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Abstract: Focusing on low-income commodity-dependent sub-Saharan African countries, the paper argues that the impact of the 2008–2009 crisis, and more generally, these countries’ growth trajectories, can be explained by the concept of the poverty trap. This is not trivial, because commodity-based traps remain debated: some countries have grounded their growth on the export of commodities, and the impact of commodity price fluctuations may be analysed through other concepts (such as cycles). Against these views, it shows that these countries’ growth trajectories exhibit the three key theoretical features of poverty traps: threshold effects, cumulative causation and low equilibria. Copyright © 2012 John Wiley & Sons, Ltd.

Keywords: commodity dependence; poverty trap; financial crisis; sub-Saharan Africa

1 INTRODUCTION

A major characteristic of low-income countries is their dependence on commodities. The detrimental consequences of this export structure have long been underscored, a key channel being price volatility and dependence on the fluctuations of global demand, which constitute a major factor of vulnerability. Price volatility has been amplified...

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during the 2003–2008 boom, which was followed by the most severe global recession in 50 years.

The paper focuses on low-income and lower-middle income commodity-dependent sub-Saharan African (SSA) countries.\(^2\) It argues that beyond the specificities of each commodity market and SSA countries’ diversity, the impact of the 2008–2009 global crisis may be analysed via the concept of the poverty trap and the related notions of multiple equilibria, cumulative causation, lock-in and threshold effects.

Such an argument is not trivial: traps may be created by factors other than commodities, some countries grounded their growth on commodities, and commodity price fluctuations may be analysed through other concepts, for example, cycles (stemming from importing countries’ income and product cycles), resulting in growth accelerations-decelerations that are not ‘traps’.

Against these views, the paper shows the explanatory power of the concept. Commodity dependence ensnares countries in the trap of products characterised by low productivity and low value added. The volatility of prices and global demand exposes them to shocks and volatile fiscal earnings, which impede investment and may therefore create threshold effects and cumulative processes that lock countries in low equilibria. Indeed, the concept of traps implies by definition the possibility of multiple equilibria, including bifurcations towards growth, domestic policies and institutions being crucial determinants in the triggering of these bifurcations. The impact of the 2008–2009 crisis, and more generally, these countries’ growth trajectories, exhibit the three key theoretical features of poverty traps: (i) threshold effects; (ii) cumulative causation and divergence, and (iii) low equilibria.

The paper therefore firstly summarises the main theoretical features of the concept of poverty traps, then assesses the critiques regarding the very existence of poverty traps, and finally, against them, shows the relevance of these three key properties of traps.

2 THE MAIN FEATURES OF POVERTY TRAPS

2.1 Lock-in Processes, Cumulative Causation, Low Equilibria

Arthur (1989:13; 1994a, 1994b) demonstrated that systems may evolve according to threshold effects, ‘lock-in by historical small events’, self-reinforcing mechanisms, multiple equilibria, with some equilibria able to lock-in economies or individuals in inefficient behaviour and low levels of income. The importance of increasing returns in growth has long been emphasised (e.g. Young, 1928; Kaldor, 1972). However, as underscored by Arrow (in Arthur, 1994a), Arthur highlighted the dynamic and stochastic nature of positive feedback processes, that is, the existence of random deviations from long-run tendencies: this property means the possibility of multiple long-run states depending on initial

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\(^2\)The 48 SSA countries are all low-income or lower-middle income countries, except eight (Botswana, Gabon, Mauritius, Mayotte, Namibia, Seychelles, South Africa—upper-middle income—and Equatorial Guinea—high-income) in the World Bank classification (http://data.worldbank.org/about/country-classifications/country-and-lending-groups—South Sudan not yet included). For the World Bank, low income means a 2010 GNI per capita of $1005 or less—25 low-income countries are in SSA out of a total of 35; it considers as lower-middle income ($1006–$3975) some SSA countries that are low income for UNCTAD (Angola, Cameroon, Côte d’Ivoire, Djibouti, Ghana, Lesotho, Mauritania, Nigeria, Sao Tome, Senegal, Sudan, Zambia). For the UNCTAD Handbook of Statistics (2011, p. xi), low income means an average 2004–2006 per capita GDP below US$ 1000.
conditions and random fluctuations. Even with suitable initial conditions, the same mechanisms can lead to either optimal or inefficient equilibria (Sindzingre, 2007a).

The notions of ‘lock-in’ (e.g. by technological choices) and positive feedback also constitute the background of the concept of path dependence (or irreversibility), defined as phenomena that have the dynamic property of non-ergodicity in stochastic processes (i.e. not having the ‘ability eventually to shake free from the influence of their past states’), and imply the existence of ‘winners and losers’ (David, 1985, 2001:18). Referring to Arthur, David (2001:25) defines the ‘lock-in’ as the ‘entry of a system into a trapping region’, the basin of attraction that surrounds a stable and self-sustaining equilibrium. A dynamic system that enters into such regions needs, in order to escape from it, external forces that alter its structure.

Lock-in equilibria may be optimal or detrimental; positive feedbacks may reinforce either poverty or development, and David emphasises that path dependence does not mean determinism. Indeed, positive feedback processes are unstable; threshold effects, bifurcations, tipping points and their directions cannot be predicted ex ante. Feedback processes may move in the right direction; when they move in the wrong direction, however, they ‘do not self-correct before they wreak serious economic damage’ (David, 2007:1).

A poverty trap is thus ‘any self-reinforcing mechanism which causes poverty to persist’ (Azariadis & Stachurski, 2005:326) and its definition includes three core features: threshold effects, cumulative causation and low equilibria.

### 2.2 Coordination Failures and Commodity Dependence as Causes of Traps

In order to understand why some economies seemed unable to catch-up, the first development theorists at the time of WWII built a series of concepts that provided a basis for further analyses of traps, those of spillover effects, linkages and complementarities, which display much overlap with those of cumulative causation and path dependence (Toner, 1999).

Rosenstein-Rodan (1943) has defined spillovers as increasing returns to an activity proportional to the number of others who undertake the same activity. Coordination failures explain the possibility of multiple equilibria, in particular self-reinforcing underdevelopment traps. As state capacity is endogenous to the level of economic development, underdevelopment traps are likely at early stages of development (Bardhan & Udry, 1999). Markets alone may not achieve the coordination that triggers development and do not necessarily lead from the lowest equilibrium to the best one (Adelman, 2000; Hoff, 2000; Adelman, 2001). This was the justification of state intervention and ‘big push’ policies at the early stages of development, as the entity most able to reallocate factors and resources across markets (Murphy et al., 1989).

The concept of poverty trap was further supported by the theories of ‘club convergence’, which confirmed the role of history (past events may have large and lasting effects) and called into question the hypotheses of growth convergence across countries to similar steady-state income levels in view of the facts that since the 1960s, only East Asian countries caught up with industrialised countries and that the world distribution of per capita incomes follows a ‘twin peak’ or polarised shape (Quah, 1996; Pritchett, 1997, 2000; Beaudry et al., 2002; Azariadis, 2006). This income gap is explained by multiple equilibria, poor countries being locked in a low equilibrium (Graham & Temple, 2006).

Multiple equilibria are illustrated by the S-shape of the growth function, which contrasts with models assuming convergence of growth paths (Barrett & Swallow, 2006). Stable
dynamic equilibria at high and low levels of welfare (\(W_h\) and \(W_l\)) coexist with at least one unstable dynamic equilibrium, a critical threshold (\(W_c\)): at this threshold, countries or households may fall into the basin of attraction of the low equilibrium \(W_l\)—the poverty trap. Once there, it is difficult to move toward a higher equilibrium (Figure 1).

Most low-income developing countries are characterised by their dependence on commodities for their exports, particularly in SSA: commodity dependence and undiversified export structure are typical causes of traps.

The UNCTAD (2008a: 50) thus defines the ‘dependency rate’ as the average share of the four main commodity exports value in the value of total exports for the period 2003–2005: 31 per cent of developing countries rely on four commodities for more than 75 per cent of their export earnings. In SSA, more than half of countries exhibit a dependency rate above 50 per cent, some having a dependency rate above 80 per cent, because they export oil. Indeed, since the mid-2000s fuels represent about half of exports of SSA (IMF, 2007, Table 4.1). Agricultural products (cotton, cocoa, coffee) also create high dependence: low-income countries such as Benin or Burkina Faso exhibit a dependency rate above 65 per cent (UNCTAD, 2008a: 50).

Table 1 shows that, despite the diversity of countries, commodities (agricultural raw materials; fuels; ores and metals) represent the majority of exports.

Commodity-dependent countries are likely to be caught in poverty and debt traps because of the low value added that is inherent in primary products (UNCTAD, 2002). These traps have been compounded by globalisation and the closer linkages between energy, agricultural commodities and financial markets over the 2000s, and the subsequent increase in price volatility and therefore uncertainty, which has detrimental effects on investment and governments’ financial management (UNCTAD, 2008b).

### 3 IS COMMODITY DEPENDENCE AN EFFECTIVE CAUSE OF TRAPS?
#### THREE CRITICISMS OF COMMODITY-BASED POVERTY TRAPS

The notion of poverty traps created by commodity-based export structures, however, has been subject to several criticisms: in particular, (i) if traps exist, they may be
generated by many factors other than commodity-based market structures; (ii) commodities do not always generate traps; and (iii) the dynamics and effects of commodities may be explained by mechanisms that do not require the concept of trap and may even refute its existence.

Table 1. Structure of merchandise exports of sub-Saharan African countries, 1995–2009

<table>
<thead>
<tr>
<th>Country</th>
<th>Food (% of total)</th>
<th>Agricultural raw materials (% of total)</th>
<th>Fuels (% of total)</th>
<th>Ores and metals (% of total)</th>
<th>Manufactures (% of total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-income and middle-income SSA countries&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
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<tr>
<td>Low-income countries</td>
<td>31</td>
<td>25</td>
<td>10</td>
<td>8</td>
<td>2</td>
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<tr>
<td>East Asia and Pacific</td>
<td>11</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td>20</td>
<td>18</td>
<td>3</td>
<td>2</td>
<td>15</td>
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<tr>
<td>South Asia</td>
<td>17</td>
<td>11</td>
<td>2</td>
<td>1</td>
<td>1</td>
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<tr>
<td>SSA low-income countries&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>Burkina Faso</td>
<td>25</td>
<td>27</td>
<td>69</td>
<td>60</td>
<td>0</td>
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<tr>
<td>Burundi</td>
<td>91</td>
<td>67</td>
<td>4</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>73</td>
<td>77</td>
<td>13</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Guinea</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>0</td>
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<tr>
<td>Kenya</td>
<td>56</td>
<td>44</td>
<td>7</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Madagascar</td>
<td>69</td>
<td>29</td>
<td>6</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Malawi</td>
<td>90</td>
<td>87</td>
<td>2</td>
<td>4</td>
<td>0</td>
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<tr>
<td>Mali</td>
<td>23</td>
<td>28</td>
<td>75</td>
<td>42</td>
<td>0</td>
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<tr>
<td>Mozambique</td>
<td>66</td>
<td>23</td>
<td>16</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Niger</td>
<td>17</td>
<td>18</td>
<td>1</td>
<td>4</td>
<td>0</td>
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<tr>
<td>Rwanda</td>
<td>57</td>
<td>42</td>
<td>16</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Tanzania</td>
<td>65</td>
<td>35</td>
<td>23</td>
<td>10</td>
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<tr>
<td>Togo</td>
<td>19</td>
<td>16</td>
<td>42</td>
<td>9</td>
<td>0</td>
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<tr>
<td>Uganda</td>
<td>90</td>
<td>63</td>
<td>5</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>SSA lower-middle income countries&lt;sup&gt;b&lt;/sup&gt;</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Côte d’Ivoire</td>
<td>63</td>
<td>48</td>
<td>20</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Ghana</td>
<td>58</td>
<td>63</td>
<td>15</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Mauritania</td>
<td>57</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Nigeria</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>96</td>
</tr>
<tr>
<td>Senegal</td>
<td>9</td>
<td>30</td>
<td>7</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>Zambia</td>
<td>3</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: adapted from World Bank World Development Indicators 2011, Table 4.4.
<sup>a</sup>All SSA countries except Equatorial Guinea.
<sup>b</sup>Data missing for most other countries. Food: Standard International Trade Classification (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 fertilisers and minerals excluding coal, petroleum, and precious stones), and 28 (metaliferous 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.
3.1 Traps Caused by Factors Unrelated to Commodities

Firstly, an argument against commodity-generated traps is that traps may result from many other factors: for example, low savings rates; market failures (credit and insurance markets imperfection, (Banerjee & Newman, 1994); ‘threshold externalities’ created by increasing returns in the accumulation of human capital (Azariadis & Drazen, 1990; Azariadis, 1996: 476); ‘misbehaving governments’ and incomplete markets (Azariadis, 2006: 23); or high initial poverty rates, which entail lower growth rates (Lopez & Servén, 2009; Ravallion, 2009). Poverty may become its own cause in the context of a lack of complementarities in expanding product variety, lack of demand and lack of support industries for more technologically advanced products, which reinforce themselves (Matsuyama, 1995).

Likewise, traps may be ‘spatial’: poverty may persist in particular areas over generations because of self-reinforcing processes such as a low level of education, poor infrastructure, low levels of taxes, limited supply of public goods and access to institutions (Durlauf, 1996, 2003); people with certain characteristics may agglomerate in ‘poor areas’, or the characteristics of some areas modify incomes for otherwise identical households (Jalan & Ravallion, 1997: 2; Hoff, 2000; Bloom et al., 2003).

3.2 The Export of Commodities as a Basis for Sustained Growth

Secondly, an argument against commodity-generated traps is that many commodity-exporting countries have enjoyed a continuous increase in their per capita income. Undeniably, some major industrialised countries have historically grounded their growth on the export of primary products or their efficient use as inputs for their industrialisation, for example, Australia, New Zealand, Canada, Scandinavian countries or the USA. As argued by Wright (Wright, 1990), the rise of US manufacturing during the 1890s was associated with a rise in the resource intensity of exports (e.g. natural gas, petroleum, copper); natural resource abundance lowered input prices and hence fostered industrial production, for example, steel products and therefore the increase in manufactured exports.

Indeed, the impact of commodity dependence on the formation of traps may be countered or intensified by many factors, such as the credibility of economic and political institutions, the level of human capital or demographic and geographic characteristics (Engerman et al., 2006; Bowles, 2006; Sindzingre, 2007a, 2007b). In particular, domestic institutions may prevent the formation of a trap and even trigger a mode of harnessing natural resources that fosters industrialisation, as in the end-19th century USA (David & Wright, 1997).

3.3 The Irrelevance of the Very Concept of Trap

Thirdly, an argument against poverty traps created by commodity dependence is that problems of commodity-exporting countries are well-explained by more powerful theories, for example deindustrialisation stemming from Dutch disease (Corden & Neary, 1982), or more recently, theories of the ‘resource curse’ (Sachs & Warner, 1995).

Similarly, commodity prices may be explained by the concepts of trends and cycles (or ‘supercycles’) (Cashin & Mc Dermott, 2002; Chang and Hellblng, in IMF, 2009a, Box 1.5), for example, by temporary fluctuations resulting from deviations from a trend and permanent fluctuations resulting from shocks with broken trends (Romero-Avila,
2009). For example, over the long run, SSA growth has moved closely with global real GDP growth: with the 2008–2009 slowing of global growth, SSA exports have been affected by lower external demands and declines in commodity prices (IMF, 2009b).

Likewise, the concepts of growth ‘acceleration’, ‘deceleration’ and ‘collapse’ (where growth decelerates to negative rates), which result from business-cycle dynamics, may be found more relevant than that of poverty traps (Hausmann et al., 2005)—although Hausmann et al. (2006) acknowledge the compatibility of these concepts with trap models. Econometric tests of traps may also be inconclusive (Rodríguez, 2008). On the example of 44 SSA countries between 1975 and 2005, Arbache and Page (2007a, 2007b) show that they are characterised by low and volatile growth, but that growth volatility is not associated with the level of GDP per capita over the long run.

Here, fluctuations of growth rates do not build a poverty trap, and these fluctuations do not predict what long-run per capita income will be: for example, it is global technological change that determines long-run growth (Easterly et al., 1993). In SSA countries, over the last 50 years, levels of income per capita have increased slowly despite high fluctuations of growth rates, and in the sense of zero growth for low-income countries, traps are rejected by the data in most time periods (Easterly, 2005; Kraay & Raddatz, 2005; Easterly, 2009).

4 RECOGNISING TRAPS’ DEFINITIONAL FEATURES IN THE IMPACT OF THE CRISIS AND GROWTH TRAJECTORIES OF COMMODITY-DEPENDENT COUNTRIES

Despite these views, it is argued here that the impact of the 2008–2009 crisis, and more generally, growth trajectories of SSA low-income commodity-dependent countries exhibit key definitional features of poverty traps. The concept remains fully accurate to explain these countries’ evolution and points to precise mechanisms that differ from those of growth rate fluctuations.

Critiques overlook key properties of poverty traps, that is, to subsume processes that (i) create threshold effects; (ii) generate divergence relative to other countries’ dynamics via cumulative causation; and (iii) lock-in in low equilibria. ‘Small events’ may induce bifurcations, large and irreversible effects, thresholds and therefore path dependence. As underscored by Arthur and David, economies may fall and remain locked in a low equilibrium, with the lock-in self-reinforcing itself, which makes structural breaks and the reaching of a higher-growth path more difficult (their ‘self-discovery’, Hausmann & Rodrik, 2003).

Has the 2008–2009 crisis induced such processes in commodity-dependent low-income SSA countries? Over the long run, do their growth trajectories exhibit these definitional features?

4.1 Threshold Effects, Bifurcations and Lasting Impacts of External Shocks

A first definitional feature of poverty traps characterises commodity-dependent SSA countries: shocks, even small, may generate large effects and make countries fall into lower equilibria. These countries are not just exposed to small shocks but also to important and recurrent shocks—world business cycles and commodity prices fluctuations, whereas dependence on volatile and declining earnings generate a lack of resilience to these shocks.
For economies that are at ‘tipping points’, at critical thresholds, in various areas—for example, fiscal balance, institutional capacity, poverty incidence—shocks may precipitate a fall into a lower equilibrium. Booms, such as that of 2003–2008, may also constitute adverse shocks, as high prices are incentives for increasing the export of a given commodity and hence dependency on it.

Commodity-dependent countries are indeed more likely to be exposed to external shocks. Funke et al. (2008), analysing the persistence of terms of trade shocks for a panel of 159 countries over 1970–2006, find that SSA and the Middle-East have been more affected than Western Hemisphere and Asia-Pacific countries, because of these two regions’ lesser degree of diversification, dependence on a few natural resources and a lower manufacturing base. During this period, SSA countries exhibited on average more than two persistent terms of trade shocks.

The commodity boom and slump of 2003–2009 is the largest and longest one since 1900, after three major booms and slumps in the 20th century (1915–1917, 1950–1957, 1973–1974; World Bank, 2009a, Table 2.1). The 2008–2009 recession is a major shock that is likely to generate threshold or ratchet effects: with tax systems heavily relying on commodity taxation, commodity exporters face losses in revenues that are more than twice the average of all low-income countries—for example, the commodities revenues/GDP ratio has fallen from 2008 to 2009 by more than 15 percentage points of GDP in Chad and the Republic of Congo, and more than 10 points in Nigeria (IMF, 2009d). As all recessions, it puts an end to many investment projects and increases unemployment—investment and employment being the aggregates that have the largest impact on future incomes (IMF, 2009a). In 2009, 76 per cent of SSA workers were in ‘vulnerable employment’, that is, own-account workers and family workers: even if they may not be directly exposed to commodity prices’ fluctuations, they are typically vulnerable to recession in domestic economic activity (ILO-International Labour Office, 2011).

Previous shocks such as the 1979 global drop in agricultural commodity prices (e.g. coffee, cocoa) followed by the 1986 drop in oil prices, although obviously different, suggest possible impacts: despite positive growth rates in the two previous decades (and premises of industrialisation), these shocks toppled most SSA commodity-exporting countries into lower equilibria that still endure three decades later and have transformed them into ‘prolonged users’ of IMF financing (IMF-IEO, 2002).

Commodity dependence also makes these countries highly dependent on imports of the commodities they do not export and therefore exposed to price shocks affecting these imports. An example is the food prices volatility of the 2005–2008 period and the high prices that in 2008 hit food-importing countries where the income of a significant part of the population is at subsistence level. This may have pushed entire groups into deeper poverty and may not be offset by a fall in food prices—domestic food prices typically decrease with a lag (World Bank, 2009b)—and global food prices remained high in 2010 and 2011 (World Bank, 2011). Indeed, the 2008–2009 crisis refers to three crises, the food crisis, the fuel crisis and the financial crisis, which have different causes, transmission channels and effects. Fluctuations of food prices and those of energy prices, however, are related (energy and fertilisers being key inputs to food production; Baffes, 2011: 31).

Although the impact of the financial crisis on low-income countries has been less significant than in middle-income countries because of their lesser exposure to financial globalisation, the volatility of energy and food prices represented major shocks both for exporting and importing countries—macroeconomic shocks on fiscal earnings and investment, and microeconomic shocks on households’ consumption. The impacts of global
food price volatility on food-importing countries vary across countries, as the pass-through of global food prices to domestic prices may be partial, and the volatility of domestic food prices is influenced by domestic factors (e.g. weather conditions, transportation, policies such as subsidies) (FAO, 2011: 27).

Shocks on commodity prices and macroeconomic volatility are transmitted to the micro-level—producers or consumers—and create fiscal constraints to publicly provided social security. Rates of return are positively correlated with initial wealth (Duclos & O’Connell, 2009; Ravallion, 2009). In the context of poorer households locked in poverty and low productivity whereas richer households have access to credit, investment, higher productivity and higher returns, these income shocks may trigger irreversible processes for the individuals who are close to subsistence income and push them past their tipping point and towards extreme poverty (Ravallion, 2008): for example, selling assets (e.g. land) that are necessary to their future income and productivity, or reducing spending on children’s education or nutritional intake (Zimmerman & Carter, 2003; Jha et al., 2009), hence generating intergenerational poverty traps (Dasgupta, 1997). In Indonesia during the 1997–1998 Asian crisis, household spending on education thus declined, even more among the poorest households, large effects being still observable in 2002 (Thomas et al., 2004; Ravallion & Lokshin, 2007).

This shows the possibility of threshold-based multiple equilibria and bifurcated accumulation strategies (Carter & Barrett, 2006). The 2008–2009 recession may thus cause welfare losses that last much longer than the crisis itself.

4.2 Cumulative Causation and Increasing Gaps between Groups of Countries According to Their Export Structure

A second feature of the concept of poverty trap is its reference to processes that are cumulative and relative to other economies. Even if commodity-based poor countries do grow, their market structures may foster divergence relatively to other countries’ growth trajectories. The industrialisation process requires structural transformation, that is, changing the exported products, but it is confronted with large market failures: for any given level of development, countries that have a more advanced export package are likely to grow more rapidly in the future, whereas the other countries are constrained by the low productivity associated with their export package (Hausmann & Rodrik, 2006)—a complementarities-based cumulative causation underlying industrialisation that is underscored since Paul Rosenstein-Rodan.

The dynamics of increasing gaps between commodity-exporting countries and other groups of countries is observable in the long-term decline in the world real price of commodities and the deterioration in the terms of trade of commodities vis-à-vis manufactures, which was first demonstrated by Raul Prebisch (1950) and Hans Singer (1950) (Pfaffenzeller et al., 2007). The long-term trend in the commodity terms of trade deteriorates because of the low price-and-income-elasticities of demand for commodities vis-à-vis manufactures, the technological superiority of developed countries and the economic power of their transnational corporations (Maizels, 1984; Maizels, 1987). This was a proof of the necessity of industrialisation, as increasing productivity and technical progress are major factors of growth (Prebisch, 1959). The Prebisch–Singer thesis remains among the most consistent arguments that, even if commodity-exporting countries grow, commodity dependence creates one of the three key features of traps, that is, cumulative
processes that generate increasing gaps, here between commodity-exporting and manufactures-exporting countries.

The composite index of commodity prices built by The Economist in 1864 illustrates a continuous decline since 1845; in 1999, the industrial commodities index had fallen to a record low, that is, 80 per cent below its level in 1845 (1845–1850 = 100, and 1999 = 20) (The Economist, 1999). Using the same index over 1862–1999, Cashin and McDermott (2002) confirm the downward trend in real commodity prices by about 1 per cent per year over that period, with little evidence for a break in this long-run trend (although the trend remains a matter of debate, (Grilli & Yang, 1988). The IMF (2009a) also underscores that over the long run, prices for many commodities have declined relative to those of manufactures and services, because of the productivity gains in the commodity-extracting sectors and the decline of many commodities’ share in total consumption as income increases (even if rates of decline vary across commodities, depending on available reserves in the case of non-renewable resources, industry structure, demand characteristics, and so on). Oil is an exception in this decline, which the IMF explains by its oligopolistic supply structure and the concentration of reserves.

This divergence is confirmed by the historical asymmetry of the impact of terms of trade shocks between industrialised and developing countries revealed by Hadass and Williamson (2003; for the 1870–WWII period) and Blattman et al. (2004), using a panel of 35 countries (not including SSA countries, however) over the period 1870–1939: commodities have been more volatile than other products, and countries with more volatile prices have grown slowly relative both to the industrialised countries and to other primary product exporters; changes in volatility had a negative influence on income growth in developing countries but not in industrial countries. They support Singer’s (1950) hypothesis, that is, the long-run impact of relative price shocks reinforced industrial comparative advantage in the ‘centre’ and favoured the sector that carried growth, whereas it reinforced primary product comparative advantage in the ‘periphery’, harming the sector that fostered growth. Similarly, Booth (2008) has highlighted the widening gap between West Africa and South East Asia throughout the 20th century regarding agricultural development, export growth and the impact of a shock such as the 1930s slump, South East Asian countries benefiting from increases in productivity and public policies, in contrast with West African countries. In addition, macroeconomic volatility increases the likelihood of being caught in a lower equilibrium, because it entails asymmetrical processes: past experience shows that periods of bust last longer than booms and that commodity prices exhibit long slumps after short booms (Cashin et al., 2002).

Global demand is boosted by technology intensity, and moreover, because of technological progress, the quantity of commodities used in a unit of GDP has steadily decreased since 1971 (World Bank, 2009a, Figure 2.12). The continuous decrease of the share of SSA in world exports is another signal of these cumulative mechanisms and divergence: it fell from 5.6 per cent in 1948 to 2.2 per cent in 2010 (1.6 per cent excluding South Africa) (Figure 2 in the succeeding text; UNCTAD, 2008c, Table 1.1.2).

Poor commodity-dependent countries are caught in processes where low productivity, low value added, low diversification and narrow industrial bases reinforce each other, cumulate and push economies towards low equilibria.

Even if SSA countries appear to grow slowly, as argued by Easterly, the elevation of their income per capita is slower than that of other countries. Less-developed countries grow slower than the world average, and outside East and Southeast Asian countries, they are not catching up with developed countries (Azariadis, 2006) (Table 2).
4.3 Low Equilibria Trapping Commodity-Dependent Countries

A third feature is the fact of being caught in a low equilibrium. There is evidence of a relationship of commodity dependence with low per capita income. Volatility of international commodity prices, together with fluctuations of supply and demand, appears to be the key channel by which commodity-dependent countries are ensnared in a low equilibrium.

Volatility is a key characteristic of commodity prices, which has been demonstrated on an historical scale. Over the past three centuries, commodities have always shown greater price volatility than manufactures (Cashin & McDermott, 2002; Jacks et al., 2009). This volatility has been confirmed during the 2002–2008 commodity boom, which was driven by supply and demand factors (in particular from emerging countries, especially China) and price transmission eased by the linkages across commodity markets (Helbling et al., 2008).

Commodity price fluctuations have been dominated by the prices of a few commodities: energy and metals prices tripled between mid-2002 and mid-2008 (Helbling et al., 2009). During the 2008–2009 crisis and the collapse of commodity prices in the second half of 2008, the magnitude of price changes and volatility rose to unprecedented levels (IMF, 2009a, Chap. 1, Table 1.2)—energy prices declined by about 70 per cent, metals prices by more than 50 per cent. The crisis fed volatility as the low prices of 2009 created...
opportunities for buyers, resulting in steep increases for some commodities. Food prices were less affected, given the lower income elasticity of underlying demand (IMF, 2009a, Chap.1). The rise and fall of food prices during 2005–2008, however, was associated with a sharp increase in price volatility (as the annualised standard deviation of monthly price changes): from about 8 per cent for the decade through 2007 to more than 22 per cent since 2008 (IMF, 2009c, Box 1.7).

Volatility has been magnified by the growing linkages between commodity and financial markets in the 2000s (the ‘financialisation’ of commodity markets, Maizels, 1984, 1987, 1994), which foster the transmission of world prices shocks across commodities and to producing countries, the overreaction of commodity prices to interest rates changes, the impacts of derivative markets on commodity prices, and therefore contagion (Baffes & Gardner, 2003; Mayer, 2009; Timmer, 2009; UNCTAD, 2009, Chap. 2; Nissane, 2010; Tang & Xiong, 2010). Since the 2000s, oil contracts are increasingly traded as financial assets; oil prices departed from their fundamental values because of new trading techniques and witnessed an increase in their variability over 2000–2008 (Cifarelli & Paladino, 2009).

The channels of a negative impact of price volatility on growth are the volatility and unpredictability of these countries’ fiscal earnings—revenue from commodities may represent 80 per cent or more of total revenue, as in the Republic of Congo, Chad, Nigeria and Angola (IMF, 2009a). Revenue volatility makes anticipations and fiscal and debt management difficult and reduces the level of public investment, for example in public goods and infrastructure—these effects are precisely shown by Ebeke and Ehrhart (Ebeke & Ehrhart, 2012) in SSA over 1980–2005. This reduces the level of private investment and in fine has a negative impact on growth (Sindzingre, 2010).

Indeed, terms of trade volatility and shocks have a negative impact on growth (Hausmann & Rigobon, 2002; Kose & Riezman, 2001, for SSA). Macroeconomic volatility (defined as the standard deviation of per capita GDP growth) has a negative impact on growth (Ramey & Ramey, 1995; Loayza et al., 2007) and differentiates growth regimes, where instability impedes growth in less stable countries (Sirimaneetham & Temple, 2009). A low level of development is associated with high levels of output volatility (Krishna & Levchenko, 2009). Specifically, volatility created by commodity dependence appears to have an adverse impact on growth (Van der Ploeg & Poelhekke, 2009). These detrimental effects of commodity price volatility are confirmed in an historical perspective by Blattman et al. (2004) who show that the price volatility generated internal instability, reduced investment and diminished growth.

It could be argued that the commodity boom of 2003–2008 underlay impressive growth rates—in SSA, a real GDP growth rate of 5 per cent between 1995 and 2007 pushed by resource-rich countries (IMF, 2008, Figure. 2.8)—and commodity prices fostered a rapid recovery in 2010—a real GDP growth rate of 5.4 per cent (IMF, 2011, Table 1.1). However, the IMF constantly emphasised the fragility of this type of growth (IMF, 2006, Chap. 5) and especially the fiscal vulnerability of oil-producing SSA countries (York & Zhan, 2009). The argument that many developed countries started their growth with the harnessing of primary products may not hold for most low-income countries, where commodities could not be utilised as inputs in industrial processes (e.g. cocoa, coffee, and even oil). Commodity-dependent low-income countries, especially in SSA, do not

3Nick Trevethan and David Brough, Commodity on course for strongest year since 1973, Reuters (UK), 31 December 2009: http://uk.reuters.com/article/idUKTRE5BU1BT20091231.
have the features of the few developing countries that were able to trigger a growth path in the 1960s, such as the Asian ‘developmental states’ and now China, that is, state-led industrialisation and a limited endowment in natural resources (Sindzingre, 2007c). Moreover, natural-resource-intensive sectors (e.g. agriculture) absorb capital that might otherwise flow to manufacturing, which reduces skill accumulation and therefore impedes industrialisation (Leamer et al., 1999).

A great number of commodity-exporting countries exhibit the following features—stabilisation in a low equilibrium, dependence on past initial conditions, stability of their export structure over decades: for example, at the beginning of the 20th century, Senegal produced 141,000 t of groundnuts, which represented 68 per cent of its exports in 1929, 80 per cent in 1960, and this commodity was still Senegal’s principal export at the end of the 20th century (Freud, 1988: 73); in 1990, fuels represented 97 per cent of Nigerian exports and 90 per cent in 2009 (World Bank World Development Indicators 2004, 2011, Table 4.4). Equally, these countries are characterised by the persistence of a narrow industrial base: in 1990, SSA thus represented 0.8 per cent of world manufacturing value added, and in 2010, 0.7 per cent (without South Africa, 0.3 per cent in 1990 and 2010) (UNIDO, 2011, Table 8.1).

In Matsuyama’s (2008) words, initial conditions may perpetuate themselves, and an economy that starts below a certain threshold may be ‘trapped forever’ below that threshold.

5 CONCLUSION

Commodity-based poverty traps are contested. The paper has argued, however, that the concept of the poverty trap remains a relevant framework for the understanding of the past growth experience of SSA low-income commodity-dependent countries as well as the effects of the 2008–2009 crisis. It has shown that this growth experience exhibit three features that are definitional of the concept of trap—tipping points, cumulative and self-reinforcing causation, low equilibria.

Of course, sub-Saharan African countries display important differences. Causalities channels and responses to external shocks are country-specific and affected by several uncertainties that stem from international commodity prices (especially oil prices), and the growth dynamics and demand from emerging countries (China, Brazil and others)—the latter being a possible cause of optimism.

Low equilibria are not created by one factor only—commodity dependence or locking-in institutions. More than elements taken in isolation, combinations matter, and causalities do not mean determinism. Different equilibria, including bifurcations towards growth, are possible. As most growth determinants are endogenous to growth, however, in low-income countries, this endogeneity is indeed one of the features of poverty traps.

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