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Changing income inequality and structural transformation

The case of Botswana 1921-2010

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Abstract: In Sub-Saharan Africa we find some of the highest levels of income inequality in the world. Nevertheless, we generally know very little about the historical development of inequality. In this paper we look at how inequality developed in colonial and post-colonial Botswana. We show that income inequality started rising in the 1940s and peaked in the mid-1970s about the time that the economy switched from cattle to diamonds. Since the 1990s, it has then declined somewhat. Following the tradition of Kuznets we discuss how this rise and decline could be related to a potential structural transformation of the economy.

Keywords: Africa, income inequality, structural transformation
JEL classification: N00, D63, O14

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1 Introduction

The African continent contains some of the highest levels of income inequality in the world (World Bank 2014). Over recent decades, the negative effects of inequality with regard to both the sustainable growth of African economies and long-term poverty reduction has been discussed (Hillbom 2008; World Bank 2006). Nevertheless, high levels of income inequality in the region appear to have started to decline during the last few years (Sala-i-Martin and Pinkovisky 2010). In this current development, Botswana could be considered a forerunner. Traditionally, high levels of inequality in Botswana have been associated with the diamond economy (Good 2008). However, a previous study on social classes and division of income during the colonial era (Bolt and Hillbom 2013a), as well as new results presented in this paper, show that the peak of income inequality took place in the mid-1970s and actually coincided with the switch between the cattle and the diamond economies. The main research questions for this paper are: How can the long-term rise and decline in income inequality in Botswana be explained? And how do changes in income inequality relate to a potential structural transformation of Botswana's economy?

Applying the arguments of Simon Kuznets (1955) on what drives down levels of income inequality, we could expect the explanation for declining income inequality to lie in the establishment and development of an industrial sector that is highly productive due to technological advances. Efficiency allows industrial/urban wages to become higher than agricultural/rural wages and the initial transfer of labour from the low-productivity agricultural sector to the high-productivity industrial sector, or from the rural to the urban areas, results in an increase in income inequalities. However, once the majority of the labour force is found in industry, then further transfers will instead mean a decrease in income inequality. The end result will be a return to low levels of income inequality, but with a general increase in income levels.

Going back to Africa, we know that this is a region that generally has experienced limited economic structural transformation and that the majority of economies are still based on agriculture. In particular, growth in the industrial sector has been very slow and transfers of labour and other resources have mainly taken place between the agricultural and the service sectors. At the same time, urban populations are growing rapidly. The African economies, then, are not following the traditional model of structural transformation assumed by economists such as Kuznets (1973) and Lewis (1954). Instead we may have to look at alternative pathways to modernization. This is also true for Botswana. While the diamond sector has been the driver of an economic growth miracle, the sector employs only a modest workforce and has had limited linkages to the rest of the industrial sector. Meanwhile, economic growth has catered for an expanding service sector, both public and private. When explaining the documented bending of the Kuznets curve in Botswana we thus have to expand on the classic Kuznets model to find alternative or modified explanations.

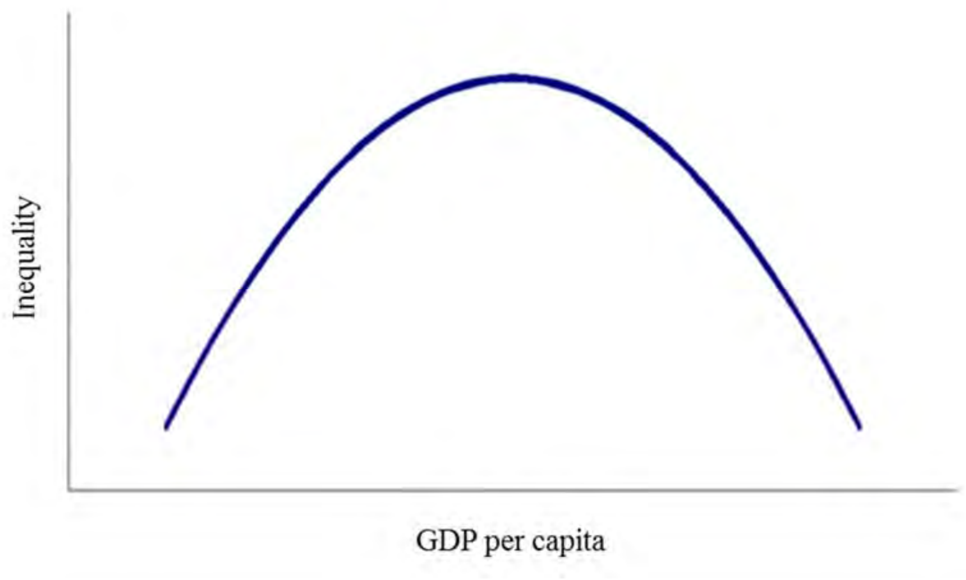
The structure of the paper is as follows: First, we present classical scholarly work on long-term changes in incomes inequality. The next section presents income inequality trends 1921-2010 in Botswana. It is followed by an analysis of the rise and decline of income inequality in relation to three over-riding themes: structural change in the economy, transfer of labour, and changes in incomes. The last section concludes.

2 Interpreting the Kuznets curve

Because *equity*, defined as equal opportunities for all and avoidance of absolute deprivation (World Bank 2006: 18-19), is a compulsory ingredient of the *development* definition, there is an inseparable link between the two concepts. Equity plays an important role in advancing development, as it frees people from the poverty trap and strengthens the political institutional structure. With overall higher levels of income as well as the support of a modern state, the rural poor can afford to turn away from being risk minimizers. Instead, they may become utility optimizers, contributing to the economy through their human capital capacities and raised productivity, as well as by bringing considerably increased supply and demand to the domestic market (Lipton 1977). Apart from possible normative positions valuing equity, it can be argued that there are more objective reasons for fighting high levels of inequality. However, the link between economic growth and development, on the one hand, and levels of income inequality, on the other, is far from clear.

In 1955 Simon Kuznets published his seminal work on long-term change in income inequality. The empirical material included only a few observations from England, Germany, and the United States, and Kuznets (1955: 26) himself wrote that he was 'acutely conscious of the meagerness of the reliable information presented. The paper is perhaps 5 per cent empirical information and 95 per cent speculation, some of it possible tainted by wishful thinking.' Despite this admittedly shaky ground, Kuznets' fundamental argument – that income inequality increases with the rise of the industrial revolution only to decrease with continued modernization – is still valued, although also challenged, six decades later. The famous Kuznets curve (see Figure 1) is taught to students in economics, economic history, and development studies, and we generally expect economic development and structural transformation to reduce income inequality while also eradicating poverty.

Figure 1: The Kuznets curve



Source: Authors' illustration.

The prime explanation offered by Kuznets for long-term decrease in income inequality is the thorough modernization of the economy, that is, the completed shift away from an agriculture-based economy to industrialization and urbanization. The argument is that the average per capita income in rural areas is lower than in the urban population, and that income inequality within the rural population is more modest than that within the urban population. Hence, in the first stage, inequality as well as income per capita increases as people move from the relatively 'equal' low-income rural employment to the relatively 'unequal' urban sector offering higher wages. This phase stresses both the rural-urban divide and the improved earnings due to the shift of labour from a low- to a high-productivity sector. In the second phase, the majority of the population is employed in industry or the service sector in the urban areas and the rural-urban divide becomes less influential. The average income per capita increases further and inequalities within the urban sector remain. These processes result in an inverted u-shaped curve, famously known as the Kuznets curve.

Both the rise in inequality and the bending of the curve, with the consequent decline in inequality, are then related to the structural transformation of the economy. Kuznets (1973) argued that, in our time, the end goal for any society is to reach Modern Economic Growth, MEG, thereby leaving the pre-modern growth process behind. MEG marks a distinct economic epoch and is separated from the pre-modern structure by six characteristics: (1) high growth rates of income per capita when the population is increasing, (2) high rate of rise in productivity, (3) high rate of structural transformation of the economy, (4) rapid change in social and ideological structures, (5) participation in a globalized economy, and (6) a minimum level of modern technology. At the same time as MEG represents a new structure, it also comprises the continuation of old trends, although in an accelerated form. This makes it complicated to identify and analyse the break between the pre-modern and the modern economy (Kuznets 1973: 248-49). Depending on its causes and characteristics, growth can be more or less likely to advance such processes of structural change, and societies can experience growth while staying pre-modern. Technological advance, the increase in productivity, and structural change in patterns of production raises income levels while distribution of resources and incomes via a modernized institutional structure leads to widespread improvements in living conditions. In the same vein, Arthur Lewis (1954) argues that economic growth and development is accompanied by increasing per capita income (on the *x*-axis of the Kuznets curve) as labour moves from the low-productivity agriculture to the high-productivity industrial sector. It is then in the nature of development that all segments of society significantly benefit from economic gains.

However, developing countries such as Botswana, which has significant mineral resources and abundant land, tend to be less equal in both income and resource distribution than other economies (Bourguignon and Morrisson 1990: 1127-28). Such types of economy are not seen as representative in Kuznets' original model of MEG, where they are reduced to being atypical cases. Building on Kuznets, using comparative history and comparative economic development, Adelman and Morris (1997: 833) elaborate on the modernization argument, taking the position that all processes of economic development are multifaceted and non-linear. In their categorization, Botswana falls into a typology of agricultural, primary-export-oriented, sharply dualistic, and land-abundant countries. Within this group, the characteristics of existing natural resource endowments and degrees of government autonomy from tribal domestic elites and colonial powers determine the patterns and sequence of structural change. The conventional Botswana success story (Acemoglu et al. 2003; Leith 2005; Samatar 1999) rests on significant growth rates due to high earnings from diamond exports. However, in-depth analysis has shown that the growth trajectory has corresponded to only two out of the six characteristics of MEG, and consequently it has been argued that Botswana is a case of pre-modern growth without sustainable economic development and structural transformation (Hillbom 2008).

The lack of MEG does not, however, invalidate a Kuznets-inspired analysis of long-term changes in inequality in Botswana. There already exist alternative interpretations of the relationship between the rise and decline of incomes inequality and the modernization process. Van Zanden (1995) has claimed that increasing inequality starts with pre-modern economic growth. In his investigation into long-term changing inequality in early modern Europe, he collects and compares Gini coefficients from a number of cities in late medieval and early modern Europe. He concludes that economic development, urbanization, and capital accumulation during this period coincided with increasing inequality. Consequently, he proposes that a 'super Kuznets curve', starting in the early modern era and stretching over a longer period of time than proposed by Kuznets, would give an upward trend from as early as the sixteenth century. Inequality continued to increase until the nineteenth century, to shift into the downward phase in the twentieth century. Potentially, a 'super Kuznets curve' could also be identified for Botswana. While it would not cover centuries, it would cover the whole process of both increasing and declining income inequality and, considering the potential lack of MEG, it would force us to consider alternative pathways to how 'modernity' drives changes in inequality.

3 Botswana's long-term change in income inequality

In a previous paper we have shown that high levels of income inequality in Botswana are not a post-independence phenomenon and we trace its roots back to the colonial era (Bolt and Hillbom 2013a).[1] For this we constructed six social tables for the Bechuanaland Protectorate from 1921 to 1974 (the 1974 social table is based on different sources, so the social division is not consistent with earlier tables, and it is therefore not shown in Table 1). Using both colonial and anthropological records we identified social classes based on occupation, we estimated the share of population per class, and we computed mean incomes for each class. Combining this with information about the costs of living at subsistence level, we determine changes in the welfare ratio, that is, the number of family consumption baskets that can be bought with existing incomes on an annual basis. With changing welfare ratios we capture changes in division of incomes between social classes over time (Bolt and Hillbom 2013a).

Our study bears a significant resemblance to Kuznets' seminal paper from 1955. Kuznets study was based on four intentions: to record and group incomes for family expenditure units according to secular income; to cover the full distribution in an economy; to exclude incomes that are not associated with full-time, full-fledged participation in economic activity; and to include all types of incomes, in-kind incomes too, but exclude capital gains. In Bolt and Hillbom (2013a) we follow the same set-up, with the exception that we do include capital gains in the form of increasing wealth from the natural increase of cattle herds.

In our next step we have calculated Gini coefficients from our social tables covering 1921 to 1974 and we have combined them with official statistics (presented in Table 2 and Figure 2).

[1] This is an older version of a paper which is currently under review. We have in the meantime constructed two more social tables for 1921 and 1974, thereby extending the time period covered, and we have refined the calculation of the social tables.

Table 1: Level and distribution of Income 1921-64

	1921			**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	Share of population	Welfare ratio	Income distribution
Large-scale cattle holders	5%	4.7	15%	5%	5.4	14%	5%	14	19%	5%	16	35.1%	4%	28	39.4%
Medium-scale cattle holders	34%	2.0	47%	34%	3.2	55.8%	34%	6.1	57%	17%	6.6	28.9%	8%	4.4	12.4%
Small-scale cattle holders	18%	1.3	16%	18%	1.4	12.6%	18%	2.3	11%	27%	2.7	19.0%	32%	1.9	20.9%
Cattle-less	8%	1.1	5%	7%	1.1	3.8%	7%	1.2	2%	20%	1.3	5.3%	24%	1.2	8.4%
Bonded labour	7%	1.0	4%	6%	1.0	3.4%	6%	1.0	2%						
Labourers															
Agriculture	1%	1.8	2%	0.3%	1.4	0.7%	1%	2.1	1%	0.6%	2.9	1%	0.6%	2.2	1.0%
Domestic services	1%	2.3	2%	0.3%	2.2	1.1%	0.4%	2.3	0.5%	0.4%	2.9	0.6%	0.4%	2.2	0.6%
Mining		0.0					1%	2.9	2%				0.1%	2.4	0.2%
Mines South Africa	2%	2.4	8%	2%	2.8	7.6%	2%	2.3	3%	3%	3.1	5.2%	5%	2.5	9.0%
Skilled labour	0.02%	2.9	0.1%	0.01%	2.4	0.04%	0.2%	3.4	0.4%	0.5%	4.6	1.2%	0.8%	2.8	1.5%
African government officials							0.5%	2.9	0.8%	0.5%	10.9	2.7%	0.7%	11.1	5.7%
European government officia	0.02%	32.6	1%	0.03%	34.0	1.3%	0.06%	24.2	0.8%	0.05%	48.6	1.2%	0.04%	29.4	0.8%
Unspecified	25.5%			25.9%			14.4%			26.5%			24.3%		
Children							10.4%								
Total population	231,810			315,137			382,602			478,090			549,510		

Source: Authors' compilation based on *Blue Books of Statistics*.

Thereby we are able to present a 'super Kuznets curve' stretching over almost nine decades, from the 1920s to the 2010s. While it may not be covering centuries, as van Zanden (1995) does in his own work on pre-modern Europe, it is to the best of our knowledge the longest running Gini for any African country. A brief explanation of the results is presented below and in the following sections we offer a more elaborate analysis of the changing economic structures.

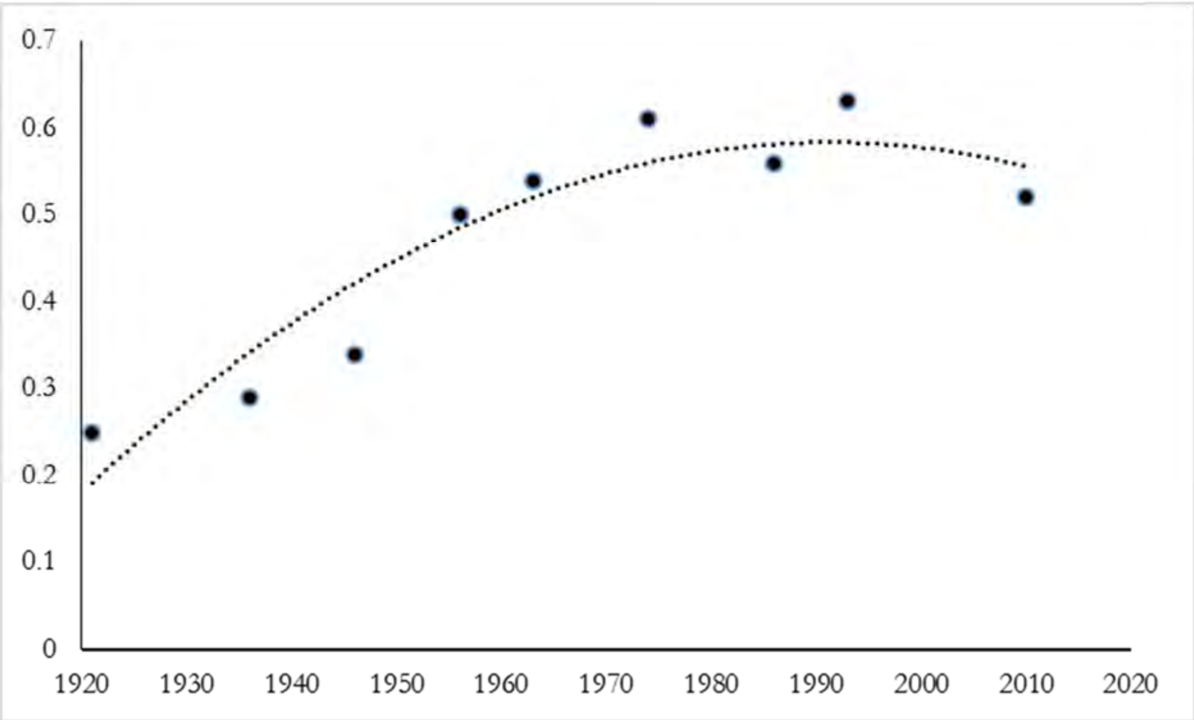
Table 2: Income Ginis Bechuanaland 1921-2010

Years	Gini
1921	0.25
1936	0.29
1946	0.34
1956	0.50
1963	0.54
1974	0.61[a]
1986	0.56
1993	0.63
2010	0.52

Notes: [a] Calculated on the basis of our social table. The official Gini for 1974 calculated by the World Bank is 0.6 (Chernichovsky et al. 1985).

Source: Ginis 1921-74, see Bolt and Hillbom (2013a); 1986 Gini, Valentine (1993); 1993 Gini, World Bank (2014); 2010 Gini, IMF (2012).

Figure 2: Income Ginis Bechuanaland 1921-2010



Source: Ginis 1921-74, see Bolt and Hillbom (2013a); 1986 Gini, Valentine (1993); 1993 Gini, World Bank (2014); 2010 Gini, IMF (2012).

The Gini curve clearly shows a rise in inequality in Bechuanaland from the 1940s onward, indicating a concentration of increasing surplus income in the hands of a few. We argue that this increasing inequality is linked to the development of the beef export sector, as well as an increasing public-private divide. The beef export sector was established in the 1930s and in its initial stages both large-scale and medium-scale cattle holders (together representing 39 per cent of the population) benefited from increased opportunity to earn income by selling off cattle. However, once the export sector fully expanded in the 1940s, access to agricultural resources 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 negatively 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. Meanwhile, the large-scale cattle holders saw their incomes increase rapidly, both because they were the main providers of beef exports and because beef prices increased. Additionally, individuals 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.

The high levels of inequality that we have demonstrated for the colonial cattle economy continued to be an important characteristic of the post-independence diamond economy. In the mid-1970s, at the time when diamond incomes started to dominate Botswana's economy, replacing beef exports as the most important source of government revenue, the country exhibited a high Gini of 0.61. During the diamond economy period income inequality increased only slightly and peaked at 0.63 in 1993 (World Bank 2014). Subsequently, it has declined to just above 0.5 at present (IMF 2012). While levels of inequality are still high in an international comparison, it is interesting to see that there has been a significant reduction over the last four decades. This finding means that we will have to contest the common view that high levels of inequality in Botswana should be associated with the diamond economy.

4 Botswana's rise and decline in income inequality

Given the initial rise and subsequent modest decline in inequality in colonial and post-colonial Botswana, it is important to analyse to what extent this rise and decline was related to a structural transformation of the economy. Relying on Kuznets' (1955, 1973) theories, we could expect that the move away from an agriculture-based economy, urbanization, and improving incomes would be the main drivers of change in income inequality. Consequently, they are the three themes for our following sub-sections.

4.1 From cattle to diamonds

Our analysis of economic structural transformation will become clearer if we divide history up into time periods based on change in economic structures, instead of according to political events. Consequently, we will follow a periodization already presented in an earlier paper defining the pre-colonial economy as stretching up until 1930, followed by the colonial cattle economy between 1930 and 1975, and finally the post-independence diamond economy from 1975 to the present (Hillbom 2014). We will match these three economic periods with changes in income inequality, as well as discussing whether changes in economic structures actually have amassed to a structural transformation of the economy as envisioned by Kuznets.

4.1.1 Pre-colonial economy, until 1930

When discussing the timing of the Kuznets curve our point of departure is an agriculture-based economy where differences in divisions of incomes are low. In the case of Botswana that means going back to the pre-colonial agricultural economy. In the pre-colonial era, the Tswana were agro-pastoralists practising an extensive agricultural system based on a combination of crop farming and cattle rearing. While land was abundant, access to water resources was the primary limiting factor for both crop farming and cattle rearing (Emongor 2006). Both resources were, as an over-riding principle, the communal property of the *morafe*[2] and held in trust by the *kgosi*.[3] Male household heads were granted private user rights to specific land sites, such as to residential plots, arable land, and cattle posts (Mgadla 1998; Schapera 1994). These regimes exhibited strong communal property rights principles and they coincided with other property rights institutions governing natural resources in pre-colonial Africa (Berry 1993; Ensminger 1997; Perrings 1992).

Meanwhile, cattle were either held in common by the *morafe* and managed by the *kgosi*, or held as private property belonging to wealthy members of society. 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. The recipient gained access to milk and draught power, as well as ownership of potential future offspring, while the lender could claim both labour and political loyalty in return (Schapera 1994). An individual's ability to control or own cattle became the basis for both economic wealth and social status.

Pre-colonial Tswana societies cannot be considered equal in terms of either social and political status or wealth. There is anthropological evidence that the ruling tribal elite, consisting of the family of the chief and other aristocrats and wealthy men, could use their position to amass agricultural resources, improve their stock, and so on. It has been noted that the commoners' property and labour could be appropriated by the chief and that patron-client relationships that on the surface seemed to be built on reciprocity also contained inequality (Iliffe 1987: 87; Wylie 1990: 23-50). As much as 90 per cent of the population held cattle, but herd sizes ranged from a couple of animals to several thousands. As there was no outlet for selling cattle, however, institutional inequality and unequal opportunities to amass wealth in the form of cattle did not translate into equivalent levels of income inequality.

Nonetheless, in the construction of our social tables on which we build our Ginis we have made an effort to take the amassing of cattle wealth into account. First, we argue that anyone holding cattle has an advantage over the group of cattle-less in society, as s/he benefited in their crop farming as they had access to draught animals.[4] Next, we also include incomes in the form of rents derived from the wealth in cattle. This wealth varies substantially between cattle owners with only a few animals and the very large-scale cattle owners with a few thousand animals. That being said, in terms of income inequality the pre-colonial society is fairly equal, which is also demonstrated by our Gini of 0.21 in 1921 and 0.29 in 1936.

4.1.2 Colonial cattle economy, 1930-75

After 1930, British colonial ambition generally across Africa was significantly enhanced. It was a time when colonial administrations started forming policies for investment and made efforts to

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[2] Setswana word for tribe, plural *merafe*.

[3] Setswana word for chief, plural *dikgosi*.

[4] In-kind income from cattle, other than the use of draught power, was limited. Cattle provided some milk, but this was only for limited home consumption at the cattle posts. Due to the hot climate, milk did not keep for longer periods and there was no market for sales. Therefore, we assume that milk did not substantially increase incomes. Additionally, anthropological sources clearly state that, even though this was an agro-pastoralist society, meat was rarely seen for sale in the villages. Instead, access to meat primarily came from hunting, hence cattle ownership did not increase meat consumption.

bring about socio-economic development (Cooper 2002). Bechuanaland Protectorate was no exception.

The most profound change of economic structures with implications for income inequality during the colonial era was the creation of the beef export sector. Given that animal husbandry, and especially the owning of cattle, was the core of the pre-colonial Tswana agricultural economy, beef exports were identified as the comparative advantage of the Protectorate (Colclough and McCarthy 1980; Parsons and Crowder 1988). The primary obstacle to expanding the cattle sector was access to water in the drier areas of the grazing range and colonial efforts before the Second World War focused on borehole drilling schemes. Initiatives did not come only from the colonial administration but also from Tswana leaders. 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 the necessary natural resources for keeping cattle, over time this encouraged an increasing polarization of cattle ownership (Hillbom 2010).

The polarization meant that the share of medium-scale cattle holders in the total population decreased while the share of small-scale cattle holders or cattle-less increased (Bolt and Hillbom 2013a). Moreover, the polarization process was further boosted by harsh natural circumstances as the Protectorate experienced periods of severe drought as well as incidences of foot and mouth diseases, especially in the 1930s and the 1960s, which negatively affected particularly the herds of the medium- and small-scale cattle owners (Good 1993; Roe 1980). The average size of the herds held by medium-scale cattle holders 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 (Bolt and Hillbom 2013a). The cattle sector came to dominate the economy and, by the time of independence in 1966, beef represented 85 per cent of total export earnings (Colclough and McCarthy 1980: 32; Harvey and Lewis 1990: 78-82).

The second group driving increasing income inequalities during the era of the colonial cattle economy was government officials – mostly the Europeans and to a lesser extent also the Africans – as they received significantly improved salaries. The welfare ratio of the European officials varied between 20 and 36 and, while the Europeans represented less than 0.5 per cent of the population throughout the period, they earned between 13 and 54 times as much compared to a situation of perfect income equality. These European officials eventually constituted a group that controlled a substantial share of surplus incomes. Meanwhile, African government administrators also experienced a continuous increase in wages and in welfare ratios, from 2.6 in 1946 to 11.1 in 1964. Also, more people as a percentage of the population were employed by the government, albeit it was still only 1 per cent at the end of the colonial period. The combination of the increase in welfare ratios and in share of the population jointly led to a strong increase in the share of European and African officials' surplus income. This is also an interesting finding when considering the long-term implications for the public-private divide, as while it apparently became increasingly profitable to be employed in the public sector, the surplus controlled by labourers and traders within the private sector remained low and stable.

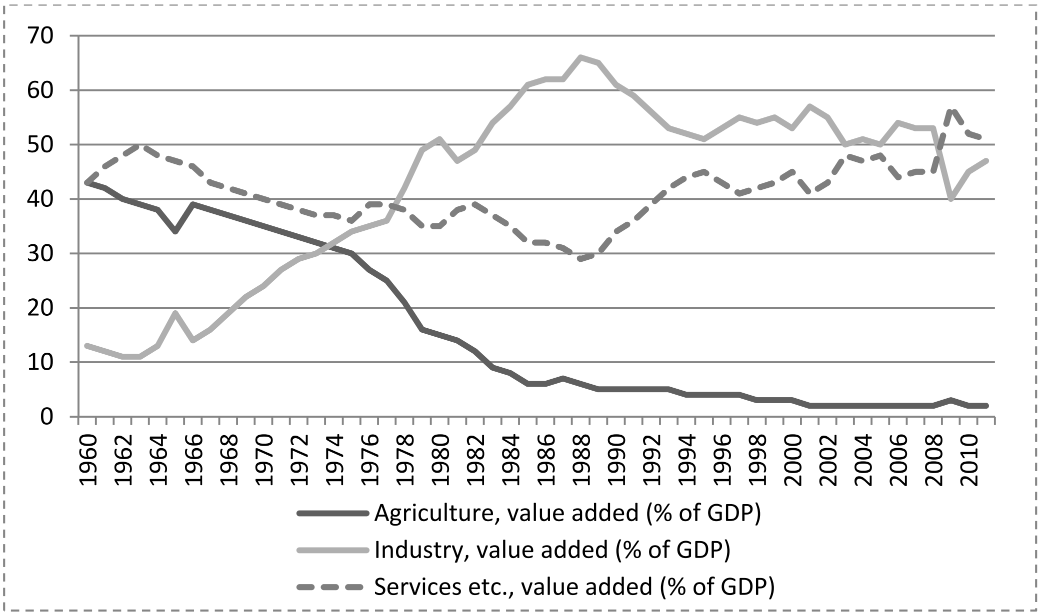
We have, then, two main explanations for increasing income inequalities. The first is the increased polarization of cattle ownership, with both a declining share of medium-scale cattle holders and a growing number of small-scale cattle holders and cattle-less. The second is the increase in income for relatively small groups within the population, that is, large-scale cattle holders amassing an increasing share of agricultural resources and cattle wealth, and government officials' rapidly increasing wages. In Kuznets' theories, increasing income inequality is driven by the start of the industrialization process and increasing salaries as people move from the low-productivity agricultural sector to the high-productivity industrial sector. Was there a proto-industrial or industrial process associated with the establishment and development of the colonial cattle economy in Botswana? The answer to this question is that the colonial beef export sector was still part of a pre-modern agriculture-based economy. First, although we could assume that there is some increase in the take-off rates, productivity was too low to warrant the cattle sector to being deemed a 'capitalist' sector. Further, for the first couple of decades there was no processing industry associated with beef exports. Then, in 1954, one abattoir was constructed, but this came after the first surge in income inequality and had very limited repercussions on the economy at large. Finally, the expansion of the service sector was based on increasing government revenues from a low-productivity agriculture-based economy, not efficient industrial production.

4.1.3 Post-independence diamond economy, 1975 to present

Prior to independence, the contribution of the mining sector to national gross domestic product (GDP) was trivial, but this changed when the discovery of diamond deposits was announced in 1967. After a few years, diamond mining started on a larger scale and, in 1973, the mining sector's contribution to GDP was 11 per cent. After roughly a decade's build-up the mining sector's contribution had grown to 23 per cent of GDP, and it was to increase further (Gaolathe 1997: 408, table 2). Figure 3 shows how agriculture – namely the cattle sector – measured as a value added percentage of GDP, plunged drastically from the mid-1960s to the mid-1980s and since then has stayed at very low levels. Meanwhile, industry, mainly diamond mining, experienced a surge that was just as dramatic during the same time period and has remained the primary productive sector in the economy. Looking at Figure 3, 1975 is identified as the breaking-point between the colonial cattle economy and the post-independence diamond-led economy.

Commonly, high levels of inequality in Botswana are associated with the diamond economy of the independence era (Good 2008). However, an analysis of the rise and decline of the Gini in Figure 2 and the structural change of the economy, from being agriculture based to becoming a diamond economy (Figure 3), makes it clear that this assumption must be re-evaluated. Income inequalities increased during the colonial cattle economy from the establishment of the beef export sector in the 1930s and reached a peak in the mid-1970s, that is, at the time of the switch to the diamond economy. Since then, income inequality has slowly declined. Can this bending of the curve be attributed to further industrialization and structural transformation of the economy as proposed by Kuznets?

Figure 3: Agriculture, industry, and service sectors, value added (% of GDP) 1960-2011



Source: World Bank (2014).

The answer to that question is no. Instead, Botswana's independence economy has become trapped in a natural resource dependency that is connected to failures to diversify the economy (Hillbom 2008). Since independence, the industrial sector has grown significantly, by roughly 18 per cent per annum in the decade 1970-80, 9 per cent 1980-93 and 8 per cent in 2008. At present the sector constitutes roughly 53 per cent of GDP. However, industrial growth is mainly due to the expansion of the mining sector generally and the diamond sector specifically. And for a diversification of the economy, it is instead manufacturing that is important. Although the manufacturing sector has grown in absolute terms, it persists at roughly 3 per cent of GDP. In comparison, in South Africa for example, the oldest industrializing country in Sub-Saharan Africa, manufacturing adds 17 per cent to GDP, and in Mauritius, another aspiring African economic growth miracle, manufacturing adds 15 per cent to GDP.

Perhaps more disturbing than the lack of structural transformation of the economy itself is the fact that the government has not been unaware of the problem. From the start of the independence era, the importance of diversification was emphasized and, over the years, a number of schemes to support entrepreneurial activities have been launched. The National Development Bank, was established in 1965 to provide loans to small-scale entrepreneurs in general and within the agricultural sector in particular. Botswana Development Corporation was a venture capital company set up in 1970 to further complement the commercial banks. Both are owned 100 per cent by the Botswana government. The most high-profile incentive programme was the Financial Assistance Policy (running from 1982 to 2001), which was intended to promote and expand employment-intensive and non-traditional businesses. Unfortunately, these and other government schemes aimed at encouraging private entrepreneurship have become subject to increasing abuse by both government employers and recipients, and subsequently they have failed to meet with initial expectations. Further, Botswana is ranked as being 'mostly free' in the 2010 Economic Freedom Ranking, which is better than most African and East Asian countries and therefore the lack of diversification does not appear to be explained by high transaction costs for setting up businesses.

As mentioned above, at independence beef represented 85 per cent of Bechuanaland's total export earnings, but in 2006 the figure had dropped 2 per cent (Colclough and McCarthy 1980: 32; Harvey and Lewis 1990: 78-82; Republic of Botswana 2007). Further, there is a continuing polarization of agricultural resources and the percentage of cattle-less rural dwellers has increased for over half a century. In the early 1990s, roughly half of rural households had no cattle while 5 per cent owned 50 per cent of the national herd (Gulbrandsen 1996: 3). With the failure of manufacturing and the decline of the agricultural sector, it is the service sector that has expanded during recent decades. At present it constitutes 45 per cent of GDP. It threatens to become the largest sector of the economy and it is paid for, directly and indirectly, by incomes from diamond exports. These incomes allow for increased demand from both the government and the public for services and goods, however, the service sector is characterized by low productivity. Diamond incomes have paid for social development and the government has spent about 40 per cent of its GDP on investments, primarily in infrastructure and human capital, a figure that is one of the highest in Africa and comparable to Norway (Acemoglu et al. 2003: 85).

In the general model for MEG, productivity increase in subsistence agriculture resulting in agricultural transformation should lead to the accumulation of capital and free labour that could move over to industry and other capitalist sectors, thereby becoming a starting point for structural change (see e.g. Lewis 1954; Mellor 1986). When the agricultural sector is failing to fill its role as the engine of MEG, other more successful sectors – in the case of Botswana the mining industry – could substitute for these shortcomings in forming capital, thereby becoming the engine of development (Gerschenkron 1962). Despite impressive growth, political stability, improved infrastructure, prudent financial management, material modernization, and investments in human capital, Botswana at the same time also experiences difficulties. There is no significant increase in productivity, there is little economic, social, or ideological transformation, and there is only a sporadic introduction of high levels of modern technology. Hence, four out of six characteristics of MEG are missing and the inference must be that contemporary Botswana, with its diamond-led economy, is a case of pre-modern growth.

If we conclude that Botswana's economic growth during the last half a decade has not been transformed into MEG, then we have to look for an alternative to Kuznets' theory on the relationship between economic structural transformation and long-term changes in income inequality. Van Zanden (1995) has argued that increasing inequality in Europe took place before industrialization, during the pre-modern economy. Looking at the period of increasing inequality – that is, 1921-74, when the Botswanan society was characterized as an agriculture-based cattle economy – this seems to resemble the case presented by van Zanden, a case of pre-modern growth. The conclusion would then be that increasing inequality is a pre-modern phenomenon, while decreasing income inequality is driven by an economy dependent on natural resources that does not fulfil the requirements of MEG, but has the ability to carry growing public and private service sectors. However, before closing the case we should have a look at other aspects of the modernization process and see what happens if we look beyond economic structural transformation to the broader picture.

4.2 Transfer of labour

An important aspect of the modernization process is the transfer of labour from the low-productivity traditional sector, that is, agriculture, to high-productivity capitalist sectors, commonly meaning industry but where the service sector and a modern agriculture are also possible options. The discussion of the transfer of labour is most clear in Arthur Lewis's writings on the allocation of surplus labour. Lewis (1954, 1979) stipulates a closed economy where population is large relative to capital and natural resources and, consequently, there is an unlimited supply of labour. As this labour leaves the subsistence sector where the marginal productivity is negligible, zero, or even negative, and moves into the capitalist sector with significantly higher productivity, structural change and economic modernization is realized.

There is another aspect of the mobility of labour. In his 1955 article, Kuznets alternated between the terms 'industrialization' and 'urbanization', the latter also being a strong, although perhaps social rather than economic, aspect of the modernization process of any country. We will therefore investigate the correlation between urbanization and long-term changes in income inequality in Botswana.

4.2.1 From agriculture to industry and service sectors

During the early colonial period, two interconnected processes of change influenced the economic structures of the Tswana states: labour migration to the mines in the future Union of South Africa and the introduction of colonial and native taxes in Bechuanaland Protectorate. The regional expansion of the mining sector from the 1860s onwards attracted labour from the whole of the Southern African region. There were few other opportunities for waged labour and salaries could be generous, fluctuating between 20 and 64 shillings per month in the years 1888-1904, depending on labour demand (Parsons 1993). At first migration was modest and mostly motivated by the gun trade, but after the introduction of colonial taxes in 1899 it increased significantly. Migration became of such a magnitude that labour became a scarce factor of production in the Protectorate, to the point that it had a negative effect on agricultural production. The population was still at a low 265,000 in the mid-1930s (*Blue Books* 1936/37) and in many areas in the south as much as half of the productive population could be absent in the 1920s and 1930s (Parsons 1993; Ramsey et al. 1996: 206-08, 211; Schapera 1994). Individuals to a large extent also migrated in order to take up employment as farm hands and domestic help. Before the cattle export sector took off at the end of the 1930s, migrant labour constituted the main source of cash income and these labourers earned substantially above subsistence (a welfare ratio of 2.5). The surplus helped the cattle-less and smallholders to stay above subsistence, thereby giving migrant families an advantage over others within the same social class.

The first wave of labour transfer was then about labour moving from the domestic agricultural sector to the foreign mining industry in neighbouring South Africa. Domestic wage employment opportunities in general, and specifically within the private manufacturing sector, continued to be very limited during the colonial era. Further, 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).

Meanwhile, skilled labour in the domestic formal private sector also represents a limited group. In 1921, only 50 individuals were recorded to work in trade, increasing to around 800 in 1946, while the number of traders increased to 2,300 in 1956 and 4,250 in 1963 (various *Blue Books* and *Annual Yearbooks*). In Table 2 and Table 3 we can see the development of the share of the population working in the private sector or industry. It is clear that numbers are modest throughout the colonial era, not exceeding 6 per cent. It is then far-fetched to call this a period of transfer of labour as a result of a proto-industrialization process, which would be in line with Kuznets. Again, we are back to van Zanden's (1995) timing of increasing income inequalities within the pre-modern society. Even since the take-off of the diamond economy no more that 15-20 per cent of the population has worked in industry at any point in time and therefore the decline in income inequality since the mid-1970s cannot be attributed to a Kuznets model where the majority of the workforce should be in industry.

Table 3: Allocation of the labour force, 1936-64

	Percentage of the population			
	1936	1946	1956	1964
Agriculture				
Large-scale cattle holders	5.00	4.00	4.70	4.00
Medium-scale cattle holders	34.00	25.00	16.80	8.00
Small-scale cattle holders	18.00	13.00	26.70	32.00
Cattle-less	7.00	5.00	20.20	24.00
Bonded labour	6.00	5.00		
Farm hands	1.00	1.00	0.60	0.60
Total	71.00	53.00	69.00	68.60
Industry				
Mining		1.00		0.10
Mines South Africa	2.00	2.00	3.20	5.10
Skilled labour	0.01	0.20	0.50	0.80
Total	2.01	3.20	3.70	6.00
Service sector				
Domestic	0.03	0.40	0.40	0.40
African government officials		0.50	0.50	0.70
European government officials	0.01	0.06	0.05	0.04
Total	0.04	0.96	0.95	1.14
Unspecified	25.90	31.00	26.40	24.30
Total population	315,137	382,602	478,090	549,510

Source: Bolt and Hillbom (2013a: Table 1).

Table 4: Percentage of total employment in agriculture, industry and service services

	Percentage of total employment										
	1936[a]	1946[a]	1956[a]	1964[a]	1985	1996	1998	2000	2001	2003	2006
Agriculture	70.9	53.0	69.0	68.6	57.90	15.6	20.4	19.7	12.4	21.2	29.9
Industry	1.71	3.2	3.7	6.0	10.60	25.6	21.9	20.9	25.5	22.6	15.2
Services	0.33	0.96	0.95	1.14	31.40	58.7	56.1	58.2	61.4	56.1	54.9

Notes: [a] Sum of percentages does not equal 100 percent, as we were not able to trace the whole population to the specific sectors (see Table 3).

Source: *Blue Books*; World Bank (2014).

While the share of the population working in industry has been modest even during the diamond economy, a more radical transfer of labour seems to have taken place between agriculture and the service sector. The growth of the service sector since independence is astounding. In 1905, there were 15 European 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 employed (excluding the police force) increased with more ambitious colonial strategies, for example, 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*). Meanwhile, in 1946, 1,700 Africans were working for the government service, of whom 153 worked for the police. The number of people working for the government increased to 2,500 in 1958 and 4,000 in 1963 (various *Blue Books* and *Annual Yearbooks*). The lower-ranking Tswana government administrators are 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, even when they primarily reside in urban settlements.

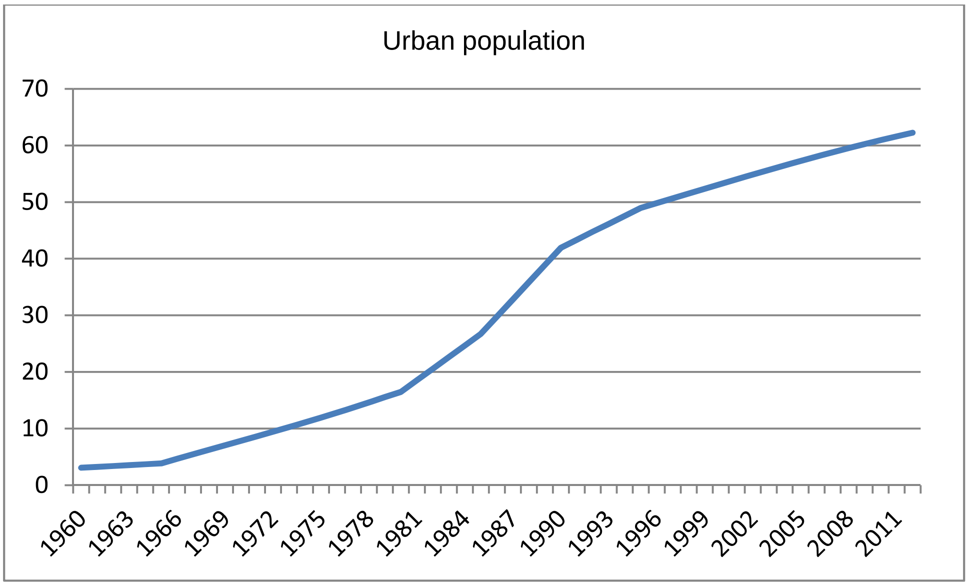
While the service sector was very modest during the colonial era, just as in the case of industry, it takes off after the establishment of the diamond economy and during the last decade or so 50-60 per cent of the total workforce has been engaged in the service sector. Meanwhile the agriculture sector has lost its dominant position in the economy and now only employs 20-30 per cent of the population (see Table 4). We then have to consider an alternative explanation for the decrease in income inequality – that the majority of the labour force does not have to be active within industry because being active within the service sector has the same kind of impact. The problem from a MEG point of view though is that the service sector generally is not as productive as industry. Without a highly profitable natural resource such as diamonds, where would the societal wealth be accumulated to pay for increasing per capita incomes?

4.2.2 Urbanization

Botswana has been urbanizing quickly for the last four decades and has moved from 4 per cent living in urban settlements at independence (Gulbrandsen 1996: 19) to more than 60 per cent presently (World Bank 2014). This could be viewed as a sign of structural change, but, although urbanization entails a profound reorganization of the population and has implications for various aspects of human development, it is not by definition equal to growth of either the industrial or the capitalist sectors wherein high productivity is found. Lewis's (1954) original model is often misunderstood and quoted as an argument for economic development being centred on a process of labour moving from agriculture to industry and of urbanization equalling industrialization. However, the focus is on labour transfer from traditional/subsistence to capitalist sectors and any sector (agriculture, industry, and services) can become capitalist as long as productivity increases sufficiently. Meanwhile, the subsistence sector is primarily associated with pre-modern agriculture, but it is a common feature in developing countries that subsistence sectors expand in urban areas as well, the most evident case being informal self-employment. Botswana's prime engine of growth, the diamond sector, is neither located in the urban areas, nor does it have significant links to other sectors of industry. The urban settlements are instead attracting labour that finds employment within the government administration, service sector, household employment, trade, and so on, some of it in the formal and some in the informal sector. Labour is, then, to a significant degree, moving from subsistence agriculture to non-capitalist urban sectors and becoming yet another indicator that MEG is not present, although there is a social transformation due to urbanization.

From a structural transformation point of view it is clear that rising income inequality in the era 1921-74 took place while the share of total population living in urban settlements was still very modest. Throughout the colonial era no more than 3-4 per cent lived in urban areas and even the definition of 'urban' could be discussed. What is certain is that urban impact was limited. We can therefore not correlate increasing income inequality to a growing percentage of the population moving to the cities and earning higher wages compared to the rural areas. In a previous paper on off-farm and non-farm employment (Bolt and Hillbom 2013b) we have also shown that differences between rural and urban wages were negligible during the colonial era. That being said, there is a strong correlation between rapidly increasing urbanization during the era of the diamond economy, 1975 to the present, when the share of urban population increases from roughly 10 per cent to over 60 per cent (see Figure 4). Meanwhile income inequality is in decline during the same time period.

Figure 4: Increase in urban population as percentage share of total population, 1960-2012



Source: World Bank (2014).

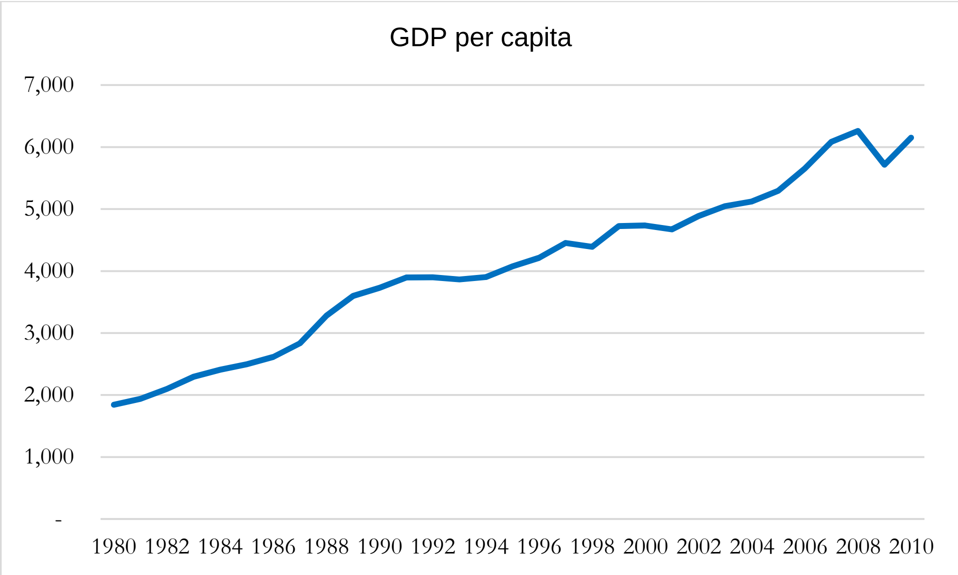
Since the early 1990s, a serious unemployment problem has been registered, with 18 per cent unemployment in 2005/06 (Republic of Botswana 2007: 2) and, as long as the industrial sector is not expanding, the figure will probably not improve significantly. With high urban unemployment rates individuals' motives for migrating to the urban areas can be questioned, but also explained in a satisfactory fashion. Urbanization becomes rational behaviour at the individual level as economic models shift focus from full employment equilibrium to expected rather than factual contemporary and future urban wages (Todaro 1969) and relative deprivation (Stark 1991). Instead of being a sign of modernization, urbanization in Botswana can then to a certain extent be perceived as a symptom of a dual economy with a poor and neglected rural sector.

Lipton (1977) points out that the most important class conflict in developing countries today is that between the rural poor and the urban groups experiencing improvements in living standards and human capital. There is an urban bias favouring the larger cities and industry at the expense of the countryside and agriculture, and it is driving a process creating dual economies. It is damaging because it is counter-productive to both an efficiency norm, implying an allocation of resources to maximize long-run output, and an equity norm, distributing income as to maximize welfare.

4.3 Economic growth and increasing incomes

At independence in 1966 Botswana was a poor, undeveloped, and seldom-heard-of part of the world. Forty years later it was regarded as a growth miracle (Samatar 1999), a sign of hope for Sub-Saharan Africa, and having attained prosperity and success. The country has experienced a staggering GDP per capita increase of 13 per cent per annum over the years 1980-89 (Mpabanga 1997: 369) and a long-run growth over the last four decades that surpasses even the performance of the Pacific Asian Tigers (Leith 2005: 4, table 1.1) (see Figure 5). We argue that this overall economic growth with increasing per capita incomes has contributed to decreasing income inequality and the downturn of the Gini coefficient in two ways: via poverty reduction programmes and new opportunities for a growing middle class primarily based in the service sector.

Figure 5: Increase in GDP per capita, 1980-2012.



Note: GDP per capita is in constant 2005 US dollars.

Source: World Bank (2014).

During the era of economic growth, there has been both a trickle down from the wealthier segments of society and a political consciousness of the need to fight high poverty rates through government transfers. As a result poverty has decreased from 59 per cent of individuals being poor in 1985 (Jefferis 1997: 484, table 2) to 30 per cent in 2005 (World Bank 2014). These are improvements that stand out in a regional context, but they have not been achieved through structural change. It is important to keep in mind that attitudes towards inequalities and poverty are rooted in normative values, and that distribution of resources and incomes is subject to conscious government policies. Government policy on distribution of wealth in Botswana has mainly been the equivalent of a basic needs system, giving support to the poor via food-for-work programmes that have been running during droughts since 1965 (Colclough and McCarthy 1980: 133) as well as providing health care and education free of charge until recently. These transfers, together with a trickle down from economic growth, have resulted in poverty reduction.

During the colonial era the British spent little in excess of administration costs in the Bechuanaland Protectorate. The independence government, however, has spent around 40 per cent of GDP primarily on infrastructure and human capital, a figure that is one of the highest in Africa and comparable with Norway (Acemoglu et al. 2003: 85; Leith 2005: 85, figure 3.9). Government policy has had better results than can be detected simply from levels of income poverty, as it has improved human capital and the capabilities of the poor. In a broader based approach, the concept of 'capability poverty' can be used, in which case Botswana scores much higher, with 30 per cent suffering from capability poverty in 1996 according to United Nations Development Programme (UNDP) as opposed to 46 per cent being income poor in the same year (Jefferis 1997: 492-93). The actions of the Botswana government in improving capabilities have then been commendable, but they have not automatically generated dynamic processes of increasing productivity and are not equivalent to equity. Indeed, the reliance on government welfare programmes have made many rural people who are destitute passive and cemented existing structures (see e.g. Nthomang 2004; Wikan 2004).

As discussed above, the new opportunities for the growing middle class, in addition, were located in the service sector. The share of services in Botswana in total GDP has been rising exceptionally fast, increasing 32-fold in real terms from 1966 to 2004, and from 46.3 per cent to over 50 per cent of GDP. Most people formally employed in the service sector work for the government. Including local government and parastatals, government accounts for 47 per cent of people in formal employment. Although the shift in employment from agriculture to services indicates a form of structural change of the economy, the service sector, although more productive than agriculture, is characterized by low productivity compared to the industrial sector. Hence, although it provides generally higher incomes for people coming from the agricultural sector – and thus reduces income inequality – it does not drive fast economic development.

5 Concluding remarks

In the paper we have shown that the last 80 years have seen a long-term rise and decline in income inequality in Botswana. The beef export sector, established and developed during the colonial era and lasting roughly a decade into post-independence, made it possible for large-scale cattle holders to turn their cattle wealth into incomes. They, together with government officials in the public sector, saw their incomes surging ahead of medium- and small-scale cattle holders and the cattle-less, as well as those employed in the private sector. Income inequality appears to have peaked at the time of the shift between the cattle and the diamond economies, and since then we have seen a declining Gini. This decline is driven by government transfers aimed at reducing poverty together with increasing incomes for large sections of society, which has meant a growing middle class, the majority of whom are employed in the dominant service sector. In the midst of this good news, however, we should keep in mind that Botswana's levels of income inequality are still among the highest in the world.

The long-term changes in the Gini raise the question of how this fits with a story about the spread of MEG. According to a traditional Kuznets model, inequality should be rising with the start of industrialization, only to decline once industry is actually dominating the economy. Others, such as van Zanden, have, however, instead argued that increasing inequality occurs already during the pre-modern economy, well before industrialization.

Considering that the content of industrial growth in Botswana can be questioned and that an economic structural transformation has not taken place, we must conclude that MEG, as envisioned by the generation of original development economists such as Kuznets and Lewis, has not taken place. Instead, Botswana is a country still characterized by pre-modern growth. While not completely refuting Kuznets' theory on long-term changes in income inequality, it is clear that it needs to be adjusted to be applicable the current context. It could be that in contemporary Sub-Saharan African countries, it is the growth of the service sector and urbanization that are at the core of the contemporary modernization process rather than industrialization, and that their effects on income inequality are similar.

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