EMPLOYMENT AND INCOME GENERATION IN THE PETTY COMMODITY SECTOR OF THE URBAN ECONOMY: THE CASE OF THE CENTRAL REGION OF GHANA*

By

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INTRODUCTION

Employment as an issue in development is gradually dawning on development planners in developing countries. It has been realized that the large scale modern sector institutions and economic activities cannot generate adequate employment for the ever expanding labour force. In recent years, attention has been drawn to the existence of a third or intermediate sector between what are labelled «traditional» and «modern» sectors. The importance of the «informal sector»: small scale fabrication, services, construction, transport, trading enterprises in income and employment generation in rural Africa has been noted by Liedholm (1973) but their importance can be magnified in the urban areas of Africa.

There have been a lot of discussions on the informal sector. These include conceptual issues, problems of measurement and the size of the sector in the urban economy, income and employment characteristics and in particular the issue of the ability or otherwise of the economic units in the sector to generate and sustain income and employment. *(1)* Interest in the informal sector has been sustained through various researches particularly those sponsored by the International Labour Office (I.L.O.). The I.L.O.'s employment missions to some developing countries and the selected case studies of cities have generated a lot of literature on the informal sector. In all the reports the «intermediate» sector or the petty commodity sector has been shown to have potential for generating enough employment and income especially for the urban poor.

In Ghana, an economic study of the «intermediate» sector by Steel (1977) suggests that this sector has that potential. Most of the studies on this sector have focused on the major urban centres of various countries, although Steel's work in Ghana is an exception. For the purposes of geographical and planning analysis it is interesting to examine the employment and income characteristics of the Petty Commodity sector and to consider the factors that promote these in regional, district and rural centres. This is an essential first step in examining the possible role the Petty Commodity sector can play in the generation of economic activities with wider spatial and economic linkages with the urban and rural economies. This paper addresses itself to this task. It also attempts to examine the relationships between the size of urban/rural centres, types of activities and

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the size of employment and income generated. Finally, an attempt is made to explain the variations observed in the size of employment, the income generated in the sector through a multiple regression analysis.

TYPE OF ACTIVITIES INCLUDED IN THE STUDY

In this study, Petty Commodity enterprises were simply defined as the small-scale industrial and service units which were largely privately owned and which employed thirty people or less. These included modern as well as traditional enterprises. The enterprises included were bakery, cement block making, carpentry, dressmaking and tailoring, metal working, smithing, auto repairs, milling and food preparations, repair and other related service units such as photography, hairstyling, watch repairing and shoe repairing.

SURVEY METHODS:

Published data on the «unorganized sector» is generally lacking in Ghana as it is in most other developing countries. The data collection machinery for the industrial sector generally does not cover such enterprises. Small-scale operators generally feel reluctant to release information concerning the operations of their enterprises probably because of the fear of taxation. Some do not have fixed working places and therefore these cannot be reached easily. It is difficult to know the total number of units operating. It thus became necessary to carry out a census survey, which formed the sampling frame from which a sample was chosen for detailed study. Only enterprises with fixed places of work were included in the census survey.

The emphasis on only the units with fixed places of work arose from the belief that such units had some semblance of permanency of business and were more likely to employ labour and also to train others to become master craftsmen in the future. Above all, it is to such enterprises that any government policies either in the form of taxation, financial incentives or any aid programme can easily be directed.

The census survey was carried out in 9 urban and rural centres in the central region. This region was chosen for the study largely because it is one of the nine administrative regions with a number of urban centres ranging from what in the national term may be described as medium sized centres to small centres located in close proximity to each other (Fig.1). In addition, most of the urban centres *(2)* showed either no growth, negative growth or slow growth rates between the census years of 1960 and 1970 *(3)* and one wondered whether this was related to employment problems. Above all in many ways the region is representative of the regions in the country in terms of demographic structure, employment structure and other economic activities.

The nine centres were chosen for their present and potential population size, socio-political and economic functions, population growth rates between 1960 and 1970, accessibility and also balance of centres

in spatial terms. The centres chosen were Cape Coast, (51,653), Winneba (30,778), Swedru (21,522), Saltpond (11,549), Elmina (11,401), Fosu (7,249), Asikuma (6,948), Komenda (5,966) and Mankesim (4,412). After the census survey, a detailed study of 595 units was done. The analysis below is a combination of the results of both the census and detailed sample surveys.

EMPLOYMENT CHARACTERISTICS OF THE ENUMERATED UNITS

Table 1 shows the total number of enumerated units and the total size of labour force in them. As may be expected there were variations among the selected centres. Cape Coast being the largest centre contained the largest number of units and employees. However, the medium sized centres of Winneba and Swedru also overshadowed the other centres, which are largely small sized centres, in terms of both the number of enterprises operating and the size of labour force in them. Table 2 shows that even when the centres were categorized into large, medium and small centres, the large centre still predominated *(4)* in the operations of small scale enterprise. A combination of size and important urban functions may have generated opportunities for small-scale operators in the large centres. On the other hand, in the medium sized and the small centres, it was likely that local economic opportunities for petty commodity production derived largely from the agricultural activities and money in the local economy rather than from say administrative, commercial and educational activities of the large, may have been more important factors.

TABLE 1

Total number of enumerated enterprises and the size of total labour force in the selected centres

Centres	Number of Enterprises	Size of Labour Force
1. Cape Coast	343	806
2. Winneba	146	512
3. Swedru	188	465
4. Saltpond	88	241
5. Elmina	86	138
6. Fosu	40	138
7. Asikuma	49	200
8. Komenda	29	70
9. Mankesim	37	88
TOTAL	1,006	2,658

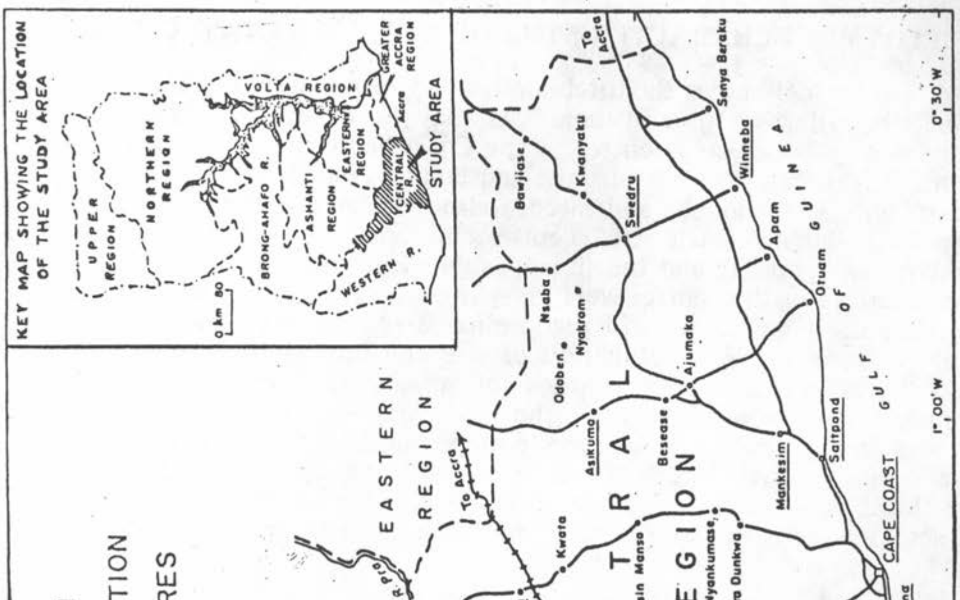
CENTRAL REGION
SHOWING THE LOCATION
OF SELECTED CENTRES
KEY MAP SHOWING THE LOCATION OF THE STUDY AREA
UPPER REGION
NORTHERN REGION
BRONG-AHAFO R.
ASHANTI REGION
EASTERN REGION
VOLTA REGION
GREATER ACCRA REGION
Accra
CENTRAL R.
WESTERN R.
STUDY AREA
0 km 80
ASHANTI REGION
WESTERN REGION
EASTERN REGION
CENTRAL REGION
GULF OF GUINEA
To Kumasi
To Accra
To Takoradi
R. Ofin
R. Pra
Dunkwo-on Offin
Twifu Praso
Hemang
Fosu
Kwata
Assin Manso
Fanti Nyankumase
Abura Dunkwa
Asikuma
Odoben
Nyakrom
Nsaba
Bawjiase
Kwanyaku
Swedru
Besease
Ajumako
Mankesim
Saltpond
Otuam
Apam
Winneba
Senya Beraku
CAPE COAST
Elmina
Komenda
KEY
Regional Boundary
Main Roads
Railway
Regional Capital
Mankesim Selected Centres
0 10 20 30 Kms.
0 10 20 Mls.
6° 30'
6° 00'
5° 30'
5° 00'
2° 00'
1° 30' W
1° 00' W
0° 30' W

TABLE 2

Distribution of the Petty Commodity units in the large, medium sized and small centres

Size of Centres	No. of Enterprises Enumerated	% of the No. of Enumerated Enterprises	Total Size of Employment	% of Total Employment
1. Large Centre (ie 50,000+)	343	34.3	809	29.9
2. Medium sized centres (20,000-49,999)	334	33.4	980	36.3
3. Small Centres (20,000)	326	32.2	909	33.7
TOTAL	1003	100%	2698	100%

However, there seemed to be no evidence to suggest that there was a relationship between the total number of employees in the enumerated enterprises and the size of population of the selected centres. The sampled survey brought out the characteristics of labour and income generated in the sector.

EMPLOYMENT CHARACTERISTICS OF THE SAMPLED UNITS

Employed generation in the petty commodity sector is a major aspect of all studies on the petty commodity producers. It is interesting to note the average size of employment per an enterprise and the likely changes in the total number of employees that may have taken place since the various enterprises were set up. It is also important to note the proportion of each type of employees as this gives an indication of the type of labour force dominating the sector and also the likely impact on employment generation in the future.

MEAN SIZE OF LABOUR FORCE PER INTERPRISE

In general most of the enterprises started with less than 10 employees. No significant differences were observed among the enterprises in the various centres (Table 3). The mean figures observed, however, concealed

important variations among the centres. A breakdown of the magnitude of the urban initial employment showed that 92% of all the sampled units began with less than 10 employees. 72.4% began with less than 5 employees. It was only the cement block manufacturing units and the auto repair unit which generally started with more than 5 employees per enterprise.

One would assume that with years as the operators find their feet in operating the various enterprises they will employ more hands. At the time of the survey, the mean size of employment per unit was about four people (see table 3). Again, a variance analysis test showed that the observed differences among the centres were not significant.

TYPES OF EMPLOYEES

Type of employees include the size of permanent or full time and part time employees per establishment, the proportion of apprentices, skilled workers and family members. Table 4 shows the percentage distribution of the types of employees in the sampled units. Most of the enterprises had at least one or two full time employees. Part time employment was not a significant form of employment neither were family employees. Most of the family employees were children and other relations of entrepreneurs who helped their parents and relations run their workshops on part time basis, particularly during school vacations. By far the most significant form of employment in the industrial sector was the apprenticeship system (66%). The system is common among carpentry, tailoring, dressmaking, metal working, auto and electrical repairing. Only 35% of the sampled enterprises employed wage labour most of whom might have completed their apprenticeship training. In general, the mean size of permanent employees per unit was greater in the large than in the medium sized and small centres and variance analysis test shows that this observed difference was significant.

INTENSITY OF EMPLOYMENT

It is difficult to calculate precisely the extent of which operators in the petty commodity production sector are employed in their activities owing to the nature of organisation of the enterprises. There are no specific conditions of work or no regimentation with respect to the number of days and hours one needs to work in a specified period. To obtain average figures of the number of hours and days worked in a period would require long periods of observation and recording. This was what Liedholm and Chuta (1976) did in their study of small-scale industries in Sierra Leone. In a study of informal sector manufacturing in Kumasi, Ghana, Aryee (1976) used output as a measure of the «intensity» of employment in the sampled enterprises. He assumed that:

> *«Given other factors of production, entrepreneurs who have higher levels of productivity could be judged to have higher degree or intensity of employment than those with lower productivity level» (Aryee 1976 p.5).*

TABLE 3 – MEAN SIZE OF EMPLOYMENT IN ALL SELECTED CENTRES*

Towns	Cape Coast	Winneba	Swedru	Saltpond	Elmina	Fosu	Asikuma	Komenda	Mankesim	All Centres
Mean	4.2 (5.91)	3.47 (5.0)	3.76 (5.64)	3.45 (3.93)	5.43 (4.43)	1.30 (3.45)	3.39 (6.12)	2.29 (3.07)	11.19 (5.81)	3.998
S. E.**	0.357	0.537	0.33	0.49	0.585	0.089	0.476	0.194	2.67	0.187
S. D.***	4.735	4.946	3.724	3.22	3.878	0.564	3.334	0.726	10.647	4.567
S. S.+	176	85	127	44	44	40	49	14	16	595

* Mean size of employment for enterprise at the time of the sampled survey.
** S. E. – Standard Error
*** S. D. – Standard Deviation
S. S.+ Sample Size.

TABLE 4 – DISTRIBUTION OF THE TYPES OF EMPLOYEES IN THE PETTY COMMUNITY IN ALL SELECTED CENTRES*

Type of Employee	Number of Employees					
	None	1–2	3–4	5–10	10+	Total
Part-time	69.4 (413)	16. (100)	8.4 (50)	4.1 (24)	1.4 (8)	100 (595)
Full-time	19.5 (116)	38.8 (231)	23.2(138)	13.7(22)	4.8(24)	100(595)
Skilled	65.5(390)	26.3(157)	4.6(27)	2.5(14)	1.2(7)	100(595)
Apprentices/ Unskilled	27.9 (116)	30.81 (183)	22 (131)	14.6(87)	4.7(28)	100(595)
Family	53.1(328)	35 (208)	7.1(42)	2.6(16)	0.2(1)	100(595)

* No. of respondents in brackets.

One cannot, however, rely very much on figures of output and income for the simple reason that such figures cannot be very reliable since most small-scale entrepreneurs do not keep records of expenditure and in most cases only recall figures from memory. In addition, such data need to be collected over a long period to enable one to discern the patterns and variations within them from period to period. Thus cross-sectional study like this one can only tell part of the story. «Intensity» of employment was calculated by means of the number of days of work in a week, number of months of business operation in a year, the number of «very busy» months and the number of «very slow» months.

The mean number of days worked per unit was about 6 days in a week. 82% of the units operated 6 days schedule and this predominance was recorded in all the centres. This schedule is typical of all the enterprises except in the bakeries in which the number of days worked depends very much on the availability of raw material inputs and rate of sale.

In all centres, all the sampled units operated fully for about 9 months of the years and closed or remained virtually inactive for 3 months of the year. In the small centres, where some of the entrepreneurs or operators were part time farmers and traders the «slow period» could be used profitably on their farms or in retail shops. During the months of operations, there were recognized peak periods for various activities. For instance, in the case of tailoring, dressmaking and industrial and personal services such as photography and hairstyling, the units usually experienced increased patronage just before and during periods like the local festivals, christmas, weddings and funerals.

In all the 9 selected centres, the mean months of operation was about 5 months but this differed from centre to centre. In general about 29% of all units sampled were busy for between 1–3 months; about 33% between 4 and 6 months; 32% between 7–9 months. A large proprotion of bakers (84%), cement blocks makers (92%), auto repairs (76%), electrical repairs (72%) and food preparation (94%) were busy for between 4–9 months, while most of the other units such as tailoring (83%), dressmaking (76%) and smithing (83%) were busy for only 1–6 months. Broadly, most entrepreneurs reckoned they operated below normal working schedule for between 1–3 months in a year.

INCOME GENERATION *(5)*

A discussion of employment generation in the petty commodity units without the earnings of the enterprise would not present a complete picture of the entire Petty Commodity sector. If anything at all turnover is an indication of the level of output in each enterprise. However, to obtain reliable data on turnover requires long periods of observation and enquiry and it is generally difficult to obtain any reliable figures. In general the mean weekly income for the sampled unit was ₵156. This compared favourably with the national minimum wage of ₵150 per month at the time of the survey (Table 5).

TABLE 5

MEAN WEEKLY TURNOVER IN THE PETTY COMMODITY SECTOR CENTRES (in Cedis)

States	Cape Coast	Winneba	Swedru	Saltpond	Elmina	Fosu	Asikuma	Komenda	Mankesim	All Centres	Large	Medium	Small
Mean	236.7	162.06	229.06	62.43	340.89	62.8	44.47	143.29	95.5	185.8	236.69	202.57	125.42
S.E.	36.99	20.11	41.31	7.68	196.27	13.23	12.66	29.75	17.89	20.61	36.99	26.08	42.38
S.D.	490.76	185.36	465.56	50.97	1301.89	83.67	88.58	111.33	71.57	563.24	490.76	379.69	609.77
S.S.	176	85	127	44	44	40	49	14	16	595	176	212	207

As table 5 shows, there was a close relationship between the mean weekly turnover and the size of centres. An analysis of variance showed that the observed differences in the mean weekly turnover among the large, medium sized and small centres are statistically significant. It thus suggests that there are greater opportunities for the generation of more income in the small-scale units in the large centres than in other centres. It is important to isolate the major factors that directly or indirectly have impact on income and employment generation in the petty commodity sector in the region. In such an exercise there are obviously a number of factors, or variables one may consider. These factors include type of human and sources of material and capital inputs used in the productive process and in particular entrepreneurial characteristics such as their educational backgrounds their age patterns, length of period of operating their enterprises et cetera. The emphasis on the entrepreneurs is justified on the grounds that they are nuclei around which the whole petty commodity sector revolves.

In discussing these factors, a model which brings together the variables enumerated above is developed. The variables are combined as independent variables in a basic multiple regression model. The same model is used for the size of income and employment generated.

Multiple regression analysis allows one to study the linear relationship between a set of independent variables and a number of dependent variables while taking into account the interrelationship among the independent variables. The linear combination can then be used to «predict» the value of the dependent variable.

The difference between the value of the dependent variable and the value predicted by the linear combination of the independent variable, is known as the residual (Norman H. Nie et al S.P.S.S. McGraw Hill 1970).

Analysis was done for all enterprises and all the centres combined and then disaggregated into main enterprises and centres and combination of centres.

By examining the signs and sizes of the regression coefficients one can become aware of the variables which have and are likely to have positive or negative impact on income and employment in the future. This may indicate policies which may be needed to promote the expansion of income and employment in the enterprises or to remove constraints to such objectives in areas where they can be applicable. The purpose of developing the models is not to attempt to use it to predict the future size of income and employment since it would be hazardous to undertake such an exercise but rather to examine the «direction» of relationships.

In such an exercise one cannot consider all possible variables in the model because most of them cannot be quantified or reduced to the form suitable for a regression analysis. It is in the light of this that the socio-economic characteristics of the entrepreneurs, which might shed light on their ability to operate their enterprises profitably, have to be emphasized. Thus there are several characteristics which can be hypothesised to have important effect on the size of income generated and employment in the enterprises studied. First the number of years during

which an entrepreneur has been operating an enterprise is significant. *(6)* All things being equal it is expected that entrepreneurs with considerable years of experience in operating their enterprises would have overcome the constraints to the smooth running of their enterprises. Normally in the early years of any business, entrepreneurs, particularly those starting on small-scale mainly through their own effort, face problem. However over the years, most of them make an effort to overcome most of the initial problems. They manage to build up contact networks for the supply of raw materials and spare parts and also they are able to obtain reliable sale outlets and sources of finance. Against this background, it is hypothesised that the value of income generated and the present size of employment are related to the number of years in business.

Related to the above is the age distribution pattern of the entrepreneurs themselves. *(7)* It may be assumed that the «older» entrepreneurs have been operating their enterprises for a much longer period that the «young» ones and thus apart from the experience that they may have acquired in running their enterprises, it is also likely that they have built up considerable internally generated resources for running and expanding their businesses. However, it may be said that the age pattern of the entrepreneurs alone may not be a useful guide in the discussion of the possibility for the expansion and/or the survival of certain petty commodity production units. The survey shows that «older» entrepreneurs were on the average more prevalent in the «traditional» and virtually «dying» units such as smithing whereas comparatively young «entrepreneurs» were found mainly in the «modern» petty production and repair units. Despite this relationship it is quite useful to examine the relationships between age of the entrepreneurs and the level of income and employment generation in the units studied. It is thus hypothesised that the age of an entrepreneur is positively related to the amount of income generated and the size of employment in an enterprise.

Another potentially important characteristics of the entrepreneurs is their level of education and type or source of their industrial training. *(8)* An acquisition of some form of education and training can contribute to an entrepreneur's managerial, organizational and technical skills and therefore, all things being equal, these variables should have positive impact on their productive capacity and thus on the size of the income and employment generated in each enterprise. However, it is difficult to assess the impact of formal education on the success of small enterprises. It could be true that some of the most essential attributes of a good craftsman can be acquired through formal education and training, yet it can also be true that such training cannot be substituted for flair and experience. Formal education can equip an entrepreneur with certain techniques and methods for solving problems but as to whether these have significant relationship with the success of small business cannot be easily ascertained. Some studies elsewhere have not found strong relationships between education and business success. *(9)*

In this study it was found that those with post middle school education obtained on an average higher weekly turnover (₵378) than those without any education at all (₵150) and those with up to middle

school education (¢159). However, a very weak simple correlation coefficient of 0.113 was found between the level of education and the size of employment and an even weaker correlation coefficient of 0.06 was found between the level of education and turnover. Despite these low coefficients it is possible that in the long run, the educated operators have some advantages over their uneducated counterparts. Increased education may «widen» the information field of the operators not only in seeking knowledge on prices and marketing of their products but also in dealing with the financial institutions in arranging for the necessary funds when the need arises. With this background, it is hypothesised that in general an educated entrepreneur has advantages over an uneducated one and thus, all things being equal, he or she should be able to achieve a higher level of turnover and employment than the uneducated counterpart.

Training is also an important factor for the success of small business especially the artisanal activities. It was found out in this study that most of the master craftsmen were trained through the traditional apprenticeship system. It is quite likely that an entrepreneur trained through this system is more likely to employ more apprentices than say skilled workers (as the case may be with those trained in the formal sector institutions). It is thus assumed that training in the formal sector confers more advantages on an entrepreneur than his counterpart who was trained in the traditional system.

It was found out that some operators were operating more than one business and thus were spreading their energies and resources. It is assumed that the operator who concentrates on one business is likely to devote alll his time and financial resources on that business and thus should be able to expand production and hence turnover as well as employment in his enterprise.

In addition to the operating characteristics of the operators themselves, some inherent characteristics of the enterprises were also used as independent variables in the model. These included the notion of work sharing or subcontracting among the enterprises and between them and the large scale or modern sector. «Worksharing» comes about when one enterprise is «overloaded» with work and thus divert part of the «excess» workload to other units. This occured among a few auto repair units. Though worksharing was not a significantly marked feature of the sampled enterprises, it has in-built advantages. It could ensure that enterprises engaged in such arrangements have work to do and therefore they should be able to maintain higher levels of turnover and probably employ more people than those who do not benefit from such an arrangement. Similarly those units which have subcontracting arrangements with formal sector institutions through direct sale of goods or services are assumed to obtain higher turnover and generate more employment than those without such arrangements.

Other variables considered are sources of capital and raw material inputs. Capital is very crucial to the survival of any economic undertaking, particularly for the very small-scale operator who normally finds it difficult to obtain capital from the formal sector sources. *(10)* It is thus hypothesised that given the imperfect capital market, one would expect

considerable advantages to accrue to entrepreneurs who had «direct» access to capital from formal sector sources. This advantage would enable operators to start their business on a larger scale and thus, all things being equal, they should be able to generate higher turnover or income and this could enable them reinvest part of the profits in their business. This in turn may directly or indirectly influence the size and nature of employment in the petty commodity sector. Again, operators who run their enterprises with only the internally generated capital would have lower economic profits than those who obtained capital from «formal» sector sources (Liedholm and Chuta 1976).

The same argument can be advanced in the case of the sources of raw material and spare parts inputs. Thus it is hypothesised that operators who obtained their inputs from the formal sector sources should be able to make more profits than their counterparts who had to rely on middlemen and other informal sector sources. *(11)*

Finally, the size of labour force per enterprise should be directly related to the income generated. Thus the bigger the size of the labour force, the more income or turnover is expected to be generated. *(12)* On the other hand it may not hold that the size of income generated would have direct and positive impact on the size of the labour force because not all operators were interested in employing more people despite their expected level of profits. *(13)* It is however expected that the level of income generated can have some positive influence on an operator's decision to employ a few more people in his enterprise.

In discussing the variables in the model, both income and employment have been discussed. However, in the model each of these would be used in turn as dependent variables. The hypotheses are examined empirically with the assumption that the characteristics are quite independent of each other. The hypotheses are examined together by statistically estimating single equation for each of the dependent variables of the following form:

$$(1)\quad O_E = a + b_1\, AG_P + b_2\, AG_E + b_3\, Ed_E + b_4\, T_E + b_5\, PRMoc + b_6\, S_F + b_7\, W_s + b_8\, I_o + b_9\, Ro + b_{10}\, RMs + b_{11}\, S_L + R$$

$$(2)\quad S_L = a + b_1,\, AG_p + b_2\, AG_E + b_3\, Ed_E + b_4\, T_E + b_5\, PRMoc + b_6\, S_F + b_7\, W_s + b_8\, I_o + b_9\, R_o + b_{10}\, RM_s + b_{11}\, O_E + R$$

where: a is a constant and b_1 .....b_{11} *are co-efficients to be determined. Most of the data are qualitative in nature and are therefore used as dummy variables.*

AG_P is the age of each enterprise. It was assumed that all enterprises set up before 1970 generate more income and perhaps employment than those set up after that date. Thus the dummy variable of one is assigned to those set up on or before 1970 and Zero to those set up after 1970. AG_E is the age of the operators.

Ed_E is the educational levels of the operators. A dummy variable of one is assigned to all with education (irrespective of the level of education) and Zero to those without any form of education at all.

T_E is the type of training received; a dummy variable of one is assigned to those who received training from the formal sector institutions and Zero to those who were trained under the traditional apprenticeship system.

PRMoc was the main occupation of the operators at the time of the survey. A dummy variable of one is given to those who were fully engaged in the enterprises sampled and Zero to those who had other major activities other than the sampled units.

S_F is sub-contracting or sale of products and services to formal sector institutions; a dummy variable of one is allocated to those with such arrangements and Zero to those without.

W_S is worksharing among informal sector enterprises; a dummy variable of one is assigned to those who share work among themselves on regular basis and Zero to those who do not.

I_C, R_C and RM_S represent sources of initial capital, capital for running the business and raw material/spare parts respectively. Dummy variables of one each to those enterprises whose operators obtained the initial capital to start their units mainly from the formal sector and Zero to those whose operators obtained their initial capital from informal sources. O_E is turnover. S_L is the size of the total labour force per enterprise. R is the residual.

RESULTS OF THE REGRESSION ANALYSIS

INCOME:

Table 6 presents the results of stepwise regression analysis. The squared multiple correlation coefficient or coefficient of determination (R^2) is very low and is thus a poor fit for variations observed in income of all the 595 units in the 9 selected centres. The regression line explains only 13% of the variations in income generated. Thus the 87% of the variations is accounted for by the residual. Some of the salient factors include the patterns of growth of the national economy and the problems associated with operating small enterprises. However, despite being low the R^2 is found to be statistically significant.

The low R^2 or explanatory power of the regression equation can be attributed to a number of factors. Perhaps the most important is the quality of data. It has already been pointed out that it is generally difficult to obtain reliable data on income from small-scale operators who do not normally keep records of day to day transactions and proceeds from sales and expenditure. A way out of this problem would have been to use time series analysis with data obtained for a number of years. It was impossible to use time series data so this study had to resort to the use of Cross-Sectional data. Also the use of dummy variables is a factor. This was reflected in the generally weak correlations between the dependent and independent variables in a correlation matrix generated in the analysis of the data. The highest positive correlation coefficient (o.24) was obtained for those enterprises whose operators have had some form of industrial training in the formal sector before setting up their enterprises. This is followed by the factors of main sources of raw materials and parts (0.19).

The low R^2 may also be due to the fact that most of the independent variables are not significant or because most of the relationships may not be linear given the complexities of the real world situation. The F-distributions obtained for the variables in equation show that only four variables can be considered to be significant. These are training, source of raw materials and parts, main present occupation of the operators and the size of the labour force enterprise (at the time of the survey). The rest are not significant because the F ratios obtained are below the theoretical ones for 5% and 1% level of significance. Due to the very low correlation coefficients obtained, one has to be cautious in using the terms «significant» and «insignificant» in describing the variables in the models.

An important aspect of the regression analysis is the size and sign of the intercepts. From table 6 it can be seen that the positive signs were obtained for training, sources of raw materials and parts, size of present employees, and subcontracting or sale of goods and services to formal sector institutions and enterprises. This may suggest that training is essential for increasing income generated in the Petty Commodity sector. The above four variables seem to support the hypotheses set. All others do not seem to have significant impact on income and employment generation in the Petty Commodity sector.

When each of the centres was examined separately it was found that the highest R^2 (0.99) was obtained for the enterprises operating in Elmina and the lowest R^2 (0.15) for those in Fosu. Both centres are categorised as small centres. Variations were also found among the various units covered in this main petty commodity study. The highest R^2 (0.99) was obtained for cement block manufacturing and the lowest for tailoring and dressmaking (0.19). Part of the differences in the R^2 observed in terms of both the units studied and the centres covered may be due to the sample sizes.

Size of Employment

Like the R^2 for income, a very low R^2 (0.15) was obtained for the size of employment. It is also found to be statistically significant. The reasons for low R^2 are the same as those discussed for income. Table 7 shows

that the main independent variables are the primary occupation of the operators, work sharing, income and linkages with the formal sector through sales of goods and services. Other variables do not have any significant association with labour force as hypothesised.

Variations in the explanatory power of the regression model were found among all enterprises in the various centres. The highest R^2 was obtained for enterprises in the large centre (0.47) and the lowest (0.17) for enterprises in the small centres. Among the various enterprises the highest R^2 was obtained for cement block manufacturing (0.96) and the lowest for those in the bakery industry (0.22). The differences in R^2 may partly be attributed to the differences in the sampled sizes.

The low R^2 obtained in the two models is an indication of the complexities of the real world situation. The results indicate that no direct relationship exists between the dependent and independent variables. However, very low R^2 of 0.09 and 0.12 were obtained for income and size of employment respectively through log transformation. Therefore the models need to be extended to include other variables. These could include types of employees, nature of demand pattern and seasonality of activities and perhaps the peculiar characteristics of the selected centres. In addition it would be necessary to consider the problems or constraints facing operators in this sector. These possible variables cannot be quantified and hence much of their explanatory power could be lost. It would be interesting to see how much these variables can add to the explanatory power of the models.

TABLE 6

VARIATIONS IN INCOME OF THE PETTY COMMODITY ENTERPRISES: REGRESSION MODEL (ALL THE 9 CENTRES)

Dependent Variables	Constant Term	AG_P	AG_E	ED_E	T_E	PR_{Moc}	S_F	W_S	I_C	R_C	R_{ms}	S_L	R^2
	121.01	–57.68	–1.45	–18.90	57.85	–14.21	70.55	–25.04	–	–15.94	17.53	17.58	0.3
	*	1.79	0.59	0.16	27.02	7.98	1.71	0.24	–	1.97	17.86	18.75	

– No regression coefficient calculated

* F-ratios

TABLE 7

VARIATIONS IN SIZE OF LABOUR FORCE OF THE PETTY COMMODITY ENTERPRISES: REGRESSION MODEL (ALL THE NINE CENTRES)

Dependent Variables	Constant Term	AG_P	AG_E	T_E	PRM_{oc}	S_F	W_S	I_C	R_C	RM_S	O_L	ED_E	R^2
SL	3.26	0.65	–0.01	0.08	0.31	1.11	1.11	0.01	0.18	0.02	0.002	0.71	0.15
	*2.23	0.22	0.53	40.12	4.23	13.59	0.11	2.26	0.23	0.23	18.72	2.17	

* F-ratio

SUMMARY AND CONCLUSIONS

The analyses presented in this paper suggest that the size of income and employment are largely related to opportunities for operating informal sector enterprises rather than to the mere size of an urban/rural centre. The size of employment in all the sampled enterprises shows the characteristic smallness of the petty commodity enterprises. A significant difference was found to exist between the three broad groups of centres in terms of the mean size of employment per enterprise at the time of the surveys.

Attempt has been made to build simple models to explain variations in income and size of employment observed among the various petty commodity units sampled. The main variables used in the models are characteristics of the operators and other salient operating characteristics of the enterprises. A number of variables were assumed to have significant impact on the dependent variables. Relevant hypotheses were set and the rational behind them briefly discussed. The R^2 obtained for income (0.13) and size of employment (0.15) were low but statistically significant. However, for both dependent variables different R^s were obtained for enterprises operating in different centres and also for the main enterprises sampled.

In terms of income, the main or significant independent variables obtained from the regression analysis are: industrial training, direct resources of raw materials and spare parts from formal sector sources, the main occupation of the operators and the size of labour force. In the case of employment, the main occupation of operators, worksharing, income and linkages with the formal sector were found to be the main variables. In both regression models the residual explained over 80% of the variation observed among the enterprises. The results of the regression analysis indicate that it is difficult to isolate major factors influencing income and employment generation in the petty commodity sector largely because of the complexities of the real world situation. One thus has to look elsewhere especially operators perception of the prospects for their business in the future, the probable mobility patterns and also in particular the problems they face in operating their enterprises. In particular the problems of inputs, finance, marketing, labour, physical, and managerial. Indeed the nature and the pattern of growth of the urban, regional, and national economy need to be considered.

NOTES

1. The literature on the informal sector is extensive. See for instance: Hart (1970, 1973), Sethuraman 1976, Merrick (1976), Mazumdar (1975), Webb (1975), Souza and Tokman (1976), Dasgupta (1973), Gerry (1974), Bose (1974), King (1974), Bromley (1978), Moser (1978), Bienefeld (1974), Weeks (1975), Remy and Weeks (1973), Muenchi (1977), Allen (1976). See also «The urban informal sector: critical perspectives» *World Development* Vol.6 No.9/10 Sept./Oct. 1978 for a series of articles on the informal sector.

2. All settlements with population size of 5000 or more are officially designated towns in Ghana.

3. The last nationwide census was held in 1970.
4. All centres which had population of 50,000 were labelled as large centres (Cape Coast is the only such centre in the sampled centres). All settlements with populations between 20,000 and 49,999 as medium sized centres. (In this respect Winneba and Swedru were categorized as the medium sized centres); all other centres were categorized as small centres.
5. Income is used here to mean, total receipts from the sale of goods and services. The term «profit» could have been used but with restricted meaning to total receipts over total expenditure. However, most small-scale operators do not keep records of accounts and may rarely distinguish between personal and business accounts.
6. About 66% of all units sampled were set up between 1966 and 1975 so that most of them had been operating for roughly between two to eleven years before the survey in 1977/78. Those enterprises set up before 1966 included smithing, bakery, carpentry, whereas most of the modern repair and production units were set up after 1966.
7. 52% of all the entrepreneurs were between the ages of 25 and 40. After this age group the proportion of entrepreneurs in other age groups decreases.
8. 25% of the operators have never been to school, only 13% have had more than 10 years of elementary school education.
9. Marris and Somerset (1971) p. 215, Mafziger (1970 p.349–60), Kilby (1965 p.92) quoted by De wilde (1971 p.17), others have indicated that some positive relationship exist. See Harris (1965) quoted by De wilde (1971 p.13), Aryee (1974, p.14).
10. 65% of all the sampled operators used their own savings and other private sources of capital to run their business.
11. Only a few petty commodity units obtained much of their supplies direct from the formal sector sources. These included cement block making and some units in the bakery industry. A large proportion of the sampled enterprises obtained their raw materials and spare parts inputs from varied sources (including both the formal and informal sector sources).
12. The size of the labour force is not the only issue here. The issue of labour rests also with the type of employees. The number of skilled viz a viz the number of apprentices can influence the quality of work produced by an enterprise and therefore, the level of patronage and hence the income generated in an enterprise: Secondly, it depends on the proportion of permanent viz a viz the number of part-time workers in an enterprise. In the analyses of the data, a weak correlations between weekly income and various types of employees were found. A weak correlation of 0.18 and 0.25 were found between weekly income and total labour force and weekly income and total full-time employees per enterprise respectively.
13. A large proportion of the sampled operators did not wish to increase their work force in the future despite the fact that some of them really had plans to physically improve or expand production in their enterprises. However, differences were observed among operators in the various units. In general a significant proportion of operators interviewed in what may be termed «modern» Petty Commodity enterprises like dressmaking (64%), tailoring (50%), hairstyling (67%), auto repair (42%) would like to employ extra hands if operating conditions improve. Comparatively small number of entrepreneurs operating the «older» enterprises (ie. those generally set up before 1970) wished to expand employment in the future.

14. The use of dummy variables as proxies for variables which cannot be quantified or measured in any particular manner; as proxies to qualitative factors (eg. – education, training, subcontracting, worksharing or as proxies to numerical factors (eg. age of enterprise) and other uses in regression model have been explained by A. Koutsoyiannis (1977 p.281–285, 18) and J. Johnston (1972, p.176–186).

REFERENCES

Allen, H.: «The informal urban industrial sector and growth: some thoughts on a modern mythology». *I.D.S. working paper.* University of Nairobi, 1976.

Aryee, G.: *Effects of Formal Education and Training on the Intensity of Employment in the Informal Sector: A Case Study of Kumasi.* World Employment Programme WEP, 2–18/WP.14 (Geneva, I.L.O. 1976).

Aryee, G.: *Small-scale Manufacturing Activities: A Study of the Interrelationships Between the Formal and Informal Sectors Kumasi, Ghana.* I.L.O. WEP 2–19/WP, 23 (Geneva I.L.O. 1977).

Bienefeld, M.A.: «The Self-Employed of Urban Tanzania» *I.D.S.*, University of Sussex, Discussion Paper No.54, 1974.

Bose, A.N.: *The Informal Sector in the Calcutta Metropolitan Economy.* W.E.P. Urbanization and Employment Research Programme, Working Paper No.5, (Geneva, I.L.O. 1974).

Bromley, R.: «The Urban Informal Sector; why is it worth discussing?» *World Development* Vol.6 No.9/10 pp.1033–1039. Pergamon 1978.

Dasgupta, B.: «Calcutta's Informal Sector» *I.D.S. Sussex. Bulletin* Vol.5 No.213, 1973.

De Wilde, J.: *The Development of African Private Enterprise.* I.B.R.D. Vol.II, Country Annexes 1971).

Gerry, C.: Petty Producers and the Urban Economy: A Case Study of Dakar, Geneva, I.L.O. W.E.P. Working Paper 1974.

Hart, K.: «Small-scale Entrepreneurs in Ghana and Development Planning» *Journal of Development Studies,* Vol.6 1970.

Hart, K.: «Informal Income Opportunities and Urban Employment in Ghana» *Journal of Modern African Studies* Vol.II (1), 1973.

Johnston, J.: *Econometric Methods.* McGraw Hill 1972.

King, K.: «Kenya's Informal Machine Makers: A Study of Small-scale Industry in Kenya's Emergent Artisan Society» *World Development* Vol.2 1974.

Koutsoyiannis, A.: *Theory of Econometrics* McMillan London, 1977.

Liedholm, C.: *Research on Employment in the Rural Non Farm Sector in Africa.* African Rural Employment Paper No.5. Department of Agric. Economics, Michigan State University, East Lansing, 1973.

Liedholm, C and Chuta, E.: *The Economics of Rural and Urban Small-scale Industries in Sierra Leone.* African Rural Employment Paper No.14, East Lansing 1976.

Marris, F. and Somerset, A.: *African Business: A Study of Entrepreneurship Development in Kenya.* Routledge and Kegan Paul, London, 1971.

Mazumdar, D.: *The Urban Informal Sector.* World Bank Working Paper No.211. July 1975.

Merrick, T.W.: «Employment and Earnings in the Formal Sector in Brazil. The Case of Belo Horizonte» *Journal of Developing Areas.* Vol.10 April 1976.

Munch, L.: A final demand approach to the informal sector and implication for public policies» I.D.S. Univ. of Nairobi, Workshop on the Informal Sector 1977.

Moser, C.O.N.: «Informal Sector or Petty Commodity Production: Dualism or Dependence in Urban Development?» *World Development.* Vol.6, No.9/10 Sept/Oct., 1978.

Nafziger, W.E.: «The Relationships between Education and Entrepreneurship in Nigeria». *Journal of Developing Areas.* Vol.4 April 1970.

Nie, N et al.: *S.P.S.S.* McGraw Hill, 1970.

Remy, D and Weeks, J.: «Employment, occupation and inequality in a non industrial city» in Karl Wohmuth (ed) *Employment Creation in Developing Societies. The situation of labour in dependent economics,* Praeger, New York 1973.

Sethuraman, S.V.: «The urban informal sector: concepts, measurement and policy» *International Labour Review.* Vol.114 No.1 July–August, 1976.

Souza P. Tokman V.: «The informal sector in Latin America» *International Labour Review.* Vol.114, No.3, November–December, 1976.

Steel, W.F.: *Small-scale Employment and Production in Developing Countries: Evidence from Ghana.* Praeger, New York, 1977.

Webb, R.: *The Urban Traditional Sector in Peru* I.B.R.D. Mimeo 1975.

Weeks, J.: «Policies for expanding employment in the informal sector of developing economies» *International Labour Review.* Vol.III June 1975.

«The urban informal sector: critical perspectives». *World Development.* Vol.6 No.9/10. Sept./Oct. 1978.

RESUME

Dans cet article, l'auteur essaie d'examiner les caractéristiques de l'emploi et du taux de création de revenus dans le secteur des petits commerces tels qu'on les trouve dans les centres ruraux et urbains de la région centrale du Ghana.

Les facteurs responsables des différences remarquées parmi les entreprises, dans divers centres, sont examinés dans une analyse de regression, en tenant compte des caractéristiques des entreprises en tant que variables indépendants. Il existe plusieurs facteurs : certains ne sont pas facilement identifiables. Les plus importants seront donc : le cycle du commerce, la qualité du travail, la capacité des entrepreneurs à évaluer les possibilités d'expansion de leurs entreprises dans l'avenir, et surtout les problèmes qu'ils rencontrent dans la gestion de leurs entreprises particulières. Le pouvoir de ces petites entreprises de créer un nombre d'emplois et des revenus appréciables dépend aussi de l'état de l'économie national