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WAGE POLICY AND EMPLOYMENT IN A DEVELOPING ECONOMY

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In their quest for the combined objectives of rapid
industrial growth and significant labour absorption, the majority
of less developed countries have made more progress towards
growth objectives than towards employment. Commonly, these
countries have experienced acceptable growth rates of industrial
output accompanied by high rates of labour productivity growth.
As a result, industrial employment has lagged significantly
behind output growth. Moreover, a somewhat unexpected pheno-
menon, widespread and growing urban unemployment, has not only
complicated matters of economic planning but, more importantly,
has emerged as the most pressing socio-political problem facing
many of these developing nations, especially the newly independent
ones of tropical Africa.

In retrospect, it now appears clear that those economists
and planners who believed that the answer to the problem of
urban labour absorption was simply to generate high rates of
industrial growth were mistaken. What in fact has happened is
that higher levels of output growth have been accompanied by
proportionally high levels of labour productivity growth. For
example, Table I provides some cross-sectional data on relative
rates of output and labour productivity growth (the difference,
of course, being employment growth) in the manufacturing sector
of a number of developing economies during the 1950's.

Table I

Relative Growth Rates of Manufacturing Output and
Labour Productivity in Selected Less Developed
Economies, 1950-1960* (Annual Rates)

	Output	Labour Productivity
Argentina	4.4	6.6
Brazil	9.8	7.2
Chile	5.4	3.7
Colombia	7.6	5.1
Venezuela	13.0	11.9
Mexico	6.5	6.1
Greece	8.9	6.9
India	6.8	3.5
Kenya	7.6	8.7
Zambia	10.5	9.0

*For Kenya the period covered is 1954-64; For Zambia,
  it is 1955-63.

Sources: For Latin America and India: W. Baer and M. Herve;
       "Employment and Industrialization in Developing Countries,"
       Quarterly Journal of Economics. Feb.1966, 800 p.91.
       For Greece: S.Geronimakis, "Postwar Economic Growth in
       Greece, 1950-61," cited in B. Higgins, Economic Development.
       New York 1968, p.769. For Kenya: Republic of Kenya,
       Development Plan 1966-70. Nairobi 1966, p.27 and 251.
       For Zambia: Census of Production in 1963 Lusaka 1965,
       Table 3.

It is apparent   the table that for any given increase in
output growth, employment appears to expand at a disproportio-
nately slower rate. For example, in a recent United Nations
study of less developed nations it was found that a two percent
increase in the rate of manufacturing output growth in general
will be associated with somewhat less than a one percent rise in
the rate of employment growth.[1]

The fundamental question that remains, however, concerns
the causes as well as the sources of the observed rapid increases
in labour productivity. Numerous analytical arguments have been
expounded. At one extreme there are those who would argue simply
along lines of "technological determinism", that is, that
industrial growth by definition necessitates the importation of
the most modern vintage of labour saving capital equipment. More
importantly, it is argued occasionally that this process neces-
sarily will go on regardless of the level of relative factor
prices due to the "physical dominance" of modern technologies
in certain industries. Since these technologies become
progressively more capital intensive over time, it follows that
labour productivety will rise continuously while employment will
lag behind. At the other extreme, there are those who argue
that the rise in labour productivity has little or nothing to
do with "capital deepening" or "capital modernizing". Rather,
they claim that it is due largely to skill upgrading through the
natural process of "learning by doing" as an essentially migratory
labour force is transformed over time into a more stable, factory
and machine-oriented labour force and to public and private
programs designed deliberately to educate and train unskilled
labour. In the "jargon" of modern economic theory, rising labour
productivity is attributable to the phenomenon of "labour
augmenting technological progress". Finally, some would claim
that improved managerial organisation lies at the heart of rising
labour productivity while others argue that the existence of
increasing returns to scale in a number of large industries
accounts for the productivity phenomenon.

With the exception of the physical dominance argument where
the problem does not arise,[2] the literature on economic deve-
lopment is not at all clear whether or not these sources of

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[1] United Nations, The Growth of World Industry 1938-1961; Inter-
national Analysis and Tables. New York, 1966, pp.81 and 85

[2] Undoubtedly in some very large scale industries, (e.g.petroleum
refining, petrochemicals, perhaps steel making) the existence of
physical dominance is a real possibility. In the great majority
of light and medium industries, however, the potential range of
efficient technical choice is significant. Actual choice in
these cases should depend largely on existing and expected
movements in factor prices.

labour productivity growth are independent of relative factor
prices and, in particular, the prevailing and anticipated
future level of industrial real wage rates. Although the
theory of induced innovation recognizes the impact of factor
price expectations on the speed and bias of technological
progress, what little empirical work has been done on this
question has been directed exclusively to the advanced economies.[3]
But it is in less developed economies where some of the largest
rises in labour productivity have been observed and where the
employment problem is most acute. Therefore, we feel it important
to shed some additional light on the empirical relationship
between wages, productivity and employment in a developing
economy not only for the explanatory value of such an exercise,
but, more importantly, for the policy implications that can
emerge from the analysis.

In this paper we shall present evidence from Kenya suggesting
that labour productivity growth (and, thus, employment growth)
is in fact functionally related to the level and growth of
industrial real wages. By looking separately at the empirical
relationship between productivity growth and wage growth for
the three major racial groups in Kenya (European, Asian, and
African) we are provided with a unique opportunity to examine
the impact of wage changes on the demand for different skill
catagories of labour since in Kenya the Europeans are the dominant
managerial class while Asians and Africans in general comprise
the skilled and unskilled catagories respectively. Our basic
argument will be that for the unskilled African labourer the
level and growth of industrial employment (and indirectly,
urban unemployment) is largely determined by the level and
expected growth of industrial real wage rates. Moreover, on
the basis of our findings we shall argue that Kenya and other
developing nations in a similar situation are faced with a
fundamental political as well as economic choice as to whether
they prefer to have a high productivity, high wage, elite
industrial labour force with considerable urban unemployment
or a lower productivity, lower wage but considerably larger
industrial labour force with relatively low levels of urban
unemployment.

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[3] See, for example, William Fellner, "Does the Market Direct the
Relative Factor-Saving Effects of Technical Progress?" in
Nat. Bur. Econ. Research, The Rate and Direction of Incentive
Activity: Economic and Social Factors, Princeton 1962, pp.171-188

Data and Regression Results

Kenya provides a good example of output expansion accompanied by an actual fall in recorded employment between 1955 and 1962. Table 2 presents data on output and employment of Africans, Asians, and Europeans in the private sector in Kenya for the years 1955-66. There was a change in coverage between 1963 and 1964, hence the series are comparable only for the sub-periods 1955-63 and 63-66.

The rapid rise in average productivity of labour of each racial group during the period is marked. At the same time average wages were rising. Table 3 presents our calculations of average wage for each of the groups during the period.

In the Table 4 we show the annual percentage changes in output, value added per worker and average wage for each of the groups.

Even a casual clance at Table 4 suggests that there is a strong positive relationship between changes in value added per worker (average productivity of labour) and changes in average wages. To get a more precise idea of the relationships we have calculated simple linear regressions (fitted by the ordinary least squares technique) between changes in value added per employee (denoted $\dot{P}$ which is _percentage_ change in "productivity") and average wages (denoted $\dot{W}$ which is _percentage_ change in wage) for each of the groups. The results are as follows:

African Workers

$$(1) \quad \dot{P} = \underset{(1.60)}{1.78} + \underset{(.17)}{.761 \, \dot{W}} \quad , \quad R^2 = .703 \qquad r = 0.845$$

Asian Workers

$$(2) \quad \dot{P} = \underset{(1.43)}{3.09} + \underset{(.28)}{.322 \, \dot{W}} \quad , \quad R^2 = .15 \qquad r = 0.388$$

European Workers

$$(3) \quad \dot{P} = \underset{(2.95)}{.41} + \underset{(.47)}{1.05 \, \dot{W}} \quad , \quad R^2 = .38 \qquad r = 0.615$$

where the figures in parentheses are the standard errors of estimate of the coefficients. Scatter diagrams with the fitted regression lines are shown in Figures 1-3.

TABLE 2

OUTPUT AND EMPLOYMENT IN KENYA, 1955-66: PRIVATE INDUSTRY AND COMMERCE

	'55	'56	'57	'58	'59	'60	'61	'62	'63	'64	'65	'66
(1) VALUE ADDED (£K MILLION) PRIVATE INDUSTRY AND COMMERCE[1]	86.3	91.3	100.5	100.5	104.7	110.4	111.1	112.8	119.2	144.7	155.5	169.8
(2) AFRICAN EMPLOYEES[2] ('000)	157.4	158.3	156.8	149.8	148.0	151.1	134.1	133.2	121.8	169.2	169.0	173.4
(3) VALUE ADDED PER AFRICAN EMPLOYEE[3] (£K)	548	577	641	672	706	731	827	847	980	855	920	980
(4) ASIAN EMPLOYEES[2] ('000)	23.6	24.7	25.8	24.8	25.1	25.6	25.0	23.5	24.3	28.3	27.6	29.0
(5) VALUE ADDED PER ASIAN EMPLOYEE[4] (£K)	3,660	3,696	3,890	4,050	4,270	4,313	4,440	4,800	4,910	5,113	5,634	5,850
(6) EUROPEAN EMPLOYEES[2] ('000)	10.6	10.5	11.4	11.6	12.0	12.3	11.7	10.6	10.2	10.2	9.6	9.5
(7) VALUE ADDED PER EUROPEAN EMPLOYEE[5]	8,142	8,695	8,816	8,664	8,930	8,976	9,480	10,640	11,700	14,186	16,198	17,850

Notes to Table 2.

1. Source: Republic of Kenya, Statistical Abstract, 1965, Table 128a/ and 1967 Tables 39a and 38a).

2. Source: Statistical Abstract (1965, Table 140a) and (1967, Table 171a)

3. Calculated (1)/(2).

4. Calculated (1)/(4).

5. Calculated (1)/(6).

TABLE 3

Average Wage Paid, Private Industry and Commerce, Kenya 1955-66*

(£X)

	'55	'56	'57	'58	'59	'60	'61	'62	'63	'64	'65	'66
(1) African Employees	68.0	73.9	80.5	82.9	86.5	92.0	103.5	110.0	132.0	123.0	138.5	148.0
(2) Asian Employees	415	433	446	452	454	457	460	485	514	523	567	627
(3) European Employees	1,019	1,048	1,105	1,147	1,150	1,179	1,265	1,321	1,422	1,480	1,594	1,779

*Calculated by dividing Annual Wage Bill for each group, Statistical Abstract (1965, Table 140) and (1967, Table 171b) by number of employees in each group from Table 2 lines (2), (4), and (6).
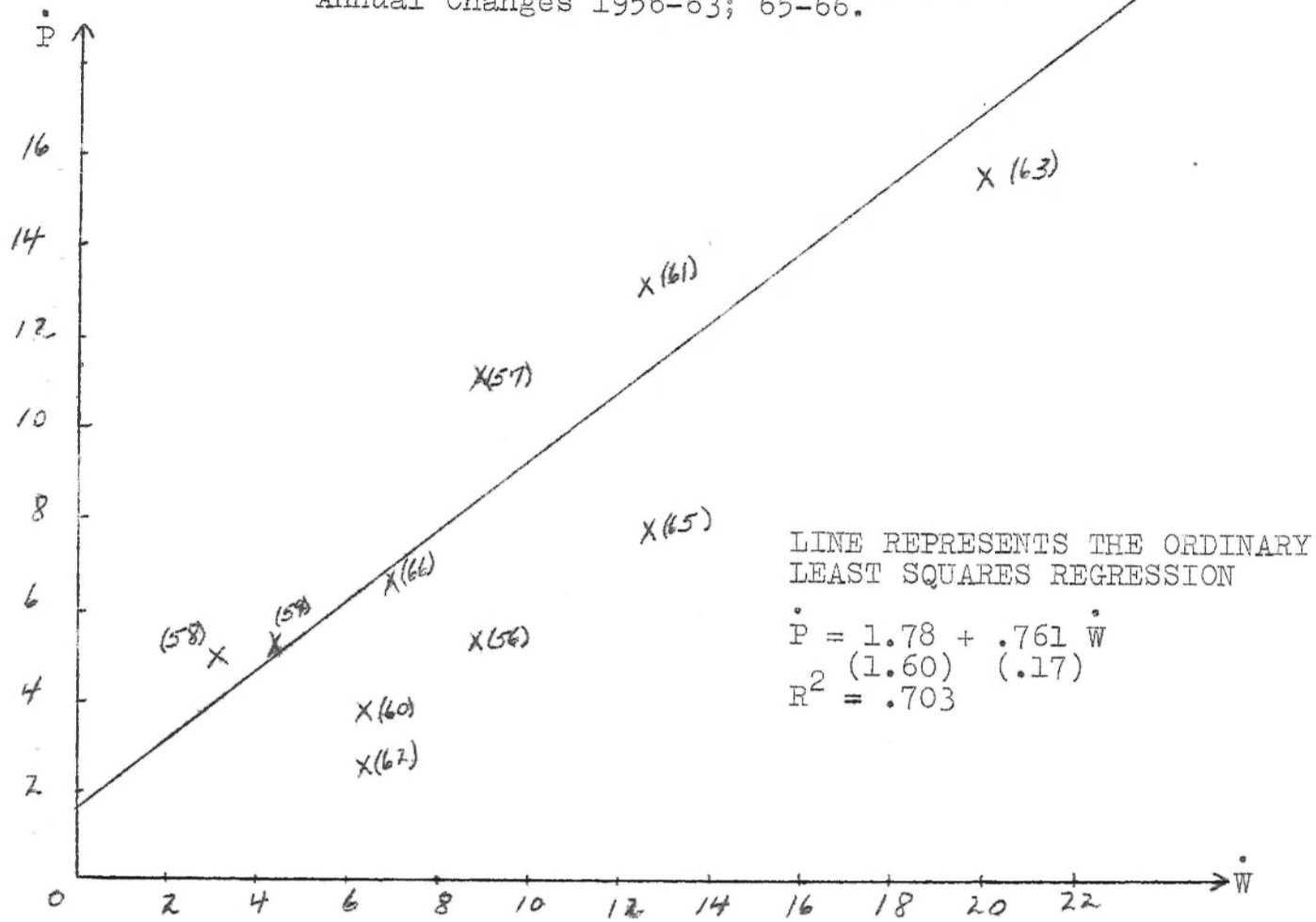
TABLE 4

Annual Percentage Charges in Value Added, Value Added Per Worker, and Average Wage:
Private Industry and Commerce in Kenya*

	55-56	56-57	57-58	58-59	59-60	60-61	61-62	62-63	64-65	65-66
(1) Value added	5.8	10.0	0.0	4.1	5.5	0.5	1.3	5.7	7.5	9.1
(2) Value added per African Employee	5.3	11.1	4.8	5.1	3.6	13.1	2.4	15.7	7.6	6.5
(3) Average Wage African Employees	8.7	8.9	3.0	4.3	6.4	12.5	6.3	20.0	12.6	6.9
(4) Value added per Asian Employee	1.0	5.2	4.1	5.4	1.0	2.9	8.1	2.3	10.2	3.8
(5) Average Wage, Asian Employee	4.3	3.0	1.3	0.4	0.7	0.7	5.4	6.0	8.4	10.6
(6) Value added per European Employee	6.8	1.4	-1.8	0.8	2.8	5.6	12.2	10.0	14.1	10.2
(7) Average Wage, European Employees	2.8	5.4	3.8	0.3	2.8	7.3	4.4	7.6	7.7	11.6

*Calculated from Tables 2 and 3. Note that no calculation is made for 1963-64 because of the break in the basic series.
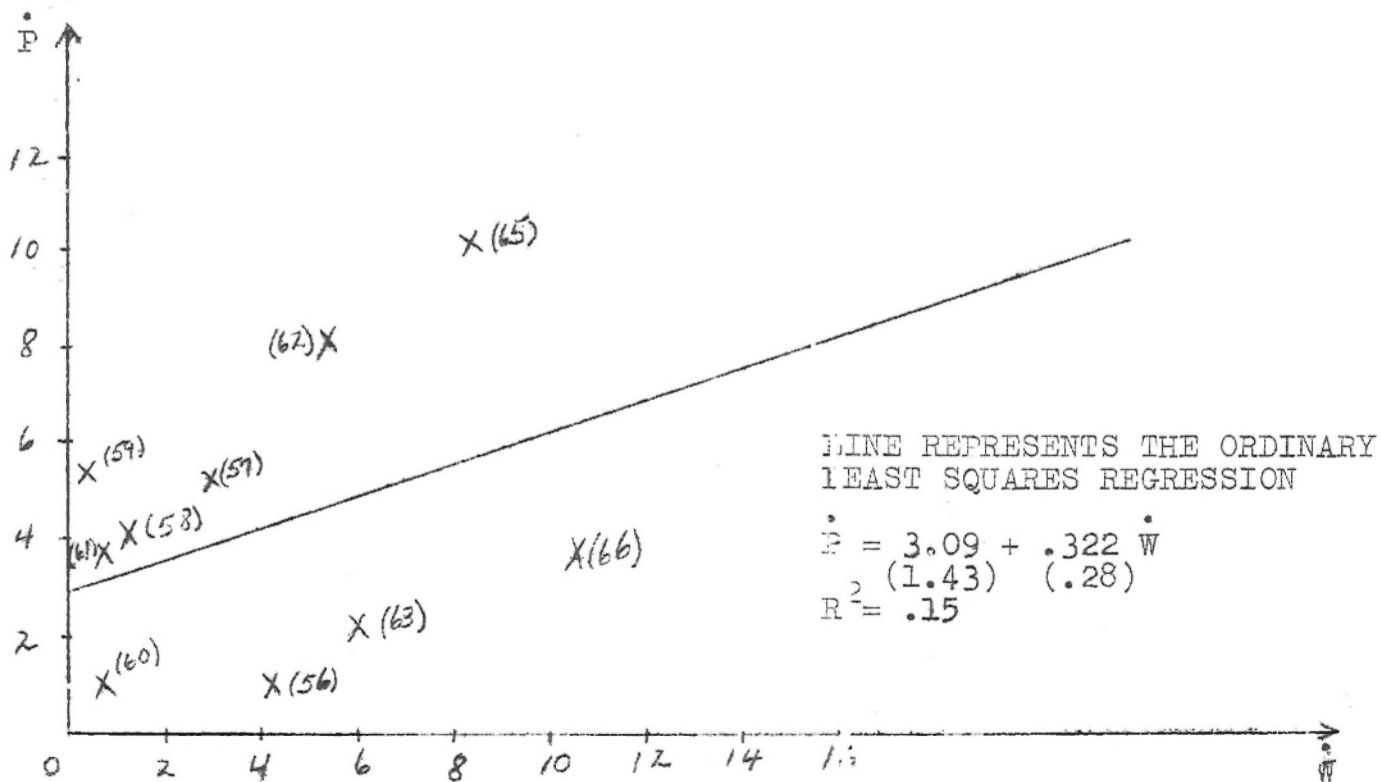
(Figure 1)

African Employees Private Industry and Commerce
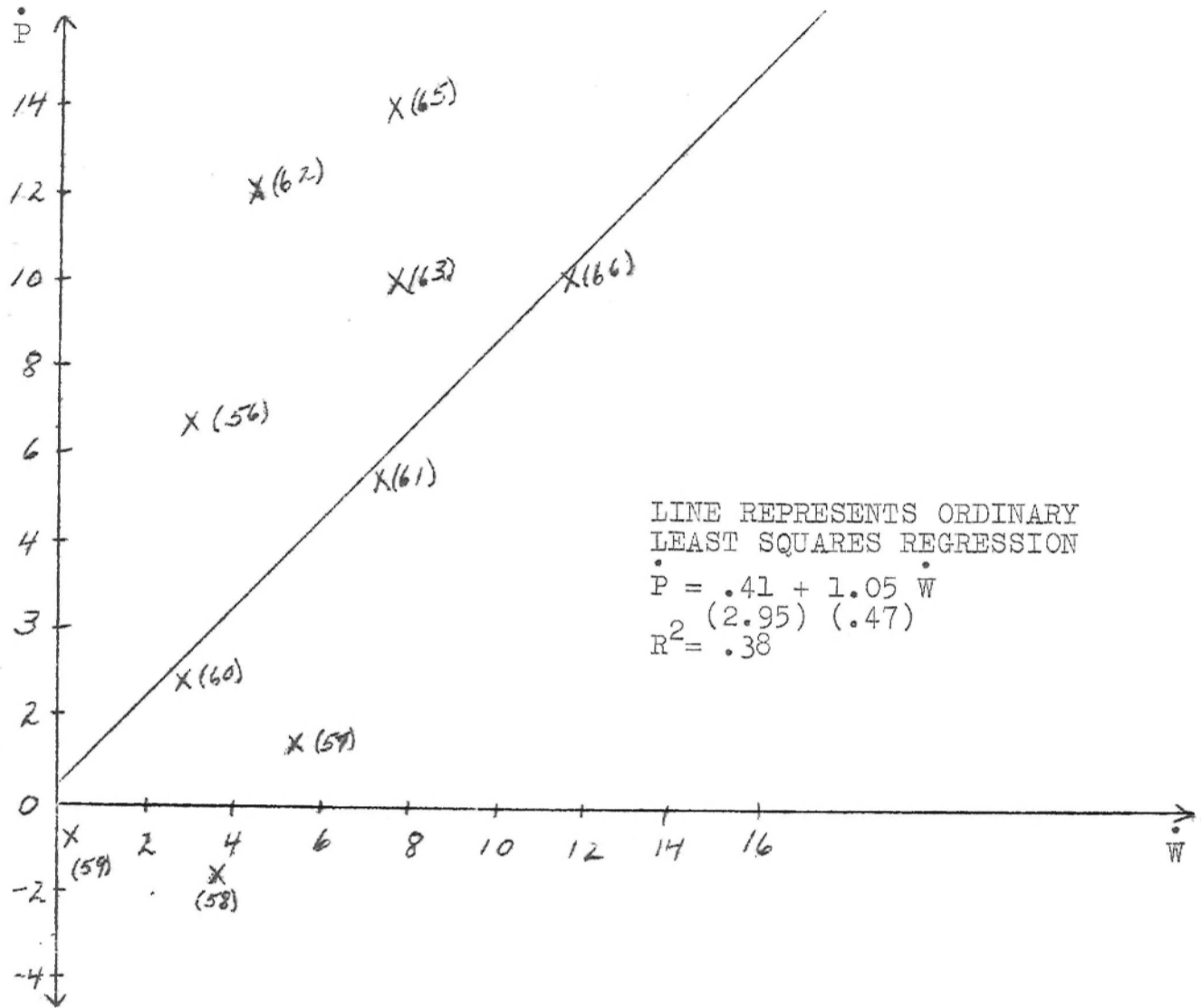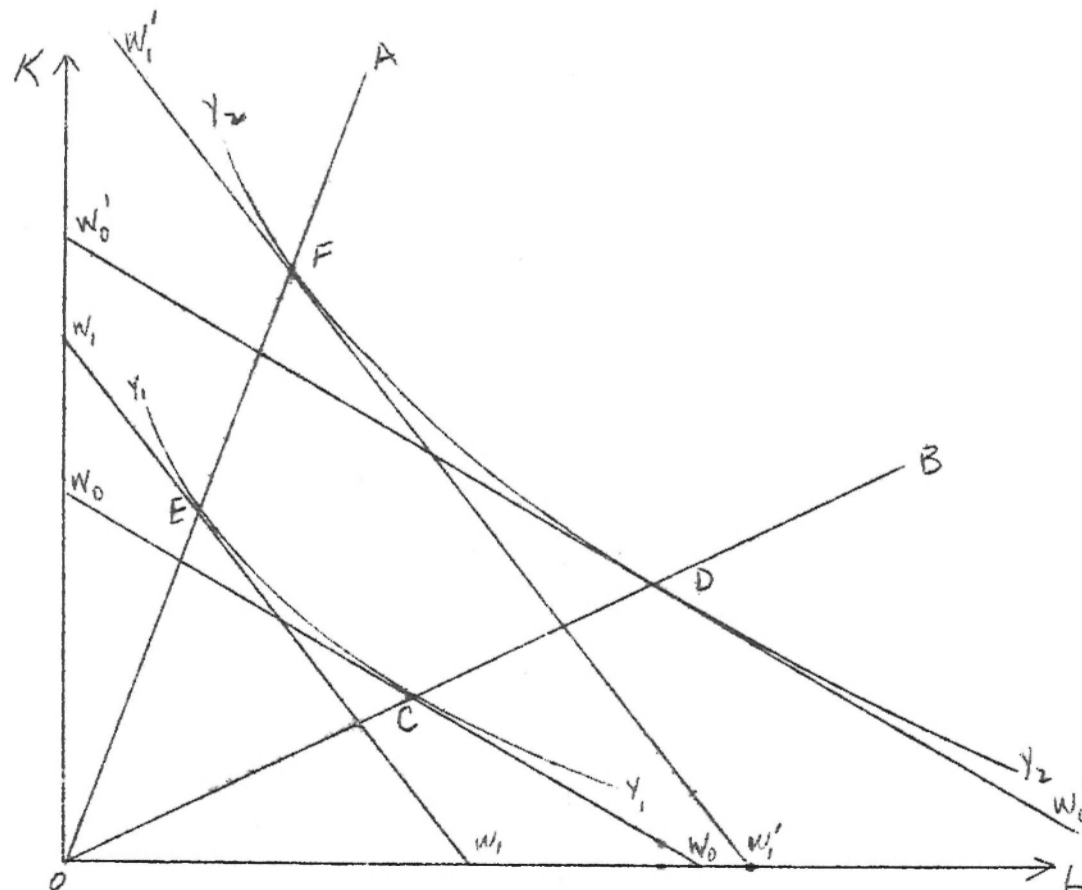Annual Changes 1956-63; 65-66.

LINE REPRESENTS THE ORDINARY
LEAST SQUARES REGRESSION

$$\dot{P} = 1.78 + .761 \dot{W}$$
$$(1.60) \quad (.17)$$
$$R^2 = .703$$

(Figure 2)

Asian Employees Private Industry and Commerce Annual
Changes 1956-63; 65-60

LINE REPRESENTS THE ORDINARY
LEAST SQUARES REGRESSION

$$\dot{P} = 3.09 + .322 \dot{W}$$
$$(1.43) \quad (.28)$$
$$R^2 = .15$$

(Figure 3)

European Employees Private Industry and Commerce.
Annual Changes 1956-63; 65-66

LINE REPRESENTS ORDINARY
LEAST SQUARES REGRESSION
$\dot{P} = .41 + 1.05 \dot{W}$
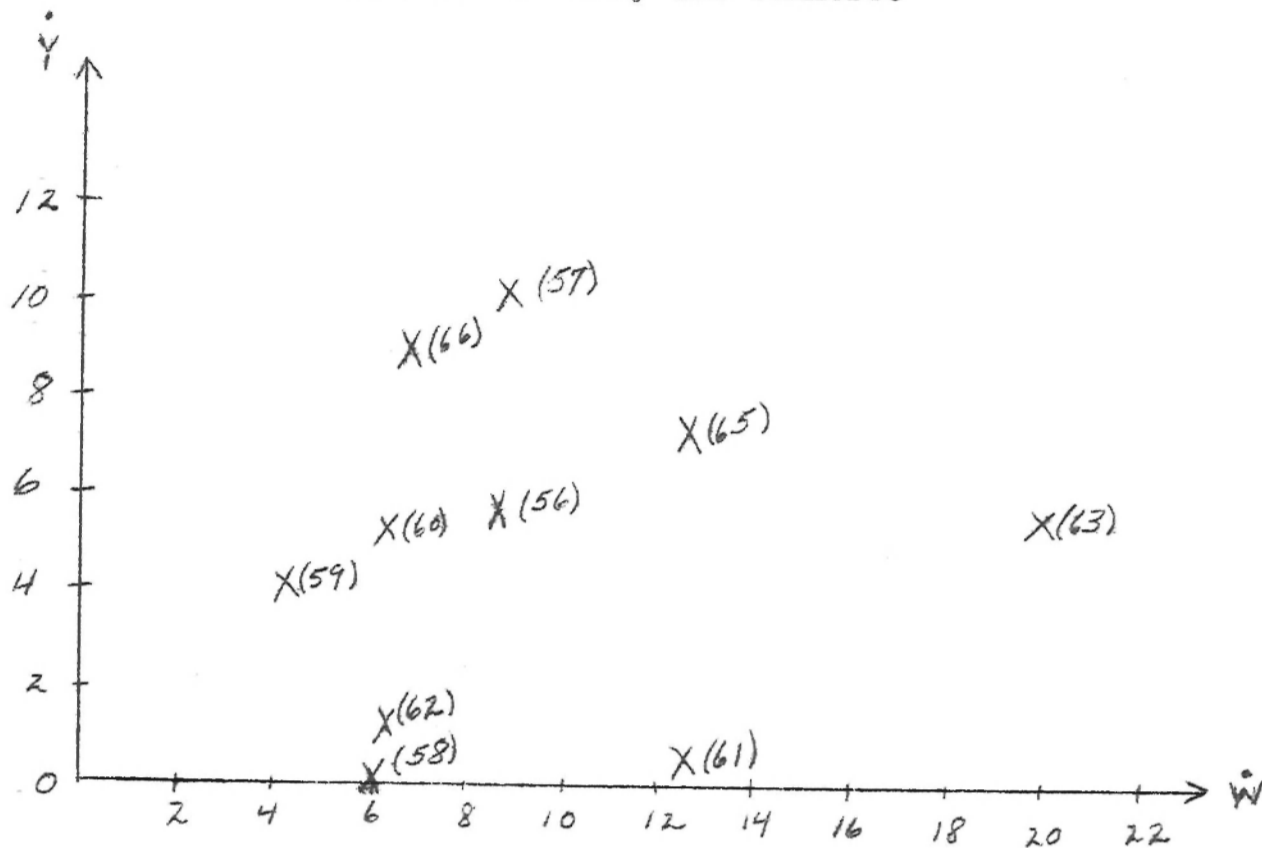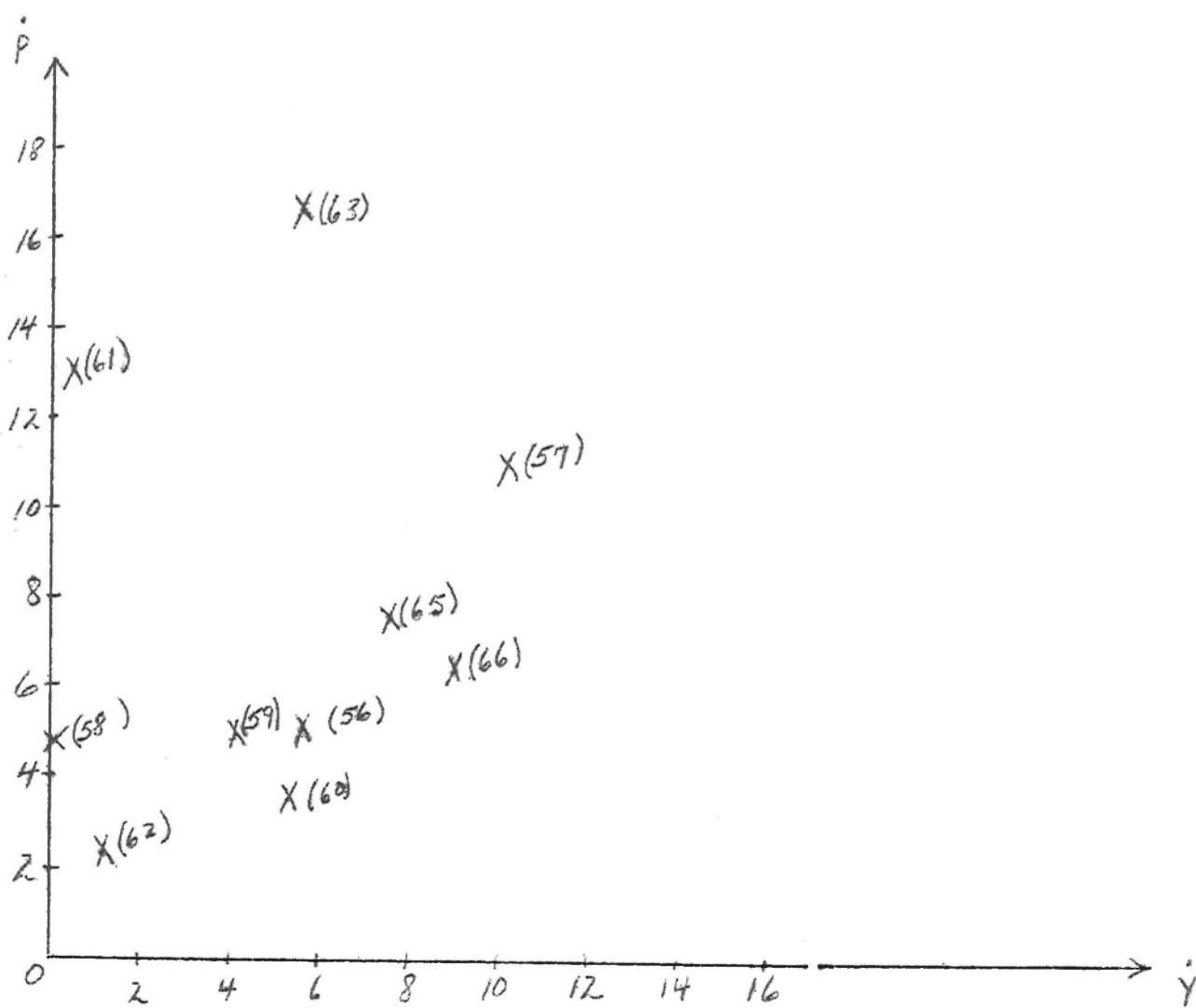$\quad (2.95) \ (.47)$
$R^2 = .38$

(Figure 4)

(Figure 5)

Output Changes and Wage Changes, African Workers,
Private Industry and Commerce

(Figure 6)

African Productivity and Output Changes, Private Industry
and Commerce

However, before examining these particular results, it is
necessary to be certain what the regression variables and
equations signify. Since changes in average productivity are
approximately equal to the difference between changes in output
and employment ($\dot{Y} - \dot{E} \rightleftharpoons \dot{P}$ where Y is output, E is employment
and the dots denote <u>percentage</u> changes), productivity change
can be interpreted as the additional amount by which employment
would have increased had there been no productivity change.
For example, suppose that in a given year output increased by
10 percent and employment only by 3 percent. Measured productivity
will have increased by approximately 7 percent and we can say
that employment would have been approximately 7 percent higher
had there been no productivity change (employment would also
have increased by 10 percent in such a case). Therefore, the
coefficient of $\dot{W}$ can be interpreted as a kind of elasticity of
demand for labour. If wages rise by x percent, employment will
rise by x times the coefficient percent less than it would have
otherwise risen. In fact, this measure is exactly equal to the
conventional static wage elasticity of demand for labour in the
special case of linear homogenous production function. Perhaps
Figure 4 will make this more clear.

If relative prices of capital and labour are represented
by the/$W_0 W_0$, an output of Y_1 will be produced by using the
input combination C. If output is expanded to Y_2, the input
combination will be D. Since we assume in this diagram that
there are constant returns to scale, measured labour productivity
will remain unchanged and employment of all inputs will increase
proportionally with output. On the other hand, if relative
factor prices are represented by $W_1 W_1$, than E and F will be the
respective input combinations for outputs Y_1 and Y_2. Measured
labour productivity will be higher at E and F than at C and D
since less labour (and more capital) are used at the former
points to produce the same outputs. However, labour productivity
will not change between E and F as long as there are constant
returns to scale.

Now our regression equations attempt to measure the
relationship between wages and labour productivity in a move
from C to F. In the case of a linear homogeneous production
function this can be decomposed into either the moves from C to
E to F or from C to D to F. In either case the moves from C
to D or from E to F will involve no change in measured labour
productivity. The moves from C to E or from D to F will both

give the same relationship between changes in wages (price of
capital being assumed to be constant) and change in labour
productivity which is also equal to change in employment.
(Note that $\dot{P} \equiv \dot{Y} - \dot{E}$. If $\dot{Y}$ is zero, then $\dot{P} = -\dot{E}$ so that the
regression relation would be $- \dot{E} = a + b \dot{W}$ and the coefficient
b is the ordinary wage elasticity of demand for labour). We
might also point out that in general we will obtain an estimate
of the elasticity of demand for labour from a multiple regression
of the type $\dot{P} = a + b_1 \dot{W} + b_2 \dot{Y}$ since by substituting $\dot{Y} - \dot{E} = \dot{P}$
and rearranging terms we get $- \dot{E} = a + b_1 \dot{W} + (b_2-1) \dot{Y}$. In this
case b_1 is the conventional wage elasticity of demand for
labour and $-(b_2-1)$ is the elasticity of employment with respect
to output which will differ from 1 if there are non-constant
returns to scale. We intend to run additional regressions in
this form but have not yet done so because of computational
limitations. However, /The coefficients b in the regressions we computed
are unlikely to much affected by the addition of the terms $b_2 \dot{Y}$
since Figure 6 suggests a very weak relationship between $\dot{P}$ and $\dot{Y}$
and Figure 5 suggests little correlation between $\dot{Y}$ and $\dot{W}$ for
African workers. Although we cannot be sure without actually
calculating the multiple regressions we would be very surprised
if the b_1 coefficients were to change much and if the b_2 coeffi-
cients would differ significantly from zero.

Let's look now at our regression results. Equation (1)
for African workers shows that some 70 percent of the variation
in average productivity is explained by variations in wage
changes (this refers to the R^2). The coefficient of $\dot{W}$ indicates
that if wages rise by x percent, measured productivity will
rise by .761x percent. Another way of looking at this relationship
is that, ceteris paribus, an increase in wages of 10 percent
would have to be accompanied by output growth of 7.6 percent
if employment is to remain constant.

The constant term of 1.78 can be interpreted as an annual
rise in labour productivity which occurs independently of wage
changes. It is important to note that this constant is not
significantly different from zero. Moreover, our data on wages
and output have been in current prices. As long as both wages
and output are similarly affected by price changes, the coefficient
of $\dot{W}$ can be interpreted as a marginal relationship between real
wages and real output. However, the constant term is not deflated
and as such reflects price increases in output which would not
be expected to affect employment along. During the period 1955-66

there was an average annual rate of inflation of close to two
percent. Therefore, we reach the somewhat surprising conclusion
that virtually no real productivity change of African employees
occured independent of wage changes during this period.

Furthermore, we know that the estimated coefficient of $\dot{W}$
is a lower bound estimate of the relationship for unskilled
workers because of Africanization of medium and high level jobs.
If high level jobs are Africanized and no change occurs in
employment or productivity of unskilled African workers, the
total African employment will rise thereby reducing measured
African productivity, and the relatively high pay for the
high-level job increases the average wage which we have measured.
Therefore our measured productivity is biassed downwards and
the wage is biassed upwards. As Africanization has been
increasing over time, the changes in productivity and wages
will be similarly biased. The coefficient of $\dot{W}$ is an estimate
of $\frac{d\dot{P}}{d\dot{W}}$ based on the available observations. If measured $\dot{P}$ is
biassed downwards and $\dot{W}$ is biassed upwards, it follows that
out estimate of $\frac{d\dot{P}}{d\dot{W}}$ is biassed downwards also. We can conculde
therefore, that the elasticity of measured productivity with
respect to wages is something greater than .761 for unskilled
and semi-skilled African workers and is not significantly
different from 1.0 at the $p < .05$ level.

It is extremely interesting to note that this result is
remarkably similar to Reynolds' findings for Puerto Rico.
Using observations for changes in labour productivity and wage
changes for 37 industries in the 1949-54 period and 50 indus-
tries in the period 1954-58, he estimates precisely the same
simple linear relationship between productivity and wage changes
and obtains estiiates of the coefficient of wage changes of
1.137 for 1949-54 and .939 for 1954-58.[4] During this period
Puerto Rico achieved extremely high rates of industrial growth
with relatively little growth in employment. "While manufacturing
output tripled in real terms between 1950 and 1962, factory
employment rose only 65 percent."[5] Minimum wages were effective
throughout the period and were raised considerably. It's
striking to observe the same kind of relationship between wages

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[4] L.G. Reynolds, "Wages and Employment in a Labour-Surplus
Economy," A.E.R., LV (March 1965) p.34.

[5] Ibid, p.26

and productivity (hence employment) in both Puerto Rico and
Kenya. While we would hesitate to generalize far beyond these
two cases without further investigation, they certainly suggest
that substitution of other factors for unskilled labour is
possible and is responsive to relative factor costs.

The "true" elasticity of demand for unskilled labour is
underestimated by both Reynolds and ourselves by our
inability to take into account the effect of real wage changes
on investment and output changes. If the wage elasticity of
demand for labour is less than 1, the wage cost per unit of
output will increase with wages. If the elasticity is 1, wage
costs per unit of output will remain constant but as long as
lower labour inputs require additional inputs of other factors,
unit costs will increase with wages. Rising unit costs will make
exports less competitive, will make import substitution less
feasible, and will tend to squeeze profit rates. All of these
effects will cause investment and output to increase less with
rising real wages than they would increase with constant real
wages. We have estimated the relationship between wage changes
and productivity changes and have stated that the coefficient
of $\dot{W}$ shows the reduction in employment growth for a given
output growth attributable to the wage change. If, however,
a smaller wage change would have given rise to both a lower
growth of productivity and a higher growth of output, then the
estimated coefficient understates the amount of employment
lost by wage increases.

At this point it is necessary to be rather careful in
delineating alternative hypotheses concerning the causes of
productivity changes and determining if our regression results
allow us to distinguish between them.

First we might consider the hypothesis that changes in
productivity will occur autonomously over time as new techniques
are developed, absolutely more efficient capital intensive
processes are introduced, and organizational improvements occur.
The constant term in our regressions would reflect such
changes and we have already discussed the fact that it is not
significantly different from zero. Therefore, we can reject
the notion of substantial exogenous productivity improvement.

The second hypotheses to consider is that productivity
changes occur as a result of output increasing. This can take

the form of "learning by doing" or of technical improvements
being embodied in new equipment. The latter might be tested
by making investment an explicit independent variable in the
regression although we would expect investment and output
changes to be correlated. Finally there is the argument that
as output increases both existing capital and labour are
utilized more intensively (increasing labour productivity
with upswings in the business cycle has been noted in most
advanced economies). In order to test this hypotheses we
would have to calculate multiple regressions with output change
entering as an independent variable along with wage changes.
We intend to make such a calculation in the near future but
Figures 5 and 6 give us enough data to tentatively reject the
quantitative importance of this hypothesis. Furthermore, an
examination of the scatter diagrams, Figures 1 and 5, suggests
that wage, productivity, and output changes have not been
moving together over time (in other words there seems to be
little serial correlation). If all three changes had been
increasing together over time we would confound the effects of
wage changes with autonomous or output-induced productivity
changes. Therefore, we feel rather confident in concluding
that there appears to be a significant causal relationship
between wage changes and productivity changes.

It is, however, difficult to establish the direction of
causation on the basis of statistical association. Is it not
possible that the institutional arrangements are such that
autonomous or output-induced productivity changes give rise to
higher wages? One frequently hears statements by both unions
and government to the effect that wages should reflect productivity
which might suggest this alternative direction of causation.
We cannot strictly reject this argument solely on the basis of
our regressions, but we do favor the original interpretation that
wage changes are the independent variable. If productivity
occured autonomoulsy and this gave rise to wage changes, we
might expect less variation in the rates of change than we
observe. Furthermore, we find that wages increased somewhat
more than productivity throughout the period (note that the
wage coefficient is less than 1). Finally, the public statements
of union leaders suggest that they would be unwilling to accept
a wage cut if productivity fell from the use of more labour
intensive production methods. This suggests that there may
well be some minimum level of wage increase which would be

acceptable. If this is the case, expectations of rising
wages will cause employers to increase labour productivity
and subsequently grant corresponding wage increases. If this
is the case, we could once again argue that wage increases,
or expectation of wage increases is the independent variable
which causes productivity increases. To recapitulate, we
cannot obsolutely reject the notion that the direction of
causation runs from productivity to wages, but we find it much
less plausible than the alternative.

Now let's look at the regression results for Asian and
European employees. In neither case does the regression
provide near the degree of explanation that it does for African
workers. This probably reflects the greater difficulty of
substitution/other factors for skilled and managerial inputs that
for unskilled or semi-skilled manpower.

Looking at the scatter diagram, Figure 2, we see that
Asian employees experienced a much narrower range of wage
changes than did Africans and that there is a great deal of
variability in the average productivity changes. We would
expect that this reflects in large part Asian exodus and Africa-
nization of many skilled jobs previously held by Asians. These
factors will cause the measured average productivity of Asian
workers to increase with relatively little effect on the
average wage of those remaining in employment. The relatively
high value of the constant term of equation (2) partially
confirms this notion (note, however, that in real terms this
suggests about a 1 per cent annual increase in average
productivity) as does the insignificant value of the coefficient.
Although this equation is consistent with the hypothesis that it
is less possible to substitute other factors for skilled than
for unskilled labour, we are loath to draw any strong conclusions
from this regression because of the special factors affecting
Asian employment during the period.

Finally, equation (3) suggests a significant unit
elasticity relationship between wage and productivity of
European employees but provides a rather weak degree of expla-
nation. Again, Africanization of posts previously held by
Europeans probably explains the weakness of the relationship.
We would also be inclined to accept the argument that wages
are a reflection more than a cause of the observed productivity
of European personnel. Most management and high-level technical

personnel compete in an international market. For the most part,
more able or productive individuals are able to bid their
salary up by changing or threatning to change companies. There
is a noticeable trend in Figure 3 for both wages and producti-
vity to be higher in recent years. This undoubtedly reflects
the entry of many new international companies into Kenya.
Since independence the administration of work permits has also
insured that Europeans working in Kenya will be those of rela-
tively high skill who can command high pay.

Sources of Productivity Change

In the previous section we argued that the evidence for
the private sector in Kenya strongly suggests that rising wages
have caused rising levels of labour productivity, particularly
among African workers. We want here to explore the mechanism
through which this is effected.

The most obvious explanation is that rising real wages
cause substitution of capital for labour. This indeed was
implicity in some of our earlier discussion and is explicit in
Figure 4. There is some evidence although of a very tentative
nature that this has occured in Kenya. Table 4 suggest that
incremental capital-output ratios for the period 1964-67 were
higher than the average capital-output ratio in 1963 for all
industries except beverages and tobacco. This suggests some
degree of substitution of capital for other factors during
recent years. We would hesitate to put too much weight on
this evidence since the treatment of depreciation in investment
and output is extremely tricky and we are unsure of the quality
of these data.

TABLE 4

Capital-Output Ratios, Selected Kenyan Industries,

Industry	K/Y 1963[1]	∆K/∆Y 64-67[2]
Food Processing	3.4	(4.0)
Beverages & Tobacco	2.0	(1.5)
Textile, Clothing, Footwear & Leather	2.2	(3.5)
Wood & Paper Products & Printing	2.1	(5.5)
Rubber Products & Chem.	4.4	(6.2)
Non-Metallic Mineral Prod.	5.8	-
Metal Products	2.3	(4.8)
All Industry	2.9	4.4

Sources: 1. Statistics Division, M.E.P.D. (1966) mimeo.
2. Preliminary Data of Ministry of Planning and Economic
Development, Kenya.
NOTE: The figures in parentheses represent informed "guesstimates".
The figure for all industry is calcualted from price adjusted
gross investment and gross domestic product.

Although we have no direct evidence at the moment, it seems likely that much of the productivity increase has arisen from improved organization and managerial practices. Evidence is abundant that scope for such improvement is considerable in most industries in most countries.[6] However, if such improvements could be made costlessly, there is no particular reason to expect them to be directly related to wages. If, however, organizational resources are limited, then they will be directed to areas in which the cost savings will be greatest. As wages rise, improved efficiency in the use of labour will become more and more important to the survival or profitability of a firm and we would expect considerable improvements in labour usage. Even more important, we think, is the substitution of supervision and organization of labour in response to higher wages.

We believe that the most important source of productivity increase has arisen from training workers and upgrading skills. Although we have no systematic data at the moment to substantiate this claim, observations of many experienced observers confirm the statement. It seems eminently reasonable from the stand-point of firms that they will devote resources to training workers if they expect that wages will be rising anyway and therefore if they are to remain competitive they will have to upgrade skills so that the workers will be worth the higher wages in the future. Of course, there is the problem of firms not wanting to train individuals who can be "poached" by firms not bearing the training costs, yet there is evidence of substantial amount of training being undertaken by firms. Some of the skills are firm-specific, other firms have been responsive to governmental pressure to undertake training. Furthermore the expanded outpouring of individuals from the educational system and trade schools have contributed to the upgrading of skills employed.

Again, it is interesting to note that Reynolds attributes most of the increase in productivity in Puerto Rico to organization, management, and training. He finds little evidence for capital deepening.

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[6] See H. Leibenstein, "Allocative Efficiency v. 'X-Efficiency,'" A.E.R., LVI (June, 1966).

These findings are also consistent with the largely
qualitative evidence available for productivity change in Uganda
industry.[1] We hope, however, to be able to obtain much more
satisfactory evidence about the sources of productivity change
from detailed cross-sectional data on Kenyan industry.

It seems reasonable to conclude, therefore, that there
has been considerable substitution of capital, organization,
management, and skills for unskilled labour in Kenya. This
substitution has been induced primarily by rapidly rising levels
of real wages. Consequently, we believe that our results have
important implications for the formulation of economic policies
designed to stimulate a higher rate of labour absorption in Kenya.

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[1] A. Baryaruha, Factors Affecting Industrial Employment: A Study
of Ugandan Experience 1954 to 1964 (Nairobi: Oxford University
Press, E.A.I.S.E.R. Occasional Paper No. 1, 1967).

Policy Implications

What are the policy implications of our findings? The
most obvious implication is that wage movements, especially
for the unskilled African labourers, do play a significant
role in influencing entrepreneurial employment decisions. Even
through there appears to be a variety of sources through which
accelerated rates of labour productivity growth are achieved,
the ultimate incentive factor causing entrepreneurs to lower
the relative labour component of their production processes is,
we would argue, the existence and anticipation of secularly
rising urban real wages. It follows, therefore, that in the
absence of a concentrated effort to "hold the line" an industrial
wage rates, potential increases in employment opportunities
arising from programmes of accelerated industrial growth will
be largely negated by the intentional substitution of scarce
capital, training and managerial organizational inputs for the
ever more expensive, although relatively abundant, unskilled
manpower.

So far we have confined out discussion exclusively to
an analysis of the impact of wages on urban employment. However,
as we have argued elsewhere, the level and rate of increase
of industrial unskilled wage rates can have an equally, if not
greater, impact on the level and rate of increase in urban
unemployment.[1] There it is argued that in spite of the obvious
existence of limited urban employment opportunities, the lure
of an ever increasing urban-rural expected wage differential
will continue to act as a magnet atrracting unskilled rural
workers away from the farm in the expectation, however slight,
of securing one of these high paying, prestigious urban jobs.
Consequently, a secularly rising urban real wage rate in obvious
excess of social costs and in spite of widespread urban unemploy-
ment exerts a dual debilitating influence in the urban labour
market. Not only does it restrain the expansion of new employment
opportunities but it also indirectly contributes to a worsening
of the already serious problem of urban unemployment through
inducing additional migration to urban areas.

One final implication of our analysis seems to be the
following: if, as out findings suggest, higher rates of wage
increases tend to be offset, albeit only partially, by higher

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[1] J.R. Harris and M.P. Todaro, "Urban Unemployment in East Africa:
An Econooic Analysis of Policy Alternatives," East African
Economic Review, Vol. 4, No.2, Dec. 1968.

rates of labour productivity growth, then it follows that if
real wages are stabilized, labour productivity growth will
also tend to level off.[1] Consequently, our findings seem to
underline a fundamental, but often overlooked, social, political
and economic policy choice with regard to wage policy, employment,
and unemployment in Kenya. The choice is this: do we want to
have a highly mechanized urban industrial economy with a small,
elite, highly skilled, highly productive labour force with
substantial and ever worsening urban unemployment, or, shall we
opt for a less mechanized, more labour intensive industrial
economy with a less skilled, less individually productive urban
labour force but one with more widespread human participation
and lower levels of urban unemployment. On strictly economic
grounds, it is not at all clear as to which alternative is most
desirable in terms of some optimum path of economic development.[2]
Only further detailed empirical study can provide an answer to the
question. However, in terms of the socio-economic priorities
of the Kenya government as revealed in Sessional Paper No. 10 On
"African Socialism", there seems to be little doubt that economic
policy framers in Kenya place highest priority on the goal of
maximum labour participation in the economy with an egalitarian
distribution of income. If such a national priority results in
lower overall rates of industrial growth and even perhaps in
somewhat higher monetary costs of production (we doubt strongly,
however, that this would be the case), it does not follow that
the social costs of pursuing the policy of maximum labour
absorption will be any greater than the pursuit of maximum growth.
In fact, we believe that they would be considerably lower given
either a short or a long run time horizen.

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[1] It does not follow, however, that total factor productivity
the more relevant criterion for efficient production, will
necessarily be lower, given lower unit labour costs.

[2] Of course in the long run Kenya will have to have a high paid high
skilled labour force if its development programs are successful.
That is the goal, and, indeed, practically the definition of
economic development. The question here, however, is how an
efficient and a socially desirable path to reach that goal
can be achieved.