

DEVELOPMENTAL
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Should Ghana specialise in the production and export of cocoa beans?

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Ghana is the world's second largest producer of cocoa beans, with the commodity dominating its economy. Eimear Flynn explores the role of cocoa in the Ghanaian economy and questions the implication from the Ricardian model which suggests specialisation in cocoa due to comparative advantage will improve Ghana's terms of trade. She instead points out that cocoa production has failed to become more efficient and also has a destabilising effect on the wider economy, and that climate change, land shortages and youth migration threaten the sustainability of production. Instead Ghana should diversify its exports in order to encourage growth, stability and investment.

Introduction

Ghana is the world's second largest producer and exporter of cocoa beans (Kolavalli and Vigneri, 2011). The country, which earned middle-income status in 2011, has occupied a leading position in the market for raw cocoa beans since the 19th century. The cocoa sector employs over 800,000 individuals in Ghana alone (Ford, 2017). While much of Ghana's growth is attributable to global demand for its exports of cocoa beans, it is not to say that the country should continue to specialise in their production in the long term. Both the Heckscher-Ohlin and the Ricardian model advocate specialisation based on comparative advantage. Although policymakers have pursued policies based on the predictions of the Ricardian model, the role of specialisation in stimulating economic growth is much disputed. The question this essay attempts to answer is whether or not Ghana should deviate from the recommendations of the Ricardian model, and diversify exports.

A Theoretical Perspective

Classical theories of trade present models in which countries specialise

in the production of goods in which they have a comparative advantage and, by doing so, can derive gains from trade. A country is said to have a comparative advantage in the production of a good if the opportunity cost of production is lower than the opportunity cost of producing the same good in the other country (Feenstra and Taylor, 2014). While the sources of comparative advantage differ in the Ricardian and the Heckscher-Ohlin models, both models yield a similar result, namely that countries can derive benefits from trade by specialising in the production of the good in which they have a comparative advantage.

The Heckscher-Ohlin model predicts that a country will export the good that uses the abundant factor of production intensively (Feenstra and Taylor, 2014). Both countries can earn a higher relative price by opening up to trade (Feenstra and Taylor, 2014). The fundamental assumption underlying the Heckscher-Ohlin framework, that technology is constant across countries, is problematic and undermines the model's use in this analysis. Such an assumption is unreasonable when examining trade between developed and developing countries, in which significant disparities in terms of their technological capabilities are identifiable. Trade models must instead capture technology's role in motivating international trade. In the Ricardian model trade is driven by differences in the technological capabilities of countries. For this reason, the Ricardian model will be the focus of this paper.

Labour is the only factor of production in the model. There are two countries, each producing two goods, cocoa and cars say. Differences in technology allow for varying degrees of productivity across countries. These differences see countries specialise in the production of the good in which they are most efficient and trade for the remainder of their needs (Feenstra and Taylor, 2014). Both countries will experience gains from trade. Specialisation will lead to economic growth as the terms of trade improve (Singer, 1950). The wages paid to labour will rise in both countries as a result. The margin of income over subsistence needs generates savings to be invested in capital accumulation (Singer, 1950). However, the extent to which specialisation facilitates capital formation is dependent on a number of assumptions, including that of perfectly competitive markets and the assumption that favourable terms of trade are passed on to producers in the form of higher incomes (Feenstra and Taylor, 2014). These assumptions have been the subject of much debate and will be explored in greater detail in the following section.

Prebisch-Singer Hypothesis

While specialisation remains a popular policy approach among govern-

ments, consensus has yet to be reached on the effectiveness of this approach to generate growth. The Prebisch-Singer hypothesis presents a challenge to the fundamental finding of the Ricardian model, to the idea that countries that specialise in the production of the good in which they have a comparative advantage will experience an improvement in the terms of trade. Prebisch (1950) and Singer (1950) suggest that the gains from trade are unequally distributed. While industrialised countries will benefit from long run improvements in the terms of trade, the same is not true of developing countries that specialise in the production of primary commodities. Primary product producers will instead experience a deterioration in the terms of trade over time (Singer, 1950).

Prebisch (1950) differentiates between the centre, the industrialised countries, and the peripheral or developing countries in order to make his case. The centre produces sophisticated manufactured goods, cars say, while the periphery specialises in the production of primary products such as cocoa. The products produced face differing elasticities of demand (Prebisch, 1950). Primary products are price and income inelastic, while manufactures have a high income elasticity of demand. Rising incomes will result in a greater expansion of the demand for manufactures. Similarly, the low price elasticity of demand for primary products suggests that a decline in price will do little to improve the earnings of peripheral countries and may in fact lead to a decline in revenue (Gemmill, 1962). Differences in elasticities will ultimately result in a decline in the terms of trade for the periphery over time.

This deterioration in the terms of trade is partially attributable to differences in the degree of market power of the centre and the periphery. The Ricardian model assumes perfectly competitive markets (Feenstra and Taylor, 2014). This assumption is likely only to hold in the periphery. Ghana, for instance, is a small open economy that has partially specialised in the production of cocoa, a homogenous good. Producers cannot influence the world market price. The cocoa market is perfectly competitive. The world market for cars, by contrast, is imperfectly competitive. Product differentiation allows producers to exert a degree of market power and influence the world price. This has important implications for trade. The perfectly competitive cocoa market means that the benefits of technological progress will be passed on to consumers directly in the form of lower prices. Conversely, improvements in the terms of trade are passed on to producers in the centre in the form of higher incomes (Singer, 1950). While the market power of the centre allows industrialised countries to retain the benefits of technological progress, the same cannot be said for producers in the periphery (Singer, 1950). In order to truly experi-

ence long run gains from trade countries must industrialise (Prebisch, 1950). Specialisation in the production of primary products will simply see the short run gains from trade bargained away by the countries of the developed world (Evans, 1976).

Innovation and Growth

Innovation plays a significant role in determining the level of productivity and growth in an economy. Fu et al.'s (2017) study of Ghana's formal and informal sectors underlines the impact of technological innovation on productivity levels. The extent to which such innovation is possible will depend on the sectors in which an economy engages. Specialisation of production in primary products may strip countries of their entrepreneurial initiative, of their innovative capacity and domestic investment (Singer, 1950). This outcome has its roots in the structure of primary product markets and their inability to generate savings to be invested in capital accumulation. Ghana's middle-income status with its high educational and institutional quality provides fertile ground for investment and innovation (Fu et al., 2017). However, specialisation in the production of primary products such as cocoa limits the scope for technical progress and innovation. The positive impact of innovation provides further support for export diversification and policies that see resource-rich countries, such as Ghana, defy their comparative advantage. A study of Ghana's cocoa sector, its history and the current challenges it faces, and an analysis of its long-term sustainability provide further evidence in support of this conclusion.

Ghana: Theory in Practice

Ghana has a comparative advantage in the production of cocoa beans. The country, which has partially specialised in cocoa production for the past two centuries¹, is the world's second largest producer of cocoa beans. Specialisation in the cocoa sector has yielded positive results for the Ghanaian economy. Kolavalli and Vigneri (2011) note the quality premium Ghanaian cocoa earns on the world market. Similarly, the cocoa sector has provided employment in rural areas and has helped prevent the deepening of the rural-urban divide (Ford, 2017). Despite the positive consequences of specialisation, however, an exploration of Ghana's history of cocoa production and the world market for cocoa underlines the risks associated with specialisation in primary product production.

A Turbulent History

Ghana's history offers proof that its cocoa sector and the macro-economy are inextricably linked. Independence from Britain marked a turning point in

the nation's history, in that of the cocoa sector and the wider economy. A period of both economic and political uncertainty ensued. A series of economic shocks saw the government become increasingly reliant on the country's Cocoa Marketing Board, which had effectively become an instrument of public finance by the late 1950s (Kolavalli and Vigneri, 2011, p. 203). In 1964, world prices collapsed and drastically reduced producer prices. The decline in cocoa prices triggered an economic downturn that persisted until the early 1980s (Kolavalli and Vigneri, 2011). It is apparent that cocoa prices dictated public finance and essentially functioned as a macroeconomic indicator in Ghana in the decades following independence. This relationship is problematic. Reliance on the industry for public finance destabilized the economy. This period of decline occurred against a backdrop of significant political turmoil in Ghana, perhaps pointing to a relationship between the cocoa sector and the country's political structure.

There is a fundamental flaw in the Ricardian model. Ricardo's theory focuses solely on the economic consequences of trade. The model does not incorporate social or political considerations. Ghana's turbulent experience of cocoa production, however, offers proof that specialisation in the production of primary commodities has both macroeconomic and political implications.

Endogenous Comparative Advantage

Government intervention in the cocoa sector has proven essential for the industry's survival since its collapse in the 1980s. Cocobod played an important role in the cocoa sector throughout this period and continues to do so today. The board provides access to fertilisers and pesticides, suggests quality improvements, encourages the production of high-yielding varieties and determines producer prices (Wessel and Quist-Wessel, 2015). Their policies aim to address the sector's efficiency problem and increase cocoa yields (Ford, 2017). The cocoa sector, however, has become dependent on these policy measures. While Ghana's climate initially afforded it a natural comparative advantage in the production of cocoa, comparative advantage is now determined by Cocobod's policy. It is endogenous to policy. It is unlikely that Ghana would have maintained its position as the world's second largest producer of cocoa in the absence of this support.

Inefficiency and Low Producer Prices

While the evidence in support of the Prebisch-Singer hypothesis is mixed, an analysis of Ghana's cocoa industry points to adverse effects of specialisation. The inefficiency of the sector provides support for their hypothesis. The Ricardian model predicts that an improvement in the terms of trade will increase

producer incomes and encourage capital formation. In Ghana, however, producer prices remain low (Kolavalli and Vigneri, 2011). Specialisation has not resulted in an increase in producer incomes. It has not generated the savings required to invest in measures that would increase the sector's productivity and encourage the growth of the wider economy. Figure 1 highlights the lagged relationship between producer prices and cocoa output. Declining producer prices typically result in a decline in output levels. In 2013/14, a 40% increase in producer prices encouraged investment in cocoa plantations in Ivory Coast and resulted in a large increase in yields (Wessel and Quist-Wessel, 2015). The experience of Ivory Coast suggests that if the benefits of trade are not passed onto farmers in the form of higher incomes, specialisation in the production of cocoa will not encourage the growth of Ghana's economy.

Dormon et al (2004) cite pests and disease, poor farm management practices, smuggling and a failure to adopt research recommendations as the primary contributors to low yields per hectare. As increasing terms of trade have been passed on to consumers in the form of lower prices, producers have been unable to invest in the external inputs required to increase efficiency and output per hectare. Recent policy measures have targeted productivity and increased yields per hectare (Ford, 2017). The government's failure to increase efficiency to date, however, suggests that Ghana should not specialise in the production of cocoa beans. Specialisation would simply see the Ghanaian economy become increasingly reliant on a sector that is inefficient and incapable of lifting the country out of poverty.



Figure 1: Ghana cocoa production and real producer price, 1990-2008, ICCO and World Bank in Kolavalli and Vigneri, 2011

While the Ricardian model predicts that specialisation will lead to an improvement in the terms of trade, a perfectly competitive world cocoa market prevents Ghana from retaining these benefits. The model's mechanism fails. Specialisation does not generate surplus income to be invested in capital accumulation and technological advancement. The result is an inefficient market

characterised by low cocoa yields. Downswings in commodity prices also have the potential to erode the gains from trade. Similarly dependence on the cocoa sector will exert significant influence on the country's economic and political structures. Continued specialisation, therefore, will not facilitate development but will instead result in the marginalisation of Ghana in the world market (Razzaque et al, 2007).

The Future of the Sector

An analysis of the future of Ghana's cocoa industry provides further support for this conclusion. The cocoa sector is unsustainable. The availability of land, rising labour costs and climate change pose a threat to the future of the sector. Such issues will likely prevent farmers from increasing cocoa yields per hectare and may see Ghana lose its comparative advantage in the production of cocoa.

The cocoa sector reached its target of 840,000 metric tonnes in 2016/17 (Cocobod, 2017). However, much of the expansion of Ghana's cocoa sector that has taken place since the 1980s is attributable to an expansion of the area under cultivation, rather than productivity increases (Wessel and Quist-Wessel, 2015). However, land is fixed and its availability limited. Many producers have already expanded their farms into some of the country's protected areas (Maclean, 2017). Deforestation has also increased rapidly in recent years. Ironically, farmers require the shade of these trees to protect their crops from dry seasons (Maclean, 2017). Lärach et al (2013) find that the positions of both Ghana and Ivory Coast are particularly susceptible to the impacts of climate change due to the limited shade and tree cover that has resulted from deforestation. Cocobod has implemented a number of measures that target efficiency and increased cocoa yields. It remains to be seen whether these measures will succeed in increasing output to 1.5 million metric tonnes in 2020/21 (Ford, 2017). If the measures fail to generate surplus incomes that will encourage capital accumulation and increased yields per hectare, as they have to date, the limited supply of land and rising global temperatures may force farmers to exit the cocoa industry.

Labour shortages also threaten the future of the sector. The cocoa industry in Ghana is labour-intensive and currently employs over 800,000 producers (Ford, 2017). Recent growth in Ghana has aided the development of strong institutions. Increased access to education, however, has resulted in rising youth migration from rural to urban areas as Ghana's young labour force seeks more sophisticated jobs. This has had a significant impact on the cocoa sector. The average age of farmers in Ghana is fifty-five. Young people are leaving cocoa growing areas and turning their backs on the country's traditional industries. Producers have been faced with rising labour costs as a result. If this upward pressure on

wages is not accompanied by a corresponding increase in producer prices cocoa farmers will be forced to exit the market.

Ghana's position as the world's second largest producer of cocoa beans is precarious. Climate change, migration and a shortage of land will likely see many of the country's farmers exit the sector over the coming decades. While Breisinger et al. (2008) attribute the growth and reduction in poverty levels that Ghana has experienced to date to its cocoa sector, specialisation in the production of cocoa will not have the same effect in the long run.

Conclusion

Ricardo's theory of comparative advantage identifies technological differences between countries as the drivers of trade. This assumption is particularly relevant to the analysis of trade relations between industrialised and developing countries, between countries such as Ghana and many of its export partners. Governments, the world over, have pursued policies based on the predictions of the Ricardian model. Ghana has partially specialised in the production of cocoa since the 19th century. Many critics, however, find fault with the Ricardian model, claiming that specialisation in the production of primary commodities will lead to a deterioration in the terms of trade over time and that it discourages innovation and results only in overdependence on sectors incapable of generating growth and alleviating poverty.

While the evidence in support of these theories is mixed, an analysis of the current state of Ghana's cocoa sector and its long-term sustainability suggest that the country should not specialise in the production of cocoa. Cocoa production in Ghana is tied to the country's economic and political structures. The sector is highly inefficient and its comparative advantage is now endogenous to government policy. Rising global temperatures, youth migration and land shortages will serve only to exacerbate the industry's imperfections. Specialisation in cocoa production, therefore, may simply result in the same fluctuations that hampered economic growth throughout the second half of the 20th century. Ghana will undoubtedly continue to produce cocoa beans. The country currently produces 20% of world cocoa output (WITS, World Bank). Ghana has attracted foreign investment to its cocoa-processing sector in recent years. The sector, however, only captures 5% of the global processing market (Mulangu et al, 2017). Expansion of the industry or of the country's wider manufacturing sector would encourage technological advancement and presents an opportunity for growth and development. Ghana might have been built on the back of the cocoa sector. Its future, however, ought not to be.

References

1. Breisinger, C, Diao, X, Kolavalli, S and Thurlow, J. 2008. The role of cocoa in Ghana's future development . Ghana Strategy Support Program Background Paper 11
2. Dormon, E.N.A., Van Huis, A., Leeuwis, C., Obeng-Ofori, D. and Sakyi-Dawson, O. 2004. Causes of low productivity in Ghana Farmers perspectives and insights from research and the socio-political establishment . Wageningen Journal of Life Sciences 52(3-4): 237-259
3. Evans, D. 1976. Unequal Exchange and Economic Policies: Some Implications of Neo-Ricardian Critique of Theory of Comparative Advantage . Economics and Political Weekly 11(5/7): 143-158
4. Feenstra, R. and Taylor, A. 2014. International Economics. New York: Worth Publishers.
5. Ford, N. 2017. Big Ambitions for Ghanaian Cocoa, African Business. [online], <http://africanbusinessmagazine.com/region/west-africa/ghana-big-ambitions-cocoa-industry/> [Accessed: 23rd November 2017].
6. Fu, X, Mohnen, P and Zanello, G. 2017. Innovation and productivity in formal and informal firms in Ghana. Technological Forecasting and Social Change <https://www.sciencedirect.com/science/article/pii/S0040162517310971> [Accessed: 28th November 2017].
7. Gemmill, R. 1962. Prebisch on Commercial Policy for LDCs . The Review of Economics and Statistics 44(2): 198-201
8. Ghoshray, A. 2011. A re-examination of trends in commodity prices . Journal of Development Economics 95(2): 242-251
9. Gunton, T. 2003. Natural Resources and Regional Development: An Assessment of Dependence and Comparative Advantage Paradigms . Economic Geography 79(1): 67-94.
10. IMF and World Bank. 1998. Ghana Enhanced Structural Assessment Facility Economic and Financial Policy Framework Paper, 1998-2000. [online], <https://www.imf.org/external/np/pfp/ghana/ghana0.htm> [Accessed: 6th December 2017].
11. Kolavalli, S. and Vigneri, M. 2011. Cocoa in Ghana: Shaping the success of an economy . in P. Chuhan-Pole (ed.) Yes, Africa can: success stories from a dynamic continent . World Bank Publications.
12. Krugman, P. and Obstfeld, M. 2003. International Economics: Theory and Policy. Pearson: Boston, MA.
13. Lärach, P., Martinez-Valle, A., Schroth G., and Castro, N. 2013. Predicting the future climatic suitability for cocoa farming of the world's leading pro-

- ducer countries, Ghana and Cote d'Ivoire . *Climatic Change* 118(2): 841-854
14. Lectard, P., and Rougier E. Forthcoming, 2018. Can developing countries gain from defying comparative advantage? Distance to comparative advantage, export diversification and sophistication and the dynamics of specialisation . *World Development* 102(1): 90-110
 15. Maclean, R. 2017. Chocolate industry drives rainforest disaster in Ivory Coast . *The Guardian*. [online], <https://www.theguardian.com/environment/2017/sep/13/chocolate-industry-drives-rainforest-disaster-in-ivory-coast> [Accessed: 6th December 2017].
 16. Oduro, A. and Offei, E. 2014. Investigating Ghana's Revealed Comparative Advantage in Agro-Processed products . *Modern Economics* 5: 384-390
 17. Prebisch, R. 1950. The Economic Development of Latin America and its principal problems . *Economic Bulletin for Latin America*.
 18. Razzaque, M., Osafo-Kwaako, P., and Grynberg, R. 1988. The Issue of Declining Commodity Prices . in R. Grynberg, and S. Newton (ed.) *Commodity prices and development*. Oxford: Oxford University Press.
 19. Sapsford, D., and Bloch, H. 1997 Some estimates of Prebisch and Singer effects on the terms of trade between primary producers and manufacturers . *World Development* 25(11): 1873-1884
 20. Singer, H. 1950. The Distributions of Gains between Investing and Borrowing Countries . *The American Economic Review* 40(2): 473-485
 21. Tilton, J. 2013. The terms of trade debate and the policy implications for primary product producers . *Resources Policy* 38(2): 196-203
 22. Wessel, M. and Quist-Wessel, P. 2015. Cocoa production in West Africa: A review and analysis of recent developments . *Wageningen Journal of Life Sciences* 74-75: 1-7

¹The cocoa sector accounts for 20% of Ghana's exports. The country also exports large quantities of gold, timber and oil (WITS, World Bank). Bloch and Sapsford (1997) find that the price of manufactures increases at a faster rate than the price of primary commodities. Conversely, Ghoshray (2011) finds that a majority of primary commodities examined do not demonstrate any trend over time, providing evidence against the Prebisch-Singer argument.