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# A Comparison of Ghanaian Civil Servants' Earnings Before and After Retrenchment

Harold Alderman  
Sudarshan Canagarajah  
Stephen Younger

CORNELL FOOD AND NUTRITION POLICY PROGRAM



**A COMPARISON OF GHANAIAN CIVIL SERVANTS' EARNINGS  
BEFORE AND AFTER RETRENCHMENT**

**Harold Alderman  
Sudharshan Canagarajah  
Stephen Younger**

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Harold Alderman is with The World Bank Policy Research Department, Poverty and Human Resources Division; Sudarshan Canagarajah is also with The World Bank, West Africa Department, Population and Human Resources Division; and Stephen Younger is a Senior Research Associate with CFNPP. The authors would like to thank Peter Orazem and Guilherme Sedlacek for helpful comments on the topic and also to express appreciation for the field support provided by S.A. Laryea-Brown.

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## ABSTRACT

Public sector retrenchment programs can generate significant savings of public expenditure. Governments are, however, often reluctant to embark upon such programs due to concerns for social costs. As a contribution to the understanding of the welfare implications of public sector retrenchment, this paper presents an ex-post evaluation of the earnings of former Ghanaian civil servants before and after their layoff. Earnings function for the current period are compared with earnings function for the time the individuals were in the civil service, with controls for selection into current employment.

The returns to human capital are found not to differ before and after retrenchment; earnings simply shift down, and the amount of that shift depends only on the redeployee's location before redeployment and the sector in which he or she currently works. Average earnings for those redeployees currently working fell by 48% of earnings at the time of employment in the civil service. That number falls to 27% an income stream equal to 10% of severance pay per year is added to current earnings. Those individuals who have found wage employment - twenty percent of those currently employed - had a much smaller reduction of earnings. The estimates indicate that the income in terms of earnings plus return on severance pay actually increased.

## 1. INTRODUCTION

Rapid growth of public sector employment has been an important feature of most African economies since independence. To some extent, this growth reflects a once popular belief that the state should be at the center of economic activity, but political patronage has also been an important motivation. Whatever the cause, the consequences are severe. Burgeoning payrolls cause fiscal deficits and crowd out other spending, especially in the development and operations and maintenance accounts. Reductions of over-staffed government bureaucracies are essential to reversing this state of affairs.

Public sector retrenchment programs can generate significant savings of public expenditure. Even with the initial expense of severance compensation packages, estimates of rates of returns from civil service redeployment in several developing countries range from 21 to 300% (Svejnar and Terrell 1991; Mills et al. 1993).<sup>1</sup> Nevertheless, governments are often reluctant to embark upon such programs due to concern for social costs. That is, offsetting such quantifiable gains to reducing civil service payrolls, there are concerns that retrenchment will result in appreciable unemployment among former civil servants, possibly leading to attendant political problems.

There are, however, few studies of retrenched worker's actual employment and earnings. As a contribution to the understanding of the welfare implications of public sector retrenchment, this paper presents an ex-post evaluation of the earnings of former Ghanaian civil servants before and after their layoff. We begin with a brief review of some of the salient features of Ghana's redeployment program followed by a discussion of some of the methodological issues that underlie the comparison of earnings prior to and following redeployment.<sup>2</sup> We then report estimates of total earnings at the time of redeployment and a subsequent period, using these results to indicate the extent of net changes in earnings plus severance pay.

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<sup>1</sup> These calculations reflect the gross savings from compensation not paid. In theory, one should net out any diminished production due to retrenched employees' absence. In many cases, however, public sector workers' productivity is probably zero or worse, so using the gross figures is appropriate.

<sup>2</sup> Redeployment is the term that the Government of Ghana uses in lieu of retrenchment.

## 2. REDEPLOYMENT IN GHANA

At the time Ghana embarked on a major program of economic reforms in 1983, the civil service and state owned enterprises (SOEs) combined employed over 4.5% of the entire population, the highest figure we are aware of for any African country.<sup>3</sup> The public sector wage bill contributed to a cycle of fiscal deficits, and consequent recourse to the inflation tax. Moreover, with the government unable to expand revenues at pace with the work force, real wages declined so that by 1984 unskilled wages in the civil service were 27% of what they were only 8 years before (Mills et al. 1993). In the same period, wages for skilled workers declined to only 7% of their earlier level, encouraging many such workers to migrate abroad.

Any attempt to deal with the incentive and productive impacts of wage compression and overall wage decline clearly had to address the over-staffing problem. A first step taken in 1986 was to pare fictitious workers through audits and by shifting to a system of payment by bank draft. More importantly, government began to redeploy civil servants, including employees of the Ghana Education Service in 1987. Between 1987 and June 1992, 59,810 civil servants, over 18% of the civil service and education service roster were redeployed, and the program continues at a slightly reduced pace.

The criteria for selecting redeployees are, in order of priority:

- 1) employees with falsified qualifications or "... whose work and conduct have persistently been negative and who can be dispensed with." (Ghana Government, 1990.)
- 2) employees older than 60, the mandatory retirement age.
- 3) employees with physical infirmities that seriously handicap their performance.
- 4) employees who volunteer to be redeployed, on the condition that their employment is not critical to the performance of their ministry or office.
- 5) employees who were most recently hired.

Except for a few ministries that the government explicitly exempted (the Ministry of Health and teaching staff in the Ghana Education Service), these rules were

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<sup>3</sup> The reform package is discussed in Alderman (1991). Civil Service reform is described in De Merode (1993) and in Alderman, Canagarajah, and Younger (1993).

applied across the civil service. While the first criterion leaves open the possibility of using redeployment for personal or political ends, that appears not to have happened to any significant extent. After a large number of non-teaching staff in the Ghana Education Service were released in 1987, redeployment appears to have followed points 2), 4), and 5), the objective criteria.

Most redeployees have come from the lower echelons of the civil service. Of the posts that the Ministry of Mobilization and Social Welfare could classify, more than 80% of redeployees held unskilled jobs. This is consistent with formal staff appraisals which show that over-staffing in Ghana is most acute in unskilled posts while many skilled positions remain difficult to fill because government salaries for skilled personnel are not competitive. This implies that the process of redeployment did not likely entail a major loss in public sector productivity due to the loss of skilled workers. However, it also implies that since most redeployees held low-paying jobs, the budgetary savings from redeployment are lower than the proportion of civil servants laid off. They are, nevertheless, substantial; De Merode (1993) estimates the budgetary savings in 1991 attributable to reduced compensation to be 8.8 billion cedis, about 8% of the civil service wage bill, or 2.5% of total government expenditure. Mills et al. (1993), calculate the rate of return to be over 60%.

Each redeployee under the mandatory retirement age is entitled to a severance package equal to 4 months' base pay plus 2 additional months' for each year of uninterrupted service. Those older than 60 are entitled only to their regular pension benefits. In addition, the government announced its intention to provide employment counseling, retraining, and courses in entrepreneurial development as well as land, tools, and inputs for potential farmers. A few programs were initiated as part of the Program of Action to Mitigate the Social Costs of Adjustment (PAMSCAD), most notably food-for-work schemes for redeployees that have returned to rural areas. In practice, these programs were very slow to emerge. Before 1991, the vast majority of redeployees neither applied for nor received any benefits other than their severance pay. For example, by mid-1990 only 4% of redeployees had participated in any form of retraining (Govt. of Ghana, 1990).

Severance pay for all redeployed workers in Ghana up until 1991 averaged approximately \$700 with compensation rising significantly over time from \$383 in 1987 to \$1003 in 1991 (Mills et al. 1990).<sup>4</sup> This rise parallels the rise in real civil service salaries on which compensation is based, including a 1991 salary unification that brought several allowances into the base pay on which severance pay was calculated. In a survey of redeployed workers (see below), Alderman, Canagarajah, and Younger found that those workers who indicated that they volunteered for redeployment received roughly 50% more in compensation than those who were involuntarily redeployed. This reflects differences in length of service and associated base salaries rather than any explicit premium for volunteering.

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<sup>4</sup> This is low relative to programs in other countries, even within Africa (cf. Kingsbury).

The average redeployee was more likely to be over 55 and more likely to be female than the general public sector work force (Alderman, Canagarajah, and Younger). In addition to mandatory retirements, the former concentration of redeployees may also be due to workers closer to the statutory retirement age being also more likely to volunteer for redeployment. The latter observation stems from the fact that women also had fewer years of job specific experience and were thus more vulnerable to the "last in-first out" rule for involuntary redeployment. There is no evidence that redeployment in Ghana has discriminated against married women on the basis that they provide a 'second income' or against any ethnic group (Alderman, Canagarajah and Younger).

### 3. MEASURING THE IMPACT OF RETRENCHMENT

The net income loss for an individual who is redeployed can be expressed in term of the difference between the severance package and the change in the present value of his or her earnings stream.<sup>5</sup>

$$\Delta \text{ PERMANENT INCOME} = \int E_{\text{private}} - \int E_{\text{public}} - \text{TRANSITION} + \text{SEVERANCE}$$

Transition costs include the standard search costs of finding other work, along with lost income during the period of unemployment. Severance pay may help to offset these costs. While severance pay is optional and may come in several forms; in Ghana, the government paid it as a lump sum at the time of redeployment.

The largest component of the change in income, however, probably comes from the difference in earnings (E) in the public and private sectors. This may include the loss of job specific skills which accumulate with experience in the former job and are rewarded as such. This is not specific to public sector employment; similar losses can occur with transitions between private sector employment (Kletzer, 1989; Carrington 1993). Slightly different, but similar to job specific efficiently acquired through experience, is the wage advantage to finding a good job match in which one's inherent abilities match the singular requirements of the job. That is, redeployees may have been especially well-suited to public sector jobs, with higher productivity (and thus higher wages) than in private employment. Being forced to lose this good job match lowers a redeployee's future earnings.

In addition to these standard considerations, there may be a specific rent or premium for public sector employment if public sector earnings exceed those in the private sector. This may occur if the former is more likely to be unionized or subject to legal mandates for the provision of benefits. Similar, wages in the public sector may be more likely to conform to minimum pay scales and provisions against gender or other discrimination than in the private sector. A number of studies have attempted to measure differences in wages across sectors, either in terms of formal and informal employment, variously defined, or in terms of government and other wage employment. Such studies are often sensitive to the means of controlling for sample selection within a segmented market.<sup>6</sup>

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<sup>5</sup> See for example, Diwan (1993).

<sup>6</sup> See, for example, van der Gaag and Vijverberg (1988). Magnac (1991) indicates that testing for wage differentials is related to, but distinct from tests of segmentation.

Even more difficult to measure is the value to the individual of lax enforcement of attendance; public sector employees may be more likely, indeed, more able, to hold more than one job. Public sector employees often appear to be paid less than private sector workers unless such moonlighting is taken into consideration (van der Gaag, Stelcner, and Vijverberg 1989).

The discussion above implies that in order to propose a compensation that attracts volunteers, or to predict the welfare impacts on individuals involuntarily redeployed, one needs detailed information on the determinants of wages in different sectors including an understanding of selection into the public sector or proof that wages adjust competitively. What does it imply for an ex post assessment of changes in income as is undertaken in this study? In an ex post study there is no need to model the choice of entry into the public sector - all individuals in the sample have made that choice - and the interpretation of any changes in earnings is conditional on that choice. There remains, however, a need to model any labor market selection subsequent to redeployment. This study uses a multinomial logit (MNL) to model sectorial choice and to provide selectivity corrections for subsequent OLS regressions (Trost and Lee 1984). The selection-corrected earnings equations for current earnings are compared to similar equations for the earnings of the same sample prior to redeployment. That is, we estimate total earnings from all occupations at two points in time, the month of redeployment and the interview date.<sup>7</sup>

The study concentrates on earnings rather than wages, in part to recognize the importance of moon- or day- lighting. We also look at earnings rather than wages because most redeployees are now self-employed and it is difficult to accurately measure their hours worked in the informal sector, especially in agriculture. In addition to comparing overall earnings, we test whether there are specific differences in determinants of earnings. For example, we test whether there is a premium on education in the public sector, as was observed by Alderman and Kozel (1989), or whether gender discrimination is different in the public sector. Specific details of the estimates are presented in the context of the data and results.

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<sup>7</sup> These are not the same across the sample. Redeployment occurred between 1987 and 1991. Interviews were undertaken from May 1991 until January 1992.

#### 4. DATA AND RESULTS

The study is based on a survey of 506 former civil service employees conducted between May 1991 and January 1992. The sample was drawn from a list of Ghanaian civil servants redeployed between 1987 and 1990 provided by the Ministry of Mobilization and Social Welfare. For financial reasons the sample was restricted to redeployees in three regions — Greater Accra, Ashanti, and Central regions. These three regions accounted for 54% of redeployees. The sample includes only civil servants; comparable records for employees redeployed from the SOEs are not available.<sup>8</sup>

Finding new employment does not appear to have been difficult. The time between redeployment and the date of the survey ranged from one month to four years, with a median of 2.25 years. Two thirds of the sample had no spell of unemployment following retrenchment, and another 20% found work within one year after redeployment. Nevertheless, 77 individuals (15%) were not working at the time of the survey.<sup>9</sup> This group, for which current earnings are unobservable, forms one branch of the MNL selection equation.

We explored several options for grouping the remaining redeployees, including divisions by type of employment (agriculture, other self-employment, and wage work), number of jobs held, and pooling all working redeployees as one group. In the end, the most useful distinctions are workers who are in the wage vs. the self employed sector and, for the latter, a distinction between being fully employed vs. underemployed. The first division is obvious.<sup>10</sup> The second division stems from the fact that many redeployees who claim to be farming do not, in fact, appear to be working very hard at it. Over 40% of the sample (227 cases) claimed agriculture as their primary source of income at the time of the interview. However, while 20% of these redeployees are working less than one acre, virtually no farmers in the 1987-1988 Ghana Living Standards Survey (GLSS) did so. Thus, although the sample exhibits a fair amount of urban to rural migration and subsequent farming activity, the activity is often distinctly

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<sup>8</sup> More details on the sample can be found in Alderman, Canagarajah, and Younger (1993). That paper also discusses the process of tracking respondents and the survey response patterns.

<sup>9</sup> Most of the redeployees in this group are out of the labor force rather than unemployed. By the traditional definition, in terms of searching for work, only 3% of the sample are unemployed (a figure that is close to GLSS results).

<sup>10</sup> We also explored a distinction between formal sector workers - defined as those who have wage jobs and were allowed both paid holidays and paid sick leave and other wage workers. As earnings equations do not differ between formal and informal wage earners, however, we aggregated these categories.

different than that of the general agricultural community and may be a transitional activity. In all, there are 77 redeployees who are not working, 90 wage earners, 37 underemployed farmers, and 302 other workers.

The results from the selection equations are presented in Table 1. Wald tests reject the hypothesis that all coefficients in each branch are zero. Similarly we reject the hypotheses that all coefficients are equal across groups or that all coefficients except the constants are equal ( $p < .001$  for each test). While the main objective of this step of the analysis is to create the sample selection variables used in the earnings function rather than to investigate the determinants of sector selection, a few of the parameters in Table 1 are noteworthy. In particular, redeployees who had either an agricultural or a non-agricultural second job at the time they were redeployed are much more likely to have employment at the time of the survey, a fact which could be useful in designing redeployment programs. While information on second jobs may be concealed and, thus, unavailable to the firm or government in making mandatory layoff decisions; workers themselves will take account of their readily available alternatives, so those who have second jobs may be more willing to volunteer for redeployment in exchange for a severance package.

The coefficients on total years of work experience and civil service experience are generally significant, with the former increasing the probability of finding new work (within the relevant range of years) and the latter decreasing it. Taken together, these suggest that some pre-civil service experience eases the transition. In addition, high unearned income reduces the probability of working in any sector, consistent with the notion that leisure is a normal good. The coefficient on severance pay, however, is positive for all groups, though statistically different from zero only for the main group of self-employed, non-underemployed workers. One plausible explanation for this, consistent with other findings in Alderman, Canagarajah, and Younger (1993), is that in the presence of poorly functioning capital markets, a large amount of severance paid in lump-sum allows a redeployee enough start-up capital to get a small enterprise off the ground. Finally, women are less likely to enter wage employment, an issue to which we will return.

Our earnings functions include a set of variables that are standard in the analysis of wage rates (work experience, education, gender, and physical location) along with others that may affect a worker's decision on hours worked (unearned income, being of retirement age, and the dependency ratio). In addition, we include some variables that may be of specific importance to our sample (experience in the civil service -a former job- and the year of redeployment). Kletzer (1989) argues that former experience may be generally useful and thus be reflected in current wages. The year of redeployment can determine current wages if early redeployees had more restricted opportunities than later workers yet find the transition costs sufficiently high to discourage subsequent job search as the economy improves. This would give a negative sign. However, the year specific dummy variables may also capture other cohort effects; if retrenchment began with the least effective workers, there may also be a negative coefficient on the dummy variables for earlier years. Finally,

Table 1 —Multinomial Logit Equation for Sector of Current Employment

Regressor	Sector								
	Self-Employed			Wage Employment			Underemployed Farmer		
	Beta	t-stat	d(Prob)	Beta	t-stat	d(Prob)	Beta	t-stat	d(Prob)
Constant	-1.58	-1.11	-0.32	-3.26	-1.72	-0.37	-5.50	-2.37	-0.31
Total Employment Experience	0.26	2.80	0.05	0.49	3.31	0.06	0.38	2.59	0.02
Total Experience <sup>2</sup> (x10 <sup>-2</sup> )	-0.39	-2.63	-0.08	-0.99	-3.30	-0.11	-0.51	-1.83	-0.03
Civil Service Job Experience <sup>1</sup>	-0.12	-1.15	-0.02	-0.22	-1.55	-0.03	-0.37	-2.39	-0.02
Civil Service Job Experience <sup>2</sup> (x10 <sup>-2</sup> )	0.17	0.73	0.03	0.47	1.30	0.05	0.62	1.69	0.03
Urban Resident <sup>1</sup>	-0.59	-0.97	-0.12	0.13	0.16	0.01	0.46	0.57	0.03
Central Region <sup>1</sup>	-0.34	-0.68	-0.07	-0.30	-0.50	-0.03	0.10	0.13	0.01
Ashanti Region <sup>1</sup>	-0.60	-1.48	-0.12	-1.17	-2.29	-0.13	0.52	0.79	0.03
Age > 55	-0.76	-1.68	-0.15	-0.42	-0.80	-0.05	-0.95	-1.30	-0.05
Dependency Ratio	0.20	0.43	0.04	-0.59	-1.06	-0.07	0.30	0.44	0.02
Gender=Female	0.14	0.34	0.03	-2.04	-3.54	-0.23	0.67	0.97	0.04
Dependency Ratio x Gender	0.56	0.88	0.11	2.05	2.49	0.23	0.61	0.69	0.03
Logarithm of Severance Pay	0.12	2.08	0.02	0.12	1.64	0.01	0.06	0.69	0.00
Logarithm of Unearned Income	-0.14	-3.70	-0.03	-0.21	-4.00	-0.02	-0.10	-1.55	-0.01
Primary Education	2.60	1.76	0.52	-0.13	-0.07	-0.01	2.89	1.45	0.16
Middle Education	0.12	0.16	0.02	-1.12	-1.24	-0.13	-1.01	-0.84	-0.06
Secondary and Higher Education	-1.37	-1.41	-0.27	-2.30	-1.88	-0.26	1.04	0.53	0.06
Primary* Years Since Redeployment	-0.90	-1.97	-0.18	-0.44	-0.77	-0.05	-1.51	-2.11	-0.08
Middle* Years Since Redeployment	-0.16	-0.60	-0.03	-0.07	-0.20	-0.01	-0.38	-0.93	-0.02
Secondary* Years Since Redeployment	0.52	1.18	0.10	0.73	1.47	0.08	-1.63	-1.31	-0.09
Non-Agricultural Second Job <sup>1</sup>	2.31	3.03	0.46	2.25	2.76	0.26	-0.54	-0.41	-0.03
Agricultural Second Job <sup>1</sup>	1.77	3.89	0.35	0.65	1.16	0.07	2.88	4.59	0.16
Time Since Redeployment	0.23	0.25	0.05	0.94	0.85	0.11	1.73	1.14	0.10
Time Since Redeployment <sup>2</sup>	0.00	0.02	0.00	-0.12	-0.66	-0.01	-0.19	-0.74	-0.01
Redeployed in 1987	0.17	0.16	0.03	0.33	0.26	0.04	-1.57	-1.00	-0.09
Redeployed in 1988	-0.11	-0.10	-0.02	-0.79	-0.57	-0.09	-0.62	-0.34	-0.03
Redeployed in 1989	-0.29	-0.28	-0.06	-0.64	-0.52	-0.07	-0.52	-0.31	-0.03
Redeployed in 1990	0.26	0.37	0.05	-0.25	-0.29	-0.03	0.83	0.65	0.05

<sup>1</sup> These variables are measured as of the time of redeployment. All others are measured at the time of the survey.

each equation includes the Mills ratio from the selection equation described above to control for sample selection bias.

The small number of observations for underemployed farmers and, to a lesser degree, wage earners make estimates of these groups' earnings functions imprecise. Nevertheless, a Wald test fails to reject the hypothesis that the slope coefficients are the same between equations. The intercepts, however do differ. That is, the earnings functions for these different groups are parallel, but shifted up or down according to the sector. Maintaining this hypothesis allows us to pool the three employed groups, including dummy variables in the pooled regressions to allow the intercepts to vary.

We must, however, account for the endogeneity of these dummy variables, which reflect the selection into each sector. Discussing an example in which a single endogenous dummy variable is the parameter of interest, Heckman (1990) points out that results that correct for endogeneity of dummy variables using simple instrumenting techniques are often robust relative to more complicated sample selection models, although failure to address endogeneity can lead to biases. Here we instrument the two endogenous dummy variables with the predicted logit probabilities. We also use a common sample selection variable for the pooled sample based on the probability of being employed in any sector.

Table 2 indicates the pooled current earnings function for all 429 individuals employed at the time of the interview. It is noteworthy that the standard human capital variables are not different from zero. None of the four variables for civil service or total job experience are significant, nor are any combinations jointly significant. Similarly, lower levels of education have no impact on earnings; the coefficient on secondary or higher education is only marginally significant.<sup>11</sup> Current earnings are mainly determined by the sector in which one works and the area of residence at the time of redeployment. This latter effect persists even for those no longer remaining urban areas. In addition, the earliest cohort of retrenched workers currently earn less although they have had a longer time to find a good job match. Gender is significant only in the regression which excludes sector selection. We return to this issue subsequently.

Table 3 indicates total and civil service earnings for currently employed redeployees at the time of redeployment. Before comparing coefficients of the current earnings with those at the time of redeployment, one further step needs to be undertaken. Current earnings are influenced by unearned income (pensions, remittances etc.); earnings decline moderately (but not significantly) with

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<sup>11</sup> Glewwe (1991) also found that years of schooling was a poor predictor of wages in Ghana.

**Table 2 —Regressions for Current Earnings (Conditional on Working)**

Regressor	Selectivity Corrected		OLS	
	Beta	t-stat	Beta	t-stat
Constant	8.83	18.92	8.88	20.76
Total Employment Experience	-0.01	-0.31	-0.02	-0.55
Total Experience <sup>2</sup> (x10 <sup>-2</sup> )	0.03	0.39	0.02	0.31
Civil Service Job Experience <sup>1</sup>	0.03	0.69	0.06	-1.51
Civil Service Job Experience <sup>2</sup> (x10 <sup>-2</sup> ) <sup>1</sup>	-0.08	-0.82	-0.13	-1.35
Urban Resident <sup>1</sup>	0.51	2.98	0.52	3.13
Central Region <sup>1</sup>	-0.20	-1.21	-0.36	-2.31
Ashanti Region <sup>1</sup>	0.02	0.12	-0.39	-2.78
Age > 55	0.03	0.20	0.05	0.32
Dependency Ratio	0.12	0.73	0.06	0.41
Gender=Female	-0.18	-0.84	-0.47	-2.94
Dependency Ratio x Gender	0.06	0.27	0.19	0.94
Logarithm of Unearned Income	-0.02	-1.16	-0.03	-2.08
Primary Education	0.09	0.39	0.06	0.30
Middle Education	0.01	0.04	0.09	0.61
Secondary and Higher Education	0.37	1.69	0.57	2.74
Redeployed in 1987	-0.42	-1.97	-0.19	-0.96
Redeployed in 1988	-0.30	-1.41	-0.35	-1.65
Redeployed in 1989	-0.08	-0.39	-0.05	-0.25
Redeployed in 1990	-0.10	-0.57	-0.18	-0.99
Wage Sector	1.19	1.92		
Underemployed	-2.02	-3.42		
Mills Ratio	0.00	0.01		

<sup>1</sup> These variables are measured as of the time of redeployment. All others are measured at the time of the survey.

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**Table 3 —Total Earnings While in the Civil Service**

	Total Earnings				Civil Service Salary Only	
	OLS		Bias-Corrected		Beta	t-stat
	Beta	t-stat	Beta	t-stat		
Constant	9.63	56.76	9.67	56.15	9.30	59.99
Total Employment Experience	-0.01	-0.54	-0.01	-0.44	0.00	0.05
Total Experience <sup>2</sup> (x10 <sup>-2</sup> )	0.06	1.64	0.06	1.65	0.01	0.25
Civil Service Job Experience <sup>1</sup>	0.01	0.58	0.01	0.40	0.00	-0.17
Civil Service Job Experience <sup>2</sup> (x10 <sup>-2</sup> ) <sup>1</sup>	-0.03	-0.69	-0.02	-0.50	0.03	0.74
Urban Resident <sup>1</sup>	0.18	2.51	0.17	2.23	0.16	2.43
Central Region <sup>1</sup>	0.08	1.23	0.09	1.28	0.11	1.68
Ashanti Region <sup>1</sup>	-0.05	-0.83	-0.08	-1.24	0.03	0.45
Age > 55	-0.07	-0.94	-0.05	-0.65	0.06	0.83
Dependency Ratio	0.08	1.65	0.10	1.86	0.05	0.99
Gender=Female	-0.24	-3.33	-0.18	-2.47	-0.24	-3.65
Dependency Ratio x Gender	-0.05	-0.75	-0.04	-0.58	-0.08	-1.33
Primary Education	-0.08	-0.99	-0.08	-0.96	0.15	1.97
Middle Education	0.02	0.36	0.03	0.54	0.22	3.82
Secondary and Higher Education	0.25	2.78	0.26	2.79	0.46	5.54
Redeployed in 1987	-0.20	-2.25	-0.18	-1.98	-0.12	-1.45
Redeployed in 1988	-0.27	-2.92	-0.26	-2.71	-0.19	-2.19
Redeployed in 1989	-0.12	-1.37	-0.12	-1.32	-0.09	-1.16
Redeployed in 1990	-0.12	-1.52	-0.10	-1.26	-0.12	-1.58

<sup>1</sup> These variables are measures as of the time of the survey. All others are as of the time of redeployment.

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higher unearned income in keeping with leisure being a normal good.<sup>12</sup> The survey did not obtain data on remittances and unearned income at the time of redeployment, implying an omitted variable bias in the civil service earnings function. We address this by assuming that the correlation of the variables in the redeployment equation and the omitted variables is the same as it was at the time of the interview. Thus, using this correlation and the coefficients of remittances and other income from the current earnings equations we can correct the other coefficients and their standard errors. These corrections appear in Table 3 under the heading of bias corrected coefficients. As one can see, they do not differ appreciably from the OLS estimates.

The structure of earnings differs little between periods. For earnings before retrenchment, the standard human capital variables also have little influence, with the exception of secondary and higher education. More importantly, the coefficients on job specific experience in the civil service are not different zero (nor are they jointly significant).<sup>13</sup> Thus, one of the avenues through which a displaced worker can lose earnings in theory, the loss of job-specific experience, is not relevant to the redeployees in Ghana because their pre-retrenchment earnings did not reflect such experience.

In the earlier period female employees earned less than their male counterparts, controlling for differences in education and in labor force experience. As these are earnings rather than wage equations, this reflects both wages and hours worked. However, the equation for civil service earnings alone also has a similar significant negative coefficient for gender. Because civil service hours are not at the discretion of the worker, this implies a difference in wages across genders. Moreover, the most likely explanation for lesser female labor market participation, dependent children, is included in the regression and is not significantly different from zero. The gender effect differs from results reported by Glewwe (1991) which show that women in Ghana earn the same as men in both government and non-government employment controlling for schooling and experience.<sup>14</sup>

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<sup>12</sup> The probability of working also declines with remittances. There is some risk of reverse causality - remittances may increase when earnings are reduced if the redeployee can rely on informal social insurance networks. However, in other regressions we separated remittances from other unearned income (mostly pensions) that is less likely to be endogenous. The coefficients on each variable were close to those reported here, and each was significantly different from zero.

<sup>13</sup> This result holds even if we exclude total experience, which is correlated with civil service tenure.

<sup>14</sup> Glewwe's study is based on 237 government and 152 private employees (25% of whom are women) from the GLSS data. His study covers a period that is a subset of the period covered in the civil service equations here. As gender bias in wages is prevalent worldwide, it would be of interest to obtain

(continued...)

The civil service earnings regressions have a pattern of lower earnings for individuals who were redeployed in 1987 and 1988. This may reflect changes in civil service pay scales as much as attributes of the workers. However, taken in conjunction with the similar pattern for current earnings, it is at least plausible that there are real cohort effects, sorting on average levels of worker productivity.

The equations for earnings at the time of redeployment also resemble current earnings in that workers in urban areas earned more when in the civil service than their rural counterparts. The only differences between common coefficients that are large relative to their standard errors are urban residence and residing in the Central region. In fact, we cannot reject the hypothesis that all the coefficients are the same across the civil service and current earnings functions with the exception of the constants and the "location" variables (urban residence and the regional dummies). This implies that the difference between former and current earnings is a downward shift in the intercept of the earnings functions, with the shift differing only by location of the redeployee's former civil service job. In terms of our earlier discussion, then, what redeployees have lost is neither returns to job-specific experience nor a higher rate of return to other human capital variables (e.g. education), but rather a premium to civil service employment which shows up in the intercept of the earnings function. This could reflect either a good job match, above-market earnings provided by a non-competitive employer, that is a rent to a particular sector, or some other segmentation of wage and non-wage sectors.

An alternative way of looking at the change in earnings is to regress the difference between current and civil service earnings (for those employed) on a set of both times varying and fixed variables. The estimating equation is:

$$\ln(y_{cu}) - \ln(y_{cs}) = X\beta + Z_{cu}V_{cu} - Z_{cs}V_{cs} + U\delta + \epsilon \quad (1)$$

where  $y$  is the redeployee's earnings,  $X$  is a vector of time-invariant regressors that affect his or her earnings (e.g. gender, education, year of redeployment),  $Z$  is a vector of time-varying determinants of earnings (e.g. age, years of experience, number of children), and  $U$  is a vector of regressors that are applicable and/or available only for the current period (the sector of current employment). The subscripts indicate time, with  $cu$  being the time of the interview and  $cs$  being the month just prior to redeployment. The  $\beta$  coefficients are equal to the difference of the coefficients in the current and former earnings functions,  $(b_{cu} - b_{cs})$ .

The approach here differs from the more common fixed effects methodology used in panel studies, which often seek to identify a time independent  $\beta$ , by

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14. (...continued)

additional data to help determine its prevalence in Ghana. (For other West African evidence of wage discrimination, see Glick and Sahn (1993) and the references within).

including  $(Z_{cu} - Z_{cs})$  as a right hand variable. Here we seek to test for changes in the earnings function before and after redeployment. Thus, we measure  $(b_{cu} - b_{cs})$  by including a time invariant  $X_i$  as a regressor; a test of whether the coefficient of  $X_i$  is zero is, therefore, a test of whether  $b_{cu} = b_{cs}$ . For variables with a positive impact on earnings, a positive  $\beta$  implies that the regressor has a larger impact on current earnings than on civil service earnings. An example is the dummy variable for residence in urban areas at the time of redeployment, which has a much more positive impact on subsequent earnings than on civil service earnings.

In addition, a few of the variables which are hypothesized to influence wages do change over time. Because we do not want to assume that the coefficients of such variables are time invariant, we also include  $Z_{cu}$  and  $Z_{cs}$  as independent variables. We test for the equality of their coefficients by testing whether  $Y_{jt} = -Y_{jt-1}$ . Finally, the model departs from most fixed effects models in that it includes an intercept. Holding changes in the independent variables at zero, this indicates the average change in earnings between periods.

Table 4 presents the results for this differenced earnings function for all redeployees who are currently working. The first two columns are unrestricted models which are comparable to the results in Tables 2 and 3. They differ only in the exclusion of the probability of being selected into a current sector (conditional on working) in Model 1. This exclusion would be appropriate under the maintained hypothesis that the selectivity effects on the earnings coefficients are comparable before and after redeployment. That hypothesis should be rejected given the significant coefficients on both variables, but the differences between the equations also serve to highlight the importance of sector selection for regional and gender effects on earnings. When the current sector is not accounted for (Model 1), the coefficient on gender is much more negative (and significantly different from zero at the 10% level). This difference suggests that women's earnings decline more than men's because of the type of employment they are selected into rather than any difference in returns to human capital once they are in a sector. The same is true for redeployees from Ashanti region (and to a lesser extent, Central region as well).

For model 2, an F-test rejects the null hypothesis that all the coefficients are the same across periods, but we cannot reject the hypothesis that all the coefficients are the same with the exception of the constants and the location variables. The third and fourth columns of Table 4 report the difference equations with the restriction that with the exception of the constant and location dummy variables, the earnings function coefficients are equal across periods. (We do not, however, restrict the coefficients on the current sector of employment.) These two models differ in that for model 3, the regressors are the predicted probability of wage earning and underemployment while for model 4, they are dummy variables. Although the estimates in model 3 are not subject to bias from the endogeneity of sectoral choice, there is some risk in using them for predictions at probability one. Ideally, the logit estimates would yield bimodal distribution of predicted probabilities, one near zero (for workers not actually in the sector) and another near one (for those that are). However, the observed distribution is unimodal, with the observations for actual wage earners

**Table 4 - Regressions for Change in Earnings (Current Earnings less Earnings Before Redeployment)**

Regressor	Model 1		Model 2		Model 3		Model 4	
	Beta	t-stat	Beta	t-stat	Beta	t-stat	Beta	t-stat
TIME INVARIANT REGRESSORS								
Constant	0.02	0.03	-0.34	-0.59	-0.66	-3.29	-0.73	-3.84
Civil Service Job Experience <sup>a</sup>	0.02	0.46	0.01	0.15				
Civil Service Job Experience <sup>2</sup> (x10 <sup>2</sup> ) <sup>a</sup>	-0.04	-0.40	-0.03	-0.27				
Urban Resident <sup>a</sup>	0.37	2.15	0.23	1.26	0.28	1.65	0.43	2.78
Central Region <sup>a</sup>	-0.50	-3.03	-0.25	-1.46	-0.29	-1.89	-0.53	-3.75
Ashanti Region <sup>a</sup>	-0.28	-1.89	0.15	0.84	0.11	0.69	-0.09	-0.71
Gender-Female	-0.10	-1.78	0.28	1.25				
Primary Education	0.11	0.54	0.43	1.81				
Middle Education	0.00	-0.03	0.18	0.95				
Secondary and Higher Education	0.24	1.09	0.19	0.85				
Redeployed in 1987	0.33	1.32	0.04	0.15				
Redeployed in 1988	0.07	0.30	0.10	0.42				
Redeployed in 1989	0.05	0.23	-0.05	-0.26				
Redeployed in 1990	-0.26	-1.33	-0.17	-0.88				
TIME VARYING REGRESSORS								
Total Employment Experience <sup>a</sup>	-0.30	-2.46	-0.38	-3.10	-0.10	-1.78	-0.07	-1.33
Total Experience <sup>2</sup> (x10 <sup>2</sup> ) <sup>a</sup>	0.20	0.78	0.39	1.52	-0.13	-1.14	-0.16	-1.47
Age > 55 <sup>a</sup>	0.15	0.53	0.03	0.10	0.07	0.28	0.14	0.55
Dependency Ratio <sup>a</sup>	-0.26	-0.78	-0.05	-0.16	-0.06	-0.23	-0.29	-1.30
Dependency Ratio x Gender <sup>a</sup>	0.33	0.74	-0.07	-0.15	-0.15	-0.52	0.06	0.24
Total Employment Experience <sup>a</sup>	0.29	2.59	0.34	3.13				
Total Experience <sup>2</sup> (x10 <sup>2</sup> ) <sup>a</sup>	-0.25	-0.97	-0.36	-1.45				
Age > 55 <sup>a</sup>	-0.19	-0.62	-0.10	-0.34				
Dependency Ratio <sup>a</sup>	0.12	0.45	0.13	0.48				
Dependency Ratio x Gender <sup>a</sup>	-0.04	-0.11	0.01	0.04				
Wage Sector			1.99	3.34	1.15	3.44	0.46	1.10
Underemployed			-0.88	-1.31	-1.44	-2.71	-1.37	-7.04

<sup>a</sup> These variables are measured as of the time of the survey. In the restricted equations, they are the difference between this variables' value at the time of the survey and the time of redeployment.

<sup>a</sup> These variables are measured as of the time of redeployment.

or underemployed farmers trailing off to the right. While these estimates may in fact be a more accurate representation of the impact of a marginal change in the likelihood of being in a sector on earnings, predictions far away from that mean may not be accurate. Therefore, we include both the dummy variable estimates (potentially biased from the endogenous sector choice) and the instrumented estimates.

In broad terms, these differenced equations tell the same story as the independent earnings functions above: the returns to human capital do not differ before and after retrenchment; earnings simply shift down, and the amount of that shift depends only on the redeployee's location before redeployment and the sector in which he or she currently works. Table 4 also indicates that those individuals with wage employment do not see their earnings decline. Thus, the reduction in earnings that is noted for the general population should be interpreted as a difference between wage and self-employed sectoral earnings rather than government and other earnings. As relatively few wage earning opportunities exist, this marked sectorial difference translates into marked changes in average earnings.<sup>15</sup>

Given the comparatively straightforward nature of the differences in earnings, it is easy to calculate redeployees' earnings losses after redeployment from the restricted models (3 and 4). The expected value for the logarithm of monthly earnings in the civil service for those individuals currently employed is 9.75 (or 17,150 1991 cedis per month) compared to only 9.08 currently. That is, for those redeployees currently working, earnings fell after they were redeployed on average by 48% of their previous earnings. This, however, is a mean over a heterogeneous group. Table 5 shows the shift in earnings for redeployees by former residence and current sector of employment, based on the restricted estimates of the difference functions in Table 4. The few redeployees who have found work in the wage sector have fared reasonably well, but the remainder have suffered substantial declines in income, even those who are currently fully employed. For the underemployed farmers, earnings have all but disappeared.

We have not, of course, identified why the labor market in Ghana is stratified so that wage earners obtain more than self-employed at similar levels of education and labor market experience. Indeed, the magnitude of this difference is such that we need to consider whether there is a systematic bias in reporting of non-wage income; the difference between earnings while in the government and subsequently might merely be because earnings in the latter period are harder to record. That is, under-reporting of income may be relatively greater for non-wage earnings which are more prevalent after retrenchment. Somewhat surprisingly, investigations using the GLSS did not support this view. We created a proportional measure of income under-reporting by taking the gap of household expenditures minus income divided by total expenditures for households in the three regions of Ghana that correspond to this study area. This measure

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<sup>15</sup> In a different subdivision of the data we found that formal sector employees - defined in terms of having both paid sick leave and holidays -earn more than other wage earners but the difference is not significant.

**Table 5 - Change in Earnings After Redeployment as a Proportion of Pre-Redeployment Earnings**

**Estimates Based on Model 3 (Instrumented Sector Dummies)**

	Sector of Current Employment		
	(Wage Employment)	(Self-Employment)	(Underemployed)
Urban	0.51	-0.52	-0.89
Cases	85	253	32
Rural	0.14	-0.64	-0.91
Cases	5	49	5

**Estimates Based on Model 4 (Sector Dummies)**

	Sector of Current Employment		
	(Wage Employment)	(Self-Employment)	(Underemployed)
Urban	-0.17	-0.48	-0.87
Cases	85	253	32
Rural	-0.46	-0.64	-0.91
Cases	5	49	5

was regressed on the share of total labor time spent in farm activities and in self employment. If there is more under-reporting of income in these activities expenditures would exceed income by a greater amount and the coefficients of the two share variables would be positive. They were, however, significantly negative.<sup>16</sup> Thus, we have no compelling reason to abandon our interpretation of the intercept on the difference equation as a change in jobs, not in the reporting of earnings.

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<sup>16</sup> Since expenditures exceed income - the average gap for all Ghana in the GLSS is 20% - it is difficult to interpret this as precautionary savings.

## 5. CONCLUSIONS

Unlike the stereotypical adjustment for Latin America, the economic reforms introduced in Ghana from 1983 did not bring about an overall economic contraction or significant cuts in government services (Alderman 1991). Thus, one should not expect that Ghana's adjustment program has harmed a large number of people. Indeed, one of the few easily identifiable groups of potentially vulnerable individuals in Ghana's reform are the unskilled workers who make up the majority of redeployed civil servants. While few of these had long periods of unemployment - relieving one concern of the government - the results presented here illustrate that under current economic conditions many retrenched workers can expect their lifetime earning stream to be appreciably lower than if they had not been retrenched.

This result, which frankly is more dramatic than we expected, could be taken as a criticism (or condemnation) of the redeployment program, but one should be careful to consider at least two caveats. First, all redeployees except those over the mandatory retirement age received severance pay, which helps offset the losses from lower earnings, albeit only partially in most cases. In our sample, the average decline in earnings for redeployees currently working was 48%, but that number falls to 27% if we add to it an income stream equal to 10% of severance pay per year (i.e. we assume that the redeployees invest their severance and earn a 10% real rate of return on the capital). Even this may exaggerate declines in consumption; individuals may choose to draw down their capital depending on their lifetime consumption objectives. Moreover, on average, individuals who obtained wage earnings have an increase in their total income stream.

Second and more importantly, we are persuaded that the difference in earnings before and after redeployment reflects the loss of a rent associated with civil service employment. In both types of models, the earnings decline is captured entirely by a downward shift in the function's intercept. While it is possible that this reflects the loss of a good job match, that interpretation is implausible when we consider that virtually all the redeployees who did not volunteer had unskilled jobs as sweepers, messengers, etc. It is difficult to believe that their civil service earnings were above market rates because they had special skills that made such posts a good job match. The notion that public sector employees, especially at the lower echelons, were simply allowed above market earnings seems much more realistic.

What the redeployees have lost, then, is a privileged post that, one could argue, they should not have held in the first place. Their gain in getting a civil service job was the Ghanaian taxpayer's loss, and vice-versa for the post-redeployment loss in earnings. Thus, while there is a tendency to give the pre-redeployment status quo a certain normative legitimacy, one should resist that tendency in this case.

This is not to say that the redeployees are undeserving of sympathy, and compensation. Even if their redeployment to a private sector job yielding more normal earnings is appropriate, redeployees will usually suffer losses associated with the transition to a new job (or jobs), and severance pay should absorb those costs, and in most cases it probably has. There are also good reasons to be concerned about the minority of redeployees who, as a result of redeployment, have fallen into poverty. Safety net programs for this group have been much less effective (Mills, et.al.; Alderman, Canagarajah, and Younger) and point to an area where the program design could be improved. Nevertheless, in general, we do not believe that our results condemn the redeployment program.

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