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Social Structures and Income Distribution in Colonial sub-Saharan Africa: The Case of Bechuanaland Protectorate 1936-1964[1]

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Abstract

In this paper we estimate the level and inequality of income for Bechuanaland Protectorate by constructing four social tables between 1936 to 1964 using colonial archives and anthropological records. We present a working hypothesis that there is need to further analyze Botswana's colonial era if we are to understand several aspects of contemporary economic structures. Our focus is on identifying the roots of post-independence high levels of inequality. We find that first of all that migrant labour to neighbouring South Africa earned well relative to domestic labour in the Protectorate, both in the formal and traditional sectors. Remittances their families back home and became an important strategy for the poorer segments of society to stay at or above subsistence. Second, the creation of a beef export sector in the 1930s brought with it new opportunities to access export incomes and starting in the 1940s this led to increasing income inequalities and a polarization in cattle holdings. Third, wages for government officials were forging ahead creating an increasing income divide between public and private formal employment. In conclusion we infer that Botswana's contemporary institutional inequality has far reaching historical roots.

INTRODUCTION

Contemporary Botswana is generally hailed as an African growth miracle and even a developmental state (Mbabazi and Taylor 2005; Mkandawire 2001; Leith 2005; Samatar 1999). The explanation for post-independence economic progress and success has routinely been found in good pre-colonial political institutions prevailing during an era of limited colonial influence (Acemoglu et al. 2003, 2010, 2012; Masire 2006). However, advocates of the success story generally ignore the continuous high levels of inequality that are found in the midst of post-independence plenty. In the mid-1970s the Gini coefficient of income distribution was 0.73 (Good 1992: 79), and it only slowly declined to 0.63 in 1993 (World Bank 2013) to now being 'only' in excess of 0.5 (IMF 2012). The negative aspects of high levels of inequality and how it has proven to be a significant factor explaining the post-independence diamond led economy's failure to diversify and combat poverty has been pointed out in previous research (Good 1992, 1994; Gulbrandsen 1996; Hillbom 2008, 2012). Our original contribution in this text is to investigate the origin of inequality from a long-term perspective.

We argue that high levels of inequality are not a post-independence phenomenon and we trace its roots back to the colonial era. We do that by constructing four social tables for the Bechuanaland Protectorate from the 1930s to 1960s. The method of constructing social tables, i.e. counting people by occupations or social classes and computing their average incomes, allows us to include a large part of the traditional sector into the discussion of standards of living. It also enables us to hypothesise about non-wage income and wealth. Concretely, we identify social classes based on occupation, we estimate the share of population per class and we compute mean incomes for each class, using both colonial and anthropological records. Combining this with information about the costs of living at subsistence, we determine changes the welfare ratio, i.e. the number of family consumption baskets that can be bought with existing incomes. With changing welfare ratios we capture changes in income inequality between social classes over time.

We find that generally low and stable incomes for the masses throughout the colonial era. However, simultaneously income inequality in Bechuanaland Protectorate started rising rapidly after 1936. This increase can be traced back to structural change during colonial times in general and the development of the beef export sector in the 1930s and 1940s specifically. First, the export beef sector not only brought with it new opportunities to access export incomes, but also led to a polarization in cattle holdings. Combined this resulted in the dominance of the export sector by the large scale cattle holding elite which lead to an

increasing inequality in incomes as well as wealth. Second, wages for government officials were forging ahead increasing the income gap between formal employment in the public and private sectors. By claiming that contemporary inequality in Botswana is not the result of the establishment of diamond economy in the mid-1970s but has its roots in the colonial economy we disagree with the assumption that the colonial era was uneventful in economic terms. Instead we claim that this was a time period of key events, one of the most important ones being the establishment of the institutional inequality that linger on today.

SOCIAL TABLES IN ECONOMIC HISTORY

The idea of constructing social tables can be traced back to the work of William Petty and Gregory King in the late seventeenth century. Petty's theories on economics and his political arithmetic method was a first attempt at describing social order and prove claims relying on statistical data rather than qualitative evidence such as narratives and anecdotal evidence. With the aim of reaching a rudimentary estimation of national accounts Petty computed incomes from land, estates and labour, and equated it to expenditures for England and Wales in 1664 (Aspromourgos 1988). King continued in his footsteps, developing the method of describing incomes and expenditures at the household as well as the national levels in statistical terms. However, he took the ideas further by incorporating demographic statistics and information about occupation. By computing numbers and size of households as well as incomes, expenses and surplus for 26 occupations (or social classes) he created the first social tables for England in 1688. His ultimate aim was to find out the contribution made by each social class to the joint wealth of society (Stone 1984).

These early methodologies have been embraced and further elaborated in the field of economic history. Social tables have been used as a way to estimate both national accounts 'from below' and inequality. By reviving and revising King's social tables from 1688, and combining them with Joseph Massie's for 1759 as well as Colquhoun for 1801-1803 and 1812, Peter Lindert and Jeffrey Williamson (1982) presented elaborate social tables for England and Wales. Their claim was that the exercise offered new perspectives on the two region's growth as well as distribution of their national product for a period covering both the pre-industrial and the industrializing society, 1688-1812. Recently, Lindert and Williamson (2012) have also constructed social tables for British North America in late eighteenth century. In this study they discuss the American growth experience by building up estimates from the income side instead of the output side.

Together with Branko Milanovic, Lindert and Williamson (2010) have also relied on social tables when computing the so called *inequality possibility frontier* in twenty-eight pre-industrial societies. Their ambition was to find a new way of measuring inequality and extraction, thereby offering an alternative to the common Gini. Such an exercise, they argued, improves our knowledge about levels of inequality and elite extraction in historical as well as contemporary pre-industrial societies. Their work partly rests on previous efforts to construct average incomes for different social classes in ancient societies, such as Rome and Byzantium. The main purpose for these exercises has been to establish estimates of the size of the economies and constructing GDPs as well as developing models for income distribution and inequality between classes (Milanovic 2006; Scheidel and Friesen 2009).

The literature further includes a few studies of present day developing countries in a historical perspective. Using constructed GDP and PPPs, van Zanden (2003) has discussed differences in economic structures and distribution of incomes comparing real wages and distribution of wealth in Java and the Netherlands in the 19th century. For the same century, Berry (1990) uses social tables to show how incomes from exports of primary products in Peru increased incomes for the established elite. He argues that as the government was indifferent to developing the agricultural and manufacturing sectors, there was an increased unequal division of incomes between classes.

The primary reason that has held back similar research for colonial sub-Saharan Africa is the lack of reliable data. Still, if we can be creative enough to deal with these challenges such research could answer questions about levels of inequality. The study potentially most similar to our own is that of Arne Bigsten (1987) computing income distribution and growth in Kenya 1914-1976. Focusing on analysing the dual economy he had to rely on weak data, especially for the early period, and he described his work as constructing crude guesses that at best could give indications of magnitudes. Bigsten constructed a social table made up of six basic income categories: traditional smallholders, self-employed, private modern agriculture, other private employment and public employees. These categories were then further divided according to ethnic belonging: African, Asian and European (Bigsten 1987 Table VI.1). The main intention was to measure increasing differences in incomes between categories over time.

For our own study we are primarily inspired by Petty and Bigsten. Just like Petty in England and Ireland in the late seventeenth century we are struggling with obtaining correct census data for colonial Bechuanaland Protectorate and consequently we will have to rely on various estimations. In order to make these estimations dependable we have to triangulate

them with qualitative data, secondary material and theoretical arguments. Meanwhile, Bigsten shows that it is possible to construct social tables for colonial sub-Saharan Africa, especially for the modern formal urban sector. Even more encouraging for an economic historian, he is a precursor in using social tables to capture change over time. The challenge that remains and that we hope to make some progress with, is to also be able to diversify within the traditional informal rural sector. Because Bechuanaland is a cattle economy it is in this respect a suitable case study as it appears to be easier to estimate wealth and incomes from animals compared to crops.

IDENTIFYING SOCIAL CLASSES

All economic historians working on colonial history know that we need to be innovative and modify earlier models developed for the European context if we are to offer analyses based on quantitative data. Colonial Bechuanaland is no exception to this rule. The Tswana themselves divided the population into three distinct classes: 'nobles' who are the descendants of former chiefs; 'commoners' descendants of groups incorporated into Tswana society a long time ago; and 'immigrants' newly admitted groups (Schapera and Comaroff 1991: 30). This division is, however, unsatisfactory for us as it was not related to income or wealth and it only depicted the traditional, Tswana dominated rural society.

We start out traditionally with ranking the economically and socially most prominent groups and then move our way down the socio-economic hierarchy to those segments of society living at the subsistence level. Due to the limitations of our material the number of social classes will be significantly lower than what has been common in previous studies on pre-industrial, but not ancient, Europe. For example, Lindert and Williamson (1982) study of England and Wales 1688-1812 contains nineteen categories. Instead we will provide seven categories, which is in line with studies of pre-industrial developing countries where van Zanden (2003) has five for Java in early 19th century, Berry (1990) has 9-12 for Peru 1870, and Bigsten (1987) five for Kenya 1914-1976.

The reason for our limitation in the number of social classes is twofold. First, groups that are the easiest to identify are also the smallest ones and sub-dividing them would make them disappear in the analysis, e.g. government officials in administration and the police force. Second, for the larger mass of rural dwellers we do not have enough information to divide them into numerous classes. Traditionally, the Tswana were agro-pastoralists, i.e. their agricultural system was based on a combination of crop farming and cattle rearing. Cattle

were either held in common by the *morafe*[2] and managed by the *kgosi*[3], or as private property. Whoever controlled cattle could use them to build patron-client relationships through *mafisa*, a system of lending out animals to cattle-less subjects and relatives on a long-term basis. While the recipient gained access to milk and drought power, as well as ownership of potential future off-spring, the lender could claim both labour and political loyalty in return (Guldbransen 1996: 214-217; Schapera 1994). Due to the system of *mafisa* individual holdings are very difficult to estimate. There is a lack of comprehensive, continuous data following changes in distribution of cattle over time. Instead we have to rely on investigations in single years and general estimates. Still, we are making a crude effort to divide the traditional sector, something that is missing from Bigsten's (1987) estimates for Kenya.

We assume that the strength of social networks among the Tswana will prevent individuals from falling below subsistence levels. Contemporary reports show that all household were involved in an intricate system of offering and receiving reciprocal gifts and tributes to relatives, clients, visitors and chiefs primarily in the form of food, but also clothes and occasionally cash (Schapera and Comaroff 1991:20). Remittances from migrant labour also played a role as one of the most important incomes for paying taxes as well as keeping people at subsistence level (Morapedi 1999). Due to lack of information about female wages we do not break down the groups according to sex. In regard to ethnicity there are groups, e.g. government officials, were wage differences between Africans and Europeans are so great that it warrants a division. We are, however, not focusing on an ethnic divide, it is a result and not a point of departure, and it will not always appear. Some social classes turn out to be dominated by one ethnic group, e.g. small- and medium size cattle holders, while others such as the cattleless represent a mix of ethnic groups.

Once the groups have been identified our next challenge is how to clearly separate them from one another and rank them according to income. Milanovic et al. (2010) state that social tables are especially useful for analysing societies where class structures are easily identified and differences in income are significant. Unfortunately, this is not the case in colonial Bechuanaland. First, income spans overlap and we cannot assume that all individuals within a higher social class are wealthier than the ones in a lower social class. Further, individuals move on a long-term as well as a temporary basis in and out of social groups and economic activities. We will get back to this specific challenge when we discussing change in inequality

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[2] Morafe is the Tswana word for tribe, plural merafe.
[3] Kgosi is the tswana word for chief, plural dikgosi.

over time as presented in our social tables. The social classes that we have identified for colonial Bechuanaland are:

Large cattle holders and landed elite: In pre-industrial societies the elite derives its wealth from amassment of agricultural resources. In colonial Bechuanaland this group is primarily made up of the tribal elites receding on communal land in the Native Reserves. This group of large scale cattle holders consisted of chiefs and a few others and individuals could hold as many as 5,000 cattle each and even more. There is also a limited number, 173 farmers in 1946 (Census 1946), of Europeans with privately owned farms either on Crown Lands or on land falling under company rule. The majority of these also belong to the group of large-scale cattle holders, but in some areas under company rule a small number specialized in commercial crop production. Before the development of the cattle/beef export sector in the 1930s large-scale Tswana cattle holders primarily sold animals to cover expenses such as paying for taxes, schooling etc. Meanwhile, the European farmers were *de facto* rather part of the South African economy. With the growing export sector they were all given new opportunities for acquiring cash incomes by selling off their cattle within the Protectorate. The commercial large-scale farms over time became highly profitable enterprises (Guldbransen 1996: 79). Throughout the colonial period, this group seems to consist of around 5 per cent of the rural population (Schapera and Comaroff, 1991: 17; Schapera, 1994).

European government administrators and officials: This group consists of higher ranking Europeans in the public sector who either stayed permanently or for a limited time period. In 1905, there were 15 officials employed by the colonial government, ranging from the Resident Commissioner to clerks. There were also 51 European police officers employed. The number of officials (excluding the police force) employed increased with more ambitious colonial strategies, e.g. tax collection and export sector development, to 30 in 1906, to 42 in 1915, to over 80 in 1930, to 120 in 1936, to 224 in 1947 (various Blue Books and Annual Yearbooks).

Tswana government administrators: The lower ranking Tswana government administrators are also part of the public sector, but they have been separated from the Europeans due to significant differences in incomes. This group is likely to be well connected to the rural areas and the agricultural sector via extended family including being part of social networks of reciprocity and receiving some incomes in kind from agriculture, also when they primarily

reside in urban settlements. In 1946, 1050 Africans were working for the government service, of which 153 for the police. The number of people working for the government increased to 2500 in 1958 (various Blue Books and annual yearbooks).

Skilled labour: This group represents the formal private sector and makes up the closest thing we have of an entrepreneurial class, although their success is varied. Traders ran trading-stores providing imported household goods and there is also a growing number of commercial butchers, bakers and eating-houses in the larger villages in the 1940-50s. Traders also control the export of ostrich feathers, ivory, skins, agricultural products and, most importantly, cattle (Schapera and Comaroff 1991: 23). In 1932, only 15 individuals were recorded to work in trade, increasing to up to around 200 in 1946. In the trade sector, 550 people were active in 1946 while the number of traders increased to 2,000 in 1958 and 3150 in 1963 (various Blue Books and Annual Yearbooks). We have consistent wage information for this group from the earliest records onwards. The group also includes other types of skilled labour such as carpenters, brick layers, and so on.

Labourers: Wage labour was considered a good complement to agricultural activities since before colonialism. After the introduction of colonial taxes in 1899 migrant labour was further boosted by the need to find work outside of agriculture in order to gain cash incomes. Especially from the 1930s and onwards diversifying incomes by sending a household member to get employment became a popular household strategy. Very few wage labourers constituted an actual proletariat in the sense of lacking control over any means of production. Rather, the majority retained access to agricultural resources for crop farming and cattle rearing, and they moved temporarily between their home village and the place of employment. Labourers were primarily recruited from rural households with few or no cattle in the rural areas and many used their savings to buy cattle as they returned home (Morapedi 1999). Figures are inconsistent when it comes to defining the size of this group, probably because it is shifting. Data from 1943 and the census of 1946 both show that around 28 per cent of all adult men may be working away from home for wage income at the same time. The bulk part, 89 per cent, was going to the Union of South Africa, 60 per cent of who were going for work in the mines[4]. The official statistics typically report a much lower share of people working abroad

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[4] The numbers given by the Blue Books and the census of 1946 differ a bit from the numbers given by Schapera and Comaroff (1991), especially with respect to the people going to South Africa to work in the mines. We use

(either by reporting the number of labour passes issued, or by stating the number of people employed by category). The Tswana groups living closest to the South African mining fields were the ones most prone to move. The group also consists of construction workers, farm hands, domestic help, etc. working in Bechuanaland itself as well as being temporary migrants to neighbouring South Africa (Schapera and Comaroff 1991: 24). We have consistent wage information for: agriculture and domestic services, and from 1946 onwards also mining, building and government services. For labourers going to South Africa to work in the mines, we have continues wage information from 1911 until independence.

Medium-scale cattle holding: Members of this group are rural Tswana holding cattle to a lesser degree than the landed elite, 10-100 head. The middle-scale cattle holders are actively using their cattle wealth to generate income as they sell off animals to pay for taxes. Based on the survey in 1943 and the investigation into the Barolong Farms, this group represent some 30-35 per cent of rural households (Schapera and Comaroff 1991:17) up until the mid-1940s. After this period, there is a continuously decline in the population share of medium sized cattle holding to around 10 per cent of the population in the mid-1960s (Good, 1992, 1993, 1994; Colchough and McCarthy 1980: 113; Oomen 1983: 38, Table 3.3). Also the size of their herd decreases from on average 34 to on average 26 heads of cattle (Schapera and Comaroff 1991; Colchough and McCarthy 1980; Rural Income Distribution Survey (1974/75).

Small-scale cattle holding: The 1943 survey together with a subsequent survey of the Barolong farms showed that prior to 1946, on average 18-18.5 per cent of rural families held less than ten head of cattle each. This number is an important distinction as this is accepted as a minimum size of any herd to yield an annually disposable income (Schapera and Comaroff 1991:17). In terms of wealth that can potentially be turned into income this group is then distinct, but since they generally do not sell cattle, they can also be considered as living on subsistence levels. Still, they do acquire incomes in kind from their animals in the form of milk which is an important nutritional addition and they also have access to draft power which is of importance for their crop farming activities (Gulbrandsen 1996: 201). The size of this social group increases to 40 per cent of the rural population in the 1960s, which is an

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the Census of 1946 combined with information from the colonial Blue Books to determine the size of each wage earning group, as that is the original material we have.

increase of 39 per cent (Colchough and McCarthy 1980; Rural Income Distribution Survey, 1974/75).

Cattleless: This group, made up of Tswana rural households, represent the poorest members of society, living at subsistence level, relying primarily on incomes from rain fed crop farming. Differently from the small-scale cattle holders they neither controlled wealth nor received incomes in kind from cattle. With the emphasis in Tswana society on patron/client relationships, extended families and *mafisa* they are kept from falling under subsistence levels as they can rely on some assistance from relatives and other, better off, members of society. The survey from 1943 show that 7.4 per cent of Tswana families held no cattle, while at the Barolong Farms 11 per cent of men held no cattle (Schapera and Comaroff 1991 :17) although they could hold other animals such as goats and sheep

An important sub-section within this income group is bonded labour. Numerous individuals, although it is impossible to say exactly how many, of the indigenous people, the Kgalagadi and Sarwa, inhabiting the area before the arrival of the Tswana, were kept in slave like labour control systems. This was most common in the Western tribes where chiefs held individuals as serfs, or *malate*. These people were not free to move away, but their 'master' could lend them out to work for someone else. *Malata* could be used for crop farming as well as hunting and herding livestock. Although this type of compulsory servitude was *de jure* abolished by the colonial administration, it *de facto* remained (Schapera and Comaroff 1991: 22, 31). *Malata* generally worked for only food and housing and they did not control any resources, i.e. they live at but not below subsistence and had no wealth.

The occurrence of bonded labour slowly decreased during the colonial period and the relative importance of the role they played in the overall group of cattleless became less significance. Meanwhile, the social class of the cattleless experienced the second largest change in group size after the small scale cattle holding social group. From approximately 12 per cent of the rural population the share of their group increased to around 30 per cent in the 1960s.

ESTIMATING FOUR SOCIAL TABLES: 1936 - 1964

Assessing the evolution of inequality in terms of income and wealth during the colonial period requires information on the size of each social group we have defined above, as well as information on wages, income and wealth for each social group separately. The first challenge

was to obtain information on the size of total population for Bechuanaland Protectorate, given that colonial censuses are found to have generally substantially underestimated population (Fetter, 1987; Manning, 2010; Jerven 2013).

Recently scholars have produced new estimates of total population for various countries in Africa going back to the late 19th century using backward extrapolation from various benchmark years, using different default growth rates (Manning, 2010; 2013; Frankema and Jerven, 2013). Manning (2010; 2013) generally takes 1950 to be a reliable benchmark and uses Indian census growth rates, adjusted for regional variances within Africa to obtain country specific growth rates. Meanwhile, Frankema and Jerven (2013) determine what they deem the first reliable benchmark per country and then apply a growth rate from a neighbouring country if they have a reliable census. Alternatively they use population growth rates from land abundant East Asian countries to extrapolate the benchmark estimate backwards.

For Bechuanaland Protectorate our starting point is the official total population estimate from the 1964 census as it is generally considered reliable, and gives very similar result to the revised population estimates presented by Manning (2013) and Frankema and Jerven (2013). To obtain the 1956 total population estimate we use the annual growth rate suggested by both Manning (2013) and Frankema and Jerven (2013) as they are identical from 1950 and onwards and with that we extrapolate backwards from 1964. However, prior to 1950, Frankema and Jerven (2013) suggest a much higher growth rate and hence a lower population level than Manning (2013) in the benchmark years relevant to our study. Because Frankema and Jerven (2013) base their growth rates on the census from neighbouring South Africa, where the living conditions were similar to Bechuanaland Protectorate we use their growth rates to obtain the 1946 and 1936 population estimates

The size of the wage earning social classes was obtained from the Colonial Blue Books and the Annual Yearbooks for Colonial Bechuanaland Protectorate. For the second half of the colonial period, numbers of people employed in the domestic economy are readily available. Also estimates of immigrant labourers are recorded but they seem to be a significant underestimate of the actual number that went abroad to earn income. In 1936 for example, a little over 8000 labour passes were issued (1.7 per cent of the population), while Schapera (1994) estimate that around one third to half of the population was absent for any given year during the 1930s to work abroad, mainly in the South African mines (see also Parsons 1993; Ramsey et al. 1996; Roe, 1980).

To estimate the size of the various groups of cattle holders and the cattleless, we used primarily anthropological sources. For 1936 and 1946 we draw on the original works of Schapera (1994) based on his extensive field work in Bechuanaland in the 1930s and 1940s and Schapera and Comaroff (1991) who rely on a 1943 survey of the distribution of the national cattle herd. For 1956 and 1964 we refer to later work such as Gulbrandsen (1996) and Good (1992, 1993, 1994) which in turn is also to a large extent based on the seminal work of Schapera, and the Rural Income Distribution Survey (1974/75).

The second challenge was to estimate average income for each of the social classes. For the wage earning part of the population this was relatively straightforward as we could use the recorded wages from the colonial archives for this. But the vast majority of the population of Bechuanaland Protectorate was living in the countryside as cattle holders and there are no records of income earned or wealth owned for these social groups. Since all wealth in the traditional economy depended on holding cattle, we have used the average size of the respective herds and average prices for cattle prevalent in each year to approximate income and wealth.

The wealth contained in cattle is estimated for all cattle owning groups by multiplying the average stock of cattle times the retail price. Cattle generated actual money income only for the large and medium scale cattle holders, as their herd size was large enough to yield an annually disposable income. Generally cattle was sold to pay taxes or to provide income for other purposes (Schapera and Comaroff 1991). To approximate how much these cattle owners sold, we assume that the main ambition of the medium scale cattle holders was to increase the size of their herd. A herd size of 50 animals was considered the optimal size which was minimally robust to diseases and droughts. In none of the years we are estimating social tables for is the optimal herd size reached by the average medium scale cattle holders[5]. Therefore, we claim that the medium sized cattle holders sold as few cattle as they could (generally a little over 1 on average) which still allowed them to pay the annual taxes. The rest of the export of cattle can be traced to the large scale cattle holders. By multiplying the number of cattle exported by the prevailing retail price for horned cattle we calculate income for the medium and large scale cattle holders. The total export was probably a slight underestimation of total cattle sold, as some of the cattle were sold domestically. But domestic sale was limited as Schapera and Comaroff (1991) argue that although meat was available in the larger villages during the 1950s, it was rarely bought and eaten.

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[5] 34 in 1936, 1946, 1956 decreasing to 26 in 1963/64.

As the small-scale cattle holders did not sell their herd to generate cash income, they depended on subsistence activities to survive. However, as small-scale cattle holders owned some cattle, they were mostly able to stay on or above subsistence. They for example acquired incomes in kind from their animals in the form of milk which was an important nutritional addition as well as access to draft power (Gulbrandsen 1996: 201). We assign small scale cattle holders a level of income one and a half times what is need to live on subsistence to capture the benefits they received from owning cattle.

The cattle-less and the bonded labour also depended on subsistence activities to survive. As they themselves owned no animals, they often depended on patron/client relationships, extended families and *mafisa*[6] to keep them from falling below subsistence levels and to access some of the in kind incomes provided by cattle[7].

For each social table that we construct (see Appendix), we estimate the average yearly income for all social classes. We calculate a welfare ration indicating how many subsistence consumption baskets each family could by with its joint income[8]. For the formal employment income is generated by one male salary which pays for all expenses. Incomes in the traditional sector is generated by two adults, the husband and wife, who both work and provide for the family and their incomes are pooled together. Finally we calculate the total income distribution taking into account the share of the population. By repeating the exercise for four consecutive decades during the heyday of colonial rule in Bechuanaland Protectorate, we can trace changes in the relative size in each social class, changes in the level of incomes and welfare ratio's and, finally, changes in the share of total income earned by each social class.

CHANGE IN DISTRIBUTION OF INCOME DURING COLONIAL TIMES

Table 1 is based on our four social tables and summarizes our results for each social class' share of population, welfare ratio and share of income distribution. Based on our social tables our first main finding is the confirmation of the importance of labour migration to South Africa to the Bechuanaland economy during the colonial period, especially before the introduction of the cattle sector, as this group contributed substantially to incomes generated

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[6] A system of lending out animals to cattle-less subjects and relatives on a long-term basis.

[7] We assume that to pay taxes, even the poorest of the population still had small-stock or crops that they could sell and potentially they were helped by family members who had wage labour, e.g. in the mines as stated my Morapedi (1999). Also according to Guldbransen (1996), labour migration is imperative for keeping those in the village at subsistence levels. This means that after tax income relative to subsistence is zero.

[8] We used the revised assumptions for estimating subsistence cost, hence 2100 calories per day for a male adult multiplied by 4 to maintain a family, following Allen (2013). For details and procedures see Bolt and Hillbom (2013).

from the 1930s and onwards. Before the cattle export sector took off at the end of the 1930s, migrant labour constituted even the main source of cash income. As a result, these labourers earned by a substantial share of total income (10.7 percent) while making up only 1.7 percent of the population. However, welfare was generally very low (ratio income to subsistence is only 2.2 for the richest African social class – the migrant labourers). The share of income generated by the migrant labourers and their standards of living (welfare ratio) remained fairly stable over time, yet their share in the population more than doubled (see table 1). Migrant labour was a reaction to the introduction of colonial taxes in 1899, which were relatively high compared to British territories in Africa throughout the colonial period[9], pushing labour to find employment outside of agriculture. As wage earning opportunities were limited within the Protectorate, most of these labourers sought employment in neighbouring South Africa were the mining sector expanded from the 1860s onwards, albeit limited at first. Salaries in the mining sector could be generous, fluctuating between 20 and 64 shillings per month in the years 1888–1904, depending on labour demand (Parsons, 1993). While mining was the sector attracting most labour, individuals also took up employment as e.g. farm hands, domestic help and in later periods also in trade and manufacturing. Especially in the latter sector wages were relatively high. Hence labour migration, although negatively affecting the access to labour within the Protectorate, did bring substantial incomes to the Tswana economy in the form of both remittances and migrants investing their savings upon returning. This surplus helped cattle-less and smallholders to stay above subsistence thereby giving migrant families an advantage over others within the same social class.

The second and most important main finding is the clear indication that increasing inequality can be traced back to the mid-1940s and there are two groups who stand out as the winners. Our first set of winners was the large scale cattle holders. While consisting of only a small part of the population (around 5 per cent throughout the period), they earned increasingly above subsistence and consistently generate a substantial and increasing share of income from the 1940 onwards.

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[9] Tax revenue per capita was 99 and 131 pence per year in 1911 and 1925 respectively and it took an unskilled urban worker 23 working days on average to earn enough to pay the tax (Frankema, 2010: Appendix 2).

Table 1: Level and Distribution of Income 1936 - 1964[10]

	1936			1946			1956			1964		
	Share of population	Welfare ratio	Income distribution	Share of population	Welfare ratio	Income distribution	Share of population	Welfare ratio	Income distribution	Share of population	Welfare ratio	Income distribution
Large scale cattle holders	5%	1.4	6%	4%	4	12%	5%	11	29.9%	4%	14	30.2%
Medium scale cattle holders	34%	1.4	42.9%	25%	2.4	47%	17%	1.6	15.8%	8%	1.8	7.8%
Small-scale cattle holders	18%	1.5	24.4%	13%	1.5	16%	27%	1.5	23.2%	32%	1.5	26.6%
Cattle less	7%	1.0	6.6%	5%	1.0	4%	20%	1.0	11.7%	24%	1.0	13.3%
Bonded labour	6%	1.0	5.9%	5%	1.0	4%						
Labourers												
Agriculture	0.3%	1.0	0.8%	1%	1.6	1%	0.6%	2.6	1.9%	0.6%	1.6	1.2%
Domestic Services	0.3%	1.1	0.9%	0.4%	1.4	1%	0.4%	1.9	0.9%	0.4%	1.2	0.5%
Mining				1%	2.0	4%				0.1%	1.1	0.2%
Mines South Africa	2%	2.2	10.4%	2%	1.8	7%	3%	2.3	8.7%	5%	1.9	10.9%
Skilled labour	0.01%	1.8	0.05%	0.2%	2.7	1%	0.5%	3.8	2.1%	0.8%	2.6	2.2%
African Government Officials				0.5%	2.3	2%	0.5%	7.3	4.0%	0.7%	7.7	6.2%
European government officials	0.03%	28.9	2.0%	0.06%	18.4	2%	0.05%	32.8	1.8%	0.04%	20.4	0.9%
Unspecified	26%			14%			26%			24%		
Children				17%								
Total Population	315,137			382,602			478,090			549,510		

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[10] For full social tables see appendix 1

This finding is explained by the most profound change during the colonial era, i.e. the creation of the beef export sector. As in many other African colonies at the same time there was in the 1930s a new-found interest from the British government to develop natural resources into revenue earning exports in Bechuanaland. Given that animal husbandry and especially the owning of cattle was the core of the traditional Tswana economy, beef exports were identified as the comparative advantage of the Protectorate (Colough and McCarthy 1980; Parsons and Crowder 1988).

The primary obstacle for expanding the cattle sector was access to water in the drier areas of the grazing range and colonial efforts before World War II focused on borehole drilling schemes. Initiatives did not, however, only come from the colonial administration. The pioneering example of tribal initiative was that of BaKgatla and Kgosi Isang, who already in the late 1920s used native funds to start a borehole drilling scheme. This was the first large scale water development scheme in Bechuanaland and it was to be followed by other Tswana initiatives (Peters, 1994: 58; Schapera, 1980: 22–23). Once constructed, boreholes were handed over to individuals or syndicates representing a limited number of relatively influential and wealthy members of Tswana society. The result was an increasingly unequal division of water resources and because controlling water meant controlling the grazing range and securing necessary pre-conditions for keeping cattle, this over time resulted in an increasing polarization of cattle ownership (Hillbom 2010). The share of medium scale cattle holders decreased while the share of the population who was small scare cattle holders or cattle-less increased (see table 1). Moreover, the Protectorate experienced periods of severe droughts as well as incidences of foot and mouth diseases, especially in the 1930s and the 1960s, which negatively affected the herds of the medium and small scale cattle owners (Good 1993. Roe 1980). As a result, the average size of the herds held by medium sized cattle holder decreased significantly during these periods, making them even more vulnerable. Meanwhile, the average herd size of the large scale cattle holders continued to increase. Another important factor driving increasing inequality in incomes and wealth as it favoured the large scale cattle holders was the significant increase in cattle prices. In the mid-1960s, just before independence, cattle prices were nearly five times higher than they were in 1930. Given that exports were nearly completely concentrated in the hands of the large scale cattle owners, this group profited the most from the economic expansion of the cattle sector.. By the time of independence in 1966 beef represented 85 per cent of total export earnings (Colcough and McCarthy 1980: 32; Harvey and Lewis 1990: 78-82).

The second group of winners were the government officials – mostly the Europeans and to a lesser extend also the Africans – as they received the highest salaries. The welfare ratio of the European officials (nominal wages to the cost for living at subsistence) varied between 18 and 32 and while the Europeans only represented less that 0.5 per cent of the population throughout the period, Europeans earned between 17 and 30 times as much compared to when incomes would be distributed evenly over the population. So although the number of colonial administrators was low - increasing from 15 in 1905 to over 300 at independence[11] - this did not mean colonial influence was limited. These European officials eventually constituted a group that controlled a substantial share of total income.

African government administrators experienced an continuously increase in wage (and welfare ratio, from 2.3 in 1946 to 7.7 in 1964) but also more people as percentage of the population were employed by the government (albeit still only 1 per cent at the end of the colonial period). The combination of the increase in welfare and in share of the population jointly led to a strong increase in their share of income generated in 1964. The increase in surplus controlled by government officials is also an interesting finding when considering the implications for the public-private divide. The long-term implication is that while it apparently became increasingly profitable to be employed in the public sector, surplus controlled by labourers and traders within the private sector remained low and stable. The relative profitability for the individual to participate in the public rather than the private sector is a common phenomenon in both colonial and post-independence sub-Saharan Africa. In the long-term perspective obstacles for economic development have occurred as the public sector commonly has become over-dimensioned, controlling most resources, while the private sector has stayed economically weak and generally lacking influence.

The rise in inequality found in Bechuanaland from the 1940s onward, that is the concentration of increasing income in the hands of a few is summarized in figure 1 below, showing Lorenz curves for the three consecutive decades from 1936 onwards. The further the curve shifts away from the 45 degrees line representing full equality, the smaller the share of the population generating most of the income and the higher is the level of inequality. The Lorenz curve below then summarizes how inequality increased during our period of investigation. In the initial stages of the development of the beef export sector in the second half of the 1930s, both the large scale and medium scale cattle holders (together representing

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[11] The number of European officials in Bechuanaland protectorate was relatively high compared to the British Empire's average: 13,193 Africans per administrator versus 37,374 Africans per administrator (Richens, 2009: Table 1)

30 per cent of the population) benefited from the increased opportunity to earn income by selling off cattle. However, once the export sector fully expanded in the 1940s, access to water became increasingly concentrated in the hands of the large scale cattle holders. In combination with periods of drought and disease in the 1930s and 1960s especially affecting the herds of the medium- and small-scale cattle holders, the share of people living at subsistence or just above substantially increased throughout the period of investigation while the large scale cattle holders saw their incomes increase rapidly. Additionally, the people working for the colonial government, representing a very small part of the population, received increasing salaries with the expansion of the colonial administration basing its incomes on the success of beef exports. Combined, the small European government officials and the African elite earned 40 per cent of total income while representing only 5 per cent of the population.

Figure 1: Lorenz curves
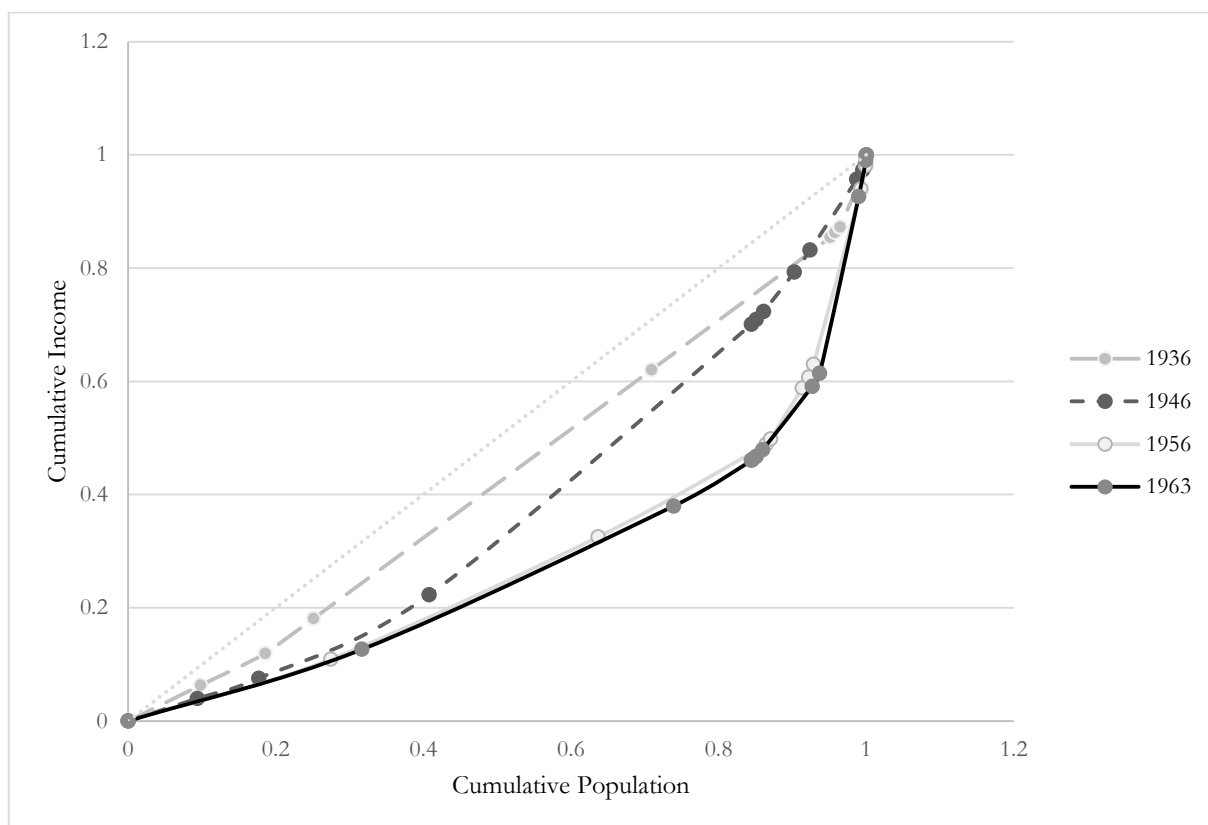
As was pointed out in the Introduction, the high levels of inequality that we have now demonstrated through both our social tables and Lorenz curves have continued to be an important characteristic of the post-independence diamond economy. In the mid-1970s, at the time when diamond incomes started to dominated Botswana's economy as they replaced beef exports as the most important source of government revenue, the country exhibited an exceptionally high Gini of 0.73 (Good 1992: 79). Although this trend was slightly curbed to 0.63 in 1993 (World Bank 2013) and just above 0.5 at present (IMF 2013) levels of inequality are still high in an international comparison. We can then conclude that there is a long-term trend of high levels of inequality stretching over almost seven decades, from the 1940s to the 2010s, and at present there are no indications of an imminent end.

CONCLUDING REMARKS

Contemporary writings seeking to explain the post-independence growth miracle with the quality of the country's political institutions commonly argue that the colonial era has had a limited impact on Botswana's history (Acemoglu et al. 2003, 2010, 2012; Masire 2006). Contrary to this literature our working hypothesis, based primarily on anthropological literature studying colonial Bechuanaland, has been that studying the colonial era is key to understanding several aspects of contemporary economic structures. Our focus has foremost been on identifying the root of the high levels of inequality that have been a consistent characteristic of Botswana's economy until the present. We have constructed social tables for 1936-1964, covering all but the very first decades of colonial rule, and based on them we have presented some interesting findings.

First, the introduction of taxes in 1899 combined with increasing opportunities for wage labour in neighbouring South Africa led to labour migration which further escalated in the 1930s and continued throughout the colonial era. While Bechuanaland in this way was deprived of valuable labour resources, temporary labour migration also added significantly to the Tswana economy. The social tables show that migrant labour earned well relative to cattle holders in the Protectorate and these incomes also benefitted their families back home. Accessing remittances became one important strategy for the poorer segments of society to stay at or above subsistence. Upon their return migrants could also invest their accumulated wealth in cattle farming.

Further, when the colonial government in the 1930s, in search of revenues to pay for the state, started to develop a commercial cattle sector it created for the first time an opportunity for the cattle keeping Tswana to acquire incomes from providing agricultural products for an

expanding export sector. These new opportunities soon became dominated by the large-scale cattle holding elite and provided a basis for increasing inequalities in incomes as well as wealth. Distribution of key agricultural resources such as water as well as cattle became polarized. The share of the population who were cattleless, i.e. the people living at subsistence level, increased while the large scale cattle holders forged ahead amassing increasingly larger herds and controlling a larger percentage of the national herd. Additionally, the price for cattle increased nearly five times between the establishment of the cattle sector and independence, which fortified the polarization effect, resulting in even more economic inequality.

Finally, there was a growing difference in real wages between the private and the public sectors, where the latter offered increasingly improved incomes and the government employees controlled more of the existing surplus. It further indicates an increased imbalance where the private sector failed to secure enough profit to compete with the public sector and the latter came to dominate the formal economy. Further research could be conducted to identify the implications of this imbalance.

With our results we concur with the strain of literature arguing that Botswana's contemporary institutional inequality has far reaching historical roots (Good 1992, 1993, 1994; Gulbrandsen 1996; Hillbom 2008, 2013; Makgala 2006; Wylie 1990) and we indicate a continuous long-term trend stretching from the 1940s until the present. We do not, however, believe that these are results unique for Botswana in the sub-Sahara African region. Consequently, we suggest that the construction of social tables for the colonial era offers a way to capture increasing inequality generally in colonial sub-Saharan Africa and that this is a method that can be copied in other studies aspiring to discuss trends of long-term inequality.

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Appendix1: Social tables

	Number in class	Share of population	Income per head pence per year	Wealth pence	Welfare ratio	Income distribution
Large scale cattle holders	15,284	5%	2,520	72,000	1.5	6%
Medium scale cattle holders	106,989	34%	2,570	24,480	1.5	43%
Small-scale cattle holders	56,551	18%	2,763	3,600	1.5	24%
Cattle less	22,926	7%	1,842		1.0	7%
Bonded labour	20,455	6%	1,842		1.0	6%
Labourers						
Agriculture	1,500	0%	3,530		1.0	1%
Domestic Services	1,500	0%	3,971		1.1	1%
Mining						
Mines South Africa	8,186	2%	8,160		2.2	10%
Skilled labour	50	0%	6,485		1.8	0%
African Government Officials						
European government officials	120	0.03%	106,404		28.9	2%
Unspecified	81,575	26%				
Children						
Total Population	315,137					

Total population is estimated extrapolating backwards from the 1964 census total with growth rates suggested by Frankema and Jerven (2013).

Size of the cattle owning social classes: large scale cattle holders 5% of rural population, medium scale-cattle holders 35% of rural population, small scale cattle holders 18.5% of population and cattle less and bonded labour 14% of rural population. Rural population is taken to be 97% of total population (Schapera 1994; Schapera and Comaroff 1991).Cattle stock large scale cattle holders is 100 heads of cattle[12], the medium scale cattle holders we assume held on average a stock of 34 heads of cattle, and the small sized cattle owners had a herd of less than 10 heads of cattle (Schapera and Comaroff 1991).

Only medium and large scale cattle holders are assumed to sell cattle for income. Medium scaled cattle holders export as few as the can in order to maintain their herd while still being able to pay taxes. In 1936 they export on average 1.19 heads of cattle, which relative to their stock is lower than the national export rate. The large scale cattle holders' export is higher than the national export rate. The sum of the total export of both groups is equal to the total national export. For income estimations we multiply the exports by the retail price for horned cattle taken from the colonial blue book (1936/37). For estimating these groups' wealth we have multiplied their average stock by the retail price for horned cattle taken from the colonial blue book (1936/37).

Small scale cattle owners do not sell cattle for income. To arrive at an income estimate for this group, we assume that as small-scale cattle holders owned some cattle, they were mostly able to stay on or above subsistence. They for example acquired incomes in kind from their animals in the form of milk which was an important nutritional addition as well as access to draft power. We therefore assign small scale cattle holders a level of income one and a half times what is need to live on subsistence to

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[12] The actual average herd size was larger, as the herd size fort this group starts at 100 head and go up to maybe even 5000. But since it proved difficult to calculate a realistic average we assumed the very conservative 100 head herd size.

capture the benefits they received from owning cattle. The income earned by cattle less and bonded labour is set equal to the price of a subsistence consumption basket (for details see Bolt and Hillbom 2013).

As both men and women are included in traditional social classes, we assume that they each had to be able to support half a family.

Wages for miners in South Africa, and men employed in commerce in industry in South Africa were provided by Pim de Zwart.

As there were no wages for women documented, we assume that wage earners had to support a whole family, that is 2 adults and three children. The costs to live at subsistence were calculated accordingly (see Bolt and Hillbom 2013).

Unspecified include the part of the rural population not specified by Schapera and Comaroff (1991).

The welfare ratio is obtained by dividing the nominal (wage) income by the cost for a family subsistence basket. The ratio thus indicates how many family subsistence baskets one income can buy.

<div align="center">Social Table Bechuanaland Protectorate in 1946</div>

	Number in class	Share of population	Income per head pence per year	Wealth pence	Welfare ratio	Income distribution
Large scale cattle holders	14,060	4%	12,348	252,000	4.3	12%
Medium scale cattle holders	97,211	25%	6,854	85,680	2.4	47%
Small-scale cattle holders	51,383	13%	4,326	12,600	1.5	16%
Cattle less	20,831	5%	2,884		1.0	4%
Bonded labour	18,586	5%	2,884		1.0	4%
Labourers						
Agriculture	2,191	1%	9,171		1.6	1%
Domestic Services	1,460	0.4%	7,942		1.4	1%
Mining	4,727	1%	11,520		2.0	4%
Mines South Africa	9,300	2%	10,440		1.8	7%
Skilled labour	835	0.2%	15,630		2.7	1%
African Government Officials	1,786	0.5%	13,104		2.3	2%
European government officials	224	0.1%	106,404		18.4	2%
Unspecified	55,038	14%				
Children	64,214	17%				
Total Population	382,602					

Total population is estimated extrapolating backwards from the 1964 census total with growth rates suggested by Frankema and Jerven (2013).

Size of the cattle owning social classes: large scale cattle holders 5% of rural population, medium scale-cattle holders 35% of rural population, small scale cattle holders 18.5% of population and cattle less and bonded labour 14% of rural population. Rural population is taken to be 97% of total population (Schapera 1994; Schapera and Comaroff 1991).Cattle stock large scale cattle holders is 100 heads of cattle[13], the medium scale cattle holders we assume held on average a stock of 34 heads of

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[13] The actual average herd size was larger, as the herd size fort this group starts at 100 head and go up to maybe even 5000. But since it proved difficult to calculate a realistic average we assumed the very conservative 100 head herd size.

cattle, and the small sized cattle owners had a herd of less than heads of cattle (Schapera and Comaroff 1991).

Only medium and large scale cattle holders are assumed to sell cattle for income. Medium scaled cattle holders export as few as the can in order to maintain their herd while still being able to pay taxes. In 1946 they export on average 1.36 heads of cattle, which relative to their stock is lower than the national export rate. The large scale cattle holders' export is higher than the national export rate. The sum of the total export of both groups is equal to the total national export. For income estimations we multiply the exports by the retail price for horned cattle taken from the colonial blue book (1946/47). For estimating these groups' wealth we have multiplied their average stock by the retail price for horned cattle taken from the colonial blue book (1946/47).

Small scale cattle owners do not sell cattle for income. To arrive at an income estimate for this group, we assume that as small-scale cattle holders owned some cattle, they were mostly able to stay on or above subsistence. They for example acquired incomes in kind from their animals in the form of milk which was an important nutritional addition as well as access to draft power. We therefore assign small scale cattle holders a level of income one and a half times what is need to live on subsistence to capture the benefits they received from owning cattle. The income earned by cattle less and bonded labour is set equal to the price of a subsistence consumption basket (for details see Bolt and Hillbom 2013).

As both men and women are included in traditional social classes, we assume that they each had to be able to support half a family.

African government Officials include police, teachers and priests (like in the blue books).

Wages for miners in South Africa, and men employed in commerce in industry in South Africa were provided by Pim de Zwart.

As there were no wages for women documented, we assume that these wage earners had to support a whole family, that is 2 adults and three children. The costs to live at subsistence were calculated accordingly.

Unspecified include the part of the rural population not specified by Schapera and Comaroff (1991) and unspecified from the 1946 census.

The welfare ratio is obtained by dividing the nominal (wage) income by the cost for a family subsistence basket. The ratio thus indicates how many family subsistence baskets one income can buy.

Social Table Bechuanaland Protectorate in 1956

	Number in class	Share of population	income per head pence per year	Wealth pence	Welfare ratio	Income distribution
Large scale cattle holders	22,655	5%	36,644	446,882	10.9	30%
Medium scale cattle holders	80,175	17%	5,470	151,940	1.6	16%
Small-scale cattle holders	127,510	27%	5,061	22,344	1.5	23%
Cattle less	96,645	20%	3,374		1.0	12%
Bonded labour						
Labourers						
Agriculture	3,000	1%	17,280		2.6	2%
Domestic Services	2,000	0.4%	12,960		1.9	1%
Mining						
Mines South Africa	15,200	3%	15,840		2.3	9%
Skilled labour	2,300	0.5%	25,920		3.8	2%
African Government Officials	2,260	0.5%	49,466		7.3	4%
European government officials	224	0%	221,399		32.8	2%
Unspecified	126,120	26%				
	478,090					

Total population is estimated extrapolating backwards from the 1964 census total with growth rates suggested by Manning (2013) and Frankema and Jerven (2013). The rural population is equal to total population minus the wage earning share of the population. This is probably an underestimation of the rural population.

The size of the cattle owning social classes is based on extrapolation between the 1946 division and the 1964 division, using log growth. The large scale cattle holders make up 5% of the population, the medium scale cattle holders 18% of the population, the small scale cattle holders 28% and the cattle less 21% of the population. The herd sizes are assumed to be similar to 1946.

Only medium and large scale cattle holders are assumed to sell cattle for income. Medium scaled cattle holders export as few as the can in order to maintain their herd while still being able to pay taxes. In 1956 they export on average 1.22 heads of cattle, which relative to their stock is lower than the national export rate. The large scale cattle holders' export is higher than the national export rate. The sum of the total export of both groups is equal to the total national export. For income estimations we multiply the exports by the retail price for horned cattle taken from the 1956 annual yearbook. For estimating these groups' wealth we have multiplied their average stock by the retail price for horned cattle taken from the 1956 annual yearbook.

Small scale cattle owners do not sell cattle for income. To arrive at an income estimate for this group, we assume that as small-scale cattle holders owned some cattle, they were mostly able to stay on or above subsistence. They for example acquired incomes in kind from their animals in the form of milk which was an important nutritional addition as well as access to draft power. We therefore assign small scale cattle holders a level of income one and a half times what is need to live on subsistence to capture the benefits they received from owning cattle. The income earned by cattle less and bonded

labour is set equal to the price of a subsistence consumption basket (for details see Bolt and Hillbom 2013).

As both men and women are included in traditional social classes, we assume that they each had to be able to support half a family.

Wages for miners in South Africa, and men employed in commerce in industry in South Africa were provided by Pim de Zwart.

We have no information on the number of European officials, so we us the 1946 number of government officials.

As there were no wages for women documented, we assume that these wage earners had to support a whole family, that is 2 adults and three children. The costs to live at subsistence were calculated accordingly.

Unspecified include the part of the rural population not specified by Schapera and Comaroff (1991).

The welfare ratio is obtained by dividing the nominal (wage) income by the cost for a family subsistence basket. The ratio thus indicates how many family subsistence baskets one income can buy.

Social Table Bechuanaland Protectorate in 1963/64						
	Number in class	Share of population	income per head pence per year	Wealth pence	Welfare ratio	Income distribution
Large scale cattle holders	21,980	4%	77,811	555,795	13.6	30%
Medium scale cattle holders	43,961	8%	10,053	125,658	1.8	8%
Small-scale cattle holders	175,843	32%	8,552	24,165	1.5	27%
Cattle less	131,882	24%	5,701		1.0	13%
Bonded labour						
Labourers						
Agriculture	3,500	1%	18,720		1.6	1%
Domestic Services	2,000	0.4%	14,040		1.2	0%
Mining	700	0.1%	12,480		1.1	0%
Mines South Africa	28,000	5%	21,960		1.9	11%
Skilled labour[a]	4,250	0.8%	29,644		2.6	2%
African Government Officials	4,000	1%	88,004		7.7	6%
European government officials	224	0%	232,607		20.4	1%
Unspecified	133,393	24%				
	549,510					

[a] includes employment in railways, commerce, minor industries, recruiting organisations and abattoir and cannery.

Total population is taken from the official census in 1964. The rural population is taken to be 8% of the population (total population minus the wage earning share of the population). This is probably an underestimation of the rural population, as the WDI states that in 1964 96% of the population was considered rural.

The division between cattle owning social classes, and their respective herd size is based on Gulbrandsen (1996) and Good (1992, 1993, 1994) which in turn is also to a large extent based on the seminal work of Schapera, and the Rural Income Distribution Survey (1974/75). The large scale cattle owning class make up 5% of the rural population, the medium scale cattle holders make up 10% of the population, the small scale cattle holders 40% and the cattle less 30%. The herd size of the large scale

cattle holders is 115 heads of cattle, the stock of the medium sized cattle holders is 26, and the small scale cattle holders own less than 10 animals on average.

Only medium and large scale cattle holders are assumed to sell cattle for income. Medium scaled cattle holders export as few as the can in order to maintain their herd while still being able to pay taxes. In 1963 they export on average 1 heads of cattle, which relative to their stock is lower than the national export rate. The large scale cattle holders' export is higher than the national export rate. The sum of the total export of both groups is equal to the total national export. For income estimations we multiply the exports by the retail price for horned cattle taken from the 1956 annual yearbook. For estimating these groups' wealth we have multiplied their average stock by the retail price for horned cattle taken from the 1956 annual yearbook.

Small scale cattle owners do not sell cattle for income. To arrive at an income estimate for this group, we assume that as small-scale cattle holders owned some cattle, they were mostly able to stay on or above subsistence. They for example acquired incomes in kind from their animals in the form of milk which was an important nutritional addition as well as access to draft power. We therefore assign small scale cattle holders a level of income one and a half times what is need to live on subsistence to capture the benefits they received from owning cattle. The income earned by cattle less and bonded labour is set equal to the price of a subsistence consumption basket (for details see Bolt and Hillbom 2013).

As both men and women are included in the traditional social classes, we assume that they each had to be able to support half a family.

Wages for the miners and those employed in commerce and industry (trade and manufacturing) in SA are provided by Pim de Zwart.

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