

Income inequality and Middle Class in Sudan: Some Statistical Facts

1996-2011

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Abstract

The aim of this paper is to measure the level and extent of inequality in Sudan during the period 1990-2011 , and to explore the size and the income share of middle class .Various measures of inequality such as Gini Coefficient , Palma ratio, median of household's incomes are used , as well as, poverty head account measures such as the bottom 20% (Rawals poorest class) or alternatively as bottom 40%, to configure the size and the share of the middle class; the analysis used household data collected by Ministry of Labor Force. It is found that Sudan falls among high Gini and Palma ratio Countries, and middle class was shrinking in terms of size and share. Using the bottom 40% as cut-off point for poverty its size is found to be 10%, 14.5% and 12% for 1990, 1996 and 2011, respectively .It is suggested that the political and economic measures that were undertaken during the period of study played a major role in arriving at the observed evolution of income distribution and its level of inequality.

عدم المساواة في الدخل والطبقة الوسطى في السودان: بعض الحقائق

الإحصائية 1990-2011

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ملخص

تهدف هذه الورقة إلى قياس مستوى ومدى عدم المساواة في السودان خلال الفترة 1990-2011 ، واستكشاف حجم ونصيب الدخل للطبقة الوسطى. تم استخدام مقاييس مختلفة لعدم المساواة مثل معامل جيني، معدل بالما، والوسيط لمداخل الأسرة، بالإضافة إلى مقاييس حساب رأس الفقر مثل أدنى طبقة الـ 20% (ما تسمى فئة رولز الفقيرة) أو بدلاً من ذلك تم استخدام فئة أدنى طبقة الـ 40% ، وذلك لمعرفة حجم ونصيب الطبقة الوسطى؛ استخدم التحليل بيانات الأسرة التي جمعتها وزارة القوى العاملة. ووجدت الدراسة أن السودان يقع بين الدول التي ترتفع فيها نسبة جيني ومعدل بالما، وأن الطبقة الوسطى تتقلص من حيث الحجم والنصيب في الدخل. باستخدام الفئة الأدنى الـ 40% كنقطة فاصلة للفقر وجد أن حجم الطبقة الوسطى هو 10% و 14.5% و 12% للأعوام 1990 و 1996 و 2011 على التوالي، وتنترح هذه الورقة أن الإجراءات السياسية والاقتصادية التي تم اتخاذها خلال فترة الدراسة لعبت دورًا رئيسيًا في الوصول إلى هذا التطور الملحوظ في توزيع الدخل ومستوى عدم المساواة.

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1. Introduction

Sudan has been considered as one of the highest growing countries in the period of 1999 to 2011 where its GDP grew to US\$ 57.9 billion in 2010, compared with GDP in 1980's estimated at US\$9.9 billion , a period during which GDP per capita grew from 0.005% to only 0.03% ; and GDP grew further to reached 10.5% in 2007, but to decline to 5% 2009, as result of international economic crisis; but the serious decline occurred after the secession of the South of Sudan in 2011, where more than 70% of oil export revenues went with this secession. The considerable economic growth after 1999 was due to the oil exploration, not to robust investment, investment in infrastructure, or the development of social and governance institutions; even the composition of the economy at the heyday of independence stagnated further.

The high economic growth was accompanied with serious negative effects; the growth following the oil boom came with its ailments of an overvalued exchange rate and the Dutch Disease phenomenon. Growth in the manufacturing and agriculture sectors lagged and their contribution to GDP was very limited. Also, the governmental policies adopted during the oil era increased the cost of production and transaction in non-oil sectors (Ali and Elbadawi , 2004 page 4-6). With neoliberal stance in economic policy, the Government implemented the structural adjustment programs emphasizing the role of the private sector as the driving force of the economy's growth; hence a considerable number of public entities were privatized. But far from achieving economic efficiency and enhancing productivity, which was used as an argument for such policy, it has led to creation of crony capitalism, due to political favoritism, and resulted in well documented rise of corruption in the privatized corporation and the wielding of their financial resources and assets in the hands of the political protégées who were appointed as managers (the case of the Cotton Corporation is an example).

Also privatization exacerbated inequality, and led to increases in size of unemployment; for instance in 15 privatized companies work force cuts ranged between 20% and 60% (Mustafa, 2018). And since the public sector employees, historically constituted important segments of the middle class, this cut-off in employment either as consequence of privatization, or as direct outcome of severance in public entities and the civil service, had a direct impact on the middle class size and stability.

The period of the oil boom growth spell depicted bad financial performance indicators: inflation rate exceeded two digits, oscillated between 11.5% and 33.5% and substantial budget deficit, due to the high military expenditure, and the country is classified as highly indebted poor country with foreign debts exceeding 50 billion dollars. Other social indicators were showing bad signs as well; head account poverty reached 47%. The picture becomes so bleak if the public expenditure for the social sector (education, health and water) is considered; since in the successive government budgets it has not exceeded 10% and lagged far behind neighboring and other similar African countries ((Mustafa, 2018, pages 63, 68).

The highly intensive capital nature of oil and mineral investment meant that only ‘enclaves’ of the economy can benefit and, in particular, not much in terms of job creation in the productive sectors of the economy can be realized. Sudan population reached about 35 million with growth rate of 2.8%, and with an unemployment rate of 20.7%. With a population structure having high percentage of young people the toll of the high unemployment rate falls on young segment of the population. According to the international labor organization (2007), the unemployment among Sudanese youth is 41.25%, the highest in the world, for females it is 43.25%, and 36.64% for males (Nour, 2011, page 28).

The problem this paper attempts to deal with is the change in shape of income distribution, the decrease of middle income groups and how the share of middle class, has been redistributed between lower and upper classes. The underlying hypothesis is that the share of income and the size of middle class have shrunk over the period of study in Sudan during the previous government regime.

The importance of the study arises from the fact studies analyzing inequality in Sudan using national household survey data are meagre, and the few available were based in limited surveys and their scope has not dealt specifically with the middle class and the impact of economic policies and inequality in their formation and development. For example, Nur (2009) carried out an analysis of household income inequality decomposition of a limited household survey in four selected states in the North Sudan. Eissa (2009) carried out macro study and sectoral assessment and simulation of poverty, economic growth and income inequality in

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Sudan, based on primary, stratified and multistage data collected from 2714 heads of households, as well as secondary data obtained from national and international institutions. None of these studies had attempted a quantification of middle class size and changes therein. Moreover using Palma ratio as a measure of inequality provides an opportunity to compare between the heterogeneous tails of distribution, as well as to verify the stability of middle income group by analyzing individual earnings using the available household income surveys.

The rest of the paper runs as follows; section II deals with definition and identification of middle class, Section III gives account of methodology and data; and section IV confined to results and discussion and finally the conclusion wraps up.

Middle class definition and identification: Theoretical underpinnings

Middle class consensus or concept is subject of interest to the philosophers, social scientists, economists, historians and politicians, who believe that middle class has an important role to play in economic development, and democratic transformation, in different countries, all over the world. Country with large middle class can grow more faster, because the existence of middle class will facilitates the creation of employment and productivity growth; middle class values are central to human capital, saving and capital accumulation. Last not least the demand of middle class for high quality and durable goods will stimulate production and marketing, and then the income levels of most of society members will increase (Banerjee and Duflo, pages 3-4).

Despite the fact that the concept of class is ambiguous and that of middle class in particular, two important economic thinkers, Karl Marx and Thorstein Veblen attempted to discriminate between different classes within societies. Veblen invented the term “Leisure class” to those earned their income being government leaders, priests, athletes or soldiers, and accumulate wealth only for power and reputation. Marx’s two main classes are proletariat who gaining their living from their labor force, and the bourgeoisie due to the ownership of means of production obtaining income by exploiting the proletariat (Eisenhauer, 2008, page107).

Moreover, the existence of middle class in society as crucial for development differences, middle class is essential to minimize society polarization and social conflict, and hence reduce inequality, and democracy will flourish in such less polarized countries. On the contrary polarized country with unstable government will enable elite to hinder democratic transformation, and human capital accumulation; hence poor will be politically discriminated against, and will be at risk of economic hazards (Easterly, 2001, Pages 318 and 330).

Before defining and identifying middle class, some differences between poor (who live on one or less two dollars) and middle class. The main differences are as following: the poor devotes all their income to food; poor as wage earners may work with no specific working skills, also without health, social insurance and benefits after retirement, in contrast to middle class who are relatively highly skilled, secured and hold well-paying job; middle class has substantial better access to formal sources of credit and much bank loans; also middle class spend much of their income on durable goods, live in large houses with better amenities, and most likely have saving account, and spend much of it on health and education, being healthy and better educated, the middle class's children will be able to realize their most talent potentiality and get better jobs in the future (Banerjee and Duflo, 2008, pages 10-18).

In spite of different definitions that invariably include various socio-economic characteristics in the definition of middle class, such as standard of living, level of education, family size, ownership of property and pattern of occupation. To give a complete classification of middle class economic definition, a good economic criterion is required that allows us to estimate the size of middle class in one country in single year, to figure out the change of its size over time; which will enable us to compare middle class between different nations.

Middle class definitions proliferates in economic literature such as what Solow refer to "middle 60%" which falls between two brackets, the bottom 20%, which includes those vulnerable to poverty, and top 20% (Atkinson and Brandolini 2011, page 8).

Palma ratio as simple measure of inequality, which defined as the share of top 10% divided by the share bottom 40%, emphasized the stylized fact that

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reflecting the stability share middle class 50 % of population (decile 5-decile 9) by the forces of centripetal capture the half of gross national income (Cobham, and Summer 2013, page 6).

Based on a number of household surveys conducted recently, different income range employed to estimate middle class, for instance the range 2-4 dollars is used to gauge middle class in poor countries, while 6-10 dollars is used as measure of middle class in developed countries (Banerjee and Duflo, 2008, page 5).

World Bank in 2007 defined middle class using certain per capita thresholds ranging between 4000\$ -17000\$. European Union used other cut-off points to determine the middle class size, determined lower bound as 75% of the median , and 125% of the median as upper bound, another method and that used in this paper is median and head count poverty measure (A Atkinson and Brandolini 2011, page 8, Rashdan 2014, page 46).

To wrap up, middle class and the increase of its size is important for demanding government policies that are conducive for growth based on wealth creation , with enhancement of inclusive economic participation of most of society members , and hence promotes self-sustaining and transformative –politically and economically growth pattern (Birdsall, 2007, page 3).

2. Methodology and Data

This study employs descriptive analytical statistics such as averages (μ) standard deviation (σ) and median, to measure inequality. However, relative inequality measures, like Gini Coefficient (G) and Palma ratio (P) satisfy the properties required of a good measure, and therefore are going to be used to detect the levels of inequality in household income. These are then used, in conjunction with relative poverty measures, such as poorest 20% or 40% of population to identify the size of middle class and its stability.

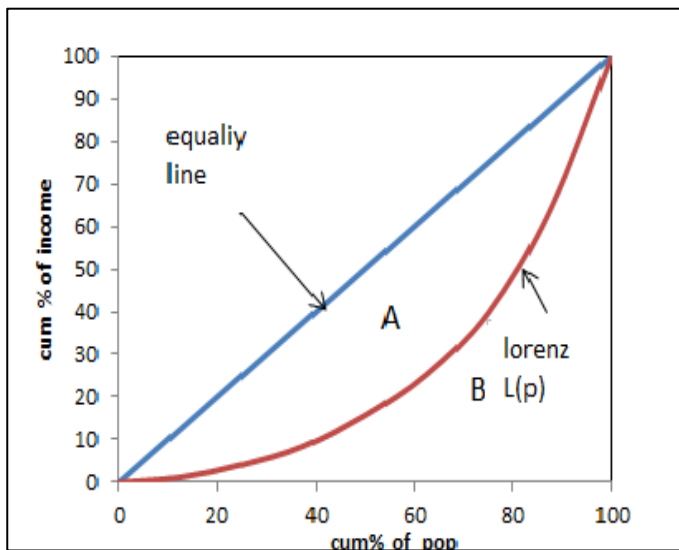
Inequality measures:

1. Gini coefficient:

Gini coefficient is measure of dispersion, a Gini coefficient of zero value expresses perfect equality while that which equal 1 represents perfect inequality; here only one individual acquired the whole income. Gini index defined mathematically based on Lorenz curve (figure 1), is the relation of area that lies between the 45° line and the Lorenz curve marked as A of figure 1 with the total area marked as A+B, that is Gini index can be expressed as:-

$$G = \frac{A}{A+B}$$

Figure (1) Lorenz curve:



Though different measures of inequality such as Theil's entropy index T, Theil's second measure L, the coefficient of variation (C.V), Palma, and the Gini coefficient satisfy these properties (1) Pigou Dalton transfer sensitivity ;(2) Symmetry: (3) Mean independence (4) Population homogeneity. (5) Decomposability. Gini is widely used than other measures. Gini coefficient can be expressed as (Admas and Alderman, 1992pages6-7).

$$G = \frac{2}{n\mu} \text{cov}(y, r) \tag{1.1}$$

Where

n: is number of observations

y: total income

μ : is mean

r: ranks for the source of income

2. The Palma ratio

Palma(2006) is a measure of income concentration based on the observation of Gabriel Palma that the middle 50% (deciles 4 to 9) incline to acquire 50% of gross national income (GNI) so the remaining half of the GNI may be more flexibly distributed between the richest 10% and the extremely poorest 40%. Palma claimed that there are two conflicting forces at work in income distributions: one centrifugal leading to an increased heterogeneity in the shares of the richest 10% and the poorest 40%, and the second is centripetal leading to homogeneity in the income share appropriated by the middle 50%. Generally speaking Palma ratio is an easy understood measure to common people than the Gini and other measures of inequality; it is a single number which gives considerable information about comparative income inequality (Cobham & Sumner 2013, page 6).

The Palma ratio can be rewritten as following:

$$\text{Bottom 40 \% share} + \text{top 10\% share} + \text{middle 50\% share} = 1 \tag{2.1}$$

Palma claimed centripetal force that leads the middle 50% to capture 50% of GNI so the above identity can be reduced to:

$$\text{Bottom 40\%share} + \text{top 10\% share} \cong \frac{1}{2} \tag{2.2}$$

We can substitute the above equation in the Palma identity

$$P = \frac{\text{Top 10\% share}}{\text{Bottom 40\%share}} \cong \frac{\frac{1}{2} - \text{Bottom 40 \%share}}{\text{Bottom 40\% share}} = \frac{1-2 \text{ Bottom 40\% share}}{2 \text{ Bottom 40\% share}} \tag{2.3}$$

Or equally:

$$P = \frac{\text{Top 10\% share}}{\text{Bottom 40\% share}} \cong \frac{\text{Top 10\% share}}{\frac{1}{2} - \text{Top 10\% share}} = \frac{2 \text{ Top 10\% share}}{1 - 2 \text{ Top 10\% share}} \quad (2.4)$$

This provides two formulas for the derivation of Palma ratio from either bottom 40 percent share, or the top 10 percent share (Cobham and Sumner, 2013 page 6-28).

3. Measurements of the middle class

Middle class is the most dynamic class and increase of its size is an indicator of social welfare and prosperity of society. In Middle East and North Africa (MENA) in six countries between 1990 and 2005 particularly, Egypt and Tunisia, who have achieved substantial economic growth, the size of middle class increased from 75.5 % to 78.7 % (Rashdan, 2014).

Apparently for the Sudan the picture is seemingly totally opposed to the situation in the aforementioned two countries. To measure the size of the middle class there are various thresholds as indicated before. One such threshold which can be chosen is the population position between the national poverty line and the median. But, because of problem of identifying standardized national poverty line for the period of study it is proposed that the bottom 20% or bottom 40% can be selected as threshold instead of poverty line, though this may underestimate the incidence of poverty which according to the official rate in 2009, is calculated as 47%. Thus, middle class size (MCS) can be expressed in a two ways:

$$\text{MCS \%} = \frac{\text{N of median observations} - \text{N of Bottom 20\%}}{\text{Total size observations}} \quad (3.1)$$

Or

$$\text{MCS \%} = \frac{\text{N of median observations} - \text{N of Bottom 40\%}}{\text{Total size observations}} \quad (3.2)$$

Data

The data source of this study is three Labor Force Household Surveys, collected by the Ministry of Manpower for the years 1990, 1996 and 2011. The coverage of the three surveys is limited to Northern 16 states which in this study are regrouped into six regions. The South was excluded due to the long persistence civil war. To eliminate the effects of money value changes during the period of the study income is expressed in the prices of 1990 taken as baseline year, and the corresponding Consumer Price Index (CPI) is used in adjusting money values in 1996 and 2011.

Table (1) shows descriptive statistics of the data series such as minimum and maximum values, , the mean, the median, the standard deviation and the coefficient of variation ($CV=\sigma/\mu$), of total household income, for the total samples of 1990, 1996 and 2011 ,and also for Khartoum and mode of living. The least minimum is (=9SDG) in 1990, the highest maximum is (=22001050 SDG) in 2011 measured in 1990 prices. The upshot in mean income in 2011 can be attributed to spell of growth aftermath of oil exploration in the end of nineties. Paradoxically the higher range in 2011 attentively implies the concentration of income in the upper income percentile. This conclusion can be confirmed by CV: 2.5, 3.8 and 2.2 for the three successive years. Also CV is higher in rural areas compared to urban areas for the years 1996 and 2011. For Khartoum a lower value of C.V of 0.44 shown in 2011, and even lower compared to the value for urban areas of 1.62; perhaps reflecting the increased urbanization of the centre and the last decade's movements of people from rural areas towards Khartoum.

Table (1): Descriptive Statistics of Household Real Income (SDG, 1990=100)

	N	Minimum	Maximum	Mean	Median	Standard Deviation	Coefficient of variation
Sudan							
1990	7276	9	1295999	2695	12000	6849.8	2.54
1996	3288	34	7165401	8841	30709	33859.7	3.83
2011	11182	42	22001050	10754	7494	23939.3	2.23
Urban							
1996	1040	512	7165041.4	181083.2	61418	545968	3.02
2011	3043	167	555108	11051	9992	17883.1	1.62
Rural							
1996	2248	40	6323680	53396.4	20473	181867	3.4
2011	8139	58.3	30532391.2	14941	6661	389179.4	26.1
Khartoum							
1996	539	682	7165401.4	281052	86667	753248	2.7
2011	748	278	183186	15632	113380	6923	0.44

Source: Own calculation based on labor household surveys for 1990, 1996 and 2011 see Mustafa (2018, pages 7,140,141).

3. Results and Discussion

Table (2) presents the share of the bottom 40%, middle 50% and the top 10%, for the three years of the study; the bottom is not exceeding 9% for each year. For the

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top 10%, share is not less than 52% for the period of the study. Contrary to Palma emphasis that the middle income share is 50% of national income, the table shows that the percentage share of middle 50% does not reach 40%.

Table (2) the Income Share of Bottom 40%, Middle 50% and Top 10%

	Bottom 40%	C.V	Middle 50%	C.V	Top 10%	C.V
Sudan						
1990	8.4	0.44	39.2	0.44	52.4	1.35
1996	4.6	0.61	31	0.55	64.4	1.65
2011	8.94	0.42	36.42	0.33	54.6	13
Urban						
1996	5.17	0.55	30.13	0.52	64.7	1.17
2011	6.06	0.39	32.67	0.32	61.27	0.99
Rural						
1996	6.17	0.60	40.03	0.48	53.8	1.8
2011	10.78	0.43	53.12	0.33	36.1	3.74
Khartoum						
1996	5.67	0.51	47.22	10.5	47.09	0.51
2011	14.59	0.44	54.92	0.38	30.49	0.56

Source: Own calculation based on labor household surveys for 1990, 1996 and 2011
See Mustafa (2018, pages 7,140,141).

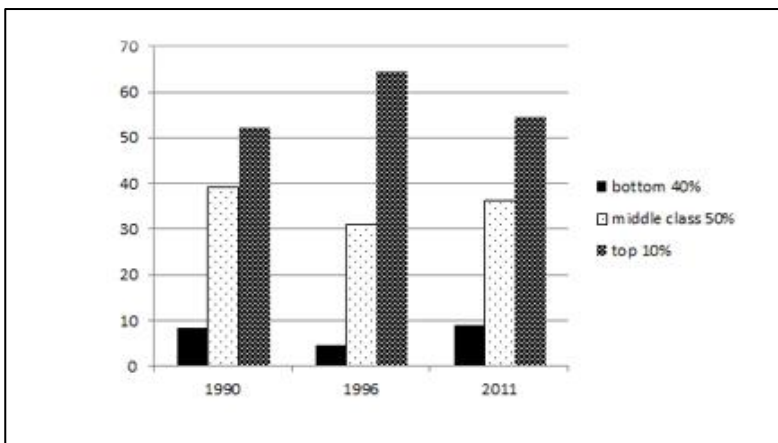
Figure (2) visualizes the income shares of bottom 40%, middle 50% and the top 10%. The share of the middle class for the three years is even less than 40% and not equal to 50% as Palma postulated. Its share is stable in the three years the coefficient of variation ($CV = \sigma / \mu$) is calculated 0.44, 0.55 and 0.33, respectively. Though the share of this class increased in 2011 by 5 points from its 1996 level but it did not reach its share level of 1990.

For the two top 10% and bottom 40%, the income share of the latter is increased and then decreased by 10 points from 1990 level and it is stable (CV not more than 0.61) for the three years in that order. It is observed that the share of the bottom 40% and the middle 50% was oscillating within the range, with the exception of rural sector and Khartoum where an evident increase is calculated between 2011-1996. But their shares were stable ($C.V$ s less than one).

The share of the top 10%, for the total income was increased in 1996 and decreased nearly to its share of 1990, where for the mode of living and Khartoum has obviously decreased. Notably the share of top 10% during the period of the study was not stable, particularly for total income and for rural sector in 2011; where $C.V$ was not less 13, and this confirming the position by Stiglitz that “normally or usually” quarter of the top 10% or 1% capturing the larger portion of income (Stiglitz, 2013). The only exception for this proposition is share of 10% in Khartoum which was stable since its $C.V$ is not more than 0.56 for 2011-1996.

Figure (2): The Income Share of the Bottom 40%, Middle Class 50% and Top 10%

(a) For the country in the three years 1990, 1996 and 2011



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(b) Rural –urban for 1996-2011

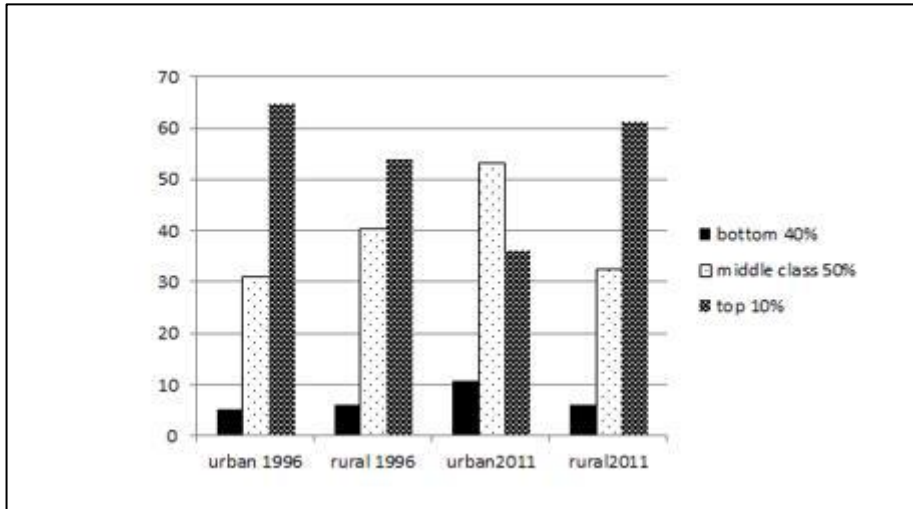


Table (3) shows Palma and Gini measures for Sudan.

The highest Palma ratio, and as expected a highest Gini is demonstrated for year 1996 equal to 14.1 and a 70 for G and P, respectively. For comparison by mode of living the findings revealed that the highest Palma ratio is (=12.51) in urban sector in 1996 followed by ratio (=10.11) in rural sector in 2011. Equally the Gini indexes are highest 0.72 and 0.67 in the same sequence. Largely a Palma ratio results are consistent with Gini coefficients as presented in the table; the highest Palma ratio means a highest Gini and more unequal distribution. The quartiles developed by Palma (2006&2011) as lower and high bounds in 1990 were (Palma<1.33) and (Palma>3.39), respectively; for 2010 Palma lower quartile bound is (Palma<1.39) and high bound is (Palma>2.95). Obviously the findings for Khartoum and by mode of living (urban and rural) are excessively exceeding the Palma quartiles and equally indicating high Gini coefficients.

Table (3): Palma and Gini for Sudan, Khartoum and by Mode of living

		Palma Ratio	Gini index
Sudan	1990	6.21	0.61
	1996	14.1	0.7
	2011	6.12	0.61
Urban	1996	12.51	0.72
	2011	3.34	0.64
Rural	1996	8.72	0.46
	2011	10.11	0.67
Khartoum	1996	8.28	0.69
	2011	2.09	0.41

Source: Own calculation based on labor household surveys for 1990, 1996 and 2011

See Mustafa (2018, pages 7,140,141).

Generally, Sudan in terms of Gini coefficient and Palma ratio is amongst more unequal countries as illustrated in table (4).

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Table (4) comparison of Gini and Palma for different countries

Country and periods	Gini	Palma	The grade of the country
Jamaica (2002)	0.66	14.67	first Gini/ first Palma
South Africa(2008)	0.63	7.05	Third Gini/ second Palma
Namibia (2003)	0.64	6.67	Second Gini/ third Palma
Honduras (2009)	0.54	5.21	Fifth Gini/ fifth Palma
Bolivia(2008)	0.54	4.85	Fifth Gini /Sixth Palma
Sudan (2011)	0.61	6.12	Fourth Gini / fourth Palma

Source: Sudan is own calculation; other countries quoted from Cobham and Sumner, 2013, also see Mustafa (2018, pages 7 140,141).

Table (5) presents the estimation of middle class size by using the median and poverty line defined as poorest bottom of population (Rashdan, 2014 page 44).

Due to problems surrounding the determination of proper national poverty line during the period of study due to change of the currency from Pound to Dinar In 1990s and reversal to the pound by 2011, and high inflation rates, the bottom 20 is employed as cut -off (Rawals poorest class), equivalent to poverty line. The size of middle class is equal to the difference between corresponding observations of the median and headcount of poor (bottom 20%) divided by the total observations. The table shows that the middle class size for the country as whole in the period of study , by mode of living, is not exceeding 35% .(Mustafa 2018).

If we go further and attempt to approximate the reality, which showed as official poverty incidence in 2009 of 47%, the bottom 40% as head count of poverty may be a candidate, which implies a middle class size of 10%, 14.5% and 12% for the 1990, 1996 and 2011, respectively. For the rural sector the size of the middle class is 7% and 12.33% for 1996 and 2011, while for the urban sector the size of the middle class is estimated as 10.3% and 11%, for 1996 and 2011, respectively.

Table (5) Estimation of the Middle Class Size

years	Total observations	Bottom20% observations	Bottom40% observations	Median Observations	Middle class size	
					1	2
1990	7276	1571	2910	3640	28%	10%
1996	3288	665	1315	1793	34%	14.5%
2011	11182	2342	4473	5770	31%	12%
Urban						
1996	1040	235	416	531	28.5%	11.1%
2011	3043	616	1217	1592	32.1%	12.3%
Rural						
1996	2248	450	899	1157	32.5%	11.5%
2011	8139	1834	3256	4296	30.3%	13%
Khartoum						
1996	539	109	216	253	27%	7%
2011	748	151	299	369	29%	9.4%

Note:

- 1- Middle class size according to bottom 20%
- 2- Middle class size according to bottom 40%

Source: Own calculation based on labor household surveys for 1990, 1996 and 2011

See Mustafa (2018, pages 7,140,141).

Conclusion

This study employed measures of inequality such as Gini coefficient, Palma ratio, median and relative poverty measures. The data used is the ones collected by Ministry of labor force for three years in 1990, 1996 and 2011, to detect inequality levels and to configure the middle class size. The findings of this study firstly indicated that Sudan household income highly unequal, with Gini ratio 0.61. Secondly the shares of middle class in the three years 1990, 1996 and 2011 are less than 40%, and the Palma ratio for the Sudan is higher compared with some other countries, implying that the top 10% appropriated more income at expense of both bottom 40% and middle 50%. When bottom 20% (the Rawls poorest class) is used as cut-off poverty measure the study found that middle class did not exceed 31% for each of the three years of the study. When the poverty head account moved to bottom 40% the middle class size deteriorated furthermore, and did not exceed 12% for the three years.

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To ponder the reasons for such results: Firstly, it is suggested that privatization of public companies and the drastic reduction of the employed labor force, mostly arising from political motives to consolidate of the ruling regime (Tamkin) in the public entities, whether in the production or services sectors, such as the employees in the education and health sectors, is one factor contributing to the shrinking size of middle class, since employees of public sector ((civil servants , teachers , doctors , engineers, lawyers , judges , employees in railways and air transport , the military staff. Etc., who came under the axe of Tamkin)), have historically been an important constituent of the middle class in Sudan. Secondly, unemployment was particularly high for new entrants to the labor market who graduated from institutions of high education. On the other hand, rural areas witnessed a deteriorating state of living standards in conflict war ridden areas which lost large areas in production, and livelihood and led to out migration and displacement of thousands to urban areas. As a result incomes are reduced and absolute poverty levels increased, and more of those who were ranked as part of the middle class joined the ranks of the poor.

As policies implication it is suggested that: government have to reform the markets, in particular labor market, through better laws and incentives that enables it to function flexibly, creating ample equal employment opportunities in public sector improves efficiency by increasing productivity and rooting out corruption and self-interest practices and curbing patronage allowances and bonuses bestowed on the civil service . The private sector has to be encouraged by the proper fiscal and monetary policies that encourage the private sector investment in productive (agriculture and manufacturing) enterprises and which create opportunities for job seekers.

Social protection programs must be designed and government has to increase the minimum wage, and to draft laws and regulations to guarantee the minimum wage in private sector for the unskilled. Here one have to consider some trade –off s, For example, to give high wages and social protection to the working people, will be in conflict with creating more employment opportunities, or by creating more jobs in the urban sector will increase unemployment of the urban populace as a result of the influx of rural people into the towns. Here rural development programs including full package of inputs, technology transfer , credit , extensions services are pertinent though initially will contribute to increase income inequality in agricultural and livestock income source, probably will lead to reduction of urban unemployment. To solve the trade-offs, social costs benefits

analysis must be conducted, since an approximate answer of right question is better than an elegant answer to wrong questions. Moreover, if the poorest people have been properly identified then they have to be targeted with social security interventions.

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Appendix (1)

Table (6): for the Mean and Standard Deviation for Bottom 40%, Middle 50% and Top 10%

	Bottom 40%	μ	σ	Middle 50%	μ	σ	Top 10%	μ	σ
Sudan									
1990	8.4	5788	2521	39.2	20521	9098	52.4	134371	181567
1996	4.6	9525	5824	31	55295	30224	64.4	569265	939065
2011	8.94	3575	1516	36.42	10811	3567	4.64	80903	1048699
Urban									
1996	5.17	23840	12785	30.13	109027	57117	64.7	1171773	1368296
2011	6.06	5374	2094	32.67	14552	4626	1.27	54591	52894
Rural									
1996	6.17	7106	4289	40.03	36347	17505	53.8	24109	439838
2011	10.78	3199	1378	53.12	9455	3131	36.1	89464	1229488
Khartoum									
1996	5.69	37278	19061	47.22	242829	255952	47.09	3417619	1752120
2011	14.59	5591	2450	54.92	16984	6474	30.49	56499	31763

Note: μ & σ as defined in the text

Source: Own calculation based on labor household surveys for 1990, 1996 and 2011

See Mustafa (2018, pages 7 140,141).