# DEVELOPMENT ECONOMICS RESEARCH CENTRE
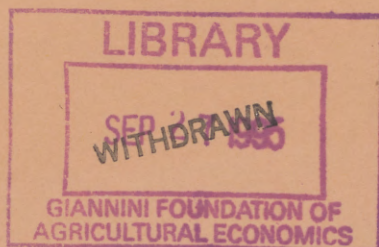## UNIVERSITY OF WARWICK

Labour Market Adjustment During a Recession:
The Micro and Macro Evidence

Victor Lavy
John Newman

Discussion Paper 80

February 1988

Department of Economics
University of Warwick
Coventry CV4 7AL
England

Labour Market Adjustment During a Recession:
The Micro and Macro Evidence

Victor Lavy[*]
John Newman[**]

Discussion Paper 80

February 1988

# 1. INTRODUCTION

The recessions and persistent unemployment experienced by many developed and developing countries over the last decade have increased interest in the operation of labor markets. Much of the debate on the causes of unemployment has focused on the role of real wages.[1] While restoration of equilibrium in the labor market in the recent recessions would appear to call for a fall in real wages, one widely held view is that this either has not taken place or has taken place very slowly, resulting in prolonged unemployment. Typically, strong labor unions in developed countries and institutional forces such as minimum wage laws in developing countries are seen to be the impediments to real wage adjustment.

A different view on why unemployment has persisted and even increased is that aggregate demand has been low.[2] Governments, reacting to balance of payments problems and revenue reductions caused by the fall in export prices, adopted contractionary fiscal and monetary policies, an approach that led to a fall in the demand for labor and to Keynesian unemployment.

There is considerable empirical evidence regarding the behavior of real wages and employment in developing countries, generally supportive of the first view (see Edwards, 1986; Collier, 1986; Sanchez, 1987; Demekes and Klinov, 1987; Fallon, 1985, 1987). However, the studies have been based mainly on analysis of aggregate wage changes, which implicitly assumes that the composition of the work force remains the same over the business cycle and that the relation between real wages and the business cycle is the same for all individuals or groups of individuals. This paper uses a case study of Côte d'Ivoire to demonstrate that reliance on aggregate data can lead to erroneous conclusions concerning the role of real wages in labor market adjustment during a recession. Using data from the 1979 and 1984 censuses of firms and employees in the private and semi-public sectors, we consider changes in real wages at an aggregate level and then at the firm and individual level in order to contrast the macro and micro evidence. Whereas the aggregate data indicate countercyclical movement in real wages, the micro data indicate the opposite - a procyclical movement.[3] Moreover,

---

[1] A second reason for the attention paid to real wages is that if real wages are rigid, then it is difficult to bring about changes in the relative price of tradable to nontraded goods. Increasing the relative price of tradable to nontraded goods is often a key element of a structural adjustment program.

[2] Studies that analyze the cyclical behavior of real wages in developed countries include Sachs (1980), O'brien (1985), Mitchell (1985), Rosen (1985), Bean, Layard, and Nickell (1987), Solow (1987), Layard and Nickell (1987), and Ashenfelter and Card (1987).

[3] Using micro data from the U.S., Bils (1985) finds very procyclical wage movements. Aggregating the micro data, he still finds strong procyclical wage movements. Aggregating does impart a countercyclical bias, but it is relatively unimportant in his case.

the micro data reveal differences in the extent of coverage of the censuses in different years. When these differences are taken into account. the micro data reveal an employment loss nearly twice as great as that perceived using the aggregate data.

Besides presenting a more accurate picture of the movement in real wages. the micro data provide important information about the turnover of firms that is not apparent from the aggregate data. Two out of every three firms went out of business during the recession. accounting for two-thirds of the employment loss. While roughly as many firms entered over the recession as exited. the new entrants were much smaller and therefore did not compensate for the employment loss.

Although the entry of new firms and the growth of surviving firms are the two vehicles for new job creation and recovery from a recession. little evidence is available on their relative importance in the case of developing countries. From a policy viewpoint. it is important to understand not only where the expansion comes from. but also the factors that influence it. If firms that survived the recession have had underutilized capital. an increase in the price received for their products. generated by an export subsidy for example, may have been sufficient to increase employment and output without any new investment. For new firms to increase employment and output, new investment might have been required. If the new, smaller firms could not get credit, they would have been unlikely to respond to an export subsidy by increasing production and employment.

The empirical analysis presented here is based. as noted, on data from two labor force surveys of the modern sector in Côte d'Ivoire. the Enquete de Main d'Oeuvre. coordinated by La Direction des Etudes et de la Recherche de l'Office National de Formation Professionelle (ONFP) as part of a joint effort among three ministries (education. labor. and economy and finance). In the surveys, the modern sector was defined as consisting of establishments in industry, commerce and services that either follow an accounting system called "Le Plan Compatable Ivorien," realized a certain value of production, or, in the case of the agricultural sector, met certain production levels. These surveys furnish longitudinal information on each firm and its employees in 1979, the beginning of the recession. and 1984. after the trough of the recession.

Section 2 provides a brief account of the recent recession in Côte d'Ivoire. Section 3 presents first the real wage changes evident from the aggregate data and then contrasts them with the changes evident from an analysis of the micro data. Section 4 discusses the dynamics of employment changes. We distinguish among exit (death of firms), entry (formation of new firms), and survival (firms making it through the recession) and relate these three phenomena to characteristics of the firm such as size, age, sector and private/public ownership. Our conclusions are presented in Section 5.

## 2. THE RECESSION IN CÔTE D'IVOIRE

The history of Côte d'Ivoire parallels the experience of other developing countries that experienced a boom in primary commodity prices in the 1970s. Since the government paid a fixed producer price and sold at international prices, rising prices for its two main crops, coffee and cocoa, resulted in a large increase in government revenues. The government used these revenues to stimulate investment: between 1976 and 1978, the share of public investment in GDP increased from 15 percent to 25 percent, while the rate of growth of GDP averaged 9.0 percent a year.

Between 1977 and 1978, coffee and cocoa prices declined by 31 percent and 10 percent, respectively, remaining at those levels until the first half of 1980. At the same time, import prices rose. The combination of the drop in coffee and cocoa prices and continued increases in import prices, especially of oil, which doubled in 1979, resulted in a cumulative decline of 31.7 percent in Côte d'Ivoire's terms of trade over the 1977-79 period. Rather than reducing investment by a corresponding proportion, increasingly the government financed continued expansion by external borrowing. Together with rising interest payments on external public debt, this borrowing transformed a balance of payments surplus into a deficit amounting in 1980 to 12 percent of GDP.

In 1981, the government initiated a drastic financial recovery and structural adjustment program, supported by an IMF loan and two structural adjustment loans from the World Bank (1981 and 1983). The program called for a reduction in the public sector deficit, a decline in the current account deficit, and the restoration of an overall balance of payments equilibrium by the end of 1983. Additional objectives were to remove the price distortions and to establish incentives to improve resource allocation.

In 1981 the government instituted a 24 percent cut in real public investment, followed in 1983 by a further 20 percent decline in public current and capital expenditures. Together with further declines in coffee and cocoa prices and a drop in export crop production attributable to a severe drought, the contractionary measures adopted by the government contributed to a deepening of the recession between 1981 and 1984.

The extent of the recession is reflected in the decrease in modern sector employment between 1979 and 1984 (Table 1). The modern sector, which had accounted for 248,350 employees in 1979 declined to 207,793 employees in 1984. This loss in employment appears to have been accompanied by an increase in the number of firms from 3,243 in 1979 to 4,231 in 1984. However, that increase reflects to a large extent greater coverage of the survey. Not included in the 1979 survey were 1,106 firms established before that year, which had 36,199 employees in 1984. When these firms are excluded from

the 1984 data. the decline in modern sector employment is 31 percent. compared to the 16 percent derived from the unadjusted aggregate data.

Entries consist of firms established after 1979. As a check that the entries were not just old firms with a new name. we confirmed that no employees had been hired before 1979. Roughly two out of every three firms in the 1979 survey (2.164 firms) had gone out of business by 1984. Although the number of exiting firms exceeded the number of new entering firms by just 127, there was a job loss of 67.511 that substantially exceeded the 25.853 jobs contributed by entering firms. That is. the jobs created by new firms were far from sufficient to compensate for the loss of jobs from exits. In all. 66 percent of all job losses arose as a result of the closure of firms. There was a further reduction of 35.098 jobs among the 1.079 surviving firms. That is. 34 percent of all job losses was the result of the net contraction of surviving firms. The firms that survived also experienced considerable turnover of personnel. Of the 145.741 employed in 1984. 80.317 had been with the same firm in 1979, while 65,424 had been hired since then. We do not know whether those newly hired had been employed at the same firm in a previous period. The implication from these figures is that 100,522 workers, or 55 percent of the workforce, in surviving firms lost their jobs or were laid off between 1979 and 1984.

### Table 1: Aggregate Employment Gains and Losses

|  | 1979 Number of Firms | 1979 Employment | 1984 Number of Firms | 1984 Employment | Change in Employment |
|---|---|---|---|---|---|
| Survivors | 1,079 | 180,839 | 1,088 | 145,741 | -35,098 |
| Exits | 2,164 | 67,511 | - | - | -67,511 |
| Entries | - | - | 2,037 | 25,853 | 25,853 |
| Expanded Coverage | - | - | 1,106 | 36,199 | 36,199 |
| Total  (including expanded coverage) |  |  |  |  | -40,637 |
| Total  (excluding expanded coverage) |  |  |  |  | -76,756 |

Note: There were 17 firms in 1979 that merged into 4 firms in 1984 and 10 firms in 1984 that split into 32 firms in 1984. This accounts for the difference in the number of surviving firms.
Source: Calculated from 1979 and 1984 Enquetes de Main d'Oeuvre. ONFP, Côte d'Ivoire.

## 3. MOVEMENTS IN REAL WAGES

A variety of reasons have been advanced as to why real wages may not be sufficiently flexible to clear the labor market. First, there may be legal impediments to lowering wages. Second, if workers are unable to detect whether a firm is accurately representing the demand for its products, they may resist wage cuts and prefer lay-offs or firings. Since a firm would prefer to pay lower wages regardless of demand conditions and would want to decrease its employment only if times were bad, a lay-off may be a more credible indication of true demand conditions. Third, a firm's management might also resist wage cuts if it feared that they would reduce the efficiency of its work force.

In this section, we examine the extent of wage flexibility -- first based on firm-level and then on individual data. The average wage in a firm was calculated as the total wage bill divided by the number of workers in the firm. Table 2 presents average real wages for surviving, exiting, and new firms, weighted by the number of employees in the firm relative to the total employees in the category. The inflation rate used to deflate the nominal wages in 1984 was 48 percent.

### Table 2: Weighted Average Real Wages

|  | 1979 | | 1984 | | |
|---|---|---|---|---|---|
|  | Number of Employees | Average Real Wage | Number of Employees | Average Real Wage | % Change in Real Wage |
| Survivors | 175,687 | 951 | 145,653 | 1.103 | 16 |
| Exits | 62,624 | 929 | - | - | - |
| Entries | - | - | 25,379 | 1,114 | - |
| Expanded Coverage | - | - | 36,169 | 832 | - |
| Total (including expanded coverage) |  |  |  |  | 12 |
| Total (excluding expanded coverage) |  |  |  |  | 17 |

Note: The average real wages are monthly wages in thousands of CFA. The differences in the number of employees from Table 1 are due to missing values on the total wage bill in the firm.

Source: Calculated from 1979 and 1984 Enquetes de Main d'Oeuvre, ONFP, Côte d'Ivoire.

New firms had an average mean wage 20 percent higher in real terms than the firms which went out of business. While there were no differences in the average mean wage in 1984 between new firms and firms that survived the recession. those firms that were included in the 1984 survey as a result of the expanded coverage had substantially lower average firm mean wages -- 25 percent lower -- than either the new firms or the surviving firms. This pattern reflects the inclusion of more small, service-oriented firms that may have corresponded more closely to some definitions of the informal sector.

Excluding firms that were included as part of the expanded coverage. the aggregate data indicate that real wages increased by 17 percent while employment fell by 31 percent. This strong countercyclical movement of wages suggests that slow adjustment or rigidity of real wages was a potentially important factor in explaining the employment loss in the modern sector.

The distribution of the change in mean real wages across surviving firms is presented in Table 3. In contrast to the picture suggested by the aggregate data, there is some evidence of real wage flexibility: 51 percent of the firms witnessed a real decrease in their mean wage. The reductions were greatest among small firms and agricultural firms and lowest among large firms and firms in the manufacturing sector.

The mean firm wage still embodies a high degree of aggregation of information on wages paid across workers in different firms. A change in mean wages in a firm arises from a combined effect of wage changes among workers who remain employed and the difference between wages received by new hires compared to those received by those who left the firm. To control for possible changes in composition within a firm between 1979 and 1984, we examine the information on individual workers within a firm. We identify what has happened to wages of workers that remained in the surviving firms and to wages of newly hired workers. Since a newly hired worker has not yet built up specific human capital in the firm, this wage is a measure of an alternative wage -- what a worker would receive if he or she left his current job and obtained employment elsewhere.


### Wage Changes of Workers Who Retained Their Jobs

It is not possible, solely by examining the wage changes of those who remained employed, to determine empirically the extent to which wage rigidity contributed to unemployment (see the discussion in Beckerman, 1986). The reason is that it is not possible to observe a wage change for a worker who becomes unemployed. Only where a worker retains the job is it possible to observe a wage change. and these individuals do not face rigid wages. By definition, their wages were sufficiently

## Table 3: Distribution of Real Wage Changes - -   Firms by Sector

| | All | Small | Large | Public | Private | Non-Trade | Manuf. | Agri. | Expand | Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| -60 and lower | 12 | 18 | 8 | 14 | 12 | 12 | 10 | 23 | 8 | 15 |
| -60 <, =< -50 | 2 | 4 | 3 | 1 | 2 | 2 | 1 | 0 | 1 | 3 |
| -50 <, =< -40 | 5 | 9 | 3 | 3 | 6 | 5 | 4 | 8 | 3 | 7 |
| -40 <, =< -30 | 6 | 7 | 6 | 6 | 6 | 7 | 2 | 3 | 4 | 7 |
| -30 <, =< -20 | 7 | 6 | 6 | 5 | 7 | 6 | 8 | 0 | 5 | 8 |
| -20 <, =< -10 | 8 | 8 | 3 | 8 | 8 | 8 | 7 | 5 | 6 | 9 |
| -10 <, =< 0 | 11 | 9 | 6 | 7 | 11 | 11 | 13 | 10 | 13 | 9 |
| 0 <, =< 10 | 8 | 6 | 14 | 3 | 9 | 8 | 12 | 3 | 8 | 9 |
| 10 <, =< 20 | 8 | 7 | 0 | 5 | 8 | 8 | 7 | 5 | 10 | 7 |
| 20 <, =< 30 | | 4 | 6 | 8 | 8 | 8 | 8 | 8 | 10 | 6 |
| 30 <, =< 40 | 4 | 2 | 8 | 2 | 4 | 3 | 8 | 5 | 4 | 4 |
| 40 <, =< 50 | 3 | 1 | 3 | 2 | 3 | 3 | 5 | 0 | 5 | 2 |
| 50 <, =< 60 | 3 | 3 | 3 | 2 | 3 | 2 | 5 | 3 | 4 | 2 |
| 60 and higher | 16 | 16 | 33 | 32 | 14 | 15 | 11 | 30 | 19 | 13 |

Note:    The Expand category consists of those firms that increased employment between 1979 and 1984. The Contract category consists of those firms that decreased their employment between 1979 and 1984. Small firms are firms with 10 or less employees. Public are firms 50 percent or more publically owned.

Source:  Calculated from 1979 and 1984 Enquetes de Main d'Oeuvre, ONFP, Côte d'Ivoire.

flexible to ensure employment. The question then becomes whether real wages could actually fall in response to reductions in demand. If they can fall (and we find evidence that they can), to argue that the rigidity of wages was responsible for the loss in employment requires explaining then why wages were not able to fall for those who became unemployed. An alternative explanation for the loss in employment in the modern sector is that wages were flexible, but when they fell below what workers could obtain in the informal sector, employees went into the informal sector.

Over the five-year period, those who retained their jobs experienced a mean 7 percent increase in real wages, despite the severe recession. However, as the distribution of real wage changes for both sexes shows (Table 4), that trend did not apply to all workers. Forty-four percent of the males and 42 percent of the females suffered real wage decreases over this period. Workers in agriculture and the traded sector contained the highest proportion of workers experiencing real wage decreases, while the public sector contained the lowest proportion. Not surprisingly, the highest proportion of workers experiencing real wage declines was found among the lowest education levels: over 55 percent of uneducated workers suffered a real wage decline (not shown).

While observed differences in wages are appropriate for comparing the welfare of individuals over this period, they are not necessarily the best indicator of the extent of flexibility in the wage structure. The reason is that different workers face different wage profiles. The wage in 1979 corresponds to a different point in an individual's wage profile than was true in 1984. The entire wage profile may also shift as a result of the macroeconomic changes in the economy. Because unskilled workers typically face flat profiles, a recession may induce a downward shift in their profile that could result in a lower wage, as may have happened in the period between 1979 and 1984. Because skilled workers typically face an upward sloping profile, they may still receive an increase in wages despite a downward shift in the wage profile. Being five years further along on a lower profile may result in an absolutely higher wage.

To examine the extent of real wage flexibility, we believe it is more informative to look at changes in real wage profiles Thus, we estimated the real wage profiles for the two years 1979 and 1984. The means and definitions of the explanatory variables used in the regressions are given in Table 5. The interaction terms are included to allow the slope of the wage profiles to differ by educational level. The ENTRY IND variable, albeit an imperfect indicator of growth in the industry, is intended to capture an element of business cycle conditions. At present, this is the only variable that can be constructed for both the 1979 and the 1984 surveys exclusively from the data provided by the surveys. In the near future, we intend to incorporate macroeconomic indicators from other sources.

Table 4: Distribution of Real Wage Changes – Individuals by Sex and Sector
(Percent of Individuals in Category)

| | -20% and Lower | -19% to -10% | -9% to -1% | 0% to 9% | 10% to 19% | 20% and Higher |
|---|---|---|---|---|---|---|
| **SEX** | | | | | | |
| Male | 17 | 11 | 16 | 14 | 10 | 32 |
| Female | 9 | 10 | 23 | 20 | 9 | 29 |
| **SECTOR** | | | | | | |
| Traded | 21 | 10 | 14 | 12 | 9 | 35 |
| Nontraded | 13 | 11 | 19 | 16 | 11 | 29 |
| Public | 14 | 13 | 20 | 15 | 10 | 27 |
| Private | 17 | 10 | 16 | 15 | 10 | 33 |
| Manufacturing | 21 | 10 | 14 | 12 | 9 | 34 |
| Agriculture | 26 | 9 | 13 | 15 | 8 | 29 |

Note: Public firms are firms 50% or more publically owned.

Source: Calculated from 1979 and 1984 Enquetes de Main d'Oeuvre, ONFP, Côte d'Ivoire.

## Table 5: Means and Definitions of Explanatory Variables

| | Retained Job | | New Hires | | |
|---|---|---|---|---|---|
| | 1979 | 1984 | 1979 | 1984 | Definitions |
| FEMALE | .12 | .12 | .07 | .11 | Dummy = 1 if female |
| EDUCATION | 4.98 | 5.77 | 4.79 | 5.28 | Years of education |
| VOTECH | .04 | .08 | .03 | .08 | Dummy = 1 if tech training |
| SPEXP | 7.93 | 12.91 | 2.32 | 2.78 | Specific experience in firm |
| SPEXPSQ | 102.49 | 206.70 | 6.99 | 9.75 | Specific experience squared |
| GENEXP | 14.88 | 14.10 | 16.01 | 15.9 | General experience outside firm |
| GENEXPSQ | 302.33 | 284.22 | 350.13 | 337.90 | General experience squared |
| EDEXP | 32.88 | 67.58 | 60.7 | 70.1 | Interaction of education and specific exp. for retained workers; Interaction of education and total exp (GEN + SP) for new hires |
| EDEXPSQ | 375.3 | 979.40 | 1027.0 | 1217.7 | Interaction of education and specific or total experience squared, respectively |
| SIZEFIRM | 895.8 | 825.6 | 1713.1 | 846.5 | Size of firm |
| AGEFIRM | 22.6 | 26.6 | 15.7 | 16.1 | Age of firm |
| PUBLIC | .29 | .29 | .39 | .40 | Dummy =1 if firm is more than 50% state owned |
| ENTRY IND | .17 | .14 | .18 | .15 | Number of workers hired in sector in last five years relative to total employment in sector |
| N | 11,958 | 11,964 | 9,396 | 7,638 | |

Table 6, column 1, presents the estimated coefficients from the 1979 regression on the log of the monthly wage, column 2 the estimated coefficients from the same regression, run using the log of the real wage in 1984 as the dependent variable. Column 3 presents the results from a regression where the dependent variable is the log of the actual salary in 1984 minus the predicted log salary using 1979 coefficients. The coefficients from the latter regression indicate the difference in the coefficients between 1984 and 1979, with t statistics for the test that the difference is significantly different from zero.

The regression results indicate a good overall fit. The human capital variables exhibit the same general pattern as in other wage estimations. The rate of return on education is 16 percent, which is high but comparable to the 20 percent rate of return in Côte d'Ivoire found by van der Gaag and Vijverberg (1987). The estimated return on vocational training is very high, but note that the mean of this variable is low. The overall flat 4 percent return on experience also corresponds to the overall return to experience in van der Gaag and Vijverberg. The comparison of the actual wage in 1984 with the wage predicted on the basis of 1979 coefficients indicates that the return on vocational and technical training and on specific experience decreased. The effects of the firm-level variables did not change greatly. The coefficient of the industry-level variable, ENTRY IND, exhibited the greatest change among all the variables. In both 1979 and 1984, in industries where entry was higher over the last five years, workers who retained their jobs received lower wages. However, the effect was significantly stronger over the five years prior to 1984.

Because it is difficult to infer what happened to the level of wages from the table of coefficients, Figure 1 presents the predicted wage profiles graphically. The predicted wages are calculated at the mean values of the explanatory variables. There is a downward shift in the wage profile between 1979 and 1984, a trend that is not inconsistent with the 7 percent increase in real wages apparent from the raw data, since that increase was calculated by comparing a point on the 1979 profile (at roughly 8 years of specific experience) with a different point on the 1984 profile (13 years of specific experience). Note that the wage profile could shift either because the explanatory variables changed or because the returns on the variables in the wage equations changed over the period.

The separate effect of changes solely in the mean values of the variables can be determined by comparing the wage profile in 1979 with the wage profile in 1984 that was predicted using the coefficients from the 1979 regression. The fact that the latter profile lies above the 1979 profile indicates that, if the explanatory variables had not changed, retained workers would have experienced a shift upwards in their wage profile. The effect of the change in the returns on the characteristics can be

- 11 -

## Table 6: Ln Wage Equations for Retained Workers

|  | (1) 1979 | | (2) 1984 | | (3) Actual 1984 - Predicted 1984 | |
|---|---|---|---|---|---|---|
| CONSTANT | 2.56 | (86.0) | 2.59 | (56.4) | .03 | (9.1) |
| FEMALE | .05 | (3.3) | -.02 | (-1.4) | -.07 | (-4.4) |
| EDUCATION | .14 | (56.6) | .14 | (26.1) | -.001 | (0.2) |
| VOTECH | .48 | (18.1) | .23 | (11.4) | -.25 | (-12.4) |
| SPEXP | .03 | (8.2) | .02 | (2.9) | -.01 | (-2.2) |
| SPEXPSQ | .0001 | (1.5) | .00004 | (2.7) | .0002 | (1.4) |
| GENEXP | .05 | (25.8) | .05 | (21.5) | -.007 | (-3.6) |
| GENEXPSQ | -.0006 | (-11.6) | -.0005 | (10.2) | .0001 | (3.4) |
| EDEXP | .004 | (8.9) | .003 | (4.5) | -.001 | (1.6) |
| EDEXPSQ | -.0001 | (4.7) | -.0001 | (4.4) | .00003 | (1.41) |
| SIZEFIRM | .00001 | (2.0) | .00002 | (4.4) | .00001 | (3.1) |
| AGEFIRM | -.002 | (-5.3) | -.002 | (-4.3) | .00008 | (0.2) |
| PUBLIC | -.12 | (10.0) | -.17 | (-13.5) | -.05 | (4.0) |
| ENTRY IND | -.04 | (-0.8) | -.51 | (-9.4) | -.47 | (-8.6) |
| $R^2$ | .62 | | .60 | | .04 | |
| N | 11,957 | | 11,963 | | 11,963 | |

Note: t-statistics in parentheses.

# Figure 1
# Real Wage Profiles for Retained Workers



Log of Real Wage

Years of Specific Experience

---- 1979  —+— 1984  —*— 1984 (1979 coef.)
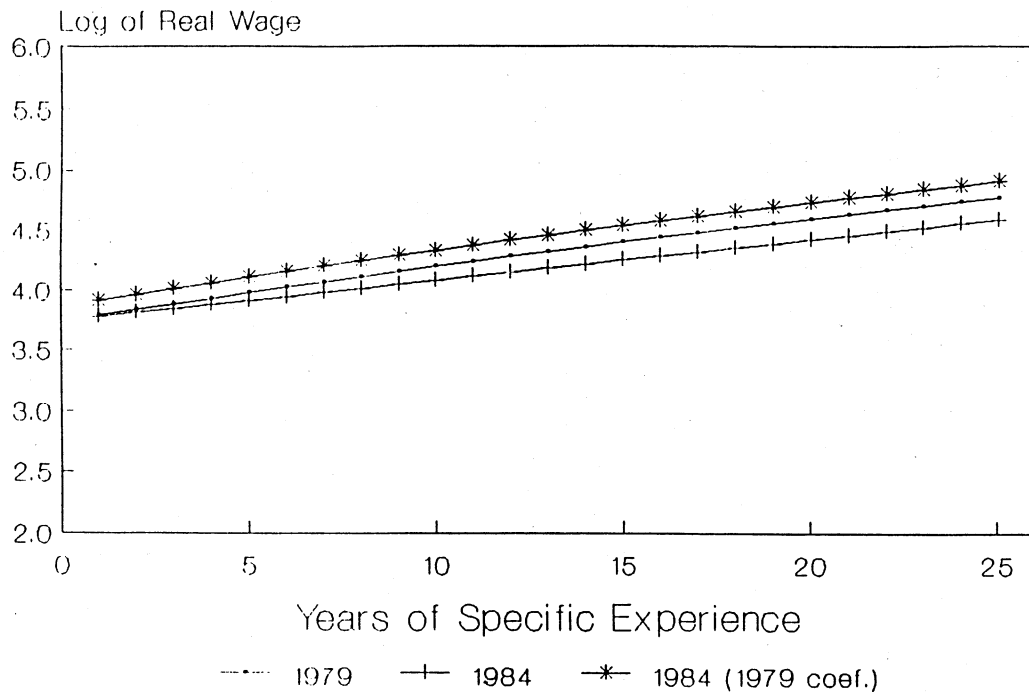
Calculated at mean values of expl. vars.

# Figure 1
# Real Wage Profiles for Retained Workers



Log of Real Wage

Years of Specific Experience

--- 1979   -+- 1984   -*- 1984 (1979 coef.)
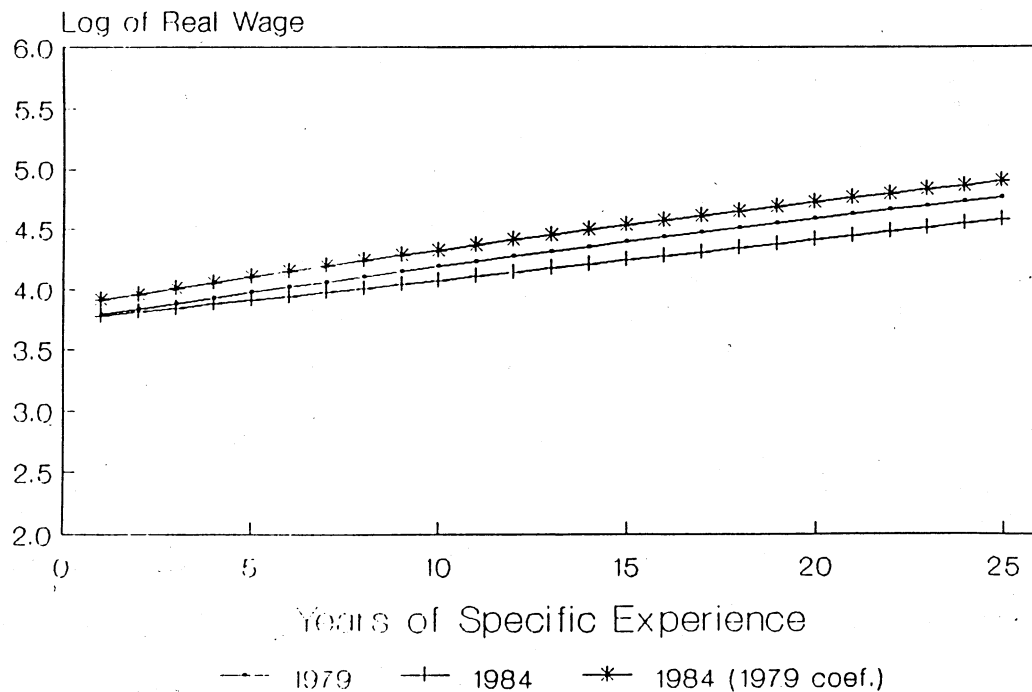
Calculated at mean values of expl. vars.

Table 7: Ln Wage Equations for New Hires over Past Five Years

| | (1) 1979 | | (2) 1984 | | (3) Actual 1984 - Predicted 1984 | |
|---|---|---|---|---|---|---|
| CONSTANT | 2.40 | (49.07) | 1.28 | (26.2) | -1.12 | (-17.4) |
| FEMALE | .11 | (17.7) | .01 | (.35) | -.11 | (-4.71) |
| EDUCATION | .15 | (30.7) | .22 | (34.7) | .07 | (11.7) |
| VOTECH | .85 | (26.2) | .23 | (8.01) | -.62 | (-22.1) |
| SPEXP | .07 | (3.59) | .14 | (5.76) | .07 | (3.02) |
| SPEXPSQ | -.002 | (-.67) | -.01 | (-1.85) | -.005 | (-1.32) |
| GENEXP | .07 | (20.9) | .09 | (21.8) | .03 | (6.25) |
| GENEXPSQ | -.0009 | (-15.0) | -.001 | (-14.0) | -.0003 | (-2.95) |
| EDEXP | -.002 | (-4.49) | -.004 | (-6.46) | -.0018 | (-3.02) |
| EDEXPSQ | .00003 | (2.48) | .00006 | (4.21) | .00003 | (2.12) |
| SIZEFIRM | -.00001 | (-3.43) | .00001 | (1.35) | .00002 | (2.52) |
| AGEFIRM | .0007 | (1.55) | -.0015 | (-2.89) | -.002 | (-4.20) |
| PUBLIC | -.08 | (-6.11) | -.19 | (-11.9) | -.11 | (-6.96) |
| ENTRY IND | -.54 | (-9.88) | -.14 | (-1.74) | .40 | (5.13) |
| | | | | | | |
| $R^2$ | .54 | | .63 | | .15 | |
| N | 9,395 | | 7,638 | | 7,638 | |

Note: t-statistics in parentheses.

wage differential among retained workers.

Among new hires, as with those who retained their jobs, wages in both years were lower in industries where there was more new entry. However, the sign of the coefficient on ENTRY IND was smaller for the later period, an indication of a smaller reduction in real wages in expanding industries in the later period.

Figure 2 presents the predicted wage profile corresponding to the three regressions. Compared to the wages of retained workers, the wage level for new hires is lower and the downward shift in the wage profile is much greater. Again, we can distinguish the shift attributable to changes in the explanatory variables from the shift attributable to changes in the returns on the characteristics. The picture is different than that for retained workers. Even if there were no changes in the returns on characteristics, real wages for new hires would be lower in 1984. This result is not altogether surprising, given the considerable compositional changes we have observed in the types of firms that entered in the later period. If there had been no change in the returns on the characteristics, real wages would have been higher than they were in 1984. Thus, for both new hires and for retained workers, the returns on characteristics fell during the recession.

At the mean of the sample, the real wages of new hires fell by 22 percent over the five-year period. The mean wages of new hires in new firms and in surviving firms were almost identical and over 40 percent higher than the mean wages of new hires in firms included as part of the expanded coverage. If these new hires had been included, the fall in real wages would have been 34 percent. Again, this points out the importance of using the microdata to control for compositional changes.

Employment Generated by New Firms

During the period 1979-84, 2,037 new firms were formed, accounting for almost half the firms in the modern sector as of 1984.[4] However, this very high rate of entry produced only 25,853 new jobs, just 12 percent of total employment. Most of the entering firms in this period were very small: 80 percent employed less than 10 people, and an additional 11 percent employed from 10 to 19 people (see Table 8). The average size of entering firms was a mere 13 employees, compared to 135.3 in the surviving sample. The low level of employment in new firms during the recent recession is very

_____

[4] We do not have information on firms which were not included in the survey because they went out of business before their existence could be recorded. Thus, all references to new firms over a specified period are conditional on the firm having survived to the survey date.

# Figure 2
# Real Wage Profiles for New Hires



Log of Real Wage

Years of General Experience

—•— 1979   —+— 1984   —*— 1984 (1979 coef.)
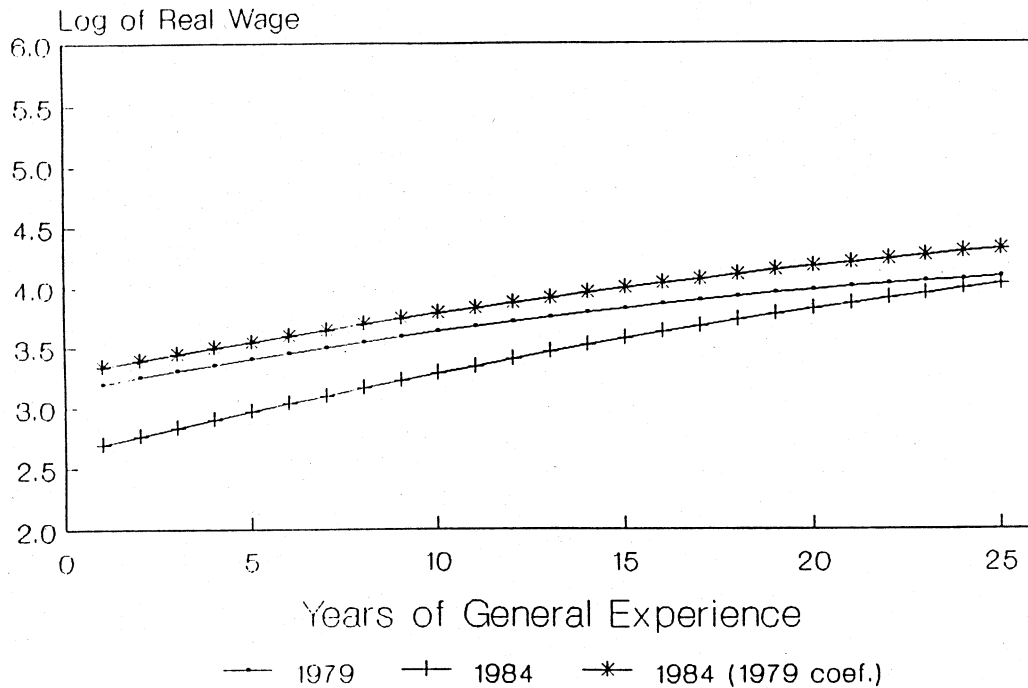
Calculated at mean values of expl. vars.

different from the employment in new firms established prior to 1979 (see Table 9). Between 1974 and 1979, 1,241 firms created 45,687 jobs as of 1979, for an average firm size of 37 employees, compared to just 13 in the recent period.[5]

In the previous section, we concluded that the real wage of new hires in all firms declined. Limiting the comparison only to new firms in 1979 and 1984 yields a decrease in real wages of 17 percent, evaluated at the mean of the sample. Thus, it can be concluded that the marginal cost of labor facing those firms fell during the recession. However, this real wage decrease was not sufficient to keep employment creation from falling by over 40 percent.

What accounts for the disappointing rate at which new jobs were created between 1979 and 1984? Part of the explanation is found in the decline of employment in in public sector enterprises. In the period 1974 and 1979, 30 percent of the employment generated in the modern sector was in firms 50 percent or more publically owned. Between 1979 and 1984, this percentage fell to 16 percent. The decline in the rate at which public firms were created accounted for 45 percent of the reduction in employment generation. Given the severe budget problems faced by the government, increasing employment by expanding public firms is not feasible. Moreover, there is an extensive body of evidence on public firms in developing countries suggesting that the government would not be wise to pursue this path even if it were feasible.

If private sector expansion is to be sought instead, it is important to have an idea of the factors that affect growth in the modern sector. As Tables 8 and 9 indicate, the pattern of entry shows a substantial shift toward the nontraded goods sector.[6] This occurred during a time when the nominal exchange rate was fixed and inflation was 48 percent, yielding a decline in the real exchange rate. The entry rate (defined as the number of new firms as a proportion of all firms in the sector) in the commercial and services sectors went up from .31 and .29, respectively, in the earlier period to .55 and .42 in the later period. These two sectors, which together accounted for 80 percent of all new firms, had the lowest average firm size. The state sector, comprising public and private administration, also increased in relative importance. All together, the percentage of new jobs created by the nontraded goods sector went from 24 percent to 51 percent, while the absolute number of jobs

---

[5] Because there was expanded coverage in 1984, the comparison actually understates the employment pattern of new firms in the most recent period. Since the firms included in the expanded coverage are smaller, the comparison overstates the differences in average firm size.

[6] The traded goods sector is defined to consist of the primary and manufacturing sectors.

Table 8: Size and Sectoral Distribution of Entries, 1979-1984

| SIZE | Number of Firms | Percent of Total | Entry Rate | Employment | Percent of Total | Average Size |
|---|---|---|---|---|---|---|
| 1-9 | 1622 | 79.4 | 0.62 | 5.669 | 21.9 | 3.5 |
| 10-19 | 208 | 10.2 | 0.38 | 2.802 | 10.8 | 13.5 |
| 20-29 | 55 | 2.7 | 0.27 | 1.317 | 5.1 | 23.9 |
| 30-49 | 65 | 3.2 | 0.28 | 2.470 | 9.6 | 38.0 |
| 50-99 | 52 | 2.6 | 0.21 | 3.611 | 14.0 | 69.4 |
| 100-199 | 22 | 1.1 | 0.15 | 3.168 | 12.3 | 144.0 |
| 200-299 | 8 | 0.4 | 0.13 | 1.907 | 7.4 | 238.4 |
| 300-499 | 2 | 0.1 | 0.04 | 815 | 3.2 | 407.5 |
| 500-999 | 2 | 0.1 | 0.04 | 1.021 | 4.0 | 510.5 |
| 1000 + | 1 | 0.1 | 0.03 | 3,073 | 11.9 | 3,073.0 |
|  | 2037 | 100.0 | 0.47 | 25,853 | 100.0 | 12.7 |
| **SECTOR** | | | | | | |
| Private | 2023 | 99.3 | 0.50 | 21,704 | 83.9 | 10.1 |
| Public | 14 | 0.7 | 0.07 | 4,149 | 16.1 | 296.4 |
| Primary | 20 | 1.1 | 0.12 | 4,814 | 17.6 | 221.1 |
| Manufacturing | 231 | 11.4 | 0.37 | 5,875 | 21.6 | 25.0 |
| Energy | 0 | 0 | 0 | 0 | 0 | 0 |
| Construction | 54 | 2.6 | 0.42 | 1,365 | 5.0 | 25.2 |
| Transportation | 26 | 1.4 | 0.25 | 1,223 | 4.5 | 47.0 |
| Commerce | 1,295 | 63.8 | 0.55 | 5,739 | 21.1 | 4.3 |
| Services | 330 | 15.9 | 0.49 | 3,341 | 12.3 | 10.1 |
| Finance | 15 | 0.8 | 0.16 | 550 | 2.0 | 23.9 |
| State | 66 | 3.2 | 0.29 | 4,316 | 15.9 | 61.6 |

Source: Calculated from 1984 Enquete de Main d'Oeuvre, ONFP, Côte d'Ivoire.

Table 9: Size and Sectoral Distribution of Entries, 1974-1979

| SIZE | Number of Firms | Percent of Total | Entry Rate | Employment | Percent of Total | Average Size |
|---|---|---|---|---|---|---|
| 1-9 | 783 | 63.0 | 0.33 | 3,340 | 7.3 | 4.3 |
| 10-19 | 183 | 14.7 | 0.27 | 2,373 | 5.2 | 13.0 |
| 20-29 | 138 | 11.1 | 0.48 | 4,287 | 9.4 | 31.1 |
| 30-49 | 53 | 4.3 | 0.20 | 3,683 | 8.1 | 69.5 |
| 50-99 | 44 | 3.5 | 0.15 | 6,107 | 13.4 | 133.8 |
| 100-199 | 15 | 1.2 | 0.07 | 3,438 | 7.5 | 229.2 |
| 200-299 | 14 | 1.1 | 0.16 | 5,232 | 11.5 | 373.7 |
| 300-499 | 6 | 0.5 | 0.07 | 3,900 | 8.5 | 650.0 |
| 500-999 | 6 | 0.5 | 0.10 | 13,327 | 29.1 | 2,221.1 |
| 1000 + | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1241 | 100.0 | 0.47 | 25,853 | 100.0 | 12.7 |
| SECTOR | | | | | | |
| Private | 1103 | 89 | 0.29 | 32,651 | 71 | 29.5 |
| Public | 138 | 11 | 0.29 | 13,036 | 29 | 94.4 |
| Primary | 29 | 2.3 | 0.17 | 3,603 | 7.9 | 124.2 |
| Manufacturing | 174 | 14.0 | 0.30 | 19,537 | 42.8 | 112.3 |
| Energy | 4 | 0.3 | 0.25 | 513 | 1.1 | 128.3 |
| Construction | 45 | 3.6 | 0.28 | 9,857 | 21.6 | 219.0 |
| Transportation | 35 | 2.8 | 0.25 | 1,424 | 3.1 | 40.7 |
| Commerce | 659 | 53.1 | 0.31 | 5,555 | 12.2 | 8.4 |
| Services | 184 | 14.8 | 0.29 | 3,193 | 7.0 | 17.4 |
| Finance | 63 | 5.1 | 0.38 | 724 | 1.6 | 11.5 |
| State | 48 | 3.9 | 0.15 | 1,281 | 2.7 | 26.7 |

Source: Calculated from 1979 Enquete de Main d'Oeuvre, ONFP, Côte d'Ivoire.

**Table 10: Size and Age Distribution of Surviving and Non Surviving Firms, by Employment, 1979\***

| | SURVIVORS | | | | NON SURVIVORS | | |
|---|---|---|---|---|---|---|---|
| | Number of firms | | Employment | | Number of firms | Employment | Survival Rate |
| | 1979 | 1984 | 1979 | 1984 | 1979 | 1979 | |
| **SIZE** | | | | | | | |
| Missing | 4 | - | - | - | 3 | - | - |
| 1-9 | 350 | 338 | 1.680 | 1.501 | 1.305 | 5.456 | 0.21 |
| 10-19 | 162 | 168 | 2.180 | 2.434 | 336 | 4.518 | 0.33 |
| 20-29 | 80 | 92 | 1.949 | 2.246 | 143 | 3.435 | 0.36 |
| 30-49 | 113 | 118 | 4.368 | 4.617 | 102 | 3.785 | 0.53 |
| 50-99 | 111 | 129 | 7.862 | 9.159 | 124 | 8.536 | 0.47 |
| 100-199 | 106 | 106 | 15.172 | 14,663 | 77 | 10.794 | 0.58 |
| 200-299 | 37 | 38 | 8.992 | 9.008 | 34 | 8.295 | 0.52 |
| 300-499 | 43 | 34 | 17,026 | 13,205 | 25 | 9,021 | 0.63 |
| 500-999 | 37 | 38 | 26,088 | 26,474 | 12 | 8,949 | 0.76 |
| 1000+ | 36 | 27 | 95,601 | 62,434 | 3 | 4,772 | 0.92 |
| | 1079 | 1088 | 180,839 | 145,741 | 2,164 | 67,511 | 0.33 |
| **AGE** | | | | | | | |
| Missing | 53 | 6 | 6,071 | 262 | 135 | 2,287 | - |
| 0-1 | 54 | 12 | 2,395 | 285 | 236 | 3,439 | 0.22 |
| 2-5 | 243 | 25 | 25,159 | 1,085 | 709 | 14,694 | 0.26 |
| 6-10 | 208 | 313 | 19,784 | 28,420 | 449 | 16,415 | 0.32 |
| 11-15 | 173 | 218 | 19,563 | 14,429 | 269 | 10,532 | 0.39 |
| 16-20 | 144 | 181 | 35,293 | 18,877 | 165 | 8,536 | 0.47 |
| 21-25 | 86 | 155 | 25,829 | 38,198 | 94 | 4,668 | 0.48 |
| 26+ | 115 | 178 | 46,745 | 44,185 | 1,017 | 6,940 | 0.52 |
| | 1079 | 1088 | 180,839 | 145,741 | 2,164 | 67,511 | 0.33 |
| **SECTOR** | | | | | | | |
| Primary | 50 | 66 | 21,212 | 19,755 | 68 | 7,835 | 0.42 |
| Manufac. | 227 | 227 | 57,669 | 52,196 | 206 | 12,251 | 0.52 |
| Energy | 2 | 2 | 3,394 | 5,243 | 13 | 1,348 | 0.13 |
| Construction | 47 | 48 | 34,118 | 6,553 | 93 | 14,602 | 0.34 |
| Transport. | 49 | 50 | 19,475 | 19,574 | 59 | 3,167 | 0.45 |
| Comm. | 454 | 451 | 13,398 | 11,210 | 1,167 | 12,271 | 0.28 |
| Services | 134 | 128 | 18,000 | 14,460 | 292 | 7,664 | 0.31 |
| Finance | 38 | 43 | 4,149 | 6,359 | 105 | 1,490 | 0.27 |
| State | 74 | 73 | 9,394 | 10,129 | 158 | 6,883 | 0.32 |

Source: Calculated from the 1979 and 1984 Enquetes de Main d'Oeuvre, ONFP, Côte d'Ivoire.

created by new firms in the nontraded goods sector remained roughly the same .[7]

Employment Change in Surviving and Exiting Firms

Table 10 presents the pattern of employment change among surviving firms and the employment loss of non-survivors. Combining the employment of entries and surviving firms, the ratio of employment in the traded to nontraded goods sectors was 40 percent in 1979 and 48 percent in 1984. Among firms that survived, it was 44 percent in 1979 and 49 percent in 1984. However, most of the movement in the nontraded goods sector was dominated by the large drop in construction, mainly attributable to the decrease in government investment. If construction is excluded, it appears that surviving nontraded goods firms suffered less of a decrease in employment than did traded goods firms.

Among surviving firms, the percentage decline in employment in the traded goods sector was 10 percent. The contrasting pattern of employment variation in surviving and new firms could reflect differential responses to permanent and transitory changes in real exchange rates. Those that were already in the industry could have withstood periods of unfavorable real exchange rates, while the unfavorable real exchange rates inhibited new firms from making the investments needed to get established.

We also present information on the pattern of employment loss in firms that did not survive. However, since only one observation is available, the reported pattern of exit is not informative of the pattern of growth of the traded and nontraded goods sectors. Since there is no basis for comparison of those sectors, there is no way to infer how the fall in the real exchange rate may have affected the pattern of exit.

5. CONCLUSIONS

Aggregate data provide a misleading account of the behavior of real wages and employment over a recession. The aggregate data suggest that employment fell by 16 percent, while real wages rose by 17 percent. The reduction in employment is underestimated. After accounting for expanded coverage in the later survey, the decline in employment is seen to be 31 percent. The increase in real wages is an artifact of the compositional changes that took place during the recession. The micro data indicate that in firms that survived the recession the real wage profile for retained workers fell by 8

---

[7] Part of the increase may be attributable to the expansion in coverage, since smaller firms, which are most likely to be found in the commercial and services sectors were included in 1984. To the extent that these firms hired workers between 1979 and 1984, the difference (but not the level) in the percentage of new jobs created by the nontraded goods sector in 1984 will be overstated.

percent and the real wage profile for new hires fell by 22 percent. In surviving firms, 55 percent of the workers in 1984 had been employed in 1979, while 45 percent were newly hired, resulting in an average reduction in real wages of 14 percent. In new firms, the reduction in real wages was the same as that of new hires in surviving firms -- 22 percent. Thus, those who hold the view that real wages are rigid in the modern sector need to reconsider the evidence. Despite the decline in real wages, the number of jobs created by new firms still fell substantially, with most of the drop coming in the traded goods sector. Indeed, the absolute number of jobs created by new firms in the nontraded goods sector remained roughly the same. This occured during a period when the real exchange rate fell. For firms already in existence, their employment changes did not indicate quite as much sensitivity to the drop in the real exchange rate: surviving firms in the traded goods sector experienced only a 10 percent drop in employment.

If the prospects for generating employment by removing impediments to real wage movement are dim, what policies can the government of Côte d'Ivoire pursue? Although much of the decline in employment creation was a result of a reduction in public sector employment, expanding government employment is not a feasible, or even desirable option. Based on our evidence, it is not clear that searching for ways to reduce real wages further would enhance welfare or even increase employment. If real wages fall low enough, workers will opt to work in the informal sector.

The current strategy of the Ivorian government is to attempt to increase the relative price of traded to nontraded goods by subsidizing exports and taxing imports, in part because Côte d'Ivoire is in a monetary union and does not have the option of undertaking a nominal devaluation. The differential pattern of employment creation of the traded and nontraded goods sectors at a time when the real exchange rate was falling suggests that firms do respond to relative prices and that raising the real exchange rate would be expected to increase employment.

# REFERENCES

Ashenfelter, O. and D. Card (1987), "Why have Unemployment Rates in Canada and the United States Diverged" in C. R. Bean, P.R.G. Layard and S. J. Nickell, The Rise in Unemployment. Basil and Blackwell Ltd., New York.

Bean, C. R., P.R.G. Layard and S.J. Nickell (1987). "The Rise in Unemployment: A Multi-Country Study" in Bean et al. op. cit.

Beckerman W. and T. Jenkinson (1986). " How Rigid are Wages Anyway ", in W. Beckerman (ed.), Wage Rigidity and Unemployment, The Johns Hopkins University Press. Baltimore.

Bils, Mark J. (1985), " Real Wages over the Business Cycle: Evidence from Panel Data ", Journal of Political Economy, Vol. 93, No. 4, August, pp. 666-689.

Collier, Paul (1986), "An Analysis of the Nigerian Labor Market", DRD Discussion Paper # The World Bank.

Demekes, D. and R. Klinov (1987), "The Stagnation in Manufacturing Employment in Latin America, 1970-1985", DRD Discussion Paper N0. 301, The World Bank, June.

Edwards, A. C. (1986), "The Chilean Labor Market 1970-1983: An Overview", DRD Discussion Paper # 152, The World Bank, January.

Fallon, Peter R. (1987), "The Labor Market in Zimbabwe: Historical Trends and an Evaluation of Recent Policy", DRD Discussion Paper # 296, The World Bank, May.

Fallon, Peter R. (1985), "The Labor Market in Kenya: Recent Evidence", DRD Discussion Paper # The World Bank.

Layard, P.R.G. and S. J. Nickell (1987), "Unemployment in Britain", in Bean et al. op. cit.

Malinvaud, E. (1987), "The Rise of Unemployment in France", in Bean et al, op. cit.

Mitchell, Daniel J.B. (1985), "Wage Flexibility in the United States: Lessons from the Past", American Economic Review, May, pp. 36-40.

O'brien, A. (1985), "The Cyclical Sensitivity of Wages", American Economic Review, December pp. 1124-1142.

Rosen, Sherwin (1985), "Implicit Contracts: A Survey", Journal of Economic Literature, Vol. 23, pp: 1144-1175.

Sachs, J. (1980), "The Changing Cyclical Behavior of Wages and Prices: 1890-1976", American Economic Review, March, pp. 78-90.

Sanchez, Carlos E. (1987), "Characteristics and Operation of Labor Markets in Argentina", DRD Discussion Paper #272, The World Bank, May.

Solow, R. M. (1987), "Unemployment: Getting the Questions Right", in Bean et al, op. cit.

van der Gaag, J. and W. Vijverberg (1987), " Wage Determinants in Côte d'Ivoire ", LSMS Working Paper No. 33, The World Bank, April.