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Involutionary Growth in a Labour-Scarce Economy

*A dialectic interpretation of the boom and bust
of cocoa production in Ghana, c. 1890-1970*

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INVOLUTIONARY GROWTH IN A LABOUR-SCARCE ECONOMY

A dialectic interpretation of the boom and bust of cocoa production in Ghana, c.
1890–1970

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Abstract: The use of the analytical tools of classic and neo-classic economics has played a significant role in the study of Africa's economic history since the 1970s. In this paper, we summon this body of work under the paradigm of Smithian growth models. Although different in techniques and approaches, this work shares a use of markets as the organising principle of the study. The aim of this paper is to critically reflect on the validity of Smithian models. We use the boom and bust of cocoa production in Ghana as an example, and conclude that while Smithian approaches provide valid explanations for the initial expansion, but are less suitable for explaining economic decline. The latter is explained by factors that are found outside of the realm of economics and thereby detached from the economic forces that account for the initial boom. We present a different analytical framework – based on the concepts of involutionary growth and forest rents – and argue that the decline in cocoa production was endogenously driven by the specific structural conditions created by cocoa production. We argue that our tentative dialectic interpretation is theoretically more consistent and empirically more plausible than previous Smithian analyses.

Key words: Involution, Smithian Models, Forest Rent, Ghana, cocoa

JEL: N01, N37, N57

I

African economic history has undergone an impressive revitalisation in the past decade. Much of the recent work is, naturally, inspired by the developments in economic history at large, whereby

the discipline is increasingly studied with the – direct or indirect – use of tools in economics. Consequently, factor endowments, institutions, allocation and relative efficiency are terms commonly found in more recent publications in African economic history (for recent overviews, see Austin 2008, Fenske 2010, Hopkins 2009, 2011). The use of analytical tools derived from economics to study Africa's past has been prominent since the 1970s, especially in regard to West Africa (e.g. Myint 1958, Hill 1963, Hopkins 1973, Gunnarsson 1978, Tosh 1980) but also in other regions (see, for example, Mosley's study of the settler economies of Southern Rhodesia and Kenya (1983)). These works have been influenced by both classic and neo-classic economics. In broader terms, one can identify this body of works as belonging to the paradigm of Smithian growth models as they use the market as an organising principle of the study of Africa's history.

The aim of this paper is to critically reflect on the validity of Smithian growth models as tools to understand long-term economic development in Africa. We develop our methodological critique by using the boom and bust of cocoa production in Ghana as a reference point. Ghana is acknowledged for its impressive growth of exports based on the production of African peasant farmers (or smallholders as commonly referred to in economics) starting in the late 19th century. In 1882, Ghana exported no cocoa beans. Nineteen years later, it became the world's largest exporter of cocoa, exporting 400,000 tons annually. Fifteen years later, the amount had increased to 200,000 tons and in 1936 it passed 3,000,000 tons (Austin 2012b: 1). The expansion was undoubtedly remarkable and it is therefore not surprising that it has received a lot of attention, not only among economic historians but also among development economists as well.

Differently from the critiques of Smithian models raised by the substantivists of the 1970s (see, for example, Dalton's (1976) review of Hopkins' 1973 book), we do not want to make the point that markets, as perceived in both classical and neo-classical economics, have only played a marginal role in Africa's history. On the contrary, we believe that the extension of trade and markets has played a vital role in mapping the paths of economic development in Africa. Our concern is the tendency to uncritically equate increased commercial activities with the forces of structural change. We argue that while Smithian models can accurately account for periods of growth, they are less suitable to explain economic decline. The paper therefore introduces an alternative framework that we believe provides us with a better explanation of the boom and bust cycle in Ghana. This framework is inspired by the concepts of involutionary growth and forest rents. Our arguments are severely weakened by the lack of reliable empirical data and should thus be treated with caution. Rather than being empirically grounded our arguments are tentative

and aim to highlight the importance of economics and ecology as explanations of economic decline in African economic history.

The paper rests on the assumption that Africa's economic history is manifested as recurrent growth and not persistent stagnation (Jerven 2010). By asking the most fundamental question in our discipline – why some countries/regions are rich and others are poor – economic historians must analyse why documented periods of growth have not been translated into sustained growth. We argue that, with all its merits, the explanatory powers of Smithian models are weak when accounting for economic decline for two main reasons. Firstly, the study of decline is commonly separated from the study of growth. Secondly, decline is often described outside the realm of economics. In the case of cocoa production in Ghana, the expansion of markets, i.e. new demand for tropical products in Europe, is identified as having played a decisive role in the impressive growth of cocoa production in the early 20th century. At the same time, growth impeding policies are identified to explain a significant part of the decline of the cocoa economy in the 1960s. The separation derives from the tendency in Smithian explanations to equate rural commercialisation with transformative development (Huang 1990: 5). However, an economic system that is efficient at one point in time might not be the one to do well in dynamic growth terms, a notion well known by classic economists (including Smith; see Cowen and Shenton 1996) and popularised by Schumpeter (1950). A given economic system might react immediately to new export opportunities, while long-term trajectories depend on factors different from those explaining the initial expansion. We thus ask if there was something in the nature of the cocoa growth process that accounted for the decline.

The first section of the paper provides a review of selected prominent literature on the cash crop revolution in West Africa and the cocoa expansion and decline in Ghana in particular. It must be stressed that section one does not contain a comprehensive review of the extensive literature; it rather focuses on a few prominent contributions. The second part provides a brief survey of the aggregate trends of cocoa production in Ghana c. 1900 to 1975. This is followed by an introduction of an alternative approach, based on the concepts of *involution* (Geertz 1963), *involutionary growth* (Huang 1990) and *forest rent* (Ruf 1995).

II

In a recent publication, Jerven argues that African economic history is not a story of stagnation, but recurrent growth, i.e. periods of spurts have been followed by “bursts” (Jerven 2010: 127).

This is no news for economic historians, but Jerven's article provides a useful entry point as it nicely summarises the core arguments of Smithian growth models. Jerven discusses four cases more in detail, namely export growth in Dahomey (1690–1950), export growth in colonial Ghana (for unknown reasons Jerven does not indicate a more precise periodisation) and mining growth in Zambia (1930–1970) and Botswana (1973–2009). He argues that in all cases the roots of economic growth were the new opportunities of exports that arose. While world markets provided new opportunities, growth was only possible 'owing to a reorganization of factors of production' (Ibid. 147).¹ That is, markets facilitated institutional and technological change and hence promoted economic growth. Jerven fails to present a coherent analysis of these bursts, but indicates that reliance on export markets cannot be sustained indefinitely (ibid. 136).

In the case of cocoa production in Ghana, Jerven follows the mainstream Smithian approach. The spurt in cocoa production was a response to the potential earnings from an external market demand, while its decline '[...] came prematurely due to the perverse taxation of cocoa producing peasants during the 1960s' (ibid. 136–137). Prematurely is the key word here. What Jerven suggests is that the stagnation and decline of cocoa production would not have happened at that point of time if it were not for distortive state policies.

In the 1950s, 60s and 70s, a number of scholars attempted to explain the initial expansion by applying Smith's vent-for-surplus theory (e.g. Myint 1958, Szereszewski 1965). The vent-for-surplus theory claims that the growth of exports, under specific conditions, is made possible by the application of previously idle resources. That is, the expansion of exports can occur without threatening domestic production. As pointed out by Austin (2012a), there are slightly different versions of the theory: one classical economics version that assumes no opportunity costs and a neo-classic version that does (reduced leisure time). These differences are not important for the purpose of our paper; what matters is that vent-for-surplus represents an orthodox Smithian growth model. Markets not only provide opportunities for change, but do so at a low, or non-existing, cost. The theory came under severe attack in the 1970s, but has partly survived and has more recently been used to account for the expansion of cocoa production in Ghana (Teal 2002).

A modified version of the vent-for-surplus theory is put forward by the economic historian A. G. Hopkins. In his book *An Economic History of West Africa* (1973), he uses markets as the organising principle of his study and argues that economic equilibrium could exist without all resources being used at their maximum. He concludes that pre-colonial techniques and

¹ Sadly, he does not discuss the latter in any great detail (for which he cannot be blamed since it is not the intention of the paper).

technologies (e.g. slavery and hoe-agriculture) were ‘rational’ given the scarcity of labour, abundance of land and thin top soils. A break with the low-level equilibrium required exogenous stimuli, here represented by the increasing demand for tropical products in world markets from the mid-19th century. This increased demand spurred peasant farmers to allocate land and labour to production for export markets. The process was characterised by vent-for-surplus in the classic form as farmers responded to new opportunities by exploiting idle resources with no opportunity costs (1973: 231–233). However, the vent-for-surplus theory needs to be modified to fit the West African case for a number of reasons according to Hopkins. Firstly, one has to take the mobility of people into account. Migrant labour played a significant role in the growth of export agriculture. This does not necessarily contradict the vent-for surplus theory, as migrant labourers could have been underutilised in their home areas, but the analysis must expand geographically to include both areas where the crop is grown as well as areas where the migrant labourers came from. Secondly, in some cases the rise in exports was not achieved without a decline in food production. In Senegal, for example, the expansion of groundnut production led to decreasing food production and a dependency upon imports of rice from the 1930s. By using Senegal as an example a third neglected factor is pointed out, namely the reallocation of labour between sexes as men gave up their military functions to engage in cash crop production. Fourthly, to claim that the growth took place without any major institutional or technological changes is to take the argument too far, which is something we return to later (1973: 233–234). With these modifications, Hopkins concludes that the vent-for-surplus theory can account for the export growth in West Africa.

In a more recent publication, Austin (2005) also identifies increased demand for tropical products as the driving force behind the long-term growth of the export economy in Asante, Ghana (1807 to 1956). Austin highlights that this new demand facilitated an export agriculture, which also contributed to higher productivity through the adaptation of products that allowed for a more efficient use of scarce resources (the shift from kola to rubber and then cocoa) (2005: 432). In a working paper (2012b), he takes the argument one step further by challenging the vent-for-surplus theory by claiming that the expansion of the cocoa sector required the reallocation of labour, not from the subsistence sector but from less profitable forms of market activities. Market opportunities facilitated a productivity breakthrough and a shift upwards of the production function.

While markets spurred the initial boom, a number of authors, working with the tradition of (neo-classic) rational-choice political economy approaches, argue that distortive policies explain

the decline in the cocoa export economy in the 1960s. Frimpong-Ansah (1991) provides a systematic attempt to use a rational-choice political economy approach. His analysis depicts a typical dichotomy between the state, on one hand, and the cocoa sector consisting of indigenous farmers, on the other hand. According to Frimpong-Ansah (1991), the colonial period was characterised by colonial strategies promoting the export of primary products such as cocoa, diamonds and gold. There was increasing cooperation between the state, farmers and traditional traders. The situation changed with the instalment of the independent government that began to intervene more fiercely in the agricultural sector. The intention was to transfer the economic surpluses generated from the cocoa sector. Stagnant agricultural productivity is pointed out as a problem in his analysis and he acknowledges that the production capacity of the cocoa sector decreased over time (ibid. 136). Yet, just like Jerven (see above), Frimpong-Ansah (1991) argues that the decline came prematurely due to factors identified outside the agricultural sector, namely pricing policies (ibid. 94). Teal provides a similar analysis when he argues that increased taxation on cocoa sales explained the decrease in export volumes (2002: 1331ff).

An interesting contribution comes from the political scientist Woods (2004). In agreement with the rational-choice political economy, Woods identifies elite rent seeking and capturing as key factors explaining the decline. However, he attempts to bridge the gap between politics and economics in the analysis. Woods analyses and compares the rent-seeking behaviour of cash crop farmers and ruling elites in Ghana and the Ivory Coast. He argues that the structural conditions within the cocoa sector affected the rent-seeking behaviour among the political elite (2004: 239). Firstly, the cocoa economies depended on the forest, leading to a natural rent as crops planted on recently cleared forestland yielded far better amounts than cocoa replanted on already established farms. However, the rent diminished over time as levels of production and the quality of the crop planted on the same land decreased each year (2004: 226). Secondly, there was a chronic oversupply of cocoa due to the time span between planting and the first crop. This made cocoa relatively price-inelastic, meaning that a decline in prices did not automatically lead to a decline in output, while a rise in prices tended to provoke new plantings and new entrants (2004: 231). These conditions created incentives for the political elite to capture the natural rent (pricing policies in the late colonial period and onwards), leaving farmers facing even smaller and diminishing rents. Woods concludes that, 'By trying to gain a monopoly over the cocoa rent, the regime created disincentives to any further expansion of pioneer fronts in Ghana' (2004: 234). The argument is partly in line with the ideas developed by Hopkins thirty years earlier with regard to West Africa as a whole. Like Woods, Hopkins aims to bridge the gap between politics and

economics. However, his approach differs from the more orthodox rational-choice political economy (which did not exist as a theoretical framework when Hopkins published his book).

Hopkins differs between an open and a closed economy, a conceptualisation borrowed from Seers (1963). In brief, one factor among others characterising an ideal type of an open economy is its dependence on a limited range of exports of agricultural and mineral products. Expatriates dominate one or more sectors of the economy (in West Africa, the dominance is especially significant in overseas trade according to Hopkins) and industrial powers are able to exert considerable influence on economic policy (the colonial powers controlled economic policies in West Africa completely). The long-term rate of growth in an open economy is determined by the size of exports and the income elasticity of demand for imports. This means that an open economy responds readily to external influences (1973: 170). Hopkins claims that the export economies in the 1930s came as close to the ideal types of open economies as West Africa was to reach (1973: 235). A closed economy also depends on the export of primary products, but adopts measures to decrease its reliance on external influences and to promote economic diversification. Expatriates' influence is subjected to regulations and economic policies and is largely in the hands of indigenous authorities, which is noted in exchange controls and import restrictions (1973: 170–171).

Hopkins argues that the transformation from an open to a closed economy in West Africa occurred because of both political and economic factors. The latter in the 1930s and 40s as the export expansion was checked and the frontiers of the market economy contracted. Cocoa producers faced deteriorated barter and income trade from 1930 to 1945. Declining prices not only affected producers, but also impacted on the domestic economy as a whole, as the growth of the latter was determined by the performance of the export economy (1973: 253–254). Consequently, Africans began to demonstrate their dissatisfaction with the open economy and with the alien colonial powers that ruled it (1973: 238). Export growth after 1945 enabled the domestic market to expand to a point where it could at least modestly support a modern manufacturing sector (1973: 268, 288). Correlated with these processes, nationalist movements grew in strength and so did the expectations of a brighter future among Africans. Demands for public services and a more diversified economy increased, which created incentives for the government to increase the transfer of surplus capital from agriculture to other sectors through pricing policies. As independence was reached in the 1950s, many countries in West Africa were therefore in the midst of a transition from an open to a closed economy (1973: 295). Politics modified rather than shaped the trajectory of change.

Hopkins also emphasises the contradictory nature of agrarian policies in the late colonial and early independent period. On one hand, through the operations of marketing boards, the ruling elite attempted to transfer surplus capital to both the public and the private manufacturing sectors. Meanwhile, the state also invested in agriculture through diffuse modern technology, especially chemical fertilisers and pesticides, in order to avoid diminishing returns. The two strategies went hand in hand as better conditions would benefit not only farmers but also the economy as a whole (1973: 287). However, the diffusion of new technologies was modest and the growth in agricultural output after 1945 continued to be achieved mainly by traditional means. This meant applying underutilised labour to underutilised land, while the application of chemical fertilisers, higher yielding seeds and pest controls increased on a modest scale (1973: 272). In short, the continued expansion of the export economy created opportunities for structural change in the economy as a whole but it had little impact on the agricultural sector. The question is why?

The remaining part of the essay is devoted to discussing an alternative way of dealing with the trajectory based on the concepts of involutionary growth and forest rents. Involutionary growth deals in its original form with the consequences of population growth and rural incomes in land-scarce agrarian societies with modest or no technological change. Land in Ghana was, by contrast, in abundance. The concept of forest rents provides us with the missing link between a labour-scarce economy (Ghana) and the concepts of involutionary growth. The supply of forestland diminished over time due to population growth and/or a flow of people into the cocoa economy. Diminishing returns could in the short-term be avoided by applying more labour to land, but this requires technological change in the longer run. This did not happen. Instead, a significant part of the cocoa growth period could be described as involutionary as more labour had to be applied in an attempt to keep production intact.

Before we explore alternative ways of understanding the decline of West African economies from the 1950s, we need to know more about the major economic trends from the cash crop revolution and onwards. Since we are aiming to identify explanatory factors within the realm of the agricultural economy, we focus on trends in agricultural output.

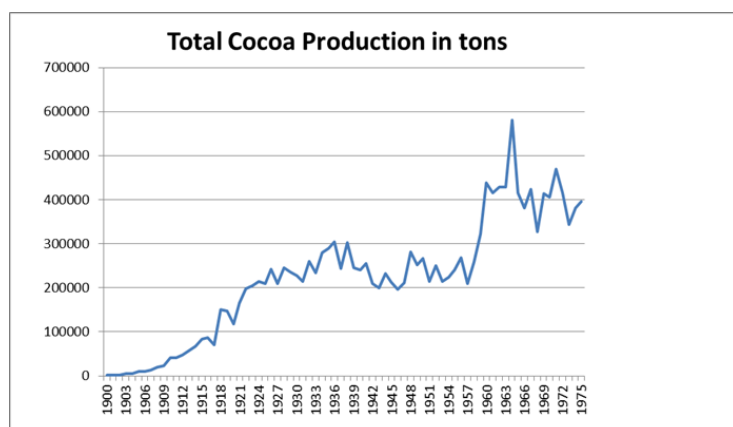
III

The growth in cocoa exports in Ghana from the late 19th century to the mid-20th century was indeed impressive. Twenty years after the crop began to be cultivated, Ghana had managed to

become the largest supplier of cocoa in the world (Austin 2005: 51). Figure 1 shows two boom periods of cocoa exports (1900–1936 and 1960–1966). These two periods were followed by stagnation. Notable, and important, exports stagnated at a higher level following the second boom compared with the previous boom. In that sense, cocoa production in Ghana seems to have been a success throughout the period.

The initial expansion was not facilitated by an increase in real prices. Teal's (2002: 1324) figures of real prices show that from 1900 to c. 1915, the volume of exports increased steadily while prices stagnated and from c. 1915 to c. 1925 the volume continued to increase while real prices declined (though fluctuating significantly). Both Woods and Hopkins provide reasonable and persuasive arguments for why such correlation would not occur. Woods stresses that cocoa is price-inelastic (see above), while Hopkins argues that farmers reacted to decreasing prices by expanding output and therefore, on a short-term basis, securing intact incomes (1973: 254). For the latter part of the period, it looks, however, as though output correlates fairly well with changes in production prices. Prices declined rapidly in the early 1960s, following a decline in output about five years later. This time gap is logical given the relatively timely process for cocoa trees to mature and the unlikelihood that farmers would uproot mature trees already planted. The correlation supports the argument that politics created disincentives for further cocoa expansion by distorting the markets.

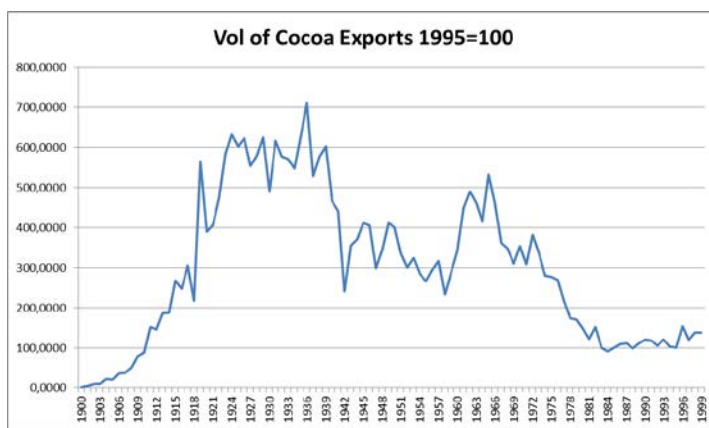
Fig 1.



Source: Teal (2002: 1324)

A more precise measure of the trajectory of cocoa production is, however, to look at exports per capita, and those figures provide a significantly different picture of the success of cocoa. Figure 2 shows the index of production per capita. Like the figures on total production above, the figures are collected from Teal's (2002) work. Export per capita also detects two boom periods, but followed by decline and stagnation. Furthermore, the second boom is significantly shorter and followed by stagnation at a lower level than the previous period of halting growth. That is, measured in exports per capita, it detects not only the boom and bursts but also a declining trend over time (with a brief boom in the early 1960s), starting in the mid-1930s. The per capita trends correlate less well with changes in relative prices until the late-1960s.

Fig 2.



Source: Teal (2002)

IV

What becomes relevant is to unpack the structural conditions the cocoa sector faced and created. We do that by tentatively employing the concept of involutory growth and forest rents to the Ghanaian case. The concept of involutory growth has been criticised for a number of reasons and we take this critique into account and explore possible pathways forward. The advantage of the two concepts is that they allow Smithian growth as well help us identify the limitations of such growth processes, everything else being equal, in promoting structural change and sustained economic growth.

The concept of involution is well known among economic historians. It was developed by Geertz in his book *Agricultural Involution: the Processes of Ecological Changes in Indonesia* (1963). Despite its popularity, Geertz never provided a clear, operational or testable definition of agricultural

involution. Instead, the concept has commonly been employed by scholars in rather loose terms describing a type of inward-turning process of change, and in that sense involution is, as pointed out by White (1983), employed as a taxonomic concept.

Geertz uses the term involution to describe the experience of Javanese rice paddy farmers under the dual pressure of a rise in population and Dutch demand (1971). Farmers reacted by employing more labour to land and thus intensified land use, a change that was supported by an increased institutional complexity in land tenure arrangements (1963: 77ff). The short-term outcome was growth in output by applying more labour input at diminishing rates of remuneration. This is a Boserupian understanding of agrarian change, i.e. population growth leads to land intensification (more specifically, increased frequency of cropping) and diminishing labour productivity. The latter, i.e. marginal returns to labour (measured as working hours), is a significant contribution to the previous understanding of agriculture in classical economics and marks Boserup's (and thus also Geertz's) close link to neo-classic economics. The crucial difference between Geertz and Boserup (1965) is that involution signifies a situation whereby farmers face diminishing returns of both labour and innovation. This means that involution is a state of population growth inducing land intensification but not technological change that would shift the production function upwards. Instead, as Geertz argues, the result is 'shared poverty', i.e. a decline in total income in equal parts as the population continues to grow (1963: 137–138). It is no longer possible to increase production per capita by changes in farming practices and people are thus pushed back to subsistence.

Geertz's concept not only depends on specific socio-political circumstances, but also relies on two specific ecological conditions of agricultural production. Firstly, the remarkable capacity of irrigated rice-terrace ecosystems, which could respond to labour intensification without major losses of soil fertility, absorbs an increased number of cultivators per unit land as well as providing increased per-hectare production (but only stable output per unit of labour). Secondly, the main food and cash crop (paddy and sugarcane) grow well in almost identical environments and both demand irrigation, which means that they are easy to combine (Geertz 1963: 35, 55).

Involution has been criticised by a number of authors. The two most critical points are the concept of shared poverty and hence the neglect of income inequality and social differentiation. Shared poverty consists of a set of complex institutional arrangements (including land reallocation and worksharing) that prevent social exclusion. Geertz uses two indicators to identify the existence of shared poverty, i.e. the absence of a class of wealthy landlords and the relatively slow decline in average farm size. The argument has been criticised on both empirical and

theoretical grounds (see, for example, Alexander and Alexander 1982, White 1983). A critical, and as far as we are aware, neglected aspect of Geertz's concept is that it depends on the assumption that land is continuously able to absorb a growing population without leading to major negative environmental consequences (see Jervez 2013). The critique above partly reflects the larger methodological problem with Geertz's historical analysis; it derives from contemporary data combined with bits and pieces of historical evidence, but mainly relies on reasoning not grounded or tested against the available historical data.

We therefore turn our attention to Huang's (1990) more process-oriented concept of *involutionary growth* (sometimes also referred to as involutionary commercialisation). Huang uses the concept to describe the process of agricultural commercialisation and growth in the Yangzi Delta in China from an impressive long-term perspective (1350–1988). In contrast to agricultural involution, involutionary growth is a process that permits rural household incomes (and production) to increase by employing an increasing number of people at diminished returns per workday (Huang 1990: 13). Huang argues that the process is marked by a *familisation* of rural production as more and more members of the household (i.e. women and children) are used for the production of cash crops. Other forms of labour (wage, share cropping etc.) do not disappear but lose relative importance to family labour (ibid. 44ff).

Huang rightly acknowledges that labour productivity can increase in pre-industrial agriculture, i.e. we are not dealing with static systems. Innovation is a general characteristic of the history of pre-industrial agriculture (the hoe being the most cited example), but so is the shift to more labour-intensive cash crops (ibid. 77). Huang, however, argues that the processes of agricultural commercialisation are not automatically transformative; rather, they require a creation of endogenous forces to spur the development of labour saving innovations or they need to be provided by exogenous factors (state, community etc.). If this does not happen, the growth process is involutionary, inevitably leading to decreased incomes in the longer run.

As previously mentioned, involution and involutionary growth have been applied to cases of low land/labour ratios. In Ghana, however, land was in abundance, which means that agriculture in general was not experiencing involutionary growth. However, just as the concept of involution partly depends on specific ecological conditions, we argue that we cannot understand the growth of cocoa cultivation without taking the ecological context into consideration. The agricultural economist Ruf (1995) provides us with a useful framework to understand how economy and ecology intersect in a cocoa economy. Forest rent was earlier used by both Woods

(2004) and Austin (2005). However, we differ as we use the term to account for both the growth and the decline of the cocoa economy in Ghana.

In very brief terms, Ruf argues that cocoa production tends to follow boom and bust patterns and that these patterns are directly related to the availability of tropical forests (1995: 11). The boom is facilitated by, and depends on, the existence of forest frontiers, where rich forest soils supply and initially subsidise forest rents. The boom period further depends on an inflow of labour to cocoa regions; cocoa production areas that are booming are commonly located sufficiently close to an abundant labour pool to attract additional labourers and the establishment of new farms by migrants. The downside is that cocoa trees deplete soil fertility to the extent that replanting on the same land is much more expensive. Replanting is necessary as yields diminish with the ageing of trees. To replant already cleared exploited forestland generally results in a decline in output and quality. Over several planting cycles, there is a net decline in the quantity and quality of cocoa. Over a period of 20 to 25 years, the forest rent is exhausted, i.e. the cost of replanting on the same land exceeds the benefits. The soil no longer contains sufficient water reserves and weed growth increases so that cocoa plants are overrun as soon as they start to germinate. Yields cannot be sustained without the further application of new technologies and/or more labour. The boom bursts (Ruf 1995: 1–54).

The burst can be met by either rehabilitation techniques or underplanting. Historically, the most common practice in cocoa areas has been total replanting. A young cocoa stand is planted immediately after the removal of older trees. The drawbacks with this method are the loss of cocoa income for several years as the farmer waits for the new trees to mature, intensive labour costs associated with the clearance of new land and potential land disputes. Alternatively, farmers can respond by planting young trees underneath the old cocoa trees and then gradually remove the old trees over the following three to four years. The advantage of this is that farmers avoid a dramatic loss of income and that the labour cost associated with replanting is spread over several years. However, yields are significantly lower compared with planting on fresh land. In Trinidad, for example, it was reported in the 1960s that underplanting did little more than maintain the former low yields of the old plot (Petithuguenin 1995: 91).

Theoretically then, assuming no technological change, the initial high yields can only be maintained by expanding the forestland frontier. The exhaustion of forest rents implies diminishing returns of land, which in the short-term can be partly prevented by applying more labour to land at diminishing rates.

As shown in Figs. 1 and 2, the Gold Coast experienced a dramatic increase in the exports of cocoa (total and per capita volumes) in the first three decades of the 20th century. In a recent paper, Austin (2012b) argues that the initial expansion was not caused by vent-for-surplus, but through the reallocation of labour from less profitable market activities (see above). The introduction of cocoa production itself marked a major technological change and labour productivity levels should therefore be compared with pre-cocoa economies. This marked a shift upward in the production function. The question is how we should understand the period following the initial boom?

The most logical starting point is to take a closer look at the productivity of land and labour. Sadly, this avenue is not open for us as we lack sufficient data. Austin discusses a number of different estimates of yields per acre made for the expansive period (up to 1936). These estimates range from 190.4 kg/acre to 272 kg/acre (2012b: 9). These figures could be compared with the estimates in the 1950s provided by Frimpong-Ansah, which showed a mean yield per acre of 150 kg (1991: 126). Estimates from 1999 suggest mean yields of 180 kg per acre, which are higher than those in the 1950s but lower than the estimates from the early period. Furthermore, the mean yields for 1999 can be compared with the much higher estimated yields from the Ivory Coast (400 kg per acre) and Malaysia (900 kg per acre) (Dormon et al. 2004: 238). Could we from these figures infer that production per unit of land decreased over time? What we know from previous surveys is that not enough new farms have been established since the 1960s. Through extrapolation, it has been estimated that the age of farms from the late 1970s to 1992 shows that nearly 70 per cent of farms were 30 years or older (Nyanteng 1995: 183). The question is if this process, marking diminishing returns of land, began earlier than the 1960s?

Austin stresses that land was in abundance at least up to the 1950s in Asante and thus did not put a constraint on expanding output (2005: 60). There are no reasons to question his interpretation, but what was true for Asante was not necessarily true for Ghana as a whole. Cocoa production in Ghana began in the eastern region and from there spread to the neighbouring regions of Volta, Central and Asante, continuing to the western region. Expansion followed the availability of suitable land, but also favourable climate conditions and the development of road infrastructure (Nyanteng 1995: 184). That is, as Asante was still flourishing, we can assume that forestland in the eastern and Volta regions had become scarce.

There are several indicators that there was not enough forestland to absorb a growing population by the late 1930s. The chiefs were already in the 1930s worried about the decreasing availability of forestland and the effect of cocoa production on food supplies and soil erosion, and they consequently initiated a ban on cocoa production in 1939. Austin claims that the chiefs' concerns were premature and that they had little effect as the expansion continued but at a more modest scale. The latter was the effect of not only the ban, but also declining prices and the Second World War (2005: 328, 350). Our macro data do though support the chiefs' interpretation. Total production did increase slightly after the Second World War (indicating that more cocoa was planted during the war), but production per capita declined significantly (see Fig 2). This does not mean that there was no forestland left, but that there was not land enough to absorb a growing population.

There is further evidence for this interpretation. Austin shows that in the case of Asante modest changes regarding access and rights to land occurred in the old cocoa growing areas in the 1940s. Young men had to wait for their fathers and uncles to give or leave them a cocoa farm before they could acquire one, which indicates that the local supplies of arable cocoa land were already in use (*ibid.* 333). Furthermore, a survey of six villages from c. 1956 to 1958 found that both chiefs and farmers acted in anticipation of an eventual shortage of land. Instead of clearing land near other farms, farmers went off into the wilderness and opened a farm there, thereby securing the possibility to expand the frontier in the future (Austin 2005: 333). Further, the ban was softened in 1946 through the Cocoa (Control of Planting) Order 1946. It was again allowed to open new farms, but only after farmers had received permission from the Ashanti Confederacy Council, which meant that the end of the ban did not imply a return to the old institutional order (Austin 2005: 329). Taken together, these factors make it plausible that the cocoa sector at large was already facing diminishing returns from the late 1930s.

VI

Given that the involutionary process was driven by diminishing forest rents and not aggregated land scarcity, it seems to be unlikely that we should identify a familisation of production. Following Ruf's model of cocoa cycles, the trend should move in the opposite direction. The burst is accompanied by a shortage of labour as the previous inflow of migrants during the boom period slows and some migrants even return to their home villages (1995: 15–16). However, before the burst, the maintenance of yields in a context of the increased shortages of forestland

requires increased labour input. Ruf estimates that 150–170 days of labour is needed for replanting compared with fewer than 90 days for first-year planting (1995: 10).

Throughout the period, the family (conjugal and lineage) provided the most important source of labour. There seems to have been a clear division of labour between the sexes. Men owned an overwhelmingly majority of cocoa farms and were responsible for much of the work. Women assisted the men, but mainly by being responsible for the shade crops (specifically plantain and cocoyam), which were also food crops (Austin 2005: 304–310). Planting food crops and the cocoa farms thus improved the quality of the crop and thereby eased the potential trade-off between growing cocoa and food crops. Apart from the family, so-called cooperative work groups, institutions that were neither wage nor bonded labour, were used. These were institutions based on reciprocity. Through mutual agreement, one family would assist another during the busy season in exchange for receiving labour from the family they had helped (*ibid.* 313–314).

Austin argues that children were involved in assisting with cocoa cultivation, but that the role of children decreased over time, which directly contradicts the notion of the familisation of the production process (2005: 310–311). The decline in child labour must be understood in light of the rise of wage labour (c. 1915–1930s) that was later replaced by share-cropping contracts (c. 1930–1950s). Wage workers and share croppers never replaced family labour (with the exception of children), but were used as a complement, i.e. family labour most likely fell in absolute numbers as its relative importance decreased over time, which also contradicts the notion of familisation.

Having said that, the persistence of share cropping can be explained in relation to the process of involutionary growth. Austin convincingly argues that the gradual shift from wage to share cropping contracts was mainly driven by demand from labourers who wanted to avoid not getting paid in years of poor harvests. For employers, share-cropping contracts were a ‘reluctant’ compromise as they were unwilling or incapable of attracting labourers by increasing wages. Share cropping cost them more on average but enabled farmers to avoid the risk of paying relatively high wages in the event of poor harvests (2005: 413–415). The gradual shift can thus not be explained by involutionary growth; it was rather a solution to acquire additional labour for farmers facing the generic dilemma of fluctuating output and wanting to avoid the risk of becoming indebted.

While the shift was not a sign of involutionary growth, the persistence of share cropping makes sense in light of involutionary growth. Both Austin and Van Hear note that the shift from share cropping increased the number of children on cocoa farms (Austin 2005: 418, Van Hear

1982: 503). Children were not directly employed by farm owners but worked on farms as members of share croppers' families. They also helped share-cropping families with tasks that had indirect effects on cocoa production, such as the cultivation of food crops and carrying of crops. The shift to share cropping also marked an increase in women employed as cocoa labourers (Austin 2005: 418). In that sense, the shift to share cropping not only reduced risks, but also increased farmers' access to much needed labour. This meant that absolute production was kept intact in the 1940s and 50s despite diminishing returns to land.

The second expansion in cocoa output in the 1960s did not sustain for more than a decade. A plausible hypothesis could be that the second boom lasted for a much shorter time because it was mainly an outcome of the recultivation of forestland that had been in fallow for the previous fifteen years. This means that the second boom depended on the cultivation of land with a relatively low yielding capacity compared with the previous boom, which could explain why the boom was so rapidly followed by a decline. Unfortunately, we have little quantitative evidence to support the hypothesis. Frimpong-Ansah (1991: 127) provides data on a number of planted trees from 1955 to 1985 and estimates yielding capacity for the same years, which allows us to calculate production per tree. The estimates, however, rely on the assumption that the number of trees per hectare and yields per tree was constant. It is therefore impossible to derive the quality of land using his figures.

The outcome of the second burst seems to have been more severe than that of the first one. The crisis had now gained momentum and, as anticipated by Ruf's model, the availability of labour had now become a problem for cocoa farmers. While farmers were partly rescued by adding more labour to land (the shift from wage labour to share cropping) following the first decline, they now found it difficult to maintain labourers they already had employed. In 1966, the Tchiman Traditional Council in Brong Ahofo, for example, reported that no cocoa could be harvested because of shortages of labour (Beckman 1976: 219–220). Or, as a farmer stated:

At present many farms are in ruins because caretakers and labourers have abandoned their posts and left unceremoniously. The farmers have lost hope on their farms.

(Cited in Beckman 1976: 219).

The remaining strategy to uphold production, assuming that cocoa farmers faced a scarcity of high-quality soils and that they could no longer uphold production through the increased input of labour, was to develop new practices or introduce new technologies, especially the use of

pesticides, as ageing trees were more vulnerable to diseases and pests. New technologies were introduced in the 1950s, mainly through state programs. From what we know, changes in land yielding technologies were, however, modest. Hopkins argues that in the post-war period, there were '[...] signs, which were important for the future of West African agriculture, of a rise in productivity (and increase per man and per acre) through application of chemical fertilizers, high yielding seeds and pest controls' (1973: 272). However, the diffusion of new technologies seems to have been modest, leaving Hopkins with the conclusion that output growth after 1945 continued to be achieved mainly through 'traditional means' (1973: 272). The Ghanaian agricultural Census of 1963 seems to support the latter view. A majority of farmers used simple tools and implements such as hoes, cutlasses and axes (Frimpong-Ansah 1991: 94). Farmers who did buy fertilisers and pesticides could not afford to purchase accurate amounts, as they faced a double crisis of diminishing forest rents and declining real production prices (Nyanteng 1995, Dorman et al. 2004: 238–239). Diminishing forest rents and declining real production prices reinforced each other and limited the possibility to uphold production through institutional and technological changes. In that sense, Beckman seems to be correct when he claims that:

'The fall in production in 1964/65 may to an important degree have reflected a natural cycle where an unusually large crop is followed by a "recoil" before production resumes momentum. But there was no easy resumption this time.' (1976: 219).

Declining relative prices and state policies did not ease the situation. However, the crisis did not develop prematurely. It was the effect of 30 years of involutionary growth manifested in the diminishing returns of forest rents. Prices and policies mattered but their effects must be understood in relation to diminishing forest rents and the impossibility of further upholding production by applying more labour to land. Post-war growth was not driven by productivity growth in agriculture. The cocoa expansion, as acknowledged by Austin, was just one boom that failed to translate into sustained economic growth. We thus agree with Austin when he states that: 'Over a span of several decades, however, cocoa farming did not generate the kind of linkages that might lead to industrialisation' (2012b: 25).

VII

African economic history has undergone an impressive revitalisation in the past decade. Much of the recent work is, naturally, inspired by the developments in economic history at large, whereby the discipline is increasingly studied with the – direct or indirect – use of tools in economics. The use of models inspired by both classic and neo-classic economics to account for Africa's economic past has been employed since the 1970s, especially in the case of West Africa. In this paper, we summon the various works that are directly inspired by economics under one paradigm: Smithian growth models. In this paper, we critically scrutinised the validity of these models by using the boom and bust of the cocoa production in Ghana as our empirical example. We argue that Smithian approaches, while being able to explain boom periods, fail to account for the following bursts. A basic problem with Smithian models is their tendency to confuse increased commercialisation with transformative forces, which leads scholars applying Smithian models to explain bursts by factors outside the realm of the economy. In the Ghana case, it is mainly state policies that distorted the operations of the markets that are identified as key parameters to account for the burst.

We offer an alternative framework based on the concept of involutionary growth and forest rents. For Ghana as a whole, the figures and scattered evidence indicate that the initial expansion of cocoa production was followed by tendencies towards involutionary growth; however, this was significantly different from the processes described in Asia where the concept was more frequently employed. In Ghana, the tendency towards involutionary growth was not primarily driven by population growth, but rather the exhaustion of forest rents due to an increased number of farmers involved in cocoa production. The process is involutionary in that there was a trade-off between expansion and land productivity. The Second World War, the ban on cocoa production and declining relative prices did not prevent all farmers from continuing to expand cocoa cultivation, but at an aggregate level, the expansion halted.

Our tentative approach thus emphasises the dialectic forces created by a growing cocoa economy. The approach enables us to identify the factors (forest rents and involutionary growth) that can account for both the boom and the bust of the cocoa economy. By employing concepts developed and mainly used to explain agrarian change in Asia, we are able to develop a framework that rescues us from the ad-hoc factors that Smithian models depend upon. More empirical research is, however, needed to empirically verify our approach.

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