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EMPLOYMENT, OUTPUT AND LABOUR FORCE TRENDS IN EAST AFRICA.

by

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Introduction

Unemployment is becoming a serious problem in underdeveloped countries. Yet in the national development plans of these countries little attention is given to the problem of increasing employment. In fact employment is usually not one of the targets in the plans it being implicitly assumed that a successful development plan necessarily leads to an increase in employment. Thus employment is regarded as a by-product of general economic development.

To a certain extent this view is true for some countries. But conditions in most underdeveloped countries call for a re-examination of the basic assumptions with respect to employment-generating process in these countries.

First with a high birth rate and a falling death rate of those aged 14 years and below, these countries are faced with younger and faster growing populations so that each year, there is a larger number of persons reaching working age than the year before.

Secondly, people in the underdeveloped countries have come to regard regular full time job as desirable and necessary. This creates unemployment problem in two main ways. First, partly due to lack of rural employment opportunities and partly due to rural-urban differentials in earnings, the adult rural population tends to migrate to the urban areas in search of paid employment. Secondly, partly due to the educational system and partly due to urban-rural differentials school leavers at whatever level are reluctant to remain in the countryside to engage in agriculture.

Thirdly, given the modern techniques of production advanced in the industrial countries (and which the underdeveloped countries have adopted) economic development may be successful in raising output without increasing employment, thus leaving a major social problem unsolved.

Because of these characteristics developing nations ought to take positive measures to solve the employment problem. This could be done by incorporating employment targets in their national development plans.

The purpose of this paper is to examine employment trends in East Africa since the early 1950's and to try and relate employment to growth in labour force, investment and output in order to discover the key factors in the employment-generating process. No attempt has been made in this paper to develop a theoritical model to explain employment the main objective being only to throw some light on the magnitude of the problem that is already with us. The data used are by no means accurate and ought to be interpreted with care.

EMPLOYMENT

The fear that the East African economies have failed to provide adequate employment opportunities to absorb the rising labour force has been expressed by various economists and sociologists who have made investigations into this problem (Baryaruha, Edgren, Hutton, Maleche, Belshaw, Kamoga). The three East African countries collect employment statistics based on annual enumeration of employees made by the respective Departments of Statistics. The Coverage is not at all complete and people employed on peasant farms and domestic servants are excluded. Thus there is a certain amount of under-estimation of actual employment. However, recent estimates of peasant employees and domestic servants suggest that even if these were included no appreciable positive trends would emerge in the employment statistics of East Africa.

A simple linear regression was used to study employment trends in each of the East African countries during the period 1954 - 1966. The following regression was fitted:-

$N = a + bt$ where N is employment measured in thousands and t is time. The results were as follows:-

Uganda: $N = 238.4 - \underset{(0.5568)}{0.2582t}$; $R^2 = .0192$

Kenya: $N = 592.3 - \underset{(1.9875)}{0.3654t}$; $R^2 = .0031$

Tanzania: $N = 416.90 - \underset{(6.896)}{5.62t}$; $R^2 = 0.0569$

(Figures in bracket are stardard deviations)

These results show that in none of the three countries is employment explained by time. Thus the fear that employment has not been increasing over time is supported by statistical evidence.

The fact that employment has not showed any appreciable trend while population and hence labour force has been increasing is a disturbing one. Realistically the growth of the labour force ought not exceed the growth in employment if the problem of unemployment is to be solved. But the size of the labour force will depend on total population, age structure and the extent to which age-sex group participate in economic activity. Unfortunately except for Tanzania no labour force surveys have been made in East Africa and hence

the size of the labour force not accurately known. However, population estimates are available and the census date give some indication of the age structure. Population trends were estimated by regression analysis for the period 1954 - 1966:-

P = a + bt where P is population in millions and t is time.

The results were as follows:-

Uganda: $P = 5.7 + 0.168t$; $R^2 = .9960$

Kenya: $P = 6.77 + 0.2324t$ $R^2 = .9960$

Tanzania: $P = 8.25 + 0.1725t$ $R^2 = .9765$

Assuming that the age structures in Kenya and Uganda are roughly similar to that of Tanzania we can use the results of Tanzania's labour force survey to estimate the labour force in the other two countries. This survey found that out of a total population of 10.2 million, 5.7 million were aged 14 years and over. After deducting those described as not in the labour force (keeping house, in school, unable to work, in prisons etc) the total labour force was estimated at 3.8 million or 37% of the population. Kenya's 1962 population census estimated those aged 15 - 60 years at 3.6 million or 45% of total population. Data are not available for Uganda but it is assumed that the pattern is not very different from that of Tanzania or Kenya. Thus one can safely assume that in 1965 the labour force was approximately 37% of total population in each country. The 37% in 1965 was then used to estimate the labour force for the other years. Three types of estimates were made based on different assumptions.

The first one assumed that the labour force in any year was a counstant 37% of total population:-

(A) $L_t = 0.37P_t$ where L is labour force
P is population and
t is time.

The second estimate was based on the assumption that the labour force was 37% of total population in 1965 [illegible] 1965 but was growing at the same rate as population before and thereafter:-

(B) $L_t = 0.37P_{65} + bt$ where b is trend coefficient of population and
t is time.

The third estimate was an average of the first two:-

(C) $L_t = \frac{1}{2}\left[0.37P_t + (0.37P_{65} + bt)\right]$

The results are given in the following tables:-

Table 1. Uganda: Estimated Labour force

Year	Population (million)	Estimated Labour force (millions)		
		A	B	C
1954	5.7	2.11	0.96	1.54
1955	5.9	2.18	1.13	1.66
1956	6.0	2.22	1.30	1.76
1957	6.2	2.29	1.37	1.83
1958	6.4	2.37	1.63	2.00
1959	6.5	2.41	1.80	2.11
1960	6.7	2.48	1.97	2.23
1961	6.8	2.52	2.14	2.33
1962	7.0	2.59	2.31	2.45
1963	7.3	2.66	2.47	2.57
1964	7.4	2.74	2.64	2.69
1965	7.6	2.81	2.81	2.81
1966	7.7	2.85	2.98	2.92
Projected				
1967	7.9	2.92	3.15	3.03
1968	8.1	3.00	3.31	3.16
1969	8.2	3.03	3.48	3.26
1970	8.4	3.11	3.65	3.38
1971	8.6	3.18	3.82	3.50
1972	8.7	3.22	3.99	3.62
1973	..	3.29	4.15	3.72
1974	9.1	3.37	4.32	3.85
1975	9.2	3.40	4.49	3.95

Table 2. Kenya: Estimated Labour Force

Year	Population (millions)	Estimated Labour Force (million)		
		A	B	C
1954	6.9	2.55	0.92	1.74
1955	7.0	2.59	1.16	1.88
1956	7.2	2.66	1.39	2.03
1957	7.4	2.74	1.62	2.18
1958	7.7	2.85	1.85	2.35
1959	7.9	2.92	2.09	2.51
1960	8.1	3.00	2.32	2.61
1961	8.4	3.11	2.55	2.83
1962	8.6	3.18	2.78	2.98
1963	8.8	3.26	3.02	3.14
1964	9.1	3.37	3.25	3.31
1965	9.4	3.48	3.48	3.48
1966	9.6	3.55	3.71	3.63
Projected				
1967	9.8	3.65	3.94	3.79
1968	10.1	3.74	4.18	3.96
1969	10.3	3.81	4.41	4.11
1970	10.5	3.89	4.64	4.27
1971	10.8	4.00	4.87	4.44
1972	11.0	4.07	5.11	4.59
1973	11.2	4.14	5.34	4.74
1974	11.4	4.22	5.57	4.90
1975	11.7	4.33	5.80	5.06

Table 3. Tanzania: Estimated Labour Force

Year	Population (million)	Estimated Labour Force (million)		
		A	B	C
1954	8.3	3.07	1.87	2.47
1955	8.5	3.15	2.04	2.60
1956	8.6	3.18	2.22	2.70
1957	8.8	3.26	2.39	2.83
1958	8.9	3.29	2.56	2.93
1959	9.1	3.38	2.73	3.05
1960	9.2	3.40	2.91	3.16
1961	9.4	3.48	3.08	3.28
1962	9.6	3.55	3.25	3.41
1963	9.8	3.63	3.42	3.53
1964	10.0	3.70	3.60	3.65
1965	10.2	3.77	3.77	3.77
1966	10.4	3.85	3.94	3.90
Projected[x]				
1967	10.5	3.89	4.12	4.00
1968	10.7	3.96	4.29	4.13
1969	10.9	4.03	4.46	4.25
1970	11.1	4.11	4.63	4.37
1971	11.2	4.14	4.81	4.46
1972	11.4	4.22	4.98	4.60
1973	11.6	4.29	5.15	4.72
1974	11.8	4.37	5.32	4.85
1975	11.9	4.40	5.50	4.95

[x] In the light of the recent Tanzania populatic census, the projected figures are underestimated. No adjustment has been made for this.

Figure I gives the three estimates for Kenya in a graphical form. For the years prior to 1965 estimate A is greater than estimate B and it is less than B after 1965 (This is a mathematical resust of the assumptions made). and estimate C lies between the two. For lack of a better measure, C has been used to estimate labour force in the three countries.

However, it must be pointed out that the actual size of the labour force depends on the extent to which population of working age perticipates or is willing to perticipate in economic activity. This factor is particularly important in East Africa where the majority of wage earners are males. The Tanzania labour force survey revealed that 56% of the labour force was male. The extent to which women respond to labour market situations can greatly influence labour supply but unfortunately no such information is available in East Africa. Granted that only a small fraction of the women of working age would be willing to take up paid employment, our estimates of the labour force do overestimate the labour supply.

The Employment Gap:

In East Africa women form only a small fraction of paid employment (about 5% in Kenya 1965). But even if we adjusted the estimated labour force figures to take into account this fact, there still remains a wide gap between the adjusted labour force and the actual employment. Available census statistics suggest that the sex distribution of labour force is in the ratio of 1:1 If therefore we assume that only 5% of the women in the labour force are willing to take up paid jobs the adjusted labour force would be:

$L^{x} = \frac{1}{2}L(1.05)$ where L^{x} is the adjusted labour force.

The adjusted labour force was compared to actual employment to determine the employment gap. The results were as follows:-

Table 4. Uganda: Estimates of the Employment - Gap

Year	Adjusted Labour force	Employment	Employment - Gap
	L^{x} ('000)	N ('000)	L^{x} - N ('000)
1954	809	236	573
1955	872	237	635
1956	924	237	687
1957	960	240	720
1958	1,050	243	807
1959	1,108	240	868
1960	1,171	245	926
1961	1,223	236	987
1962	1,286	231	1,055
1963	1,349	222	1,127
1964	1,413	225	1,187
1965	1,470	242	1,228
1966	1,533	246	1,287

Table 5. KENYA: Estimates of the Employment - Gap

Year	Adjusted Labour force L^x ('000)	Employment N ('000)	Employment - Gap $L^x - N$ ('000)
1954	914	544	370
1955	987	615	373
1956	1,066	597	469
1957	1,145	614	531
1958	1,234	593	641
1959	1,318	597	721
1960	1,370	622	748
1961	1,486	590	896
1962	1,564	580	984
1963	1,649	533	1,116
1964	1,738	592	1,146
1965	1,827	591	1,236
1966	1,906	603	1,303

Table 6. TANZANIA: Estimates of the Employment - Gap

Year	Adjusted Labour force L^x ('000)	Employment N ('000)	Employment - Gap $L^x - N$ ('000)
1954	1,297	409	888
1955	1,365	383	982
1956	1,418	394	1,024
1957	1,486	391	1,095
1958	1,538	407	1,131
1959	1,601	410	1,191
1960	1,659	417	1,242
1961	1,722	412	1,310
1962	1,753	397	1,356
1963	1,853	340	1,513
1964	1,916	351	1,565
1965	1,978	333	1,645
1966	2,047	337	1,710

If our assumptions are correct then estimates of the employment - gap indicate the number of people who could have been absorped into paid employment in order to solve the problem of unemployment and under-employment in East Africa. In 1966 this number was well above one million in each of the three countries, being 1.2 million 1.3 million and 1.7 million in Uganda, Kenya and Tanzania respectively . In a sense this is an indication of the potential wastage of human resources that could have been productively utilized if employment opportunities were available. In the rural areas the "unemployed" seem to live on meagre subsistence and their pressure is not felt by the government. But in the urban areas to which the rural population tends to migrate the problem of the unemployed (or underemployed) is already causing some concern. Cities like Nairobi, Dar-es-Salaam and Kampala are already swarmed with job seekers of all types and discriptions and this is already causing social problems that tend to get worse every day - slums, robbery, juvenile delinquency, prostitution etc.

Though governments have taken various measures to deal with the problem there is no indication that these measures are achieving their goals. The plain fact is that the labour force is growing much-faster than the economy can absorb and only drastic measures can avert the problem. It is not the purpose of this paper to suggest such measures but only to point out the magnitude of the problem.

Employment and Output:

Statistics on Gross Domestic Product of Kenya Uganda and Tanzania show an upward trend since the early 1950's. To measure this trend a linear regression was fitted for the period 1954 - 1966:-

$Y_1 = a + bt$ where Y_1 is monetary GDP measured in £ million and t is time.

$Y_2 = a + bt$ where Y_2 is monetary and non-monetary GDP measured in £ million and t is time.

The following results were obtained:-

Uganda:

$$Y_1 = 80.4 + 5.1308t; \quad R^2 = .1678 \quad (1.085)$$

$$Y_2 = 119.8 + 7.7071t; \quad R^2 = 0.78 \quad (1.228)$$

Kenya:

$$Y_1 = 119.3 + 9.1993t; \quad R^2 = 0.96 \quad (0.5835)$$

$$Y_2 = 161.8 + 11.5258t; \quad R^2 = 0.96 \quad (0.7415)$$

Tanzania:

$$Y_1 = 66.4 + 9.7764t; \quad R^2 = 0.95 \quad (0.6501)$$

$$Y_2 = 130.5 + 10.594t; \quad R^2 = 0.96 \quad (0.6092)$$

The fact that in each country, monetary Gross Domestic Product increased substantially while employment showed us trend at all implies that the elasticity of demand for labour with respect to changes in output is less than unity. For each country the elasticity of demand for labour

$EdL = \frac{\Delta N}{\Delta Y_1} \cdot \frac{Y_1}{N}$; (where N is employment and Y_1 monetary GDP) was calculated and the following results obtained:-

Table 7.

Elasticity of Demand for Labour.

Year	Uganda $Ed_L = \frac{\Delta N}{\Delta Y_1} \cdot \frac{Y_1}{N}$	Kenya $Ed_L = \frac{\Delta N}{\Delta Y_1} \cdot \frac{Y_1}{N}$	Tanzania $Ed_L = \frac{\Delta N}{\Delta Y_1} \cdot \frac{Y_1}{N}$
1955	0.04	4.40	- 1.85
1956	0.00	- 0.44	3.56
1957	0.21	4.70	- 1.78
1958	- 0.40[x]	- 2.75	0.77
1959	- 0.89	0.18	0.10
1960	0.08	0.05	0.29
1961	- 6.10	- 4.80	- 0.51
1962	0.71	- 0.52	- 0.63
1963	- 0.25	- 1.54	- 1.48
1964	0.15	1.31	0.27
1965	1.21	- 0.04	- 1.80
1966	0.09	2.20	0.08

[x]Except for Uganda 1958 all the negative elasticities are due to a fall in employment.

If these elasticities are correct then one would conclude that planned increases in Gross Domestic product will not increase the demand for labour and in fact may result in a fall in employment as production becomes more and more capital intensive. Several reasons have been advanced for the apparent capital intensity of production in the underdeveloped countries; e.g. lack of labour intensive equipments suited for less developed countries; managements' drive for modernization; government and trade union wage policies etc. These will be the subject of another study and are not dealt with here. Suffice it is to point out that one cannot lay much hope on planned growth in national income to generate employment in East Africa. In other words, employment is not at all a by-product of general economic development and a successful development plan does not necessarily lead to an increase in employment.

INVESTMENT AND EMPLOYMENT

It has been suggested by an International Labour Office study that one way of increasing employment is to step up the rate of investment . This is a necessary but not a sufficient condition for increasing employment. The final outcome will depend on what type of investment is being undertaken. If the investment is capital intensive employment may in the short run fall though the output may increase.

No investment statistics are available in East Africa and little is known about the type of investment taking place especially in the rural areas. Howerer, data are available for the gross capital formation and these may be used to throw some light on the effect of investment on employment. To do this, a simple linear regression was run on employment as a function capital formation (1954 - 1966):-

$N = a + bK$ where N is employment and K gross capital formation. The following results were obtained:-

Uganda:

$$N = 228.6 + 0.3857K; \quad R^2 = .0662$$
$$(.2897)$$

Kenya:

$$N = 576.5 + 0.3455K; \quad R^2 = .0521$$
$$(0.4411)$$

Tanzania:

$$N = 475.7 - 3.0156K; \quad R^2 = .4559$$
$$(0.9932)$$

These results show that only 7% and 5% of changes in employment are explained by changes in capital formation in Uganda and Kenya respectively and that capital formation had a small positive effect on employment in each of these countries. For Tanzania on the other hand capital formation had a negative effect on employment and 46% of the changes in employment are explained by changes in capital formation. Without information on the break-down of capital formation by type one cannot say much about its effect on employment. However one can conclude from the results of the regression analysis that in Tanzania capital formation had negative effect on employment.

Conclusion:

The purpose of thes paper was to throw some ligh on employment and labour force tends in East Africa since the early 1950's and to try to relate employment trends to Gross Domestic Product and Investment. While population (and hence labour force) has been growing since 1954, employment has showed no trend at all and in fact has declined during some years. The supply of labour thus far exceeds demand for labour i.e. the East African economies has failed to absorb the rising labour force.

The monetary Gross Domestic Product has been increasing in each of the East African Countries and since employment has not this suggests that the elasticity of demand for labour with respect to changes in output is less than unity. Crude estimates of this elasticity reveal that for some years it was negative, implying a fall in employment with rising output. One factor which may lead to a negative elasticity of demand for labour may be changes in relative prices of labour and capital resulting in factor substitutability. Due to insufficient data, this factor has not been dealt with in this paper. However, whatever the cause of low elasticity of demand for labour what seems obvious is that a mere increase in the national product will not by itself lead to an increase in demand for labour. Nor can one rely wholly on increased investment if this investment takes the form of capital intensive methods that replace labour. Thus new measures must be sought to fight the employment problem in East Africa since a successful development plan does not necessarily guarantee more employment.

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APPENDIX

UGANDA

Year	Population (million)	Employment ('000)	Gross Domestic Product (Monetary) (£ million)	Gross Capital Formation (£ million)
1954	5.7	236.0	92.8	18.5
1955	5.9	237.4	102.0	23.2
1956	6.0	237.0	102.8	21.8
1957	6.2	240.6	109.4	20.4
1958	6.4	243.0	106.3	19.6
1959	6.5	239.5	107.6	17.1
1960	6.7	244.5	110.5	18.6
1961	6.8	236.1	111.2	18.0
1962	7.0	230.8	107.9	17.7
1963	7.2	221.6	128.6	20.0
1964	7.4	224.9	140.8	24.2
1965	7.6	241.7	149.5	32.3
1966	7.7	246.0	172.8	30.7

Source: Statistical Abstract.

KENYA

Year	Population (million)	Employment ('000)	Gross Domestic Product (Monetary) (£ million)	Gross Capital Formation (£ million)
1954	6.9	544.4	112.5	
1955	7.0	615.5	134.7	35.3
1956	7.2	596.7	145.2	43.8
1957	7.4	614.4	154.2	45.6
1958	7.7	593.2	155.5	45.6
1959	7.9	596.9	161.8	40.2
1960	8.1	622.2	175.3	40.3
1961	8.4	589.8	176.8	41.6
1962	8.6	579.8	180.9	32.1
1963	8.8	533.3	192.4	33.6
1964	9.1	591.7	212.8	31.9
1965	9.4	590.8	222.2	36.3
1966	9.6	603.1	243.5	36.0

Source: Statistical Abstract.

T A N Z A N I A

Year	Population (million)	Employment ('000)	Gross Domestic Product (Monetarry) (£ million)	Gross Capital Formation (£ million)
1954	8.3	409.1	79.1	25.9
1955	8.5	383.1	81.8	28.9
1956	8.6	394.2	89.3	27.6
1957	8.8	390.5	92.9	29.5
1958	8.9	407.3	97.9	27.4
1959	9.1	409.7	106.2	29.1
1960	9.2	417.1	122.7	23.2
1961	9.4	411.5	126.2	26.6
1962	9.6	397.0	134.0	24.4
1963	9.8	340.3	150.6	24.3
1964	10.0	351.3	171.2	30.1
1965	10.2	333.7	176.4	41.9
1966	10.4	336.5	198.0	47.2

Source: Statistic Abstract;
Background to the Budget 1967 - '68.

Fig I. Estimated Labour Force in Kenya