



LUND UNIVERSITY
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Growth, Inequality and Poverty in the Gold Coast, 1891-1947

Evolution of a Colonial Cash Crop Economy

by

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The triangular nexus of growth, inequality and poverty is one of the central themes of contemporary development economics. Despite the Gold Coast being one of the most well-researched colonial economies of Sub-Saharan Africa, so far no comprehensive study regarding the colony's PGI triangle exists. This thesis connects the dots drawn up by the extensive body of previous research concerning the Gold Coast, presenting a comprehensive story of a cash crop colony. The study confirms that the immense growth was made possible by a combination of local agricultural capabilities in the form of cocoa agriculture and the technological developments in transportation brought by the British. However, in line with most theoretical frameworks concerning the PGI triangle, not every resident of the colony was able to equally benefit from the new opportunities, and inequality rose across the colony, while absolute living standards increased. The performance of the cocoa economy drove these trends both directly and indirectly, while different geographical and political characteristics, plus the access to rail transportation, gave rise to new patterns in regional differences.

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1 Introduction

For much of the recent past, African economic history has focused on explaining current variances in incomes instead of tracing trajectories of growth that have taken place, often leading to what Austin (2008) dubbed the „compression of history” (Jerven, 2014). However, heavily contradicting Acemoglu and Robinson (2012), Jerven (2014) and Green (2016) attest that in many cases, neither indigenous nor colonial institutions were contraproductive to growth. The Gold Coast, known as Ghana since 1957, is one such case. Moreover, the Gold coast is one of the most well-researched economies of colonial Africa (Jerven, 2014), with numerous scholarly works making use of the immense amount of primary data and historical recordings that is passed down to the field mainly in the form of colonial administrative documents.

Major works concerning the history and politics of the country have existed at least since the 1960’s (Ward, 1967, Kimble, 1963). Extensive studies of the Gold Coast’s cocoa economy made their debut at a similar time (Hill, 1963, Szereszewski, 1965). Recently, Austin (2005, 2008, 2014), Jerven (2014) and Green (2016) have made significant contributions towards a historically accurate portrayal of the growth trajectory and labour relations of the colony, while Luntinen (1996) and Jedwab and Moradi (2016) have deepened our understanding of the importance of the Gold Coast’s railway transportation revolution. Aboagye and Bolt (2018) have uncovered the evolution of inequality within the country during the colonial period, while quantitatively measured living standards have been explored by Rönnbäck (2014) Moradi (2008) and Moradi, Austin and Baten (2007 & 2013).¹

1.1 Aim and Scope

However, to the knowledge of this author, no work exists to date that attempts to truly connect the dots drawn up by this extensive body of literature. Thus, the contribution of this thesis is manyfold. Besides fitting into the line of literature examining the growth-inequality-poverty triangle, a central issue of contemporary development economics (Bourgignon, 2004),

¹ Naturally, the list is incomprehensive.

the thesis bridges existing gaps within the literature covering the economy and society of the Gold Coast by presenting the interactions of the so far separately studied aspects of the colony's history. Moreover, due to its wide scope, the thesis may act as a meta-study and a starting point for those interested in delving deeper into the issues at hand themselves.

1.2 Outline of the Thesis

This thesis will present an analysis of the growth-inequality-poverty triangle regarding the British colony of the Gold Coast between 1891 to 1947. Section II presents a brief literature review of the meta-scope of this thesis, explaining the motives and nature of British colonialism in West Africa and the basics of the growth-inequality-poverty triangle as defined by contemporary development economics literature. Section III is an extensive literature review, compiling works about the Gold Coast from the beginning of the twentieth century to the most recent years, and wherever possible, connecting the particularities of the Gold Coast to the meta-historical analysis of colonialism and the theoretical background of the growth-inequality-poverty triangle, as presented in section II. The literature review explores separately the three distinct strains of scholarly works dealing with economic growth, inequality and living standards and poverty, respectively. Section IV explains in detail the methods and data that were used in the three OLS regressions that provide the backbone of this analysis, the results of which are presented in section V. Section VI briefly summarizes and discusses these results and concludes the thesis.

2 The Wider Context of British Colonial Rule and the Growth-inequality-poverty Triangle

2.1 European Activity and British Colonialism in West Africa and the Gold Coast

The presence of Europeans on the coasts of West Africa began around the fifteenth century, with the arrival of Portuguese traders (Shumway, 2014). In the following centuries, they were followed by the French, the English, the Dutch, the Swedes, the Danes and the Germans, drawn to the region by the promise of natural resources and slaves. The onset of conflicts, conquest and direct political control was preceded by three and a half centuries of trade partnership (Kimble, 1963). Until the late nineteenth century, European interests were vested in mutual trade, not territorial domination of any kind (Kimble, 1963, Shumway, 2014).

The British crown eventually banned the trading of slaves to all of its subjects in 1807. While the issue of slavery has hung heavily on the European conscience ever since, it must be noted that more fortunate African societies were eager and willing to participate in the trade as partners (Kimble, 1963, Moradi, Austin and Baten, 2007, Rönnbäck, 2015). While certain local groups were amongst the strongest opposers of the abolition (Kimble, 1963), Akurang-Parry (2004) writes of a tradition of anti-slavery amongst the Gold Coast intelligentsia. The dividing nature of the African slave industry is explored by Whatley and Gillezau (2011) who find that ethnic stratification increased as a result of slavery on the West African coast.

The British abolition of slavery failed to stop both internal slave trading and trafficking conducted by the merchant fleets of other nations (Kimble, 1963, Lovejoy and Richardson, 1995). However, after 1807, the nature of trade between Africans and Britain shifted permanently to what was basically an exchange of foodstuffs and raw materials for manufactured products (Kimble, 1963), the latter including both a wide selection of industrial goods and textiles, as well as luxury items such as alcoholic beverages and tobacco products.

British forts and settlements along the coastline were not under direct Crown control until well into the nineteenth century. The Gold Coast Settlements came under permanent Imperial rule in 1843 (Kimble, 1963, Shumway, 2014), and even then, the onset of Imperial administration followed trade, and not vice versa (Kimble, 1963). The large-scale colonization of Africa began only in the last decades of the nineteenth century, before which European presence was mostly confined to the trading outposts on the very coastlines of the continent. This late, but very quick process of colonization was, amongst others, fueled by discoveries of rich resource deposits on the African mainland, growing sentiments of nationalist pride, geopolitical scrambles and developments in medicine and industrial technology, which finally enabled the penetration of the continent for Europeans. The spheres of influence claimed by European powers were largely unrecognized by rival states until the Berlin Treaty of 1885, when imperialist powers effectively partitioned the continent between themselves (Shumway, 2014).

The motivations behind this spurt of European expansion in Africa, however, is a highly debated topic of history. The Marxist tradition of understanding economic imperialism views colonization and expansion as a mere process of securing greener pastures for accumulated capital, with the sole intention of reaping higher profits after returns have started their decline in the home country. This view came under heavy fire by groups of scholars who understood the late-nineteenth-century scramble for Africa as an acquisition of geopolitically important strategic locations, the development of which as colonial estates was a mere necessity of covering the costs of their administration (Hopkins, 1968). However, renowned economic historian A. G. Hopkins (1968) maintains the legitimacy of conventional economic explanations, while also not completely dismissing theories with different orientations in their explanation of the processes. Hopkins (1968) relies on a case study of Lagos, Nigeria, where British business circles were very much active in lobbying and pressuring the government to extend colonial rule in order to secure their own economic interests. In any case, the colonial expansion of European powers, and by extension, the colonial era of Africa is a complex and diverse issue, involving much of the entire history of two continents across centuries. Even with the broadest of generalizations, it is established that the nature of colonial presence in Africa differed vastly not only depending on the identity of the colonizer, but also whether we are talking about settler colonies or not. It is the conviction of this author that when reductionist terms and explanations must be used for the sake of convenience, it should be

done – and, on part of the reader, perceived – with a humble appreciation and full recognition of the infinite complexity of human intention and interaction, down from the state level to the last individual.

Nonetheless, Shumway (2014) asserts that before 1874, British-African political relations on the Gold Coast were based on somewhat equal treaties, holding native African diplomatic traditions in respect. Since the times of the abolition, the British crown protected the interests of merchants involved in legitimate² commerce. In this, they were under pressure by various merchant groups (Shumway, 2014) – the more pluralistic relationship between English monarchs and capitalists are a well-studied aspect of economic history, considered to be the root of Britain's success by some (Acemoglu and Robinson, 2012). From the 1830's the region was considered a Protectorate by the British. After the signing of an 1831 treaty „for the better protection of lawful commerce” (Shumway, 2014, 7), the language of official British communication reflected more and more a sense of authority over the coast, until a military gambit by the Ashanti kingdom in 1873 prompted Britain to openly annex the Southern parts of modern-day Ghana under colonial rule in 1874. This was eventually followed by an extension of the colony over the forest kingdom of Ashanti and the vast savannah of the Northern Territories in 1901 (Shumway, 2014).

2.2 The Growth-inequality-poverty Triangle

The relationship between growth, inequality³ and poverty has captivated the minds of economists since the 1960's, when several developing nations enjoyed high growth rates, without the expected reduction in poverty rates (Perkins et al, 2005). Kuznets (1955) hypothesized that with the transformation of agricultural economies into industrial ones, the very different rates of return between the two sectors should result in growing inequalities, while as the industrial transition closes to its final stages, more people gain from the benefits of industry, and inequality decreases. In a similar, but more nuanced manner, Adelman (1984) writes that in earlier stages of development, inequality rises as different parts of the population have different possibilities in responding to the emerging high-productivity opportunities facilitated by technological development. The renowned two-sector labour-

² Meaning non-slavery trade.

³ Throughout this section „inequality” refers to intra-country inequality, unless noted otherwise.

surplus model of Lewis (1954) can also be used to understand the interaction of growth and inequality (Perkins et al, 2005). According to Lewis (1954), a traditional agricultural economy tends to employ more people than necessary, and thus the emerging industrial sector can soak up labour reserves with zero negative marginal product for the agricultural sector. As wages are kept down by this mechanism but industrial profits increase, rising inequality in the early stages of development finds a possible explanation (Perkins et al, 2005).

While growth and inequality captured by the Gini coefficient are quite straightforward concepts, the definition of poverty is at all times subjective (Perkins, 2005). Different countries often define poverty for themselves, while the World Bank has its own poverty line, updated every now and then, currently sitting at 1.90 PPP USD of daily expenditure, measured in 2011 prices (Perkins et al, 2005, World Bank, 2019). Supposedly, thresholds for absolute poverty ought to measure the minimum requirement for caloric replacement (Adelman, 1984). In other authors' words, the absolute poverty line is supposed to cover needs that are „physically and socially essential” (Bourgignon, 2004, 1). However, according to Lahoti and Reddy (2015), the latest rebasing of the poverty line resulted in a lower threshold than the one used before 2015. This lowering of the poverty standard explains much of the recently reported positive developments in the fight against poverty, meanwhile multiple scholars argue that the standards set by the World Bank underestimate the needs of a dignifiable human life by a long shot (Hickel, 2015). Nonetheless, when dealing with economic history reaching into the more distant past, scholars can not rely on World Bank definitions and data, and very often not directly on administrative records of the economy at hand, either. As the contemporary concept of poverty was not a focal point of economic thinking, at least not in colonial economies, more complicated and creative ways must be devised to assess the extent of poverty.

The concept of relative deprivation should also be assessed when addressing the extent of poverty. While absolute poverty lines, no matter how subjective, reflect an attempt to capture objective thresholds of health and well-being (Perkins et al, 2005), the concept of deprivation defines poor people according to income levels relative to those of their societies (Bourgignon, 2004). Nolan and Whelan (1996) conceptualize poverty as an exclusion from certain aspects of societal life due to a lack of resources, thus relativizing the definition of poverty according to the understanding of the respective societies of the poor. Santos (2013) writes of deprivation not only as a function of direct income, but access to public facilities

such as roads, education, healthcare etc. While Nolan and Whelan (1996) find that current income is only one of the factors significantly affecting self-assessed deprivation, there is a long tradition of literature assessing the negative psychological and societal effects of relative income deprivation (Åberg Yngwe, 2005, Kondo, 2015, Chan et al, 2017), indicating that assessing poverty beyond absolute definitions is also an important component of developmental thinking. However, Nolan and Whelan (2014) find that rising inequality, inexorably connected to the concept of deprivation, can not yet be conclusively asserted as a driver of worsening societal conditions in itself.

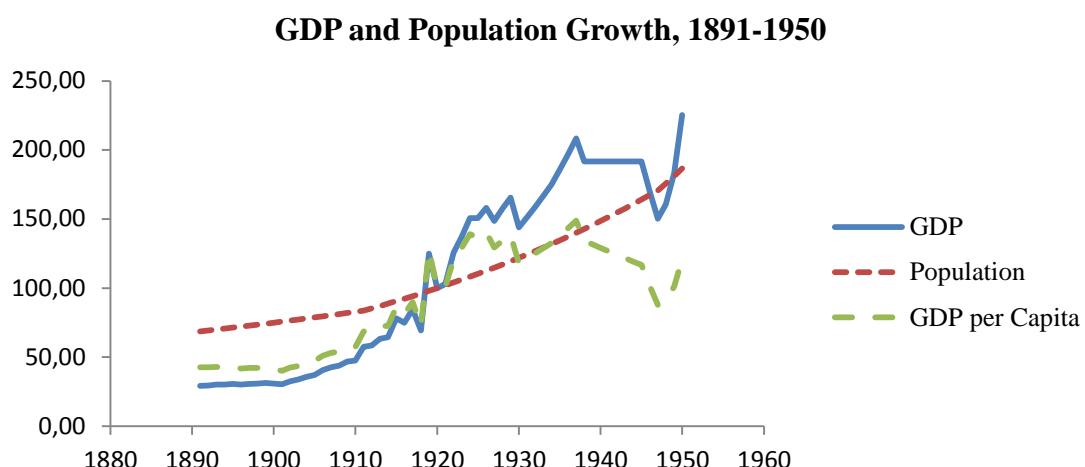
The arithmetics of the growth-inequality-poverty triangle are explained in detail in Bourgignon (2004). Whether growth spurts have a significant effect on poverty reduction depends greatly on the growth and inequality elasticity of poverty (Bourgignon, 2004) – inequality, for example, can also decrease through a strengthening of the middle classes, without the poorest strata receiving any benefits. While these relationships are purely arithmetic, Bourgignon (2004) asserts that the true challenge rests in finding the balance between growth and distribution policies, and by extension, isolating the effects of inequality on growth – in the case of the Gold Coast, targeted distribution-altering policies were hardly in the scope of the colonial administration, at least to the knowledge and understanding of this author. Berg et al (2018) presents empirical evidence that lower net inequality, controlling for the effect of redistribution, is benign to growth. However, in this thesis, the link will be examined only from the perspective of the effect of growth on inequality and not the other way around. Moreover, to the knowledge of this author, it is apparent that most scholars (Adelman, 1984, Bourgignon, 2004, Perkins et al, 2005, Berg et al, 2018) addressing the growth-inequality-poverty triangle do so from the perspective of a contemporary definition of development policy, complicating the task of connecting colonial economies from the examined period to more recent development literature.

3 Literature Review of the Gold Coast, 1891-1947

3.1 Economic Growth of the Gold Coast, 1891-1947

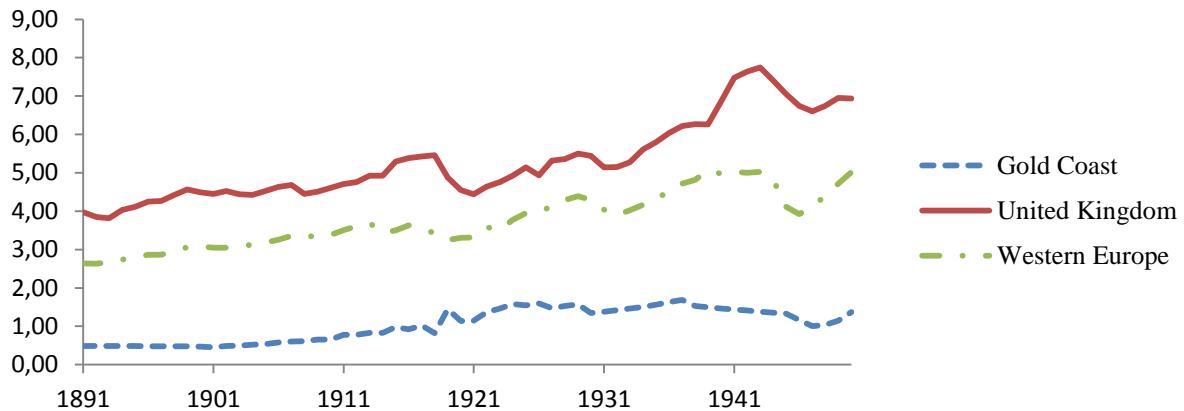
Perhaps the most comprehensive summarizing account of the Gold Coast's growth in the studied period is Morten Jerven's (2014) study estimating GDP series for colonial Gold Coast between 1891 and 1957. Besides the provided dataset that will be explained in detail in section III, Jerven's (2014) paper is a great summary and starting point for any further papers working with the larger picture of the Gold Coast's economy during the period.

Based on physical quantitative data compiled from colonial Blue Books, Jerven's study (2014) finds a cca. 3-fold increase in GDP per capita measures between 1891 and 1947. The calculations are partially based on earlier works including Szereszewski (1965) and Maddison (2003) and are mostly in line with earlier scholarly works covering the history of the Gold Coast. Jerven refers to Dowrick and DeLong (2003) to suggest that the Gold Coast made progress in closing the gap with the industrial core during the interwar period. Naturally, the statement's validity varies with each different definition of the „industrial core”, but data from Maddison (2003) regarding the UK and an average of 12 Western European countries, juxtaposed with Jerven's estimates, does not seem to support it, at least not on terms of pure GDP per capita.



1. Figure: GDP and Population in the Gold Coast, 1891-1850, 1920= 100, source: Jerven, 2014

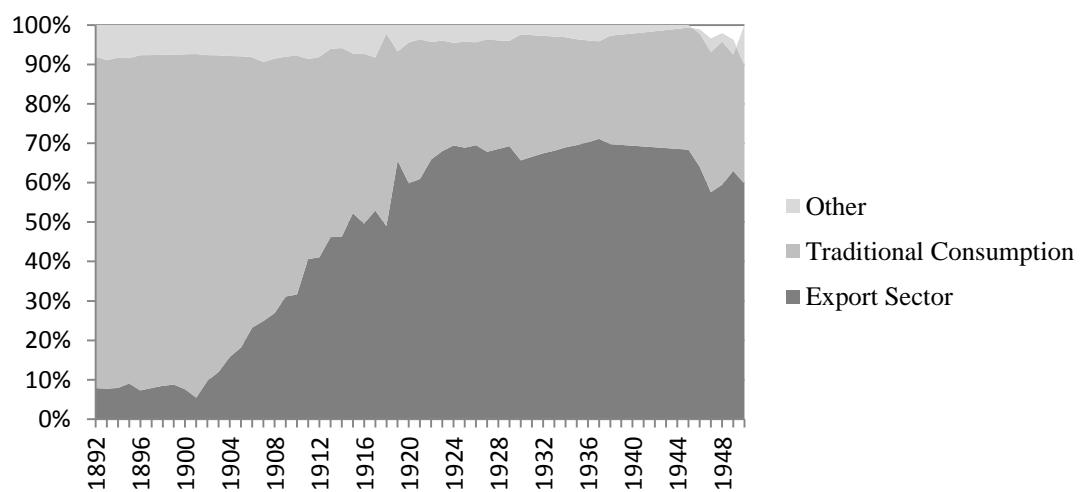
GDP per capita Convergence, 1891-1950



2. Figure: GDP per capita Convergence between 1891 and 1950, based on Jerven, 2014 and Maddison, 2003. Y axis represents billion 1990 International Dollars.

Nonetheless, significant growth had taken place between 1891 and 1947. Jerven (2014) reinforces the well-known fact that the Gold Coast boom was mainly driven by exports, chief among them cocoa, supplemented by minerals and palm products. Exports were taxed substantially, leading to steady increases of public expenditure, further driving GDP growth. „Traditional” consumption, practically the unrecorded section of the economy, was assumed to grow in line with the Gold Coast population, which also boomed in the period. Regardless, its GDP weight decreased from 85 to 57 percent in the first two decades of cocoa trade (based on Szereszewski, 1965) and gradually kept decreasing throughout the colonial period.

Gold Coast GDP Composition, 1892-1950

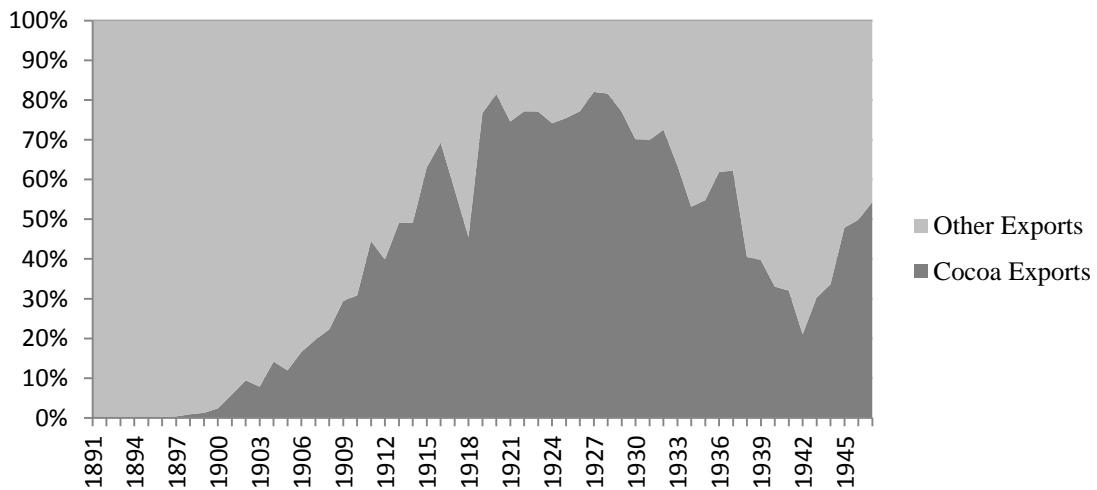


3. Figure: Gold Coast GDP Composition, 1892-1950, based on Jerven, 2014

Jerven (2014) also mentions the potential drawbacks of heavy reliance on primary exports – the lack of strong backward and forward linkages, the exposure to price shocks, and, in the case of cocoa, the heavy role of the so-called forest rent. According to Jerven (2014), his study discovers nothing fundamentally new. Rather, his paper confirms and puts real, quantitative data and analysis behind concepts that were largely already known to the field.

As the Gold Coast's growth was primarily based on exports of cocoa, an at least rudimentary understanding of the nature and local history of the crop itself is essential for understanding the colony's growth trajectory. Director of Agriculture W. T. D. Tudhope provided perhaps the first detailed report of the Gold Coast's cocoa industry in 1909, much before the peak of the cocoa industry in the 1930's. Tudhope asserts that until that point, every ounce of the dominant cash crop had been produced by native farmers – unlike in most other, primarily Asian, cash crop colonies at the time. Green (2016) reinforces Tudhope's point, stating that the cocoa industry was built entirely on capabilities indigenous to the Gold Coast.

Weight of Cocoa in Gold Coast Exports, 1891-1947



4. Figure: Weight of Cocoa in Gold Coast Exports, 1891-1947, based on Frankema, Williamson and Woltjer (2018)

The importation of cocoa that would result in serious economic expansion was most probably done by natives returning from other parts of Africa (Tudhope, 1909, Ghana Cocoa Board, 2019). Nonetheless, Tudhope claims that a government-run botanical station in Aburi, distributing plants and seeds from 1890, was instrumental in the boom. Tudhope finds support for his claim in the fact that at first the cocoa industry took off around the Akwapim region in South-Eastern Ghana, where Aburi is located (Tudhope, 1909). It is true that the Eastern Province, notably Akwapim and Akim Abuakwa, can be considered the cradle of the

Ghanaian cocoa industry (Austin, 2014). On the contrary, Green (2016) quotes Hymer (1971, unknown publication), who asserts that „*The industry was developed by Ghanaian capital, Ghanaian enterprise, and Ghanaian technology, with little help from the colonial government*“. This assertion somewhat contradicts the traditional Marxist understanding of economic imperialism (as in Hopkins, 1968), as little to no British capital was directly involved in the cocoa boom.

The particularities of cocoa farming are explained in detail by first Tudhope (1909) and then Green (2016). The jungle bush is cleared away, with leaving the taller trees standing. In the cleared areas, food crops and young cocoa plants are often planted simultaneously, partially explaining the fact that food production during the period did not decrease with the onset of cocoa farming (Jerven, 2014). The farms are then given little care apart from periodical pruning and undergrowth clearing, but in some cases, notably when the owner is short of funds for the employment of labour, the farm is left completely unattended for 3 to 4 years (Tudhope, 1909).

Along with the tendency to plant trees too close to each other and without system, Tudhope (1909) laments the practice of leaving farms unattended as greatly detrimental to the performance and general health of the crops, potentially resulting in devastating plant epidemics. Green (2016) mentions a serious outbreak of swollen shoot disease in 1936 that, by 1946, had affected a quarter of all trees in the colony. Green (2016) adds that the too close planting of trees is mostly a characteristic of poorer quality soils, especially replanted farms.

That cocoa took the Gold Coast economy by storm is of no question; virtually no cocoa was exported in 1891 and the colony became the world's largest exporter in a mere two decades (Austin, 2014). However, for the explanation of this transition, multiple concepts compete (Green, 2016). Different applications of the Smithian vent-for-surplus theory stem from Szereszewski (1965) and Myint (1958), recently re-explored by Teal (2002) – at the core of these explanations lies the assumption that the inputs of the cocoa industry, land and labour, were previously idle before responding to export demand in the world market. Szereszewski (1965) claimed that before the cocoa boom, there was a preference for leisure which kept the economy in a low-level equilibrium. Hill (1967), who had lived and interacted with Ghanaian farmers for several years herself, heavily criticized the leisure-preference theory on more empirical grounds as opposed to Szereszewski's assumption-based account. Confirming Hill

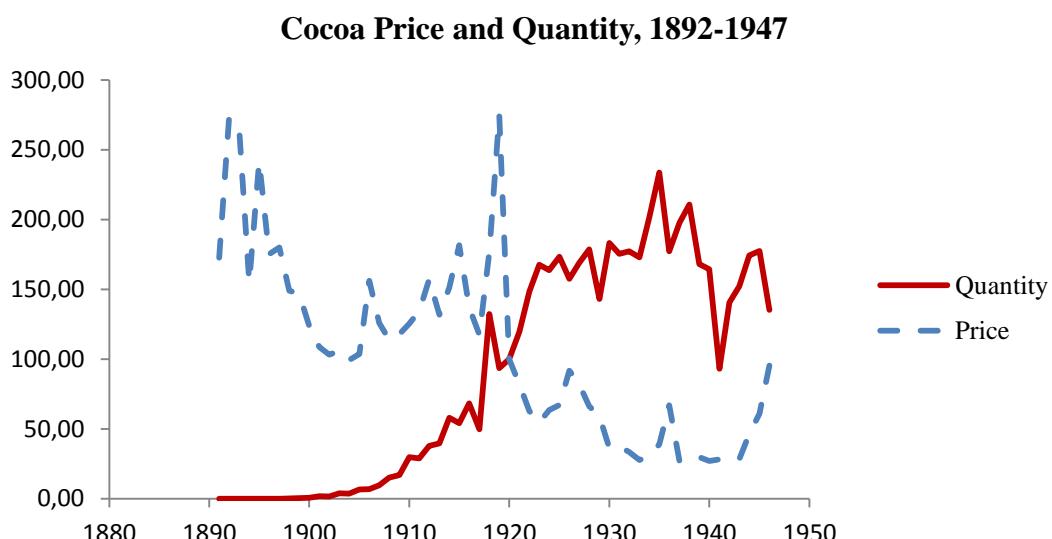
(1967), newer and more detailed research shows that the shift to cocoa represented a move away from less productive market activities to a more profitable equilibrium, thus the cocoa revolution can be understood much more as a productivity breakthrough than a vent for surplus (Austin, 2014). In an earlier work, Austin (2005) asserts that the agricultural boom was due to increases and shifts in external demand for tropical products, while later he (Austin, 2014) adds that Swiss chocolate was invented in 1876, just a few years before the introduction of large-scale cocoa farming in the Eastern regions.

Referring to the evolution of the growth-inequality-poverty triangle, the leisure-preference version (Szereszewski, 1965) of the vent-for-surplus theory can be somewhat likened to the Lewisian (1954) two-sector model. While the cocoa industry was still agricultural, it represented a distinct step forward from the subsistence economy, in which much of the Gold Coast population was occupied, and from where it suctioned labour at little to no opportunity cost partly due to the possibility of simultaneous planting of food crops (Tudhope, 1909, Green, 2016). The leisure-preference theory was eventually refuted (Hill, 1967, Austin, 2014), but the appearance of cocoa as a productivity breakthrough can be still understood in the growth-inequality framework of Adelman (1984), as not every Gold Coast resident was able to benefit directly from the new opportunities.

Whether cocoa trees are planted on fresh forestland or already used – exhausted – clearings is of great importance. Jerven (2014) mentions the importance of the so-called forest rent, a concept that Green (2016) explains in detail. The cocoa tree reaches bearing age around the third year and matures by the seventh, reaching absolute full capacity around the eighteenth (Tudhope, 1909, Green, 2016). However, over a period of 20-25 years, the plant exhausts the soil to the point that the costs of replanting exceed the benefits. Quoting Green (2016, 3): „*in short, cocoa was a frontier crop depending on the possibility to expand continuously into virgin forestland to capture forest rents.*” As Robertson (1982) notes, in the area of Larteh, where production once began, farmers in 1960 were growing less than 10 percent of the cocoa they had been growing 30 years before. Forest rent, simply put, is the availability of fresh forestland for the planting of the cocoa trees. When forest rent is unavailable, farmers must replant trees on exhausted farmlands to continue production, decreasing yields and incomes to employ external labour. As funds dissipate, family labour on the farm becomes more and more important – to keep profits afloat, the farm employs an increasing number of people at diminishing wage rates. The process is fueled by the expansion of the population in the period

of booming. This process of land intensification and dropping labour productivity is referred to as involutionary growth – as opposed to expansionary growth, when, in the case of the Gold Coast, fresh forestland is available and the expanding frontier acts as a pulling force for labour (Green, 2016).

Green (2016) uses the concepts of forest rent and involutionary growth to explain the booms and busts of the Gold Coast cocoa industry. While the initial boom can be explained by more conventional economic paradigms, the bust cycles of the industry coincide with the exhaustion of the forest rent. Being a perennial crop, with harvesting not being the largest investment of labour, the price of cocoa had little immediate effect on exported quantities. While earlier works tried to explain the great bust of the 1930's with dropping cocoa prices, Green (2016) shows that prices had been fluctuating before as much as then, without a plunge in export tonnage. However, by the late 1930's, colonial officials, as well as local chiefs, were raising concerns about the quickly disappearing virgin forestland and the future of the industry.



5. Figure: Cocoa Price and Quantity in the Gold Coast, 1892-1947, based on Frankema, Williamson and Woltjer (2018)

Moreover, Milburn (1970) presents the story of the bitter conflict between farmers and exporters over a quota agreement signed by the three largest British cocoa-buying companies⁴, designed to limit competition and high cocoa prices that prevailed in 1936-1937.

⁴ The UAC, Holts and Cadbury Brothers.

In 1938, the Ashanti Confederacy Council⁵ passed a legislation banning the opening of new cocoa farms. Green (2016) reports purely of agricultural reasons stated above, but Milburn (1970), while not mentioning the legislation itself, writes extensively of a hold-up of cocoa in Ashanti and the eventual temporary stoppage of cocoa trade in Kumasi in 1937-1938. Milburn (1970) also quotes a supreme chief from the Eastern Province in saying that the hold-up started from the bottom, not the top. While the opening of farms did not stop completely in the Ashanti region, the legislation was passed without much resistance from farmers, indicating that it was either indeed grounded in reason, or at the very least reflected general sentiments. The legislation was not softened until 1946. This event marked the closing of the jungle frontier and the inaccessibility of forest rents, the true underlying cause of the cocoa crisis (Green, 2016). Note that when taking the quickly expanding population into account (Green, 2016), the 1930's exhibit a much more severe crisis than what is suggested by Figure 5.

The importance of the Gold Coast railway can not be overlooked when talking about the cocoa-induced period of immense growth. Back in 1909, Tudhope mentioned better transportation facilities as one of the three most pressing needs of the cocoa industry, adding that the traditional method of head-carrying or cask rolling all the way to the ports may cost more than half the actual value of cocoa in some cases. This was still a step forward from palm oil and kernel, the prices of which would have completely been consumed by the transportation for farmers living farther inland (Hill, 1967). Luntinen (1996) explains the story of the Gold Coast railway in great detail, beginning his account with asserting that the cocoa boom would have been impossible without the extensive railway system built by the colonial government. Multiple experts on Ghana (Austin, 2014, Jedwab and Moradi, 2016) have stressed the critical role of the rail in the development of the cocoa industry since then. The first ideas about the Gold Coast railway came about in 1873 (Luntinen, 1996), about the same time as the British Cape Coast rail construction picked up. The main reason for the momentum in the Cape Colony rail construction was the discovery of diamonds in 1867 (Gwaindepi, 2019) and similarly, the first Gold Coast plans emphasized servicing the gold mining industry.

⁵ The Ashanti king, Pempreh, was dethroned and exiled shortly after the conquest of Ashanti. However, as mutual trust between colonial officials and natives grew, Pempreh was allowed to return and eventually the old Ashanti state was formally revived as the Ashanti Confederacy Council over the course of the 1930's. The decision fit well into the British colonial concept and policy of indirect rule.

After much debate, the first lines were constructed between 1898-1901, connecting the small port of Sekondi with the gold mines of Tarkwa, running in the Western and Central Provinces of the colony. By 1904, the line measured cca. 137 miles after being extended to Kumasi, the Ashanti capital. Between 1911 and 1923, Kumasi was gradually connected to the colonial capital Accra. While cocoa farms did appear in number around the Western Sekondi line (Jedwab and Moradi, 2016), the first truly cocoa-centered section of the rail started operating in 1911, between Accra and Mangoasi in the Eastern region. By 1923, the most important cocoa-producing regions of the East and Ashanti had easy rail access to the port in Accra. A line crossing the Central Province from Kade to Huni Valley was completed in 1927. The Great Depression and the Second World War delayed further construction. By 1947, the three main lines – Western, Central and Eastern – measured a total of 434 miles⁶ (Based largely on Luntinen, 1996). Moreover, Luntinen (1996) presents the story of how the culture and mindset of industrialized cultures, the evolution and spreading of which comprises the magnum opus of economic historian Clark (2007), penetrated the Gold Coast society first through the introduction of the railway.

The effects of the railway are examined to great depth by Jedwab and Moradi (2016). The study reports the emergence of a very specific spatial equilibrium between 1901 and 1931, when most of the rail construction took place. The paper divides the colony into 2091 grid cells of 121 km², then tests the effects of nearby railways and rail stations present on cocoa production, population growth and urbanization rates. On 1927 cocoa production, the presence of a railway in 1918 has statistically significant positive effects up to the 30-40 km vicinity of the given cell, with the model explaining 55% of total variance. Population growth and urbanization are similarly affected, although the effect wears off more quickly with the increase in distance from the railway. By including cocoa production as a control variable, Jedwab and Moradi (2016) also attest that the population growth effect was mainly due to the increase in the possibilities offered by the crop. The results confirm the earlier literature emphasis (Tudhope, 1909, Luntinen, 1996) on the importance of transportation in the development of the Gold Coast and less developed export economies in general. It does not, however, explicitly connect the railways to the larger picture of the Gold Coast's growth. Moreover, much more so than the introduction of a new crop, the railway is an explicitly technological innovation. As the success of the cocoa economy and the expansion of the

⁶ Not including wharf lines, sidings, station loops etc. The 434 miles refers to the distance covered by the rail.

railway were inseparable (Tudhope, 1909, Luntinen, 1996, Jedwab and Moradi, 2016), the cocoa boom is even clearer as a driver of both growth and inequality in Adelman's (1984) context of unequal opportunities offered by technological development.

It is clear that unlike the picture painted by the traditional models of development explained in section II, the Gold Coast achieved its impressive growth rates without ever developing its own industrial sector. However, as mentioned earlier, the cocoa sector was a giant leap on the productivity ladder, and thus might substitute the role of industry in short and middle-term perspectives. Not in the long term, though, as the relative standing of primary exporters is known to diminish as technology progresses and leading economies move further and further up the value chain. Obstacles like Engel's inexorable law and the 'curses' of raw resources such as the infamous Dutch disease stand in the way of any economy threading the then-trajectory of colonial Gold Coast (Perkins et al, 2005). Post-colonial administrations were well aware of this. As an interesting fact, Lewis himself, author of the 1954 two-sector model, served as an economic advisor for Kwame Nkrumah's Ghana on the eve of its independence. However, Lewis' suggestions of agricultural development and lighter import-substituting industries more in line with Ghana's existing endowments did not resonate well with the sky-high ambitions of Nkrumah and his administration (Akyeampong, 2017). The following decades brought about a story of devastating failure of development and catch-up, after which Ghana in 1984 eventually became the exemplary pupil of the IMF and essentially returned to the structure of the colonial economy (Luntinen, 1996).

3.2 The Evolution of Inequality in the Gold Coast, 1891-1947

Inequality is a multi-faceted phenomenon; while what scholars see in the final datasets are mere incomes, there is much more at play than the individual market success of homogenous actors. Naturally, the expansion of the British-controlled area beyond the immediate coastline and the subsequent cocoa transition brought about significant changes in the Gold Coast's societal and political structures. There is an extensive literature covering these processes. Much of the political developments taking place under the studied period are explained in the classic works of Kimble (1963) and Ward (1967), while Austin (2005) presents the labour relations prevailing in Ashanti from the slavery of the early nineteenth century to the free labour of the cash crop era.

The backbone of the regression analyses regarding inequality is provided by Aboagye and Bolt (2018). The study mainly utilizes Gold Coast census data to construct income and inequality tables for each province of the colony in 1891, 1901, 1911, 1921, 1931, 1948 and 1960, of which the last will be omitted from this analysis. As the colony exploited the opportunities offered by the world market and modern transportation, the earned incomes did not always benefit everyone equally. Overall, the colony-wide Gini coefficient increased from 0.24 to 0.44 between 1891 and 1948. However, inequality remained largely stagnant between 1901 and 1931. While their levels of inequality tend to vary greatly, different provinces exhibit similar trends regarding their individual coefficients. Aboagye and Bolt (2018) assert that during the examined period, it was mostly the change in wages that drove inequality trends, as opposed to the change in occupational classes, which dominated the subsequent interval to 1960.

Ward (1967, 327) suggests that cocoa was a „poor man’s crop”, and that everyone’s ambition was to eventually own a patch of the valuable plant. Aboagye and Bolt’s (2018) account seems to be at odds with this notion. They refer to the set-up costs of the crop and the long germination period, stating that it was only a relatively wealthy minority with substantial incomes from other sources who could afford to venture into the cocoa business. Correspondingly, their compiled dataset presents relatively low population percentages being cocoa farmers, with the highest figure being 12.72% in Ashanti during 1931. Nonetheless, the paper asserts that the three main winners of the inequality spurt between 1931 and 1947 were European government officials, commercial workers, and naturally, cocoa farmers.

The role of the commercial workers is an interesting case. Under the category, Aboagye and Bolt (2018) include traders, bankers, financial employees as well as cocoa brokers. The exportation of the cocoa crop to the world markets was mostly done by large British companies, as mentioned earlier (Milburn, 1970). Between the farmer and the exporter stood the cocoa broker, who was often paid a large allowance sum for the purchase of cocoa (Tudhope, 1909, Milburn, 1970). Tudhope (1909) lamented that the colony only exported second-grade cocoa due to middlemen caring only about the quantity, and not the quality of the crop.

Meanwhile, the 1937 agreement mentioned earlier officially sought to curb abuses and speculative behaviour of middlemen by reducing the amount of allowances paid to them, which was said to far exceed the value of their services, and did nothing to benefit the producer. Indeed, much of the mistrust of the African farmers was directed not solely at the Europeans, but African brokers (Milburn, 1970). This, however, did not convince African farmers, who remained in firm opposition to the agreement until its withdrawal. In 1948, riots broke out in Accra, which were attributed to eight underlying causes by an investigating Commission appointed in London itself. Amongst the main causes was the concentration of economic power in European and Syrian hands – this meant the largest shop owners and traders in the capital (Ward, 1967). The timing of the riots seems to fit Aboagye and Bolt’s (2018) timeline of inequality rather well.

Interestingly, the grievances of cocoa farmers were also amongst the listed causes. The swollen shoot disease, which affected a quarter of cocoa trees by 1946 (Green, 2016) was a devastating and irreversible virus, requiring the cutting and burning of infected trees (Ward,

1967). The native farmer had little understanding of the concept of a virus, and the drastic methods ordered by the colonial Government were often met with understandable contempt and suspicion (Ward, 1967). It is thus highly likely that without the epidemic, the incomes of cocoa farmers would have been even higher than what Aboagye and Bolt (2018) suggest.

It might also be important to mention that „cocoa farmers” under the definition were not only the ones who legally owned property. While the role of sharecropping is mentioned by Aboagye and Bolt (2018), it is important to add that a specific type of sharecropper, the abusa-man, is listed as a cocoa farmer in census data (Robertson, 1982). Tudhope mentions already in 1909 the prevalence of one particular type of contract, in which the sharecropper receives one-third of the crop he produces on the owners farm. Robertson (1982) presents a detailed history of this economic contract titled abusa, literally meaning one-third. The abusa-man often lived on the farm, sometimes with his family, and used the same lands to cultivate food crops for sustenance. The abusa-man was also sometimes the close relative of the farm owner, waiting for the opportunity to acquire his own land (Robertson, 1982).

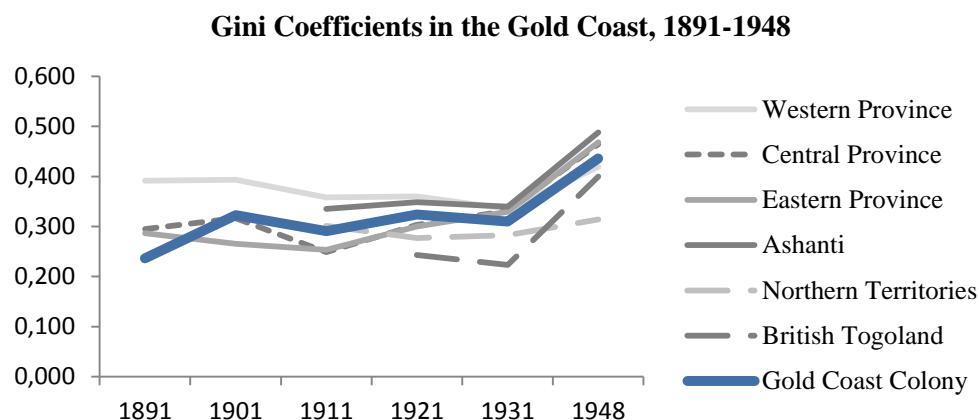
Disparities between specific provinces of the Gold Coast should also be mentioned. It must be noted that the colony was far from being ethnically homogeneous. Luntinen (1996) asserts that the peoples of Ghana speak seventy to one hundred different languages and dialects. Aboagye and Bolt (2018) do not include ethnic distributions, but Green (2016) mentions that by 1960, over 90 percent of cocoa production belonged to Ashantis.

While much of the Southern colony may have been bound together by belonging to the same meta-ethnicity, the Akans⁷, the Northern Territories are different story. Despite being included together with the rest of the colony from 1901, there were no such ethnic or political grounds for feelings of a common past, apart from warlike Ashantis hunting the area for slaves (Kimble, 1963) and extorting tribute from local states, such as Dagomba (Moradi, Austin and Baten, 2007). The slave industry eventually transitioned to a suctioning of labour on the cash crop farms in the forest regions (Austin, 2008).

This was exacerbated by the facts that the savannah region was not suitable for cocoa production, that local elders and chiefs were very suspicious and resistant to progressive ideas and education and that the Government regarded the underdeveloped regions as pointless to spend significant funds on while the Southern areas were not at their full potential (Kimble,

⁷ This includes Ashantis.

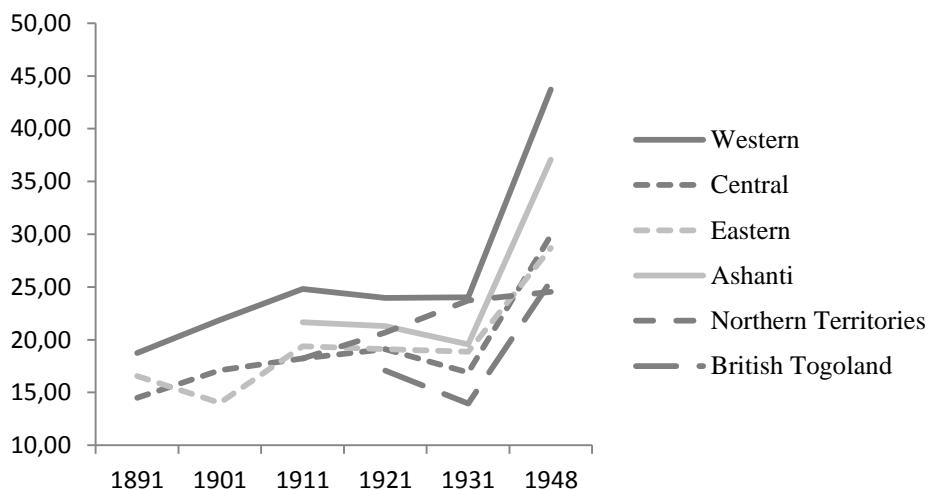
1963). However, by the 1930's, the Government made efforts to transform the Territories into the food basket of the colony (Grischow, 2016). Similarly, British Togoland, which joined the colony only after the First World War⁸, was less developed than the coastal provinces – despite the Southern parts being suitable, cocoa production did not appear in them until the 1940's (Aboagye and Bolt, 2018). In accordance with this assumption, inequality in the Northern Territories remained low throughout the studied period, while average wages started lagging behind the rest of the colony by 1947. On the other hand, Moradi, Austin and Baten (2013) assert that in the Northern Territories, individuals may have had access to better nutrition. As nutritional inputs are sensitive to inequality, the lower rates prevailing in the North may have contributed to this, along with the food-farming focus of the region.



6. Figure: Gini Coefficients in the Gold Coast, 1891-1948, based on Aboagye and Bolt (2018)

⁸ Germany's defeat resulted in the German colony of Togoland being split into British and French Togoland. The latter became what is today known as the country of Togo, while British Togoland is part of Ghana to this day.

Average Wages in the Gold Coast, 1891-1948



7. Figure: Average wages in the Gold Coast, 1891-1948, based on Aboagye and Bolt (2018)

3.3 Poverty and Living Standards in the Gold Coast, 1891-1947

That general living standards increased in the Gold Coast colony during the first half of the twentieth century is by now not a disputed notion. However, it is also important to take a look at what level they started out from. Pre-colonial living standards were first quantitatively explored by the study of Rönnbäck (2014) through wage data of canoemen employed by the Royal African Company at Cape Coast Castle, pitched against the price of consumer baskets. Canoemen were amongst the lowest skilled and paid workers, close to slaves, and still, Rönnbäck (2014) finds no evidence of relatively low living standards. Rönnbäck (2014) asserts that wages had been converging to sustenance levels in many parts of the world between 1728 and 1751, and the study's findings fit well into this trend. Rönnbäck (2014) refers to the high worker mobility of the region to suggest that the data may be regarded as representative.

The assessment of the contemporary concept of poverty is a more elaborate question in the case of a colonial economy. Before World War II, the main focus of colonial governance in West Africa was that of opening up local economies and connecting their capabilities to the world markets, with less regard to the individual welfare of natives. The Colonial

Development and Welfare Act, passed in 1946, represented a partial shift in Imperial political aims, allocating significant funds for welfare and research purposes. However, especially under the period in question, issues of poverty as understood today by developmental organizations such as the World Bank and the UNDP, were not in the scope of policy and research regarding the Gold Coast.

The dataset of Aboagye and Bolt (2018) assumes subsistence-level incomes for the lowest layers of society. Nonetheless, Aboagye and Bolt (2018, 6) confirm the Government's neglect for these people, mentioning that this group „often barely scratched a living from the soil”. Moreover, they refer to more recent reports from Ghana to assert that the North, having been unable to benefit from the cocoa economy, still lags behind the Southern areas in terms of development and poverty reduction. Aboagye and Bolt (2018, 14) explicitly refer to the subsistence group as „impoverished”. Moreover, they mention that their incomes were enough for survival, but nothing more, somewhat corresponding with the state that Banerjee and Duflo (2011) refer to as poverty traps. Thus, the subsistence group, ranging from 49 to 64 percent of total population during the studied period according to Aboagye and Bolt (2018), can be one possible way to assess the extent of absolute poverty.

Concerning poverty, Schaffer (2017) finds strong linguistic evidence of widespread seasonal hunger in the Northern Territories in traditional greetings and proverbs. An ethnographic study and a caloric intake survey from 1934 and 1941, respectively, albeit riddled with statistical uncertainty, confirm near-starvation levels of seasonal hunger in certain areas. However, Schaffer (2017) finds that the actions of the colonial Government, including trade and extraction of land and labour, did not exacerbate the prevailing hunger conditions of the area. On the contrary, remittances by young men working on lucrative Southern farms may have even had a positive effect (Schaffer, 2017).

Meanwhile Grischow (2016) suggests that the disturbance of natural equilibria in human and tse-tse fly habitats by shifting trade routes resulted in the revival of the deadly sleeping sickness borne by the insect. Earlier Moradi, Austin and Baten (2007) challenged the notion of the colonial-era disturbance of the pathogen equilibrium in West Africa, referring to the constant contact with Europeans since the fifteenth century, apparently not taking into account the possibility of doing so by aggravating native threats to human health. By the 1930's, the sickness reached epidemic levels, threatening the Government's plans of agricultural

transformation. Medical officer Morris effectively eradicated the disease through his decades-long work between 1928 and 1952 (Grischow, 2016).

The role and welfare of women in the colony is explored by Ayesu, Gbormittah and Adum-Kyeremeh (2017). On the eve of colonialism, their roles were heavily subordinate to that of men, and while their engagement in the main industries remained low, they quickly overtook „petty” food agriculture and trade as men more and more started to focus on the more lucrative cocoa industry. The colonial administration soon realized that the welfare of women and children, crucial to the welfare of the colony at large, required measures specific to them.

The account of Ayesu, Gbormittah and Adum-Kyeremeh (2017) thus provides a good overview of the general healthcare attitude of the Government. From 1928, multiple maternal and infant health facilities and training centers were opened. This was more than necessary, as child mortality in Accra was as high as 40 percent in 1921. While hospital attendance increased rapidly from the 1930’s, it remained low for a long while due to local traditions, misunderstanding and mistrust on part of Africans (Ayesu, Gbormittah and Adum-Kyeremeh, 2017). This suggests that measuring the evolution of living standards or poverty by variables constructed from hospital attendance or other medical records – colonial reports include numbers for patients in and patients out for each year, for example – is problematic due to heavy selection and reporting bias.

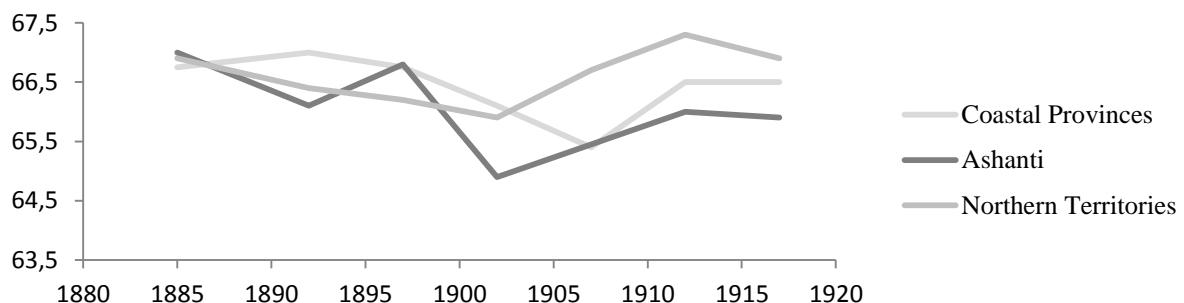
To the knowledge of the author, the only studies painting a somewhat comprehensive picture of all-around living standards in colonial Gold Coast are from Moradi (2008) and Moradi, Austin & Baten (2007 & 2013). The latter two use the same methods as the 2008 study with more nuanced applications. In the 2008 study, Moradi uses height measurements taken by the local military during conscription for WWI and WWII to assess changes in living standards during the colonial period. The assessment of height has been used by a wide range of studies in the past as a measure of living standards and is recognised and recommended as an apt measurement of nutritional standards by the WHO, albeit much less reliable as a predictor of overall income (Moradi, 2008). Moradi (2008) also asserts that height measurement assesses outcomes, not inputs – whether the nutritional standards were enough to meet objective biological requirements or not. Moreover, height is highly sensitive to inequality, as additional inputs in children who attain their nutritional requirements provide highly diminishing returns.

Moradi (2008) reports that average height increased by an astonishing 2 cm between the 1880-1893 and the 1905-1919 cohorts, indicating a steady rise in physical quality of life. However, Moradi, Austin and Baten (2007) present more nuanced results by dividing the cohorts into 5-year intervals. Heights of birth cohorts from the 1880's have decreased at a steady rate until the beginning of the twentieth century, from which point they exhibited the growing trends reported originally by Moradi (2008), although they remained below the original 1880's levels. Moradi, Austin and Baten (2007) attribute the dropping heights to the relatively violent nature of the period, mentioning the wars of British expansion in the Southern areas and the activities of the notorious slave trader, Samori in the North. The latter events are also presented in detail in Ward (1967). Moreover, Moradi, Austin and Baten (2007) assert that the period was particularly heavy on the Northern Territories with regards to the hunger problems mentioned by Schaffer (2017). While the growth in height can be understood as a return to pre-1880 levels, it must also be noted that the increase in living standards took place simultaneously with heavy population growth (Jerven, 2013), indicating an abundance not seen before in the Gold Coast. Moreover, while with those born around 1880, heights across the colony were roughly equal, the 1915-1919 cohorts show significant regional variation. Contrary to what one may expect when looking at the trends of the cocoa economy, mean heights were the highest in the Northern Territories. Moreover, regional poverty rates also seemed to be the lowest in the North, according to the dataset of Aboagye and Bolt (2018). The two assertions are probably interrelated. As mentioned earlier, the Northern Territories was forced to focus more on locally consumed agriculture instead of the valuable cash crop. While in the long run this may have been detrimental, the lower inequality rates and the better quality nutrition available during childhood could very likely result in better overall health outcomes.

Moradi, Austin and Baten (2013) take their 2007 study further by regressing multiple spatially derived variables on the heights of individuals born at each respective location. The newer study finds positive and significant correlations regarding height differences between birth cohorts and whether the locality adopted large-scale cocoa farming or not. Moradi, Austin and Baten (2013) also assert that the presence of a railway station had similar effects in cocoa-less regression analyses, but the coefficient lost its significance with the inclusion of cocoa quantities, strongly suggesting a confirmation of the beneficial effects of the railway on cocoa production. The 2013 study also extends the birth cohorts into the 1930's, which apparently

saw the birth of lower-height generations. However, in their conclusions, Moradi, Austin and Baten (2013) do not mention an explanation for this negative turn of events.

Average Male Heights (inches) by Birth Cohort in the Gold Coast, 1885-1919



8. Figure: Average Male Heights (inches) by Birth Cohort in the Gold Coast, 1885-1919, based on Moradi, Austin and Baten (2007)

Subsistence-based Poverty Ratios Across the Gold Coast, 1891-1948



9. Figure: Subsistence-based Poverty Ratios Across the Gold Coast, 1891-1948, based on Aboagye and Bolt (2018)

4 Data and Methods

Being a quantitative, post-positivist study, the analysis shall consist of three OLS regressions capturing the particularities and interactions of growth, inequality and poverty. Beyond the extent of poverty, data regarding living standards is not available to this author to the extent that would validate such analyses. For the spatial analyses, Moradi, Austin and Baten (2013) had access to primary military recruitment data, while an analysis of province-wide height measurements would provide very shaky results.

Due to constraints of time and resources, the study uses exclusively secondary data. Numerical data regarding growth, wages, inequality and commodity prices was on one hand acquired from Jerven (2014), Frankema, Williamson and Woltjer (2018) and Aboagye and Bolt (2018). The former two rely on Blue Books and Annual Colonial Reports. As the two were compiled at different points in time each year, minor data discrepancies exist between the two sources regarding quantities and prices. However, these margins of error are minimal in proportion. Besides census data, Aboagye and Bolt (2018) rely on a wide range of official publications and scientific literature to calculate and estimate social groups, wages and regional distributions. Numerical data regarding railway mileages were obtained by roughly following Luntinen's (1996) map layouts and measuring distances between sites of major stations using Google Maps.

4.1 Constraints and Limitations

The obtained datasets, however, are prone to major errors. Besides objectively measured export data, Jerven's account (2013) relies mainly on assumptions and proxies to construct the colony's GDP series. Aboagye and Bolt (2018) obtain and calculate data from multiple dozens of different sources, relying heavily on data extrapolation. Meanwhile the method of railway measurement is bound to be a few kilometres off. Although the routes between major stations are largely straight, smaller curvatures and other issues could cause marginal errors in measurement. Needless to say, critically assessing these datasets is far from criticizing the work itself. Colonial-era data is, obviously, scarcer and probably less reliable in nature than

contemporary information. While the datasets used are currently the best the field has at its disposal, the author of this thesis is thus bound by the same limitations of data scarcity as previous scholars working on the topic. But in light of the aim of this paper, that is not a major problem. The issue at hand is not about pinpointing numbers to decimal precision, but to capture general trends and connect the dots drawn up by previous literature, thus getting closer to a comprehensive understanding of the Gold Coast economy and society during the discussed time period.

In his book *Poor Numbers*, Jerven (2013) warns of the terrible regressions of the African development economics industry, which often rely on inaccurate data and feeble theoretical foundations, ultimately resulting in misleading and highly harmful misconceptions about the post-colonial development of the continent. Amongst others, Jerven (2013) mentions the high share of the informal sector, irregular and low-quality data collection, filling and extrapolation of data in case of missing entries and the cross-utilisation of multiple kinds of data. In total academic honesty, one has to admit that the following analyses are riddled with perhaps all of these faults. Nonetheless, besides the excuse of time and resource constraints, one can once again point to the purpose of this thesis, which is not to pinpoint exact numbers, but to identify and confirm the most significant trends, and enrich our conceptual understanding of colonial economies in light of contemporary theoretical frameworks.

4.2 Specification of Models

While ideally new research should fit into existing traditions in the respective literature, availability of compiled data severely limits the composition and type of models available in our case. Moreover, to the knowledge of this author, no comprehensive regression analysis regarding the complete picture of Gold Coast growth, or the growth of any other similar economy, has been conducted. In any case, the different nature and administrative qualities of each particular African colony would render the imitation of models used elsewhere pointless. In short, no particular theoretical explanation exists for the choice of models. The simplest OLS regressions were constructed, while the regressors attempt to capture every piece of useful and historically justified data that was available to the author.

(y) $GDP = \beta_1 + \beta_{cocoaprice} + \beta_{noncocoaprice} + \beta_{frontierclosing} + \beta_{WWI} + \beta_{WWII} + \beta_{easternline} + \beta_{centralline} + \beta_{westernline} + \beta_{period} + \epsilon$

(y) $Gini = \beta_1 + \beta_{cocoavalue} + \beta_{noncocoavalue} + \beta_{averageincomes} + \beta_{cocoafarmerprop} + \beta_{subsistenceprop} + \beta_{europeansprop} + \beta_{foodcropprop} + \beta_{rail} + \beta_{centrum} + \beta_{period} + \epsilon$

(y) $Poverty = \beta_1 + \beta_{gdppercapita} + \beta_{i.region} + \beta_{averageincomes} + \beta_{rail} + \epsilon$

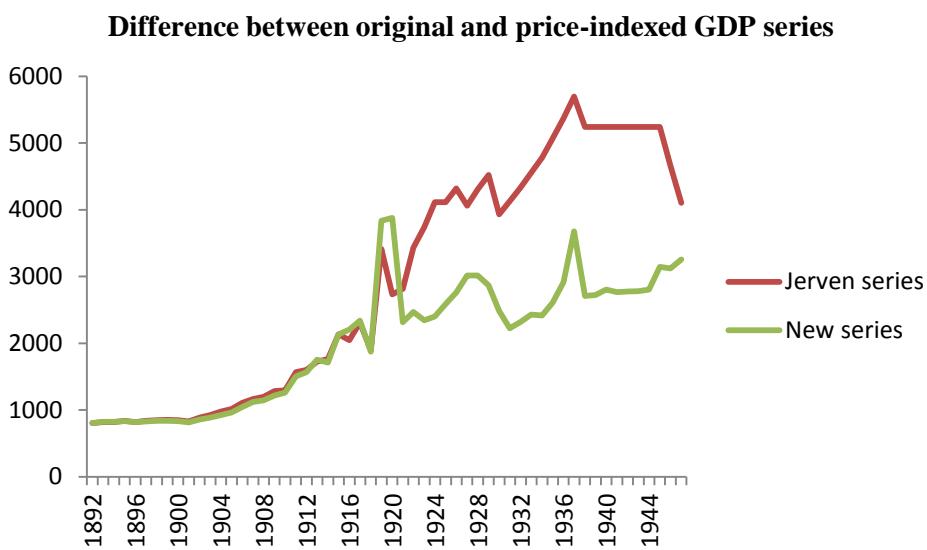
4.3 Data Specifications

4.3.1 Growth

Jerven (2014) divides the colony's economy into seven sectors and provides growth multipliers for each year based on physical quantity data acquired from the Blue Books. Jerven's (2014) GDP series, unlike the trajectory sketched out by Maddison (2003), provides sufficient variance for OLS analyses to exploit. However, it does not take into account the number one weakness of a primary export economy: the sensitivity to price fluctuations.

The African Commodity Trade Database compiled by Frankema, Williamson and Woltjer (2018) provides price and quantity data for each of the Gold Coast's major exports up to 1947. Thus, when deflating prices with annual GBP inflation data acquired from Morley (unknown year), a real price index for Gold Coast cocoa and non-cocoa exports can be constructed. If Ghana was to catch up, the main challenge after independence was to industrialize, as recognised by first Ghanaian president Kwame Nkrumah (Akyeampong, 2017), which inexorably requires substantial foreign inputs. Moreover, these commodities were not consumed for local needs, but sold mainly to buy imported luxuries or industrial goods. A complete quantitative series of imports might cover the relative price shifts of exports and imports. However, the Jerven (2014) series exclusively proxied tobacco, spirits and textiles for imported consumption, while using a weighted multiplication of other sectors to measure capital formation. Moreover, the Blue Books only record imports officially arriving through the ports, not taking into account the possibility of smuggling, which plagued respective Governments from the early colonial era (Ward, 1967) to the 1980's (Green, 2016).

Thus, a GDP series updated according to real price indices captures the situation of the Gold Coast economy more accurately than purely quantitative data. The value of the export sector of the economy, as compiled by Jerven (2014), was adjusted with multipliers constructed from these price indices, weighted by value shares of cocoa and non-cocoa exports. As the real cocoa price index experienced a significant decrease throughout the period, the new GDP series paints a slightly less favourable, albeit still impressive picture. It must also be added that for the sake of simplicity, both Jerven (2014) and this thesis include only the seven export commodities that were present in every year of the studied period – cocoa, gold, palm oil, palm kernel, rubber, timber and copra. This omits diamonds, coffee, cola nuts and manganese, marginally decreasing the sum product of the economy.



10. Figure: Difference between original and price-indexed GDP series

Jerven (2013) asserts that while GDP is too important a metric to be ignored, it is not by any means an objective number. It is always a result of a series of customized calculations, in which a whole range of arbitrary assumptions is involved, and thus should be assessed carefully. The modification of Jerven's (2014) GDP series has been done in the spirit of this statement, and should be regarded as such.

As Luntinen (1996) and Jedwab and Moradi (2016) assert, the railway was a crucial factor in the cocoa boom. To test this, the construction of all three lines in place by the end of the period – western, central, eastern – was tracked year-by year following Luntinen's (1996) account. The method is prone to minor inaccuracies. Luntinen (1996) only mentions occasions when the line had reached a certain important destination, or was finished. Thus,

when a certain rail line was reported to have had traversed a certain distance over a certain number of years, the distance was divided equally between the years. Moreover, the variables measure mileage that could affect exports through being already in use during a certain year. Unless finished early during the year, newly constructed mileage was added to the respective line's length only the year following its construction.

Whether the decline of the late 1930's was caused by the pressing need of conserving forestland (Green, 2016) or social and political upheaval (Milburn, 1970), perhaps both, the ban on new farms in Ashanti was passed in 1938, marking the closing of the frontier and the end of the forest rent for the cocoa economy. To test Green's (2016) assertion, a dummy variable was created with a value of one (otherwise zero) for each year between 1938 and 1946, the softening of the legislation.

To test whether World War I and II had any effect on the Gold Coast's economy, similar variables will mark the years 1914-1918 and 1939-1945, the latter heavily coinciding with the closing of the frontier. Luntinen (1996) tells of the detrimental effect of the naval and submarine warfare on Gold Coast export possibilities. In his Colonial Reports, Governor Guggisberg (1919) writes that while the people of the colony suffered relatively little, shipping had been reduced to all time lows in the later years of the war. Moreover, Guggisberg (1919) asserts that a significant amount of cocoa was held back by official legislation in 1918, the release of which partially led to the unprecedented export quantities of 1919. While not being a place of conflict itself, during World War II the colony was assigned a significant role in the logistical support of the North African campaign (Luntinen, 1996). 1942, the year of El-Alamein, the culmination of the African theatre of war, marked a substantial decline in the exports of cocoa. However, the importance of the warplane industry also prompted the Imperial Government itself to invest in a shorter, but quickly built railway exporting bauxite (Luntinen, 1996).

Lastly, the timeline of the studied colonial period was somewhat arbitrarily divided into four distinct periods, based on the trends of the exported quantities of cocoa. From 1891 to 1900, the growth in cocoa quantity was quasi-linear and somewhat flat, as opposed to the period of 1901-1918, when it picked up substantially. In 1919, quantities peaked, and 1919-1936 marked the most impressive period of the Gold Coast cocoa industry, producing cca. 3 times the growth under roughly the same time as the second period. The absolute peak of the period

was reached in 1936-1937, from which point the quantity of cocoa gradually decreased until 1947. The timespans between the last three periods coincide with the 18 years it takes for the cocoa plant to achieve full capacity (Green, 2016). Moreover, Green (2016) suggests that exceptional years may greatly motivate the opening of new farms. The take-off of the industry may have prompted a significant wave of new planting around 1900. These plants would reach full capacity around 1918-1919, coinciding with a truly exceptional amount of exports. If we were to assume that this record year once again prompted a great wave of farm opening, the timing of the absolute peak in 1936-1937 may find a sound explanation.

4.3.2 Inequality

The regional Gini coefficients calculated by Aboagye and Bolt (2018) will serve as the object of the colonial inequality analysis. Aboagye and Bolt (2018) acquire population shares for each major occupational group according to population censuses, and calculate their incomes from various other sources. In this study, census years 1891, 1901, 1911, 1921, 1931 and 1948 will be included. Since much of the data is available only up to 1947, the inequality data of 1948 was substituted for 1947, resting on the assumption that inequality is stable over time, with only minor increments per one single year. Similarly to the growth analysis, a period variable was added to differentiate between the relatively stagnant period comprising of the first four set of observations and the last two, between which inequality took off significantly. The addition of this control variable was deemed necessary to pick up omitted variable bias due to a potential shift in the main drivers of inequality.

Aboagye and Bolt (2018) assert that inequality in the period was driven by changes in wages, as opposed to changes in the occupational composition of the population. Nonetheless, the population shares of cocoa farmers, European administrators, food crop farmers and the subsistence group were regressed on inequality. Europeans had the highest incomes by far, while food crop farmers had the highest cumulative income shares. While their incomes were meager, the subsistence group represented the largest shares of the population.

The wage effect was tested through three variables. In the growth regression, the price indices of cocoa and other exports, combined with the period variable capturing trends in quantity, was used to explain variance. In the inequality regression, this was substituted by export values acquired from Frankema, Williamson and Woltjer (2018). Moreover, regional average

incomes calculated by Aboagye and Bolt (2018) were also regressed on the regional coefficients.

To test whether the presence of a railway affected inequality in the colonial period beyond the income effect, a dummy variable indicating whether the region had access to rail to any extent during the previous period was added. The dummy variable „centrum” possesses a four-fold meaning. The regions marked with zero are the Northern Territories and British Togoland, the particularities of which have been explained earlier. The Western, Central and Eastern Provinces, plus Ashanti, were marked as centrum regions. Thus the variable captures whether the region had rail access at any point during the period, whether it was a central area for cocoa and mining industries, whether it was an area dominated by Akan people and political structures and whether it occupied a central place in the Government’s development schemes.

4.3.3 Poverty

The poverty analysis also mostly relies on data provided by Aboagye and Bolt (2018). Following their description of the living standards of the subsistence group, the proportion of these people within regional populations shall serve as the proxy to measure the extent of Gold Coast poverty between 1891 and 1947. Just like with the inequality analysis, the 1948 entries were assumed to closely resemble those of 1947, and thus were used in the regression.

However, the proportion of the subsistence group ranged from 49 to 64 percent regarding total population, and soared in the seventies for certain regional entries (Aboagye and Bolt, 2018). Much of the remaining share was occupied by the group of food crop farmers. Due to the already high extent of what we could proxy as absolute poverty, and the lack of variance within the lower strata of middle-income individuals, it seems pointless to assess relative deprivation using thresholds crafted from percentages of average regional incomes.

Due to scarcity of data and theoretical focus of less recent scholars and administrators, combined with the assumption that reporting bias hinders the viability of health-related variables, the selection of regressors may seem a bit meager. Colony-level per capita GDP is a most obvious choice, along with regional average incomes. The railway variable, explained regarding the inequality regression and regional Gini coefficients will also be used.

4.4 Summary Tables of Variables and Expected Coefficients

Growth		
Variable name and (u.o.m.)	Description, source	Expected coefficient
<i>goldcoastgdp (million 1990 Intl. Dollars)</i>	Gold Coast GDP series by Jerven (2014) updated according to export price indices	Y variable
<i>cocoapriceindex (0-1)</i>	Price index of cocoa based on the African Commodity Trade Index (Frankema, Williamson and Woltjer, 2018)	+
<i>noncocoapriceindex (0-1)</i>	Value-weighted price index of gold, timber, rubber, palm oil, palm kernel and copra, based on Frankema, Williamson and Woltjer (2018)	+
<i>frontierclosing (0/1)</i>	Dummy, years under the legislative ban on new farms, 1938 – 1946 (Green, 2016)	-
<i>war1 (0/1)</i>	Dummy, World War 1	-
<i>war2 (0/1)</i>	Dummy, World War 2	-
<i>easterntline (km)</i>	Length of the Accra-Kumasi rail (Luntinen, 1996)	+
<i>centralrline (km)</i>	Length of the Huni Valley-Kade rail (Luntinen, 1996)	+
<i>westernrline (km)</i>	Length of the Sekondi-Kumasi rail (Luntinen, 1996)	+

<i>period</i> (1-4)	The four distinct growth periods of cocoa cultivation based on Frankema, Williamson and Woltjer (2018) and Green (2016)	+
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1. Table: Summary explanation of variables used in the growth regression analysis

Inequality		
<i>gini</i> (0-1)	Regional Gini coefficients based on tables by Aboagye and Bolt (2018)	Y variable
<i>cocoavalue</i> (1891 £)	Value of cocoa exports (Frankema, Williamson and Woltjer, 2018)	+
<i>noncocoavalue</i> (1891 £)	Value of gold, timber, rubber, palm oil, palm kernel and copra exports (Frankema, Williamson and Woltjer, 2018)	+
<i>avgincomes</i> (£)	Regional average incomes based on Aboagye and Bolt (2018)	+
<i>cocoafarmerprop</i> (0-1)	Regional proportion of cocoa farmers (Aboagye and Bolt, 2018)	+
<i>subsistenceprop</i> (0-1)	Regional proportion of people living on subsistence level (Aboagye and Bolt, 2018)	-
<i>foodcropprop</i> (0-1)	Regional proportion of food crop farmers (Aboagye and Bolt, 2018)	-
<i>europeansprop</i> (0-1)	Regional proportion of	+

	European administrators, smallest group with highest incomes (Aboagye and Bolt, 2018)	
<i>rail</i> (0/1)	Dummy, whether a rail in the region existed for a whole year before the census (Luntinen, 1996)	+
<i>centrum</i> (0/1)	Dummy distinguishing the Southern provinces from the Northern Territories and British Togoland	+
<i>period</i> (1-2)	Distinguishing between the initial period and the steeply rising inequality trends after 1931	+

2. Table: Summary explanation of variables used in the inequality regression analysis

Poverty		
<i>subsistenceprop</i> (0-1)	Regional proportion of people living on subsistence level (Aboagye and Bolt, 2018)	Y variable
<i>gdpc</i> (1891 £)	Colony-level GDP per capita	-
<i>avgincome</i> (£)	Regional average incomes (Aboagye and Bolt, 2018)	-
<i>rail</i> (0/1)	Dummy, same as before (Luntinen, 1996)	-
<i>gini</i> (0-1)	regional Gini coefficient (Aboagye and Bolt, 2018)	+
<i>region</i> (1-6)	Categorical variable distinguishing between the	+/-

	six assessed provinces	
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3. Table: Summary explanation of variables used in the poverty regression analysis

5 Results

5.1 Growth

Number of Observations 56

Prob > F 0.0000

Adjusted R-squared 0.9253

Variable	Sign	Coefficient on GDP	Significance
cocoapriceindex	+	832	***
noncocoapriceindex	+	996	***
frontierclosing	-	662	***
war1	-	1.3	-
war2	-	10.3	-
easternlne	+	9.4	***
centrallne	-	2.3	-
westernlne	+	0.1	-
period	+	797	***
constant	-	1842	***

*p < 0.1; **p < 0.05; ***p < 0.01

4. Table: Results of the Growth Regression Analysis

The specified model explains over 92 % of the variance in the modified GDP series in the Gold Coast's growth based on Jerven (2014). The price indices of cocoa and non-cocoa exports affected gross product roughly equally. The two wars do not seem to have had a statistically significant effect, although the coefficient is negative. However, the closing of the frontier, as emphasized by Green (2016), decreased the Gold Coast's GDP heavily in the period 1936-1946. The periodical shifts of cocoa production have a positive effect at any chosen level of significance. Of the three railways, each added mile of the Eastern railway, traversing the cocoa-producing regions of the Eastern province and the Ashanti forestland, increased the colony's GDP by over 9 million 1990 international dollars. As the line's final mileage surpassed 150 miles, the line is responsible for an immense portion of the colony's economic performance, confirming the findings of Luntinen (1996) and Jedwab and Moradi (2016).

5.2 Inequality

Number of Observations 29

Prob > F 0.0000

Adjusted R-squared 0.7389

Variable	Sign	Coefficient on Gini	Significance
cocoafarmerprop	-	0.12	-
subsistenceprop	+	0.2	-
europeansprop	+	54.4	**
foodcropprop	+	0.26	**
cocoavalue	+	2.61e-08	**
noncocoavalue	+	5.66e-10	-
avgincomes	+	0.0063	***
rail	-	0.8	**
centrum	+	0.08	**
period	+	0.08	**
constant	-	0.46	-

***p < 0.1; **p < 0.05; ***p < 0.01**

5. Table: Results of the Inequality Regression Analysis

As for inequality, 74% of variance in the regional Gini coefficients compiled by Aboagye and Bolt (2018) is explained by the second econometric model. Confirming their assertion about the importance of wage effects, average incomes and the value of cocoa exports both have a statistically significant positive effect on inequality. The effect of non-cocoa export values is positive, but not significant. Overall, it seems logical to assert that inequality rose with the increase in disposable incomes. Aboagye and Bolt (2018) assert that the benefits of the cocoa economy trickled down to other parts of society as well. However, the annual value of cocoa does not completely explain average incomes, reinforcing the results of the growth analysis that the price effect of non-cocoa exports was just as significant as that of cocoa.

The population share of cocoa farmers does not seem to have a statistically significant effect on inequality. However, the coefficient is negative, weakly suggesting that inequality decreased with the number of people sharing directly in the cocoa economy. The share of

food crop farmers, on the other hand, has a significant and strongly negative effect. According to the dataset of Aboagye and Bolt (2018), food crop farmers had the largest cumulative income shares, with individual incomes usually slightly lower than that of small-scale cocoa farmers. However, their population shares fluctuated in the 20-30 percent range, thus effectively forming the „middle class” of the Gold Coast society. The presence of European government officials significantly lifted inequality rates – not surprising, as their incomes soared high above the rest. It must be noted though that their shares were the lowest, ranging from 0.15 to 0.01 percent, thus overall explaining relatively little of the total Gini coefficients. While also not significant, the percentage of the subsistence group had a positive effect of inequality. As their incomes were fixed around the hypothetical subsistence level, according to the data they did not partake in the increase of living standards measured in disposable incomes, forming the lowest strata of society.

Interestingly, being a central region increased Gini coefficients by 8% in itself. This suggests that *ceteris paribus*, the less centralized political formations prevailing in the lands not dominated by Akans resulted in more equal distribution of resources. The presence of a railway, however, had a significantly negative 8% modifier on regional Gini coefficients. We know from the earlier analysis that the railways had a significant contribution to the growth of the colony. However, it seems that beyond the growth effect – which was positive, but picked up by other variables in this regression – access to the ports enabled more people to partake in the export economy. The abnormally high transport costs mentioned by Tudhope (1909) may have resulted in only the farmers closest to the ports, or the farmers with the largest properties being able to profitably grow the crop. Moreover, Luntinen (1996) mentions that a very high portion of the civilian passengers of the Gold Coast railway were food crop farmers and petty traders travelling to smaller markets. Thus, even beyond the enabling of the export boom, the railway could be said to have immensely benefited even those not directly sharing in it.

5.3 Poverty

Number of Observations 29

Prob > F 0.0000

Adjusted R-squared 0.5965

Variable	Sign	Coefficient on Poverty	Significance
gdpc	-	0.0025	***
region (Base: Western)			
- Central	-	0.0045	-
- Eastern	-	0.044	-
- Ashanti	+	0.067	*
- Northern Territories	+	0.06	-
- British Togoland	+	0.125	*
rail	+	0.118	***
gini	+	0.194	-
avgincome	-	0.001	***
cons	+	0.85	***
*p < 0.1; **p < 0.05; ***p < 0.01			

6. Table: Results of the Poverty Regression Analysis

Unsurprisingly with regards to the available data and analytical methods, the poverty analysis seems to provide the least amount of sensible results. Nonetheless, it suffices for a high-level trend-identifying analysis, which is the main purpose of this thesis. The specified model manages to explain roughly 60 percent of variance within poverty ratios – that is, the percentage of population living at a meager level of subsistence. As expected, poverty ratios declined steadily with the growth of GDP per capita, regardless of the region in question. The coefficient of average incomes is also negative and sufficiently significant. Nonetheless, this result bears a significant amount of reverse causality stemming from the method of calculation. Interestingly, the presence of a railway seems to reliably indicate higher poverty ratios. However, there is zero theoretical or intuitive basis for accepting this suggestion. Jerven (2014) quotes Gerschenkron in saying that if numerical results contradict underlying historical knowledge – and, by extension, common sense – it is the former that should be discarded.

6 Discussion and Conclusion

6.1 Summary

Summarizing the results of the three regressions and the information known from the analyzed literature, the emerging trends seem rather standard in light of previous growth-inequality-poverty analyses. Transcending the subsistence-dominated era and shifting towards more organized activities and higher productivity rates is the first step of the most well-known historical growth and inequality frameworks such as those of Lewis (1954) and Kuznets (1955). Immense growth was enabled by the productivity breakthrough of the newly introduced cocoa crop. The agricultural revolution represented a response to shifts in world market demands, but also required the technological advances brought by Europeans in the form of rail transport. However, as Adelman (1984) theoreticizes, not everyone was able to benefit from the new opportunities, resulting in rising inequality across the colony. Nonetheless, the vast fortunes that entered the economy thanks to the export crop diffused throughout the markets of the Gold Coast, creating new opportunities and driving average incomes upwards, resulting in a steady reduction of absolute poverty.

The colony, however, can not be considered as a homogenous entity. The studied administrative regions varied greatly regarding numerous characteristics, such as suitability of the soil for cocoa farming, distance and connection to the central ports, and prevailing political structures. As a result, the nature of inequality and poverty varied across different parts of the colony. This is an important, but often overlooked aspect that is especially relevant to African countries, which were often artificially created during and after colonialism by including previously unrelated ethnic and political structures within the same borders. When addressing country-level issues, such as the growth-inequality-poverty triangle of an entire nation, the full picture can never be understood without first accounting for potential striking regional differences. Much like Jerven (2013), this thesis once again confirms that qualitative rigour and an understanding of local history must always precede numerical analysis.

6.2 Relations to Previous Literature

Moreover, the regression analyses confirm several assertions from the literature, previously untested in such quantitative analyses, at least to the knowledge of the author. The effect of export values and price fluctuations, and by extension, average incomes on the updated GDP series and on inequality and poverty ratios, respectively, was rather predictable. However, the thesis also confirms the novel assertions of Green (2016). On one hand, by finding a significant and heavily negative effect for the closing of the frontier from 1938 to 1946. Moreover, the timing of record years and the significant positive effect of the period variable in the growth analysis is a weaker, but still considerable suggestion towards confirming the 18-year periods of the cocoa plant and the motivational effect of exceptional years.

The contributions of the railway literature (Luntinen, 1996, Jedwab and Moradi, 2016) also find confirmation. In the growth analysis, the benefits of the eastern Accra-Kumasi railway distinguish themselves from other lines. While keeping in line with Luntinen's (1996) assertion that the railways were a great opportunity for food crop farmers to boost their activities through easy access to local markets, the presence of a railway seems to have negatively affected inequality beyond the growth effect provided directly to cocoa farmers.

Thus, the thesis has presented a picture of the trends regarding growth, inequality and poverty that characterized the Gold Coast between 1891 and 1947. The findings were largely in line with more recent literature describing these interactions in developing nations (Adelman, 1984, Bourgignon, 2004, Perkins et al, 2005).

6.3 Concluding remarks

Referring to a famous 1987 quote from Manning, Jerven (2012, 28) finished the working paper that would become the 2013 study used in this thesis with the following: „*If Africa is not to be marginalized in global economic studies and if we are to understand the relative importance of historical events for African development today, similar reconstructive research should be undertaken where it is feasible. Avanti, Economic historians!*„, Despite constraints and difficulties, the author of this thesis is hopeful and at the same time confident

that such research has been undertaken in the form of this thesis. While this author would not completely discard the contributions of Acemoglu and Robinson (2012), this thesis fits into the line of economic history literature which warns heavily against simplistic cross-country explanations for present-day differences in incomes. As for *avanti*⁹, this thesis can hopefully provide a basis for studies that can exchange wideness of scope for increased quantitative rigor, or perhaps provide inspiration to examine Africa's colonial past within the context of more contemporary frameworks offered by advancements in developmental economic history.

On one hand, future research could attempt to tackle the data and methodology limitations of this wide-scoped study, and provide more focused analyses regarding less broadly defined topics. However, doing this may require digging into primary data thus far uncompiled. The Blue Books and Colonial Reports still undoubtedly contain much valuable information that has not yet been used by the field.

On the other, while the quantitatively measurable aspects of the country were explored to a considerable extent, the study barely even scratched the surface of the complex web of political and social relations within which the studied trends were embedded. The works of Kimble (1963) and Ward (1967) could provide a great starting point for studies concerning these aspects. As mentioned earlier, the Gold Coast is one of the most well-studied colonial economies. Economic historians could take advantage of this fact to approach the colony from the perspective of political or institutional economics. Such studies would greatly benefit the discipline's understanding both the past and present of African economies. In light of the simplistic and inaccurate nature of some of the most discussed scholarly works (Acemoglu and Robinson, 2012) claiming to understand the institutional background of African growth and development, such studies could prove very valuable indeed.

⁹ Meaning „Forward!” in Italian

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