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THE ROLE OF PRIMARY COMMODITIES IN ECONOMIC DEVELOPMENT: SUB-SAHARAN AFRICA VERSUS THE REST OF THE WORLD

- Fabrizio Carmignani
- Abdur Chowdhury

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Abstract

The impact of the dependence on primary commodities for economic development is analysed within the framework of growth regressions. While there is no evidence of a "generalized" primary commodity curse, reliance on primary commodities does retard growth in sub-Saharan Africa (SSA). Which factors account for this SSA specificity? Some suggest that SSA specializes in commodities that are not conducive to economic growth and that SSA depends on primary commodities more deeply than the rest of the world. These explanations are not strongly supported by the data. The key to the SSA specific curse appears to lie in the interaction between institutions and primary commodities.

I. Introduction

Sub-Saharan Africa (SSA) is generally characterized by a heavy dependence on primary commodities[1] (see table 1). For a number of geographical and income groups, table 1 reports the ratio of primary commodity exports to total exports in two periods, 1975-1979 and 2000-2004. The information is presented for the entire aggregate primary commodities and for its four main components: food, agricultural raw materials, fuels and base metals.

Table 1

Indicators of dependence on primary commodities
(Per cent of total merchandise exports)

	Agricultural raw materials		Food		Fuels		Ores and metals		Primary commodities	
	1975-1979	2000-2004	1975-1979	2000-2004	1975-1979	2000-2004	1975-1979	2000-2004	1975-1979	2000-2004
Sub-Saharan Africa	7.1	4.7	24.2	14.7	35.7	37.6	9.7	7.8	76.7	64.9
North Africa and Middle East	4.9	0.9	10.0	5.7	72.6	71.0	6.0	1.8	93.6	79.5
South Asia	7.6	1.3	33.2	12.0	1.3	4.2	6.9	2.9	49.1	20.5
Latin America and Caribbean	5.2	2.1	37.2	16.6	23.1	17.5	11.9	6.1	77.4	42.3
Low-income countries	7.9	2.9	29.2	15.5	23.8	28.2	6.8	3.9	67.6	50.4
Middle-income countries[a]	6.1	2.1	21.0	9.4	32.2	17.9	5.3	4.3	64.6	33.6
High-income countries	3.9	1.7	11.2	6.4	8.1	6.2	3.6	2.4	26.7	16.6

Note: The classification of countries by category follows the World Bank, *World Development Indicators, 2006*. See appendix for variables description.

a Due to changes in the classification of countries by income category, for the middle income category 1980-1984 data replace the 1975-1979 data.

* The authors, Fabrizio Carmignani (United Nations Economic Commission for Africa), P.O. Box 14935, Yaounde, Cameroun (fcarmignani@uneca.org) and Abdur Chowdhury (abdur.chowdhury@unece.org) United Nations Economic Commission for Europe, Geneva, Switzerland, would like to thank the participants of the Regional Round Table on Primary Commodities organized by the Common Fund for Commodities in Yaounde, Cameroon, 16-17 September 2006, for helpful comments on an earlier version. The usual disclaimers apply.

1 Throughout the rest of the paper primary commodities include: food and live animals, beverages and tobacco, animal and vegetable oils and waxes, excluding manufactured goods; crude materials, mineral fuels, lubricants and related materials; non-ferrous metals, metalliferous ores and scrap, crude fertilizers. This broad definition follows United Nations (1987).

For the SSA region, primary commodity exports account for 65 per cent of total exports, the largest component being represented by exports of fuels. This contrasts with an average of 50 per cent in low-income economies and an average of 33 per cent in middle-income economies. Only Northern Africa and the Middle East have a higher concentration of exports, mostly due to the dramatic dependence of these countries on oil. What is also striking is the development over time of SSA dependence. In 1975-1979, SSA and Latin America displayed very similar ratios. By 2000-2004, the ratio in Latin America dropped to about two thirds of the SSA ratio. Similarly, the difference between SSA and low- and middle-income countries has significantly increased over the last three decades.

Against this background, researchers have tried to determine whether dependence on primary commodities could be one of the fundamental causes of the generally slow pace of economic development in SSA (see, for instance, Sachs and Warner, 1997 and Deaton, 1999). The purpose of this paper is to address this question within the more general framework of the literature on the curse of natural resources.[2] Using a broad panel sample of countries, the paper tests for the impact of primary commodities on average per capita income growth. The empirical model will be specified so as to allow primary commodities to affect growth in SSA differently from what they do in the rest of the world. The mechanisms driving any eventual difference between SSA and the rest of the world will then be investigated.

Empirical support for the "resource curse" hypothesis comes from, among others, Sachs and Warner (1995 and 2001), Leite and Weidmann (1999) and Bravo-Ortega and De Gregorio (2005). Three main channels of transmission have been modelled and empirically tested. The first one operates through commodity prices and is particularly relevant for countries that strongly depend on exports of raw agricultural materials and food. Because of the higher volatility and declining secular trends of several commodity prices, countries that are dependent on primary commodities face adverse shocks in their terms of trade, coupled with increased economic uncertainty. This then translates into lower growth through adverse wealth effects and reduced factors accumulation (see, for instance, Blattman et al., 2005 and Dehn, 2000).

The second channel relies on the Dutch Disease effect. In this vein, natural resources would distort the economy by reducing the competitiveness of the manufacturing sector, which in turn is the sector most likely to generate positive externalities and learning-by-doing spillovers that benefit growth (Sachs and Warner, 1995). Finally, the third channel hinges on political economic effects. Two main arguments can be identified in this respect. On the one hand, countries with abundant natural resources (oil and precious minerals in particular) are more likely to develop rent-seeking and predatory states that are harmful for growth (Tornell and Lane, 1999; Isham et al. 2005). On the other hand, natural resources can make a country more prone to civil war as a result of disputes over their appropriation (Collier and Hoeffler, 1998). In particular, sparse network mechanisms could imply that the link between primary commodities and conflicts is mostly driven by agricultural dependence rather than by other natural resources (Humphreys, 2005).

The extent to which the resource curse is an empirically relevant explanation of bad economic performance is, however, an unsettled issue. Stijns (2005) shows that the negative effect of natural resources on growth is econometrically not robust. Mehlum et al. (2006) point out that natural resources are not a curse per se, but their effect on income depends on the quality of institutions. That is, when institutions are grabber friendly, heavier reliance on natural resources pushes income down. Conversely, when institutions are producer friendly, natural resources promote faster growth. Along these lines, Snyder (2006) suggests that lootable wealth does not necessarily breed disorder (and hence poor economic performance). In his political-economic framework, resource abundance leads to crises and civil war only if the country is not initially endowed with institutions that provide rulers with sufficient control over the revenues generated by lootable resources. But if such institutions exist, then order will prevail, thus breaking the resource dependence-political instability spiral that leads to low

[2] The term "resource curse" has come to identify the hypothesis by which countries that are abundant in natural resources and/or heavily dependent on primary commodities experience persistently lower growth rates.

economic growth. Finally, with respect to the specific case of Africa, Deaton (1999) concludes that while commodity price booms and busts are important determinants of economic performance, the roots of African slow development seem to lie elsewhere.

This paper provides new evidence on the issue. Its main findings can be summarized as follows. First, SSA does suffer from the resource curse while the rest of the world does not. This differential effect, which will sometimes be referred to as the "SSA specificity", mostly arises from the negative growth effect that fuels and base metals have in SSA. One can see in this result an extension of the hypothesis that natural resources are not a curse per se, but rather that they are a curse depending on some other initial conditions of the economy. Second, only a few of the commodities that characterize the structure of production and export specialization of SSA seem to be intrinsically bad for growth in the sense that they significantly increase the economy's exposure to growth-reducing terms of trade shocks. Third, at the global level, the failure to identify a significant relationship between commodities and growth can be explained by the existence of a non-linear effect. At least for some groups of commodities, an increase in dependence reduces growth, but only if the productive structure of the country is not sufficiently specialized. When the initial level of dependence on commodities is high, further specialization yields a positive growth payoff. In fact, to the best of the authors' knowledge, such a non-linearity has never been identified in previous work. Fourth, institutional development affects the strength of the SSA specificity. Once the interaction between primary commodities and institutions is explicitly modelled, the SSA specificity vanishes. On the contrary, the interaction between primary commodities and trade openness does not eliminate the difference in the growth effect of primary commodities between SSA and the rest of the world.

The rest of the paper is organized as follows. Section II presents the basic regression framework and the differential role of commodities in SSA and in the rest of the world. Section III links the peculiar pattern of specialization of SSA to terms of trade effects. Section IV studies whether non-linearities emerging at a high level of dependence can be responsible for the specificity of the SSA curse. Section V looks at the interaction between primary commodities and institutions and between primary commodities and trade integration. Section VI concludes. The appendix contains the description of variables and a full list of data sources.

II. Searching for a curse

A. Econometric model

The econometric analysis in this paper makes use of a standard growth regression framework of the type:

$$g_{it} = \alpha_0 + \alpha_1 x_{1,it} + .. + \alpha_n x_{n,it} + \beta z_{it} + \varepsilon_{it} \quad (1)$$

where g is the growth rate of per capita GDP period over period t in generic country i, x_k (with $k = 1, 2…n$) is a set of control variables, z is an indicator of dependence on primary commodities, ε is a random disturbance, and the αs and β are parameters to be estimated. To capture long-term effects, data are averaged over a five-year span, starting in 1975-1979 until 2000-2004. The full sample includes up to 109 countries (see appendix for a list).

The methodological difficulties in estimating equation (1) are well-known (see, inter alia, Caselli et al. 1996 and Temple, 1999). The first hurdle is the choice of control variables. In the voluminous literature on growth empirics, up to some 70 or so variables have been used on the r.h.s. of equation (1). Given the impossibility of using all of them simultaneously, one is left with a close to infinite number of combinations of subsets.[3] The feasible strategy is then to select a number of controls on the basis of theoretical considerations and then test for the sensitivity of results to changes in the basic specification of the model. In line with this approach, the following variables are used as controls: (i)

[3] See Sala-i-Martin (1997) for a quantification of possible combinations.

the lagged value of per capita GDP to account for the relative convergence hypothesis, (ii) average inflation rate and government consumption to GDP ratio to account for the macroeconomic policy stance, (iii) the enrolment rate in secondary schooling to proxy for the impact of human capital accumulation, (iv) an index of ethno-linguistic fractionalization and the absolute geographical latitude of countries to capture country-fixed effects that previous research has shown to be important determinants of growth in the least developed countries, (v) the ratio of exports and imports to GDP to measure the degree of a country's trade integration with the rest of the world, and (vi) time dummies to account for time-specific effects.[4]

The second major problem in the estimation of (1) concerns the choice of the estimator. In order to address the issues of endogeneity and correlated individual effects that make standard Ordinary Least Squares inappropriate, Caselli et al. (1996) propose to estimate growth regressions with a variant of the Generalized Method of Moment (GMM) of Arellano and Bond (1991). However, since the basic specification chosen for model (1) also includes time-invariant country fixed effects, this paper revolves to an instrumental variables approach that can be derived as a special case of the GMM dynamic panel.[5] The endogenous variables in model (1)[6] are therefore instrumented using their one period-lagged values (recall that data are five period averages, so that the observation in 1970-1974 is used to instrument the observation in 1975-1979: the observation in 1975-1979 is used to instrument the observation in 1980-1984, and so on). In order to strengthen the set of instruments and increase the number of overidentifying restrictions, legal origin dummies are added to the group of lagged variables, the underlying rationale being provided by the results of La Porta et al. (1999). This also allows controlling for some possible residual endogeneity of lagged income.[7]

The final methodological issue concerns the measurement of dependence on primary commodities. Sachs and Warner (1995) suggest using the share of exports of natural resources in GDP while Sala-i-Martin and Subramanian (2003) extend this to include the share of the exports of four types of natural resources – fuels, ores and metals (base metals), agricultural raw materials and food. The same approach is adopted in this paper. To address endogeneity concerns, the indicators of primary commodity dependence are also instrumented using their lagged values.

B. Growth and dependence on primary commodities

The basic findings concerning the primary commodity curse are reported in table 2. Column I of the table shows the basic growth regression without indicators of primary commodity dependence. All of the control variables, with the exception of the inflation rate, are statistically significant and display the expected sign. The rate of relative convergence is lower than that reported in Barro and Lee (1994), but is still different from zero, thus implying that initially poorer economies grow faster. A larger government, represented by higher values of the government consumption to GDP ratio, reduces growth most likely because it implies greater non-productive public expenditure and taxation. The positive coefficient on school enrolment reflects the positive direct impact on growth of human capital formation. The country fixed effects indicate that more ethnically fractionalized countries grow less,

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[4] In its basic version, therefore, the model does not include investment variables. The underlying argument is that the policy and external environment variables already included fully explain how investment influences growth (see, for instance, Burnside and Dollar, 2000). The sensitivity analysis seems to support this point: when a proxy for physical capital accumulation (the capital formation ratio to GDP) is added to the basic framework, its estimated coefficient is insignificant together with that of most of the other variables. This suggests the presence of multicollinearity as if the policy and environmental variables of the basic specification were also determinants of investment. In other words, the variables of the basic specification can be seen as incentive variables.

[5] With Caselli et al. (1996) country fixed effects are eliminated by first differencing the model and then using lagged values of the variables in levels as instruments for the first differences. In the instrumental variables approach lagged values instrument the levels directly. For further discussion see also Wooldridge (2002).

[6] Inflation, government consumption, school enrolment, trade openness.

[7] In order to verify the validity of this choice of instruments, the Sargan test of overidentifying restrictions is conducted on each set of estimates (see Newey and West, 1987). The results support the choice in the paper.

probably because of their intrinsically greater socio-political instability, and that geographical location does matter in the process of economic development. Finally, greater openness to trade appears to promote faster growth. Two additional features of the basic specification in column I are noteworthy. First, the null hypothesis that overidentifying restrictions are correct cannot be rejected (with 15 instruments and 11 regressors, the p-value associated with the Sargan statistic of 2.92 is 0.57): this provides support to the choice of instruments. Second, the model is able to explain much of the difference in growth performance between SSA and the rest of the world. Indeed, a regional dummy taking value for SSA countries is included among the regressors, but its coefficient is statistically insignificant (coefficient is -0.009 with a p-value of 0.14).[8]

Table 2

Growth and dependence on primary commodities

	I	II	III	IV	V	VI	VII
Lagged income per capita	0.010***	-0.010***	-0.010***	-0.010***	-0.010***	-0.010***	-0.010***
Inflation	0.003	0.002	0.002	0.003	0.003	0.002	0.002
Government consumption	-0.072***	-0.061***	-0.061***	-0.097***	-0.075***	-0.090***	-0.110***
School enrolment	0.041***	0.039***	0.038***	0.047***	0.044***	0.044***	0.049***
Latitude	0.049***	0.045***	0.045***	0.049***	0.044***	0.048***	0.045***
Ethnic fragmentation	-0.010***	-0.006	-0.006	-0.009**	-0.005	-0.004**	-0.003
Trade openness	0.012***	0.012***	0.012***	0.012***	0.012***	0.012***	0.012***
Primary commodities		-0.003					
Primary commodities *SSA			-0.010**				
Primary commodities *(1-SSA)			-0.004				
Agricultural raw materials*SSA				0.003			
Agricultural raw materials*(1-SSA)				-0.012			
Food*SSA					-0.010		
Food*(1-SSA)					0.000		
Fuels*SSA						-0.062***	
Fuels*(1-SSA)						-0.001	
Ores and metals*SSA							-0.067***
Ores and metals *(1-SSA)							0.004
Number of observations	283	256	256	259	258	257	259
Sargan test	2.92	5.74	6.24	5.3	5.04	4.18	3.82

Note: SSA denotes the dummy variable taking value 1 for sub-Saharan countries. For a full description of variables see appendix. Time dummies and constant are not reported. Column I also includes the SSA dummy separately: its estimated coefficient is -0.009 with a p-value of 0.14. The raw Sargan test reports the J-statistic for the test of overidentifying restrictions. *, **, *** respectively denote the significance of coefficients at the 10, 5 and 1 per cent levels of confidence.

[8] Several other variables have been added to the basic specification in order to test its robustness. As already noted, the inclusion of the investment to GDP ratio creates a clear multicollinearity problem with several of the other regressors, thus suggesting that the basic specification in column I already captures most of the incentive effect. Variables representing depth of financial intermediation (the M2 to GDP ratio) and financial openness (an index of capital account liberalization) turn out to be largely insignificant. The budget deficit is available only for a smaller set of countries, including quite a limited number of SSA economies. However, when included in the regression its estimated coefficient fails to pass the zero restriction test. Dropping the inflation rate – the only non-significant variable in the basic specification – does not alter the results on the other variables. The full set of estimates conducted to check robustness is available from the authors upon request.

Column II re-estimates the growth model with the inclusion of the ratio of primary commodity exports to total exports as an indicator of dependence on primary commodities. While most of the results on the control variables do not change (the only exception being a fall in the statistical significance of the coefficient on ethnic fragmentation), the coefficient on primary commodities dependence is negative but not different from zero at the usual confidence levels. This means that after controlling for the other policy and environmental determinants of growth, the growth-reducing impact of primary commodities is negligible. That is, in the global sample there is no statistical evidence of a primary commodities curse. Note that the Sargan test statistics increases significantly. However the null hypothesis of the test cannot be rejected, the p-value being 0.22.

In order to test for a possible differential effect of primary commodities in SSA relative to the rest of the world, a slightly amended growth specification is estimated:

$$g_{it} = \alpha_0 + \alpha_1 x_{1,it} + .. + \alpha_n x_{n,it} + \beta_1 z_{it} dSSA + \beta_2 z_{it} (1 - dSSA) + \varepsilon_{it} \quad (2)$$

where *dSSA* is the dummy variable taking value if country *i* is in sub-Saharan Africa and all the other variables and parameters are the same as in equation (1). With model (2) the relationship between primary commodities and growth is allowed to have different slope in SSA relative to the rest of the world.

The estimates of model (2) are displayed in columns III to VII of table 2. It appears that primary commodities reduce growth in Africa, but not in the rest of the world. In column III, where commodities dependence is measured by the aggregate share of primary commodity exports, both β_1 and β_2 are negative (-0.010 and -0.004 respectively), but only β_1 is statistically different from zero at the usual confidence levels. Thus, for the average SSA country, the marginal impact of primary commodities on growth is negative. For the average country in the rest of the world, instead, the marginal impact of primary commodities on growth is negligible. Disaggregating the indicator of primary commodity dependence into its four main components shows that fuels (column VI) and ores and metals (column VII) drive much of the growth-effect of primary commodities in SSA. In both cases, heavier dependence on natural resources does not translate into lower growth in the rest of the world, but it does so in SSA.

The curse is therefore a SSA specificity. The relevant issue is then to understand what lies at the root of this specificity and how it can be overcome. A first possible cause rests with the peculiar structure of SSA specialization. Two dimensions of this structure are of relevance: composition by commodity of production/export structure and the depth of dependence on these commodities. Along the first dimension, one could argue that SSA specializes in individual primary commodities that are particularly "bad" for growth. Along the second dimension, it could be that SSA suffers from a primary commodity curse because its dependence on them is too deep. For instance, it could be that oil is good for growth when it accounts for 5 per cent of total exports and bad for growth when it accounts for 38 per cent of total exports.[9]

Alternatively, one might argue that the role of primary commodities in the growth process is linked to specific socio-economic features of the system. Two such features are the overall degree of trade openness of the country and its stage of institutional development. These features, by affecting the impact of primary commodities on growth, could be the key to addressing the SSA specificity. The rest of the paper deals with those issues.

III. The effect of specialization patterns

A. Does SSA specialize in primary commodities that are intrinsically not conducive to growth?

The primary commodities in which SSA specializes are not necessarily the same in which the rest of the world specializes.[10] Thus, the different pattern of specialization (reflected in a different structure of primary commodity exports) might explain why SSA is vulnerable to primary commodity

[9] Incidentally, in 2003 oil exports accounted for 5.3 per cent of total exports worldwide and for 38.3 per cent of total exports in SSA.

[10] In fact, according to 2003 data from the *UNCTAD Handbook of Statistics*, out of the ten most relevant primary commodities in SSA export structure, only three also figure among the ten most exported primary commodities worldwide.

dependence while the rest of the world is not. To put it simply, the hypothesis is that primary commodities are a curse in SSA because, among the several commodities available, SSA has specialized in those that are particularly less conducive to growth.

To see how relevant this hypothesis might be, model (1) has been re-estimated using the export shares of individual commodities in place of the aggregate indicator of primary commodity dependence *z*. The individual commodities chosen are those in which SSA tends to specialize the most.[11]

Table 3 reports the list of selected individual primary commodities (copper is added to the group of the 10 most exported commodities by SSA), their share in total SSA exports and – for comparative purposes – their share in total world exports. Column III then shows the estimated coefficient on export share of individual commodities in the growth regression.[12] It turns out that only three commodities appear to be intrinsically bad for growth: cotton, coffee and iron ores. A positive growth yield, on the other hand, is generated by oil, cocoa, silver and coal. For the others the growth effect is statistically negligible.

Table 3

Growth yield and terms of trade effects of selected commodities

	I Per cent of SSA exports 2003	II Per cent of world exports 2003	III Estimated coefficient in growth regression	IV Estimated coefficient in terms of trade regression
Oil	38.3	5.3	0.009**	0.099***
Cocoa	3.3	0.1	1.626***	0.104***
Cotton	1.1	0.1	-0.276***	-0.038***
Coffee	0.7	0.1	-0.108***	-0.107***
Fruits and nuts	1.4	0.5	-0.008	0.034
Sugar	0.9	0.2	-0.032	-0.128*
Silver	3.2	0.2	1.160***	0.019
Iron ores	0.6	0.2	-0.041**	0.086**
Coal	1.8	0.3	0.085***	-0.002
Copper	0.6	0.4	0.005	-0.111***

Note: Columns I and II report for each commodity the weight in total African (column I) and world (column II) exports. Column III reports the estimated coefficient of the country's commodity export to total export ratio in a growth regression estimated on the sample of non-African countries (rest of the world). The control variables in the growth regressions are lagged per capita GDP, inflation, government consumption, school enrolment, latitude, ethnic fragmentation, trade openness, time dummies and a constant. The control variables in the terms of trade regression are school enrolment, capital formation, per capita GDP in per cent of US per capita GDP and world per capita GDP growth rates. *, **, *** respectively denote the significance of coefficients at the 10, 5 and 1 per cent levels of confidence.

Thus, a few of the commodities in which SSA specializes do reduce growth over and above any other possible SSA specificity. Yet, the commodity in which SSA specializes the most (oil) yields a positive growth payoff in the rest of the world. Therefore, it cannot in itself be blamed for the differential negative effect that fuels, and primary commodities in general, appear to have in SSA relative to the rest of the world.

[11] However, the sample for the estimation excludes all of the SSA countries. In this way, in fact, it is possible to see whether these commodities are intrinsically bad for growth. If the sample were to include the SSA countries, then an eventually negative coefficient on commodities' export shares would not permit to disentangle between the growth effect of commodities per se and the growth effect of commodities in SSA.

[12] Commodities have been added one at a time in a growth regression that includes all of the controls of the model in column I of table 1. To save space the coefficients on these controls are not reported in table 2. They are indeed very similar to those reported in table 1 and can be obtained upon request from the author.

B. Specialization pattern and shocks of the terms of trade

One of the main channels that could explain why some commodities are bad, or good, for growth involves the terms of trade. As broadly documented in the literature, the international price of several commodities exhibits large swings and secular declining trends. This in turn affects the terms of trade of countries that export those commodities, thus opening up a channel of transmission from commodity specialization to growth (Dehn, 2000 and Blattman et al., 2005). The inclusion of the annual change in terms of trade as an explanatory variable in the model of column I of table 1 confirms the empirical relevance of the terms of trade channel. The estimated coefficients are as follows (p-values in parenthesis; coefficient of time dummies are not reported):[13]

Growth = 0.051 -0.004*lagged GDP p.c. -0.016*inflation -0.014*government consumption + 0.001*school
(0.00) (0.00) (0.03) (0.62) (0.92)

enrolment + 0.025*latitude -0.012*ethnic fragmentation + 0.001*trade + 0.050*terms of trade growth
(0.05) (0.04) (0.42) (0.000) (3)

Number of observations 159, Sargan test statistic 1.13

To check whether the selected primary commodities listed in table 3 affect growth through terms of trade effects, the relationship between each commodity share of exports and average annual changes in terms of trade is estimated using the following regression:

$$tot_{it} = \gamma_0 + \gamma_1 w_{1,it} + ...\gamma_m w_{m,it} + \delta q_{it} + \upsilon_{it} \quad (4)$$

where *tot* is the growth of terms of trade in country *i* over time *t*, w_j ($j = 1....m$) is a set of controls, *q* is the specific commodity share of total exports, υ is a random error and γs and δ are the parameters to be estimated. The choice of controls include: (i) secondary school enrolment and the capital formation ratio to GDP to account for factor accumulation and hence for the potential expansion of the country, (ii) per capita GDP in per cent of US per capita GDP to account for the stage of economic development and hence the degree of product variety and quality, and (iii) world GDP per capita growth to reflect the dynamics of potential international demand.[14] Estimation is again by instrumental variables, using lagged variables of all regressors as instruments. Data are averaged over five-year periods.

The last column of table 3 reports the estimated δ for all the selected primary commodities that constitute the core of SSA specialization.[15] Cotton and coffee effectively appear not to be conducive to growth through their negative effect on terms of trade. Iron ores however do not seem to worsen the terms of trade, therefore their negative effect in the growth regression must be due to some other channel (i.e. possible negative spillovers stemming from their extraction/production). Interestingly, specialization in sugar also exposes the country to negative terms of trade shocks, but this is probably compensated by other possible positive spillover associated to sugar production, since the overall effect on growth is not negative. Oil and cocoa specialization increase the likelihood for the country to experience positive shocks to the terms of trade, which is in line with their aggregate positive growth yield.

C. Summing up

To sum up the evidence in this section, some of the primary commodities on which SSA most strongly relies (cotton and coffee) are not conducive to growth. This negative effect is likely to work through the greater exposure to adverse shocks to terms of trade that such commodities imply. Iron

[13] The data on terms of trade growth are available for a shorter time series, this explains the smaller number of observations and some changes in the estimated coefficient on the other regressors. Interestingly, it seems that when changes in the terms of trade are accounted for, the residual impact of trade openness is negligible.

[14] This choice of regressors draws on the work of Debaere and Lee (2003).

[15] Again, readers interested in the estimated coefficients of the controls can obtain them from the authors upon request.

ores also do not appear to be conducive to growth, but not because of terms of trade effects. To what extent these findings help explain the specificity of the SSA curse detected in section II is however questionable. As noted in the previous section, the SSA specificity seems to emerge mostly from fuels and base metals. But, with the exception of iron ores, none of the other fuels and metals in which SSA heavily specializes appear to be intrinsically bad for growth. On the contrary, oil (but also coal and silver) positively affects growth outside SSA. Hence, the pattern of specialization of SSA relative to the rest of the world can account for some of the SSA specificity, but the roots of this specificity probably lie elsewhere.

IV. Non-linear effects on the commodity-growth relationship

The specialization pattern of SSA differs from that of the rest of the world not just with respect to the individual primary commodities that are produced/traded, but also in terms of the depth of the specialization itself. As noted in table 1, SSA relies on primary commodity exports much more than the average low- and middle-income countries of the world. The comparison between the export shares reported in the first two columns of table 3 provides further evidence on the depth of SSA dependence on some commodities: on the commodities in which it specializes, SSA specializes very deeply. Might this be the reason why primary commodity dependence is a curse in SSA and not elsewhere?

To answer the question it is necessary to check for non-linearities in the commodities-growth relationship. In fact, suppose that the relationship is an inverted U-shape: at initially low levels of dependence on primary commodities, the effect of an increase in specialization increases growth; at initially high levels of dependence, however, an increase in specialization reduces growth. Several mechanisms could generate such a non-linearity. For instance, at very high levels of dependence on primary commodities, negative marginal returns on specialization might arise, while at low initial levels of dependence, the benefits of economies of scale would make further specialization desirable.

If the relationship is effectively an inverted U-shape, one could argue that SSA has long reached the level of dependence to the left of the maximum and is therefore on the downward sloping part of the curve (where primary commodity dependence becomes a curse). The rest of the world, however, would be approaching the maximum from the left: that is, it would be on the rather flat part of the curve around the maximum (where primary commodities are neither a curse nor a blessing).

The test of this hypothesis again requires the estimation of a slight modification of the regression model 1:

$$g_{it} = \alpha_0 + \alpha_1 x_{1,it} + .. + \alpha_n x_{n,it} + \beta_1 z_{it} + \beta_2 (z_{it})^2 + \varepsilon_{it} \quad (5)$$

where the only difference relative to model (1) is the inclusion of the square term z^2. The set of controls however includes the regional dummy for SSA countries to avoid the possibility that a bad growth performance of highly dependent economies in SSA gives rise to a spurious pattern of coefficients on z and z^2. Results are reported in table 4.

There is evidence of a clear non-linearity in the role of primary commodities. In column I both the level and the square value of the commodity dependence indicator are statistically significant. The strength of the non-linearity might well explain why a linear specification – such as the one in model (1) – fails to identify any significant effect of primary commodity dependence on growth. However, the pattern of estimated coefficients β_1 and β_2 suggests that the relationship is U-shaped rather than inverted U-shaped. This means that the positive effect of primary commodities on growth occurs at initially higher levels of dependence. Therefore, for primary commodities, the benefits of economies of scale do not seem to accrue below a threshold level of specialization. Columns II to V of table 4 replicate the regressions in column I using the familiar four disaggregate categories of primary commodities. There is strong evidence of a non-linear effect for both food and fuels, while the coefficient on agricultural raw materials shows a pattern that is consistent with a U-shaped relationship, but statistically not different from zero. Finally, for base metals, the relationship does seem to take an inverted U-shape, but again coefficients do not pass the zero restriction test.

Table 4

Non-linear effects of primary commodities on growth

	I	II	III	IV	V
Lagged income per capita	-0.012***	-0.010***	-0.011***	-0.012***	-0.010***
Inflation	0.002	0.002	0.003	0.002	0.004
Government consumption	-0.03	-0.102***	-0.118***	-0.09***	-0.117***
School enrolment	0.046***	0.046***	0.042***	0.063***	0.043***
Latitude	0.041***	0.047***	0.056***	0.037***	0.050***
Ethnic fragmentation	-0.003	-0.002	-0.004***	-0.014**	-0.008*
Trade openness	0.009***	0.009***	0.009***	0.011***	0.014***
Primary commodities	-0.064***				
Primary commodities*2	0.060***				
Agricultural raw materials		-0.103			
Agricultural raw materials*2		0.257			
Food			-0.120***		
Food*2			0.173***		
Fuels				-0.132*	
Fuels*2				0.158**	
Metals					0.005
Metals*2					-0.016
Number of observations	256	259	258	257	259
Sargan test	5.05	2.18	1.86	1.07	5.54

Note: Time dummies, sub-Saharan Africa dummy and constant are not reported. The raw Sargan test reports the J-statistic for the test of overidentifying restrictions. *, **, *** respectively denote the significance of coefficients at the 10, 5 and 1 per cent levels of confidence.

The finding that primary commodity dependence has a U-shaped relationship with growth has two important implications. First, it does not explain the SSA specificity with the fact that SSA dependence on commodities is deeper than in the rest of the world. On the contrary, with a U-shaped relationship, primary commodities should foster growth in SSA more than in the rest of the world. Second, the policy recommendation that developing countries should diversify their productive structure to avoid the natural resource curse ought to be reconsidered. Diversification is good for growth if the economy does not initially achieve a level of dependence on primary commodities that is above the minimum of the U-shaped relationship. For instance, the estimates in column IV suggest that diversification for fuel-exporting economies is growth enhancing only if the fuel exports to total exports ratio is not already above 42 per cent. If it is above this threshold level, then diversification – which might nevertheless be desirable for redistributive and sustainability purposes – will imply a contraction in output growth.[16]

V. The interaction of primary commodities with the structural features of the SSA socio-economic system

Taking stock of sections III and IV, one can argue that SSA is not cursed by mother nature: only a few of the commodities it specializes in are truly and intrinsically bad for growth and the depth of

[16] In order to test the sensitivity of the findings, the regression equation was re-estimated after dropping countries that heavily depend on primary commodities (namely, countries for which dependence is one standard deviation or more above the sample mean). The pattern of coefficients on z and z^2 does not change substantially. Similarly, the U-shaped relationship holds when the sample for estimation excludes countries that depend the least on primary commodities (namely, countries for which dependence is one standard deviation or more below the sample mean). However, when the sample is restricted to those countries that are within one standard deviation from the mean there is no longer evidence of a U-shaped relationship. This suggests that jointly heavily dependent and least dependent countries make the relationship U-shaped, while at intermediate levels of dependence the relationship is likely to be linear and statistically significant. Clearly, further work to identify and explain non-linearities is desirable.

specialization in these (and other) commodities does not seem to generate any negative growth yield. The key to addressing the SSA specificity must lie then in the interaction that primary commodities have with some structural features of the socio-economic SSA system. Two such features will be considered in this section: trade integration and institutional development. The general underlying assumption is that such features interact with primary commodities and help to shape the influence that primary commodities have on growth. Therefore, if SSA is systematically different from the rest of the world along any of these features, then the effect of primary commodities on growth in SSA will also be systematically different from the rest of the world.

From a methodological point of view, the role of this type of interaction is most aptly investigated through the use of interactive effects (see, for instance, Kose et al. 2005a,b). The growth regression model is therefore expressed as follows:

$$g_{it} = \alpha_0 + \alpha_1 x_{1,it} + .. + \alpha_s x_{s,it} + .. + \alpha_n x_{n,it} + \beta_1 z_{it} dSSA * x_{s,it} + \beta_2 z_{it} (1 - dSSA) * x_{s,it} + \varepsilon_{it} \quad (6)$$

where $x_{s,it}$ is one of the controls (that is, the generic control is x_k with $k = 1, 2\ldots, s, \ldots n$) and everything else is as in equation (2). In fact, equation (6) is just an extension of model (2) allowing for the interactive term between primary commodities and trade openness or institutional quality (or eventually any other control variable).

A. Interaction between trade openness and primary commodity dependence

Popular views hold one of two extremes: SSA is regarded as a victim of either too much or too little trade integration with the world economy. The data on the trade share of GDP suggests that relative to other regions at comparable levels of development, SSA is neither much more nor significantly less open to world trade.[17] Nevertheless, the interaction between trade integration and commodity dependence could provide interesting insights into the primary commodity curse.

Table 5 reports the results of estimating equation (6) with x_s that now denotes the trade to GDP ratio.

The main conclusion of the table is that even after accounting for the interaction with trade openness, the effect of primary commodities dependence on growth remains very similar to what was observed in section II: primary commodities are not a curse outside SSA. In column I the coefficient β_1 is negative and the coefficient β_2 is not different from zero. That is, dependence on primary commodities reduces growth in SSA, but not in the rest of the world. The interaction between trade openness and primary commodities does not therefore eliminate the specificity of the SSA resource curse. The results in column II confirm this finding: the basic model (2) is re-estimated using only observations such that the trade to GDP ratio is above the full sample mean (70 per cent). In other words, the equation in column II tests whether the differential behaviour of primary commodities between SSA and the rest of the world persists at high levels of trade integration. The answer is unambiguously positive. The other columns in the table re-estimate equation (6) using the four disaggregate categories of primary commodities. With the exception of the agricultural raw materials category (column III), for all of the other categories (columns IV, V and VI) results are in line with those in column I.

[17] Between 1975 and 2004, the trade to GDP ratio in Africa has gone from 56 per cent to 66 per cent. The average for low- and middle-income countries was 28 per cent in 1975 and 65 per cent in 2004. Thus, SSA started from a definitely more integrated position to end up at practically the same level of integration as countries at comparable levels of income. It would therefore seem that trade integration cannot qualify as a socio-economic feature that systematically distinguishes SSA from the rest of the world, even though one has to acknowledge that the 65 per cent trade to GDP ratio in SSA in 2004 was significantly higher than that observed in some other major world regions (the ratio was, for instance, 49 per cent in Latin America and 41 per cent in South Asia).

Table 5

The interactive effect of trade and primary commodities on growth

	I	II	III	IV	V	VI
Lagged income per capita	-0.011***	-0.014***	-0.010***	-0.010***	-0.010***	-0.010***
Inflation	0.003	0.007	0.002	0.002	0.002	0.002
Government consumption	-0.072***	-0.055***	-0.092***	-0.078***	-0.096***	-0.099***
School enrolment	0.046***	0.045***	0.043***	0.047***	0.046***	0.046***
Latitude	0.045***	0.061***	0.046***	0.042***	0.047***	0.046***
Ethnic fragmentation	-0.006	-0.005	-0.009***	-0.006*	-0.005	-0.004
Trade openness	0.012***	0.012***	0.012***	-0.012***	0.012***	0.013***
Primary commodities*SSA*trade	-0.011**					
Primary commodities*(1-SSA) *trade	-0.002					
Primary commodities*SSA		-0.016***				
Primary commodities*(1-SSA)		0.002				
Agricultural raw materials*SSA*trade			-0.007			
Agricultural raw materials*(1-SSA) *trade			0.049			
Food*SSA*trade				-0.012***		
Food*(1-SSA)*trade				0.000		
Fuels*SSA*trade					-0.068**	
Fuels*(1-SSA)*trade					0.002	
Ores and metals*SSA*trade						-0.059***
Ores and metals*(1-SSA)*trade						-0.003
Number of observations	256	120	259	258	257	259
Sargan test	3.73	2.94	6.03	3.91	5.31	3.92

Note: SSA denotes the dummy variable taking value 1 for sub-Saharan countries. For a full description of variables see appendix. Time dummies and constant are not reported. The raw Sargan test reports the J-statistic for the test of overidentifying restrictions. *, **, *** respectively denote the significance of coefficients at the 10, 5 and 1 per cent levels of confidence.

It is worth noting that the marginal effect of primary commodities dependence now depends on the level of trade integration.[18] Thus, a SSA country will be more prone to the resource curse the higher its degree of trade openness. Of course, this does not mean that SSA countries that depend on primary commodities should pursue autarky.[19] The policy implication can, therefore, be summarized as follows. For the average SSA country, the net effect on growth of increasing trade integration is always positive, even though it becomes weaker the greater the initial degree of dependence on primary commodities. At the same time, the average SSA country that strengthens its dependence on primary commodities will suffer a stronger slowdown in growth the higher its degree of trade integration. Therefore, increasing trade integration is a growth-enhancing policy in SSA to the extent that it does not involve a significant increase in the share of primary commodity exports.

B. The interaction between institutional development and primary commodities

An increasing volume of research highlights the importance of studying the political economy of primary commodity dependence (e.g. Tornell and Lane, 1999; Isham et al., 2005; Mehlum et al., 2006). Since available quantitative indicators of institutional quality seem to suggest that SSA is on average lagging behind the rest of the world in terms of institutional development,[20] the interaction

[18] Since $\frac{\partial g}{\partial z} = \beta_1 x_s$ for African countries and $\frac{\partial g}{\partial z} = \beta_2 x_s$ for the rest of the world.

[19] The marginal effect of trade integration on growth for a SSA country is given by $\frac{\partial g}{\partial x_s} = \alpha_s + \beta_1 z$. Taking the estimates in column I as a reference, this marginal effect is positive for $z < 1.09$. Since z is by construction smaller than 1, it turns out that increasing the trade share is always growth enhancing.

[20] See, for instance, Transparency International (various issues) and Kaufmann et al. (2005).

between institutions and commodities might take care of the observed different growth effects commodities have in SSA relative to the rest of the world. A test of this hypothesis is possible through equation (6), with x_s that must now proxy for institutional quality.

In fact, finding a good and reliable measure of institutional quality is all but easy.[21] The notion of institutions that is most relevant in the context of the resource curse literature is one of the quality of the legal arrangement that disciplines the activities of the private sector and its interaction with the public sector. Based on this interpretation equation (6) will be estimated, using as a proxy for institutional development the index of quality of the legal system and enforcement of property rights available from the Fraser Institute through its Index of Economic Freedom of the World (Fraser Institute, 2006).[22]

Table 6 reports the estimates of model (6) with the proxy for institutional quality. The issue of joint endogeneity of institutional quality and growth is dealt with by letting the institution index be instrumented by the country fixed effects and the legal origin dummies already in the set of instruments. Again, the test of overidentifying restrictions is supportive of this choice.

Table 6

The interactive effect of institutional quality and primary commodities on growth

	I	II	III	IV	V
Lagged income per capita	-0.012***	-0.013***	-0.013***	-0.015***	-0.0131***
Inflation	0.005	0.010	0.005	0.011	0.009
Government consumption	-0.116***	-0.145***	-0.102***	-0.149***	-0.135***
School enrolment	0.063***	0.055***	0.056***	0.061***	0.056***
Latitude	0.032***	0.024**	0.027***	0.021***	0.027***
Ethnic fragmentation	-0.005	-0.002	-0.066	-0.002	-0.001
Trade openness	0.010***	0.012***	0.009***	0.011***	0.012***
Institutional quality	0.002*	0.005**	0.003*	0.007*	0.005**
Primary commodities*SSA*inst quality	0.001				
Primary commodities*(1-SSA)*inst quality	0.001				
Agricultural materials*SSA*inst quality		-0.009			
Agricultural materials*(1-SSA)*inst quality		-0.004			
Food*SSA*inst quality			-0.002		
Food*(1-SSA)*inst quality			-0.000		
Fuels*SSA*inst quality				-0.005	
Fuels*(1-SSA)*inst quality				0.002	
Ores and metals*SSA*inst quality					-0.007
Ores and metals*(1-SSA)*inst quality					-0.002
Number of observations	235	235	235	235	235
Sargan test	1.50	4.73	1.47	2.29	1.52

Note: SSA denotes the dummy variable taking value 1 for sub-Saharan countries. For full description of variables see appendix. Time dummies and constant are not reported. The raw Sargan test reports the J-statistic for the test of overidentifying restrictions. *, **, *** respectively denote the significance of coefficients at the 10, 5 and 1 per cent levels of confidence.

Consider the estimates in column I. The coefficient on the institutional index is positive and statistically significant, suggesting that better institutions promote growth, everything else being equal.

[21] See Carmignani (2003) for a critical survey of the most popular measures and their limitations.

[22] The index is available for a total of 127 countries (including 30 SSA countries) and takes values from 1 (lowest institutional quality) to 10 (highest institutional quality). For the period 2000-2004 the average score for SSA was 4, while the average score for the rest of the world was 5.8. Considering that the standard deviation across the full sample of countries in 2000-2004 was 2.2, the gap between SSA and rest of the world appears to be significant, although not dramatic.

Interestingly, the degree of ethnic fractionalization ceases to be significant, thus indicating – similarly to La Porta et al. (1999) – that ethnicity is a determinant of institutions. Even more importantly, the effect of primary commodities is now insignificant in both SSA and the rest of the world. Thus, when the role of institutions and their interaction with primary commodity dependence are taken into account, primary commodities are no longer a curse in SSA as well as in the rest of the world. The results in the remaining columns of the table, where use is made of the four disaggregate categories of primary commodities, are qualitatively analogous to those in column I. Note that what the table says is not that primary commodities are good or bad for growth depending on the quality of institutions, but rather that once controlling for differences in institutional development, the role of primary commodities is negligible in both SSA and the rest of the world. To put it differently, when institutions improve, primary commodities are no longer a curse in SSA just as they are not a curse in the rest of the world. This result is therefore more in line with Sala-i-Martin and Subramanian (2003) than with Mehlum et al. (2006).

The lack of significance of the interactive terms implies that institutional development is good for growth no matter what. This translates into a straightforward policy implication: the best way to address the primary commodity curse in SSA is to improve the institutions that regulate economic activity in all fields. Some back of the envelope computations based on the estimates in table 6 suggest that a generic country starting from the average level of institutional quality in SSA (4) and able to improve its institutions up to the level of Finland (9.3) would see its growth rate boosted by an average 2 per cent a year,[23] ceteris paribus.

VI. Conclusions

The econometric analysis in this paper has uncovered some interesting results. While there is no evidence of a generalized curse at global level, it appears that primary commodities negatively affect economic growth in SSA. One might think that this specificity arises from the fact that SSA specializes in commodities that are not conducive to growth and/or depends on commodities much more than the rest of the world does. In fact, only a few of the primary commodities that characterize the production structure of SSA are intrinsically bad for growth. Moreover, the existence of a U-shaped relationship in the commodities-growth relationship implies that the depth of SSA is not the reason why primary commodities are a curse in SSA only. Taken together these findings generalize the argument of Deaton (1999): while adverse price dynamics of some commodities (like cotton and coffee) do not help, the root cause of slow African development resides elsewhere. The key to understanding the SSA specificity seems to lie in other features of the socio-economic system. In particular, the interaction between institutions and primary commodities significantly weakens the SSA specificity, making primary commodity dependence irrelevant in SSA as well as in the rest of the world. This is not the same as saying that good institutions transform primary commodities from a curse into a blessing. In this sense, the results of the paper are more in line with Sala-i-Martin and Subramanian (2003) than with Mehlum et al. (2006).

A number of policy implications can emerge from this paper. First, institutional development is the key to overcoming the curse in SSA. The interaction of institutions with primary commodities practically eliminates the negative effect those latter have on growth in SSA. Moreover, better institutions are unambiguously positive for growth, with a marginal effect that can be quite large. Thus, countries in SSA have in their institutional development the tool to offset the potential negative spillovers coming from their specialization in primary commodities. Second, more trade integration is good for growth, even though the marginal effect of a larger trade share of GDP weakens as dependence on primary commodity increases. This seems to point to the need for diversification of the

[23] In doing this computation, the average of the five coefficients estimated for the institutional indicator was taken. In fact, the estimated coefficients on this indicator display some instability, in the sense that they range between 0.002 and 0.007 depending on the specification. While this does create some uncertainty on the effective quantitative impact of institutions on growth, it does not invalidate the qualitative results, namely that institutions are good for growth and that better institutions eliminate the primary commodity curse in SSA.

export structure. However, and this goes as third policy implication, the non-linearity in the commodities-growth relationship suggests that diversification promotes growth to the extent that the initial level of specialization of the country is not already too high. In practical terms, this means that for mono-commodity economies (i.e. particularly those where oil accounts for most of their exports), diversification must be pursued gradually, together with the process of broad institutional development, in order to avoid adverse growth effects.

Finally, a number of avenues for future research can be pointed out. One certainly concerns the non-linear effect of primary commodities on growth. While this result appears to be econometrically robust, it will be interesting to deepen the understanding of the mechanism at its roots. Another interesting area to pursue will be the extension of the analysis to other measures of economic development and/or macroeconomic performance. For instance, output growth volatility is an important factor influencing people's welfare and long-term growth prospects. The question is then to see how dependence on primary commodities affects volatility and growth simultaneously. Finally, a third possible direction of research should focus on subregional effects. SSA is a broad continent covering several subregions at different states of economic and institutional development. These subregions are also different in terms of their degree of integration and policy coordination. The issue is then to model the primary commodity-growth relationship allowing for differences across subregions in sub-Saharan Africa. This will of course require some considerable efforts in data collection since, at the present stage, the number of observations available for most subregions would not be enough to allow the estimation of a growth model of the type used in this paper.

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Appendix

Variables description and data sources

Variable name[a]	*Description*	*Source*[b]
Growth per capita GDP	Annual per cent change in constant prices per capita GDP	WDI
Lagged per capita GDP	One period lagged value of log per capita GDP (constant prices)	WDI
Inflation	Average annual rate of change of consumer price index	WDI
Government consumption	Final government consumption expenditure in per cent of GDP	WDI
School enrolment	Net secondary schooling enrolment rate	WDI
Latitude	Absolute latitude	La Porta et al. (1999)
Ethnic fragmentation	Index of ethnolinguistic fractionalization	La Porta et al. (1999)
Trade openness	Total exports plus total imports in per cent of GDP	WDI
Primary commodities	Exports of primary commodities in per cent of total exports. Primary commodities include food and live animals, beverages and tobacco, animal and vegetable oils and waxes, excluding manufactured goods; crude materials, mineral fuels, lubricants and related materials; non-ferrous metals, metalliferous ores and scrap, crude fertilizers	WDI
Agricultural raw materials	Exports of agricultural raw materials in per cent of total exports. Agricultural raw materials include SITC section 2 excluding divisions 22, 27 and 28	WDI
Food	Exports of food and beverages in per cent of total exports (include SITC 0, 1, 4, and 22)	WDI
Fuels	Exports of mineral fuels in per cent of total exports (include SITC 3)	WDI
Ores and metals	Exports of ores and metals in per cent of total exports (include SITC 27, 28, 68)	WDI
Oil	Exports of oil in per cent of total exports (SITC 333)	UNCTAD
Cocoa	Exports of cocoa in per cent of total exports (SITC 072)	UNCTAD
Cotton	Exports of cotton in per cent of total exports (SITC 263)	UNCTAD
Coffee	Exports of coffee in per cent of total exports (SITC 071)	UNCTAD
Fruits and nuts	Exports of fruits and nuts in per cent of total exports (SITC 057)	UNCTAD
Sugar	Exports of sugar in per cent of total exports (SITC 061)	UNCTAD
Silver	Exports of silver in per cent of total exports (SITC 681)	UNCTAD
Iron ores	Exports of iron ores in per cent of total exports (SITC 281)	UNCTAD
Coal	Exports of coal in per cent of total exports (SITC 322)	UNCTAD

*Variable name**a***	*Description*	*Source**b***
Copper	Exports of copper in per cent of total exports (SITC 682)	UNCTAD
Aluminium	Exports of aluminium in per cent of total exports (SITC 684)	UNCTAD
Institutional quality	Index of legal structure and property rights (Area 2 of the Economic Freedom Index)	Fraser Institute
Terms of trade growth	Annual per cent change in net barter terms of trade	WDI
Capital formation	Gross capital formation (addition to fixed assets plus net changes in inventory) in per cent of GDP	WDI
World growth	Annual per cent change of constant prices per capita GDP for the world aggregate	WDI
Financial intermediation	Monetary aggregate M2 (money and quasi-money) in per cent of GDP	WDI
Financial openness	Index of capital account liberalization	Fraser Institute
Time dummies	Dummy 80 = 1 for years in the 1980s and 0 otherwise Dummy 90 = 1 for years in the 1990s and 0 otherwise	
Legal dummies	Dummy UK = 1 if legal origins are Anglo-Saxon Dummy FR = 1 if legal origins are French Dummy SC = 1 if legal origins are Scandinavian Dummy GE = 1 if legal origins are German	La Porta et al. (1999)
SSA	Dummy variable taking value 1 for African countries	

a Variable name as it appears in the tables and/or in the text.

b Detailed references for the sources are as follows:

WDI: World Bank, *World Development Indicators* (various issues), Washington, D.C.

UNCTAD: United Nations Conferences on Trade and Development, *Handbook of Statistics* (various issues), Geneva.

Fraser Institute: *Economic Freedom of the World, 2006 Annual Report,* J. Gwartney and R. Lawson with W. Easterly (eds.), Vancouver.

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