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The dynamics of income
inequality in a dualistic economy:
Malawi from 1990 to 2011

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Table of contents

1. Context and purpose of the paper	3
2. Colonial origins of inequality and its subsequent evolution over the long term	4
3. Independence, and the adoption of an agriculture-led development model	8
3.1 Choice of the development model	8
3.2 Structure of the agricultural sector	9
3.3 Impact of agricultural policies on income inequality	11
4. Population issues: growth, HIV/AIDS and migration, and their impact on the economy's un-equalizing structural evolution	14
4.1 Population growth	14
4.2 Testing the 'suboptimal structural transition hypothesis' by means of microdecompositions	18
5. Impact of economic policies on inequality	21
5.1 Trade liberalization, economic structure, and income inequality	21
5.2 Macroeconomic policies and the crisis of 2009–2011	22
5.3 Fiscal policy and income redistribution via tax, transfers and human capital formation	23
6. Summing up, policy conclusions, and suggestions for further research	29
References	31
Annex 1	33

The dynamics of income inequality in a dualistic economy: Malawi from 1990 to 2011¹

ABSTRACT. This paper aims to document and explain the evolution of inequality in Malawi over recent decades using data from various national and international sources. Inequality rose between 1968 and the late 1980s due to the agricultural export-led development model adopted by the Banda regime, which favoured the estate sector and medium-sized farms and thereby created a ‘dualism within the dualism’ that exacerbated the inequality inherited from the colonial era. Between the early 1990s and the mid-2000s, inequality declined, in part owing to the adoption of the Starter Pack programme which covered all smallholders and substantially strengthened maize production per capita, including among the poorest farmers. Finally, inequality rose again between 2004 and 2011. Applying a microdecomposition analysis, this paper shows that a key driver of the rise in inequality during this period was the suboptimal structural transition of the economy from a low-inequality crop agriculture to high-inequality sectors such as livestock production, commerce, transport and formal and informal services located in both urban and rural areas. Such suboptimal structural transition was in part due to the decline of manufacturing induced by the trade liberalization of the 1990s and the skewed distribution of the rise in incomes from livestock production.

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1. Context and purpose of the paper

Malawi is a small country located in Southern Africa. It is 47,000 sq miles in area, 540 miles long and 150 miles wide at its widest part. A fifth of its surface is covered by lakes and rivers. The country is bordered by much larger countries, Tanzania and Mozambique to the East and Zambia to the West. The country is landlocked and the nearest harbours, Beira and Nacala, are about 1000 km from Lilongwe, a fact that increases transport costs for imports and exports. The country became a British colony in 1893 and was granted independence in 1964.

In 2011 (the last year for which inequality data are available) the total population was 15.5 million, and its current growth rate is estimated at around 3 per cent (United Nations Population Division 2015). Population density is high, at 127 people per sq. km, against an average of 37 for sub-Saharan Africa as a whole, and continues to increase owing to rapid population growth. The mainstay of the economy is agriculture, which currently employs 65 per cent of the workforce and generates about 36 per cent of GDP and 90 per cent of foreign exchange earnings. Upon independence the country adopted an explicit agricultural export-led development model and has so far placed limited emphasis on the expansion of other sectors.

This paper aims to document and explain the evolution of income inequality between colonial times and 2011, so as to draw policy lessons for the future. The analysis is based on the existing literature, statistical data from various national

and international sources, seven household consumption surveys and the RIGA Income Surveys of 2004 and 2011. The latter surveys make it possible to decompose total income inequality into the sum of the concentration coefficients of each production sector (agriculture, manufacturing, services, and so on) weighted by their share in the total value added. A change over time in sectoral value-added shares and their concentration coefficients affects the distribution of income. The paper is structured as follows: Section 2 discusses the colonial origins of income inequality and its subsequent evolution. Given the importance of agriculture, Section 3 analyzes the nature of rural institutions, the agricultural policies followed during the last 30 years, and their impact on growth and inequality. In turn, Section 4 discusses the relationship between inequality and a number of population issues (its growth, its slowing owing to HIV/AIDS, migration and urbanization). It also tests the extent to which change in the structure of income by sector and income source influenced the increase in inequality over 2004 and 2011. Finally, Section 5 discusses the extent to which public policies (trade liberalization, macroeconomic policy and tax and expenditure policies) affected both the distribution of income and its redistribution via transfers and the provision of public services. Section 6 summarizes the main findings and suggests areas for further research.

2. Colonial origins of inequality and its subsequent evolution over the long term

As in most of sub-Saharan Africa, tracing the long-term evolution of inequality in Malawi is problematic, as there are hardly any inequality data for the colonial period, for 1985–1993 there are no data whatsoever, for other periods there are only a few data, and data are drawn from different sources (tax returns, unstandardized distribution of consumption per capita, and standardized distributions of income per capita) which use different concepts of income and focus on different segments of the income distribution. Most important, the design of household income and consumption expenditure surveys on which the Gini coefficients are computed differ from one another. Thus, Malawi does not escape the usual problems encountered in measuring income and consumption inequality in the region (Cornia and Martorano, 2016).

As suggested by the title, this paper focuses on the inequality changes of the last two decades. These, however, are strongly path-dependent and, to understand fully their evolution over the long term, it is necessary to have a good understanding of the colonial origins of inequality and of its post-independence evolution. The empirical evidence about inequality changes over time can be summarized as follows:

- i. Malawi became a British protectorate in 1893. Though no precise inequality data were collected at that time, pre-colonial asset and income inequality were fairly low as the country exhibited an egalitarian distribution of farmland in the context of a communal land tenure system. Most people were engaged in subsistence agriculture under conditions of abundant land supply. Mining and manufacturing were little developed.
- ii. Inequality increased in the aftermath of colonization, as a fairly egalitarian rural economy with no landed gentry was turned into a heterogeneous economy. Indeed, the European settlers annexed part of the best land to develop a plantation economy aiming at exporting cash crops such as cotton, tea, and tobacco (Sindima 2002). The changes put in place at that time led to an unequal access to land and human capital as well as to the proletarianization of rural labour through the ‘hut tax’ and ‘thangata system’ (Kwengwere 2011). Indeed, in line with the ‘centre-periphery development model’ typical of the colonial era, in Malawi as elsewhere the colonizers did not promote the development of manufacturing, universal education and physical infrastructure, but limited themselves to the

² Acemoglu and Robinson (2012) contrast the growth performance of the ‘Western offshoots’—Australia, Canada, New Zealand and USA – where European migrants settled and developed ‘inclusive political and economic institutions’ which paved the way to economic growth and moderate inequality – with that of developing countries where only a few Europeans settled and the colonial powers created ‘extractive institutions’ to exploit local resources. These extractive institutions represented an important obstacle to growth when the colonies became independent, as the absence of pro-growth institutions, human capital and infrastructure retarded industrialization and entailed a worsening of income and wealth inequality.

creation of ‘extractive institutions’²² that allowed them to profit from the agricultural resources of the country.

With colonization, the Malawian economy evolved into four main sectors: a highly productive ‘estate sector’ controlling a rising share of land that in 1978 accounted for 16 per cent of the land belonging to smallholders (Pryor 1988, Table A2); a large number of smallholders (1.3 million around 1990), and a few medium farmers producing maize and cash crops for export (Lele 1990); and a reserve of cheap labour employed in the Malawian estates or the Southern African plantations and mines, this reserve at its peak absorbing 12 per cent of the total Malawian workforce. Overall, such shifts raised inequality, as part of the land rent was appropriated by the white settlers and as the average incomes/wages of the three sectors differed substantially.

iii. Between 1964 and the early 1980s the country recorded a decline in the income share of the top 0.25 per cent of the income earners, and in the top 0.1 per cent (Atkinson 2014), owing to the departure of the European elites which had constituted the main group of taxpayers. Indeed, based on an analysis of tax returns, Atkinson (2014, p.51) notes that “*The top income shares in Malawi show a distinct decline in the period from 1964 to 1980. The share of the top 0.25 per cent went from 7.7 per cent in 1964 to 5.3 per cent in 1978–80; the share of the top 0.1 per cent fell from 4.6 per cent to 3.6 per cent in 1978–80.*” This decline was all the more marked since in 1938 and 1945 the shares of the same groups were respectively 7.92 and 7.30 per cent (*ibid.*, Table 8). However, Pryor (1988) shows that during the same period the sectoral and overall Gini coefficients rose substantially, thus entailing a worsening of the overall distribution,

TABLE 1: Gini coefficients of the main economic sectors

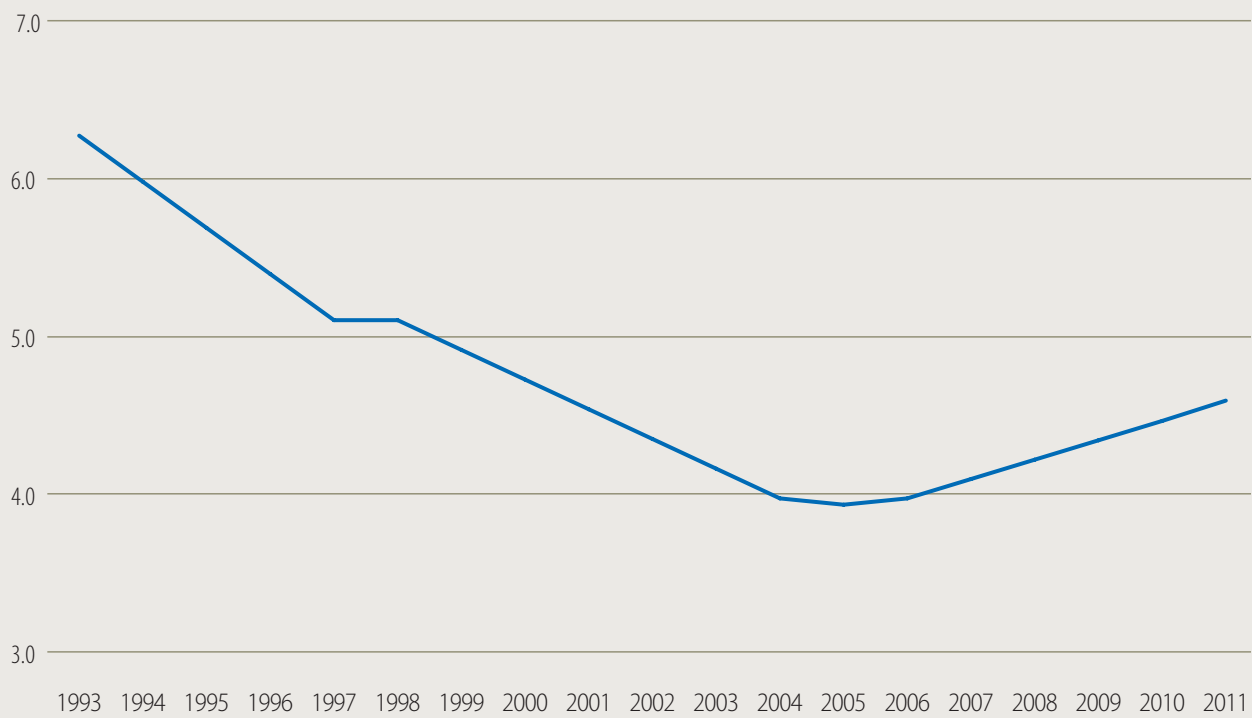
	1968/9	1984/5
Smallholder families	.203	.453
Families on estates	.187	n.a.
Families in small towns	.466	n.a.
Families in four main cities	.660	.621
Total	.449	.599

Source: Pryor (1988)

except for its top segment (Table 1). Given the decline in maize output per capita between 1985 and 1991, it is likely that the inequality rise documented in Pryor (1988) for 1964–1985 continued at least until 1991, including because of the sharp decline in net barter terms of trade experienced by the country until 1994 (Figure 2) and the effects of Structural Adjustment Programmes (SAP) designed with little attention to their distributive impact. Indeed, as observed in commodity exporting economies, a worsening of the terms of trade generates a negative effect on tax returns, income level and balance of payments, as well as a weakening of the exchange rate, which are events that cause a drop in household purchasing power, a loss of employment and a contraction in the supply of social services that disproportionately affect low-income households.

iv. As for the period 1993–2011, Figure 1 below traces the dynamics of the Gini coefficient of the distribution of consumption per capita based on six Household Surveys. Figure 1 suggests that the coefficient declined steadily until 2004–5 (probably owing to the introduction of Starter Pack programme over the years 1998–2005 and other factors discussed below), but that then it rose by 6–7 Gini points between 2004/5 and 2011.

FIGURE 1: Trend in the Gini coefficient of consumption expenditure per capita



Source: Cornia and Martorano (2016)

(v) Finally, for the years 2004 and 2011 we can make use of the micro-data of two standardized Integrated Household Surveys (IHS-2 and IHS-3) produced by the Rural Income Generating Activities (RIGA) project carried out by the Food and Agriculture Organization of the United Nations (FAO) and the World Bank. A comparison of these two income surveys suggests that the Gini coefficient of the distribution of household income per capita increased by 12.5 points – i.e. more than the 6-7 Gini point rise computed on the basis of the distribution of household consumption expenditure per capita in Figure 1. In the following, we discuss the factors that explain such long-term inequality trends, focusing in particular on the period 1990–2011.

The above measures of inequality are downward biased. Indeed, they are calculated on the basis of surveys where the unit of observation and analysis is the household (and not the individual) and the income concept collected is average household income or consumption per capita. This implicitly assumes that all family incomes/consumption are pooled and distributed equally among all household members, with no discrimination by age and gender. Of course this is not true, as in Malawi and most other developing countries inequality among individuals is higher than among households, being strongly affected by cultural norms that discriminate against women in access to land, health and education, participation in the formal labour market, and political and social life. However, information on

TABLE 2: Female/male (F/M) ratio for economic and social indicators

	1980-85	1985-90	1990-95	1995-00	2000-05	2005-10	2010-15
F/M life expectancy at birth	1.06	1.06	1.04	1.02	1.00	1.03	1.04
F/M access to anti-retrovirals	...	...	...	...	...	1.29	1.33
F/M secondary school enrolment	0.42	0.52	0.61	0.69	0.78	0.84	0.91
F/M yrs of education of workers ¹	0.50	0.41	0.48	0.50	0.51	0.56	0.66
F/M-headed land owned	...	...	...	...	0.88 ²	...	0.85 ³
F/M-headed income pc	...	...	...	...	0.79 ²	...	0.70 ³

Source : Authors' compilation based on United Nations Population Division (2015), WDI and RIGA surveys for 2004 and 2011; Note: ^{1/} data on years of education refer to the first year of the period considered and are from Barro and Lee (2013) ^{2/} refers to 2004, ^{3/} refers to 2011.

the measurement of inequality among individuals is very difficult to obtain, owing to the approaches followed by the above surveys. Gender inequality can thus be inferred only indirectly on the basis of administrative statistics, (rare) ad hoc surveys or by disaggregating the results of income/consumption surveys between male-headed and female-headed households. In this regard, Table 2 suggests that as in most developed and developing countries, Malawian women have a longer life

expectancy at birth than Malawian men (although this advantage declined during the worst years of the HIV/AIDS infection that affected women more frequently than men); discrimination in access to health and education has gradually declined due to the emphasis placed by the MDGs on reducing gender bias; and economic discrimination (e.g. land owned and income per capita) did not decline or increase.

3. Independence, and the adoption of an agriculture-led development model

3.1 Choice of the development model

At independence, 87 per cent of non-estate land was owned communally, there were few landless families and only 3 per cent of non-estate land was privately owned. The number of African estate owners was extremely small as all estates were European-owned. However, the number of African owners increased as the European-owned estates were gradually transferred to local elites with links to the Banda regime (Kwengwere 2011). The rate of urbanization was extremely low³, and between 1968/9 and 1984/5 the share of population living in cities rose only from 6 to 9 per cent. As suggested by the Kuznets curve, urban migration raised economic inequality as average rural wages were only 22-29 per cent of urban ones (Pryor 1988). Rural-urban migration then continued at a slow pace and by 2005-2010 the share of urban population reached 15 per cent (Table 3).

At independence the country adopted a development strategy based on the export of cash crops produced by the estates, and on migrant remittances. Smallholders were assigned the task of producing ‘wage goods’ (maize) and some cash crops, and of supplying cheap labour to the estate sector. Given the dominance of agriculture and the fairly egalitarian distribution of non-estate land, such an approach potentially had equalizing effects – though these were in part offset by the persistence of the estate-smallholders dualism and its subsequent aggravation (see later).

Given Malawi’s narrow resource base, the adoption of an agricultural export-led development was to some degree unavoidable. But that approach was affected by an almost continuous decline in the international terms of trade that – as noted - affect revenue collection, wages, employment and the distribution of income. Indeed, while the net

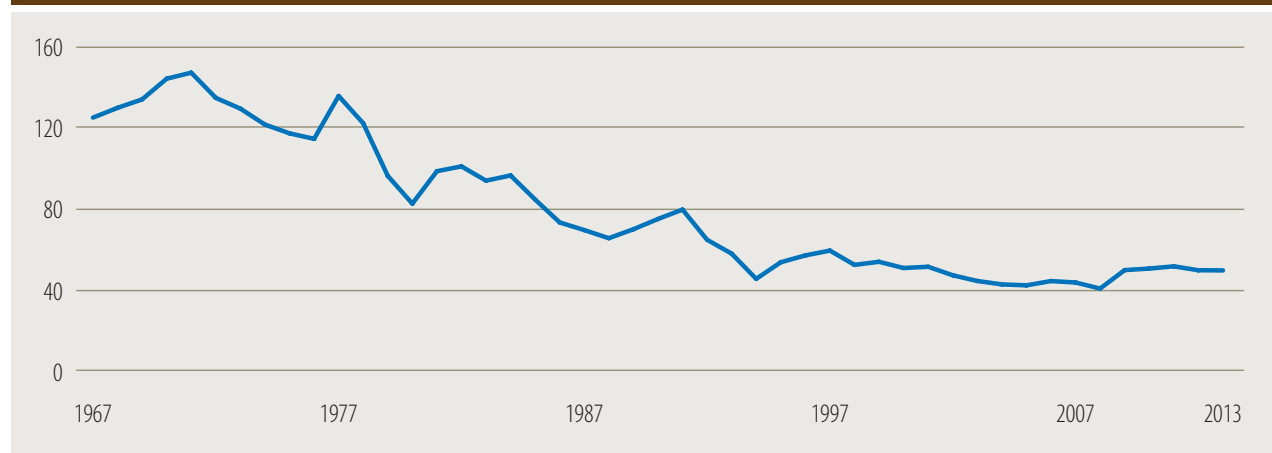
TABLE 3: Food security situation by size of land holding in ha, percentage values (2008/09)

Food security group	No land	<0.5	0.5-1.0	1.0-2.0	2.0-4.0	>4
Poor	3	12	35	36	12	2
Borderline	2	10	31	33	18	5
Acceptable	2	7	26	36	20	9

Source: World Food Programme, 2010

³ During colonial times, the cities were considered mainly as ‘white only’ (Droppelman et al., 2012).

FIGURE 2: Evolution of net barter terms of trade index, 1967–2013 (1982=100)



Source: Authors' compilation based on Pryor (2008) for 1967–1985 and World Development Indicators for the subsequent years.

barter terms of trade index rose from 86 in 1967 to 100 in 1970, it then dropped to 57.3 in 1985 owing to the collapse of tobacco prices and the surge in oil and fertilizer prices (Pryor 1988). In subsequent years, this decline stabilized (Figure 2) but was not reversed even by the rapid growth of resource-poor China.

3.2 Structure of the agricultural sector

As noted, food production was and remains dominated by the subsistence farming of maize and tubers. Less than 20 per cent of maize output is marketed. Only 10 per cent of households use irrigation, and for most of them food output is vulnerable to changes in rainfall and soil degradation.

Though land concentration was and still is not very high⁴, smallholders' incomes, their ability to increase output, food security and income inequality correlate closely with farm size (Table 3). Only households with more than 0.8-1.0 ha can produce enough maize, raise a sufficient number of heads of cattle, and obtain credit for agricultural inputs. However, due to rapid population growth,

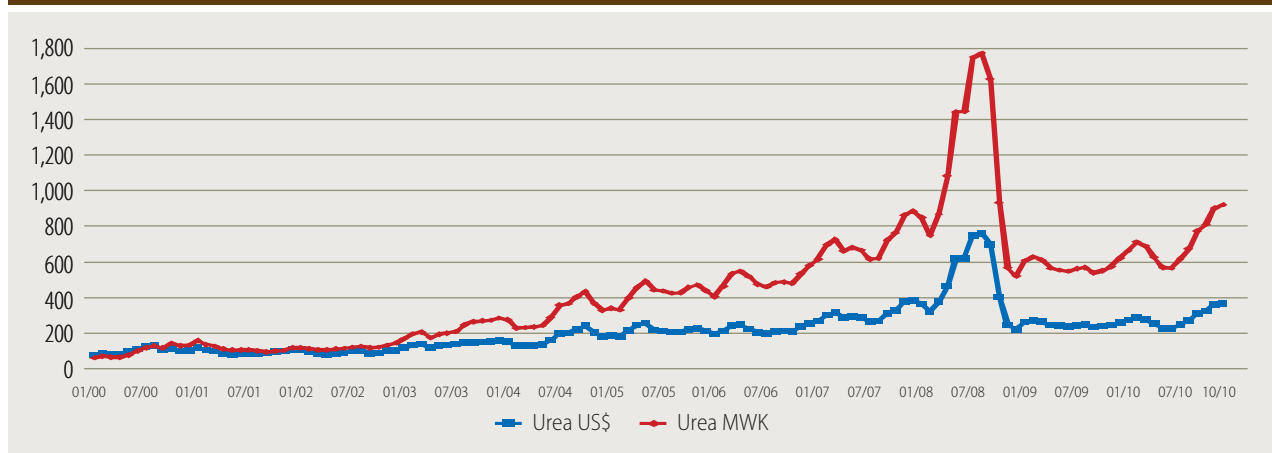
the proportion of smallholders with less than 0.8 ha rose from 28.7 per cent in 1968/9 to 55 per cent in 1980/81 and has risen further in the subsequent years.

As in other countries of sub-Saharan Africa, in Malawi smallholders with not enough land sell part of their crops at low prices immediately after the April harvest and buy food at higher prices during the subsequent 6 to 9 months by selling goats, pigs and chickens and doing *ganyu* i.e. casual labour on the estates or elsewhere in exchange for food or cash. However, *ganyu* wages fell and maize prices rose at times of food shortages. This is problematic for the 60 per cent of the households that are net maize buyers (Dorward *et al.*, 2008) and, as such, are vulnerable to wage and maize price fluctuations that have a dramatic effect on income inequality and the distribution of real purchasing power (Hartwig and Grimm 2002, Cornia and Martorano 2016).

With rising land scarcity, there has been a gradual proletarianization and informalization of labour. This trend has been exacerbated by the on-off exclusion

⁴ The Gini coefficient of the distribution of planted land per smallholder household rose from 0.369 to 0.381 between 1968/9 and 1984/5 (Pryor, 1988, Table A5). If land belonging to the estates (some 16 per cent of that of smallholders) were included, the Gini coefficient of land concentration would rise to around 0.5.

FIGURE 3: Trend in urea price in dollars and Kwacha



Source: Cornia, Deotti and Sassi (2011)

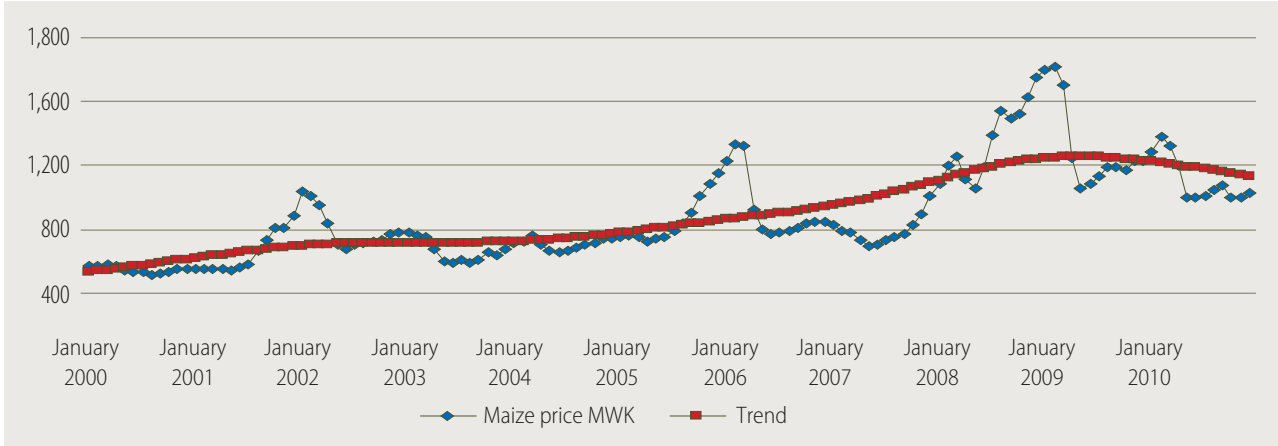
of small farmers from fertilizers due to lack of credit and subsidies that affected their ability to respond to the price stimuli introduced by the SAP of the 1980s. Indeed, the price elasticity of maize supply was small (0.16) owing mainly to the strong dualism of the fertilizer market (Lele 1990).

Agricultural output and income inequality in Malawi are also severely influenced by changes in the price of imported agricultural inputs (energy, fertilizers and pesticides) and by changes in maize prices in its large neighbouring countries. In particular, dependence on imported fertilizers, whose prices are closely linked to energy prices, increases the country's vulnerability to changes in world oil prices. A rise in the latter increases production costs and can cause a drop in fertilizer demand even among medium-sized farmers. This in turn translates into lower maize yields and production, and/or higher maize prices, or in a shift out of crops that require heavy fertilization (maize, tobacco, tea) and into roots and tubers. Lewin and Fischer (2010) estimated

that a 25 per cent increase in urea prices raises the probability of food insecurity by 30 per cent in Central Malawi and 18 per cent in Southern Malawi. For instance, while at the beginning of the 2000s, the Starter Pack programme, combined with favourable weather, contributed to bumper harvests in three consecutive years, the subsequent rise in the world price and the Kwacha devaluation of 2008 caused a 250 per cent rise in Malawi's domestic fertilizer prices (Figure 3) that contributed to the food crisis and famine of 2009-2010 (Figure 4).

Given the vulnerability to changes in their price, adequate fertilizer subsidy programmes are fundamental to stabilization of fertilizer use. Indeed, with low and volatile fertilizer use, limited irrigation, exposure to external price shocks, and policy mistakes (see later) the country suffered recurrent food crises that in 2001/2, 2005/6 and 2009/10 generated maize price spikes and outright famines (Figure 4), impacting inequality, especially during the 2008–2010 food crisis.

FIGURE 4: Current monthly average price of maize (kwacha per kg) and its trend, 2000-2010



Source: Cornia, Deotti and Sassi (2001). Note: the long-term trend was computed with the Hodrick-Prescott filter.

3.3 Impact of agricultural policies on inequality

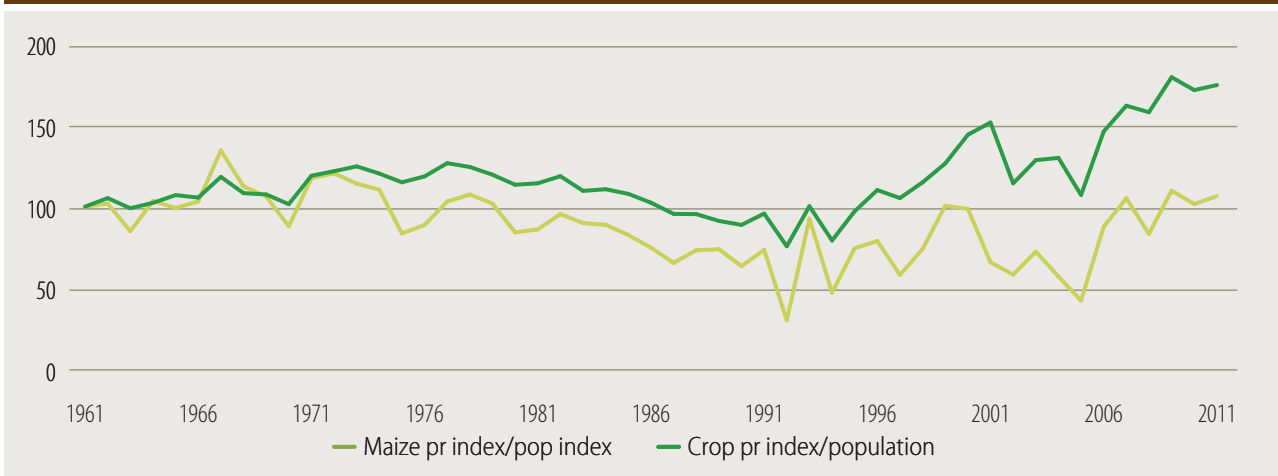
In line with the choice of an ‘agricultural export-led development model’, the government assigned a large share of public investments to agriculture and emphasized the creation of rural infrastructure and intensification of fertilizer use in the less fertile Central and Southern regions. The policy generated some initial progress in terms of increased agricultural output (Figure 5).

However, the targeting of agricultural policies changed over time. During the early post-independence years public support was

concentrated on smallholders, and nearly all investments and subsidies were allocated to development projects focusing on them, thereby generating some equalizing effects.

But the maize and tobacco output of smallholders fluctuated widely, thus raising doubts in government circles about their ability to promote growth, ensure food security, and generate sufficient revenue for essential infrastructure investments. For this reason, from the late 1960s the Government switched to ‘an estate and medium-sized farmers strategy’ and reallocated land leases, production licences, credit on favourable terms, and fertilizer

FIGURE 5: Index of maize and cash crop production per capita (1961 = 100)



Source: Authors’ elaboration based on FAOSTAT.

subsidies towards estates and medium-sized farmers with capacity for absorbing new farming techniques, raising yields, introducing new crops and developing cattle-raising. While this policy shift generated rapid economic growth for 10 to 15 years, its impact was un-equalizing (Pryor 1988) as land, labour and profit were being squeezed out of the smallholder sector (Lele 1990), as rural wages gradually declined.

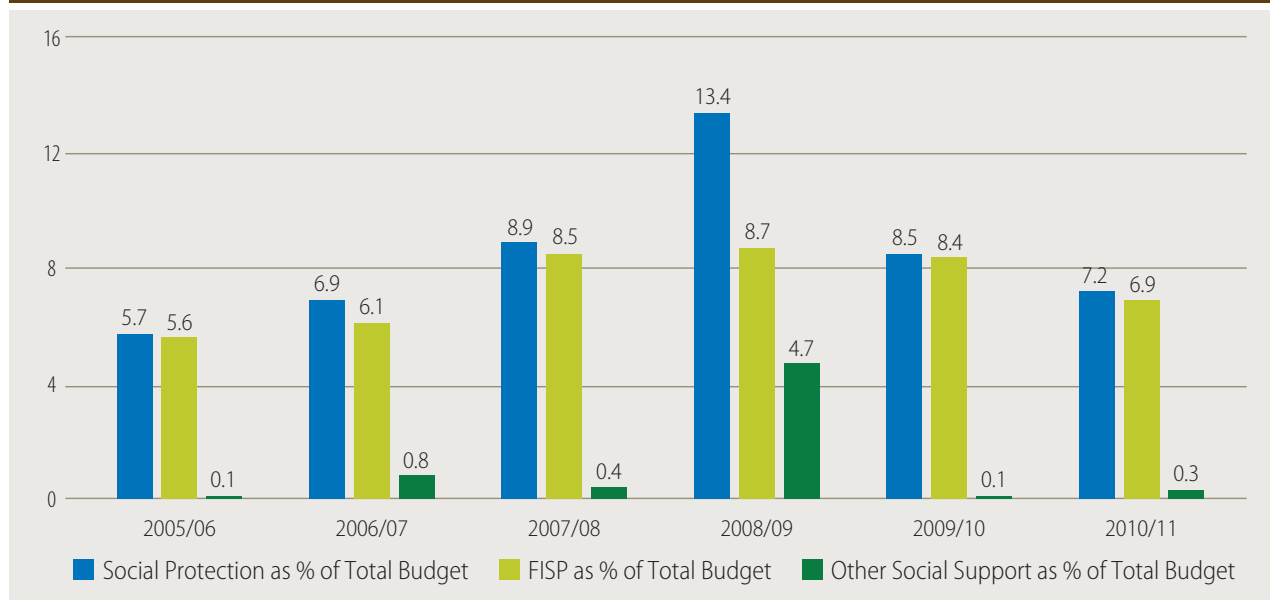
Such policies exacerbated what Lele (1990) called '*the dualism within the dualism*' i.e. the dualism between small versus medium-sized farmers in the context of the colonial-era dualism between estates and smallholders. With this shift, the composition of agricultural output changed. While since the 1970s the country had experienced rapid growth in cash crops, maize production per capita now declined (Figure 5), smallholders became more dependent on wage income, and maize prices increased, thus depressing the purchasing power of marginal smallholders, who as net food buyers pay higher maize prices than better-off families (Mussa 2015). The nominal and real distributive effects were therefore un-equalizing (Table 1).

The SAPs introduced in the 1980s further skewed the access to fertilizers. The SAPs were mainly aimed at re-establishing macro balance after the exogenous shocks that hit Malawi in the late 1970s and 1980s. These included an oil price increase, a fall in world tobacco prices from 100 in the early 1980s to 28 in 1987 (Figure 2), drought, an inflow of refugees from war-torn Mozambique, and an increase in transport costs due to the Mozambican civil war that forced a shift from Beira to the more expensive Nacala export route. The standard SAP measures were accompanied also by price and

trade liberalization, and an attempt to end fertilizer subsidies. Even a donor-funded smallholder revolving fund was closed in 1988.

The wisdom of such policies has been frequently contested. In countries like Malawi characterized by high population density, falling farm size, high cost of imported fertilizers, skewed access to credit, weak extension services and narrow markets, a private sector-led agricultural intensification has few chances to succeed and is by definition un-equalizing. For that reason in 1998 the Government with support from most bilateral donors introduced the innovative Starter Pack programme. The programme provided free small packs of high-yielding maize and legume seeds and fertilizers, enough for 0.1 ha (Levy *et al*, 2004). In the first three years nearly three million packs were distributed – enough for all smallholders. In the 2000–2001 and 2001–2002 seasons the Starter Pack programme was scaled down and efforts were made to target the poorest smallholders. In 2002–2003 and the following year, in response to the serious food crisis of early 2002, the programme was expanded to reach near-universal coverage (*ibid*). Despite considerable year-to-year fluctuations, over 1998–2005 the programme was able to reverse the decline in maize production per capita of 1981–1991. Such improvement broadly coincided with the fall of inequality over 1993–2005 (Figure 1). Impact evaluations showed in fact that the Starter Pack programme raised average maize production by about 125–150 kg per household, and kept maize prices low during the lean season. At the aggregate level, in the programme's initial years maize production was 500,000 tons higher than ever before and 67 per cent higher than the prior 20-year average (World Bank, n.d.).

FIGURE 6: Trend in Social Protection Allocations compared to Farm Input Subsidy Programme (FISP)



Source: World Bank (2013)

The approach to fertilizer subsidies and agricultural intensification changed again in 2005–2006 with the introduction of the Farm Input Subsidy Programme (FISP). FISP is also credited with the recent decline in Malawi’s food insecurity. The programme remains controversial, but became the government instrument of choice to reach low-income farmers. Except for 2008–2009, FISP accounted for virtually all of social expenditure (Figure 6), that in 2012–2013 absorbed 4.5 per cent of GDP (World Bank, 2013). Yet its impact on inequality and poverty alleviation was unsatisfactory (see later) as FISP failed to reach the poorest farmers.

Agricultural policies were and are mainly executed by the Agricultural Development and Marketing Corporation (ADMARC), a parastatal entity created in 1971⁵ to complement the limited reach of private markets, promote agricultural exports, commercialize agricultural inputs, act as a buyer of last resort, regulate prices, maintain a strategic

maize reserve, authorize exports, and ensure food security through domestic and foreign purchases of maize. ADMARC’s food security policies have at times been severely criticized. While in 1998 it prevented a famine, in 2000–2001 due to financial problems it sold much of its maize reserves just before the poor harvest of 2002, a decision that caused food shortages, a famine, and a negative impact on income inequality (Hartwig and Grimm 2002). In 2002 the World Bank forced ADMARC to reduce its trading operations to allow greater private sector competition, but these measures also generated mixed results.

As a result both of weather shocks and ADMARC’s inappropriate operation in the maize market, the country suffered recurrent food price spikes and food crises in 2002, 2005 and 2009–2010 (Cornia, Deotti and Sassi 2012). These affected food prices and, through them, the distribution of purchasing power (Dorward and Chirwa 2011, Parameswaran 2012, Chirwa and Muhome-Matita 2013).

⁵ The precursor to ADMARC, the Farmers Marketing Board, was set up in colonial times

4. Population issues: growth, HIV/AIDS and migration, and their impact on the economy's un-equalizing structural evolution

4.1 Population growth

Income inequality was also affected by changes in population growth, migration and the spread of HIV/AIDS. With the rural transformation discussed in Sections 3.2 and 3.3, formal employment in the estate sector increased markedly but then stagnated due to the exhaustion of fertile land and the inability to create substitute employment opportunities in industry and services. Population growth (Table 4) and limited technological intensification eventually pushed the country's agriculture to its 'land frontier' and to a decline in farm size that reached 0.23 ha in 2009, or lower values in the densely populated South. Falling farm size and soil fertility have become an obstacle to the production of enough food for self-consumption even in good years (Harrigan, 2008) and have increased the dependence of rural

households on unskilled wages (that declined due to an increase in labour supply) and other non-farm sources of income. Another effect was a steady increase in rural non-agricultural activities (RNAA) (Table 6, Droppelman *et al.* 2012, T) and rural-urban migration (Table 4).

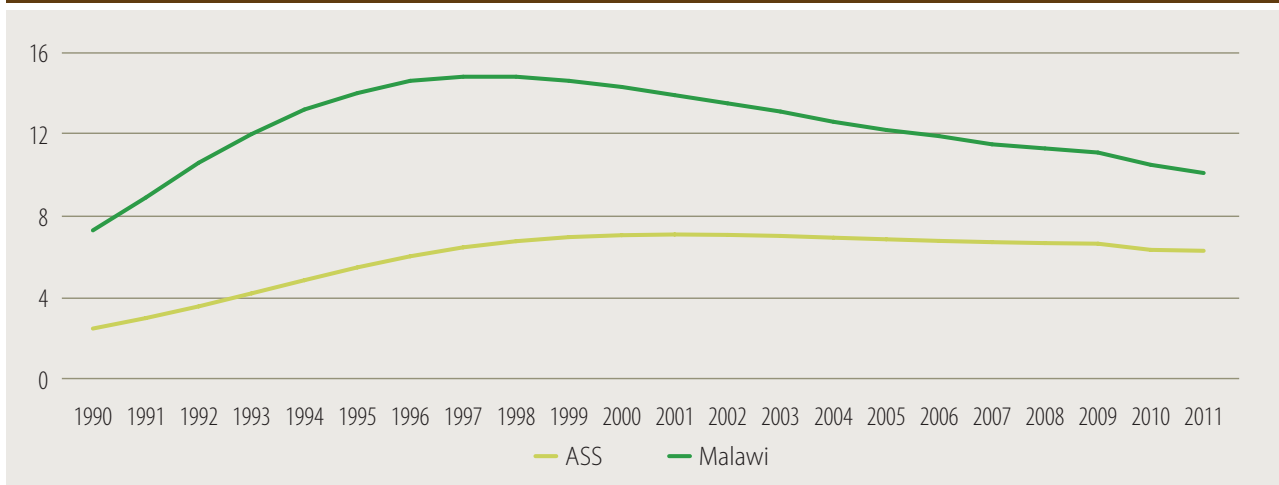
High population growth affected not only average farm size but also land degradation through soil exhaustion and erosion, overuse of biomass and deforestation. Some 98 per cent of the population depends on firewood as a source of energy for cooking. Population growth also causes a considerable pressure towards deforestation, that reduced forest cover from 38 per cent in 2001 to 34 per cent in 2013 (World Development Indicators). Malawi's National MDG report offers even more worrying estimates of the trends in

TABLE 4: Population dynamics in Malawi, 1980-2010

	1965-70	1980-85	1985-90	1990-95	1995-2000	2000-2005	2005-2010
Total fertility rate (TFR)	7.20	7.58	7.40	6.60	6.44	6.07	5.83
Population growth rate	2.39	3.05	5.20	1.06	2.55	2.64	2.99
Total population (mill.)*	4.5	7.2	9.4	10.1	11.3	12.9	15.0
Population per sq km*	38.2	61.3	79.7	84.1	95.6	109.1	126.7
% Urban population*	6.1	10.2	11.6	13.3	14.6	15.1	15.5
Urban population (mill.)	.274	1.09	1.32	1.65	1.94	2.33	2.81

Source: Authors' compilation based on United Nations Population Division (2015). NOTE: * end year of period considered

FIGURE 7: Prevalence of HIV/AIDS among 15–45 year-olds)



Source: Authors' elaboration based on World Development Indicators

forest cover, biomass use, and flooding. These trends are unsustainable and have already entailed a drop in agricultural productivity that has in particular affected smallholder communities due to declining access to land and natural resources and environmental degradation. While some relief from falling land productivity may come from improved farming techniques and greater fertilizer use, the latter may in turn affect the quality of the water table. All this suggests that the main solution to this economic-environmental problem has to come from an intensification of population control policies and a faster decline in the total fertility rate (TFR).

Population growth remains in fact very high. Since the 1970s its growth rate has varied around 3 per cent a year, except for the 1990s when it was affected by the rise in the number of AIDS-related deaths (Figure 7).

As noted, during the 1990s population growth was retarded by the spread of HIV/AIDS. While this may have temporarily reduced the pressure on the land (and through that on inequality),

HIV/AIDS also generated perverse distributive effects, as it impoverished AIDS-affected families by reducing the number of working adults, increasing the time allocated by healthy adults to the care of HIV patients, and raising drug and funeral costs (Cornia 2007). Some progress in the fight against HIV/AIDS was achieved over the last 15 years thanks to the diffusion of antiretroviral therapy (ART)⁶ (Table 2), palliative care and awareness-raising programmes, although the disease still represents a source of income polarization between HIV/AIDS-affected and non-affected families.

Finally, the inequality impact of population pressure on the land was raised by the vanishing opportunity to migrate. During the colonial era, landless or near-landless rural workers unable to find work in the estate sector migrated elsewhere in Southern Africa. This trend continued after independence, and by 1972, 10.3 per cent of the labour force worked abroad (Kwengwere 2011). The direct effect of remittances was un-equalizing, as migrants earned wages higher than the incomes of smallholders, though their general equilibrium effects might have been favourable,

⁶ Initially, anti-retroviral therapy was provided only by hospitals. Nowadays, it is also provided by health centres and nurses. Thus, the coverage of integrated ART doubled – from 300 sites to more than 600 – over 2011–2013. The percentage of HIV-positive pregnant women covered by antiretroviral therapy increased from 44 per cent to 73 per cent between 2010 and 2013 (Government of Malawi, 2014).

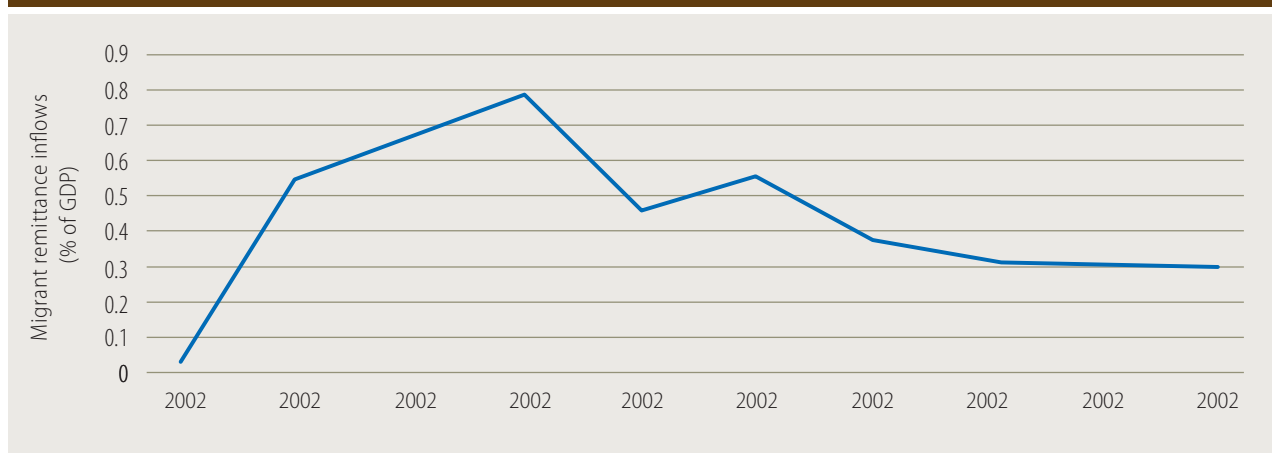
as remittances generated a positive income effect and provided foreign exchange that relaxed the balance-of-payments constraint on growth. The evidence about the inequality impact of migration in other parts of the world is mixed, but in countries with a long history of migration (e.g. Mexico and El Salvador) remittances had an equalizing impact on income distribution during the last decade (Cornia 2014).

From the mid-1970s migration declined, as Malawi began withdrawing its workers following a plane crash that killed 73 miners. In addition, since the 1990s, Malawians expatriates were often deported following a rise of xenophobia in South Africa and, recently, Tanzania. Thus, the crude net migration rate fell from 18.8 per cent during 1985–1990 to around 1.5 per cent in 2005–2010 (United Nations *et al.*, 2014). Yet, while mass migration declined, over the last two decades there was a surge in the number of migrants with tertiary education (World Bank 2011). Their share in the total rose from 13.3 to 20.9 per cent between 1990 and 2000 and further in 2010 (*ibid.*).

The decline in emigration was accompanied by a parallel decline in remittances. Though these are always underestimated, Figure 8 shows that between 2002 and 2011 they ranged between 0.1 and 0.8 per cent of GDP. The effects on inequality are uncertain, although due to the shift in skill composition of migrants, they are likely to be un-equalizing.

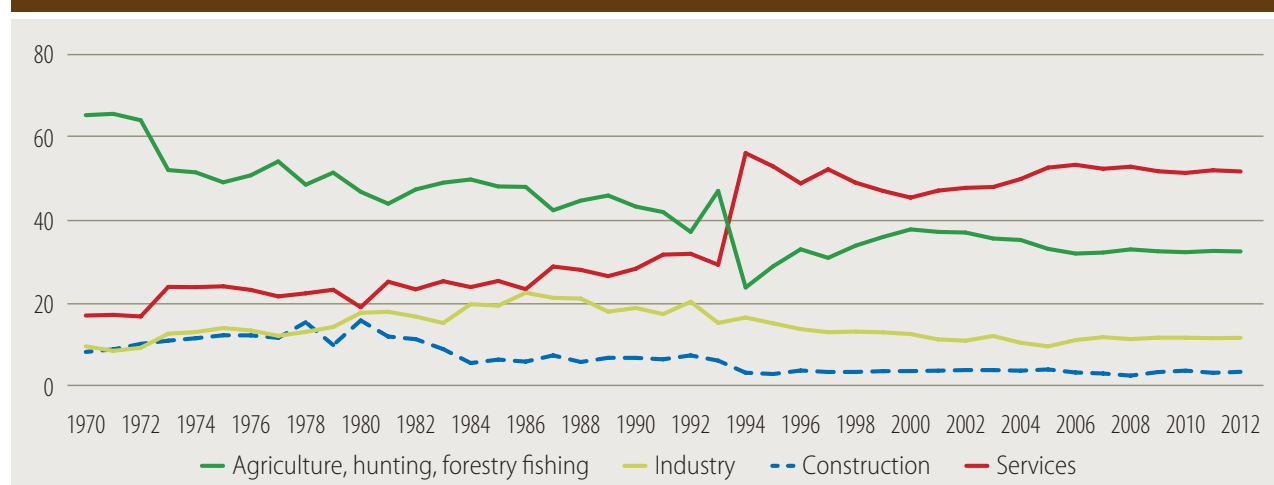
Due to the above changes in population growth, farm size, foreign emigration, rural-urban migration and sectoral income growth, the output composition of Malawi’s sectoral GDP experienced a shift away from agriculture and towards rural non-agricultural activities (RNAA) and urban-based activities, in particular services. Indeed, between 1992 and 2012 the value-added share of agriculture in the total fell from 50 to nearly 30 per cent (Figure 9). In turn, manufacturing (broadly defined) declined from nearly 20 per cent in 1992 to around 10 per cent. Construction also declined. On the other hand, the value-added share of services increased especially during the 1990s, reaching a level of just above 50 per cent in 2012

FIGURE 8: Trend in the remittances/GDP ratio, 2002-2011



Source: Authors' elaboration based on African Development Indicators

FIGURE 9: Evolution of main sectors' value-added shares, 1970 - 2012



Source: Authors' elaboration based on UNCTAD base data

(Figure 9). In particular, finance, communication and private and government services recorded the most significant expansion since the early 1990s (Charman 2013 and Figure 9).

In particular, with a steadily rising population there was also a labour shift to the urban informal sector, microenterprises, transport, small-scale trade, personal services, and unregulated commerce (Durevall and Mussa, 2010). Yet, due to limited job creation in urban and peri-urban activities, the redundant rural labour force often became employed in rural non-agricultural activities (RNAA), such as small-scale trade, communication services, repairs, etc. For instance, Droppelman *et al.* (2012, Table 3) show that between 2004 and 2009, 40 per cent of construction jobs, 20 per cent of manufacturing jobs, and one sixth of service jobs were located in rural areas.

As a result, the value-added share of agriculture declined, although it remained the most important sector⁷. Meanwhile between 1992 and 2002 the value-added share of industry (mining, manufacturing, construction, utilities) fell from 20

to 10 per cent to stabilize in the subsequent years at around that level. Main factors in this decline were low domestic and foreign investments, trade liberalization and – towards the end of the 2000s – an overvalued exchange rate. As in other African countries, these factors caused the displacement of domestic manufacturing output by competitive Chinese and Indian imports (AfDB *et al.*, 2011). Within the broad industrial sector, only mining and quarrying recorded positive growth (*ibid.*, Charman, 2013).

Only services increased their value added share. Their rise (Figure 9) is however problematic in several respects. While most of the formal service sector is accounted for by comparatively well-paid government and financial services, the informal sector has a low labour productivity and in many cases represents a source of livelihood rather than of productive employment. The distribution of income in both the formal and the informal urban service sector is also characterized by greater inequality than in the smallholder sector, labour-intensive manufacturing and construction. This *'suboptimal evolution of the structure of*

⁷ "Crop and animal production provide the largest subsector contribution towards GDP. Smallholders account for the bulk of agricultural output in all sectors apart from sugar, tea and flue-cured (Virginia) tobacco, although smallholders produce over 90 percent of burley (air-cured) tobacco" (Charman, 2013: 47).

production’ concerned both growth – as workers only seldom moved from low- to high-productivity jobs as suggested by standard Lewis-type models – and employment and income distribution. Indeed, the informal (urban and rural) sector is characterized by higher inequality, due to unequal access to assets, human capital, credit and inputs. Meanwhile, inequality also rose within the formal sector, as shown in the next section.

4.2 Testing the ‘suboptimal structural transition hypothesis’ through microdecompositions

To test empirically the distributive impact of the hypothesis about the suboptimal reallocation of labour and value added by sector we carried out a microdecomposition of the changes between 2004 and 2011 of the overall Gini coefficient of the distribution of household income per capita computed on the standardized Integrated Household Surveys 2 and 3 generated by the RIGA project⁸. To do so, we follow the standard Rao (1969) approach which indicates that, after eliminating from the survey all zero observations, at time *t* the Gini coefficient *G_t* is equal to the weighted average of the concentration coefficients (*C_{it}*) of the various sectors of the economy weighted by their shares in total value added (or value added), i.e.:

$$G_t = \sum s_{it} C_{it} \quad \sum s_{it} = 1$$

This algorithm makes it possible to identify the absolute and relative contributions of each production sector’s concentration coefficients

and income shares to overall inequality in 2004 and 2011. By taking the difference in relative contribution between 2004 and 2011 (last column of Table 5) we obtain the relative contribution of each sector to the increase of the overall Gini coefficient. Given the methodological issues highlighted in footnote 7 and to test the robustness of the results obtained with the Rao methodology we also used the Distributive Analysis Stata Package (DASP) (Abdelkrim and Duclos, 2007) in which the zero values are included in the distributions of subgroups, as well as the Ytzhaki-Lerman (1985) approach. As shown in Annex 1, the results thus obtained are very similar to the ones presented on page 19.

After this methodological preamble, Table 5 shows that between 2004 and 2011 the overall Gini increased by a sizeable 12.5 points (i.e. more than the 7 points shown in Figure 1 that is based on the distribution of household consumption per capita), and that this increase was due to:

- a large ‘structural effect’ i.e. a shift in economic activity and value added creation from low-inequality agriculture (which experienced a huge 19.2 percentage point decline in its value-added share in just seven years) towards sectors characterized by high inequality (commerce, transport and telecommunication, ‘services’ and construction) while mining, manufacturing, utilities, and finance-insurance-real estate (FIRE) were unchanged or recorded modest variations (Table 5 and Figure 7);

⁸ There is a large and at times conflicting literature on the decomposition of the Gini coefficient at one point in time (static decomposition) or on its change over time (dynamic decomposition) (Jurkatis and Strehl, 2013). Somewhat different results may be obtained depending on the methodology followed, particularly in the case of very peculiar distributions of income sources/population subgroups. Results also depend on whether the Gini coefficient is to be decomposed by ‘income sources’ (as in Table 6) or ‘population subgroups’ (e.g. production sectors) as in Table 5, especially if the number of subgroups is high, and depending on whether zero observations are removed or not from the distributions of the subgroups. The initial method proposed is that of Rao (1969), in which the total Gini is decomposed using the weighted average of the concentration coefficients of the income sources (or other subgroups) multiplied by their shares in the total, as shown in the text. A similar approach which also considers that the ordering of the distribution of total income may differ from that of the subgroups has been proposed by Lerman and Ytzhaki (1985) who developed the following formula: $G = \sum R_k G_k S_k$, where the total Gini *G* is equal to the weighted sum of the sectoral Gini *G_k* weighted with the respective income shares in total income *S_k*, multiplied by *R_k* which is the correlation between the Gini of the income component *k* and that of total income. A dynamic approach was proposed by Wan (2000) in which the Δ Gini over time is equal to $\Delta G = \sum \Delta s_i C_{it} + \sum \Delta C_i s_{it} + \sum \Delta s_i \Delta C_i$ where the first term represents the ‘structural effect’ (i.e. the change in total Gini due to changes in the shares *s_i* of income sources or population subgroups), the second term the ‘real inequality effect’ (reflecting the changes of concentration coefficients in each sector or income source) and the third is an ‘interaction term’ between the first two.

TABLE 5: Rao decomposition of the increase in the Gini coefficient between 2004 and 2011

Value added by sector	2004				2011				Δ relative contribution 2004-2011
	Income share	Concentration index	Absolute contribution	Relative contribution	Income share	Concentration index	Absolute contribution	Relative contribution	
Agriculture	0.648	0.312	0.202	0.449	0.456	0.277	0.126	0.220	- 0.229
Mining	0.000	0.491	0.000	0.000	0.004	0.812	0.003	0.005	0.005
Manufacturing	0.069	0.608	0.042	0.093	0.075	0.719	0.054	0.094	0.001
Utilities	0.006	0.692	0.004	0.009	0.005	0.875	0.004	0.007	- 0.002
Construction	0.010	0.541	0.006	0.013	0.025	0.733	0.018	0.032	0.019
Commerce	0.084	0.615	0.052	0.115	0.152	0.809	0.123	0.214	0.099
Transport	0.018	0.775	0.014	0.031	0.043	0.885	0.038	0.067	0.036
Finance, insurance and real estate (FIRE)	0.013	0.924	0.012	0.027	0.018	0.920	0.016	0.029	0.002
Services	0.137	0.787	0.107	0.239	0.227	0.833	0.189	0.330	0.091
Other sectors	0.015	0.713	0.010	0.023	0.002	0.714	0.002	0.003	-0.020
Total	1.000		0.450	1.000	1.000		0.575	1.000	0.000

Source: Authors' elaboration based on the standardized RIGA Surveys for 2004 and 2011

- an almost universal and sizeable 'real inequality effect' i.e. an increase in the concentration coefficients of the distribution of income in all sectors except agriculture, FIRE, and 'others' ;
- as a whole, the increase in overall Gini appears to have been driven by the decline in value-added share and concentration coefficient of agriculture and by the parallel increase in the value-added share and concentration coefficient of commerce, transport, services and – to a much lower extent – construction. All other sectors affected the change in inequality only marginally.

Overall, these results confirm the hypothesis of 'suboptimal structural evolution' of the economy between 2004 and 2011 – due to the inability to generate a broad-based income increase in a modernized agriculture featuring higher yields among small farmers, and the long-term decline and subsequent stagnation in the share of labour-intensive construction and manufacturing

due, in the case of the latter, to premature trade liberalization, infrastructural deficits and low savings.

To further explore the overall rise of inequality we decompose the change in the Gini coefficient between 2004 and 2011 by income source, following here also the Rao (1969) approach. The results (Table 6) are consistent with those of Table 5 and show, in order of importance, that:

- the first factor in the inequality rise is the 4.5 point increase in the income share from livestock production and – more importantly – the massive surge in the inequality of the distribution of this kind of income (its Gini rose from .400 to .716). This seems to suggest that together with a near exhaustion of farming land in the South and Centre, there was a shift to land-saving but more capital-intensive livestock production by better-capitalized farmers and estates, less so by small farmers with a low farm size and no access to credit, technical assistance or new technologies;

- a second key driver of the inequality increase was the shift from agricultural formal and self-produced incomes to informal incomes in the non-farm urban and peri-urban sectors, where income inequality is much higher due to a skewed access to assets, credit and technology. This shift from low-inequality wage employment in agriculture and smallholder crop production (whose share dropped by a massive 18.9 points between 2004 and 2011 – see Table 6) to high-inequality income sources had a large inequality impact;
- non-farm formal sector wages became more unequally distributed, while their share in total income increased by 8 per cent, reflecting the shift of employment towards urban and peri-urban jobs in services, transport and commerce (and to a smaller extent manufacturing and FIRE) i.e. sectors where the introduction of modern technologies increased the demand for skills and the skill premium. The latter rose also because of the limited increase in the supply of workers with secondary education, particularly workers in the bottom 80 per cent of income distribution (Figure 12);
- capital incomes (rental and other non-specified incomes) contributed marginally to the increase in income inequality as their income share rose by 1.8 points and – most importantly – their concentration coefficient rose from .439 to .778;
- lastly, the decomposition underscores the limited impact of public and private transfers in redistributing income to the poor, despite the introduction of the social assistance programmes discussed in Section 5.3. Many of such social programmes (that absorb altogether around 1 per cent of GDP) are at the pilot stage, are scattered across many activities, and have not yet generated the impact observed in well-trying and high-coverage programmes like Brazil's Bolsa Familia that are credited as explaining 30 per cent of the 10 Gini point decline observed in Brazil during the last 15 years (Cornia 2014).

TABLE 6: Decomposition of the rise of the Gini index between 2004 and 11 by type of income

Value added by sector	2004				2011				Δ relative contribution 2004-2011
	Income share	Concentration index	Absolute contribution	Relative contribution	Income share	Concentration index	Absolute contribution	Relative contribution	
Wage employment-Agriculture & fishing	0.081	0.279	0.023	0.052	0.088	0.272	0.024	0.041	-0.011
Wage employment-Non-farm activities	0.224	0.755	0.169	0.387	0.305	0.814	0.249	0.423	0.036
Annual net income from crop production	0.437	0.286	0.125	0.286	0.248	0.236	0.059	0.100	-0.186
Annual net income from livestock production	0.097	0.400	0.039	0.089	0.142	0.716	0.102	0.173	0.084
Annual net non-farm self-employment income	0.122	0.592	0.072	0.166	0.166	0.785	0.131	0.223	0.057
Annual gross total public-private transfers	0.034	0.189	0.006	0.015	0.025	0.186	0.005	0.008	-0.006
Annual income other sources (rental income, non-labour sources)	0.006	0.439	0.002	0.006	0.024	0.778	0.019	0.032	0.026
Total	1.000		0.436	1.000	1.000		0.587	1.000	

Source: Authors' elaboration based on the 2004 and 2011 standardized RIGA household surveys.

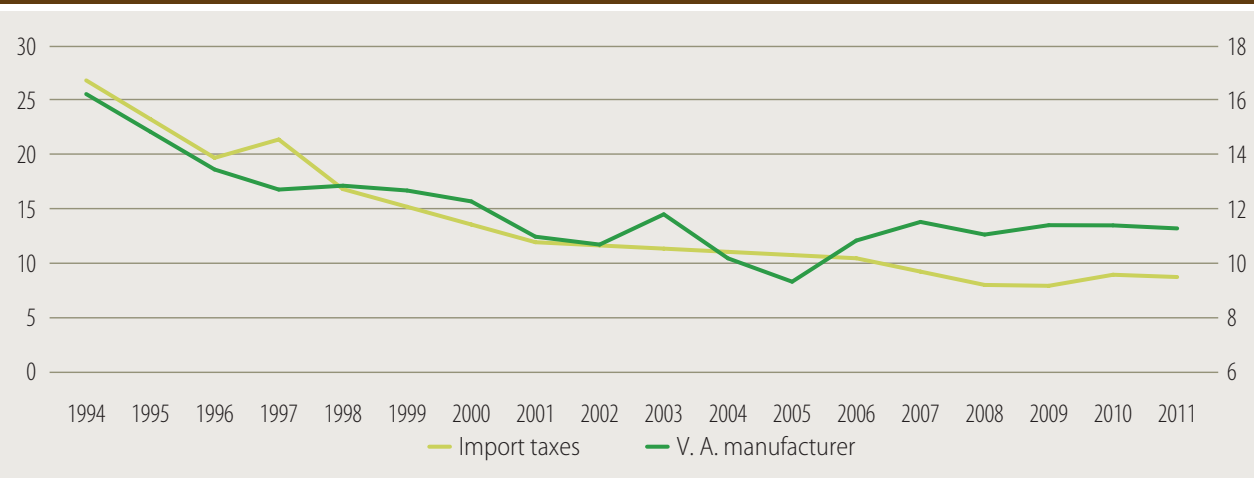
5. Impact of economic policies on inequality

5.1 Trade liberalization, economic structure, and income inequality

Due to the macro shocks and world recession of the early 1980s, between 1981 and 1988 Malawi adopted three Structural Adjustment Programmes (SAP). Although their initial emphasis was on macroeconomic stabilization, they gradually included structural measures that shifted the policy focus to liberalizing the agricultural sector (by stopping the transfer of customary land to the estates, and allowing smallholders to grow burley tobacco), promoting agricultural exports, removing the fertilizer subsidy, removing industrial prices, introducing periodic adjustments of the exchange and interest rate, and privatizing state-owned companies. In turn, the 1987 Enhanced Structural Adjustment Facility (ESAF) included a reduction in export licensing and import tariffs and, in 1994, a relaxation of exchange controls (Kwengwere 2009). Manufacturing has never been the mainstay

of the economy: although the country made some efforts at promoting its development, the sector never took off, as manufacturing firms were never able to create enough backward linkages with the rest of the economy, in particular agriculture. Thus, the country continued to depend on imports of even basic agro-processed goods, thereby foregoing the potential it had in agro-business and textile. The problems of manufacturing were exacerbated by the trade liberalization of the 1990s. Instead of nurturing small industries, the SAP entailed a steady reduction of import tariffs that caused a parallel one-to-one decline in the share of manufacturing in total output (Figure 10) and an influx of cheap goods from China and India (Table 7). Trade liberalization thus crowded out domestic manufacturing output and increased imports. However, during the late 2000s, there was an increase in Chinese foreign direct investment (FDI) (55 per cent of which was directed to

FIGURE 10: Tariff rate and manufacturing value-added share, 1994-2011



Source: Authors' elaboration based on WDI data

manufacturing) and Indian FDI (mainly allocated to agriculture and the pharmaceutical sector) which may lead a resurgence of manufacturing in the future (Said and Singini 2014, African Economic Outlook 2011).

5.2 Macroeconomic policies and the crisis of 2009–2011

During the late 2000s the trend in inequality was also affected by a severe macroeconomic crisis. Between 2006 and 2009 the economy returned to rapid GDP growth (6 per cent a year), steady donor support, and stable macro conditions (Table 7). Tax reforms led to a slight increase in tax collection and an improvement in fiscal stance while in 2006 the country benefited from massive debt relief (see later) and a steady flow of foreign grants (Table 8).

That favourable performance was interrupted in 2009 by a large increase in fertilizer prices (Figure 3), the import of large quantities of maize, an increase in electoral-cycle expenditures by 1.2 per cent of GDP, an 80 per cent decline in FDI (Table 7), and a reduction in remittances: all factors that aggravated the fiscal deficit (African Economic Outlook 2011; Said and Singini, 2014). In addition, a policy of fixed exchange rate (used as a ‘nominal

anchor’ against inflation) worsened a chronic current account deficit and led in 2011 to an acute foreign exchange crisis (IMF 2015). In response to the crisis the Government that took office in May 2012 devalued the Kwacha by 33 per cent, adopted a floating exchange rate and liberalized the currency regime, raised the interest rate, reinstated automatic price adjustments for petroleum products, and increased electricity rates.

The 2010–2011 macroeconomic crisis triggered a large recession while inflation accelerated (Table 7), the poverty rate increased by ten points, labour absorption declined (Beck *et al* 2013) and inequality rose, including because of a rapid increase in food prices (Mussa 2015). Indeed, the crisis was accompanied by a large increase in the price of maize in 2009 and 2010 (Figure 4), which led to emergency food imports and a large increase in child malnutrition (Cornia, Deotti and Sassi, 2012). Unlike in other famines, the 2009–2010 food crisis happened in a context of growing maize production (Figure 2). In June 2007 the country reportedly recorded a maize bumper crop which, according to the Ministry of Agriculture, generated a surplus of one million tons. The Government thus authorized private traders to export 450 000 tons of maize (Jayne and

TABLE 7: Main macroeconomic indicators, early 1990s–2012

	Early 1990s	Mid-1990s	Early 2000s	2005	2006	2007	2008	2009	2010	2011	2012
GDP growth rate, per cent	4.0	3.1	-3.3	0.5	-0.8	6.5	5.4	6.0	3.6	1.4	-1.0
Total investment/GDP	20.4	19.5	14.5	22.7	25.7	26.5	25.7	25.6	26.0	15.3	16.9
Gross national savings/GDP	15.1	5.5	7.6	10.7	14.4	27.4	16.0	20.7	30.4	9.4	12.5
Inflation, end of period CPI* change	15.3	49.2	28.6	16.6	10.1	7.5	9.9	7.6	6.3	9.8	34.6
Exports of goods & services/GDP	23.5	27.6	24.8	24.0	22.6	28.3	28.2	24.6	29.4	29.5	37.6
Imports of goods & services/ GDP	31.4	47.2	36.2	52.2	47.1	40.3	48.9	39.0	44.9	39.8	54.2
Foreign direct investment/GDP	0.0	1.1	0.9	5.1	1.1	3.4	4.6	1.0	1.8	2.3	3.1
Real effective exchange rate index (2005 = 100)	194.2	139.5	147.5	99.7	96.3	94.1	97.1	106.3	100.0	95.6	78.5

Source: WEO IMF (2015), World Development Indicators. * consumer price index

Tschirley, 2009). But by late 2007 the private traders had exported only 283 000 tons due to difficulties in procuring maize on the market. The Government pledged to export the remaining 167 000 tons, while an export of 400 000 tons to Zimbabwe was also allowed.

This unrealistic 'export drive' led to a rapid maize price escalation (Figure 4) that forced the Government to suspend exports, restore the maize trading monopoly of ADMARC (*ibid.*), permit informal maize imports of 50 000 tons and introduce maize rationing. Despite this crop forecasting mistake, in June 2008 the Government announced a new maize harvest surplus of 500 000 tons. ADMARC was instructed to purchase a quantity of maize greater than in the previous years. However, in response to the rush for maize and limited market availability prices again rose dramatically. By early August 2008, two to three months after the reportedly good harvest, maize prices reached historic highs (Figure 4). To control the price increase, private traders applied for import licences that were not approved as – it was argued – the country had sufficient maize supply. As a result, the price of maize continued to rise and imports were not enough to prevent the rise. The sequence of events suggests that in recent years official production figures had been systematically overestimated by ADMARC and the Ministry of Agriculture. In addition, the maize export drive and the subsequent ADMARC interventions exacerbated the spikes of maize prices. Speculation in the domestic market following high world food prices (Chirwa, 2009; FEWSNet, 2008b), inflationary pressures, exchange rate devaluation, and the increase in the cost of urea were additional factors in the food price increase, which also had a major impact on inequality.

5.3 Fiscal policy and income redistribution via tax, transfers and human capital formation

In Malawi, income redistribution in cash and kind has historically played a more limited role than in other developing countries, due to the country's low income per capita, difficulties in taxing agriculture and the informal sector, lack of redistributive institutions, weak public sector accountability, and problems of economic governance that often entailed fraud and the diversion of public funds intended for education, health and agriculture⁹. In turn, large capital flights weakened the balance of payments and the conduct of external macro policy. Overall, the 'corruption perception index' (that ranges between 0 for very high corruption and 10 for minor corruption) fell from 4.1 in 2000 to 2.7 in 2007 – suggesting a rise in corruption – to return to 3.7 by 2013 (Teorell *et al.*, 2015). In addition, Ndikumana and Boyce (2010) suggest that between 1970 and 2004 alone capital flights amounted to 133 per cent of Malawi's 2004 GDP. This loss of resources resulted in a weakening of Government spending allocated to agriculture, infrastructure, education, health and nutrition, which are all activities that – if properly implemented – would have had an equalizing effect over both the short and the long term. It is certain that corruption, poor economic governance and weak accountability reduced the equalizing impact of fiscal operations.

Despite such setbacks, between 2000 and 2011, approximately, the average tax/GDP ratio slightly exceeded the average for 16 sub-Saharan African countries (Cornia 2016), and in 2010 surpassed the 18.5 per cent mark (Table 8). This encouraging performance was mainly due to improvements

⁹ Problems of corruption and fraud seem to have become particularly acute since the late 2000s. According to recent audits funded by DFID in 2013 (a period not covered by this paper) the country experienced a looting of public coffers amounting to an estimated 8 billion Malawi Kwacha, while subsequent revelations suggested that the looting started as early as 2009. The outcome was a freezing of donor budgetary support that affected the availability of drugs in hospitals and the provision of educational material.

in the country's tax administration, with the establishment of a semi-autonomous Malawi Revenue Authority and the introduction of an Electronic Tax Register. Indirect taxes made the most significant contribution to total tax revenue, while the share of trade taxes decreased over time. The ongoing outcomes of those new measures, however, remain unknown.

On the expenditure side, the country benefited from debt relief in the context of the HIPC (Heavily Indebted Poor Countries) programme. External debt fell from 160 to 20 per cent of GDP, relative to 2005, and debt service payments fell from 4.7 to 1.9 per cent of GDP, thus freeing resources for domestic spending. Foreign grants also played a crucial role in sustaining the fiscal stance of the country as net ODA (official development assistance) was stable at around 10-12 per cent of GDP during the 2000s (Table 8).

These changes generated a greater 'fiscal space' that allowed the Government to increase spending on agriculture, education and social protection (Figure 11) that, in principle, have an equalizing

effect. However, the poor management of this additional spending led to a new widening of the fiscal deficit in 2011. In particular, the primary deficit rose to close to 4 per cent in 2011 and to more than 5 per cent in 2012 (Table 8).

The impact on inequality of public spending on agricultural subsidies, education and social protection is discussed hereafter:

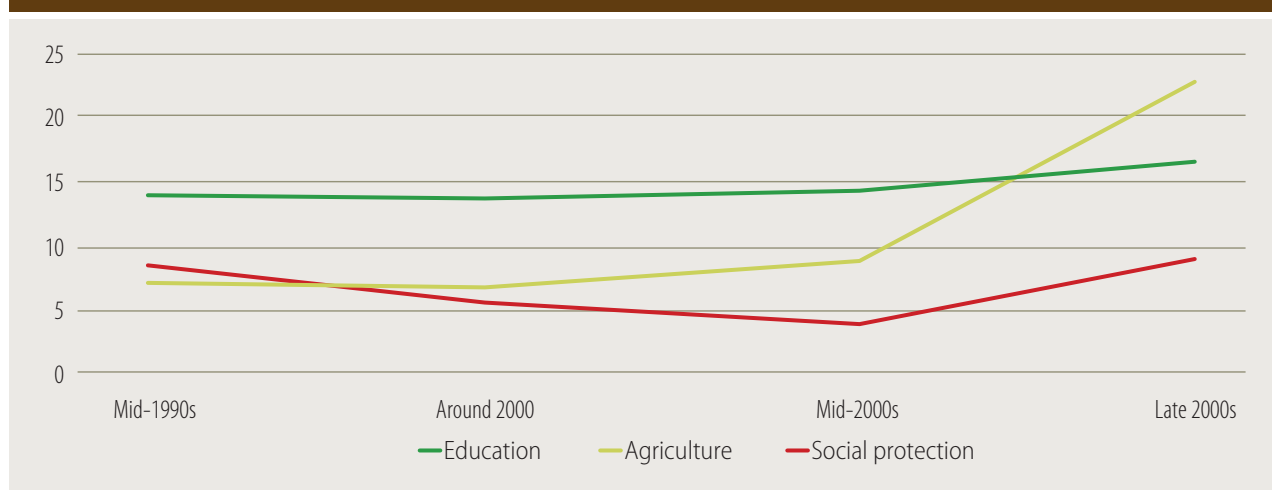
i. **Education and health spending.** As observed in Latin America, an increase in secondary school enrolment among the children of the poor was the main driver of the decline in human capital inequality, skill premium, and overall inequality observed during the 2000s (Lopez Calva and Lustig 2010, Cornia 2014). In Malawi public spending on education as a share of GDP reached around 5 per cent by the late 2000s (World Bank's EDSTATS dataset), a high value by sub-Saharan African standards. Most of these resources are allocated to primary education (Table 9) which registered a steady increase in net attendance rates, especially for the bottom three quintiles (Figure 12, left panel) despite the rapid growth in the

TABLE 8: Trends in main government fiscal indicators, 2001–2012

	2001	2002	....	2006	2007	2008	2009	2010	2011(p)	2012(p)
Total revenue and grants	27.5	24.1	....	31.2	31.7	30.1	31.9	33.9	31.5	29.9
Tax revenue	17.0	15.3	....	15.6	16.6	17.6	16.5	18.8	17.9	17.5
Grants	9.1	6.9	.....	13.7	13.6	10.9	13.8	11.7	10.9	9.6
Total expenditure and net lending (a)	33.4	31.9	....	31.2	33	32.8	35.5	35	37.9	37.3
Current expenditure	22.7	24.6	.....	24.4	21.3	21.1	26.7	24.7	26.4	25.5
<i>Excluding interest</i>	<i>18.0</i>	<i>19.4</i>	.....	<i>19.7</i>	<i>17.8</i>	<i>18.9</i>	<i>24</i>	<i>22</i>	<i>24</i>	<i>23.5</i>
Wages and salaries	5.2	6.9	.....	5.3	5.1	5.5	5.7	5.7	5.8	5.8
Goods and services	6.8	8.1	.....	8.6	6.6	7.7	11.9	10.4	12	11.8
Interest	4.6	5.1	.....	4.7	3.5	2.3	2.7	2.7	2.4	1.9
Capital expenditure	10.2	7.4	.....	6.8	11.5	11.7	8.8	10.2	11.5	11.8
Primary deficit	-1.2	-2.8	.....	4.7	2.2	-0.4	-0.8	1.5	-3.9	-5.4
Overall deficit	-5.8	-7.9	.....	0.0	-1.3	-2.7	-3.6	-1.1	-6.3	-7.4

Source: Authors' compilation based on African Economic Outlook (2011)

FIGURE 11: Selected sectors' share of total public expenditure



Source: Authors' elaboration based on Social, Political and Economic Event database (SPEED) and World Bank data.

number of children reaching school age. In contrast, spending on secondary education was substantially lower in absolute terms and in relation to the average for sub-Saharan Africa.

Indeed, the transition from primary to secondary education still represents a major problem of the Malawian educational system: with a modest public financing of secondary education, the net attendance rate remained between 10 and 20 per cent. In addition, in the early 2000s the net attendance rate of the children in the bottom household quintile was around 2 per cent, against

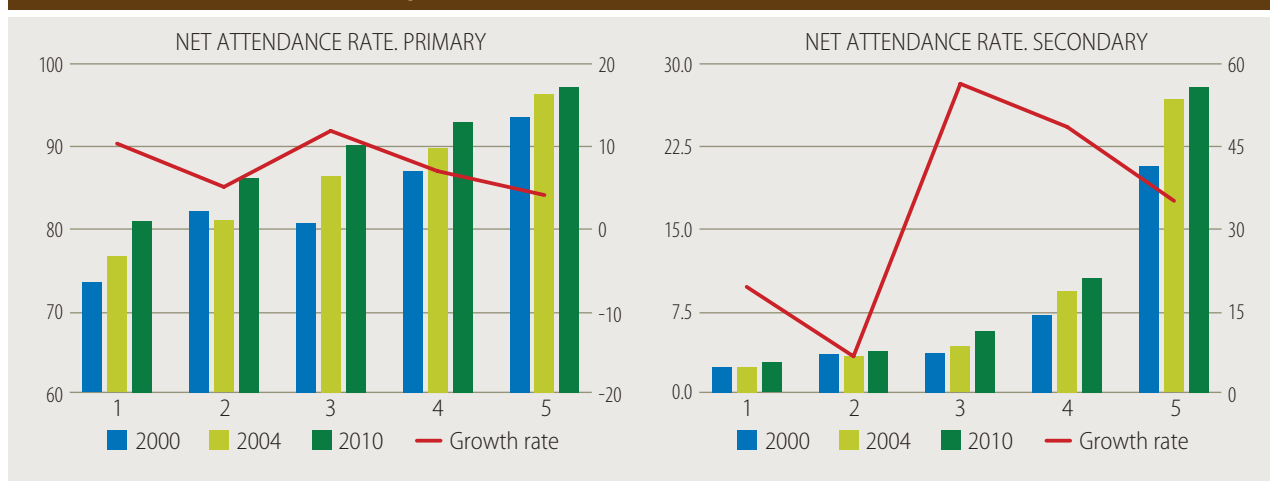
a rate of more than 20 per cent for those in the fifth quintile (*ibid*). Furthermore, between 2000 and 2010, the growth in enrolment was lower in the first two quintiles while it grew quickly in the next three (Figure 12, right panel). Lastly, attendance rates in tertiary education remained extremely low and highly skewed in favour of the richest quintile, while enrolment in tertiary education of the children in the bottom 40 per cent was zero. Furthermore, only the richest quintile benefited from an increase in tertiary education between 2000 and 2010, a factor which has negative implications for income distribution.

TABLE 9: Shares of public spending on education by level

	2008/09	2009/10	2010/11	2011/12
Primary	48.2	46.5	48.5	51.3
Secondary	17.8	17.2	16.8	14.8
Technical	1	1.2	1.4	1.5
Teacher training	2.8	3.7	4.4	6.4
Higher	21.5	22.6	20.5	18.4
Management	8.6	8.8	8.4	7.5
Total	100	100	100	100

Source: Authors' elaboration based on Mambo et al. (2012) quoted in World Bank (2013)

FIGURE 12: Net attendance rate in primary education (left panel) and secondary education (right panel) by income quintiles, 2000, 2004 and 2010 and growth rates, 2000 to 2010

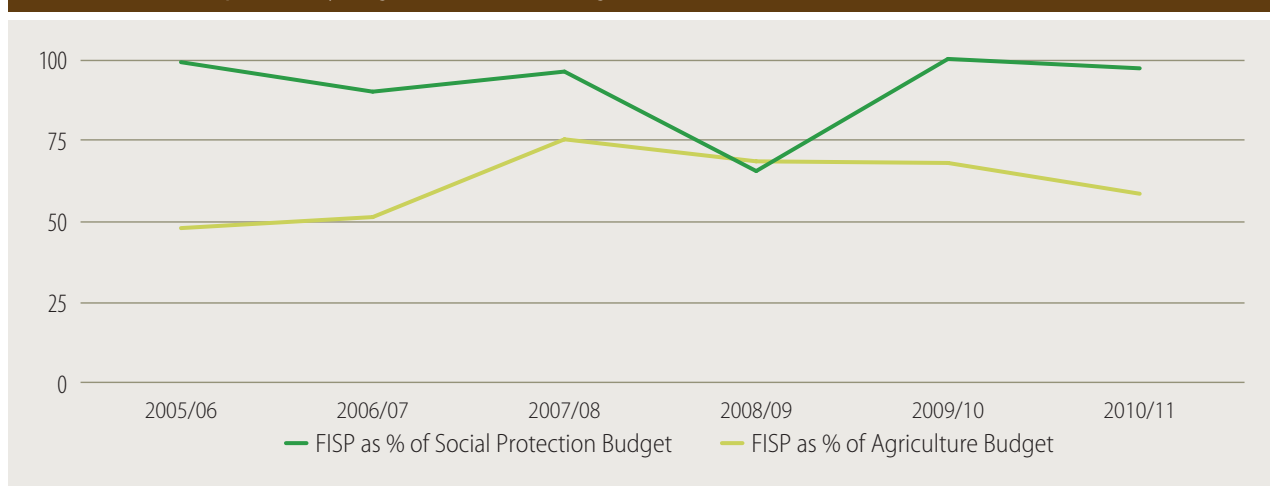


Source: Authors' elaboration based on Demographic and Health Survey data.

Data on the redistributive effect of health expenditure are much more limited, including because expenditure on health is lower than that on education and is financed to a large extent by the households. In this regard, a World Bank (2013) study for 2011 suggests that the attendance rate at government health facilities is broadly proportional (i.e. similar across quintiles), while that at private institutions is much more skewed in favour of the upper two quintiles. A more detailed analysis of the long term redistributive effects of health spending is in order.

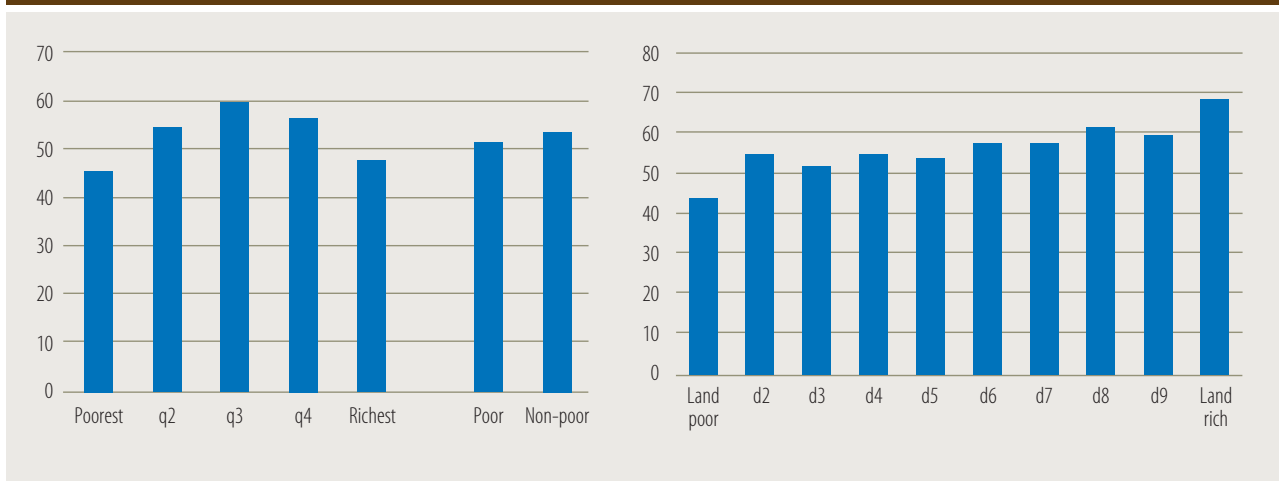
ii. **Agricultural subsidies.** Malawi spends more than most other countries in sub-Saharan Africa on agricultural subsidies. The most important programme is now FISP that absorbed up to 4.6 per cent of GDP in 2012/2013 (Figure 6) and covered 1.5–2 million people (Beck et al. 2013). Agricultural subsidies have traditionally been the instrument of choice to promote growth among small and medium-sized farmers and absorbed as much resources as all other social protection programmes counted together (Figure 13). Indeed, the 2006 Malawi Growth and Development Strategy (MGDS)

FIGURE 13: Farm Input Subsidy Programme in Sector Budget



Source: World Bank (2013)

FIGURE 14: Percentage of agricultural households benefiting from FISP by wealth and poverty status (left panel) and deciles of worked land area (right panel), 2011



Source: Benfica (2013) quoted in World Bank (2013)

included “measures to enhance agro-processing in the main export crops (tea, tobacco and sugar); measures to improve smallholder productivity through technology uptake and infrastructure development; measures to improve extension services (including training field advisory staff); and measures to ensure national food security” (Charman, 2013: 61).

However, recent studies (Chirwa and Muhome-Matita, 2013, Dorward et al. 2012) show that FISP was not able to address the problem of fertilizer affordability among the poorest smallholders. In particular, the targeting process failed to reach the poorest strata. In 2011 the program’s ‘inclusion error’ was 54 per cent (Figure 14). Also, households with larger landholdings have a 25 percentage point higher probability of having access to FISP coupons than land-poor households (*ibid*).

iii. **Non-contributory social transfers.** Traditionally, social transfers absorbed a modest share of the budget due to low tax capacity, weak accountability, and lack of institutions to

implement social assistance programmes. However, in recent times the Government modernized the social protection system, particularly when it became evident that the existing measures were failing to reach the poorest rural households. In particular, there is a broad consensus that FISP was not enough to deal with the problem of poverty and inequality and that there is a need to implement alternative measures (AfDB *et al.*, 2014). Thus, in 2009 the Government launched the National Social Support Policy with the aim of improve the living conditions of the very poorest (Charman, 2013). “However, effective implementation of these programmes is undermined by insufficient financial resources for scaling-up coverage and ensuring sustainability. In specific cases, identification, targeting and graduation of beneficiaries pose major challenges” (AfDB *et al.*, 2014: 13)¹⁰.

Within this context, a Social Cash Transfer Scheme (SCTS) was introduced in 2006 in one district and later on scaled-up to 15 districts out of a total of 28 (Galera Shaba, 2013). The goal of the

¹⁰ Excluding FISP, social protection expenditure was slightly above 1 per cent of GDP in 2012–2013 (World Bank, 2013).

programme is to interrupt the intergenerational transmission of poverty among the ultra-poor and labour-constrained households (Table 10). In particular, the programme aims at raising school enrolment, reducing child labour, and increasing access to health services. To do this, the Government provides an unconditional cash transfer of US\$ 4–13 per month, depending on the number of eligible members. Moreover, a schooling attendance bonus is provided for children attending primary school (US\$ 1.30 per month)

and secondary school (US\$ 2.60) (Covarrubias *et al.*, 2012). According to recent evaluations, the programme has a positive impact on productive expenditures (Boone *et al.*, 2012). Other pro-poor schemes are the School Feeding Programme, the Public Works Programme (PWP), the Malawi Rural Development Fund (MARDEF), the One Village One Product (OVOP) scheme and the Youth Enterprise Development Fund (Table 9). However, in this case the most vulnerable groups do not benefit from these measures either.

TABLE 10: Malawi Social Protection Programs and Expenditures

Programme	No. districts	Intended target group	Households	Persons	Benefit per h-h in kind or MK
FISP	28	Poor household farming families	300 000	1 600 000	500 annually
School Feeding Programme	13	Primary schoolchildren		630 000	Daily
SCTS	8	Ultra-poor labour-constrained h-hs	28 000	100 000	2700 monthly
Income Generating Public Works Programme (the programme is now referred to as Rural Infrastructure Development Program)	15	Poor h-h/vulnerable persons	Na	Na	Na
MASAF Public Works Program	28	Poor with labour capacity	586 000	2 900 000	14 400 annually
Government Public Pension Scheme		Retirees	Na	30 000	

Source: World Bank (2013)

6. Summing up, policy conclusions and suggestions for further research

Since independence, inequality has evolved in three distinct if interrelated phases. Firstly, the agricultural export-led development model adopted by the Banda regime favoured the estate sector and medium-sized farms, thereby creating a *'dualism within the dualism'* that exacerbated the inequality inherited from the colonial era. The forced return of migrants residing abroad put additional pressure on unskilled wages and inequality. As a result, inequality rose from 1968 to the late 1980s.

For the years 1985–1993, there are no inequality data and our conclusions for this period are mainly speculative. In any case, the cancellation of fertilizer subsidies stipulated by the SAPs contributed to a further polarization of agricultural production, and to a decline in maize output per capita until 1991–1993, while the un-equalizing effects of HIV/AIDS intensified with its spread. Unfavourable trends in international terms of trade did not help either. A detailed analysis of the inequality dynamics during this period is however in order.

The downward trend in inequality that began in 1993 seems to be related to the decline in HIV/AIDS incidence and, more importantly, to the adoption of the Starter Pack programme between 1998 and 2005. The latter covered all smallholders and substantially strengthened maize production per capita, including among the poorest farmers. Meanwhile the international terms of trade had

nearly stabilized. This period also witnessed the beginning of a structural transformation of production that had an offsetting effect on the decline of inequality. Here too, additional research is needed to identify more precisely the relation between the main variables.

Finally, the 2004–11 inequality rise is better understood, thanks to the availability of standardized micro data from the RIGA project and the DHS surveys. A key driver of the rise in inequality during this period was the suboptimal structural transition of the economy from a low-inequality crop agriculture (that had reached its 'land frontier' in the absence of a widespread agricultural modernization) to high-inequality sectors such as livestock production, commerce, transport and formal and informal services located in both urban and rural areas. Such suboptimal structural transition was due in part to the decline of manufacturing resulting from the trade liberalization of the 1990s and the skewed distribution of the rise in incomes from livestock production. Despite the increasing fiscal space made possible by debt cancellation under the HIPC initiative and efforts at raising revenue, the potentially equalizing impact of public spending was limited due to the lack of redistributive institutions and, in some cases, corruption. Indeed, since 2005 redistribution pivoted around FISP that, as noted, is not equalizing, while the new Social Cash Transfer Scheme is well-targeted but

has had limited coverage. In addition, the limited increase of workers with secondary education in the bottom 80 per cent of the population caused an undersupply of skilled workers and raised the differential between skilled and unskilled wages. This picture could be improved by a detailed analysis of the impact of the tax system.

In terms of policy recommendations, a few key points should be emphasized. Firstly, the transition to a modern input-intensive and environmentally sustainable agriculture has still not been achieved – although the need for it is becoming more urgent every day, with 65 per cent of a rapidly growing population still engaged in agriculture, and as problems of environmental sustainability become ever more pressing. The favourable (if controversial) impact of the Starter Pack programme offers some indications about how to promote the Green Revolution In Malawi, although this programme should be accompanied by measures aimed at reducing its environmental impact and at controlling deforestation. Rural credit and technical assistance to spread land-saving and capital-intensive livestock production is also necessary.

A faster decline in the TFR and population growth (still running around a high 3 per cent) is essential and should be a public policy priority.

This objective could be achieved – as observed in poor developing countries such as Ethiopia and Bangladesh – through state- and community-based promotion of responsible motherhood supported by changes in legal norms about age of marriage and gender discrimination, distribution of contraceptives, and creation of a preliminary form of a state-financed, low-cost social safety net to reduce the need to have many children to ensure the survival of the parents in old age. A slowdown in population growth is even more necessary when it is considered that the country long ago reached its land frontier and that productive employment in non-agricultural sectors (including RNAA and manufacturing) are hampered by low domestic savings, high transport costs, a skewed supply of workers with secondary education, and a premature trade liberalization. In all these areas, public policy should consider introducing changes to increase investments (including by encouraging FDI and controlling capital flights), improve secondary school enrolment among the children of the poor, attempting to support small and medium-sized enterprises and the urban informal sector, and reassess the policy of trade liberalization by introducing WTO-compatible industrial policies. There are historical examples for these measures that could be drawn upon to help develop labour-intensive activities in manufacturing and productive services.

References

- Acemoglu, D., Robinson, J. A., & Woren, D. (2012). *Why nations fail: the origins of power, prosperity and poverty*. New York: Crown Business.
- Abdelkrim, A. and J-Y. Duclos (2007), "DASP: Distributive Analysis Stata Package," PEP, World Bank, UNDP and Université Laval.
- Atkinson, A.B. (2014), 'The colonial legacy: Income inequality in former British African colonies,' WIDER Working Paper n. 045/2014, WIDER, Helsinki.
- Baker and Tilly (2014), "Report on Fraud and Mismanagement of Malawi Government Finances," Report dated 14 February 2014. www.gov.uk/government/uploads/system/uploads/attachment_data/file/285877/20140221_National_Audit_Office_Malawi_-_Forensic_Audit_Report_-_FINAL_ISSUED.pdf
- Barro, R. and J.W.Lee (2013), "A New Data Set of Educational Attainment in the World, 1950-2010." *Journal of Development Economics*, vol. 104, pp.184-198.
- Beck U., Mussa R. and K. Pauw (2013), "Did rapid smallholder-led agricultural growth fail to reduce rural poverty? Making sense of Malawi's poverty puzzle," Paper prepared for UNU-WIDER's "Growth and Poverty Project" (GAPP).
- Charman, A. (2013), "Social Protection and Labour Markets in Malawi: the Centrality of Agriculture" available at: www.undp.org/content/dam/undp/library/Poverty%20Reduction/Inclusive%20development/Social%20protection,%20growth%20and%20employment/Draft8_SPG&E_web.pdf.
- Chirwa, E. and M. Muhome-Matita (2013), 'Agricultural Growth and Poverty in Rural Malawi,' Paper presented at the GDN 14th Annual Global Development Conference on Inequality, Social Protection and Inclusive Growth, June 19–21, 2013, Manila, The Philippines.
- Cornia G.A. (2016), "Income Inequality Levels, Trends and Determinants in Sub-Saharan Africa: an overview of the main changes," mimeo, UNDP Project on SSA Inequality.
- Cornia G.A. (2014), "Falling Inequality in Latin America: Policy Changes and Lessons," Oxford University Press, Oxford
- Cornia, G.A. (2007), "AIDS, child wellbeing and public policy," UNICEF-ICDC, Florence
- Cornia, G. A. and B. Martorano (2016), "Building the integrated inequality database and the seven sins of inequality measurement in Sub-Saharan Africa," UNDP Africa Policy Notes 2016-02, United Nations Development Programme, Regional Bureau for Africa.
- Cornia, G. A., L. Deotti and M. Sassi (2012), "Food Price Volatility over the last Decade in Niger and Malawi: Extent, Sources and Impact on Child Malnutrition," UNDP-RBA Working Papers Series 2012-02, February, UNDP New York
- Covarrubias, K., Davis, B. and P. Winters (2012), "From protection to production: productive impacts of the Malawi Social Cash Transfer scheme," *Journal of Development Effectiveness*, 4(1), 50-77.
- Dorward, A., E. Chirwa, V. Kelly, T. Jayne, R. Slater, and D. Boughton (2008), Evaluation of the 2006/7 agricultural input subsidy programme, Malawi, Final report, School of Oriental and African Studies and Wadonda Consult and Michigan State University and Overseas Development Institute. 15
- Dorward, A. and E. Chirwa (2011), 'The Malawi Agricultural Input Subsidy Programme: 2005-6 to 2008-9,' *International Journal of Agricultural Sustainability (IJAS)*, 9 (1), 232–247.
- Droppelman, K., J. Mukuwira and I. Khumwenda (2012), "All Eggs in One Basket: A Critical Reflection on Malawi's Development Strategies," *Journal of African Development* Fall 2012, Volume 14, n.2.
- Durevall, D., and R. Mussa (2010), *Employment Diagnostics: Analysis on Malawi*: International Labour Organization (ILO), Geneva, Switzerland
- Galera Shaba, W. (2013), Social Protection and Informal Workers in Malawi, Paper presented at a SASPEN and FES International Conference; Birchwood Hotel, Johannesburg (16–17 September 2013).
- Government of Malawi (2014), Global AIDS Response Progress Report (GARPR): Malawi Progress Report for 2013, available at: www.unaids.org/sites/default/files/country/documents/MWI_narrative_report_2014.pdf

- Harrigan, J. (2008). Food insecurity, poverty and the Malawian starter pack: Fresh start or false start? *Food Policy* 33, 237–249. 2
- Hartwig, R. and M. Grimm (2002), “An Assessment of the Effects of the 2002 Food Crisis on Children’s Health in Malawi,” *Journal of African Economies* 21 (1):124-165.
- Kwengwere, P. (2011), “Inequality in Malawi,” available at: www.osisa.org/sites/default/files/sup_files/chapter_2_-_malawi.pdf
- ILO (2010), ‘Employment Diagnostic Analysis on Malawi,’ available at: www.ilo.org/emppolicy/pubs/WCMS_143247/lang-en/index.htm
- Jurkatis, S. and W. Strehl (2013), “Dos and Don’ts of Gini Decompositions,” Working Paper Series 2013-03, Einstein Foundation, Berlin.
- Lele, U. (1990), ‘Structural Adjustment, Agricultural Development and the Poor: Lessons from the Malawian Experience,’ *World Development*, Vol. 18(9), p. 1207-1219, September.
- Lerman, R. I., & Yitzhaki, S. (1985). Income inequality effects by income source: a new approach and applications to the United States. *The Review of Economics and Statistics*, 151-156.
- Levy, S. with C. Barahona and B. Chinsinga (2004), “Food security, social protection, growth, and poverty: the Starter Pack programme in Malawi,” Natural Resource Perspectives Paper N. 95, September 2004. ODI London
- Lopez Calva, L.F. and N. Lustig (2010), “Declining Inequality in Latin America: A Decade of Progress?,” Brookings Institution Press and UNDP.
- Mambo M., Cole P., and Ndala K. (2012), Education Sector Plan Review Report, September 2012.
- Mussa, R. (2015), “Do the Poor Pay More for Maize in Malawi?,” *Journal of International Development*, 27(4), 546-563.
- Ndikumana, L. and J. K. Boyce (2010), “Measurement of Capital Flight: Methodology and Results for Sub-Saharan African Countries,” *African Development Review*, Vol. 22, No. 4, 2010, 471–481
- Parameswaran (2012), The Effect Of the 2006 Agricultural Input Subsidy Program on Malawian Agricultural Productivity and General Social Welfare , available at: http://politics.as.nyu.edu/docs/IO/4600/Parameswaran_Sasha.pdf
- Pryor, F. (1988), ‘Income Distribution and Economic Development in Malawi,’ WDP 36, August 1988, The World Bank
- Rao, V. M. (1969), “Two Decompositions of Concentration Ratio,” *Journal of the Royal Statistical Society*, 132, 418–25.
- Said, J. and K. Singini (2014), “The political economy determinants of economic growth in Malawi,” ESID Working Paper No. 40.
- Sindima, H. (2002), Malawi’s First Republic: An Economic and Political Analysis. University Press of America, 2002.
- Teorell, Jan, Stefan Dahlberg, Sören Holmberg, Bo Rothstein, Felix Hartmann and Richard Svensson (2015). The Quality of Government Standard Dataset, version Jan15. University of Gothenburg: The Quality of Government Institute, available at: www.qog.pol.gu.se
- United Nations, DESA-Population Division and UNICEF (2014). Migration Profiles - Common Set of Indicators.
- United Nations, DESA-Population Division (2015), ‘World Population Prospects 2015,’ United Nations.
- Wan, Guang (2001). Changes in regional inequality in rural China: decomposing the Gini index by income sources. *Australian Journal of Agricultural and Resource Economics*, 45(3), 361-381.
- World Bank (n.d.), “Jump-Starting Maize Production in Malawi through Universal Starter Packs” www.worldbank.org/html/extdr/fertilizeruse/documentspdf/MalawiSP.pdf
- World Bank (2011), Migration and Remittances Factbook 2011, available at: <http://elibrary.worldbank.org/doi/book/10.1596/978-0-8213-8218-9>
- World Bank (2013), Malawi: Public Expenditure Review, Public Expenditure Review (PER). Washington DC: World Bank Group. <http://documents.worldbank.org/curated/en/2013/11/19230252/malawi-public-expenditure-review>.
- World Food Programme (2010), Republic of Malawi. Comprehensive Food Security and Vulnerability Analysis, Rome, World Food Programme.

Annex

ANNEX TABLE 1.1: Relative contribution to overall Gini decomposition according to different approaches

Sectors	Lerman and Yitzhaki (1985) with zeros	Rao (1969) with zeros	Rao (1969) without zeros
Agriculture	-0.244	-0.244	-0.229
Mining	0.005	0.005	0.005
Manufacturing	0.006	0.006	0.001
Utilities	-0.003	-0.003	-0.002
Construction	0.020	0.020	0.019
Commerce	0.123	0.123	0.099
Transport	0.032	0.032	0.036
Finance, insurance and real estate	0.001	0.001	0.002
Services	0.081	0.081	0.091
Others	-0.021	-0.021	-0.020

Source: Authors' elaboration

ANNEX TABLE 1.2: Relative contribution to overall Gini decomposition according to different approaches

Income sources	Lerman and Yitzhaki (1985) with zeros	Rao (1969) with zeros	Rao (1969) without zeros
Wage employment - Agriculture and fishing	-0.011	-0.011	-0.011
Wage employment- Non-farm activities	0.024	0.024	0.036
Annual net income from crop production	-0.181	-0.181	-0.186
Annual net income from livestock production	0.070	0.070	0.084
Annual net non-farm self-employment income	0.078	0.078	0.057
Annual gross total public and private transfers	-0.003	-0.003	-0.006
Annual income other sources	0.024	0.024	0.026

Source: Authors' elaboration