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Cocoa in Ghana, the 'Political Crop'[1]: Does State Control Shield the Cocoa Sector from Exposure to Capital Flight?

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Abstract

Since its introduction into Ghana in the 19th century, cocoa has been considered a strategic crop, over which the post-independence governments have maintained substantial control. Cocoa is indeed referred to as a 'political crop'. The cocoa sector is closely regulated by the government through the Ghana Cocoa Board (COCOBOD). This paper investigates the implications of the industrial organization structure and state regulation for the performance of the sector, and specifically for minimizing the exposure to capital flight typically faced by resource-rich countries through export misinvoicing and leakage of foreign exchange earnings from exports. Indeed, compared to the gold sector in Ghana and the cocoa sector in neighboring Côte d'Ivoire, both of which are fully liberalized and dominated by foreign corporations, the cocoa sector in Ghana exhibits relatively little evidence of export misinvoicing. Moreover, the foreign exchange earnings from exports of cocoa beans are fully repatriated as they are controlled by COCOBOD. It is important to note that derived cocoa products are exported by private companies, and only national companies are obligated to repatriate their export earnings. In contrast, like in the case of gold, foreign-owned cocoa companies have no obligation to repatriate their export earnings. The analysis, however, indicates that the gains from the cocoa sector in terms of contributions to GDP,

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tax revenue and poverty reduction remain sub-optimal. This suggests that there is substantial room for improvement through targeted reforms and policy interventions at the sectoral level.

1. Introduction

Ghana is the second largest producer and exporter of cocoa behind its neighbor Côte d'Ivoire, with the two contributing more than 60 percent of the world's cocoa exports. But cocoa is not like any other crop in Ghana. The government keeps it 'close to its chest', with heavy involvement in the organization of the sector, from setting producer prices to organizing the purchase and export of cocoa beans (see, among others, Kolavalli and Vigneri, 2017). In fact, cocoa is so important that it is referred to as "a political crop"; one that can make or break political regimes, as was the case in February 1966 when the government succumbed to popular pressure following its attempt to cut the producer price of cocoa to save the ailing Cocoa Marketing Board (CMB). From the farmgate to the port, the operations in the cocoa sector are fully controlled by the Ghana Cocoa Board (COCOBOD), which pays commissions to licensed buying companies (LBCs)[4] for getting the crop from the farmgate to its warehouses where the beans are stored for sale to global cocoa processing companies or processed domestically.

A recurrent theme among operators in the cocoa sector is that, unlike natural resources, cocoa trade is not subject to capital flight.[5] Capital flight is indeed an important issue for Ghana as it is for most African countries. The latest estimates suggest that the country has lost $85.7 billion through capital flight from 1970 to 2022. The phenomenon has exploded since the turn of the century, with a total of $44.6 billion in capital flight between 2010 and 2022. The analysis of capital flight is presented in a separate paper (Ndikumana, 2023).

The expectation that the cocoa sector is less vulnerable than other natural resource sectors to capital flight is inspired by state regulation and the special organizational structure whereby COCOBOD controls exports of cocoa beans and repatriates all the proceeds of exports through the Bank of Ghana. Note, however, that the export of cocoa products, which is handled by private companies operates under separate rules. Only national companies are required to repatriate their foreign exchange earnings from exports of cocoa products, while foreign-owned companies are not required to do so. This is important as foreign companies dominate the cocoa products processing segment of the sector. In any case, significant state control over the natural resource sector may be part of an appropriate strategy for addressing the endemic problem faced by African resource-rich countries where exploitation and trade of these resources serve to enrich private individuals and multinational corporations that benefit from lenient tax regimes – notably granting multi-year tax holidays to otherwise profitable investments – and evade taxes through profit base erosion, export

[4] There are 48 LBCs, of which only one, Produce Buying Company Limited (PBC), is jointly owned by the government (majority owner) and private shareholders. Eight of the LBCs did not participate in the 2018/2019.
[5] Opinion expressed during our meeting with representatives of LBCs.

underinvoicing and smuggling, all facilitated by systemic opacity in the reporting of international resource trade transactions.

The cocoa sector in Ghana differs significantly from the gold sector, which is fully liberalized, privately run and dominated by foreign companies. Statistical analysis reveals systematic inconsistencies in gold export statistics, pointing to both export underinvoicing and unmatched exports, especially for gold registered as being exported to South Africa. This bilateral trade relationship is of interest especially given that South Africa is a prominent destination of Ghana's gold and that there are major South African companies operating in the gold sector in Ghana. The opacity of gold export statistics has been identified in other studies (Ndikumana, Naidoo and Aboubaker, 2022; UNCTAD, 2016; Ndikumana and Boyce 2023) and is an important matter of concern. The issue is explored in a separate paper under this project (Ndikumana and Cantah, 2023). It is worth noting that the cocoa sector in Ghana also differs significantly from that in Côte d'Ivoire which is fully privatized and dominated by foreign corporations, and where trade statistics exhibit substantive discrepancies pointing to export underinvoicing as a conduit of capital flight (Merchaert, 2022).

The object of this paper is to examine the extent to which the cocoa sector may be exposed to or protected from capital flight by exploring its industrial organization with an emphasis on the nature of the main actors and the fiscal regime that governs operations along the entire cocoa value chain from production to exports. The paper begins with a review of the long history of cocoa planting in Ghana and the various phases of the evolution of cocoa production over time. It then presents the institutional framework and organization of the sector with an emphasis on the fiscal regime governing the sector. This is followed by an analysis of the contribution of the sector to the economy in terms of tax revenue, foreign exchange earnings, and poverty reduction. The analysis is supported by data collected from various government sources and first-hand information and insights gained from meetings with various stakeholders, as well as visits to cocoa farms in the Central region in January 2023. The paper examines whether the cocoa sector is exposed to capital flight by analyzing bilateral cocoa trade statistics between Ghana and its trading partners, using data from Comtrade, in search of evidence of export misinvoicing as a channel of capital flight. Over the 2000-2022 period, total export misinvoicing of cocoa and cocoa products amounted to $12 billion out of $59 billion of partner's imports. For cocoa beans exports alone, the corresponding amount of misinvoicing is $7.3 billion out of $47.8 billion of exports. The discrepancies between Ghana's recorded exports and its partners' imports are much lower than in the case of gold exports, where a large fraction of Ghana's gold exports cannot be traced in the records of partners' imports. Over the same period, while Ghana reported $67 billion worth of gold exports, all partners together recorded $44 billion worth of gold imports. The opaque link is gold going through South Africa, whose records show virtually no imports from Ghana while Ghana exported $28.4 billion over 2000-2022. The paper concludes with a summary of the findings and some policy recommendations.

2. History of Cocoa Production in Ghana

In 1879, entrepreneur Tetteh Quarshie arrived in Ghana with cocoa pods from Fernando Po, an Island located in Equatorial Guinea and built a plantation at Akwapim Mampong in Ghana's Eastern region (Hill, 1963). That marked the beginning of cocoa growing in Ghana. Commercial production of cocoa subsequently extended to other parts of the country. Today it is grown mostly in the forest districts of Ashanti, Bono, Bono East, Ahafo, Eastern, Volta, Central, and Western North and Western regions, covering between 1.6 million and 2 million hectares (FAOSTAT, 2016) (Figure 1).

Figure 1. Cocoa growing regions in Ghana

Source: Authors' construction.[6]

The production of cocoa in Ghana has gone through four developmental phases categorized by Kolavalli and Vigneri (2011): An exponential growth phase from 1888 to 1937; a stagnation phase before and following independence (1938–64); a downturn from 1965 to 1982; and a recovery and expansion phase that started with the launch of the Economic Recovery Program in 1983. These phases are discussed below.

Exponential growth phase, 1888-1937

Following the introduction of cocoa by commercial producers from the eastern part of Ghana, cocoa production grew rapidly as farmers migrated and purchased land in cocoa growing areas. The 'cocoa rush' rapidly propelled Ghana to the status of the world's leading cocoa producer

[6] The authors appreciate Dr. Didier Wayoro's assistance with the design of the map.

during the 1910-1914 period. Exports of cocoa began during this phase, with two bags of cocoa beans[7] shipped out of the country in 1891 (Manu, 1989). Thereafter, cocoa exports increased rapidly from 546 tons in 1900 to over 26,520 tons in 1911, and 317,220 tons in 1936, accounting for half of global production at the time (Manu, 1989). The rapid expansion of cocoa production during this phase was mainly due to the opening of new plantations and expansion of existing ones throughout the cocoa growing districts. Cocoa emerged as a potential contributor to export-led growth as the expansion of cocoa cultivation and trade enabled not only the emergence of a 'capitalist cocoa growing community' but also generated spillover and linkage effects in the rest of the economy (Hill, 1963; Berry, 2018).

Stagnation phase, 1938-1964

The expansion of cocoa production eventually slowed down starting in 1938, as pests and diseases wreaked havoc on the sector. Moreover, the drop in international cocoa prices during this period further discouraged production. The government encountered considerable financial difficulties, with the financial resources of the Cocoa Marketing Board (CMB) nearly depleted, and it was forced to cut cocoa producer prices, a move that proved to be politically costly. In February 1966, the government was overthrown, the state of the cocoa industry worsened, and the economy suffered a downturn marked by high inflation.

Downturn phase, 1965-1982

In addition to the crash in world cocoa prices in 1965, cocoa production was further undermined by the aging of cocoa trees and diseases, which rendered the cocoa unappealing to cocoa farmers, some of whom turned toward food crop agriculture (Amanor, 2010). As a result, cocoa production fell to as low as 159, 000 tons in 1983/84. Along with the decline in production, the period was also marked by smuggling of cocoa across borders. It is estimated that about 20 percent of Ghana's cocoa was smuggled to Côte d'Ivoire between 1970 and 1980 (Stryker et al., 1990). To revitalize the cocoa industry, the government implemented new policies including the payment of incentives to cocoa growers, ushering in a new era of recovery and a second expansion phase from 1983 (Kolavalli and Vigneri, 2011).

Recovery phase, 1983-onward

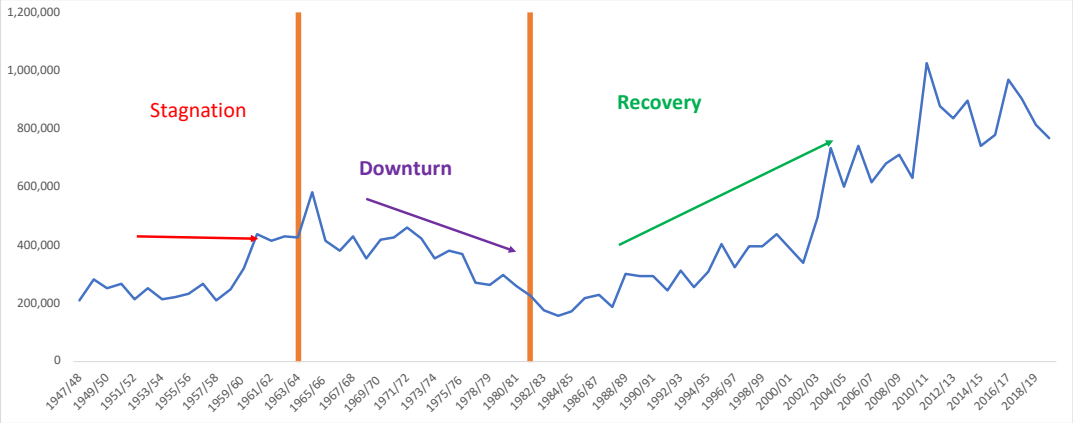
The cocoa sector began to improve starting in 1983 with the implementation of the Cocoa Rehabilitation Project under the Economic Recovery Program (ERP) (Kolavalli and Vigneri, 2017). In particular, the government increased the producer price, which meant that Ghanaian cocoa farmers were paid more than they could earn by selling their crop to neighboring countries, which helped to discourage cocoa smuggling, especially into Côte d'Ivoire. Farmers were also

[7] One bag of cocoa beans weighs 64 kg.

granted some compensation for removing and replacing disease-infested cocoa plants. With the introduction of higher-yield cocoa trees, cocoa production increased to 400, 000 tons by 1996, and accelerated further starting in 2001. This may be ascribed to high global market prices during that period, as well as the deployment of various interventions by COCOBOD such as the cocoa mass spraying program and fertilizer subsidies (Vigneri and Santos, 2008). Some of the expansion in recorded cocoa production during this period was due to the smuggling of cocoa from neighboring countries especially the Côte d'Ivoire, estimated to be between 120,000 and 150,000 tons in 2004 alone (Brooks et al., 2007).

The long-term trend of cocoa production is illustrated in Figure 2. The figure shows the various phases of expansion, stagnation, decline and recovery.

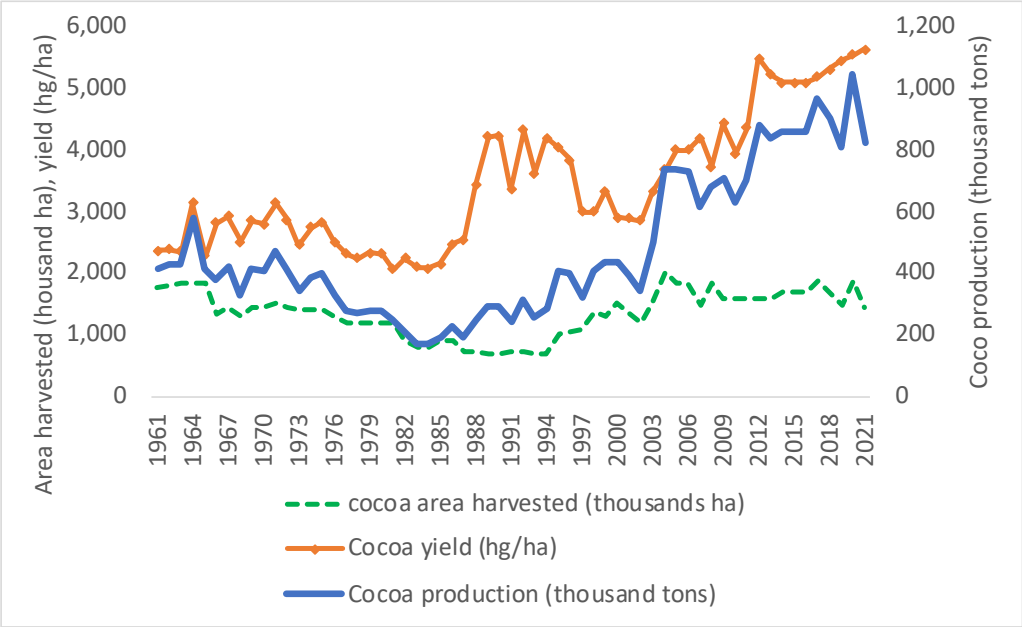
Figure 2. Trend of cocoa beans production from 1947 to 2020 (metric tons)



Source: Authors' construction with data from COCOBOD and other sources

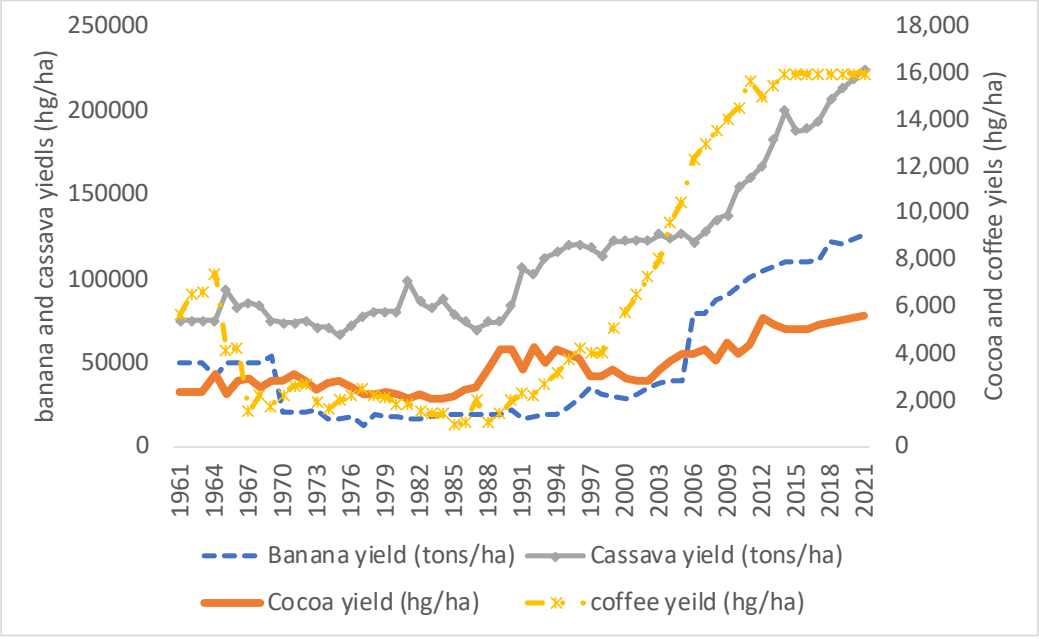
Overall, an important factor behind the trends and fluctuations in cocoa production was the change in the size of harvested area, as can be clearly seen in Figure 3. The decline in harvest area was due to a combination of factors, including a reduction in producer price, pests and diseases, as well as aging plants. From 1965 to 1982, cocoa production declined by a cumulative 51.3%. During this period, the size of the harvested area shrunk by 50.8 percent, while yields declined by only 1 percent. From 1983, cocoa production accelerated, and by 2004 it had risen by a cumulative 264 percent. The upward trend has generally continued until today, albeit with marked cyclical variations, which are typical for cocoa production. The post-1983 production expansion has been driven by an increase in both harvested area and yield. As the size of the harvested area rose by 122.2 percent from 1983 to 2004, yields also increased by 63.8 percent during the same period. Interestingly, cocoa yields have moved in tandem with those of other major agricultural products as illustrated in Figure 4.

Figure 3. Cocoa: production, yields and area harvested, 1961-2021



Source: FAOSTAT, https://www.fao.org/faostat/en/#data/QCL

Figure 4. Yields of cocoa compared to other major crops in Ghana, 1961-2021



Source: FAOSTAT, https://www.fao.org/faostat/en/#data/QCL

Today, Ghana produces 900,000 tons of cocoa on average per year. Cocoa production in the 2020/21 season hit a record of 1,047,000 tons, a 34.8 percent increase over the previous season's

output (Ministry of Finance Budget for 2022). For the 2021/22 crop season, production was estimated at about 900,000 tons. However, actual production turnout was only 683,000 tons due to unfavorable weather conditions and the activities of illegal mining (Ministry of Finance Budget for 2023).

3. Organization of the Cocoa Sector

This section discusses the organization of the cocoa sector, the purchase and export of cocoa, and the role of the various actors engaged in the sector.

Ghana Cocoa Board (COCOBOD)

The Ghana Cocoa Marketing Board was founded in 1947 by ordinance. In 1984, the Ghana Cocoa Board Act 1984 (PNDCL 81) was promulgated, and the Board was renamed the Ghana Cocoa Board (COCOBOD). In 2020, the COCOBOD Act was amended to transfer the oversight of COCOBOD and related matters pertaining to the production of cocoa from the Ministry of Finance to the Ministry of Food and Agriculture.

COCOBOD has two subsidiary companies: Cocoa Marketing Company Limited (CMC), which engages in the sale and marketing of cocoa, and Quality Control Company (QCC), which oversees and enforces quality standards for cocoa beans.

The Ghana Cocoa Board Act 1984 (PNDCL 81) tasks COCOBOD with the following functions:

- Initiate programs aimed at controlling pests and diseases affecting cocoa, coffee and shea nut plants.
- Undertake and encourage the processing of cocoa, coffee, shea nut and cocoa waste with the aim of adding value for export and local consumption.
- Undertake, promote and encourage scientific research aimed at improving the quality of cocoa, coffee, shea nut and other tropical crops.
- Regulate the internal marketing of cocoa, coffee and shea nut. Secure the most favorable arrangements for the purchase, grading and sealing, certification, sale and export of cocoa, coffee and shea nut.
- Purchase, market and export cocoa and cocoa products graded under the Cocoa Industry Regulation and Consolidation Decree, 1968 NLCD 278.
- Assist in the development of the cocoa, coffee and shea nut industries of Ghana.

The functions of COCOBOD are classified into two main areas, specifically pre-harvest and post-harvest – and they are performed by its specialized divisions. The pre-harvest functions are carried out by the Cocoa Research Institute of Ghana (CRIG), the Seed Production Division (SPD) and the Cocoa Health and Extension Division (CHED). The post-harvest functions consist of quality control measures that farmers must observe to produce and supply high-quality cocoa beans to

COCOBOD through the Licensed Buying Companies (LBCs). They are performed by Quality Control Company Limited (QCCL) and CMC Limited. Foreign companies may obtain a license to operate as LBCs, provided they meet COCOBOD's requirements as stipulated in the Regulation and Guidelines for the internal marketing of cocoa (2015).

Cocoa purchase and export processes

COCOBOD is the sole body mandated by the government to regulate the cocoa purchasing process in Ghana. Specifically, it is the only entity authorized to purchase cocoa beans directly from farmers or through licensed LBCs. The procedure for storage and exporting of cocoa beans is stipulated in the Cocoa Industry Regulation and Consolidation Decree, NLCD 278 (1968) and the Cocoa Industry Regulations, L.I. 598 (1968), which spell out cocoa quality standards, the rules regarding the handling and inspection of the quality of cocoa beans, as well as how and where cocoa should be stored. Paragraphs 1 to 7 of N.L.C.D. 278 (1968) deal with the handling and inspection of cocoa to ensure quality, while paragraph 13 spells out penalties for quality standard violations. Paragraph 2 of N.L.C.D. 278 (1968) states that "no person other than a grower of cocoa who is transporting his cocoa from the land on which it was grown to his premises for the purpose of fermenting and drying, shall transport cocoa which has not been thoroughly dried." It is also states in paragraph 3 that "No person shall export or cause or permit to be exported or attempt to export any cocoa unless and until the same has been inspected by an inspector who shall have affixed to each bag a seal and grade-mark" (N.L.C.D 1968).

LBCs that wish to enter the cocoa purchasing business must obtain a purchase license and comply with criteria set up by COCOBOD regarding the organizational structure, operational strategy and financial strength of the company. In addition, applicants are required to demonstrate that they have access to adequate well-ventilated warehousing which must be approved and certified by the Quality Control Company (QCC) of COCOBOD. LBCs must also abide by requirements concerning the type of packaging bags, grading and sealing procedures, minimum capacity of the sheds, and disinfection of sheds. The applications are reviewed by the Cocoa Sector Marketing Committee (CSMC), consisting of representatives of cocoa farmers, Licensed Buying Companies (LBCs), cocoa hauliers, QCC, CMC, COCOBOD, the Institute of Statistical Social and Economic Research of the University of Ghana, the Bank of Ghana and the Ministry of Food and Agriculture. The Minister of Food and Agriculture chairs the committee.

At the start of each cocoa season COCOBOD provides LBCs with seed funds to purchase cocoa beans from farmers. The LBCs must submit to COCOBOD an advance performance bond in the form of a bank guarantee to ensure that the seed funds granted to the LBCs are recoverable. LBCs employ district officers and purchasing clerks or cocoa marketing clerks as representatives in the cocoa growing areas to purchase cocoa directly from farmers. The cocoa beans are then temporarily stored in the LBCs' warehouses and later moved to district cocoa depots where quality is rechecked by COCOBOD QCC officers. Next, cocoa beans are graded and sealed with each

cocoa bag tagged with a seal indicating the quality of the cocoa and the station identification number. The cocoa beans are then transported to CMC warehouses where QCC officers undertake further quality checks. Cocoa beans are rejected if they do not meet the quality standard set by the Quality Control Department. The graded and sealed cocoa are transported to the port where they are received by the CMC and final checks are done to ascertain quality by QCC before final export.

The actors in the cocoa industry

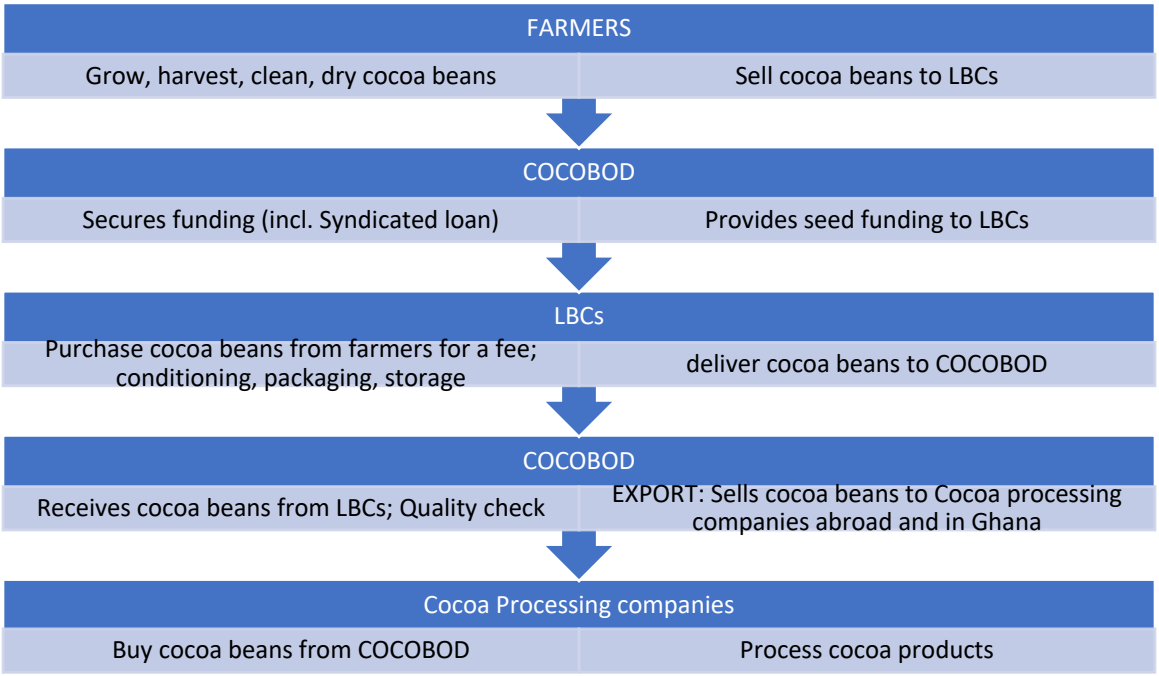
The actors in the cocoa value chain can be classified into main actors and supporting actors (Abbadi et al. 2019). The main actors are those contributing directly to the production, processing, transportation and marketing of cocoa and cocoa products. This includes farmers, private input suppliers, licensed buying companies, haulers, CMC, processors, and retailers of cocoa products. Supporting actors do not participate directly in production, processing, transport and retailing, but rather provide various types of support services in the form of research, extension, quality control, finance and insurance, and disaster management. They include cocoa research institutions, COCOBOD's Quality Control Company (QCC), farmers' groups, Non-Governmental Organizations (NGOs), and formal and informal finance and insurance companies. Table 1 presents the main and supporting actors in the cocoa value chain. A summary of the processing of the cocoa and the division of labor among various players is provided in the flow chart in Figure 5.

Table 1. The main actors and supporting actors in the cocoa industry in Ghana

Main actors	**Functions**
Farmers	Production of cocoa beans
Private input dealers, Cocoa Health and Extension Division (CHED), Seed Production Division	Supply seeds, fertilizers, pesticides, fungicides, extension delivery.
Licensed Buying Companies (LBCs)	Purchasing cocoa beans from farmers and deliver to COCOBOD
Haulers	Transportation of cocoa beans
Cocoa Marketing Company Ltd (CMC)	Sale (local and export) and shipment of cocoa beans
Processors	Processing cocoa powder, cocoa butter, liquor, cakes, beverages, chocolate
Cocoa Waste Companies	Exporting cocoa waste
Supporting actors	**Functions**
COCOBOD (CHED); Cocoa Research Institute of Ghana, other research institutions; Farmers' groups	Extension services and research
COCOBOD (QCC)	Quality assurance
Formal and informal financial services	Loans and financial services
Insurance organizations (public and private)	Insurance and social protection
National Disaster Management Organization (NADMO); Ghana National Fire Service; Local disaster volunteer groups	Disaster management

Source: Monastyrnaya et al. (2016).

Figure 5. Value chain and division of labor in the cocoa industry



Source: Authors' design

4. Organization of COCOBOD and the LBCs

COCOBOD: organization and financial position

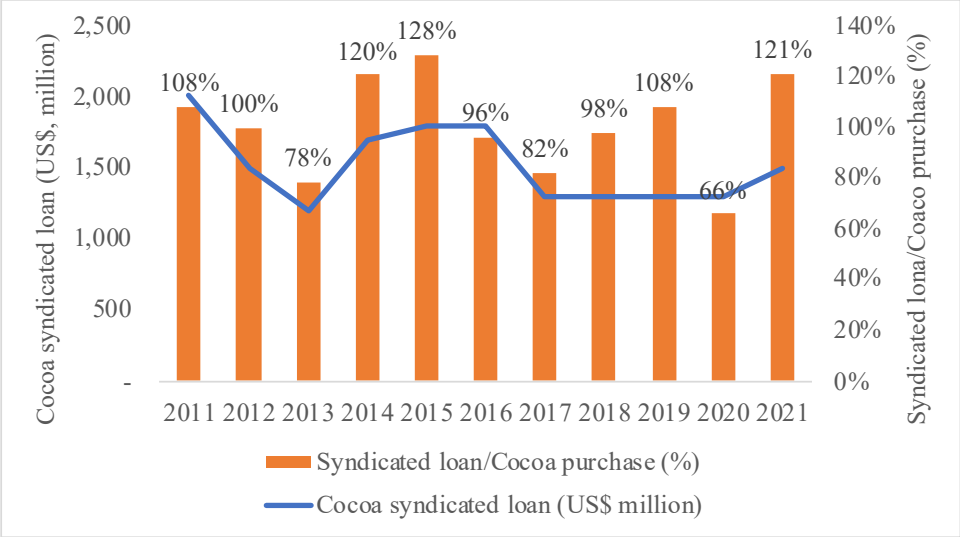
Through its two subsidiaries (CMC and QCC), COCOBOD is mandated per the Ghana Cocoa Board Act of 1984 to purchase, market, enforce quality control, and export cocoa beans as well as regulate the cocoa sector. COCOBOD purchases cocoa beans through licensed buying companies (LBCs) and sells them to international buyers (typically cocoa processing companies) or local processing companies.

Since 1992/93, COCOBOD has been raising funds from the international money market every year to finance the purchase of cocoa from farmers and to cover its administrative expenses and other projects. It signs a one-year syndicated loan agreement with foreign and local financial institutions, which is backed by cocoa sales contracts with its buyers.

The syndicated loan is expected to provide sufficient funding to cover the purchase of all cocoa produced in the season. However, in some years, the syndicated loan covered only a fraction of

the cocoa purchase, the lowest being in 2020 at 66 percent (Figure 6).[8] Some of the cocoa purchase is covered by LBCs' own funds or through borrowing from banks locally or abroad (for foreign-affiliated LBCs). LBCs express concern that the seed funds are often disbursed late, forcing them to use other sources to pay for the cocoa at the farmgate.[9,10] This is very important as the LBCs must honor their commitments vis-à-vis the farmers to secure reliable delivery of cocoa every season. Given that all LBCs must pay the same price for the cocoa, and therefore cannot compete based on the crop price, they must secure the confidence of farmers on other dimensions, including being able to swiftly pay for the cocoa beans upon delivery. Therefore, delays in the disbursement of seed funding by COCOBOD can be costly for the LBCs as they must protect their reputation vis-à-vis the farmers.

Figure 6. Cocoa syndicated loan: volume and coverage of cocoa beans purchase



Source: Authors' construction using data from the Bank of Ghana

COCOBOD's poor financial performance is a chronic problem for the government. The financial statements presented in Table 2 exhibit the typical financial situation of COCOBOD, which over time has run chronic losses in operating a vital sector for the Ghanaian economy. It operates as a monopoly with exclusive rights to purchase and export cocoa beans. It plays a commanding role in the financing of the sector, in setting producer prices and the rules of engagement in the sector. So, the question is: why is it unable to generate a profit in the cocoa business? Monopolies typically

[8] Note that the seed fund may turn around a few times before it is recovered. Therefore, a given amount can be used to purchase a much larger amount of cocoa during the season. It is therefore normal that the value of the seed fund distributed by COCOBOD is less than the total volume of cocoa beans purchased in a season.
[9] Information obtained from meetings with managers of LBCs.
[10] Note that, according to COCOBOD, seed funds are a privilege not a right for LBCs. When an LBC prepares its business plan to apply for a license, it does not include seed funds from COCOBOD as a source of financing for its activities. LBCs are supposed to raise their own funds to purchase cocoa beans. COCOBOD grants seed funds to LBCs to enable them to pay the farmers promptly.

leverage their privileged position in the sector to earn above-normal profits. COCOBOD is an institutionalized monopoly, set up for the explicit purpose of serving the government's goal of running a sector deemed too strategic to leave to the market. In that sense, maybe the assessment yardstick should not be monetary profit. What would be the yardstick then? It is a multidimensional one. It includes the regulation of cocoa trade so that it is transparent, notably to keep cocoa smuggling and export misinvoicing to a minimum. It includes the provision of training and technical support to farmers to improve productivity and combat crop diseases. It also includes the promotion of the wellbeing of cocoa farmers through ensuring a 'living producer price', provision of support services on the farms, investment in infrastructure, and social services such as education through financial assistance with COCOBOD scholarships to farmers' children.[11]

Very importantly, a major value addition of the centralized organizational structure of the cocoa sector is the generation of scarce hard currency and ensuring that export earnings by COCOBOD (on cocoa beans) and Ghanaian-owned companies (cocoa products) are fully repatriated into the country. This is different from the gold sector which is monopolized by foreign companies that enjoy special arrangements about repatriation of export proceeds. Those are all very important outcomes, and they must feature in the assessment of the performance of COCOBOD as a statutory monopoly in the cocoa sector. The analysis in Sections 5 and 6 will shed light on some of these performance dimensions. The analysis will also provide insights into the differences between the cocoa sector and other sectors that run on private-led models such as gold, which is covered in a separate paper that is part of this project (Ndikumana and Cantah, 2023).

Table 2. COCOBOD's financial position (in million GHC)

Description	2018	2019
Revenue	9,038.4	9,762.6
Direct cost	7,311.6	8,134.2
Gross profit	1,726.7	1,628.4
Profit/Loss for the year	-78.2	-320.5
Total equity	1,556.8	2,948.9
Loans	6,650.6	7,148.8
Total liabilities	10,250.9	12,120.1

Source: COCOBOD financial statements, 2018 and 2019

Licensed Buying Companies (LBCs)

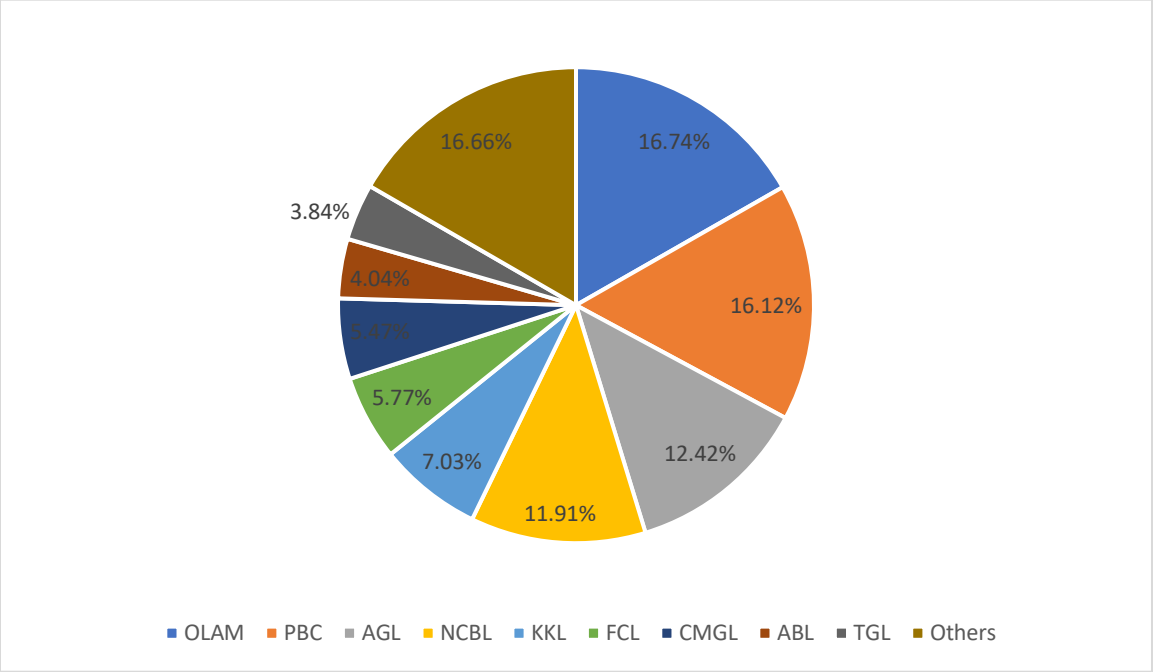
COCOBOD commissions Licensed Buying Companies (LBCs) to buy cocoa beans from farmers, check the quality of the beans, package them, and deliver them to COCOBOD warehouses where

[11] COCOBOD runs a Cocoa Scholarship Award Scheme that provides scholarships for second cycle school, benefiting about 7,500 students per year for the 3-year stream or 10,000 students for the 4-year stream. Source: https://cocobod.gh/social-responsibility-category/cocobod-child-education-support

they are subjected to further quality testing. Except for the Produce Buying Company Limited (PBC), which is a private company in which the government owns shares, all other LBCs are fully privately owned, and the majority are owned by Ghanaians. According to COCOBOD's 2018 annual report, there are 48 LBCs in Ghana.

Despite the large number of companies, the cocoa purchase business is quite concentrated, with the 4 largest LBCs accounting for over 57 percent of total beans purchased in a season. The largest LBCs are Olam Ghana Limited with a market share of nearly 17 percent, PBC with 16 percent, Agroecom Ghana Ltd (AGL) with 12.4 percent, and Nyonkopa Comm. Buyers Ltd (NCBL) with about 12 percent (Figure 7).

Figure 7. Market share of LBCs – 2018/19 Cocoa Season



Source: Ghana Cocoa board 2018/19 annual report

Produce Buying Company Limited (PBC)

PBC is the largest and only LBC in which government shares. It was incorporated in November 1981 as a wholly state-owned enterprise and a subsidiary of COCOBOD. It was changed into a public limited liability company in 1999 and subsequently listed on the Ghana Stock Exchange (GSE) in May 2000. However, the company was suspended from the GSE in August 2019 for failing to publish its financial statements. In December 2021, the suspension was lifted, and its shares have since been traded on the GSE. PBC is primarily responsible for the purchase of cocoa

beans, coffee, shea nuts and shea butter, transportation and storage of these products in warehouses and subsequent sale to COCOBOD. The shareholding structure of PBC is presented in Table 3 and its financial position for 2020 and 2021 is presented in Table 4.

Table 2. PBC Shareholding structure

Name	percent holding
Social Security and National Insurance Trust (SSNIT)	38.10
Ministry of Finance	36.69
African Tiger Mutual Fund Ltd	7.92
NTHC/Institutional Investor Consortium	2.93
SCBN/Mauritius Re Altree Custody Services Ltd	2.50
Current PBC Employees/Commission Agents	1.07
Others	10.79
Total	100
Memo: Total assets as of 2021: GHC859 million	

Table 3**.** PBC's Financial statements in 2020 and 2021 (GHC, million)

	2020 (GHC)	2021 (GHC)
Revenue	614.5	326.9
Gross profit	49.1	29.1
Profit/loss for the year	5.4	1.9
Retained earnings	-472.2	-412.9
Total equity	246.5	187.3
Long term loan	512.7	448.3
Total liabilities	1,152.5	859.1
Memorandum: Debt/equity ratio	*207%*	*239%*

Source: PBC financial statements, 2020 and 2021

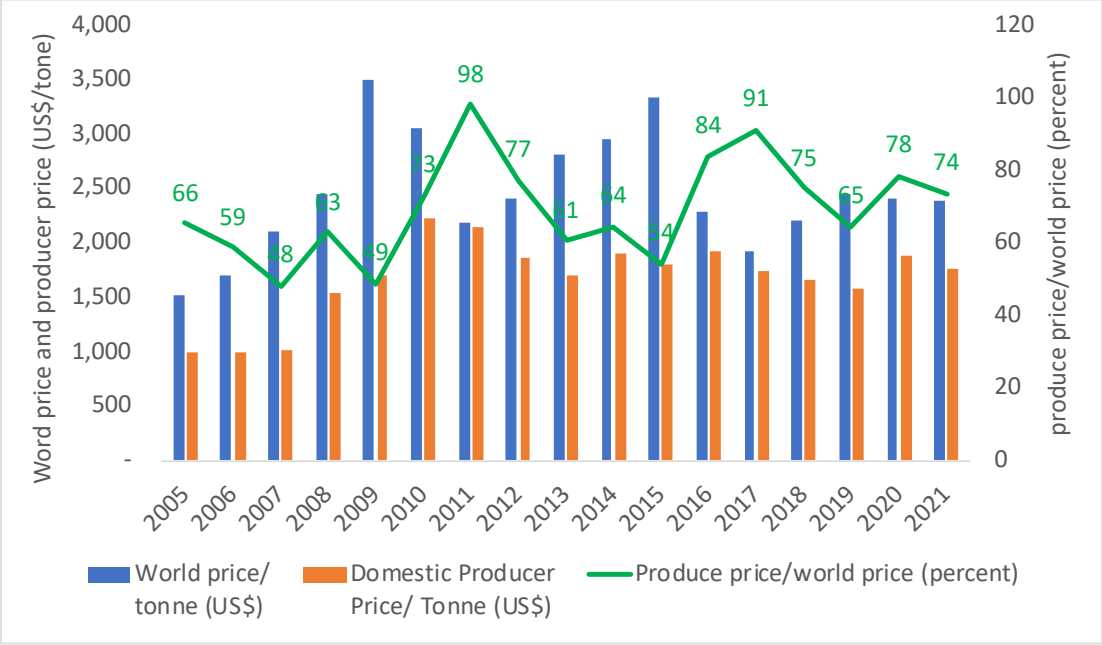
In 2021 PBC made GHC1.9 million in profits, down from GHC5.4m in 2020. However, the negative retained earnings suggest that the company has been accumulating losses over the years. PBC also depends heavily on borrowing from financial institutions. Long-term loans stood at GHC448 million in 2021. It is important to emphasize, however, that the company's high debt to equity ratio is consistent with how the industry is structured as LBCs depend heavily on borrowing, mostly in the form of seed funds from COCOBOD to finance the purchase of cocoa.

Cocoa price setting mechanism

Price determination within the cocoa value chain is subject to government regulation[12] and is controlled by the Producer Price Review Committee (PPRC), which was created in 1983. Chaired by the Ministry of Finance, the PPRC comprises representatives from COCOBOD, the Bank of Ghana, farmers, licensed purchasing companies (LBCs), and haulers. The government's policy is to ensure that cocoa farmers receive no less than 70 percent of the international market price of cocoa beans on an annual basis. The technical committee of the PPRC undertakes the price setting exercise based on projections of FOB cocoa prices in US$, the exchange rate of the cedi to the US dollar, and the crop size in the following crop year.[13] The PPRC also considers expected prices in the neighboring countries to discourage smuggling. COCOBOD then announces the cocoa producer price just before the opening of the main cropping season in October.

Figure 8 presents the trend of the ratio of the domestic producer price to the world market cocoa price. The year 2011 was unique in that the domestic price nearly equaled the world price. This situation was caused by a sharp fall in the world market price relative to 2010 partly due to increased global supply of cocoa, and the government's inability to reduce the farmgate price due to the high political sensitivity of any price cut. Ghana exported more than 1 million metric tons of cocoa in 2011 for the first time in its history. In response, the government of Ghana reduced the export tax on cocoa to support the domestic price in the interest of farmers, effectively reducing the government's expected revenue (Budget statement, 2012).

Figure 8. World market price and domestic producer price of cocoa



Source: Authors' construction using data from the International Cocoa Organization (world market price); Ministry of Finance (domestic producer price). GHC prices are converted into US$ prices

[12] See Kolavalli et al. (2012).
[13] See Vigneri and Kolavalli (2017).

using the average annual exchange rate. Note that while the world cocoa price includes the cost of insurance and freight (CIF), the farmgate price is on a free-on-board basis. Therefore, part of the difference is accounted for by the CIF.

While the government's goal is to guarantee a stable producer price of at least 70 percent of the world cocoa price, the actual ratio fluctuates substantially; it was as low as 48 percent in 2007, but also as high as 98 percent in 2011. The variation in the ratio is due to fluctuations in the world price and imperfect information about other factors considered in in setting the producer price, notably movements in the GH¢/US$ exchange rate.

Challenges faced by operators in the cocoa sector in Ghana

Private companies operating in the cocoa sector in Ghana face several challenges related to the cyclical nature of the crop, centralized regulation of the sector, uncertainties and costs related to the domestic economic environment as well as the vagaries of global cocoa markets. For LBCs, the first challenge is inherent to the centralized control of price setting by the government, which forces LBCs to devise non-price-based means to secure their supply of cocoa beans, notably by establishing credibility of timely payment procedures. In addition, LBCs offer various services to farmers, including credit, support to farmers cooperatives with education and sensitization, and geo-mapping of farms to determine input needs and land potential to increase productivity. LBCs may also engage in other activities related to corporate social responsibility, and some of them promote environmental sustainability which may be of interest to foreign buyers who prefer and promote "green cocoa".

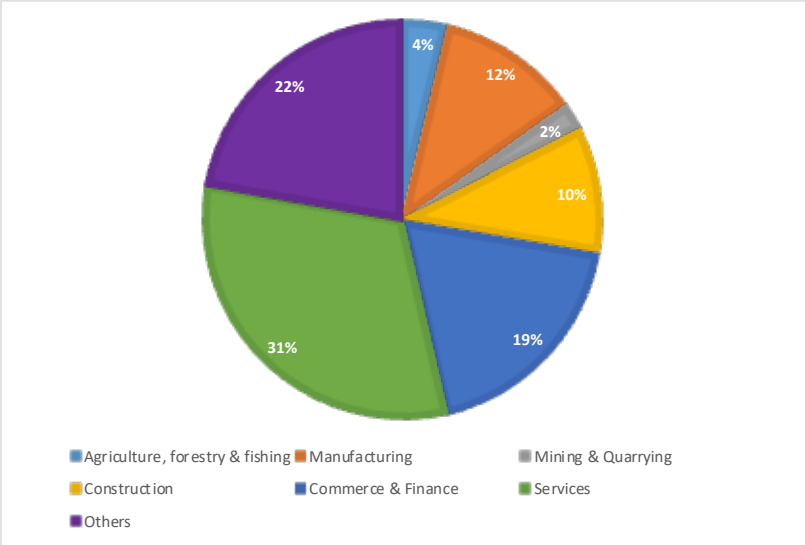
Another challenge faced by LBCs is securing adequate financing to purchase cocoa beans and cover other operating expenses. LBCs rely significantly on seed funds from COCOBOD, leading to high debt to equity ratios in their balance sheets.[14] An important problem cited by LBCs is the delay in the disbursement of seed funds, which endangers their ability to pay the farmers on time. While foreign-owned LBCs may be able to secure funding from abroad notably from their parent companies, this poses a currency mismatch problem as they must pay farmers in cedis and collect payments from COCOBOD in cedis, making it costly to repay foreign loans that are denominated in foreign currency.

For all LBCs, borrowing from domestic banks is costly given the high lending interest rates and their limited profit margins. The agriculture sector generally receives a very small share of domestic bank credit partly due to the high-risk perception of banks vis-à-vis the sector (Nkurunziza, Ndikumana, Nyamoya, 2016; Ndikumana, Naidoo, Perez 2023). The lion's share of bank credit goes to the service sector, especially the commerce and finance, and their shares in total bank credit have been rising over time (Figure 9). Over 2020-2022, 31.4 percent of total bank

[14] However, note that LBCs are expected to mobilize their own funds (see footnote #9) and that the seed funds are granted by COCOBOD to ensure prompt payment to farmers.

credit was allocated to the services sector. The commerce and finance sector received 18.7 percent of the loans, followed by manufacturing (11.5%) and construction (10.2%). Agriculture received just 3.7 percent of total loans while mining and quarrying received 2.3%.

Figure 9. Sectoral allocation of credit to the private sector, average 2020-2022 (percent of total)



Source: Author's construction using data from Bank of Ghana

To alleviate the financing constraints faced by local LBCs, COCOBOD has now limited its supply of seed funds to domestically owned LBCs. However, foreign-owned companies believe that such a practice creates an uneven playing field in favor of domestic companies. Foreign owned LBCs find this ironic given that they are often called to help COCOBOD when it needs cash by providing advance payment of cocoa beans.[15]

5. Contribution of the Cocoa Sector to the Ghanaian Economy

The fiscal regime and government revenue mobilization from cocoa

The fiscal regime governing any sector has two main objectives. The first is to mobilize government tax and non-tax revenue along the entire value chain from exploration to production, export and repatriation of foreign exchange earnings from exports. The second is to incentivize private engagement in the sector by providing reductions and waivers of tax on profits, equipment imports, and other fiscal accommodations. For example, while the statutory corporate income tax (CIT) in Ghana is 25%, a reduced rate of 1% is applied to cocoa product processing businesses

[15] Insights from meeting with managers of private LBCs in Ghana in January 2023.

conducted wholly in the country for the first five years.[16] The fiscal regime governing the cocoa sector has evolved over time, with occasional fine tuning of the regime to better achieve these two objectives.

In the 1950s, the government increased export taxes and began to capture a significantly bigger portion of cocoa export earnings through a progressive *ad valorem* tax that varied with the average price of cocoa (Kolavalli and Vigneri, 2011). Following the 1954 elections, the cocoa export tax was raised again, although the producer price had remained unchanged for four years. In the context of declining international cocoa prices, this caused dissatisfaction and agitation among cocoa growers, prompting the government to raise producer prices in 1956–57. Cocoa production declined substantially in the 1970s and 1980s due to a lack of incentives for farmers, worsened by high taxes. For example, taxes accounted for 44 percent of cocoa export earnings in the 1983/84 crop season (Kolavalli and Vigneri, 2011). Given that cocoa competes with other crops for the farmer's time and land, the fiscal regime is an important tool positioning cocoa favorably in the agricultural sector relative to other crops.

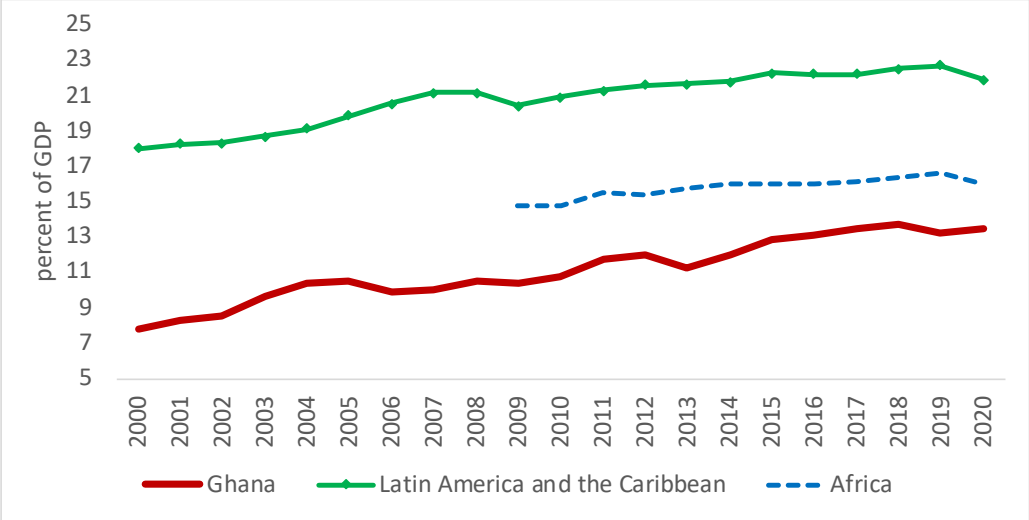
Starting with reforms under the Economic Reform Program period (1983-1991), the government sought to implement measures aimed at reversing the decline in cocoa production (Roldan et al., 2013; Kolavalli and Vigneri, 2017). It crafted a medium-term cocoa development strategy in 1996, which included increasing the producer's share of the F.O.B. price of cocoa from 60% in 1999/2000 to 70% in 2004/05, a 2 percentage points increase each year. This increase was made possible by a steady reduction in cocoa taxes and enhanced cocoa marketing efficiency. In June 1999, the government declared that the nominal producer price for the 1999/2000 crop year would remain at 2,250 cedis per kilogram, the same as the previous year. Given the drop in international cocoa prices within the period, this increased the producer's share of the free-on-board price of cocoa to 70%, while cutting the burden of cocoa taxes to 15% (Harnack et al., 2000).

We have not been able to obtain data on tax revenue collection from the cocoa sector specifically and therefore cannot assess the overall effectiveness of the fiscal regime relative to the objective of maximizing government revenue from the cocoa sector. However, an examination of aggregate data indicates that the government has made some progress over the years, with a slowly but steadily increasing tax revenue relative to GDP. The tax revenue to GDP ratio increased from 7.8% in 2000 to 13.4% in 2020. However, this remains well below potential and significantly low relative to other countries. As can be seen in Figure 10, Ghana's tax to GDP ratio has trended much below Africa's average. Generally, Africa performs poorly in tax mobilization relative to other regions, and Ghana performs below the African continent's average of 16% (Figure 11). Within African countries, Ghana's position below the trend line in Figure 12 indicates that it has room to

[16] Ghana Investment Promotion Center, "Ghana Incentives Inventory".

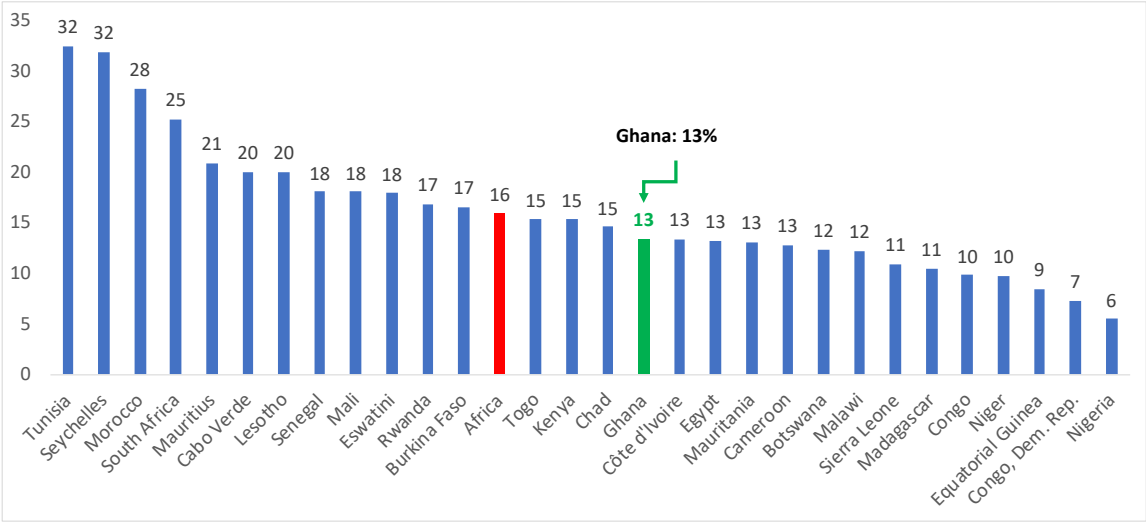
increase tax revenue collection by better leveraging its economic endowments. In other words, the government is 'leaving money on the table' due to ineffective tax revenue mobilization.

Figure 10. Trend of tax revenue to GDP (%): Ghana vs. regional averages



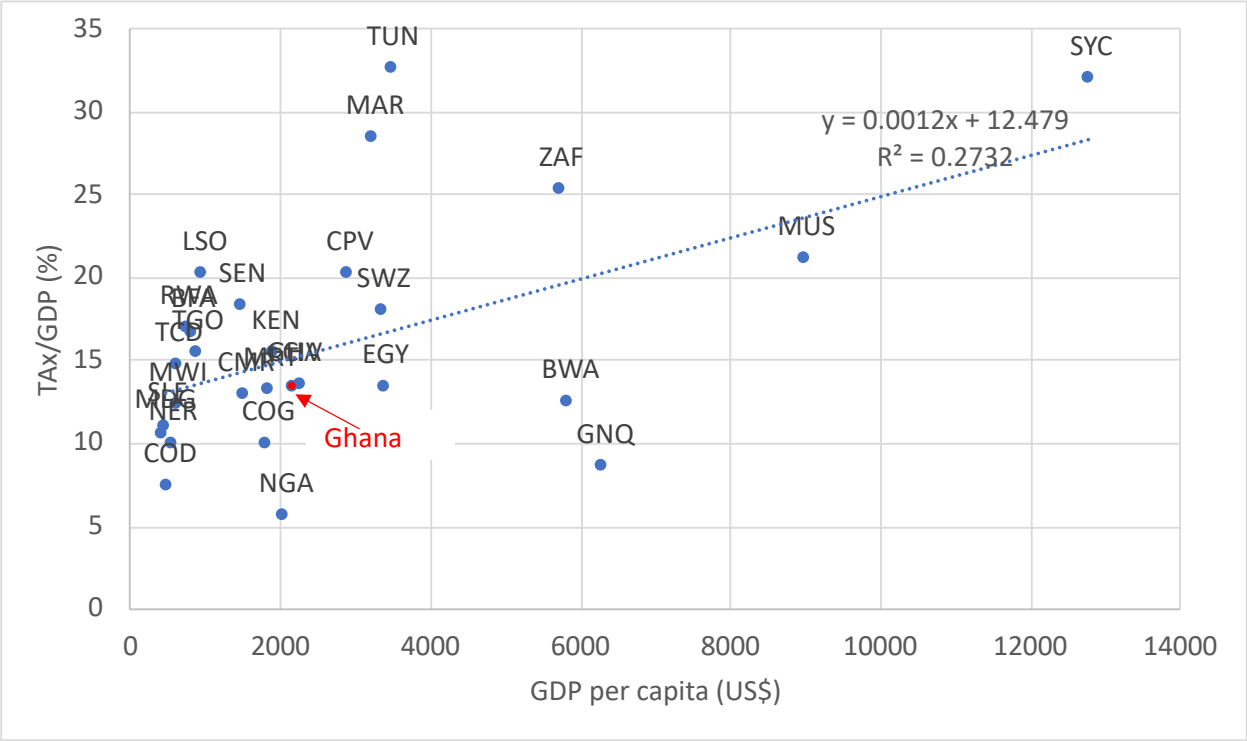
Source: OECD tax database, https://www.oecd.org/tax/tax-policy/tax-database/

Figure 11. Tax revenue to GDP ratio (%) in African countries, 2020



Source: OECD tax database, https://www.oecd.org/tax/tax-policy/tax-database/

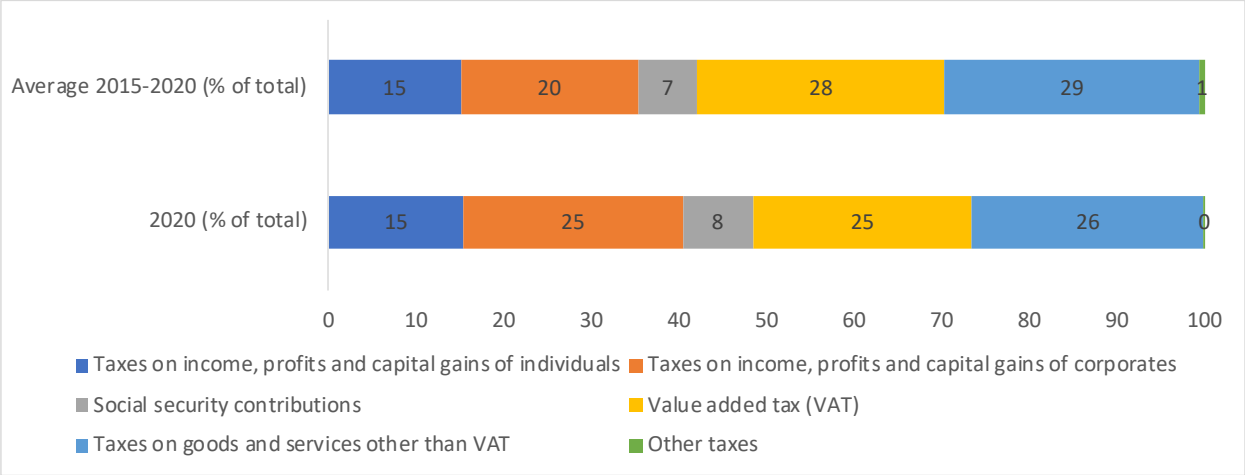
Figure 12. Tax revenue relative to GDP per capita in comparative perspective, 2020



Sources: OECD tax database, https://www.oecd.org/tax/tax-policy/tax-database/; World Development Indicators

Ghana's tax structure is heavily dominated by trade tax and corporate tax. In 2020, VAT represented 25 percent of total taxes, and other taxes on goods and services accounted for 26 percent (Figure 13). This was followed by corporate income and capital gains tax accounting for 25 percent. A detailed presentation of the performance by main categories of taxes and their contribution to total taxes is provided in Table 5.

Figure 13. Tax structure (percent of total taxes), 2020 and average 2015-2020



Source: OECD tax database, https://www.oecd.org/tax/tax-policy/tax-database/

Table 5. **Tax collection performance in Ghana in comparative perspective**

	2020				Average 2015-2020			
	Ghana	Africa	Top performer	OECD	Ghana	Africa	Top performer	OECD
Total tax (% of GDP)	13.4	15.9	31.3 (Seychelles)	33.5	13.3	16.2	31.9 (Seychelles)	33.4
Key tax categories, percent of GDP								
Taxes on income, profits and capital gains (total)	5.5	6.1	12.6 (South Africa)	11.3	2.7	2.8	5.5 (South Africa)	11.1
Taxes on income, profits and capital gains of individuals	2.1	3.1	9.1 (South Africa)	8.3	2	3.1	9 (South Africa)	8
Taxes on income, profits and capital gains of corporates	3.3	2.9	5.5 (Seychelles)	2.8	2.7	2.8	5.5 (Seychelles)	2.9
Taxes on goods and services (total, including VAT)	6.8	7.9	18.8 (Seychelles)	10.6	7.6	8.3	19.1 (Seychelles)	10.8
Value added tax (VAT)	3.4	4.5	10 (Seychelles)	6.7	3.7	4.8	10.2 (Seychelles)	6.7
Social security contributions	1.1	1.5	10 (Tunisia)	9.2	0.9	1.4	10.2 (Tunisia)	8.9
Key tax categories, percent of total tax revenue								
Taxes on income, profits and capital gains (total)	41.0	38.4	40.3	33.7	20.3	17.3	17.2	33.2
Taxes on income, profits and capital gains of individuals	15.4	19.5	29.1	24.8	15.0	19.1	28.2	24.0
Taxes on income, profits and capital gains of corporates	24.6	18.2	17.6	8.4	20.3	17.3	17.2	8.7
Taxes on goods and services (total, including VAT)	50.7	49.7	60.1	31.6	57.1	51.2	59.9	32.3
Value added tax (VAT)	25.4	28.3	31.9	20.0	27.8	29.6	32.0	20.1
Social security contributions	8.2	9.4	31.9	27.5	6.8	8.6	32.0	26.6

Source: OECD tax database, https://www.oecd.org/tax/tax-policy/tax-database/

Contribution of the cocoa sector to GDP

The cocoa sector contributes to GDP in diverse ways. Data from the Ministry of Finance indicates that in 2020 the crop subsector contributed GHC25.7 billion to GDP (at constant 2013 prices). Out of this, cocoa contributed GHC2.8 billion, representing 11 percent of GDP of the crops sub-sector (Table 6).

Table 6. Contribution of cocoa to GDP at constant 2013 prices (GHC, million)

Year	Agriculture GDP	Crop sub-sector GDP	Cocoa GDP	Cocoa GDP as a percent of crop sub sector GDP
2016	26,824	19,788	2,318	11.7
2017	28,491	21,207	2,531	11.9
2018	29,880	22,447	2,625	11.7
2019	31,271	23,636	2,768	11.7
2020	33,583	25,703	2,821	11.0

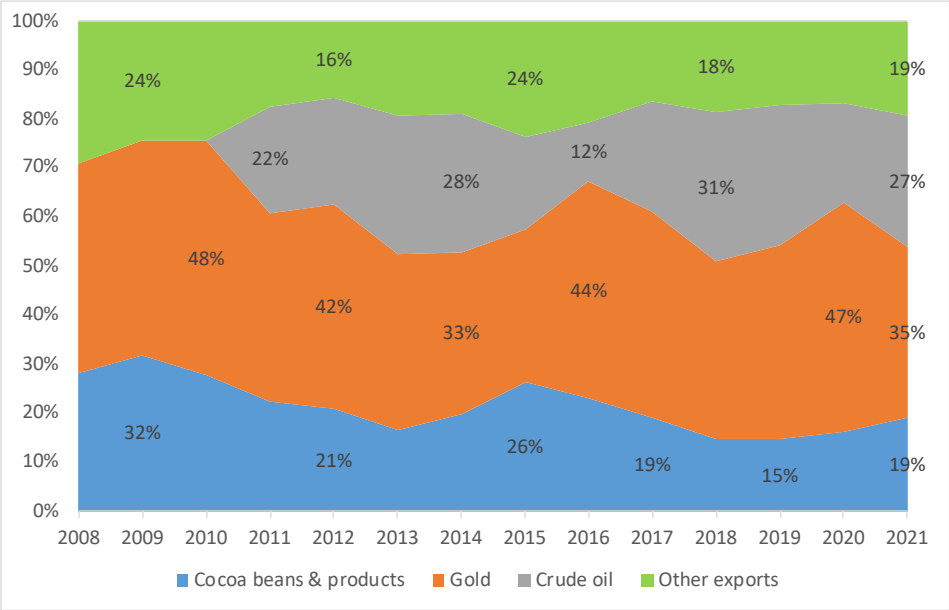
Source: Authors' computation using data from the Ministry of Finance

Exports and foreign exchange earnings from cocoa

Cocoa is strategically important especially due to its contribution to foreign exchange earnings through three key channels, namely exports of cocoa beans and products, external financing of cocoa purchase through syndicated loans, and foreign direct investment in the sector. A major distinguishing feature of the cocoa sector from other export-oriented sectors, such as gold, is that exports of cocoa beans are fully controlled by COCOBOD, and therefore the totality of export proceeds are repatriated to the country through the Bank of Ghana. In that sense, the volume of cocoa beans exports is a relatively accurate indicator of the inflows of foreign exchange from cocoa beans exports. National companies are also obligated to repatriate fully the proceeds of exports of derived cocoa products, while foreign-owned companies are exempt from such obligation.

In 2021, Ghana exported $2.8 billion worth of cocoa beans and products, which represented 19 percent of total exports. This placed cocoa in third position after gold (35%) and crude oil (27%). The share of cocoa in total exports has declined steadily over time, especially at the beginning of the 2010s with the discovery of oil (Figure 14). Between 2009 and 2021, its share has declined a full 13 percentage points from 32% to 19%.

Figure 14. Share of cocoa and other leading exports in total exports (percent)



Source: Authors' computation using data from the Balance of Payments Statistics, Bank of Ghana

In addition to exports, the cocoa sector brings in foreign exchange reserves through the syndicated loan borrowed by COCOBOD annually. Over the past five years, the loan brought in an average of $1.3 billion in foreign exchange, with variations in the amount reflecting fluctuations in the size of annual cocoa production. The loan was $1.1 billion in 2022, down from $1.5 billion in 2021.

The last source of foreign exchange inflows into the country thanks to the cocoa sector is foreign direct investment. While we could not access data on FDI destined specifically for the cocoa sector, an examination of the distribution of FDI across sectors suggests that the share of the cocoa sector is likely to be very small. The entire agriculture, forestry and fishing sector receives less than 1 percent of total FDI flows to Ghana (data from the Bank of Ghana). Most foreign direct investments go to the mining and quarrying sector which captures 68 percent of total inflows, with finance and insurance coming at a distant second place with 14 percent. The limited amount of foreign investment in the cocoa sector is partly a result of the dominance of the government in the sector, a strategic decision that certainly carries costs and benefits.

Cocoa and poverty reduction

Cocoa is a source of livelihood for households that are directly involved in planting cocoa on their farms as well as those that are employed at the various stages of the cocoa production and processing value chain. The cocoa sector, therefore, has a high potential for contributing to the fight against poverty. It can be a source of wealth creation through the development of local entrepreneurship along the cocoa value chain, as well as activities that are related directly or

indirectly to the sector through spillover effects. The actual contribution of cocoa to poverty reduction and wealth creation ultimately depends on production and productivity at the farm level, access to financing for farmers and other operators in the sector, crop prices, and the overall economic environment as it influences the purchasing power of revenue from cocoa as well as the cost of living.

Data on the actual contribution of cocoa to poverty reduction and wealth creation is quite scarce. But an approximate picture can be gleaned from the limited information we were able to obtain from various sources. The results of the Ghana Census of Agriculture (2017) indicate that cocoa cultivation dominates tree crop agriculture in Ghana, accounting for 78.6 percent of cultivated land in cocoa growing areas. Data from the 2021 Housing and Population Census indicates that the agricultural sector, which includes the cocoa subsector, employs 3.2 million people, representing about 33 percent of the total labor force. Cocoa employs about 800,000 farmers directly, and it is a major source of livelihood for over six million people in the country (ISSER, 2017; Tutu, 2009, Asamoah et al. 2013; Anthonio and Aikins, 2009).

Regarding poverty reduction, a 2007 study found that poverty among cocoa farmers had declined from 60% in 1991/92 to 23.9% in 2005/2006 (World Bank, 2007). Amankrah (2008) also found evidence of a reduction in poverty rate associated with cocoa farming activities and the provision of social amenities by the government in cocoa growing areas. While it is difficult to isolate the impact of cocoa on poverty levels and trends, the evidence shows that on average poverty tends to be lower in cocoa growing areas compared to non-growing areas. Indeed, data from the Ghana Living Standards Survey (GLSS 7) indicates that in 2016/17, non-cocoa growing regions had a relatively higher poverty incidence compared to cocoa growing areas (Table 7 and Figure 15).[17]

[17] It is worth noting that rural roads and other types of infrastructure are in higher supply and better quality in cocoa-growing areas than in non-cocoa growing areas. This might also contribute to overall better economic environment and lower poverty in cocoa growing areas.

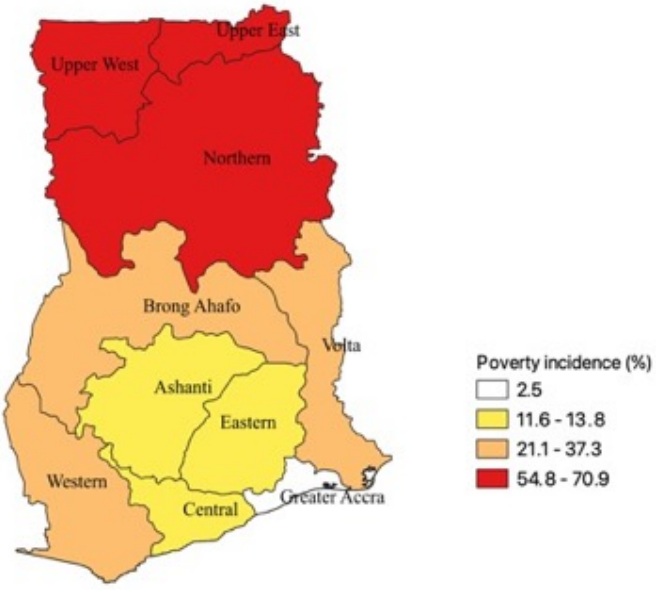
Table 7. Cocoa farming and poverty incidence by region, 2016/2017

Region	Poverty incidence (%)	Volume of cocoa beans purchased by COCOBOD (tons) 2019/2020 year
Ashanti	11.6	165,830
Eastern	12.6	89,131
Volta*	37.3	5,383
Central	13.8	85,526
Western*	21.1	332,647
Brong Ahafo*	26.8	88,460
Non-cocoa growing regions		
Upper West	70.9	-
Upper East	54.8	-
Northern*	61.1	-
Greater Accra	2.5	-

Source: Ghana Living Standard Survey 2016/2017 and COCOBOD[18]

* Note: Under the new administrative map, Brong Ahafo has been split into three regions: Ahafo, Bono, Bono East; Western split into two regions: Western and Western North; Volta split into two: Volta and Oti; and Northern split into three: Northern, North East and Savannah.

Figure 15. Poverty incidence by region



Source: Authors' construction[19]

[18] https://cocobod.gh/cocoa-purchases

[19] The authors are grateful to Dr. Didier Wayoro for his assistance with the design of the map. The map shows the 10 regions (as opposed to the new 16 regions) according to which the survey data was collected.

* Note: Under the new administrative map, Brong Ahafo has been split into three regions: Ahafo, Bono, Bono East; Western split into two regions: Western and Western North; Volta split into two: Volta and Oti; and Northern split into three: Northern, North East and Savannah.

Several historical and structural factors account for the stark disparity in poverty incidence between Ghana's northern regions and the other regions. One major historical factor of these disparities is the colonial legacy. Ghana's northern regions traditionally suffered from colonial era marginalization, while southern regions, which are richer in natural resources such as gold, cocoa, and timber, were the focus of the colonial administration's economic program. This resulted in the underdevelopment of the Northern regions' infrastructure, lack of educational opportunities, limited access to markets and less favorable economic prospects (Shepherd et al., 2004). Even in the post-colonial era, the northern areas have generally seen less investment in infrastructure development, including poor healthcare services, insufficient electricity access, and inadequate road networks. Despite efforts to close the infrastructure gap, there hasn't been a coordinated plan to balance regional growth across the country.

Secondly, geographical factors partly explain the higher levels of poverty in the North. Compared to the South, the North is characterized by a more arid climate and less fertile land, which makes agriculture more difficult and less productive (Chamberlin, 2005). Droughts are common in the North, which causes crop failures and deepens food insecurity and poverty. The northern areas have historically had limited access to high-quality education, resulting in higher illiteracy. In 2013, the adult literacy rate was 30.6% for Northern Region, 36.6% for Upper East and 38% for Upper West, compared to the national average of about 60%, 79.1% for Greater Accra and 63.1% for Ashanti Region (GSS, 2014). Lastly, in contrast to the southern areas, which are more industrialized and have a better environment for food and cash crop agriculture, the northern regions offer fewer economic opportunities. Cash crops like cocoa tend to do better in the southern areas, enhancing he comparative advantage of the south.[20] The combination of colonial legacy of marginalization, structural and geographical disadvantages, and lack of mitigating policies contribute to keeping the northern regions behind in terms of social and economic development, hence the higher poverty rates.

What would the farmer say?

To get a real sense of the contribution of cocoa to the wellbeing of farming households, we visited farms in Nyankrom near the town of Swedru in the Central region of Ghana in January 2023. Cocoa cultivation is the main activity for cocoa farmers in the area as in other cocoa growing regions. One of our hosts grows cocoa on an eight-acre land and produces an average of eight sacks of fresh cocoa beans on average per year. The male head of household shared that working

[20] The northern regions have potential for cotton, rice and shea nut cultivation, but these have received less attention than cocoa.

on cocoa occupies all his time – and even his nights, as he must "keep one eye open" for thieves for the week that it takes to dry fresh beans on a stand outside his house. The household's modest living conditions illustrate of the low income generated from growing cocoa. While the family has been able to build a small house covered with aluminum sheets, it does not have much of anything else in terms of valuable assets derived from cocoa. Subsistence farming (banana, cocoa yam, vegetables, etc.) helps supplement the monetary revenue from cocoa. In addition, the children benefit from COCOBOD scholarships if they make it to high school.

So, how much does our host household earn per year from cocoa framing? At the 2022-2023 season cocoa price of 800GHC/bag[21], the 8 sacks would have generated 6,400GHC, which is 46 percent of per capita GDP (2021 value). This means that to earn the national average per capita GDP from growing cocoa, our host farmer in Nyankrom would have to either more than double productivity or the area planted (to 17.5 acres), both of which would be difficult to achieve. If our host is representative of the average cocoa farming household, it means that poverty remains a real threat for the average cocoa grower in Ghana.

This example seems to represent the lower bound of the earning prospects of a cocoa farmer given the particularly low yield reported by the farmer. Estimates of cocoa yields vary substantially by source, region (quality of the soil), type of land tenure and even gender of the owner. As can be seen in Table 8, the yield varies from 1 bag to 2.3 bags per acre. The estimates suggest that to earn the GDP per capita (using 2021 values), a farmer would have to engage a minimum of 8 acres at the highest productivity and up to 20 acres at the lowest productivity.

The disparities in cocoa yields suggest that there is room for improvement by activating the appropriate policy levers, especially through increased investments in quality input, care for the cocoa trees, and technical support to farmers. The benefits from such investments can be substantial both at the household level and at the national level.

[21] The beans in a bag of cocoa weigh 62.5 kilos. The empty bag adds about 1 kg, and a sample for the three quality checks adds another 0.5 kg.

Table 8. Various estimates of cocoa yields by land tenure rights and gender of the farm owner

	Yield per hectare (kg)	Yield per acre (kg)	Yield per acre (bags)	Income per acre in cedis	Income per acre in current US$	Cocoa income per acre in per cent of per capita GDP 2021	Acres needed to earn income equivalent to per capita GDP
				at 800 cedis/bag	at 10GHC/US$ (2023 rate)	Per capita GDP: 13983GHC	
By land tenure type							
Abunu[22]	214.9	87.0	1.4	1113.7	111.1	7.9%	12.6
Abusa[23]	157.5	63.8	1.0	816.2	81.6	5.8%	17.1
Owner	139	56.3	0.9	720.3	72.0	5.1%	19.4
By rights to land							
Full rights	327.3	132.5	2.1	1696.1	169.6	12.1%	8.2
Partial rights	233.6	94.6	1.5	1210.6	121.1	8.7%	11.6
By gender							
Female	334	135.2	2.2	1730.9	173.1	12.4%	8.1
Male	360.3	145.9	2.3	1967.1	186.7	13.3%	7.5
Farmer visited in Nyankrom			1	800	80	5.7%	17.5

Source: Report on Land Tenure & Cocoa Production in Ghana A CRIG/WCF Collaborative Survey, February 2017, Nana Kofi Acquah/LANDMAPP. https://www.worldcocoafoundation.org/wp-content/uploads/files_mf/1492612620CRIGLandTenureSurveyFinal41217.pdf

Notes: 1 bag = 62.5 kg; 1 ha = 2.47 acres. Acres needed to earn per capita GDP in 2021 are obtained by dividing GDP per capita (13,983GHC) by income per acre in GHC. Total earnings by the farmer in Nyankrom on 8 acres = 8x800GHC = 6,400GHC = 46% of 13,983 GHC (2021 per capita income).

[22] Under the *Abunu* land tenure system, a piece of land is given to a farmer and crops are shared equally between the farmer and landowner. The *Abunu* system is used for perennial crops or tree crop production.

[23] Under the *Abusa* land tenure system, the farm is divided into three: two-thirds go to the farmer and one-third to the landowner. The *Abusa* system is often used in the case of annual crop production.

6. ‘Counting the Beans’: Investigation of Export Misinvoicing and Smuggling

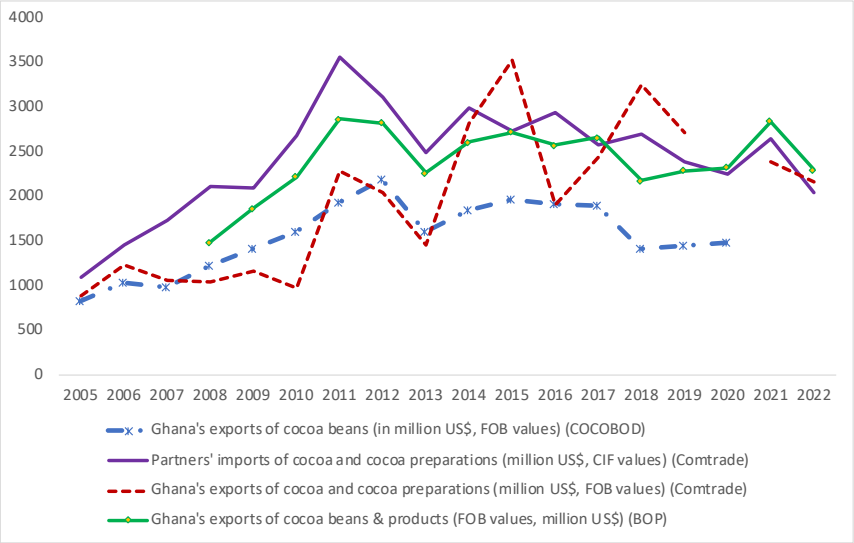
In this section, we assess the degree of exposure of the cocoa sector to capital flight through estimation of cocoa export misinvoicing and possible smuggling across neighboring borders. While there are other channels of capital flight, export misinvoicing of primary commodities constitutes an important mechanism of capital flight and other illicit financial flows that plague resource-rich countries in Africa and other developing regions. The analysis is based on a comparison of mirror trade data between Ghana and its trading partners following the established methodology in the literature (Ndikumana and Boyce 2022). The section begins by comparing export data from various sources to examine possible inconsistencies across sources, which is often a preliminary indicator of export misinvoicing. This is followed by formal estimation of cocoa export misinvoicing focusing on the ten leading trading partners.

Cocoa export misinvoicing

Inconsistency in cocoa exports data

The data on cocoa exports shows some inconsistencies in levels and trends across sources. This can be seen in Figure 16 which presents data from COCOBOD, the Balance of Payments (Bank of Ghana) and Comtrade. The differences may arise for various reasons, including whether the data refers to just cocoa beans alone or includes cocoa products, reporting delays and various statistical errors. Specifically, COCOBOD exports only include cocoa beans, while the other series include cocoa beans and derived cocoa products. This explains the difference between Balance of Payments and COCOBOD values. Further below, we assess whether these differences could be due to export misinvoicing by using Comtrade as the common source for data on Ghana’s exports and its partners’ imports, accounting for the cost of insurance and freight.

Figure 16. Ghana's cocoa exports and partners' imports (million US$), various sources



Sources: COCOBOD, Bank of Ghana (BOP data), Comtrade

Estimation methodology

Cocoa export underinvoicing refers to situations where the value of cocoa exports recorded by Ghana, augmented by the cost of insurance and freight, is significantly below the value of cocoa imports (CIF value) as reported by Ghana's trading partners in the Comtrade database. The cost of insurance and freight is obtained from the OECD's "International transport and insurance costs of merchandise trade" (ITIC) database,[24] categories HS 1801-1806. To estimate cocoa export misinvoicing we use the methodology developed by Ndikumana and Boyce (2022)[25] with data from Comtrade over the period 2000-2022.

For Ghana's trading partner j in year t, cocoa export misinvoicing DX is estimated as follows:

$$DX_{Gj,t} = M_{jG,t} - cif_{Gj,t} * X_{Gj,t} \qquad \text{eq. 1}$$

$X_{Gj,t}$ stands for Ghana's cocoa exports to partner j in year t as recorded in Ghana's data in Comtrade, $M_{jG,t}$ represents cocoa imports by Ghana's trading partner j as recorded by partner j, and $cif_{Gj,t}$ is the cost of insurance and freight for cocoa exports from Ghana to country j. A positive value of DX indicates export underinvoicing, reflecting capital flight, while a negative value would indicate export overinvoicing, which is rather rare.

[24] The database can be accessed online here: https://stats.oecd.org/BrandedView.aspx?oecd_bv_id=itcs-data-en&doi=9c638cb6-en

[25] Also see Ndikumana and Boyce (2010).

Export misinvoicing may occur for several reasons, which fall into three main categories: financial motives; circumventing foreign exchange controls; and reducing administrative burdens (Buehn and Eichler 2011; Buehn and Farzanegan 2012; Patnaik, Gupta, and Shah 2012; Storti and de Grauwe, 2012).[26] In the specific case of cocoa exports from Ghana, these motives do not apply in the case of cocoa beans because the entity in charge of exporting them is a government-owned organization (COCOBOD), which has no incentives of minimizing taxation and evading exchange controls. Exports of cocoa beans by any other actor or entity is forbidden by law. It follows that under this specific industrial organization arrangement, discrepancies between Ghana's recorded exports and partners' recorded imports of cocoa beans would reflect statistical inconsistencies due to reporting delays and errors, as well as smuggling of cocoa beans between Ghana and its neighbors. The smuggling of cocoa beans would generate apparent export underinvoicing if the importer is able to identify the product as originating from Ghana while the transaction does not appear in Ghana's statistics as it crossed borders illicitly.

The standard motives for export misinvoicing would, however, apply to the case of cocoa products, which are exported by private cocoa processing companies. For this reason, we present estimates of export misinvoicing both for total exports of cocoa and cocoa products and results for export misinvoicing of cocoa beans alone.

Estimates of export misinvoicing of cocoa and cocoa products

The estimation results of export misinvoicing for cocoa and cocoa products are reported in Table 9. The analysis focuses on the top ten leading partners in terms of shares in total exports. The leading buyer of Ghanaian cocoa and cocoa products is the Netherlands, accounting for 27 percent of Ghana's total exports. It is followed by Malaysia (10 percent of total exports), and farther by the United States (7.2%), Belgium (6.5%) and the United Kingdom (6.2%)..

The comparison of Ghana's exports and its partners' imports reveals relatively low discrepancies, suggesting that export misinvoicing is minimal. Nonetheless, some cocoa export underinvoicing is detected in cocoa sold to France ($2.2 billion), the United Kingdom ($1.5 billion), and Germany ($1 billion), while overinvoicing is observed in the case of trade with Belgium ($1 billion) and Malaysia ($880 million). Overall, trade with the rest of the world exhibits apparent export underinvoicing to the tune of $12 billion out of the $59 billion of total exports. Relative to the volume of exports, the estimated export misinvoicing of cocoa and cocoa products is limited. This contrasts with the neighboring Côte d'Ivoire where cocoa trade exhibits substantial discrepancies pointing to both export underinvoicing as well as export overinvoicing connected with transit through trading hubs (Merckaert, 2022). The case of the cocoa sector in Ghana also differs

[26] See Kellenberg and Levinson (2016) and UNCTAD (2016) for further discussions of the motives for trade misinvoicing, with a focus in the latter on primary commodities exports from resource-rich developing countries.

markedly from the gold sector which exhibits large discrepancies in the export data, pointing to both export underinvoicing and export underinvoicing (Ndikumana and Cantah, 2023).

The case of cocoa beans

The results of the analysis of bilateral trade statistics for cocoa beans only are presented in Table 10. Cocoa beans represent 81 percent of total exports of cocoa and cocoa products. They exhibit the same geographical distribution, with the Netherlands and Malaysia as leading importers. The pattern of export misinvoicing is also similar with underinvoicing of cocoa beans destined to France ($2.2 billion) and the United Kingdom ($1.4 billion). There is a larger volume of overinvoicing of cocoa beans destined to Netherlands ($1.5 billion), and similar levels for Belgium ($865 million) and Malaysia ($855 million). Overall misinvoicing of cocoa beans is much smaller than that of cocoa and cocoa product, estimated at $7,3 billion, representing 16 percent of total exports of cocoa beans over the period 2000-2022. In a nutshell the discrepancies in mirror trade statistics are substantially lower for cocoa beans than overall cocoa sector exports, which is a result of the control of exports by COCOBOD. Even the observed discrepancies cannot be explained by the usual motives of export misinvoicing as they would not apply to a product managed by a publicly owned entity.

Table 9. Exports misinvoicing of cocoa and cocoa preparations, total over 2000-2022 (billion, constant 2022 US$)

Partner	Matched years only			All years		Partner's share (%)	
	Export misinvoicing	Ghana's exports	Partner's imports	Ghana's exports	Partner's imports	Share in Ghana's exports to World	Share in Partners' imports
Belgium	**-1,070.2**	2,850.1	2,003.2	2,850.1	2,098.0	6.5	3.3
France	**2,203.9**	2,200.6	4,575.3	2,200.6	4,894.5	5.0	7.8
Germany	**1,002.7**	2,292.1	3,472.9	2,292.1	3,703.1	5.2	5.9
Japan	**528.3**	2,238.7	2,967.2	2,238.7	3,202.2	5.1	5.1
Malaysia	**-880.4**	4,401.7	3,933.0	4,401.7	4,123.8	10.0	6.5
Netherlands	**-81.4**	11,915.3	12,759.8	11,915.3	13,468.8	27.1	21.3
Spain	**-186.2**	1,755.6	1,705.6	1,755.6	1,852.4	4.0	2.9
Türkiye	**812.0**	1,526.8	2,459.9	1,526.8	2,731.7	3.5	4.3
United Kingdom	**1,555.4**	2,714.1	4,485.3	2,714.1	4,697.1	6.2	7.4
USA	**621.8**	3,172.7	3,964.4	3,172.7	4,233.9	7.2	6.7
World	**12,047.5**	**44,040.3**	**59,550.4**	**44,040.3**	**63,106.4**	**100.0**	**100.0**

Source: Authors' computation using data from Comtrade

Table 10. Exports misinvoicing of cocoa beans*, total over 2000-2022 (billion, constant 2022 US$)

Partner	Matched years only			All years		Partner's share	
	Export misinvoicing	Ghana's exports	Partner's imports	Ghana's exports	Partner's imports	Share in Ghana's exports to the World	Share in Partners' imports
Belgium	**-865.6**	2,609.8	1,927.6	2,609.8	2,020.3	7.3	5.7
France	**2,205.0**	1,425.8	3,730.0	1,425.8	3,937.4	4.0	11.1
Germany	**638.8**	1,473.3	2,214.6	1,473.3	2,331.4	4.1	6.6
Japan	**446.2**	2,102.2	2,719.1	2,102.2	2,937.2	5.9	8.3
Malaysia	**-855.2**	4,313.3	3,826.5	4,313.3	4,005.6	12.1	11.3
Netherlands	**-1,524.4**	9,142.0	8,255.2	9,142.0	8,628.2	25.7	24.3
Spain	**-419.9**	1,301.4	971.4	1,301.4	1,071.2	3.7	3.0
Türkiye	**391.9**	1,438.2	1,931.6	1,438.2	2,185.8	4.0	6.1
United Kingdom	**1,444.8**	2,386.8	4,002.2	2,386.8	4,188.3	6.7	11.8
USA	**472.8**	2,349.5	2,904.2	2,349.5	3,084.8	6.6	8.7
Total (cocoa beans only)	**7,330.6**	35,566.9	45,371.9	35,566.9	47,791.8	100.0	134.4
Share of total cocoa & derived products	61%	81%	76%	81%	76%		

* Note: The statistics in this table cover cocoa beans only (HS 1801) and do not include cocoa preparations

How about cross border cocoa smuggling?

Smuggling of cocoa across borders from or into Ghana is a result of several factors that can be categorized into structural, policy, and other domestic and global factors. The key structural factor is the seamless nature of the borders between Ghana and its neighbors, in the sense that no deterrent physical barrier such as a river or lake separates Ghana from Côte d'Ivoire, Togo and Burkina Faso. This makes it particularly difficult to monitor the movement of cocoa between Ghana and its neighbors. In fact, in some areas, cocoa farms straddle the border between Ghana and Côte d'Ivoire, making it impossible to enforce any kind of "rule of origin" for cocoa. The seamless nature of the borders implies that farmers can sell their crop in either country depending on various factors influencing the returns to the transaction, mainly the differential in producer prices and in the convenience and timeliness of the payment procedures.

A key policy factor driving cocoa smuggling is the disparity in price setting mechanisms. While the producer price is determined by the Producer Price Review Committee in Ghana, it is determined by market forces in the case of Côte d'Ivoire. This implies possible significant 'price gaps' between the cocoa market in Ghana and in neighboring countries, which induces smuggling into or out of Ghana depending on the direction of the price differential. An empirical study by Jebuni-Dotsey (2023) finds that the real price differential between Ghana and its neighbors induces smuggling, especially in the cocoa growing regions bordering Côte d'Ivoire and Togo. The study estimated that one percent higher price abroad leads to between 0.11% and 0.53% losses in cocoa sales for Ghana. The study finds that the intensity of cocoa smuggling has trended down recently as the disparities in real prices have narrowed.

Another policy factor of cocoa smuggling is the exchange rate, as it influences the purchasing power of the farmer's and trader's earnings in each country. In the case of Ghana, for example, a faster depreciation of the cedi than the CFA against major currencies in 2022 most likely induced cocoa smuggling into Côte d'Ivoire.

Measuring smuggling is difficult given its nature as a clandestine and illicit activity. To provide a glance at the extent of cocoa smuggling we compare the value of Ghana's exports to neighboring countries as reported by Ghana and the value of imports of Ghana's cocoa reported by its neighbors in the Comtrade database. Obviously, this is an imperfect approach given that the very purpose of smuggling is to avoid recording on either side of the border. Moreover, when cocoa is eventually exported, there is no clear means of identifying its true origin in the importer's statistics. In other words, when a company in Côte d'Ivoire purchases cocoa that was smuggled from Ghana, it has no effective means of distinguishing it from locally produced cocoa. The Ghanaian cocoa beans may therefore get out of Côte d'Ivoire with a Côte d'Ivoire label. A similar scenario happens on the Ghana side where smuggled Ivorian cocoa is comingled with Ghanaian cocoa at the export station.

The analysis of cocoa export statistics in Comtrade shows very little trade with Ghana's neighbors (Table 11). Cocoa exports to Burkina Faso, Côte d'Ivoire and Togo reported in Comtrade database represent less than 0.1 percent of total cocoa exports. The discrepancies in bilateral trade statistics are also very small. It is likely that systematic smuggling is limited.

Table 11. Cocoa trade between Ghana and its neighbors: cumulative amounts over 2000-2022 (million, constant 2022 $)

Partner / neighbor	Only matched year		All years		Share in Ghana's exports to World (percent)	
	Ghana's exports	Partner's imports	Ghana's exports	Partner's imports	Share in Ghana's exports to World	Share in Partners' imports
Burkina Faso	2.1	0.6	2.1	1.1	0.00	0.00
Côte d'Ivoire	15.9	17.9	16.0	18.1	0.04	0.03
Togo	6.8	3.1	6.8	3.5	0.02	0.01
Total (neighbors)	24.9	21.6	25.0	22.6	0.06	0.04
World	44,040.3	59,550.4	44,040.3	63,106.4	100	100

Source: Authors' computation using data from Comtrade

7. Conclusion

The special place of cocoa in Ghana as 'a political crop' is exhibited in the scrutiny by the government on the operations of the sector from plantations to the export counter. The sector is an important source of livelihood for millions of Ghanaians who draw income directly from growing cocoa and indirectly from employment along the cocoa value chain, or indirectly from businesses that benefit from the sector's spillover effects. While there is no good data on the direct impact on household revenue, the limited information available suggests that it is modest. It is also an important potential source of government tax and non-tax revenue as well as foreign exchange earnings. However, actual revenue collection from corporate income tax from the sector has remained below the potential. From a positive perspective, this underachievement in revenue mobilization suggests that there is room to improve if proper reforms and interventions are undertaken and enforced.

This paper sought specifically to investigate the role of the cocoa sector in the Ghanaian economy with a particular purpose of exploring whether and to what extent it is exposed to capital flight through export underinvoicing as is typical for natural resources in most African resource-rich countries. Recent evidence that illustrates this capital flight-natural resource nexus include studies on cocoa in Côte d'Ivoire (Merckaert, 2023), oil in Angola (Shaxson, 2023) and minerals in South

Africa (Aboobaker et al., 2023). The analysis in this paper focused on the cocoa sector, examining export misinvoicing as a channel of capital flight through the analysis of mirror trade statistics between Ghana and its trading partners as reported in Comtrade. While there are some discrepancies in the export data across various sources, the results from the analysis of trade statistics show little evidence of cocoa export misinvoicing. In that sense, the cocoa sector in Ghana is indeed very different from the one in Côte d'Ivoire. It is also very different from the gold sector in Ghana where there is substantial gold export misinvoicing and systemic opacity in gold trade statistics. The outcomes are impacted by the ownership structure – domestic vs. foreign, private vs. public – and the extent of regulation of the sector throughout the entire value chain. It appears that government control of the cocoa sector in Ghana is associated with lower risk of capital flight through export misinvoicing. It is also associated with substantial welfare gains, especially in terms of predictability and stability of cocoa producer price, and ensuring repatriation of foreign exchange earnings from exports of cocoa beans that are managed by COCOBOD, which is an elusive goal for other resource rich countries where extractive sectors are fully liberalized and privatized. The evidence implies that the organizational structure of the extractive sector plays an important role in maximizing the gains for the national economy and particularly for reducing the exposure to capital flight.

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