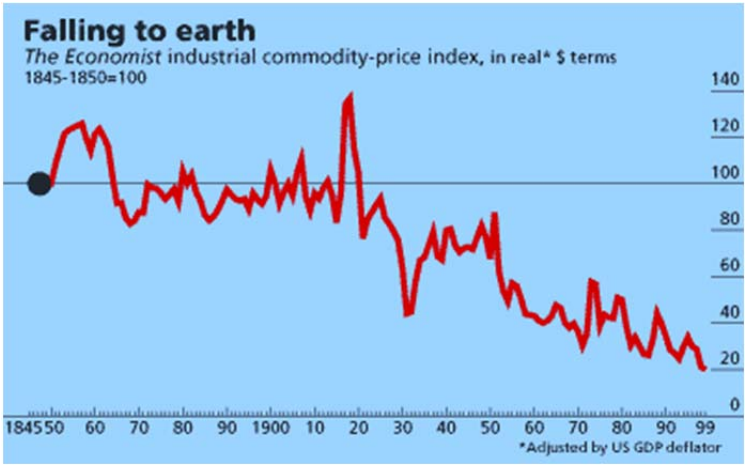
Founding scholars of development economics such as Raul Prebisch and Hans Singer have demonstrated the long-term and structural decline of commodity prices[4]. This decline, however, remains debated, in particular because the 2000s have witnessed high prices for many commodities (e.g., oil, metals, some agricultural products), especially

[4] Among many papers, Prebisch (1950), Singer (1950).

due to the demand from emerging countries. Indeed, the rebound was rapid after the 2008-10 financial crisis. This may suggest the existence of a 'supercycle' – i.e. a cycle that lasts much longer than an ordinary business cycle -, which started in the early-2000s, and perhaps a break in the decline.

The IMF also emphasises this decline, and underscores that despite increases, the prices of most nonfuel commodities remain below their historical peaks in real terms. According to the IMF (2006), over the past five decades, commodity prices have fallen relative to consumer prices at the rate of about 1.6 % a year. This long-term downward trend is found for most of the 20th century, and may be attributed to large productivity gains in the agricultural and metals sectors relative to other parts of the economy. For the IMF, however, compared with the prices of manufactures, commodity prices stopped falling in the 1990s due to globalisation of the manufacturing sector, which slowed manufactured products' price inflation. This long-term decline is particularly apparent in figure 6, as it shows two different calculations, one made by *The Economist* from an index of industrial commodities it has started in 1845, and the other made by World Bank researchers.

Figure 6: The long-term decline in commodity prices since 1845



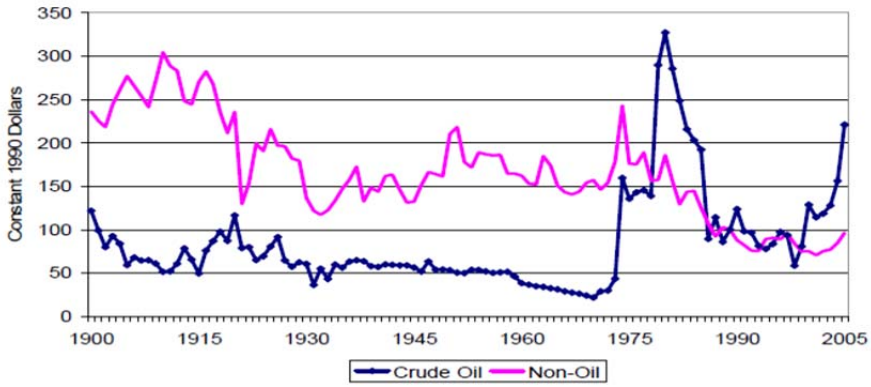
Source: *The Economist*, 15 April 1999. *: adjusted by US GDP deflator. See also Brahmbatt and Canuto (2010), based on Grilli and Yang (1988) and Pfaffenzeller et al. (2007).

For example, Frankel (2010b) has also demonstrated this decline since 1960 for copper prices.

Commodity prices volatility: facts

Commodity prices are above all characterised by their volatility. This volatility has been demonstrated since a long time in the literature and affects prices over the long-run, in particular since the mid-19th century (Cashin and McDermott, 2002, for the period 1862-1999; Blattman *et al*., 2007, for the period 1870-1939).

Figure 7: Real oil and non-oil commodity prices

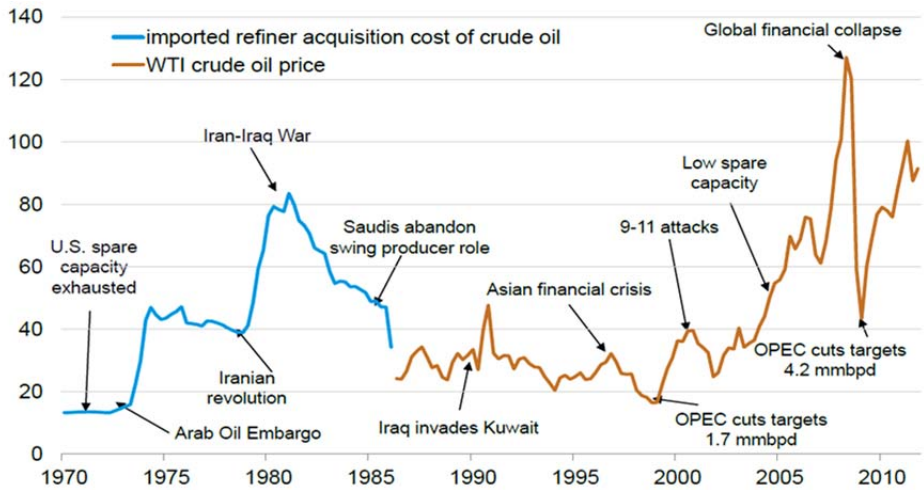


Source: Streifel (2006).

Oil is a special commodity: it is a strategic input for all developed and emerging countries, and price formation is determined by complex factors where global political economy and the financialisation of commodity markets play a particularly important role; despite the existence of OPEC, producing countries governments have limited power on the formation of these prices and hence their volatility. This is especially crucial because of the increasing importance of oil in SSA.

Oil prices are characterised by high volatility, as is shown by figure 8. Oil prices fluctuations were the causes of the major shocks that affected world economies in the 20th century (1973, 1979) as well as global business cycles, and oil prices backed the commodity price 'supercycle' of the 2000s. Their volatility moreover disseminates across commodity markets and contributes to the volatility of other commodity prices, and generates co-movements of prices, as many commodity prices depend on oil at some stage of their production and transportation (Baffes, 2007).

Figure 8: Crude oil prices (price per barrel, real 2010 dollars, quarterly average)



Source: Energy Information Administration (EIA) (US Department of Energy), 10 January 2012: http://www.eia.doe.gov

Table 2 below shows how frequently long lasting shocks to terms of trade hit various regions between 1975 and 2006. The authors argue that the higher occurrences in SSA and Middle East had more concentrated export portfolios that were more closely linked to oil.

Table 2: Frequency of persistent terms of trade shocks by region, 1975-2006

	Number of countries	Size and Type of Shocks					
		10 percent			30 percent		
		overall	positive	negative	overall	positive	negative
All	159	228	110	118	79	46	33
Advanced	28	19	9	10	2	1	1
Emerging markets / developing countries	131	209	101	108	77	45	32
of which Middle-East	17	32	14	18	13	7	6
Sub-Saharan Africa	23	47	16	31	19	7	12
Asia	12	13	6	7	3	3	0
Western Emisphere	21	35	19	16	9	6	3
Europe	29	21	12	9	1	1	0
Transition Economies	57	80	43	37	34	22	12

Source: Funke et al (2008). Note: The authors measured *persistent* ToT shocks. This being when the five-year mean of the terms of trade for the period *t-4* to *t* compared to period *t+1* and *t+5* differs by a predetermined threshold (10% and 30% in this chart), where *t* is the period of the shock.

It was shown previously that the majority of commodity exporters in SSA have unusually high levels of concentration in their export portfolios. Yet a diversified export portfolio is broadly recognised as a crucial factor for achieving sustained economic growth. Besides having numerous other benefits (in earning value added, learning and resource mobilisation, for example), a diversified portfolio permits swings in global prices to be hedged. With a narrow portfolio, however, countries are vulnerable to these price movements.

The costs of volatility

More recent commodity literature stresses price volatility as the most important factor behind the 'resource curse'. In fact Van der Ploeg and Poelhekke (2009a) find that resources can actually be a boon to growth. Their max-likelihood regressions (table 3) effectively estimate separately the effect on GDP per capita growth of exporting commodities were these commodities' prices stable, and the effect on GDP per capita growth of the variability in these commodities' prices. They find that the former effect is positive but the latter is negative and, on average, dominates the former, appearing as a resource curse. In fact the curse is not due to the abundance of resources, but to the volatility of resource prices. Cavalcanti *et al*. (2011) has similar findings: that Terms of Trade growth for commodity exporters in isolation would have had a positive impact on growth, yet this effect was dominated by the negative impact of ToT volatility.

Table 3: Effects of various commodity exports on volatility and growth

Dependent Variable	yearly GDP growth per capita 1970-2003		yearly GDP growth per capita 1970-2003				
(constant 2000 international dollars, PWT 6.2)	(6a)	(6b)	(7a)	(7b)	(7c)	(7d)	(7e)
Annual growth equation							
1st lag GDP per capita growth	0.221***	0.220***	0.232***	0.230***	0.230***	0.226***	0.226***
	(0.025)	(0.025)	(0.026)	(0.027)	(0.027)	(0.027)	(0.028)
Average investment share of GDP '70-'03	0.045*	0.045*	0.063**	0.065**	0.063**	0.065**	0.074***
	(0.025)	(0.025)	(0.025)	(0.026)	(0.026)	(0.026)	(0.026)
Average population growth rate 1970-2003	-0.478***	-0.478***	-0.461***	-0.346**	-0.343**	-0.358**	-0.307**
	(0.144)	(0.145)	(0.133)	(0.152)	(0.149)	(0.139)	(0.147)
log per capita GDP 1970	-0.014***	-0.014***	-0.012***	-0.011***	-0.010***	-0.011***	-0.010***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Human capital 1970	0.002**	0.002**	0.001*	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Volatility (σ_t)	**-0.971****	**-1.022*****	**-0.427*****	**-0.350****	**-0.334****	**-0.426*****	**-0.388*****
	(0.378)	**(0.297)**	**(0.129)**	**(0.141)**	**(0.148)**	**(0.148)**	**(0.127)**
Point based resources 1970	0.050*	0.054*	0.014	0.008	0.005	0.018	0.016
	(0.030)	(0.028)	(0.023)	(0.023)	(0.029)	(0.023)	(0.022)
Financial development 1970	-0.018**	-0.018***	-0.010*	-0.008	-0.008	-0.009	-0.007
	(0.007)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Sachs Warner updated openness dummy 70	-0.006	-0.007*	0.001	0.002	0.003	0.001	0.001
	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Constant	0.170***	0.174***	0.121***	0.107***	0.106***	0.115***	0.104***
	(0.030)	(0.027)	(0.018)	(0.018)	(0.019)	(0.019)	(0.015)
Variance equation							
Initial point-source resources 1970	1.621***	2.125***	-0.426	-0.720	-0.493	-0.563	-1.247***
	(0.589)	(0.596)	(0.488)	(0.634)	(0.645)	(0.862)	(0.337)
Initial diffuse resources 1970	0.801	0.807	-0.897***	-0.133	-1.076	0.167	0.483
	(0.514)	(0.497)	(0.323)	(0.638)	(0.974)	(0.430)	(0.378)
Initial financial development 1970	-1.290***	-1.266***	-1.063***	-0.858***	-0.842***	-0.754***	-0.594***
	(0.072)	(0.121)	(0.136)	(0.096)	(0.226)	(0.166)	(0.153)
Sachs Warner updated openness dummy 1970	-0.693***	-0.700***	-0.467***	-0.536***	-0.487**	-0.545***	-0.215**
	(0.160)	(0.160)	(0.180)	(0.174)	(0.207)	(0.164)	(0.095)
Distance to nearest navigable river or coast	0.001***	0.001***	0.001***	0.001***	0.001***	0.000**	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Financial development * point based share		-2.780					
		(2.049)					
Point-source export share volatility 70-03			9.303***	9.528***		15.837***	14.491***
			(0.774)	(1.286)		(1.141)	(0.588)
Diffuse export share volatility 70-03			10.907***	3.899*		1.841*	3.737***
			(1.491)	(2.004)		(1.047)	(1.377)
Government share volatility 70-03				10.525***	10.406***	9.786***	8.372***
				(1.179)	(3.260)	(2.709)	(1.510)
Agricultural R.M. resource share volatility 70-03					0.631		
					(3.023)		
Foods resource share volatility 70-03					10.916***		
					(1.690)		
Ores & metals resource share volatility 70-03					6.626***		
					(2.543)		
Fuels resource share volatility 70-03					9.513***		
					(1.719)		
Financial development * point based volatility						-34.343***	-29.620***
						(6.542)	(3.295)
sd ToT index growth							4.321***
							(0.181)
Constant	-6.100***	-6.093***	-6.517***	-6.751***	-6.826***	-6.711***	-7.401***
	(0.062)	(0.067)	(0.030)	(0.035)	(0.057)	(0.075)	(0.020)
Observations	2084	2084	2084	2084	2084	2084	2084
Log likelihood	3732.3	3732.5	3792.2	3814.4	3815.2	3819.0	3842.8
Countries	62	62	62	62	62	62	62

Robust and clustered (by country) standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Van Der Ploeg and Poelhekke (2009a). Note: Underneath Variance equation (about a third of the way down), the coefficient on variables listed is their contribution to the variance of the commodity's price.

Van Der Ploeg and Poelhekke (2009a) put a figure on this by applying the coefficient found in the growth-volatility regression to a counterfactual, where fast growing South East Asian economies are compared with African economies had their export price volatility been equal. The cost of volatility in foregone growth is estimated to be around 2.98% per year for resource rich African countries.

Van Der Ploeg and Poelhekke's results also show more open and financially developed countries experiencing stable and fast growth even where they export many resources but in some countries, particularly landlocked African countries, the adverse volatility effect dominates the positive effects of resources. These results run counter to such blanket predictions as Sachs and Warner's (2001) natural resource 'curse' by showing that a Commodity Dependent Developing Country (CDDC)'s problems arise not from owning resources *per se*, but from exposure to price volatility – and inability to effectively manage this volatility.

UNCTAD (2003) observed that price volatility has impacted incomes, indebtedness, investment, poverty and development. Hausmann and Gavin (1996) show that price volatility has been bad for growth, for investment, for income distribution, for poverty and for educational attainment. Hnatkovska and Loayza (2004) estimate that a 1 s.d. increase in volatility results in a 1.28% loss in annual GDP growth.

Taking a longer view than Van Der Ploeg, Blattman *et al* (2007) also attempted to disentangle resource abundance from resource price volatility. They showed that countries exporting commodities with more volatile prices have developed more slowly compared to industrial leaders. Exogenous shocks are consistently smaller and less frequent in advanced countries whereas they happen more frequently in developing countries (Loayza, 2004) due to the structure of their trading portfolios. Kraay and Ventura (1998) argue that sectors in which developing countries have a comparative advantage are inherently more volatile. Koren and Tenreyo (2007a) argue this is due to specialization in a smaller range of technologies that are less robust: as development proceeds production technology becomes more diverse thus more hedged against shocks. By reverse logic, commodity producers using simple technology are more exposed.

The channels of volatility: Dutch Disease

The ways volatility operates are manifold. Dutch Disease is perhaps the most famous mechanism. This occurs when a commodity's price is booming[5] and can cause deindustrialisation by hurting the competitiveness of other tradable sectors. It has three causes. Firstly, the booming price of exports puts upward pressure on the exchange rate, making other exports less competitive. Second, the booming sector demands factors of production, increasing their price to the tradables sectors. Third, the booming sector offers large rents, some of which are spent on nontradables, driving up their prices as inputs for the tradables sectors. Thus tradables export sectors find their prices less competitive at prevailing exchange rates even while their costs rise.

The reasons for this being a problem are that non-commodity tradables sectors (usually manufacturing) are often the most dynamic sectors in an economy, with high learning by doing effects and spillovers that can drive up productivity in the broader economy (Hicks, 1953). Deindustrialisation can also prevent the rapid growth from increasing returns that industrial agglomeration is argued to bring about (Krugman and Venables, 1995) – so called 'external economies'.

The channels of volatility: investment

Another way volatility impacts growth is through investment. Blattman *et al*. (2007) argued that foreign capital flows declined more steeply where comm. prices were more volatile and this effect was asymmetric between the core and periphery (in favour of the core – presumably due to core countries' greater abilities to manage ToT movements). Cavalcanti *et al.* (2011) show that total factor productivity, physical capital accumulation, and human capital acquisition are all negatively impacted by ToT

[5] Dutch Disease need not always occur with commodities. It can plague the exporters of anything whose price is booming. Yet booming prices is a phenomenon most often associated with commodities.

volatility. As far back as 1980, mainstream thought had recognised that cyclically induced uncertainty might retard investment. Where investment is irreversible, cost benefit analysis reveals, it should be undertaken when the costs of deferring investment exceed the expected value of information gained when waiting (Bernanke, 1983). This expected value is positive in uncertainty: volatility encourages a 'wait and see' approach in investors. Piot-Lepetit (2011) argues this cautiousness may contract trading as well as investment:

"A period of extreme volatility may cause a loss of investor confidence in the solvency of trade-counterparties and thereby reduce market participation and liquidity at a time when it is most needed. Such a loss of confidence would intensify volatility and could potentially lead to a temporary breakdown in organised trading" (Piot-Lepetit, p.6).

Aizenman and Marion (1999) show a negative relationship between volatility and private investment even with control variables but that public investment and volatility are well correlated[6].

Other studies found no evidence that volatility reduces the *rate* of investment (Guillaumont and Combes, 2000; Ramey and Ramey, 1995). Guillaumont and Combes (2000) find that volatility operates through the residual, rather than a lower rate of investment. That is, it has a greater effect on factor productivity than on capital accumulation. Although average rates of investment may not be reduced, throughout the cycle, investment does respond to price signals. Due to diminishing returns, this means "a gain from a high level of investment is lower than a loss from a low level" and therefore average productivity growth is reduced by investment[7]. This is exacerbated by "over-designed, ill prepared and unproductive investment" during booms – primarily public investments (ibid).

Bleaney and Greenaway (2001) find that growth is negatively affected by ToT volatility but investment is negatively affected by exchange rate volatility. This is intuitive: managers in tradables sectors must factor exchange rates into their risk profile of investments. If commodities constitute a large share of exports, they may feed through to the exchange rate (Breisinger, 2008). Instability in the REER is assumed to distort market signals and induce misallocated Investment (Guillaumont and Combes, 2000). Offering further proof that advanced countries have better resilience to shocks, Aghion et al. (2009) find that exchange rate volatility reduces growth for countries with relatively low financial development, but there is no significant similar effect for financially developed countries.

The channels of volatility: fiscal policy

A third way in which volatility may hamper growth is through its effect on fiscal policy. Standard economic theory tells us that fiscal policy should be countercyclical (Cespedes and Velasco, 2011). Even the IMF, relaxing its usual austerity prescriptions, has been moved to comment that countercyclical fiscal policy might be necessary to 'weather the

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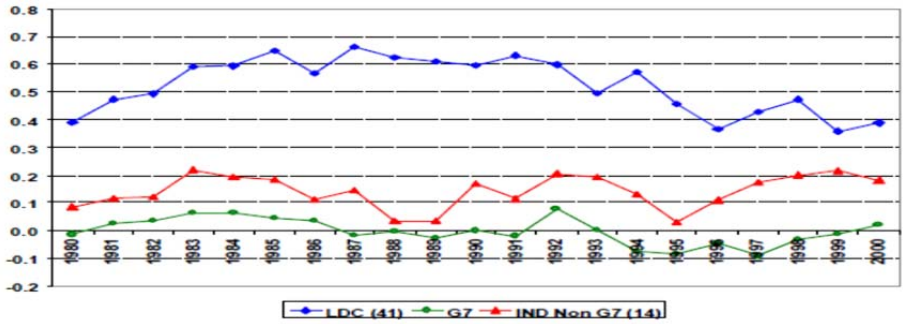
[6] The phenomenon of public consumption and investment responding positively to volatility is discussed below.

[7] Reversing this logic, the possibility of increasing returns due to industrial agglomeration (Krugman, 1986) might be why Fatas (2002) finds business cycles reduce growth much more in poor countries, where diminishing returns are more likely.

storm' of the current highly volatile commodity price dynamics (Jerven, 2010). Yet many governments fail to save during booms[8], particularly in LDCs (figure 9) and this asymmetry is driven largely by commodity-rich countries where fiscal revenues are closely tied to commodity trade[9]. Commodity prices being notoriously volatile, such 'extraverted' fiscal policies (Jerven, 2010) are highly pro-cyclical: effects of external shocks when they occur are amplified but the prime mover (at least from the individual countries' perspectives) is the external shock (ibid).

Figure 9: Pro-cyclicality of public consumption, 1980–2000



Source: Montiel and Serven (2004). Note: The table shows the median of country specific coefficient estimates obtained by regressing the growth of public consumption on the rate of GDP growth (plus a constant). These are rolling 15 year windows with medians by country income group

Oil countries in particular have had pro-cyclical fiscal policies. Villafuerte and Lopez-Murphy (2010) measure the change in fiscal policy relative to the economic cycle. Or more specifically, the ratio between: a) changes in cyclically adjusted non-oil primary deficit (fiscal impulses) and b) the difference between actual non-oil real GDP and potential non-oil real GDP in percent of potential non-oil real GDP (the output gap). The results are shown in table 4.

Table 4: Degree of fiscal pro-cyclicality among oil producing countries

	2003-2008			2009		
	ΔOG	FI	FI/ΔOG	ΔOG	FI	FI/ΔOG
HI	7.0	7.8	1.1	-3.3	0.0	0.0
UM	10.3	13.6	1.3	-7.1	-4.6	0.7
LM	3.8	11.7	3.1	-2.1	-4.5	2.1
L	2.6	9.0	3.4	-1.6	-8.0	5.1

ΔOG = change in output gap (in percent); FI = fiscal impulse (in percent of non-oil GDP)

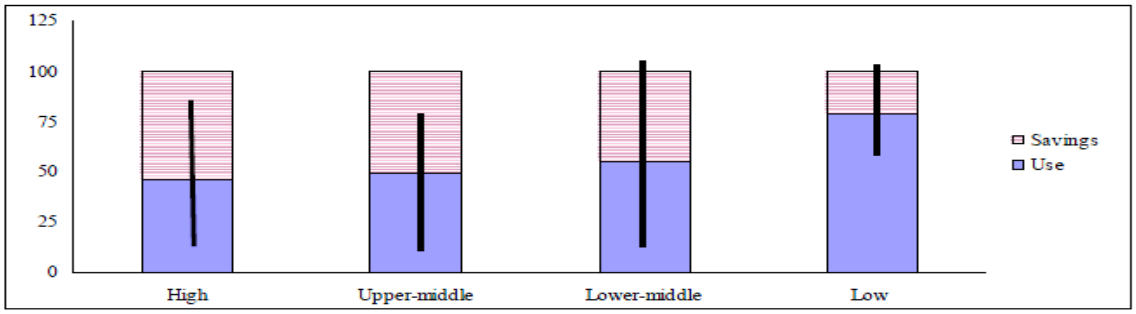
Source: Villafuerte and Lopez-Murphy (2010).

[8] Cuddington (1989); Talvi and Vegh (2005); Cespedes and Velasco (2011). Pro-cyclicality is a particular problem for low income countries (Cuddington, 1989; Tornell and Lane, 1999; Kaminsky, Reinhart, and Vegh, 2004; Talvi and Végh, 2005; Alesina, Campante and Tabellini, 2008; Mendoza and Oviedo, 2006; Ilzetski and Vegh, 2008; Frankel, 2011).

[9] Gelb (1986); Cuddington (1989); Medas and Zakharova (2009); Gavin, Hausmann, Perotti and Talvi, (1996); Gavin and Perotti (1997); Calderón and Schmidt-Hebbel (2003); Perry (2003); Villafuerte *et al* (2011).

The results show the degree of pro-cyclicality (FI/ΔOG) to be inversely related to income and that in low income oil producing countries an asymmetry exists: fiscal reversals during busts are larger than fiscal expansions during booms. Elsewhere, they show that capital spending projects are hit proportionally harder during downturns in low income countries. The asymmetries are explained by lower income oil producing countries using more of their oil revenues in contrast to higher income countries, that save more of theirs (figure 10).

Figure 10: Use and savings of additional oil revenue by income level (2004–2008, percent of additional oil revenue)



Source: Villafuerte and Lopez-Murphy (2010).

Some argue that even during booms, fiscal balances might worsen. Constituencies demand redistribution during booms which prevent surplus accumulation and necessitates borrowing during busts, which crowds the market and necessitates credit constraints (Alesina and Tabellini, 2005). Where societal divisions exist[10], mistrust between constituencies (e.g. Nigeria, Zambia) can pre-emptively fuel demands and booms can engender *voracity effects* (Tornell and Lane, 1999) which are greater than the amount of the windfall. Montalvo and Reynal-Querol (2005) show that ethnic or religious polarization has a large negative effect on growth through the increase of government consumption. Rodrik (1999) models the effects of external shocks and finds that less trust and greater divisions reduce the capability of institutions that might otherwise act as shock absorbers.

Furthermore, this situation can give rise to ratchet effects: political difficulties in reversing spending during downturns meaning the fiscal balance further deteriorates. Although these were not present in Villafuerte's and Lopez-Murphy's sample (downturns caused more than proportional fiscal cutbacks there), they certainly were in Zambia's downturn where vested interests in the civil service strongly resisted cutbacks when the government attempted fiscal reforms following the copper price collapse (Rakner, 2004).

Where fiscal policy amplifies shocks, one would expect all the previously discussed adverse consequences of volatility to be exacerbated. Indeed, Fatas and Mihov (2005)

[10] Theoretically any divisions, though in practice usually along the lines of ethnicity and/or religion.

show that volatility in fiscal policy reduces growth: an increase in the volatility of fiscal policy corresponding to one standard deviation in their sample reduces long-term economic growth by about 0.75 percentage points. It should be noted that their measure isolates changes in *discretionary* fiscal policy – changes that are independent of the business cycle as measured by structural changes in potential output. But they define discretionary to include politically motivated fiscal policies. In contrast, where institutional reforms have been implemented to permit countercyclical fiscal policies, as in Chile for example, economic growth is improved (Frankel, 2010b).

The problem of pro-cyclical fiscal policy in response to commodity price volatility in low income countries can be self perpetuating because, as discussed previously, where a country earns substantial resource rents, the government will have less incentive to develop a broader fiscal architecture (Cardenas *et al*, 2011). Kubota (2000) argues that in the earlier stages of development when fiscal needs are lower and the costs of erecting and administering a broad tax base are high, it is optimal for governments to raise revenue via trade taxes. It is easier from an operational and informational perspective to collect taxes at a single point, such as ports, than to build a broad based tax apparatus (Grabowski, 2010). It should be noted that such incentives are aside from using trade taxes as part of an industrial policy strategy of restricting international competition and cover only the needs for revenue. In Kubota's model, trade liberalisation should be observed *after* governments diversify their revenue sources through efficiency enhancing and revenue increasing tax reforms. The evidence suggests this is indeed how fiscal policy develops (table 5). Trade taxes indeed constitute a large part of SSA's total taxes (ATCP, 2003).

Table 5: Relationship between income and share of trade taxes in total taxes

Income (1995$)	Mean income	% of trade taxes in government revenue
10,000+	15,968	6.9
10,000–1,000	3,012	16.4
1,000–0	440	29.2
All observations	2,357	21.9

Source: Grabowski (2010).

Nissanke (2010a) has identified another problem some CDDCs face in implementing counter-cyclical fiscal policy: because many of them settled for very unfavourable terms during the process of privatizing their national resources (Zambia's experience of this will be discussed in the case study) the contribution of commodity exports to their fiscal budgets are small. Yet volatile commodity prices still impact pro-cyclically on these countries' exchange rates but governments have less fiscal space to intervene and limit the adverse impacts of such exchange rate volatility.

The contribution of commodity-based export structures to the formation of 'poverty traps'

The key problem of the current composition of exports prevailing in SSA countries is that commodity price volatility implies the volatility of fiscal earnings and output,

which has a negative impact on growth. A central channel of this causality is the negative impact of volatility on investment, in particular its 'ratchet effects' (Nissanke, 2010b; Sindzingre, 2010).

The long-term decline of Sub-Saharan African economies' share in world exports

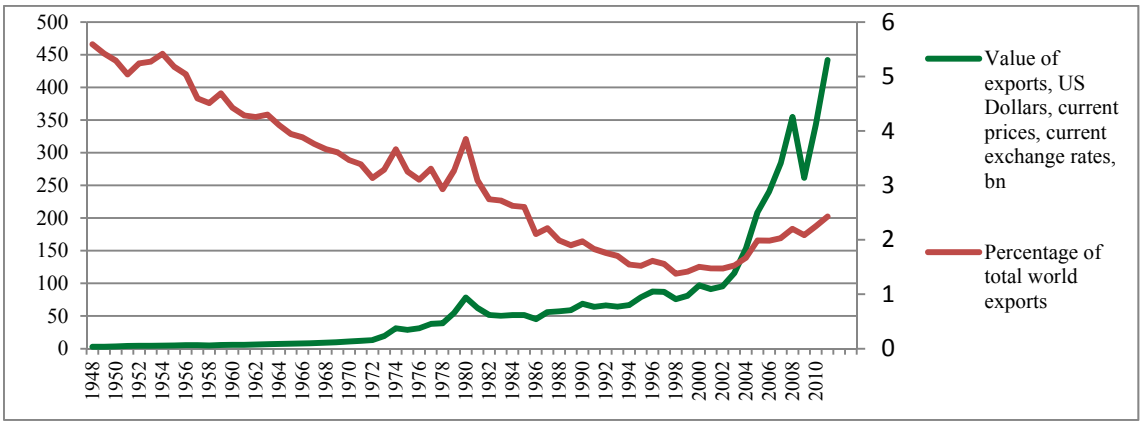
Export structures based on commodities reduce capacities for economic performance through a series of channels, the most important ones being, as argued by Frankel (2010a), long-term trends towards decline in world commodity prices, price volatility, crowding out of manufacturing activities, and Dutch Disease.

Indeed, Sub-Saharan African countries opened their trade in the 1990s due to the conjunction of the IMF and World Bank stabilisation and adjustment programmes, together with adhesion to the WTO. Trade liberalisation has increased the importance of international trade in SSA.

However, despite the increased trade orientation of SSA, the share of SSA in world trade has declined. For the continent as a whole, Subramanian and Matthijs (2007) have calculated that Africa's share of world exports has declined from above 7% in 1948 to less than 2% in 2004. According to the UNCTAD Handbooks of Statistics (2007; 2010, table 1.1.2), the share of SSA exports in world exports declined from 3.9% in 1980 to 1.5% in 2000. In line with better growth rates in the 2000s as well as the growing demand from emerging countries and higher commodity prices, however, this share increased in 2005, where SSA exports represented 2.0% of world exports. It has stabilised in the second half of the 2000s and still represented 2.0% of world exports in 2009 - 1.5% excluding South Africa.

The share of SSA in world export has declined because SSA exports have grown much more slowly than world exports, SSA being therefore marginalised in world trade, which for UNCTAD is partially explained by the secular decline in SSA terms of trade and its inability to sustain growth. As shown by figure 11, SSA declining shares in world trade reflect SSA slow GDP growth, and other countries' increasingly outward orientation, not a decline in trade or export shares of GDP.

Figure 11: Sub-Saharan Africa's exports: percentage of world exports (right axis) and value (left axis), 1948-2011

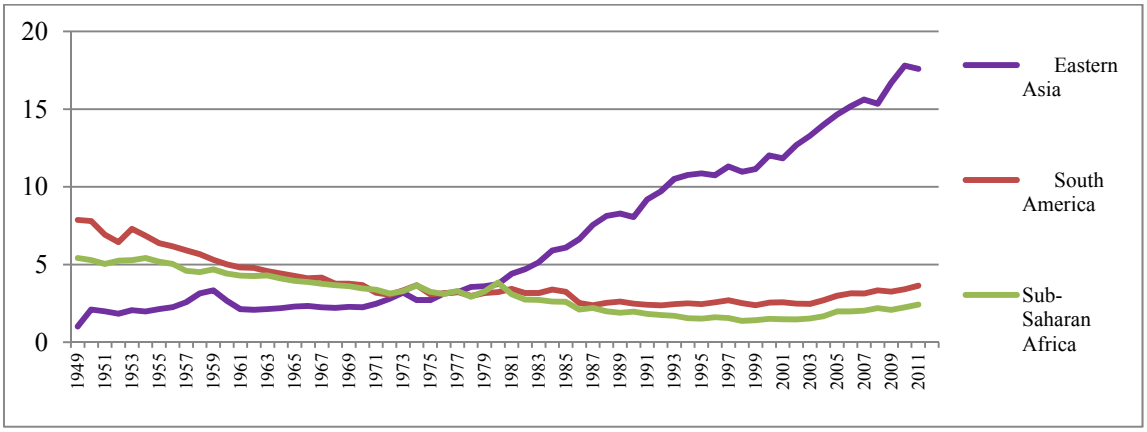


Source: UNCTAD Statistics: http://unctadstat.unctad.org

Above all, SSA countries suffer structural constraints, in particular lower competitiveness and a lower labour productivity than its competitors in the developing world, e.g., in emerging economies, especially in manufacturing. SSA countries may have gained in competitiveness through the exchange rate (e.g., devaluation of the CFA franc in 1994 in the *West African Economic and Monetary Union*/WAEMU countries), but the adjustment and post-adjustment programmes in the 1980s-2000s witnessed little improvements in productivity growth.

The decline of SSA in world exports is associated with the divergence with other parts of the world, as SSA share declines relatively to other regions that witness a spectacular increase in their share, notably Asia.

Figure 12: Share of exports in world exports by region, 1948-2011 (percent)



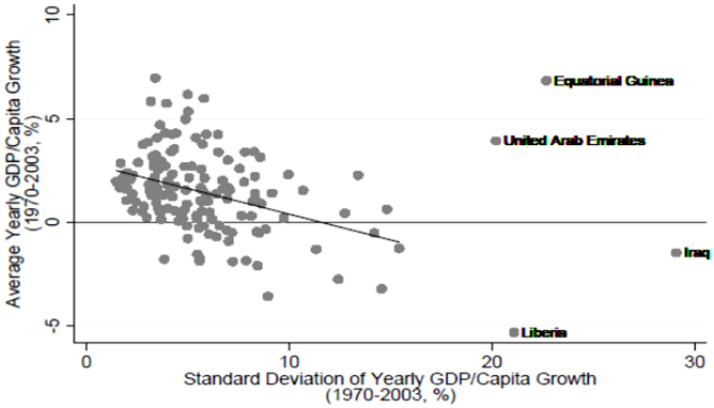
Source: UNCTAD Statistics: http://unctadstat.unctad.org, author's calculations.

The contribution of commodity-dependence to the formation of traps: the negative impact of volatility on growth

Price volatility exposes commodity-based countries to shocks, in particular fiscal shocks, as these countries depend on very few commodities for most of their fiscal earnings. As shown by a large literature, there is a relationship between exposure to shocks and low growth. In particular, volatility has a negative impact on investment, and therefore impedes growth.

Indeed, there is a negative relationship between macroeconomic volatility and growth: over the long-run, the volatility of the terms of trade is detrimental to growth **(**Krishna and Levchenko, 2009). **As revealed by Loayza *et al.* (2007),** macroeconomic volatility is both a cause and an effect of low levels of development, and results from a combination of external shocks, volatile macroeconomic policies and microeconomic rigidities. Volatility entails a direct welfare cost for risk-averse individuals, as well as an indirect one through its adverse effect on income growth. Interestingly, Loayza *et al.* also show that volatility is the strongest for SSA.

Figure 13: The lower annual growth in GDP per capita of volatile countries



Source: Van der Ploeg and Poelhekke (2009b).

2.3. The contribution of China to international commodity prices dynamics

What are the growth prospects of SSA countries given their current export structure, and knowing that this growth is a prerequisite for structural transformation? As underscored by the IMF (2006), many countries are exposed to fluctuations in commodity prices, and the future dynamics of commodity markets is uncertain: the rise of China and other large emerging markets may lead to a fundamental change in long-term price trends, and prices may remain high, particularly those of metals; it may be argued, however, that speculation has decoupled metals prices from market fundamentals and that prices will fall back and continue to decline gradually in real terms, as during most of the past century.

Another question refers to the possibility of this structural transformation: for example, can China's growth and demand for SSA products and the new orientations of SSA exports be an opportunity for structural transformation? This is argued, for example, by Klinger (2009), who shows that, for a group of developing countries in Africa, Latin America and Central Asia, exports within the 'South' are more sophisticated and better connected between themselves (within the 'product space') than exports to the North. In contrast, exports to the North are not growth-enhancing, nor do they offer learning opportunities to foster structural transformation: South-South trade flows may therefore create the conditions for structural transformation.

China as a driver of the increase in commodity prices in the 2000s

Commodity prices have always been subjected to price cycles, and are partially determined by global and country-level business cycles, i.e. short-term fluctuations of growth, industrial activity, real incomes and demand. According to the United States National Bureau of Economic Research, there were 55 cycles between 1854 and 2009 in

the United States (lasting 55 months on average)[11]. The 2000s, however, witnessed a spectacular increase in all commodity prices, and the length and magnitude of the price increases led some observers to describe this evolution as the beginning of price 'supercycle'.

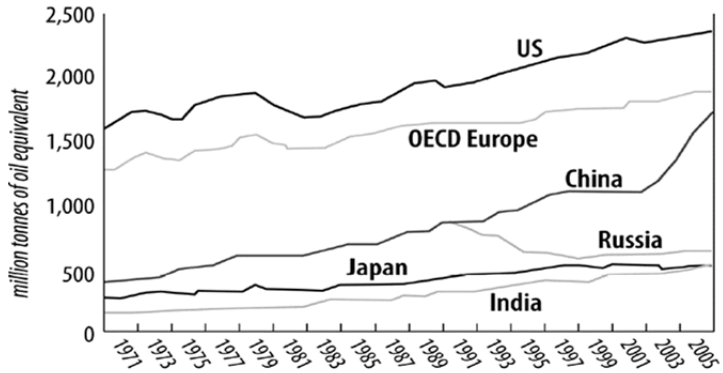
Indeed, the price increase of the 2000s has followed three major commodity booms and slumps in the 20th century - 1915–17; 1950–57; 1973–74 (World Bank, 2009, table 2.1), but the 2003-2008 commodity price boom has been associated with unprecedented price increases (World Bank, 2009). The increase in prices of 2003-2008 is the largest and longest one since 1900 and it has involved a wide range of commodities. The real U.S. dollar price of commodities has increased by some 109% between 2003 and 2008, or 130% since the earlier cyclical low in 1999. By contrast, the increase in earlier major booms never exceeded 60% (World Bank, 2009).

The increasing importance of China's demand in commodity price formation

Many factors have underlain the 2003-2008 price commodity boom, with some being specific to particular commodities. Factors of commodity prices movements traditionally include the fluctuations of supply and demand, those of interest rates and exchange rates as well as the levels of inventories.

Several ancillary causes of the current commodity price boom have been identified. These include speculative forces (UNCTAD, 2009) and slow supply responses (due to under-investment in capacity caused by low prices in the 1990s (ibid)). But there seems to be agreement among both mainstream and heterodox economists that demand from Asia, in particular China, is the dominant cause. China's rapid growth and industrialisation has entailed massive amounts of energy consumption (figure 14).

Figure 14: Total energy demand, 1971-2005



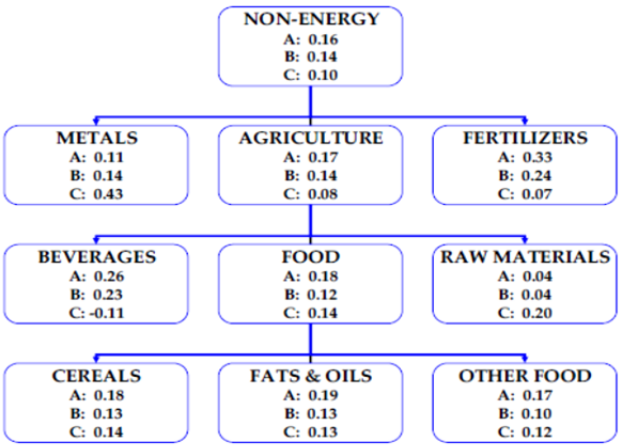
Source: ICG (2008).

The consequently higher oil prices are argued by Baffes (2007) to feed through to other commodities (figure 15 shows estimates). High oil prices could boost general

[11] Source: http://www.nber.org/cycles.html.

commodity prices: precious metals as inflation hedgers[12], luxury commodities demanded by oil exporting countries, raising the opportunity costs of growing food crops when bio-fuel crops (as an energy substitute for oil) increase in value, and commodities requiring energy intensive production. This last point is particularly borne out by the pass through to raw materials and metals in figure 15.

Figure 15: Commodity price indices and crude oil price pass-through



Source: Baffes, 2007. Note: The numbers following the letters A, B, and C refer to elasticities for the 1960-2005, 1972-2005, and 1984-2005 periods, respectively.

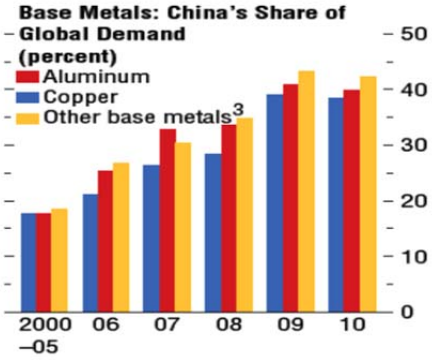
Among the most important factors of the boom of the 2000s, there are the rise in demand from emerging countries, especially China – a 'commodity-intensive' emerging economy, as coined by the IMF (2011, p. 31) -, and a mismatch between supply and demand that occurred in the 2000s. China's and India's growth and demand for primary commodities are viewed as a key cause of the 2003-2008 price boom and distinguish it from the other booms of the 20th century (Radetzki, 2006).

Oil and metals prices have been boosted by strong demand growth, low prices in the period prior to the early-2000s, and the rising demand from China, especially its very high demand for metals. Cuddington and Jerrett (2008) thus identify three supercycles in metal prices in the past 150 years, and consider that the 2000s are the early phase of a fourth super cycle, which is mostly determined by the industrialisation of China.

China has been for example the main contributor to the growth in global demand for aluminum, coal and copper (World Bank, 2009): during 2003–2007, China contributed two-thirds of the increase in world consumption of aluminum and copper and almost all the increase in world consumption of lead, tin, and zinc (IMF, 2011, table 1.3); its share in global base metal consumption has doubled to 40% between 2000 and 2010, which reflects the spectacular growth in its manufacturing sector over the past two decades (IMF, 2011, fig.1.23). Similarly, the IMF (2011b) calculates that a 1-percentage-point increase in China's industrial production growth is associated with a 2-percentage-point increase in oil and copper prices.

[12] High oil prices, of course, causing the inflation.

Figure 16: China's share of global demand, in percentage, 2000-2010



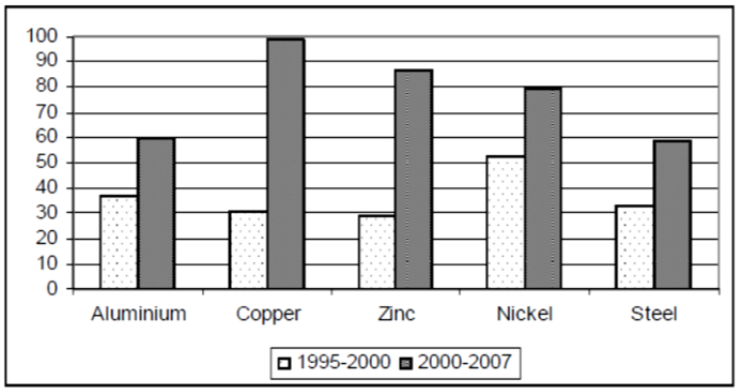
Source: IMF (2011). (3): IMF index-weighted average of lead, nickel, tin, zinc and lead.

The time necessary for the establishment of new capacity in response to demand also keep minerals prices at high level – for Radetzki *et al*. (2008), however, prices may fall as soon as the new capacity is in place.

For its part, the boom of agricultural commodity prices has reflected the rising demand for biofuels and high energy prices, oil in particular (World Bank, 2009). The demand from emerging markets, especially China, contributed to the increase in food prices between 2010 and 2011 – China has become a central and net importer in global grain and oilseeds markets (IMF, 2011), as well as cotton and rubber (Nissanke and Söderberg, 2011). For other studies, however, demand from China did not contribute to the price boom of all commodities, e.g., wheat, corn or cotton (Tang and Xiong, 2010a and b), or oil, where US demand keeps an important role (Roache, 2011).

In fact, China also directly boosts metals prices. Farooki (2009) shows that metals demand from China is particularly strong, constituting most of the increased demand for all main metals since 2000 (figure 17).

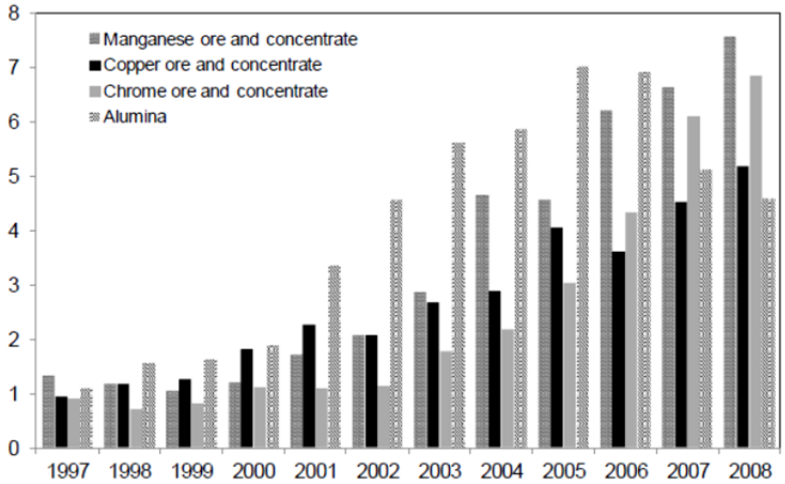
Figure 17: Increase in global metals demand accounted for by China



Source: Farooki, 2009. In 1995-2000 China's share of new demand was less than 50%, but in 2000-2007 China accounted for more than half the increase in demand for aluminium, nickel and steel and nearly all of the increase in demand for copper.

This demand is caused by a massive industrialisation drive and a rapidly urbanising population[13]. Such demand is substantially beyond China's production capacity. Figure 18 shows Chinese imports for selected metals.

Figure 18: China's major mining commodities imports: volumes (million tons)



Source: Yu (2011).

China's demand for copper deserves particular attention, it having constituted nearly all of increased demand since 2000. Table 6 shows China's reliance on copper imports during its rapid growth.

Table 6:China's copper output and growth rate and consumption

	1950	1960	1970	1980	1990	2000	2007
Copper mining output (ktons)	2.9	87.4	145.8	221.3	295.9	593.0	928.0
Annual growth rate (percent)	n/a	40.6	5.3	4.3	2.9	7.2	6.6
Refined copper output(ktons)	10.5	100.3	165.3	383.6	558.7	1371.0	3499.4
Annual growth rate (percent)	n/a	25.3	5.1	8.8	3.8	9.4	14.3

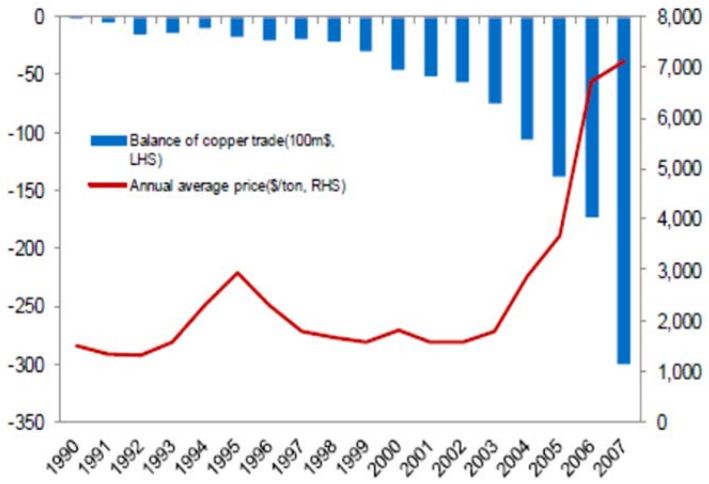
	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
Refined Copper Consumption (Ktons)	729	1190	1942	2307	2737	3123	3875	3682	3587	4926
Total copper consumption (Ktons)	729	1190	2650	3620	4140	4663	5536	5301	5108	6596

Source: Yu (2011).

[13] 14m per year – twice London's resident population (Yu, 2011).

This huge demand explains why copper prices have exploded (figure 19)[14].

Figure 19: China's copper mining products trade balance and international copper price



Source: Yu (2011).

Some observers claim the entry into the global system of a colossal giant like China this represents a permanent structural break (Heap, 2005; IMF, 2006; Farooki, 2009), but this depends both on how the West recovers from the crisis and China's future growth path. Yu's (2011) analysis predicts China's commodity import demands may level at around 2015 when Chinese economic policy may looks set to prioritise balanced economic restructuring over rapid output growth. By then the global recovery *may* have taken hold and global demand could remain high[15]. It is also possible that other BRICS economies might take up any slack from China's then lower demand. However, policy responses must always be very careful in assessing the permanence of a price shift. Misdiagnoses can result in severe indebtedness (Cuddington, 1989), as happened in the 1970s/80s (Maizels, 1994).

For many SSA countries, China's demand pattern is a boon to terms of trade as oil, minerals, and agricultural products (in which China is a net importer and sub-Saharan Africa a net exporter) have risen. China's consumption during 2010 accounted for about 20 percent of world consumption of non-renewable energy resources (oil, gas, coal), 23 percent of major agricultural crops (corn, cotton, rice, soybeans, wheat), and 40 percent of base metals (copper, aluminum).

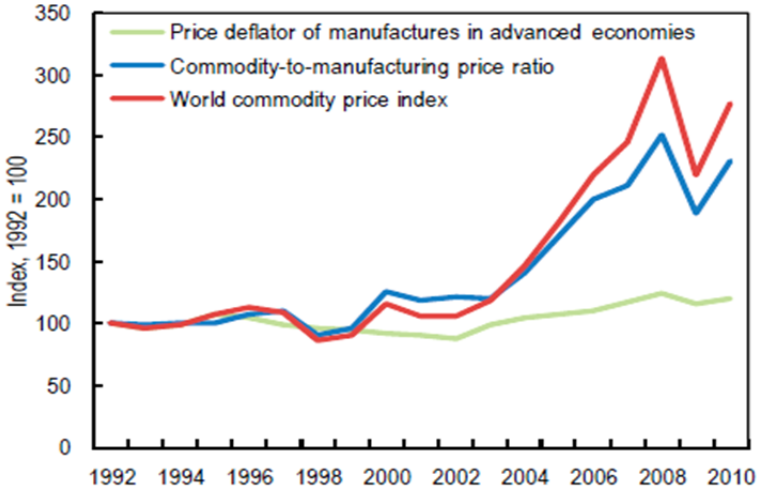
Meanwhile, growth in Chinese manufacturing exports have held inflation down in these products.

---

[14] Copper is a very versatile metal and is particularly useful for most of the key uses required during industrial upgrading: construction, electrical, industrial machinery and transport.

[15] It is true that demand for commodities to *maintain* industry and infrastructure is less intensive than to build such, but when China's demand plateaus, OECD maintenance demand might sustain current demand levels.

Figure 20: International commodity and manufactures price indices



Source: IMF (2011b), SSA Regional Outlook.

However, although this evolution in the terms of trade represents a welfare gain for many SSA countries, it potentially reinforces sub-optimal trade patterns for CDDCs.

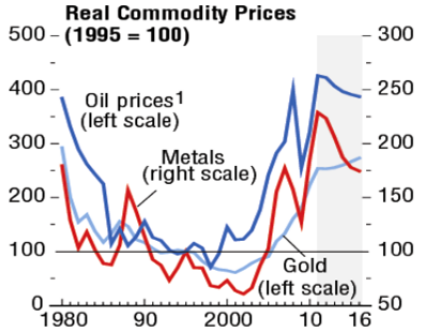
China as a factor of high prices for commodities in the medium term?

The 2008-2009 financial crisis has been associated with very sharp price drops and fluctuations. According to the IMF (2009a, chap. 1), the magnitude of price changes and volatility rose to unprecedented levels for many major commodities, especially oil. As was the case in past cycles, commodities linked to industrial activity (e.g., fuels and base metals) have been most affected.

Remarkably, after their spectacular fall in 2008, commodity prices rebounded within a short time span, and increased again in 2010, in particular oil prices and the prices of some agricultural commodities. If not the sole factors, the demand for commodities from emerging countries as inputs for their own growth and industrialisation, as well as the demand of new middle classes, explain the high prices of some commodities.

The IMF acknowledges that the prospects for activity in China are very important for many commodities, due to the rapid increase China's share of global commodity demand over the 2000s. At the global level, the increase in the demand for commodities strongly depends on China' growth rates and their evolution. Per capita oil consumption in the United States and other OECD economies has been flat since the early 1980s, while it has risen rapidly in China (IMF, 2011a, figure 3.5). The growth rate of global primary energy consumption (non renewable - oil, coal, gas - and renewable) has accelerated in the past decade, mainly due to China, which is now the first energy consumer in the world: energy consumption in China is projected to double by 2017 and triple by 2025 from its 2008 level (IMF, 2011a, p. 93).

Figure 21: Real commodity prices, 1980-2016



Source: IMF (2011a).

Assessments of commodity prices obviously depend on the time span that is considered. In this regard, even after their post-crisis rebound, it may be noted that real commodity prices remain below their levels of the 1970s.

More importantly, China's likely rebalancing of its growth toward private consumption may reduce China's demand growth for some primary commodities used in processing and investment (e.g., base metals), and China may experience a decline in 'commodity intensity' that will have an adverse impact on the price of these commodities and therefore the countries exporting these commodities (Roache, 2011).

Equally, the sustainability of China's growth remains uncertain, which is acknowledged by the IMF (2011a) and other studies. Eichengreen *et al.* (2011) thus show that China's growth may slow down after 2015 - when its per capita incomes will reach around 17,000 US$ (in 2005 constant international prices).

3. The increasing trade and investment relationships of China with Sub-Saharan Africa and their ambiguous impacts

China has become a significant trade partner of SSA economies, and it has also invested significantly in SSA economies not only via its multinationals, but also via a great number of locally based medium-size enterprises. A theoretical question is therefore whether these changes may generate structural transformation and trigger sustained growth paths in SSA countries. This section shows that the transmission channels of China's impact on growth prospects in SSA economies are multiple, both direct and indirect, and underscores the ambivalence of these impacts.

3.1. The increasing trade and investment relationships of China with Sub-Saharan African countries

The increase in trade relationships between China and Sub-Saharan Africa

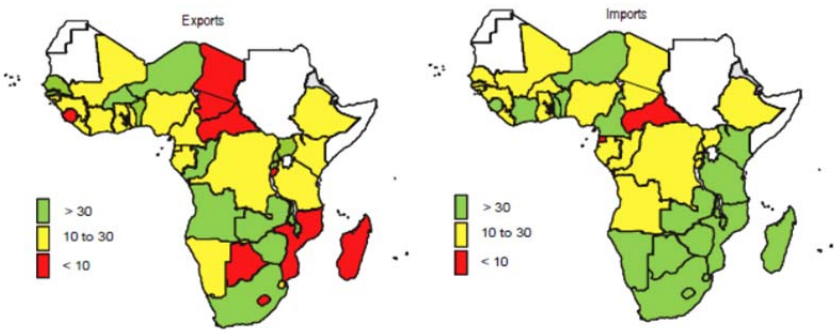
If China pursues its impressive growth rates, its demand for SSA products may remain sustained, not only for primary commodities, but for low-end manufactured products that will increasingly no longer be made in China due to increasing local factor costs.

China expands the international demand for SSA exports, and may even be a substitute for industrialised countries when the latter are in crisis – China's growth and demand have thus attenuated the impact of the 2008-09 crisis on SSA and fostered a rapid rebound. China therefore constitutes a genuine factor of growth for SSA countries. The intensification of SSA trade relationships with China is accompanied by increasing exchanges with other emerging countries, in particular Brazil (OECD, 2010).

The IMF underscores that despite country-by-country variation in the degree of reorientation towards emerging countries, all SSA sub-groups (oil exporters, low-income and middle-income countries) are exporting a lower share of their products to traditional OECD countries than in 1990, and a greater share to China (IMF, 2011b).

The past two decades have seen many SSA countries increasingly engage in South-South trade (figure 22). The change is more pronounced for imports.

Figure 22: Sub Saharan Africa: change in ratio of exports to non DAC countries to total exports, 1990-2010

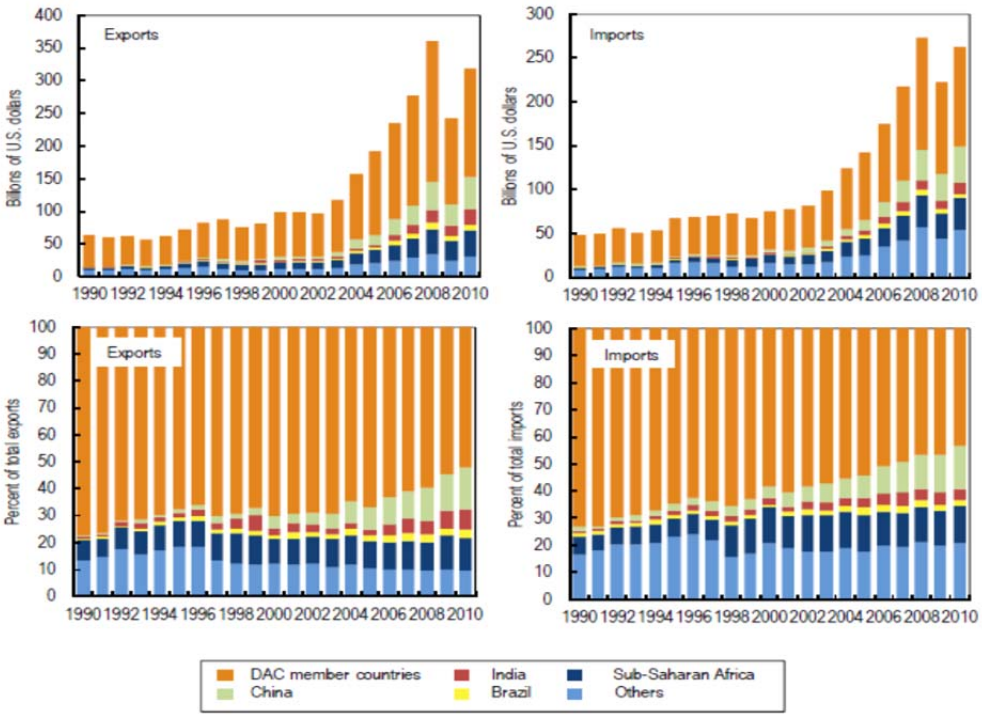


Source: IMF (2011b). Note: Data for Eritrea are unavailable.

Growing trade with China has been the most dominant trend driving this (figure 23). By 2010, the share of SSA trade with Brazil, India, and China reached approximately 3%, 6%, and 17%, respectively, rising from negligible shares in the 1990s. Between 1990 and 2010, the share of DAC countries in total trade decreased from 70% to 56% in the Latin America and Caribbean region and from 65% to 46% in the Middle East-North Africa region (IMF, 2011b)[16].

[16] Trade with DAC countries declined only proportionally, whilst growing in absolute terms – crisis years notwithstanding.

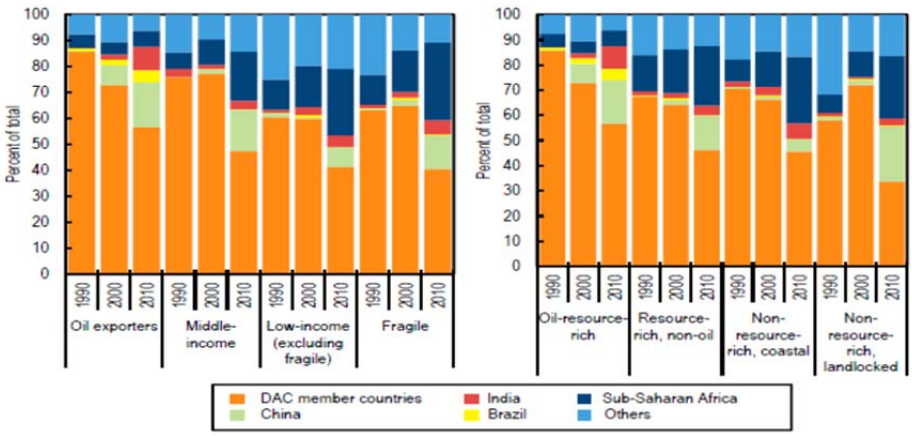
Figure 23: Sub Saharan Africa: total exports and imports by partner



Source: IMF (2011b), fig 3.1.

The growth of trade with Brazil, India and China (BICs) is greater than that predicted by a standard gravity model (IMF, 2011b) and may reflect the resource intensity of these countries' growth paths along with resource abundance in SSA (ibid). However, China has also engaged more with non resource-rich African countries (figure 24). In fact, while trade with Brazil and India has followed more heterogeneous patterns across SSA countries, trade with China has followed evolved similarly.

Figure 24: Sub Saharan Africa: exports by partner and SSA economy classification



Source: IMF (2011b).

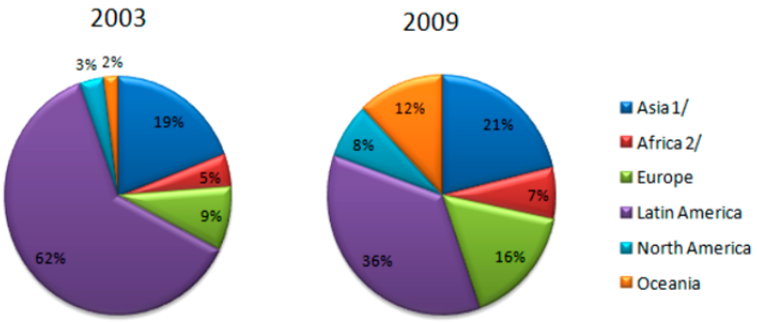
The increase in Chinese investments in Sub-Saharan Africa: not only the primary sector, but also the manufacturing sector

As in economic theory investment is among the most robust predictors of growth, any increase in Chinese investment is likely to have a positive impact on SSA economies.

The government of China created in 1994 the Export-Import (Exim) Bank in order to facilitate exports and investment, and Sinosure, which provides export credit insurance. The Exim Bank's main activities are export credit, international guarantees, loans for overseas construction and investment and official lines of credit, according to Moss and Rose (2006), who underscore that the Exim Bank is an important piece in China's foreign policy and its quest for the securing of strategic natural resources and global influence.

SSA is not the major destination of Chinese FDI.

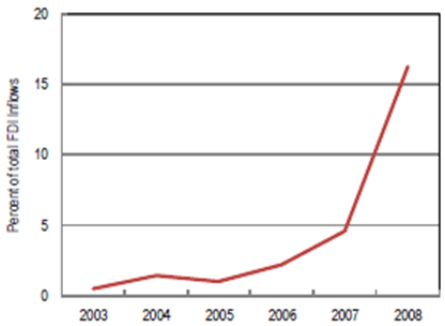
Figure 25: China's global FDI outflows: geographical distribution



Source: Mlachila and Takebe (2011) (IMF), figure 6, based on the *Statistical Bulletin of China's Outward Foreign Direct Investment.* 1) excluding Hong Kong SAR, Macau SAR; 2) including North Africa.

Chinese investments in SSA, however, exhibit a sharp increase.

Figure 26: Sub-Saharan Africa: inflows of FDI from China



Source: IMF (2011b), fig. 3.8; see also UNCTAD (2010b).

Chinese FDI flows still account for a small share of total FDI flows to SSA. There are also important variations from one year to the other. For example, according to Mlachila and Takebe (2011, table 4) estimates, Chinese FDI flows would have represented about one billion $ in 2009, and 5.5 billion in 2008. South Africa, Nigeria, Zambia and Congo DRC were the main destinations on average over 2003-09. As underscored by Mlachila and Takebe, however, finding reliable data on Chinese FDI to developing countries may be 'mission 'impossible': Chinese statistics exhibit important discrepancies and most countries do not keep FDI data on a balance of payment basis by country of origin.

Nevertheless, Chinese FDIs are increasingly important for SSA. For Christensen (2010), who also underscores the notorious difficulty in calculating FDI flows and the likely underestimation of this figure, Chinese FDI flows represented about 2% of the total of foreign direct investment in the continent as a whole. For Mlachila and Takebe (2011), the Chinese share is estimated to have increased from less than 0.5% of global FDI to SSA countries in the early 2000s to about 4.5% in 2007. For the IMF, Chinese FDI to SSA as a share of total FDI to the region climbed from less than 1% in 2003 to 16% by 2008 (IMF, 2011b).

In addition, the effects of investment vary according to their motives - among others, market-seeking, efficiency-seeking and resource-seeking –, and economic sectors - e.g., spillover effects on technology, productivity and skills, and effects on employment. Spillover effects on skills and employment appear to be mixed and vary across countries, sectors and projects – some investments may be highly capital-intensive and rely on Chinese workforce, others not (Broadman, 2007).

As for the trade relationships between China and SSA, the structure and impact of Chinese FDIs on SSA share many similarities with those of the other countries that invest in the continent (Kragelund, 2009). In SSA, foreign direct investment, whatever the investor's country, has a strong focus on the primary sector, and especially oil. In 2009, the top recipients in terms of magnitude of FDI flows (above 3 billion $) were Angola, Nigeria, South Africa and Sudan (UNCTAD, 2010b). Similarly, Chinese investments in SSA focus on the primary sector and natural resources extraction. In terms of value, Chinese investments are thus mostly resource-seeking and often involve large Chinese state-owned enterprises (such as the oil companies, e.g., CNPC or CNOOC[17]). Chinese outward investment is indeed characterised by the importance of state-backed FDI (Zhu *et al*., 2011).

An increasing number of medium and small enterprises operate in SSA, however, and in terms of number of projects, the largest numbers of investment projects undertaken by Chinese investors are in manufacturing and infrastructure (Gu, 2009; UNCTAD, 2010b). Investors' surveys conducted by Gu (2011) confirm that these numerous small, private manufacturing firms invest independently of the Chinese government (sometimes with the support of local overseas Chinese, Song, 2011), and moved from exporting to SSA to investing in production in SSA - and increasingly in industry parks where they collaborate in coordinated production.

[17] China National Petroleum Corporation; China National Offshore Oil Corporation.

Chinese investments in SSA thus also target the industrial, manufacturing and service sectors – notably the telecommunications, construction and banking sectors. While large Chinese state-owned enterprises tend to invest in the extractive, infrastructure and construction sectors, Chinese private investors tend to invest in SSA manufacturing and services (Kaplinsky and Morris, 2009) – in particular the textile and garments sector (Alden, 2007a, chap. 2; Henley *et al.,* 2008). For example, the manufacturing sector accounts for the largest amount of Chinese FDI in Ethiopia, attracted by low-cost labor (IMF, 2011b).

All SSA countries are involved. Estimates of the number of Chinese FDI firms vary widely (and often do not disentangle SSA from 'Africa'). UNDP/UNCTAD (2007), quoted by Mlachila and Takebe (2011) estimated that there were approximately 700 Chinese enterprises operating in Africa. For Christensen (2010), by end-2008, Chinese investors had set up around 1600 companies in Africa, firstly in South Africa, followed by Nigeria, Zambia, Sudan, Algeria, Mauritius, Tanzania, Madagascar, Niger, Congo, Egypt, and Ethiopia. For Orr and Kennedy (2008), the number of Chinese state-owned and private enterprises in Africa has been estimated at about 1000 across all countries.

China is also investing in Special Economic Zones (SEZs) (Brautigam and Tang, 2011): five are expected in Africa - two in Nigeria and one each in Ethiopia, Mauritius and Zambia (Brautigam, 2010a). SEZs may foster spillovers effects, for example in terms of local employment. The first SEZ in SSA, announced in 2007 for Zambia (in the Chambishi copper belt region) claimed that it would create 60000 jobs (Corkin *et al.*, 2008). Outcomes, however, remain disappointing, and SEZs are confronted with the long-lasting competiveness problems that affect SSA (by end-2009, only 4000 jobs had been created in the Zambia's SEZ, Brautigam *et al.,* 2010).

3.2. The positive impacts of trade relationships with China and Chinese investments

The positive impacts of trade relationships with China

The benefits of improved terms of trade for SSA countries go beyond the improved welfare that increased purchasing power affords and can contribute to growth and development. LDCs must export to earn foreign-exchange (forex) to import the goods they cannot yet produce but that are crucial input to developing a diversified industrial sector (McKinnon, 1964). Also, by stimulating their export industries, higher commodity prices can promote linkages in the countries that export them (Ibrahim, 2002). However, some commodities, particularly point source commodities, may exhibit 'enclave' characteristics (Hirschman, 1958).

Higher commodity prices also permit greater fiscal space for governments who rely on taxing commodity exports. This can feed into an industrial policy strategy for diversification and upgrading. Hausmann and Rodrik (2006) argue that activist industrial policy is required to overcome product space inertia. To elaborate, Hausmann *et al* (2007) found that 'what you export matters' – that exporting simpler products such as basic commodities generates less productivity spillovers than exporting processed commodities or manufactures. But both Hausmann and Rodrik (2006) and Hidalgo *et*

al. (2007), using the analogy of a forest, find the *catch 22* problem that upgrading (tree-jumping) to more complex products is more difficult if you are currently producing simple products (at the forest's sparsely treed periphery) than if you already producing complex products (near the dense centre). Governments have a role in Overcoming co-ordination failures and catalysing diversification (Rodrik, 2007) to overcome commodity dependence and developing human capital through education and physical capital through direct industrial investments (Adelman, 1999).

This role of the state was recognised as far back as 1943 when Rosenstein-Rodan (1943) argued that the state must engineer sectoral linkages and overcome coordination failures (Adelman, 1999). But the industrial policy debate is ongoing between the market-allocative-efficiency mainstream and structural-imperfections heterodox economists. However, the heavily state engineered growth of the 'Asian miracles' supports the case for industrial policy. Also, Adelman's survey of growth determinants (ibid) finds predominantly that government intervention has been instrumental in overcoming market imperfections in early development. Following the Post Washington Consensus, the debate has moved on from the days following the Berg Report (Berg, 1981) and the perception of states as always being harmful for growth. A debate between Justin Lin and Ha-Joon Chang reveals this: there is much common ground and the disagreement is not whether the state should intervene at all but the degree to which it should (Lin and Chang, 2009). In fact, even the mainstream IMF (Arslanalp *et al.*, 2010) now concedes that public investment in capital formation is important, being more positively correlated with growth over the long term for non-OECD countries than OECD countries. With this in mind, higher commodity prices represent potential opportunities for developmentally focused governments of CDDCs.

The positive impact of Chinese investment on growth via infrastructures

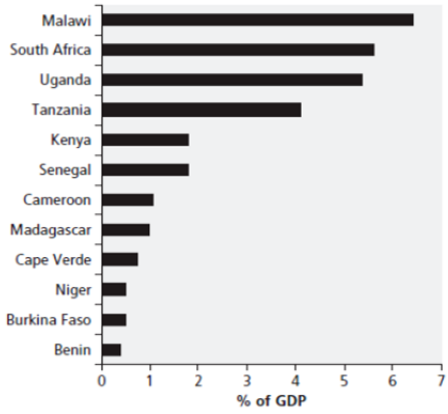
Moreover, Chinese investments occur not only in the commodity sectors but also in industrial sectors and infrastructure, which are likely to have a positive impact on growth and fiscal balances - as infrastructure is a key determinant of growth.

Indeed, a significant amount of Chinese foreign direct investment in SSA is associated with the creation or rehabilitation of infrastructure: Chinese investors and the government of China increasingly invest in infrastructure in Africa, for example in Angola, Nigeria and Sudan, via water and sanitation, transportation, energy and mineral-related projects (Orr and Kennedy, 2008).

The improvement in infrastructure has *per se* a positive impact on SSA growth and trade capacity. There is also a correlation between infrastructure and export diversification, and the current low levels and distorted composition of exports in SSA are partly due to poor trade infrastructure, as trade delays reduce exports (Hummels, 2001; 2007).

Poor infrastructure is a key impediment to growth, trade and competitiveness of SSA, in particular power, rural electrification and transport (Calderon and Servén, 2010). Power outages represent substantial costs in SSA: in particular, they slow industrial development and therefore are an obstacle to structural transformation.

Figure 27: Economic cost of outages in selected countries in Sub-Saharan Africa



Source: Foster and Briceño-Garmendia (2010).

Transportation costs are much higher in SSA than any other region of the world (Portugal-Perez and Wilson, 2008, on the example of transport costs from SSA cities to Rotterdam). Moreover, delays for exporters due to poor infrastructure are compounded by bureaucratic inefficiency (Freund and Rocha, 2009). The delays in inland transport are also an important factor restricting trade.

A crucial aspect of SSA countries is the combination of a commodity-based market and export structure with a poor level of the infrastructure stock. This generates important constraints and transaction costs on the circulation of goods and people.

3.3. The negative impacts of the intensification of China's trade and investment relationships with Sub-Saharan Africa

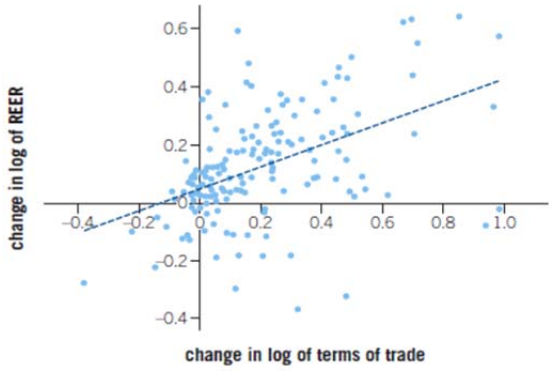
The negative impacts of trade relationships between China and Sub-Saharan Africa

Higher and more volatile commodity prices, driven substantially by China, can result in negative effects, notably Dutch disease, in the context of weak institutions. Furthermore, China's demand may lock SSA economies into their century-old pattern of dependence on the export of primary commodities. Chinese imports from SSA are mostly commodities, whilst its exports to SSA – and indeed, the World – are mostly manufactures. To SSA commodity producing countries, this represents huge competition in a route out of traditional export structures. So through its demand and its competition, China potentially reinforces existing market and export structures.

Dutch disease effects

The theory of Dutch disease was discussed above. Figure 28 shows evidence that commodity price shocks can lead to appreciations in the real exchange rates of a cross section of countries.

Figure 28: Terms of Trade shocks and real appreciation



Source: Brahmbhatt et al (2010)

However, Dutch disease posits this boom will affect not just the REER but industry value added as well. Ismael (2010) models this effect for a sample of oil producers during an oil boom. He uses the following regression:

$$\Delta lny_{ijt} = \alpha + \sum_{i=1}^{I} \beta_i 1(industry) + \sum_{j=1}^{J} \gamma_j 1(country) + \sum_{i=1}^{T} \varphi_t 1(year) + \sum_{i=1}^{4} \eta_{t-i} \Delta lnwindfall_{t-i} + u_t$$

The independent variable is the output of sector i in country j at time t, and the first three regressors are dummies associated with industry, country and time respectively. The final regressor captures the effects of an oil price shock at various lags. Ismael finds four lags to be significant with the value reported in table 7. The middle row reports the total estimated impact of the shock for all lags. Including fixed effects does not much alter the results that a 10% oil windfall reduces industrial output and value added across industries by around 3.6% and 3.3 – 3.4% respectively over four years.

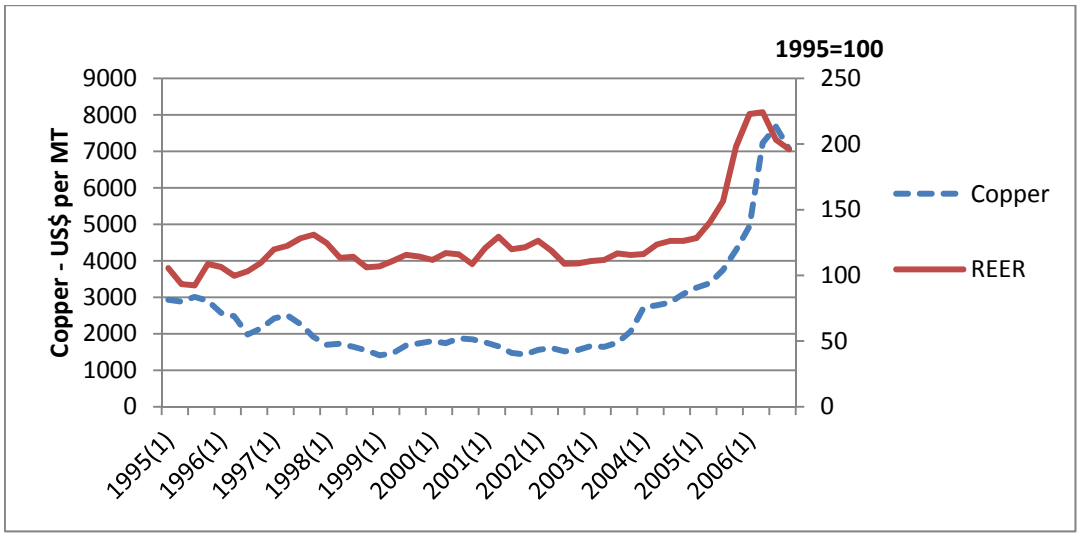
Table 7: Dutch Disease effects on industrial output and cross sectoral value added

	Output (1)	(2)	Value Added (3)	(4)
	Pooled	Fixed-Effect Panel	Pooled	Fixed-Effect Panel
η_{t-1}	-.108*** (.0237)	-.106*** (.0238)	-.116 *** (.0281)	-.111*** (.0285)
η_{t-2}	-.0866 *** (.0221)	-.0891*** (.0218)	-.068*** (.0236)	-.0672*** (.0233)
η_{t-3}	-.0966 *** (.0124)	-.0966 *** (.0124)	-.104*** (.0132)	-.101*** (.0132)
η_{t-4}	-.0653*** (.0133)	-.0646*** (.0129)	-.0547*** (.0158)	-.0519*** (.015)
$\sum_{i=1}^{4} \eta_{t-i}$	-.357*** (.0495)	-.356*** (.0492)	-.342*** (.0564)	-.331*** (.0561)
Observations		44731		42582
Total Countries		90		83
Oil-Exporting Countries		15		15
Industries		81		81
Country FE	YES	NO	YES	NO
Year FE	YES	YES	YES	YES
Industry FE	YES	NO	YES	NO
IndustryXCountry FE	NO	YES	NO	YES
R^2	0.05	0.02	0.04	0.02

Source: Ismael (2010). Notes: The data covers the period 1977–2004 on 81 manufacturing sectors and covers 90 countries including 15 oil exporters (oil ≥ 20% exports) (for non oil exporters, the regressor capturing windfall is set to zero.

Dutch Disease effects can also be observed at the individual country level. For instance Zambia (the subject of the case study below) witnessed large appreciations in its REER coinciding with the boom in copper prices (figure 29).

Figure 29: Copper prices and the Real Effective Exchange Rate



Source: Authors' calculations based on IMF statistical appendix and IMF commodity price index[18]

It must be noted that there were other factors impacting Zambia's exchange rate in this period such as its attainment of HIPC status (the conditions for which are thought to signal prudent macroeconomic management, and thus a more favourable investment climate which attracts foreign capital), an expansion in non traditional exports – doubling in value during 2000-2005, and a tighter monetary policy (Cali and te Velde, 2007). But simple regression evidence suggests that copper prices still had the largest impact (table 8).

Table 8: Correlation between Zambian REER and copper prices

Period	2003–06		2004–06		1985–2006
	X value	Copper Price	X value	Copper Price	Copper Price
Correlation	0.9436	0.904	0.949	0.942	0.466
R Square	0.887	0.818	0.900	0.887	0.217
Coefficient	0.514	0.023	0.613	0.031	0.015
t-statistics	16.343	13.058	15.285	14.264	8.401
Observations	40	40	28	28	256

Source: Cali and te Velde (2007).

18 Copper price is the LME spot price in US$ per metric tonne of grade A cathode.

As well as the predicted effect on the exchange rate, booming copper prices also seemed to have effects on the broader economy in line with the predictions of the Dutch Disease theory: non booming tradables sectors declined whilst booming tradables and non-tradables sectors expanded (table 9).

Table 9: Zambia's sectoral share of GDP, 2001-2005

	2000	2001	2002	2003	2004	2005[a]
Non-booming tradable	**30.6**	**29.5**	**28.8**	**28.8**	**28.5**	**28.0**
Agriculture, Forestry and Fishing	17.2	16.0	15.2	15.2	15.0	14.7
Agriculture	8.5	7.6	6.9	7.1	7.2	7.0
Manufacturing	10.5	10.4	10.7	10.9	10.9	10.7
Electricity, gas and water	2.9	3.1	2.9	2.7	2.6	2.6
Booming tradable	**6.4**	**7.0**	**7.9**	**7.7**	**8.4**	**8.2**
Mining and quarrying	6.4	7.0	7.9	7.7	8.4	8.2
Non-tradable	**56.8**	**57.2**	**58.2**	**58.7**	**59.2**	**60.4**
Construction	4.9	5.3	6.0	6.9	7.9	9.0
Wholesale and retail trade	18.3	18.4	18.7	18.8	18.8	18.9
Restaurants, bars and hotels	1.9	2.3	2.3	2.4	2.4	2.5
Transport, storage and comm.	6.3	6.2	6.1	6.1	6.1	6.3
Financial Institutions and insurance	8.2	7.8	7.9	7.7	7.6	7.5
Real Estate and Business services	9.5	9.4	9.5	9.4	9.3	9.2
Community, social and personal services	7.7	7.8	7.7	7.4	7.1	7.0
Less:	-4.9	-4.8	-4.7	-4.6	-4.5	-4.4
TOTAL	89.1	88.9	90.0	90.7	91.5	92.2
Taxes	10.9	11.1	10.0	9.3	8.5	7.8
TOTAL GDP at Market prices	100.0	100.0	100.0	100.0	100.0	100.0

Source: Cali and te Velde (2007).

Borrowing Cali and te Verde's methodology, it can be shown that the decline of the manufacturing sector continued after 2005 though for different reasons. Table 10 shows the evolution of Zambia's economic structure from 2006–2009.

Table 10: Zambia's sectoral share of GDP, 2006-2010

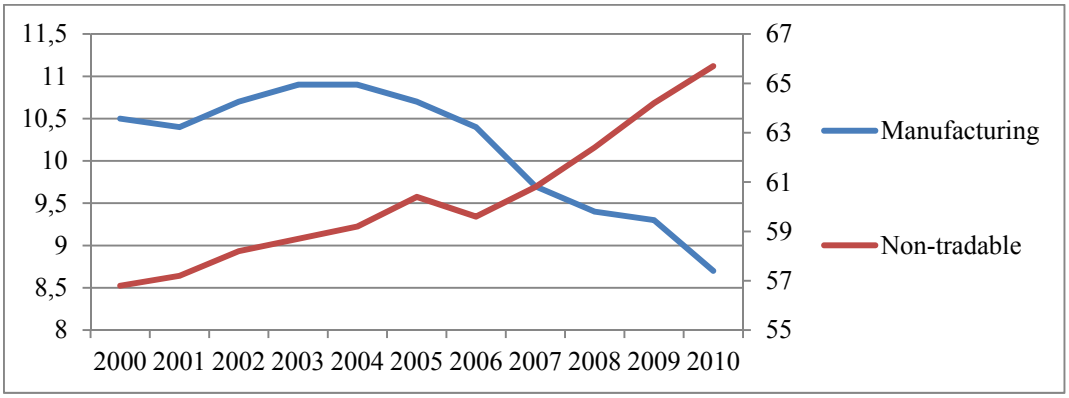
	2006	2007	2008	2009	2010
Non-booming tradable	**33.6**	**32.4**	**32**	**32.9**	**31.6**
Agriculture, Forestry and Fishing	20.2	19.8	19.8	20.8	20.1
Manufacturing	10.4	9.7	9.4	9.3	8.7
Electricity, gas and water	3	2.9	2.8	2.8	2.8
Booming tradable	**4.2**	**4.4**	**3.6**	**2.6**	**3.7**
Mining and quarrying	4.2	4.4	3.6	2.6	3.7
Non-tradable	**59.6**	**60.8**	**62.4**	**64.2**	**65.7**
Construction	12.2	14.5	16.1	18.3	20.2
Wholesale and retail trade	16.9	16	15.6	15.3	14.4

Restaurants, bars and hotels	2.9	2.9	2.9	2.4	2.4
Transport, storage and comm.	4.2	4.3	4.1	3.6	4
Financial Institutions and insurance	8.4	7.9	8	8.6	8.7
Real Estate and Business services	6	5.8	5.7	5.7	5.5
Community, social and personal services	9	9.4	10	10.3	10.5
Less:	-4.8	-4.5	-4.6	-4.5	-5
TOTAL	92.6	93.1	93.4	95.2	96.1
Taxes	7.4	6.9	6.6	4.8	3.9
TOTAL GDP at Market prices	100	100	100	100	100

Source: adapted from Zambia Central Statistical Office Monthly bulletin (CSO), June 2011. Note: 'agriculture' aggregates Cali-te Velde's categories 'Agriculture, Forestry and Fishing' and 'Agriculture'.

Now it is a construction boom that is occurring at the expense of the manufacturing sector. But the mining sector actually appears to decline relatively. In fact, these figures may actually mask the extent of Dutch disease. As will be discussed later, there have been extensive investments in increasing Zambia's copper processing capacities, with new smelters and refineries being built. This is reflected in the Construction figures in table 10 and has permitted a huge growth in refined copper output (Meteorex, 2011). Yet this is classed as manufacturing (ISIC class 242 under category C: Manufacturing, [Unstats, 2012]) so with this in mind, the decline in manufacturing overall (figure 30) must be smaller than the decline in non-copper manufacturing.

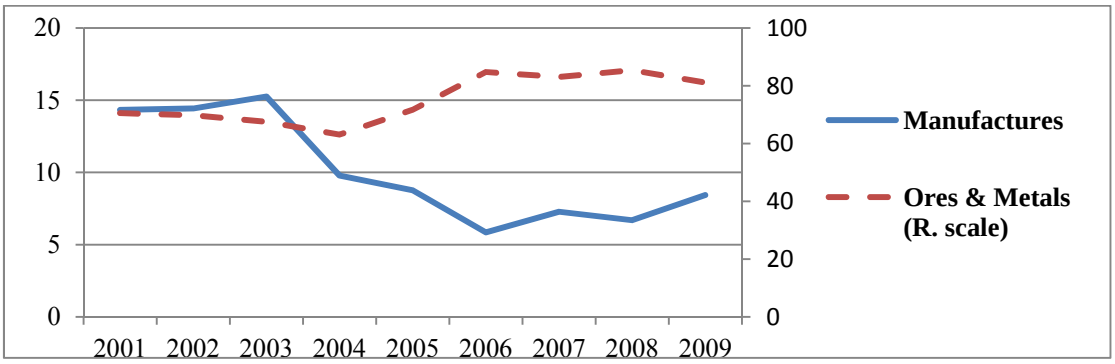
Figure 30: Zambia's aggregate sectors as % of GDP



Source: Zambia CSO, June 201. Note: non tradable is on the right scale.

Unfortunately, disaggregated figures for manufacturing were not available so this remains speculation, though supported by Figure 31, which shows the shifting structure of Zambia's export portfolio. In this case 'ores and metals' includes refined copper (as it includes all subsections of SITC code 68 in the classification of the World Development Indicators 2011) and manufactures excludes processed metals.

Figure 31: Zambian exports as % of total merchandise exports



Source: World Bank World Development Indicators 2011.

The risk of lock-in Sub-Saharan African economies in the exporting of commodities

China, however, may constitute a significant constraint for developing countries, in particular low-income commodity-dependent SSA countries. China's relationships with SSA are driven by the quest for the inputs - oil and other raw materials – that are necessary for its own industrialisation, its infrastructural investments and its exports. The growing demand from China - and other large emerging countries - for SSA commodities, e.g., oil, metals, cotton, etc. pushes prices upwards: therefore, the demand for commodities from China may lock-in SSA countries in their existing commodity exporting structure. Blattman *et al* (2007) discuss positive price shocks as possibly reinforcing traditional structures since as long ago as 1870, although they present this as speculation on their other results.

In this regard, there are two different and simultaneous types of effects, which may have damaging impacts on SSA economies. On the one hand, the high levels of prices of some commodities, which are driven by China's growth and demand, may be detrimental for the exporters of these commodities as they create strong incentives for remaining within this pattern of exports, although this pattern is a major factor of vulnerability to external shocks and fluctuations of international prices and demand.

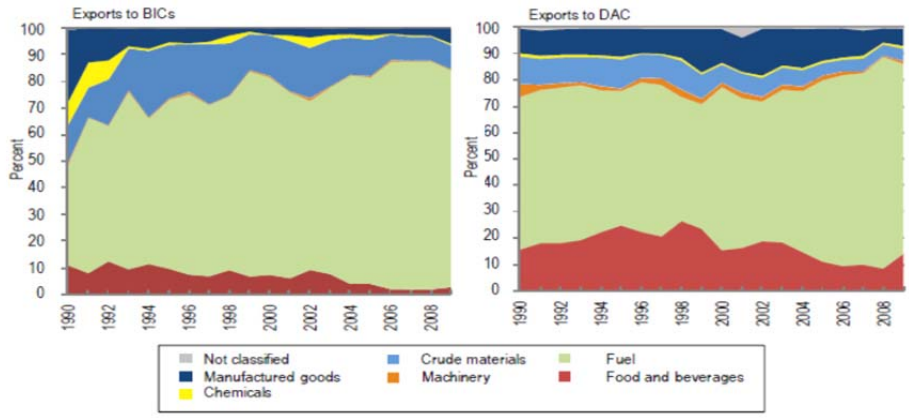
This strengthening of the specialisation of SSA in commodity exports is not only driven by China but also by other emerging countries: as underscored by UNCTAD (2010a, p. 36), the composition of SSA exports to other developing countries over the 2000s has shifted towards primary products at the expense of manufactures.

On the other hand, these commodities' high levels of prices harm the SSA countries that do not export them and on the contrary need to import them (e.g., oil- or food-importers), as they cause a deterioration of their trade balance.

It is important to note, however, that the current export pattern of SSA to China does not differ from SSA export pattern to other parts of the world. Oil dominates SSA export to China, but SSA exports to the rest of the world exhibit the same composition – firstly oil and gas, then non-petroleum minerals and metals (Wang and Bio-Tchané, 2008). The six largest SSA exporting countries to the rest of the world are South Africa, Nigeria, Angola, Côte d'Ivoire, Equatorial Guinea, and Gabon, which are almost all oil countries, plus South Africa (Ye, 2010). By 2008, oil accounted for about 70% of all

SSA exports to China, India and Brazil - for more than 80% of exports if South African exports are excluded (IMF, 2011b).

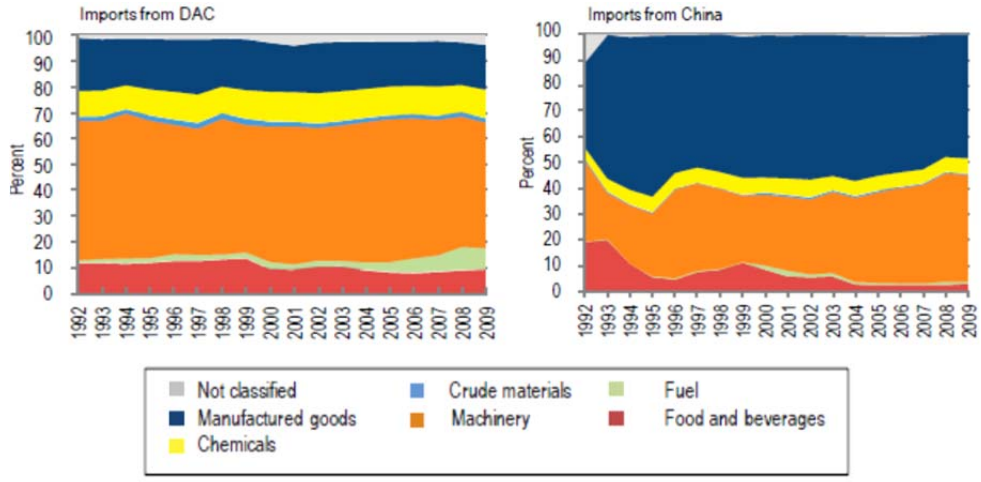
Figure 32: Sub-Saharan Africa exports to OECD countries, and to China, Brazil and India by product composition



Source: IMF (2011b), fig. 3.5. BIC: Brazil, India, China. SSA here excludes South-Africa.

Similarly, the patterns of Africa's import from China and from the rest of the world do not exhibit significant differences. Africa imports manufactured goods and processed commodities from the world, e.g., manufacturing goods, machinery and equipment, food and chemicals, with a greater share of manufacturing goods from China (typically, low-end manufactured products), compared with a greater share of machinery and transport equipment from the rest of the world (Ye, 2010; IMF, 2011b).

Figure 33: Africa imports from China and from the rest of the world

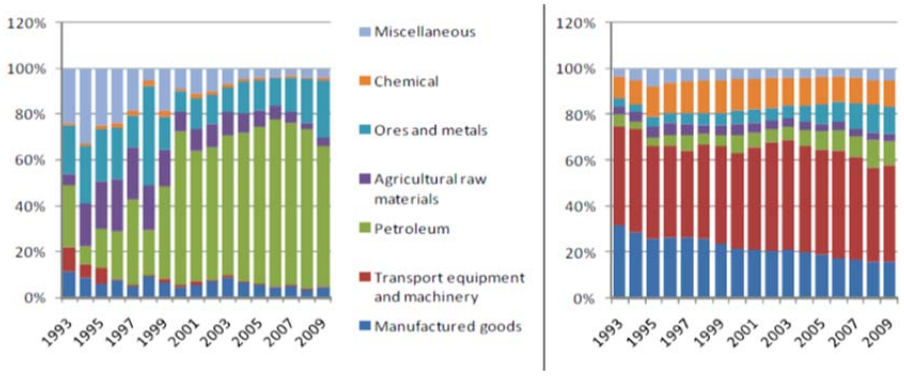


Source: IMF (2011b), fig. 3.7.

On the side of China, however, the type of goods it imports from SSA is specific to SSA: this confirms the view that China trade relationships with SSA are keeping the

continent in its specialisation of commodity exporting region. Indeed, China imports commodities from SSA, but imports different products from other parts of the world, i.e. manufactured goods, transport equipment and machinery, and chemicals.

Figure 34: China's imports from Africa China's imports from rest of the world



Source: Ye (2010).

China's trade as a threat for Sub-Saharan African industrial sectors

China trade may not only intensify the specialisation of commodity exporters in this pattern of export, but China may also have a detrimental impact on existing manufacturing sectors in SSA. Such a detrimental impact is not specific to SSA: it may be more destabilising in SSA, however, in view of the narrowness and fragility of local manufacturing sectors.

Firstly, China's 'demand pull' positive effects may be counter-balanced not only by stronger commodity-dependence, but also by lesser possibilities for SSA industrial sectors of upgrading and shift from resource-based industries to non-resource and skill-based ones (Farfan, 2005).

Moreover, as demonstrated by Kaplinsky (2006), the entry of China into the global market has increased the demand for many 'hard commodities' (oil, metals), but China as an exporter of manufactures may undermine the prices of many manufactures, which is compounded by the concentration in global buying. For Kaplinsky and Morris (2008), China may undermine export-oriented industrialisation, which may be detrimental to SSA development, as export-oriented manufacturing can constitute a developmental path for SSA, as was the case for the first Asian developmental states' and China itself. China has become a major global exporter of manufactures, which creates severe problems for export-oriented growth in SSA.

For example, while they can be first steps in export-oriented manufacturing growth, SSA clothing and textile sectors are facing important difficulties because of the competition of China's products. SSA's clothing and textile industries incur the risk of being excluded from global markets and are threatened in their domestic markets. Kaplinsky *et al.* (2007) thus reveal that the share of SSA exporters in US clothing and textiles imports grew between 2001 and 2004, reflecting preferential AGOA trading arrangements. The end of the Multifiber Arrangement (MFA) in 2005 put an end to MFA quotas, which were limiting Chinese exports, and SSA exporters experienced a

significant fall in their share of the US market after quota removal. On the contrary, the share of China in these product markets grew significantly.

This is also shown by case studies. In Ethiopia for example, China has displaced other countries as export destinations for that country. Imports of Chinese footwear have reduced the activities of local firms, and over the long term risk crowding out Ethiopia's efforts to use sectors such as footwear as a basis for industrialisation (Gebre-Egziabher, 2009).

The negative impacts of Chinese investments

In addition, large Chinese investments (especially in infrastructures) may also have lock-in effects, as they are organised by original contracts that exchange investments for commodities (coined as the 'Angola model').

The potential lock-in effects in commodity-based export structure of China's package linking investment, trade and aid

A characteristic of the relationships between China and SSA is that their three main channels - trade, foreign direct investment and aid - are interlinked and bundled via original contractual links. This contractual package constitutes an 'exchange' of products for investment - under which SSA governments exchange - in a way that may be compared with barter - exports of commodities for investment by Chinese firms, often in infrastructure.

These bundling arrangements imply a potential 'lock-in' effect: in closely linking trade, investment and aid, they entails the risk of maintaining SSA export structure in its commodity-based pattern, as well as reducing the room of maneuver on the side of the SSA contracting government.

As analysed by Kaplinsky and Morris (2009), these original contractual arrangements represent a strategic integration of Chinese operations in SSA: Chinese aid complements trade and FDI flows and distinctions between these three dimensions are blurred. This is compounded by the fact that, as underscored by Foster *et al*. (2008), the financial terms of Angola mode are very difficult to assess because they depend on the implicit price agreed for the commodity traded: prices rise and fall over the period of the loan, for example typically for oil, and the term of the loan is adjusted accordingly. In addition, only about 7% of Chinese infrastructure finance is directly linked with natural resource extraction, as it usually goes to broader development projects (Foster *et al.*, 2008, p. x).

Indeed, China bundles its aid with commercial trade finance in a single transaction: the money from the Exim Bank does not pass through the host country government and goes directly to the Chinese contractor (Orr and Kennedy, 2008). As underscored by Kaplinsky and Morris (2009), these contracts constitute 'packages' in which the Exim Bank provides a line of credit, often at subsidised interest rates; large Chinese firms, often state-owned enterprises, then tender for infrastructural and resource projects (e.g., mining, oil, roads, railways); and finally these funds, which are tied to the use of Chinese inputs, are transferred from the Exim Bank to the firms and are repaid by the recipient country through commodity exports to China. As underscored by Foster *et al.*

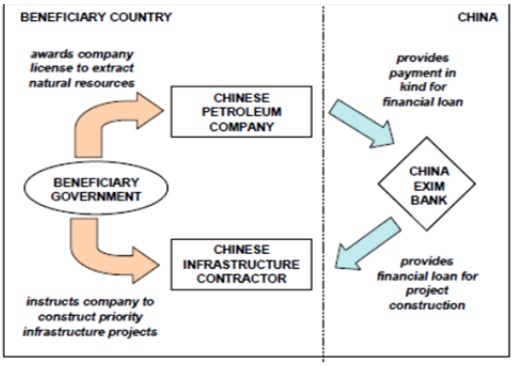
(2008), the China Exim Bank's terms and conditions are agreed on a bilateral basis, with the degree of concessionality depending on the nature of the project: they calculate that for both infrastructure and non-infrastructure loans Chinese loans compare favorably with private sector lending to SSA but not with official development assistance[19].

These contracts focus on extractive sectors and can be coined as 'resource-for-infrastructure' investment contracts – typically oil, but also copper and other metals (Alden and Alves, 2009): as underscored by Zongwe (2010), natural resources are exchanged for national infrastructures through two related investment contracts, a resource (mining, oil) contract and an infrastructure contract. China gets the resources from the host country in SSA and, in exchange for the resources, China implements infrastructure projects in that country. The two investment contracts secure the extraction of natural resources, their export to China and the use of the revenues thus generated to fund infrastructural and industrial projects in the host state.

This is the so-called 'Angola model' (or 'mode'), as Angola has been considered as the first and paradigmatic example of such contractual arrangements - in 2004 Angola and China's Exim Bank agreed on a series of financing packages for public investment projects in Angola, which were based on oil-backed concessional loans from Chinese banks (Corkin, 2011), for the financing of infrastructure in the sectors of energy, water, health, education, fisheries, road, rail and airport public works projects.

The 'Angola Model' is now the framework of most Chinese state-owned enterprises' activity in SSA. It is a new type of concessional finance, which attracts SSA governments in comparison with aid from traditional donors (Davies, 2010). This 'model', however, has to be understood as an ideal-type, as its actualisation differs across SSA countries, according to their political specificities, the commodity, sector and project considered – Angola's empirics of the oil sector do not even entirely fit with the 'Angola model'.

Figure 35: Structure of the 'Angola Model' arrangements



Source: Foster *et al.* (2008).

[19] Chinese loans provide a grant element of 36% to Africa, vs. 66% for official development assistance (ODA) in the sense of the OECD-Development Assistance Committee/DAC (Foster *et al*., 2008).

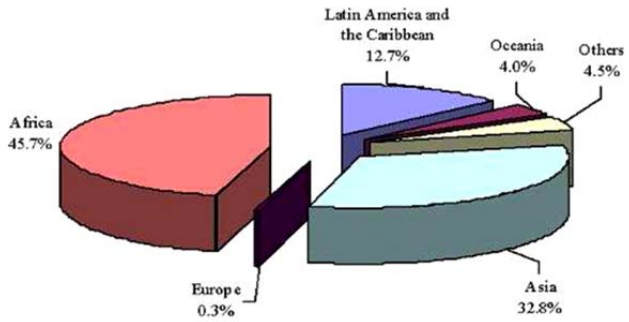
The links of Chinese aid with trade and investment: their ambiguous impacts

Chinese aid flows to Africa are increasingly important, and as such, it may be assumed that they can be beneficial for the continent's development. Their impact may be ambiguous, however. Potential lock-in effects are inherent to the bundle structure of the 'Angola model', as it links aid, trade and investment and gives Chinese aid a specific organisation – although China's aid may also be channelled outside the contractual modalities of the 'Angola Model'.

Official flows from China to Sub-Saharan African governments do not primarily consist of aid, but of commercial-rate export credits (Brautigam, 2010b). Exim Bank export credits, which mostly support infrastructure projects in SSA, are much larger than aid flows. While aid was historically a major instrument of China's economic engagement with Africa, with aid flows relative to trade being about 20% in the early 1990s, this ratio declined to 3-4% in 2004-05 (Wang and Bio-Tchané, 2008; Brautigam, 2009). China, however, created the FOCAC (China-Africa Cooperation Forum) in 2000 and has augmented its aid since then.

According to the government of China's White Paper on foreign aid (China's Information Office, 2011), financial resources provided for foreign aid fall into three types: grants (aid gratis), interest-free loans and concessional loans. The first two come from China's state finances, while concessional loans are provided by the Exim Bank. This highlights the close links between trade, investment and official development assistance. As a donor, China differs from 'traditional' donors by its close ties with the state banks and state enterprises, which are often involved in the implementation of China's foreign policy vis-à-vis SSA. By the end of 2009, China had provided 38.8 billion US$ in aid to foreign countries, firstly under the form of grants (GoC White Paper, China's Information Office, 2011). These aid flows go in the first place to Africa (45.7% of total flows).

Figure 36: Geographical distribution of China's foreign aid funds in 2009



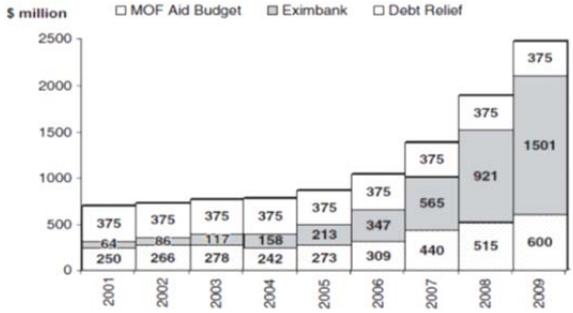
Source: China's Information Office, White Paper on foreign aid (2011).

It is difficult to disentangle Chinese aid in the sense of official development assistance (ODA) from other flows, notably commercial flows, and Chinese statistics do not follow the OECD Development Assistance Committee (DAC) definition of ODA. As aid flows are difficult to disentangle from export credits, aid may be tied to the delivery of Chinese goods and services (Christensen, 2010). According to Brautigam (2009), who has analysed multiple sources, aid to Africa would have represented 2.5 billion

US$ in 2009. China is therefore a significant donor, broadly at the level of Japan or the United Kingdom.

Although figures cannot be strictly compared (they also refer to SSA and not Africa), France's ODA to SSA amounted to 3.2 billion US$ in 2007-08 (average), United Kingdom's ODA 2.6 billion US$ and United States' ODA 5.7 billion US$ for (OECD-DAC, 2010, pp. 111, 129, 130).

Figure 37: China's aid to Africa, US$ millions



Source: Brautigam (2009, p. 170), quoted in Humphrey (2011) and Fan *et al*. (2010). MOF: Ministry of Finance; Eximbank: Eximbank concessional loans.

Chinese aid flows are not linked to donors' conditionalities as is the case for 'traditional' donors - the international financial institutions (the IMF and the World Bank), the EU or bilateral donors. In particular, Chinese foreign assistance is not conditional to recipient countries' compliance with political (such as 'good governance'), environmental or social conditions. China's government views its aid as an element of a policy of strengthening its ties with SSA governments in order to fulfil strategic objectives, such as the securing of its access to natural resources that are crucial for its own growth and consolidate diplomatic alliances (Alden, 2007b).

The associated risks have been underscored in several studies, such as the strengthening of questionable political regimes and weak support to the genuine ingredients of long-term sustainable growth (Brautigam, 2010b). The very limited contribution to growth and even harmful effects of 'traditional' donors' assistance, however, are now demonstrated by a vast literature (among many others, Easterly, 2003; 2007), as are its political motives (Alesina and Dollar, 2000). Moreover, Chinese aid may fill the critical gaps that characterise traditional donors (Nissanke and Söderberg, 2011). As argued by Brautigam (2011), China's aid may not be official development assistance but can still be considered developmental. For SSA governments, in contrast with traditional donors, China's aid provides them with a 'fiscal space' and room for manoeuvre in the choice of policies they consider as appropriate for themselves.

4. The channels and impacts of China as shaped by recipient country specific characteristics: the example of Zambia

In this context, it is political and financial imperatives and industry and commodity specific characteristics that affect an individual country's ability to harness opportunities for increasing long run growth created by high commodity prices. This section illustrates the differing effects China has from Western investors in Zambia in this respect by first considering the general picture of Copper sector investors in Zambia then considering areas in which the outcome was different for Chinese investors.

4.1. A key dimension of trade and investment relationships between China and Sub-Saharan Africa: African countries' political economy

Export structures obviously cannot be viewed as the sole and systematic causal factors of weak growth performance, as is shown by the numerous countries that have based their long-term growth on the production and export of commodities, for example Canada, Australia, Scandinavian countries, and interestingly, the United States at the period of the beginning of their growth in the 19th century (Wright, 1990; Wright and Czelusta, 2002).

It is the combination of export structures and other factors such as domestic political economy and institutions that generate processes that impede growth and lock-in SSA economies in 'low equilibria' and traps. Political and economic institutions *in fine* command the composition of exports and the use of commodities (Mehlum *et al*., 2006; Torvik, 2009). Trapping processes are typically self-reinforcing and endogenous. Poor institutions – or poor infrastructure – may foster economic stagnation, while the latter foster poor institutions, and for example political regimes that do not invest in infrastructure and are unable to implement efficient taxation systems and provide public goods.

Indeed, many SSA countries are characterised by institutions – economic, political, social - and by a specific political economy that may not be favourable to growth and aggravate the consequences of existing export structures. In most SSA countries, political institutions are shaped by authoritarian regimes or illiberal democracies, where institutions are democratic only *de jure*, but not *de facto*: arbitrariness, patronage relationships and corruption typically prevail in such regimes. Authoritarian regimes may have a detrimental impact on growth as they suffer problems of credibility, which lower the efficiency of all their policies, promises and commitments. As shown by Acemoglu (2003), all governments are affected by the problem of commitment and credibility, because there is no meta-level above government that has the coercive capacity to enforce government policies and promises: this is even more the case for developing countries, especially SSA governments that are simultaneously confronted with weak institutions and low levels of incomes.

Many SSA countries are also characterised by political instability and credibility problems, which are key factors of endogenous processes leading to poverty traps. As revealed by Olson (1993), the combination of political instability and dictatorships may

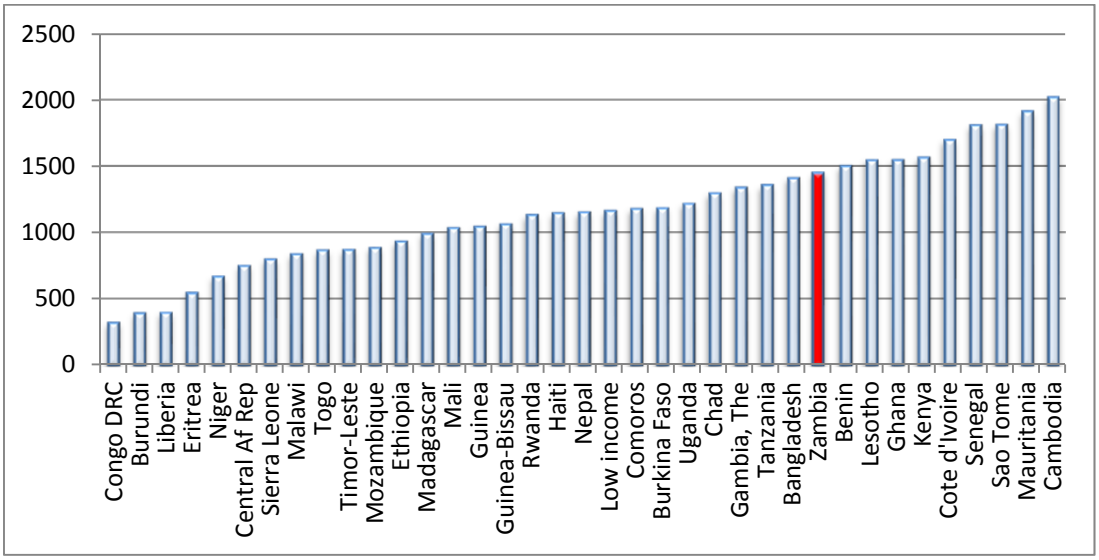
foster the emergence of predatory regimes, which have no incentives to increase wealth and create efficient economic institutions that would aim, for example, at diversifying and industrialising. This political economy is reinforced by commodity-based export structures, which generate rents whose redistribution strengthens patronage systems (Sindzingre and Milelli, 2010).

4.2. The political economy of Zambia's privatisation process

The potential for CDDCs to mobilize their commodity sectors for development depends crucially on how large a share of the value of these resources they can capture. This is a function of their bargaining power: whether bargaining in the global market over sale price of commodity exports or bargaining with tendering businesses over the fiscal treatment of a commodity sector being privatized. Bargaining power then determines taxes and royalties paid by the MNEs but also other benefits such as the relative linkages to the domestic economy vs. leakages abroad and human capital investments. What can be noted is that these factors resulted in different outcomes for the Chinese investors in Zambia's copper sector, as will be outlined below.

A high-grade copper industry, based in the Zambia's copperbelt, has defined this country's economic history. Post-independence, Zambia was a middle-income country whose GDP was among the highest in Africa. During the 1970s, however, the collapse of copper prices devastated the economy. Mineral revenues fell from 60% to 2% of GDP between 1970 and 1976 (Auty, 2008) and with an undiversified economy, Zambia declined rapidly: a 50% fall in GDP per capita between 1974-94 (Fraser and Lungu, 2007). By 1985, the World Bank re-classified Zambia from low-middle-income to low-income and by the 1990s Zambia was included on the list of least-developed countries by the UN. Today it is among the poorest countries in the world (figure 38).

Figure 38: 2009 GDP Per Capita (PPP current $US) (poorest countries)



Source: Data from World Development Indicators (2010).

A new government came to power in 1991 on a liberalising platform with a huge popular mandate and were eventually to privatise ZCCM[20], the state operated mining conglomerate. However, because private wealth accumulation was viewed suspiciously under Kaunda (AfDB, 1997), no capital rich domestic class had developed who could participate in this privatisation process so when ZCCM was unbundled and sold in 2000[21], it was to foreign investors.

Foreign direct investment has the potential to promote development through technology and skills transfer, employment opportunities, increasing productivity and enhancing access to export markets with higher value product offerings (Kopulande and Mulenga, 2011). But these gains are not inevitable and the extent to which they are enjoyed depend on the conditions of investment. In Zambia, several factors were at work resulting in outcomes of privatisation negotiations that heavily favoured incoming investors at the expense of Zambia. It was increasingly critical that ZCCM be revitalised, it being a loss-making, heavy drain on public funds since the copper price collapse exposed its glaring inefficiencies. But the government lacked the resources to do this (Lungu, 2009). Because Zambia's development drive was heavily dependent on imports (60% of which were for industry) it was important to have a dynamic export sector, earning forex, which the copper sector had previously been. Ongoing large external deficits underlined the need for revitalisation. In fact, the ongoing external deficits since the copper bust, and the need for financing that international private capital was reluctant to meet, had led to the need for donor financing, and an increasing influence of these donors over Zambia's economic policies (Fraser, 2007). The donors were intent on ZCCM's privatisation and, as time went on, grew increasingly impatient, and more prepared to use severe aid sanctions (Rakner, 2004: 22). Thus ZCCM's privatisation was very time critical, which incoming investors knew.

For their part, the incoming investors faced risks which made them more inclined to exploit Zambia's vulnerability and secure favourable tax treatment to offset their investment risks. Copper prices, it must be remembered, were still very low when the bulk of ZCCM was sold off. Moreover they were (and are) very volatile, and therefore represented uncertain revenue streams for these incoming investors. Furthermore, the prospects of passing on cost increases was limited: firstly, raw materials shares in copper products are on average very high, so it is harder for downstream market to absorb cost rises profitably; secondly, because Zambia is relatively small in the global copper market, if exporters from Zambia tried to raise prices, purchasers could buy elsewhere[22]. These were notable risks considering the size, and irreversibility, of an investment in a copper mine.

In this context, there were vested interests within the government who resisted the privatisation of ZCCM, the state owned mining conglomerate which was still a source of patronage rents whilst constituents who favoured the privatisation, but on equitable

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[20] Zambia Consolidated Copper Mining.

[21] Practically, ZCCM's *assets* were divested to the private sector, with ZCCM-IH remaining publicly controlled, although the literature generally refers to "ZCCM" being privatised. This convention is retained here.

[22] Some copper MNEs in Zambia sold internally to offshore parent companies, such as Glencore, but in those cases, cost raises then are not passed on but remain internal, so will still be resisted.

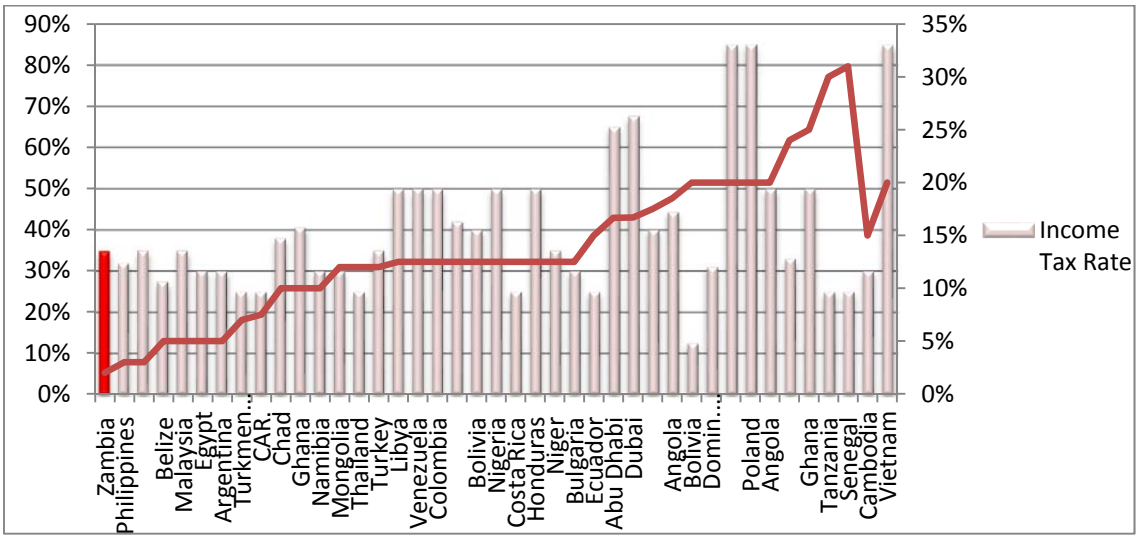
terms, had been weakened by political reforms (Rakner, 2004:16,80). There was thus little unified opposition to the unilateral appropriation of privatisation negotiations by the executive which, substantial evidence suggests, was extremely corrupt (Hallum, 2010). There is understandably no proof that the government took bribes during privatisation negotiations to fund their looming elections. But the balance of probabilities is heavily suggestive, sufficiently to retain corruption as a strong factor that may have influenced negotiations.

4.3. The fiscal outcome of the privatisation process

The Zambian 'Mines and Minerals Act, 1995' (MMA95 henceforth) stipulated Zambia's mining sector regulations. It removed foreign exchange controls – permitting full profit repatriation (Fraser and Lungu, 2007) and set royalties at 3% but permitted the government to enter into company-specific 'development agreements' (DAs) that override MMA95 (Lungu, 2009). Despite MMA95 specifying that royalties should be no less than 3%, most firms pay just 0.6%. The DAs have grace periods (of no renegotiations) of between 15-20 years and the larger MNEs pay corporation tax of 25% instead of the standard 35%.

Comparing these levels globally (figure 39) shows Zambia's is one of the most generous not only in Africa but globally. In addition, MNEs took on only ZCCM's assets, not their liabilities (which include pensions and unpaid services bills etc) the government still struggles to meet these.

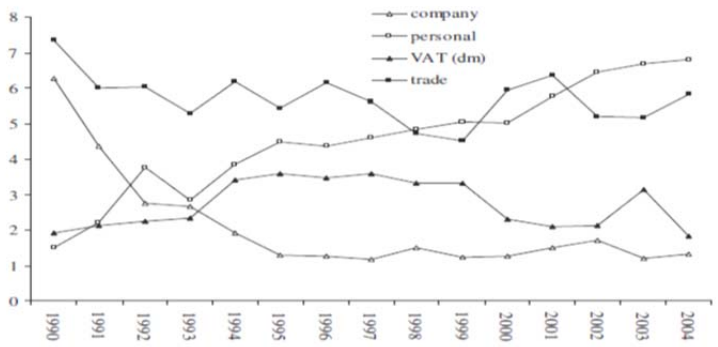
Figure 39: Global mineral taxation rates



Source: Adapted from data in Baunsgaard (2001). Notes: Royalty and tax rates are the upper limits each country levies as values varied. These figures therefore overstate the actual tax obligations on average.

Figure.40 shows the how total tax revenue was constituted during 1990-2004.

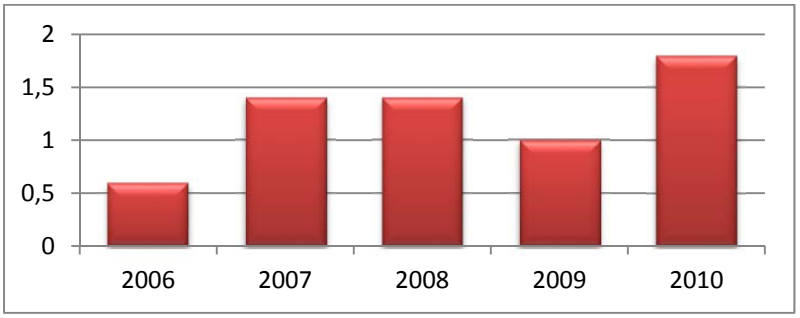
Figure 40: Types of taxes as a % of GDP, 1990–2004



Source: Weeks and McKinley (2006).

Figure 41 shows mining taxes during 2006-2010.

Figure 41: Mining taxes received by the Zambian Government (%GDP)



Source: IMF Country Reports, 2009-2011.

But these figures in isolation actually overstate receipts. A World Bank sectoral study of the tax burden in Zambia, which included VAT claim-back provisions (table 11) and effective subsidies on machinery found the mining industry had a Marginal-Effective-Rate-of-Tax (MERT) of 0%. Mining had the most favourable tax treatment nationally. Mineral inventories are highly taxed (World Bank, 2004), but this encourages more rapid depletion of copper.

Table 11: VAT receipts, 2003

Net VAT Receipts by Sector		
Sector	**Kwacha (M)**	**Percent of Total**
Financial Services	11,764	3.0%
Telecom	44,722	11.4%
Mining	(653,838)[18]	-166.5%
Manufacturing	70,067	17.8%
Tourism	(400)	-0.1%
Agriculture	(27,394)	-7.0%
Other	947,750	241.4%
Total	**392,671**	**100.0%**

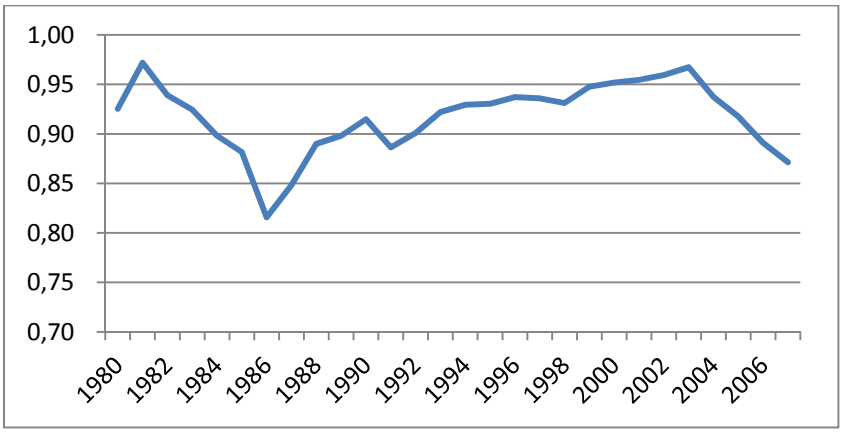
Source: World Bank (2004).

During 2002–2006, the Government earned about $70m from total copper sales of $3bn (Walters, 2010) and during 2003-2006, whilst mining companies made total profits of $652m, the treasury received just $71m of this (Simutanyi, 2008). In 2007, one of the mining multinationals, Vedanta, remitted just US$6.1 million in royalties from KCM despite extracting ore valued at $1bn and making profits of over $310m –equivalent to the Zambian health budget (Zambian-Economist, 2011b).

With an election looming in 2008, the opposition became vociferous in their condemnation of mining sector regulations and, under pressure, the government passed a new act: the 'Mines and Minerals Act 2008' (MMA08 henceforth). This introduced a windfall tax but was strongly resisted by the mining MNEs, who threatened legal action and withdrawal until the government backed down and watered down MMA08's provisions. The opposition leader also made a U-turn on this as his political successes grew, citing the need for employment. Today even the pro business World Bank and IMF have backed calls for a fairer distribution of Zambia's mineral rents (Lusaka-times, 2010; Post-Zambia, 2010) but the government, at the behest of the mining firms, has so far resisted these calls (4castResearch[23], 2009; Reuters, 2011).

As discussed earlier, high forex earnings and improved fiscal space are two benefits of a commodity price boom that CDDCs can harness for development. But this has not been possible in Zambia. Repatriations of profits reduce forex earnings: GNI averages 5–10% less than GDP (figure 42) due to repatriations of income abroad – these leakages have increased as a proportion of GDP during the boom.

Figure 42: Zambia's GNI / GDP



Source: Data from World Bank World Development Indicators (2010).

Low tax and royalty levels reduce the fiscal space that might otherwise have allowed the government to reinvest natural mineral wealth, increasing diversification and countering Dutch Disease effects. In fact, Ley (2010) found this has not occurred in Zambia: negative genuine saving has usually occurred (table 12).

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[23] http://www.4castresearch.com/mining-sector/mining-finance/927--zambia-plans-no-mining-tax-rises-trade-minister-.html

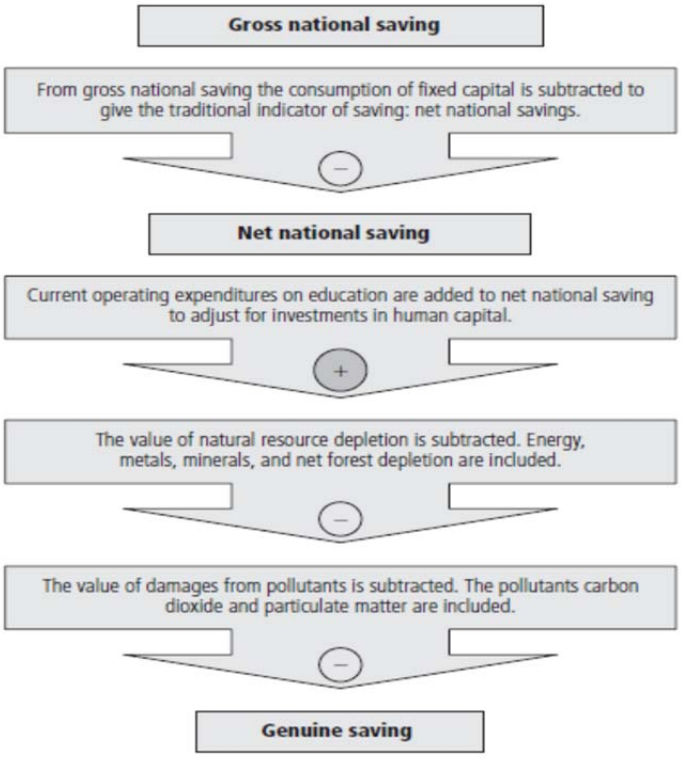
Table 12: Zambia: adjusted net savings, 2001-2007

	2001	2002	2003	2004	2005	2006	2007
Gross Savings	-0.7	6.1	11.1	13.7	15.4	26.3	26.2
Minus Consumption of Fixed Capital = Net Savings	9.0	2.2	2.6	4.6	5.7	15.8	15.5
Plus Education Expenditure	-6.6	0.3	5.1	7.5	7.8	17.9	17.6
Minus Mineral Depletion = Adjusted Savings	-8.6	-1.9	2.2	-1.2	-2.3	0.8	-2.2

Source: Ley (2010). Notes: For ease of calculations, figures exclude GHG emissions and pollution damages. All figures are percentages of GNI; each line shows the result after the adjustments.

Figure 43 below clarifies what is meant by genuine saving.

Figure 43: Flow chart of genuine saving calculation



Source: World Bank (2006).

ZCCM used to provide physical and social infrastructure but since privatisation, mining MNEs have not continued to do so, stating that mining is their competency and the government should manage the social sector and public goods (Fraser and Lungu, 2007).

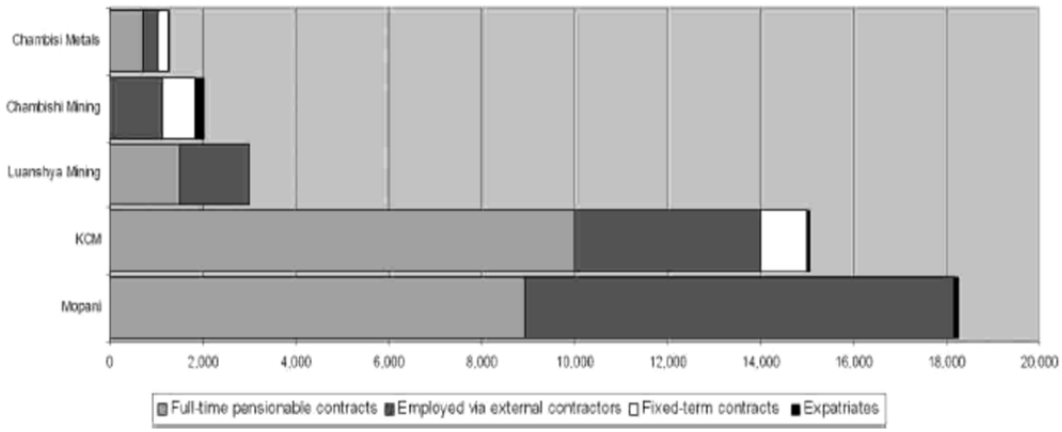
4.4. Foreign direct investment as skill transfer

Another way FDI is said to benefit host countries is through upgrading human capital. Under privatisation ZCCM's pension liabilities have been abandoned and only assets were taken on. Pensions were often used by workers to finance entrepreneurship upon retirement or for younger relatives. If retiring mine workers had planned on setting up a business, ZCCM often offered training and networking opportunities in that field (Fraser and Lungu, 2007).

Now, in contrast, low wage levels since privatisation have led to increases in nutritional defects, increased incidences of preventable diseases, and prostitution (Fraser and Lungu, 2007). Workers are more often placed on fixed term contracts and the workforce is increasingly employed on a casual basis, reducing job security and the returns to skill acquisition. Health and safety issues are sidelined by mining firms as an area for government to regulate and enforce, yet asymmetric resources and power limit the government's ability to do this. Also, management are usually expatriates from the MNE's home country (ibid).

There are exceptions to these trends, however. The two largest operations, Mopani Copper Mining and KCM, treat their employees better than the rest (figure 44) – KCM also gave high skills training to several local employees (KCM, 2011).

Figure 44: Workers under different conditions of service in five large Zambian copper mines, 2006



Source: Fraser and Lungu (2007).

4. 5. The different impacts of Chinese investors in Zambia

China has been present in Zambia since independence in 1964 and Zambia is the third most important destination of Chinese FDI in Africa (Lafargue, 2005). In 2007, first post independence President, Kenneth Kaunda, described China and Zambia as having a history of political friendship, but one that has changed in recent years to be include more economic interest. But in recent years, the Chinese presence there has been characterised by more controversy.

Michael Sata, whilst in opposition, was vociferous in attacking Chinese practice. He claimed close relations between Chinese investors and the Zambian government along with political funding from the former allowed Chinese firms to ignore Zambian laws – a claim the Chinese embassy Beijing denied. However, certain industrial incidents have harmed the reputation of Chinese investors in Zambia and seemed to confirm Sata's accusation. In April 2005 there was an explosion at the BGRIMM plant[24] that killed 52 Zambian workers and no Chinese. No charges were brought. In 2006, in wildcat strikes over delays in wage payments by NFC Africa, two protestors were shot and wounded (Telegraph, 2010). Two Chinese managers were charged with attempted murder but charges were later dropped. On the other side, one Zambian was charged with the murder of a Chinese manager at the Collum mine (Brautigam, 2011c). Such cases are shocking but then again, are they representative? One the one hand, there is undoubtedly a certain amount of anti Chinese feeling in Zambia, and stories such as these might lead one to ask is there any smoke without fire? But on the other hand, to take Brautigam's analogy, is the 2010 BP deepwater oil spill off the Gulf of Mexico representative of British businesses operations in the USA? (Brautigam, 2012).

Sata's election in 2011 was seen by some observers as a vote of no confidence in Chinese investors as Sata had promised diplomatic confrontation with the Chinese state if elected. A Chinese official in response broke Beijing's pledge to not intervene with the politics of trade and investment partners by warning China would cut diplomatic ties with Zambia if Sata were elected (Financial Times, 2011a). So far, this has not happened since Sata became president and, as President Sata seems to have become more pragmatic in his stance on Chinese investors – taking a 'business is business' approach (ibid). He has now welcomed Chinese investors, on the understanding their investments should benefit Zambians. However, were his previous populist attacks on Chinese investors justified? Or to view it in developmental terms, have the Chinese had a better or worse effect on Zambia's development than the Western MNEs?

Chinese mining investments in Zambia

Non Ferrous Company Africa (NFCA) is the Chinese mining firm active in Zambia. It is a subsidiary of the Chinese state owned China Non-ferrous Metal Mining (Group) Co (CNMC). NFCA owns the Chambishi mines, the Luanshya mines and other operations within the 'Chambishi investment zone' – such as Sino Metals, CCS and BGRIMM explosives. NFCA pays 35% tax, as opposed to the 25% paid by Konkola Copper Mines and Moapni Copper mines, the two largest mining firms in Zambia (Fraser and Lungu, 2007[25]). There was no information available on the royalty rate it pays in its development agreement, but in terms of capital investment tax deductions, loss carry-over, customs exemptions, VAT refunds, foreign currency retentions and withholding tax, NFCA enjoyed similar benefits as the other mining firms. In this sense, Chinese investors do not improve fiscal space anymore than any other mining firms (Kopulande and Mulenga, 2011). In fact, most large scale Chinese investments enjoy significant tax breaks, with only small and medium sized investors not enjoying these (ibid). However, it is claimed by China Daily, a paper that is less subject to state control than many, that

[24] BGRIMM explosives being a subsidiary of NFC Africa.
[25] On Chinese investment in the copper sector in Zambia, see also Fessehaie (2011).

a Chinese built Special Economic Zone in Zambia has generated $500m in fiscal revenues since its inception (China Daily, 2012).

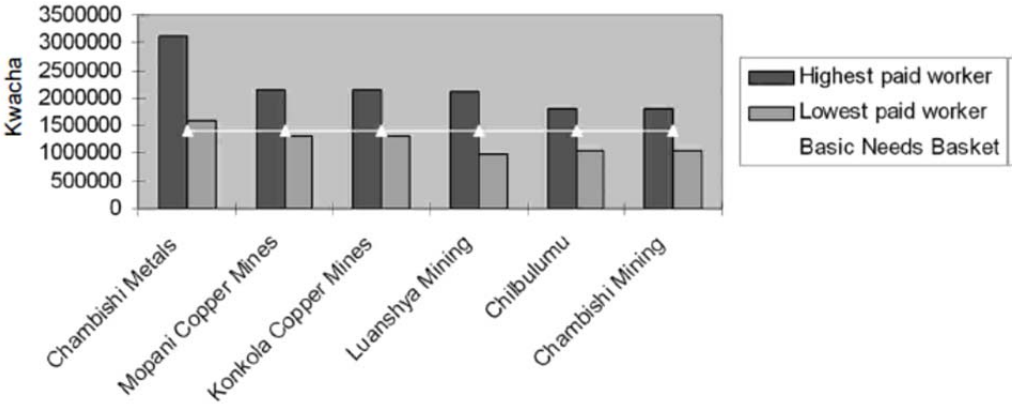
Aside from tax treatment, there are two key areas where the Chinese presence in Zambia stands out from other MNEs: Human capital and capital investments.

Human capital

Popular feeling in Zambia is, on the whole, anti-Chinese. Zambians feel that the Chinese underpay workers and treat them poorly, yet some also feel that low paid, bad jobs are better than unemployment (Financial Times, 2011b). There are some strong positives from China's mining operations with respect to employment. The investments CNMC have made in Zambia's mining sector have spurred job growth there (Pambazuka news, 2012). Furthermore, whilst other mines were laying off workers during the downturn, NFCA kept theirs on and even hired some of those laid off from other mines (Brautigam, 2011d).

In terms of treatment of labour, Chinese investors have the worst record in Zambia. Chambishi mining, majority owned by NFCA[26], offered only 52 permanent contracts for its 2,100+ Zambian employees whilst employing 180 Chinese nationals on permanent contracts. It paid the lowest wages of all the mining firms (figure 45). The wages that some workers claim they earn working at Chambishi mining is significantly below the poverty line and just 10% of the basic needs basket. NFC Africa has also attempted to introduce a very unpopular 'scientific encouragement scheme' whereby workers are paid half of their salary and the other half 'floats' according to company performance, workers' division and the individual's performance (Fraser and Lungu, 2007).

Figure 45: Comparison of salaries between Zambia's mining firms



Source: Fraser and Lungu (2007).

Low wages have growth implications because they reduce the amount of demand from mineworkers available to stimulate local businesses. A Post Keynesian analysis would

[26] Not to be confused with Chambishi metals, majority owned by Enya Holdings BV, a British company.

perhaps then consider how this asymmetry of income distribution between employer and employee affects effective demand: with higher income due to lower wage bills, would the consequently higher demand from the mine owners offset the reduced demand from the mineworkers? The differences between saving propensities would be considered and so forth. But in the case of Zambia, the foreign owners of the mines remit profits abroad (as do expat senior employees)

But this is not the only growth issue. With poor promotion prospects, the returns to skill acquisition for Zambians in the mining sector are low and with lower incentives for human capital upgrading, productivity growth in the economy will be slower (Easterly, 2002). Of NFCA's senior management team, 11 are Chinese and just one is Zambian.

Perhaps not directly a growth issue, but related to welfare and positive labour relations (which should indirectly improve growth), are working conditions. On these counts, the majority of observers stress that China's record in the Zambian mining sector is poor. A 2011 Human Rights Watch survey interviewed 95 Zambian miners. All of those who had previously worked at other mines said that NFCA safety practices were the worst they had encountered (Pambazuka-News, 2012). The report found that NFCA mines had the highest fatality statistics (ibid).

Working hours in CNMC mines – eight-hour shifts, six days a week – were in accordance with Zambian law and industry standards. But this was not so at NFCA processing plants, where workers worked 72 hour weeks – more than workers at any other company in the industry. Furthermore, Chinese owned mines, Sino Metals and CCS, there have been efforts to bar one of Zambia's two main mining unions and discrimination against members (Human Rights Watch, 2011) whereas at the non-Chinese mines, workers have been free to join either union. The Chinese-owned Luanshya copper mine also recently fired 11 workers for inciting a strike in response to perceived slow pace of talks over improved pay (Mena-fm, 2011).

However, the Chinese impact on human capital is not just through employment. In December, the Chinese ambassador to Zambia signed an agreement to restock the Levy Mwanawasa general hospital with advanced medical supplies at a cost of 10m Yuan ($1.6m) (Times of Zambia, 2011a).

Chinese investments

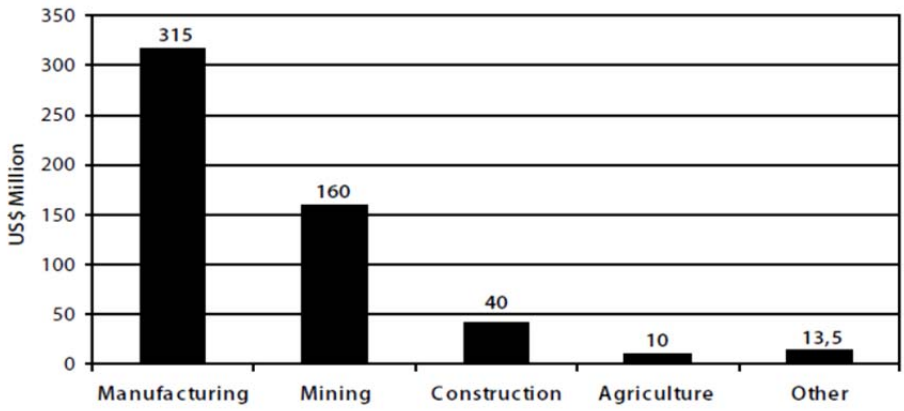
Although the Chinese investors' records on labour are unimpressive, they have been investing heavily in developing the processing capacities of Zambia's mining sector. In April 2010, NFCA indicated plans to invest $600 million in Zambia in 2010 and 2011. It built a new smelter which increased Zambia's processing capacity and freed NFCA from its reliance on the South African firm, Transmine, for this part of the value chain. It now controls the entire value chain up to refined copper exports, which are sent to China (Bastholm and Kragelund, 2011:129).

On privatisation, the Chambishi mine was not operational and had a skeleton staff of just 100 but now, under NFCA's ownership, it employs over 2,100 people (Fraser and Lungu, 2007). In 2009, NFC Africa acquired 80% of the Luanshya copper mines with pledges to bring it to one of Zambia's top three copper producers (it was one of the smallest then). However, some local commentators claimed the sale price was too low. This is a valid criticism. A mine with a capacity of 60,000 t/p.a. should have cost

between $300m – $350m in 2009[27]. Luanshya's capacity was about 40,000 t / p.a. at that time and it was sold for $50m!

Chinese FDI is the fastest growing FDI in Zambia (Kopulande and Mulenga, 2011) and to date, China has invested around $2bn in Zambia, making it the third largest investor there (and the biggest investing country in the mining sector) (Times of Zambia, 2011b). Figure 46 shows the biggest recipients of Chinese FDI in Zambia.

Figure 46: Distribution of Chinese FDI : the four largest sectors



Source: Bastholm and Kragelund (2011: 125). Note: Manufacturing includes activities related to copper, such as smelting and refining capacity investments.

The bulk of Chinese investments went to the copper sector and, given China's copper deficit (table 6 and figure 19), were directly related to China's huge priority of resource seeking (Bastholm and Kragelund, 2011:133). But resource seeking is not the whole story, as will be argued below. But even where this is the incentive Chinese investments in Zambia must be assessed differently than those by Western MNEs. In fact, the management secretary of NFCA has stated the firm would likely not have invested in Zambia without state support for its parent, the state run CNMC (Bastholm and Kragelund, 2011:129). Some have raised concerns that the extent of new mining investment potentially entrenches Zambia in low value mineral extraction activities (Kopulande and Mulenga, 2011). But there have been Chinese investments in processing copper and also in other sectors (discussed below) that may not have occurred without resource acquisition as an incentive for the investors.

The motivations for Western MNEs' investments can be analysed using Dunning's eclectic theory of foreign investment: the so called OLI framework (Dunning, 2001). This framework could be used to show that, for example, western firms ownership advantages were that they were often subsidiaries of huge global MNEs who possessed the capital and expertise to reinvigorate Zambia's mining sector profitably; the location advantages of Zambia to these firms was overwhelmingly resource seeking; and as

[27] Due to lack of data, this figure was extrapolated from Radetzki's (1978) estimation of a mine cost in 1978 and adjusted with a dollar GDP deflator. As mining technology has been relatively stable since then, the real cost should be expected to not change too dramatically.

regards internalisation advantages, these also existed in many cases. Mopani Copper mines (MCM), for instance, exports back to its parent company, Glencore, using transfer pricing[28]. But compared to the Chinese FDI, Western firms are more atomic. Chinese firms are indeed also profit seeking, but their operations are planned in line with national objectives: large Chinese FDI investments are usually by SoEs and link more closely to an overarching foreign policy and strategic central planning imperatives (Wu and Chen 2001; Buckley *et al*., 2007; Woo and Zhang, 2006).

China has a foreign policy strategy of building up 'soft power' (Jianbo *et al.,* 2009) by offering concessions and aid to trade & development partners. Kurlantzick (2007) terms this "China's charm offensive". As an example, China offers zero tariff market access on about 60% of Zambia's exports (Times of Zambia, 2011b). This zero tariff policy is not particular to Zambia, being part of China's stated aim of developing South-South relations (GCM, 2011).

In fact, Kaunda's description of a 'political friendship' at the start of this section can be seen to have existed long before either China's current massive thirst for resources or its diplomatic charm offensive. For instance, Chinese aid has been continuously supporting the Tanzam railway in Zambia for the past 35 years: long before the current resource drive (Brautigam, 2011b) and whilst China was also impoverished.

There are areas where Chinese investments are more obviously related to soft power. For China, investments in the construction and agricultural sectors are seen primarily as a diplomatic tool with which to build closer relations (Bastholm and Kragelund, 2011:130). However, these are in themselves profitable. In fact the agricultural investments have aspects of market and resource (land) seeking incentives within the OLI framework and may even reinforce future food security in China. Also, it is Chinese firms that have won the bulk of large scale construction tenders in Zambia but unfortunately the exact links between these tenders and Chinese aid are not known. Suffice to say China offers support to finance these tenders. For example, a US$39m soft loan in 2007 to reconstruct essential transport infrastructure (ibid). So even here, it is not entirely diplomatic imperatives driving aid.

In fact, the political friendship serves more than just geopolitical purposes. Relations between Chinese officials and the Zambian political elite have traditionally been close, and this channel may facilitate favourable investment terms vis-à-vis other investors (Bastholm and Kragelund, 2011:126). Chinese investors in Zambia also have other perks due to state support. The Bank of China (BOC) branch in Zambia is not run commercially, but as a strategic operation to facilitate the other Chinese investments there and has not made profit in the ten years since its inception (ibid). Loans from the China development bank to Chinese outward FDI are made at concessional rates. Chinese state support thus grants improved political connections, preferential loans, soft constraints and the foundations for scale economies. These are O and L advantages for Chinese firms in Dunning's framework but they originate largely in the Chinese state (ibid, 134) rather than the firms themselves. They perhaps offer unfair advantages to Chinese firms operating in Zambia and this observation could be seen as potentially growth and welfare inhibiting.

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[28] In fact, a public audit revealed that Glencore vastly underpriced copper exports to Switzerland, understated production quantities and overstated costs by up to $381m in 2007 (Zambian-Economist, 2011a). Thus internalisation advantages can also be illicit.

But self interest often seems to be accompanied by mutual gains where Chinese FDI is concerned. For instance China has built a special trade and economic cooperation zone in Zambia (the first one of several it built in Africa, China Daily, 2012). This improved poor infrastructure, inadequate services, and weak institutions by focusing efforts on a limited geographical area (Resource Investor, 2011). Speaking of these zones, a reporter for Africa News.com stated:

"While the West supports microfinance for the poor in Africa, China is setting up a $5 billion equity fund to foster investment there. The West advocates trade liberalization to open African markets; China constructs special economic zones to draw Chinese firms to the continent. Westerners support government and democracy; the Chinese build roads and dams" (Isaac Twumasi Quantus, cited in Resource Investor, 2011)

Since its establishment, the zone has generated significant tax revenue: $500m by one source (China Daily, 2012) – nearly the entire public wage bill for that period. It also created 12,000 jobs and attracted 17 companies who have invested up to $900m in it. This zone is an example of how political and economic incentives combine in China's relations with Zambia.

However, whilst this zone undoubtedly offers great advantages to Zambia in terms of spillovers, employment and infrastructural development the advantages of it to China are not simply soft power gains. It is managed by CNMC, the parent company of NFCA. A central aim is to create a production chain centred around CNMCs key Zambian enterprises and to create an export hub for locally produced Chinese products to the Southern African region. In this, much like other Chinese outward FDI, it is directly supported financially by the Chinese state and investments in this zone are supported with cheap financial packages (Bastholm and Kragelund, 2011:128).

5. Conclusion

This paper has shown that the impact of China on commodity dependent countries cannot be categorically defined as solely positive or negative. In fact, China has an ambiguous impact both at the global level and on the growth determinants of CDDCs that operate at a local level. This was shown by first considering global trade and investment trends caused by China then by presenting a case study of Zambia to illustrate the political economy of how Chinese investment operates within a CDDC.

Many CDDCs, particularly in Sub-Saharan Africa, have had disappointing growth performances and failed to escape from commodity dependence. In fact, export portfolios appear to have concentrated in many cases, increasing vulnerability. SSA has diverged from the rest of the world in terms of income growth and Africa has reduced its share of overall World trade, even whilst increasing its share of the global oil trade. Where growth has occurred it has often been closely linked to commodity prices, thus raising the specter of growth collapses. This cycle is recurrent in Sub-Saharan African CDDCs.

Volatility in growth of CDDCs, linked to volatility in commodity prices, was shown to be very harmful for growth, adversely affecting investment (or the efficiency of investment) and fiscal policy. Also, during a boom, Dutch Disease effects may occur, causing deindustrialization and reducing the diversification of the productive economy, which makes the bust hit harder. It was shown that terms of trade volatility occurs more frequently and is more destructive in poorer CDDCs.

The current commodity price boom started in around 2002 and as it has proceeded, some commentators have voiced the idea that this time it may be a permanent boom. This would present a more stable opportunity for CDDCs than the previous recurrent boom bust cycles. The reason for expecting permanence is that Chinese demand is broadly recognized as the leading cause of the commodity price boom since around 2002, particularly for fuel and metals, as Chinese rapid industrialization has required resource inputs in excess of China's production capacity.

The emergence of such a colossal economy represents both opportunities and challenges for CDDCs. Clearly there are increased trading opportunities, and African CDDCs have been taking advantage of these, with smaller fractions of their exports going to OECD countries and more to China and SE Asia. However, the China induced boom can have ambiguous effects. For poor fuel importers, it can impact negatively on terms of trade and external solvency. Furthermore, for CDDCs relying on food imports for their food security, the rise in food prices, possibly due to pass through of fuel prices, carries humanitarian risks - poverty, starvation and unrest. For fuel and metals exporters, however, the terms of trade improvements this causes present opportunities for economic growth by improving foreign exchange earnings and fiscal space, both of which are important for development in early stages: to import essential input goods and to grant governments the capability to intervene to overcome market failures.

However, even for those whose terms of trade benefit from the current boom, there are challenges. The risk of being locked in to low value added activities is heightened by the trading patterns between many CDDCs and China. These are similar to the trade patterns these countries have had with Western countries for decades: exporting raw or only semi processed commodities and importing manufactures. The risk of lock in is intensified because China exports, and dominates the market in, those products that were traditionally a first step to industrial upgrading: light manufactures. More recently China has moved into controlling higher value added nodes of the South-South global value chain, potentially locking SSA countries into lower value added activities in the South, as they have been for decades in the North.

It is not just China's demand and trade channels that affect SSA, but its investments. Outward FDI from China has mushroomed during its emergence. Whilst SSA receives only a small percentage of this, it is the fastest growing recipient of Chinese FDI these inflows constitute an important part of SSA countries' financing. Chinese FDI has targeted many sectors: manufacturing, telecoms, construction and banking, for example, and for a variety of motivations from resource seeking through market and efficiency seeking. But large Chinese investments in SSA have been strongly focused on the primary sector and resource extraction.

Chinese investments benefit recipient countries through job creation and related infrastructure investments, which can help overcome SSA's crippling problems with power outages and transport costs. But the way in which many Chinese investments are

‘bundled’ as part of trade and aid relationships – ‘resource for infrastructure’ deals that can hinder prospects for diversification by increasing lock in to low value activities by making subsidized loans and investments linked to resource exports from the recipient countries and possibly even tied to conditions of Chinese goods and service imports.

Thus the conditions of Chinese aid and investment have very different conditions to Western equivalents, being less concerned with governance and political rectitude and more explicitly linked to Chinese strategic interests. This was shown in more detail when the case of Zambia was considered. This case showed that because of poor bargaining power when privatizing its copper sector, Zambia today benefits little from its natural copper wealth, which is repatriated abroad by MNEs who pay paltry taxes and royalties even whilst copper prices boom. The Chinese mining firms differ little in this respect. Yet their presence differs from Western firms in being part of a larger Chinese policy. In fact, the Chinese presence in Zambia demonstrates strongly two key aspects of Chinese policy in general: the acquisition of resources and the building of soft power. However, the means of achieving the former often undermine the goals of the latter. Well documented industrial mistreatment, accidents, violence and deeply troubled industrial relations tarnish China’s image in Zambia even whilst large scale non mining investments boost it.

The ambivalent effects of China’s presence are not just related to image, however. In terms of its effect on economic growth, China’s presence in Zambia is as ambivalent as China’s global presence is on Africa. On the one hand, CNMC pays as little tax and royalties as the rest of the mining firms, repatriating Zambia’s natural wealth (and profits obtained from such) to China giving little fiscal space in return. In fact, whereas other mining firms offer at least some human capital gains, Chinese owned mines offer the lowest pay, worst conditions and poorest promotion prospects.

Like many mining firms, NFCA directly boosted Zambia’s processing capacity by investing in smelting and refining plants, creating jobs and increasing Zambia’s capacity for higher value added activities in the process. However, Chinese investments in Zambia were not limited to commercial mining enterprises and included investments in manufacturing and politically motivated investments in construction and agriculture.

China has had a positive relationship with Zambia since the former’s independence from Britain in 1864 and has invested in Zambia’s development there even whilst relatively impoverished. Nowadays, Chinese investments in Zambia are driven by a mixture of economic and diplomatic interest. China invests in Zambia’s construction and agricultural sectors for diplomatic purposes and has built an economic zone that is mutually beneficial. With all these things considered, it may appear that, though in largest part resource seeking, Chinese investments give a better ‘return’ on Zambia’s natural wealth than Western resource seeking investments (and perhaps this underlies President Michael Sata’s remarkable toning down of the vitriol he formerly directed at China). Yet the mining community in Zambia’s copper belt may disagree with this assessment and point to the poor labour, safety and skill transfer records they have endured under Chinese mine owners. Furthermore, with rather nepotistic political arrangements and softer constraints, it could be said that Chinese firms are uncompetitive and therefore constrain the emergence of local competition.

It is fair to say that the Chinese presence in Zambia has created jobs, infrastructure, entrepreneurship and production that may not have existed in their absence, but it is also

possible that the same presence has reinforced traditional production structures, restrained competition, perpetuated nepotism and caused distress and suffering amongst the mineworkers. These things considered, one can point to pros and cons and the only definite conclusion one can draw is that the Chinese presence in Zambia has had ambiguous impacts on welfare and growth.

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