

# **The Size and Sources of Economic Rents in a Developing Country Manufacturing Labour Market**

**Francis Teal**

Centre for the Study of African Economies  
University of Oxford  
and  
St John's College, Oxford

June 1994

## **Abstract**

The size of rents to labour in a developing country urban labour market is documented in this paper. The data set used enables the relative importance of unions, firm size, profitability, ownership and firm age to be assessed. It is shown that all these factors affect earnings providing strong support for a rent sharing theory of wage determination in a developing country similar to much recent evidence for developed country labour markets.

JEL Classification: J30 and O55.

Key words: Labour markets, rent sharing, developing countries, unions.

---

The data used in this paper were collected by a team from the Centre for the Study of African Economies, University of Oxford and the University of Ghana, Legon as part of the Regional Program on Enterprise Development (RPED) organised by the World Bank. The questionnaire was designed by a team from the World Bank. The Ghana part of the study is funded by the Overseas Development Administration (ODA). Ursula Kretzer assisted both in collecting and cleaning the data. I would like to thank Andrew Oswald for his assistance and encouragement in the writing of the paper. Simon Appleton has been very patient and helpful in answering questions. All errors are mine.



# 1. Introduction

In the analysis of developed country labour markets much attention has been focused on the relationship between the rents firms may earn and wage setting behaviour. It has been found that large firms pay more than smaller ones, Brown and Medoff (1989), and that higher wages are reflected in higher productivity, Wadhvani and Wall (1991), Levine (1992). Both of these findings are consistent with rent sharing and efficiency wage theories of wage determination. In the developing country literature the source of rents has been identified primarily with the public sector. The dual sector model applied to urban labour markets in developing countries initially assumed an institutionally fixed wage in the formal or modern sector substantially above rural wages, Lewis (1954), Todaro (1969), Harris and Todaro (1970). "Earnings in the subsistence sector set a floor to wages in the capitalist sector, but in practice wages have to be higher than this, and there is usually a gap of 30 per cent or more between capitalist wages and subsistence earnings", Lewis (1954, p.150) While the formal sector was not necessarily public it was assumed that wage setting in the modern sector was effectively controlled by the public sector. A distinction was drawn between the urban formal and informal sectors; in the former wages were set substantially above the market clearing rate while in the latter wages were competitively determined. Developments of these models have drawn a distinction within the private sector between the capital using and non-using sector, Steel and Takagi (1983), and within the public sector between productive and unproductive activities, Gelb, Knight and Sabot (1991).

In the analysis of public policy towards public sector employment various models of wage determination have led to formulae for the shadow wage rate which depend crucially on the size of the gap between wages in the formal and informal sector; Sah and Stiglitz (1985) present a very general analysis. While there are numerous studies suggesting this gap is large - Barnum and Sabot (1977), Steel (1977), Mazumdar (1983), Little, Mazumdar and Page (1987) - the data used in these studies has not enabled the relative importance of alternative institutional factors in determining the size of the wage differential to be assessed. This is clearly an issue of some importance. In Ghana, the country from which the evidence presented in this paper is drawn, public policy has implicitly sought to reduce the rental element in pay by eliminating the favourable tax treatment of allowances and by encouraging privatization of public enterprises. Rent sharing theories of wage determination suggest that both these policies can reduce earnings but no empirical evidence exists as to the effectiveness of such measures. It is the object of this paper to provide such evidence and to assess the relative importance of various institutional factors in the determination of labour earnings.

In the next section the potential sources of rent to wage labour in Ghana that our data set enables us to identify are discussed - unionisation, profitability, ownership, firm age and size. Labour income can be decomposed into basic wages and allowances and this decomposition is exploited in section 3 to show that unions operate to raise labour income through allowances. A rent sharing theory of wage determination would suggest that the policy of consolidation would reduce labour income and we show in section 4 that there is evidence for such an effect. In section

5 we present evidence as to the relative size of the sources of rent in the labour market. Section 6 concludes with a summary of the major results.

## 2. The Sources of Rents

The data used in this study are drawn from two waves of a survey of employees in Ghana's manufacturing sector. The surveys were carried out in 1992 and 1993. Our data enable us to investigate five potentially important mechanisms by which formal sector employees can capture rents. There are two possible sources of these rents. Wages may be set above the market clearing competitive rate either by labour raising its cost in an imperfect labour market or by firms earning rents from an imperfect product market which the firm then chooses, or is compelled, to share with the workers. It is this distinction between sources of rents that has been exploited by Konings and Walsh (1994) to discriminate between the efficiency wage and rent sharing hypotheses. Our data is more limited and our purpose simply to compare the relative importance of the factors that have been identified as possible sources of rents.

The first, and most obvious, of the first source of rent is through the unionisation of the industry. In the post-second world war period the formation of unions was encouraged in many British colonial dependencies of which Ghana, then the Gold Coast, was one. There remains a strong centralised element in pay setting of which unions are one important component. The importance of unions as political factors in the economic policies of African states is argued by Bates (1981). The role of organised labour under the policies of structural adjustment is discussed in Herbst (1991).

The next potential rent, which is an example of the second source of rents, is that workers in more profitable firms will be able to capture some of those profits. Evidence that wage determination can be understood as the result of a bargaining process in which profitability is a key element has been presented by Christofides and Oswald (1992), and Abowd and Lemieux (1993) for Canada; by Blanchflower, Oswald and Sanfey (1993) for the US and by Nickell and Wadhwani (1990) for Britain. Abowd and Lemieux (1993) discuss in detail the problems posed by the endogeneity of the profits term. They find that instrumenting this variable greatly increases the size of the rent-sharing effect on earnings. For our data set we have instruments for profits in the financial position of the firm which affect profits but would normally be omitted from the wage equation. In section 5 we investigate the importance of this issue for our data set.

A third possibility the paper investigates is that older firms will pay more. If one mechanism of control of companies is that companies become more "visible" to the public sector with age then they may become more susceptible to pressure to increase wages. A fourth mechanism we investigate is the role of ownership. It has been argued that state firms and those with foreign ownership provide mechanisms by which workers can capture rents. "Wages paid by foreign-owned or partly foreign-owned firms are usually higher than those of domestic firms because social welfare legislation tends to be much more strictly enforced against such firms",

McDiarmid (1977, p.17). There appears to be very little evidence of the effects of firm age or ownership on earnings.

These effects, which are all institutional methods of capturing rents, can be compared with the size effects on earnings. Jones (1994) gives details of how the size and sector effects in this Ghanaian data set compare with the international evidence and finds a remarkable similarity between the Ghanaian data set and other comparable ones for both developing and developed countries. She shows there are substantial effects on earnings from firm size. In this paper the importance of size once profit and other financial variables are included in the analysis can be assessed.

During the period over which these surveys were carried out it was public sector policy to consolidate allowances into wages. As we will discuss further below substantial amounts of labour income were paid in the form of allowances which were usually additions to wages based on the occupational status of the worker. In our data set we can identify both the wage and allowance components of earnings and, as we show, there are important differences in the determinants of these components. There were two reasons for the policy of consolidation. The first was to improve the tax base for the government. The second was to limit the attractiveness of public rather than private employment. It was assumed that allowances were a more important aspect of employees earnings in the public than private sectors. During the first wave of the survey the policy of consolidation had been announced but not widely adopted. In the wave 1 questionnaire employees were asked their wages and firms were asked the allowances paid to employees. If some of the institutional factors determining labour income operate through allowances, rather than wages, then the policy of consolidation should have affected the rental element in earnings. We are able to show that there evidence that this is so.

In the earnings functions reported in the following sections we confine our attention to male workers. Women are excluded as they are concentrated in certain industries and give rise to distinct problems for analysis. For the data set used here it is particularly important to note that we have excluded apprentices who are young trainees usually to small firms whose only payment is frequently allowances. The role of allowances in that section of the labour market is arguably different from that in the worker sector so we exclude apprentices from this analysis. The fact that allowances are a relatively important source of earnings at both the lower and upper end of the labour market is a fact of considerable interest but one we do not consider further in this paper.

### **3. Wages and Earnings in Ghana's Manufacturing Labour Market**

In the data set we have measures of firm size, unionisation, ownership, profitability and firm age. In the last section it was noted that policy over the period of the surveys sought to consolidate allowances into basic pay. In this section we consider the determinants of both wages and earnings (ie wages plus allowances) for the first wave of the survey. Very little consolidation of allowances with wages had occurred in the first wave of the survey so it offers us an opportunity to examine labour

income determination before a substantial change instituted by public policy. Table 1 presents the results of a standard earnings regression for both wages and earnings for all male workers and all private sector male workers in the first wave of the survey. The dependent variable in columns [1] and [3] is the natural log of wages and in columns [2] and [4] it is the natural log of earnings. The standard human capital determinants of earnings are modelled as age, age squared, years of education and tenure. Table 1 shows that, for the first wave of the data, the determinants of wages are significantly different from those of earnings. The union effect more than doubles in size when we move from wages to earnings and this is true both for all workers and private sector workers alone. With the exception of the union effect the changes in the coefficients on other variables is small between the two regressions. There is some increase in the size coefficient. The effect of profits per employee on wages is better defined for wages than for earnings. With the exception of job tenure, which is not well defined for either definition of labour income, the human capital effects on earnings and wages are all well defined and identical for both wages and earnings. The other sources of rents do not vary between the two definitions of remuneration. There are no effects on labour income from ownership and increases in firm age reduced both wages and earnings. The results reported in table 1 strongly suggest that some of the institutional factors identified above matter much more than others. Unions, profits and firm age all alter wages and earnings. Only unions operate through the allowances aspect of earnings. In the next section we examine both waves of the data to establish whether the policy has affected this outcome.

#### 4. Unions as Sources of Rents

In this section we consider if the policy of consolidation has altered earnings as a result of the changes in the tax treatment of allowances. We begin by presenting evidence that, as a result of the policy, allowances as a proportion of earnings decreased substantially between the two waves of the survey. Table 2 presents data for the two waves for both wages and earnings by sector, firm size and location. While the same firms were interviewed in both waves of the survey the same workers were not. In order to standardise for changes in the composition of the sample between the two waves table 2 presents the comparative data for production workers with an intermediate level of education, ie. from 6-10 years. The table shows that on average the importance of allowances in earnings declined from 30.3 to 10.5 per cent between the two waves of the survey. This figure may exaggerate the extent of the fall in the importance of allowances. In the second wave of the survey allowances were asked of the workers rather than of the firm. While many firms, particularly the larger ones, had consolidated wages with allowances, some had not done so. Further some workers were unclear as to how much of their pay was wage and how much allowance. Also, as a result of conducting the interviews, it became apparent that the use of the term allowance varied across the firms in the sample. In collecting the data the instruction issued to the enumerators was to ensure no double counting. It is possible that in avoiding such double counting earnings in the form of allowances were recorded as wages. While these caveats qualify the results presented in table 2 we would argue that the effects are too large and too systematic

to be explained by such factors. While the data collected may exaggerate the extent of the fall it is clear that the policy of consolidation has changed the importance of allowances in earnings. If this is so we would expect to observe a significant change in the union effect on earnings in the second wave of the data.

To test that hypothesis we consider a pooled data set of both waves of the regression. The results are reported in table 3 column [1]. In order to test whether there are significant changes between the two waves of the data we run the pooled data set with year dummies. As in table 1 we confine the sample to male workers. There is a substantial change in the effect of the union variable between the two waves of the survey. In the first year unions raise wages by 28 per cent for all workers. In the second wave this effect declines by 25 per cent leaving a small net effect of about 3 per cent in the second wave of the data. This very large and highly significant effect suggest that, at least in the very short term, public policy has succeeded in substantially reducing the union premium. This data is, as far as we are aware, the only source of a test of the effect of public intervention in altering the union rents available to workers. With the exception of the union dummy the only significant changes between the waves were to one of the location variables and one of the occupational categories. Both of these findings almost certainly reflect measurement error as the sample size is small for both the categories. The results reported in table 3 column[1] allow for these shifts between the two waves by including the interactive terms. The regressions also control for location, sector and occupational effects.

## **5. The Relative Size of Rents from Profitability, Ownership, Age and Size**

Table 3 reports in column [1] our preferred equation estimated by ordinary least squares (OLS) explaining the determinants of earnings for all male workers for both waves of the survey. The problem with this specification is that profits per employee is clearly an endogenous variable. In the data set we have information on the financial position of the firm and we use that information to obtain instruments for the profits per employee variable. We also test whether the ownership variables, which are not significant in the OLS estimation, do affect profits and thus have an indirect effect on earnings. Table 3 column [2] reports the results of a two stage least squares (2SLS) estimation in which financial variables and ownership dummies act as instruments. The effect is to raise very substantially the coefficient on the profit term and to eliminate the significance of the size coefficient.

The regression in Table 3 column [2] enables us to compare the relative importance of unions, size, ownership, age and profitability in the determinants of earnings for our pooled data set. The results show that unions, profitability and firm age are all highly significant determinants of earnings. Further, firm age enters with a negative sign. The hypothesis advanced in the introduction that older firms being more "visible" would be more likely to pay higher wages appears to be incorrect. One possible reason for this result is that older firms in Ghana are larger and have been adversely affected by the recent trade and financial liberalisation measures. These measures have reduced protection and substantially raised the price of capital to

larger firms. If firm age is correlated with an adverse effect on profitability then the finding that age reduces earnings would be further evidence for a rent sharing view of wage determination in Ghana.

In order to assess the roles of size and ownership we need to consider the reduced form equations for profits per employee and earnings reported in table 4. It appears that foreign owned firms do not pay higher wages, except in so far as they are larger or more unionised than domestic firms. In Ghana most foreign ownership comes from the local Lebanese community and relatively little from foreign owned multinational companies. What we have identified as foreign ownership in our data set may well have different implications from economies where foreign ownership means control external to the economy. In contrast to the findings for foreign ownership state ownership reduces earnings through an adverse effect on profits. The OLS regression is misleading in suggesting that ownership is unimportant as ownership affects profits which do have a highly significant effect on earnings.

In the introduction we noted that the existence of a gap between formal and informal sector wages was simply assumed in many dual economy models. One problem with establishing the size of this differential has been that a comparison of rural with urban wages requires an allowance for the different costs of living in rural and urban areas. Indeed in the case of Ghana it has been suggested that, once allowances have been made for the differential costs of living between rural and urban areas, that wages for rural and urban unskilled workers are very similar, Rimmer (1992, p.130 citing Rourke and Sakyi-Gyinae (1972)). Our data set enables us to establish the size of the gap between informal and formal sector firms in a clearer way than some alternative data sources as all workers in our sample were located in urban areas.

Before presenting our results we show in table 5 how important are the relationships between the various potential sources of rents that we can analyze from this data set. It is clear from table 5 that state and foreign ownership is concentrated in larger firms. It is also the case that all large firms are unionised; large in this context means firms employing more than 100 people. Firm age tends to increase with size as do profits per employee although micro enterprises are an exception. Table 5 shows that profits per employee in the first wave were substantially higher in micro enterprise (those with less than five employees) than small enterprises (those with from 5-29 employees). One possible reason for this finding is that for micro enterprises there is no simple way of separating the labour income to the entrepreneur from the profits to the fixed factor. However as this pattern is not repeated for the second wave of the data it may be the case that measurement error is more serious in the first wave.

Table 6 presents our results and sets out the earnings gain available to an average worker for both waves of the survey. For wave 1 joining a union raises earnings by 31 per cent. To assess the implications of moving from a relatively unprofitable to a relatively profitable firm we have used the average measure of profits for a large firm as compared with a small one. We have excluded micro enterprises as, for reasons just given, there are ground for believing the profit numbers are over-stated. Thus working in a relatively profitable firm so defined raises wages by 24.7 per cent in Wave 1 and by 37.9 per cent for Wave 2. In their study of US data Blanchflower, Oswald and Sanfey (1993) find that "a two-standard deviation rise in profitability increases the long run level of pay by a little over eight



per cent". We have not adopted this manner of measuring the profit effect as it seems clear from a comparison of the OLS with the 2SLS estimation that much of the profit effect in this data set is operating through the size measure. If we focus simply on the unionisation and profitability effects we obtain a differential of 54 per cent for formal workers in a unionised, profitable firm relative to other workers for the first wave of the data. In the second wave this differential is reduced to 45 per cent. Workers in older firms would have a lower premium.

## 6. Summary and Conclusions

The question of how, and why, wages paid to labour are above its supply price is an issue of central policy importance in any economy. In this paper the how part of that question has been investigated for a developing country manufacturing labour market. The data set we have used is unusual in two respects. First, it allows us to investigate the relative importance of various institutional factors in the determination of earnings all of which have been suggested as means by which labour can capture rents such that their wage is above their opportunity cost - unionisation, profitability, ownership, firm age and size. Second, during the period over which the data were collected, the composition of earnings between basic wages and allowances altered so the effect of changes in allowances on earnings can be assessed.

We have used both these distinctive features of the data to show that unionisation has been a very importance determinant of earnings, that this effect operates primarily through allowances and that, possibly only in the short term, public policy has greatly reduced the differential. In the first wave of our data the union differential was 31 per cent. Estimates of union effects in developing countries are scarce. In his survey of urban developing country labour markets Squire (1981) gives no figures for the union premium similar to those available for OECD countries summarised in Blanchflower and Freeman (1992). Our first year estimate is larger than those found for the OECD countries.

In assessing the relative importance of the institutional factors we can identify from our data set all, except foreign ownership, were significant determinants of earnings. This finding regarding foreign ownership appears consistent with earlier research, Knight (1975) citing Reuber et al. (1973). There was a very important effect due to profits. Older firms paid less. This finding is consistent with a rent seeking explanation of wage differentials as older firms in Ghana are larger ones and these have been particularly adversely affected by the trade and financial liberalisation reforms introduced since 1988. While there were large effects from firm size on earnings if the endogeneity of profits was ignored this affect disappeared in the 2SLS estimation of the earnings function.

Both the unionisation result and the profits result are consistent with a rent sharing interpretation of the data. These rents are large. A worker in a profitable, unionised firm had a wage premium of 54 per cent for the first wave of the data and a premium of 45 per cent for the second wave. It appears that the differential of 30 per cent suggested by Lewis (1954) forty years ago rather understates the current level of the differences between formal and informal sector earnings.

## References

- Abowd, J.A. and Lemieux, T. (1993) "The effects of product market competition on collective bargaining agreements: the case of foreign competition in Canada", *Quarterly Journal of Economics*, vol. CVIII, 4 November, pp.983-1014.
- Barnum, H.N. and Sabot, R.H. (1977) "Education, employment probabilities and rural-urban migration in Tanzania", *Oxford Bulletin of Economics and Statistics*, 39, 2, May, 109-126.
- Bates, R.H. (1981), *Markets and States in Tropical Africa: The Political Basis of Agricultural Policies*, University of California Press, Berkeley.
- Blanchflower, D.G and Freeman, R.B. (1992) "Unionism in the United States and other advanced OECD countries", *Industrial Relations*, 31, 1, Winter, 56-79.
- Blanchflower, D.G., Oswald, A.J. and Sanfey, P. (1993) "Wages, profits and rent-sharing", May, mimeo, IES, Oxford.
- Brown, C. and Medoff, J. (1989) "The employer size-wage effect", *Journal of Political Economy*, 97, 5, 1027-1059.
- Christofides, L.N. and Oswald, A.J. (1992) "Real wage determination and rent-sharing in collective bargaining agreements", *Quarterly Journal of Economics*, August, 985-1002.
- Harris, J.R. and Todaro, M.P. (1970) "Migration, unemployment and development: A two-sector analysis", *American Economic Review*, 60, 126-42.
- Herbst, J. (1991) "Labour in Ghana under structural adjustment: The politics of acquiescence", Chapter 9 in Donald Rothchild (ed.) *Ghana The Political Economy of Recovery*, SAIS African Studies Library, Lynne Rienner Publishers, Boulder and London.
- Gelb, A., Knight, J.B. and Sabot, R.H. (1991) "Public sector employment, rent seeking and economic growth", *Economic Journal*, 101, 408, 1186-99.
- Jones, P. (1994) "Wage determination in the urban labour market in Ghana", mimeo, CSAE, Oxford.
- Knight, J.B. (1975) "Wages in Africa: what should a foreign firm do?" *Oxford Bulletin of Economics and Statistics*, 37, 2, May, 73-90.
- Konings, J. and Walsh, P.P. (1994) Evidence of efficiency wage payments in UK firm level panel data", *The Economic Journal*, 104, 424, May, pp.542-555.
- Little, I.M.D., Mazumdar, D. and Page, J.M. (1987) *Small Manufacturing Enterprises: A Comparative Analysis of India and other Economies*, Oxford University Press for the World Bank.
- Levine, D. (1992) "Can wage increases pay for themselves? Tests with a production function", *Economic Journal*, September, 102, 1102-1115.
- Lewis, W.A. (1954) "Economic Development with Unlimited Supplies of labour", *The Manchester School*, May, 22, 2.
- Mazumdar, D. (1983) "The rural-urban wage gap migration and the working of urban labour market: An interpretation based on a study of the workers in Bombay City", *Indian Economic Review*, 18, 2.
- McDiarmid, O.J. (1977) *Unskilled Labour for Development: its Economic Cost*, The John Hopkins Press, Baltimore for the World Bank.
- Nickell, S. and Wadhvani, S. (1990) "Insider forces and wage determination" *Economic Journal*, June, 100, 496-509.

- Reuber, G.L. (et al.) (1973) *Private Foreign Investment in Development*, Oxford University Press.
- Rimmer, D. (1992) *Staying Poor: Ghana's Political Economy, 1950-90*, Pergamon Press, Oxford.
- Rourke, B.E. and Sakyi-Gyinae, S.K. (1972) "Agricultural and urban wage rates in Ghana", *Economic Bulletin of Ghana*, 2nd Series, 2(1).
- Sah, R.K. and Stiglitz, J.E. (1985) "The social cost of labour and project evaluation: a general approach", *Journal of Public Economics*, 28, 135-163.
- Squire, L. (1981) *Employment Policy in Developing Countries: a Survey of Issues and Evidence*, Oxford University Press for the World Bank.
- Steel, W.F. (1977) *Small-scale Employment and Production in Developing Countries: Evidence from Ghana*, Praeger Publishers, New York.
- Steel, W.F. and Takagi, Y. (1983) "Small enterprise development and the employment-output trade-off", *Oxford Economic Papers*, 35, 423-446.
- Todaro, M.P. (1969) "A model of labour migration and urban unemployment in less developed countries", *American Economic Review*, 59, 138-48.
- Wadhwani, S.B. and Wall, M. (1991) "A direct test of the efficiency wage model using UK micro-data", *Oxford Economic Papers*, 43, pp.529-548.
- White, H. (1980) "A heteroscedasticity-consistent covariance matrix estimator and a direct test for heteroscedasticity", *Econometrica*, 48, 817-838.

**Table 1 Wage and Earnings Equations for Male Manufacturing Sector Workers (Wave 1 Data)**  
Dependent variable: Columns [1] and [3] ln(wages) Columns [2] and [4] ln(earnings).

	All Workers		All Private Sector Workers	
	Wages [1]	Earnings [2]	Wages [3]	Earnings [4]
Constant	6.51 [20.62]	6.56 [21.59]	6.47 [19.99]	6.52 [21.01]
Age	0.06 [3.74]	0.067 [4.59]	0.063 [3.85]	0.069 [4.68]
Age <sup>2</sup>	-0.0007 [-3.31]	-0.00077 [-4.25]	-0.00072 [-3.50]	-0.0008 [-4.41]
Tenure	-0.003 [-0.68]	0.001 [0.24]	-0.0019 [0.38]	0.0027 [0.57]
Education (in years)	0.024 [3.45]	0.024 [3.68]	0.021 [2.67]	0.022 [2.96]
Ln(Firm Size)	0.074 [2.47]	0.083 [2.81]	0.097 [2.98]	0.11 [3.29]
Union	0.09 [1.1]	0.235 [3.19]	0.12 [1.43]	0.26 [3.41]
Some Foreign Ownership(FOR)	-0.07 [-0.97]	0.006 [0.09]	-0.123 [-1.63]	-0.052 [-0.79]
Some State Ownership (STATE)	-0.52 [-0.72]	0.079 [1.14]		
Profits per Employee) (PROFEMP)	0.04 [4.22]	0.023 [2.29]	0.035 [3.28]	0.016 [1.52]
Firm Age	-0.00357 [-1.65]	-0.006 [-3.09]	-0.0035 [-1.63]	-0.0066 [-3.16]
Number of observations	351	351	312	312
Breusch-Pagan $\chi^2$ (D.F.)	63.6 (25)	37.8 (25)	59.54 (24)	28.9 (24)
Adjusted R <sup>2</sup>	0.44	0.514	0.459	0.54

The figures in [ ] parenthesis are t statistics where the standard errors have been corrected for heteroscedasticity by the method due to White (1980). The regressions reported in this table control for location, sector and occupation effects.

**Table 2**  
**Weekly Wages and Earnings in Cedis for a Production Worker with 6 - 10 Years of Education**  
**By Firm Sector, Size and Location**  
**Wave 1 (1992) and Wave 2 (1993)**

	Wages in 1992	Earnings in 1992	Wages in 1993	Earnings in 1993	Allowances as a % of Earnings 1992 1993	
Bakery	4,269	7,482	3,115	4,024	42.9	22.6
Food	4,301	5,129	5,352	5,452	16.1	1.8
Furniture	5,127	6,585	6,831	6,908	22.1	1.1
Garments	3,941	4,959	4,988	6,759	20.5	26.2
Machines	4,569	6,400	6,184	8,484	28.6	27.0
Metal	4,828	6,704	6,058	6,569	28.0	7.8
Textile	3,296	4,479	5,423	5,875	26.4	7.7
Wood	3,959	5,508	4,615	5,361	28.1	13.9
Large	4,151	6,039	6,928	7,654	31.2	9.5
Medium	4,906	6,213	5,927	6,525	21.0	9.2
Small	4,341	5,463	5,786	6,124	20.5	5.5
Micro	none	none	6,731	6,859	.	1.9
Accra	4,584	6,366	6,499	6,839	28.0	4.9
Kumasi	4,663	5,752	5,105	5,490	18.9	7.0
Takoradi	3,493	4,231	5,019	9,334	17.4	46.2
Cape Coast	none	none	3,461	3,461	.	0.0
Total	4,458	5,913	6,018	6,500	24.6	7.4

In 1992 (Wave 1) of the survey workers were asked their basic wage and firms were asked for the allowances by the category of the worker. To obtain the data for earnings the data for firm level earnings was merged with the individual level data. In 1993 (Wave 2) workers were asked both wages and allowances. Thus there was no need for the wave 2 survey to use firm level data in the determination of earnings. The sectors and locations given in this table are those used as the controls in the regressions reported in this paper.

**Table 3**      **Earnings Equations for Pooled Data Set**  
**All Male Manufacturing Sector Workers**  
Dependent variable:  $\ln(\text{Earnings})$

	[1] <u>OLS</u>	[2] <u>2SLS</u>
Constant	6.64 [28.48]	6.75 [27.02]
Age	0.06 [5.87]	0.06 [4.86]
Age <sup>2</sup>	-0.0007 [-5.43]	-0.00065 [-4.43]
Tenure	0.0037 [ 1.28]	0.003 [0.83]
Education (in years)	0.03 [5.24]	0.028 [4.44]
Ln(Firm Size)	0.058 [2.75]	0.023 [0.83]
Union (1992)	0.25 [4.15]	0.27 [4.13]
Any Foreign Ownership (FOR)	0.02 [0.54]	
Some State Ownership (STATE)	-0.003 [-0.051]	
Profits per Employee (PROFEMP)	0.026 [1.99 ]	0.25 [ 3.55]
Firm Age	-0.0059 [-3.89]	-0.004 [-2.43]
Union*Year Dummy	-0.22 [-3.09]	-0.20 [-2.76]
Number of observations	723	723
Adjusted R <sup>2</sup>	0.51	0.36
Breusch-Pagan $\chi^2$ (D.F.)	135.7 ( 29)	
$\chi^2(4)$ (Sargan test for validity of instruments)		7.58

The figures in [ ] parenthesis are t statistics where the standard errors have been corrected for heteroscedasticity, White (1980). The regressions reported in this table control for location, sector and occupation effects. The sample was restricted to firms with positive value-added and to full time workers, defined as those working more than 35 hours per week.

**Table 4 Modelling Reduced Form for Profits per Employee and Ln(Earnings)**

	Profits per Employee	Ln(Earnings)
Constant	-0.34 [-0.72]	6.76 [29.68]
Age	0.025 [1.29]	0.059 [5.74]
Age <sup>2</sup>	-0.0003 [-1.33]	-0.0007 [-5.24]
Tenure	0.008 [1.42]	0.0043 [1.48]
Education (in years)	0.0077 [0.719]	0.028 [5.14]
Ln (firm size)	0.139 [2.95]	0.055 [2.59]
Union	-0.069 [-1.49]	0.221 [3.59]
Firm Age	-0.008 [-2.39]	-0.006 [-4.02]
Union*Yeardum	-0.176 [-1.11]	-0.271 [-3.81]
<u>Instruments</u>		
STATE	-0.455 [-3.61]	0.054 [0.90]
FOR	0.139 [1.22]	0.054 [1.23]
Overdraft per Employee	0.324 [3.23]	0.145 [4.13]
Formal borrowings per Employee	0.132 [2.63]	0.041 [1.98]
Informal Borrowings per employee	-0.795 [-2.343]	-0.397 [-2.73]
Number of observations	723	723
Adjusted R <sup>2</sup>	0.155	0.526
Breusch-Pagan $\chi^2$ (D.F.)	1978.2 (31)	150.0 (31)

The figures in [ ] parenthesis are t statistics where the standard errors have been corrected for heteroscedasticity, White (1980). The regressions reported in this table control for location, sector and occupation effects. The sample was restricted to firms with positive value-added and to full time workers, defined as those working more than 35 hours per week.

**Table 5 Ownership, Unionisation, Profits per Employee and Size**

	State [%]	Percentage Foreign [%]	Unionised [%]	Profits per Employee [Cedis]	Firm Age [Years]	Size [Number]
<b>WAVE 1 DATA</b>						
Large [N=21]						
Mean	14	48	100	1,158,510	25	268
STD	36	51	0	2,813,971	16	255
Medium [N=28]						
Mean	4	36	50	758,814	15	52
STD	19	49	51	1,515,359	8	20
Small [N=76]						
Mean	5	7	9	275,613	13	15
STD	22	25	29	476,549	10	7
Micro [N=29]						
Mean	0	3	0	332,115	15	4
STD	0	19	0	405,570	12	1
All [N=154]						
Mean	5	17	27	496,640	15	54
STD	22	38	45	1,305,226	12	127
<b>WAVE 2 DATA</b>						
Large [N=19]						
Mean	5	47	100	1,673,233	23	251
STD	23	51	0	2,793,190	16	264
Medium [N=41]						
Mean	10	27	49	682,390	18	51
STD	30	45	51	1,074,601	11	18
Small [N=85]						
Mean	2	9	8	389,079	12	14
STD	15	29	28	714,465	10	7
Micro [N=29]						
Mean	0	7	0	315,755	13	3
STD	0	26	0	333,229	12	1
All [N=174]						
Mean	4	17	26	586,195	15	47
STD	20	38	44	1,227,968	12	113

N is the number of observations and STD is the Standard deviation.



**Table 6 The Size of the Rents in Ghana's Manufacturing Labour Market**

	Wave 1	Wave 2
Mean earnings in Cedis per Week of a production worker with intermediate levels of education	5,913	6,500
<b>Increment in earnings in cedis per week from:</b>		
Joining a union (a)	1,743	471
Working in a more profitable firm (b)	1,460	2,460
Moving from a firm aged 5 to one aged 30 (c)	-621	-683
<b>Rents from Unionisation and Profitable Firms as % of Basic Earnings:</b>	54	45

(a) This estimate is obtained from the union coefficients in table 3 column [2].

(b) From table 5 a large firm in Wave 1 made a profit per employee of Cedis 1,158,510 as compared with a small firm's profits of Cedis 275,613. The percentage increase in earnings is calculated as the rise implied by moving from a small to a large firm of average profitability. A similar calculation is done for the Wave 2 data.

(c) The fall of 10.5 per cent is obtained from the coefficient on firm size in table 3 column [2]. The percentage change is the same for both waves of the survey.

## Appendix of Variable Definitions and Sample

### Variable Definitions

Age	The age of the worker.
Age <sup>2</sup>	The age of the worker squared.
Education	The education of the worker in years. This variable was constructed from answers as to the final stage of school or university completed. It is treated as a continuous variable although we cannot measure years of education from this data set quite that precisely.
Tenure	Years in current job.
Ln (Firm Size)	Log of size of firm in terms of employees. There is an element of discretion as to how this variable is defined for the second wave of the survey as a distinction was made between full time and total employees. The definition of size uses simply full time employees for the second wave on the grounds that that is as comparable as possible with Wave 1.
Union	Dummy variable =1 if firm has any union members.
Union*Year Dummy	Dummy variable = 1 if firm has any union members in Wave 2 of survey. This variable acts to capture the shift in the union variable between the two waves of the data.
Firm Age	The age of the firm in years.
PROFEMP	The profits per employee for the firm. This variable was calculated by taking sales revenue less wages less intermediate inputs and indirect costs. There is no allowance for depreciation.
STATE	Dummy =1 for some State Ownership (if the firm had both state and foreign ownership it was placed in the FOR category)
FOR	Dummy =1 for any Foreign Ownership. The omitted category is thus firms with solely Ghanaian owners.

#### The location dummies included in the regressions are:

KUM	Dummy variable = 1 for workers living in Kumasi
TAK	Dummy variable = 1 for workers living in Takoradi
CAPE	Dummy variable = 1 for workers living in Cape Coast

#### The occupational dummies included in the regressions are:

MGMT	Dummy = 1 for management
ADMIN	Dummy = 1 for administration
SALES	Dummy = 1 for sales
TECH	Dummy = 1 for technical
SUPER	Dummy = 1 for supervisor
MASTER	Dummy = 1 for master

#### The sector dummies included in the regressions are:

FOODS	Dummy = 1 for Food Sector
BAKERY	Dummy = 1 for Bakery
WOOD	Dummy = 1 for Wood Sector
FURN	Dummy = 1 for Furniture Sector
METAL	Dummy = 1 for Metal Sector
MACHINES	Dummy = 1 for Machine Sector

Financial variables used as Instruments:

Overdraft per employee

This variable refers to Wave 1 of the data. It is the sum of all the overdraft facilities available to the firm.

Formal Borrowing per employee

This variable refers to Wave 1 of the data. It is the sum of all the formal sector borrowing of the firm, ie borrowing from banks and other formal sector institutions.

Informal Borrowing per employee

This variable refers to Wave 1 of the data. It is the sum of all borrowing from friends, relatives, moneylenders and other informal groups identified by the survey.

**Sample**

The sample had to be restricted to firms for which the financial and other firm level information was available. Firms with negative value-added were dropped on the grounds that such a result implied substantial measurement error in the firms financial variables. Firms which acted as co-operatives were dropped on the grounds that they were indistinguishable in structure from micro firms but would have been classified as large. One firm which only appeared in Wave 2 data had large profits and well above average wages. We dropped this firm from the sample as it caused a highly significant shift in the coefficient on profits per employee between the two Waves of the data. Its inclusion would have strengthened the results on profits reported in the paper.

