

ON MODELLING LDC LABOUR PROBLEMS: A STUDY AND APPLICATION
OF THE EFFICIENCY-WAGE HYPOTHESIS FOR NIGERIA

by

Fidelis Ezeala-Harrison

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presented to the University of Manitoba
in partial fulfillment of the
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Fidelis Ezeala-Harrison

ABSTRACT

The downward rigidity of wages and its implications for the labour market are some of the central observations that must be explained, whether in a developed economy or an underdeveloped one. Any satisfactory theory of wages (and employment) must provide explanation for not only the phenomenon of downward wage inflexibility but also the reasons why in some instances falling wages may not eliminate unemployment. This happens to depict the situation in the less developed countries (LDCs), and this dissertation addresses this problem, with particular reference to Nigeria.

This study models the relevant behaviour of the LDCs' labour markets, and establishes that the assumptions and hypothesized relationships are consistent with the observed situation in the Nigerian setting, and as such can be helpful as an illuminating paradigm to the understanding of LDCs' labour problems.

As any relevant policy prescriptions for addressing the employment problem in any LDC can only emerge out of the necessary relevant theoretical constructs for the labour market, the Efficiency-Wage model of employment and wages is developed and applied to the Nigerian labour market in particular and to LDC labour markets in general, to explain the pertinent factors determining employment and wage conditions in the economy. The resulting expositions are then screened in the light of the existing empirical evidence, to ascertain the extent to which they may or may not depict the real world conditions which require attention.

Most LDCs are agrarian, therefore the agricultural sector of the economy and the conditions of employment in it hold very crucial implications for the overall labour market. In this connection, this thesis extends special attention to the modelling of the agricultural labour market using the efficiency wage theory.

The model is found to be innovative in analyzing the labour problems of the underdeveloped countries. It explains not only the incidences of high and inflexible wages in the face of massive unemployment in the formal/industrial sector, but also the basis of the "labour market segmentation" that characterize the society. It indicates also, that the labour/employment problems in such countries

can be modelled and brought within the realm of modern labour economics.

Important policy implications emerge from this exercise: specific micro policies directed toward the appropriate sectors of the labour market are necessary requirements for tackling the LDCs' labour/employment problems.

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Fidelis Ezeala-Harrison.

Dedicated to my mother: Late Madam REBECCA O. EZEALA

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Chapter I
INTRODUCTION

1.1 GENERAL OVERVIEW

An attempt is made here to utilize neoclassical¹ modelling to explain some of the fundamental basis for the condition of wage and employment behaviour in the Nigerian economy in particular, and in the less developed countries (LDCs) in general. A major aspect of such a condition is the downward wage rigidity found in most LDCs where it has been observed that wage rates adjust only slowly (if at all), and not fast enough to bring about equilibrium between labour markets, with unemployment as the consequence (Fields, 1974a: 906; Blaug, 1973: 62).

Also, such conditions include the "segmentation" of the labour market (House, 1984a; House and Rempel, 1976b). These conditions could be explained by recourse to

¹ In labour economics generally, the reference 'neoclassical' is used to denote the analytical methods that make use of the notion of individual and group maximization/optimization behavioural tendencies, as well as the idea that price flexibility leads to market-clearing [See: Cain (1975; 1976), Carter (1982), Rosen (1982), Sobel (1982) or Addison and Siebert (1979), Ehrenberg and Smith (1985)]. In this thesis, we follow this tradition, such that any reference to the term 'neoclassical' is to be reckoned in this "labour economics sense". Ours envisage a 'marginal analysis', and is only to such an extent neoclassical.

neoclassical economic analysis.² Such an undertaking is being attempted here by utilizing the Efficiency-Wage Hypothesis and its implications for the labour market.³

The wage stickiness that characterizes LDC labour markets is studied from the firm's behavioural point of view (in accordance with optimization tendencies), not only in terms of the non-institutional factor of the reduction of hiring and training costs, but also (and more importantly) in terms of gains to the firm in worker "efficiency" as wages are raised. Such a condition causes an inter-sectoral (i.e. industrial-agricultural and/or urban-rural and/or formal-informal and/or modern-subsistence) wage differential that does not respond to market forces. Several authors have drawn attention to this phenomenon [see below], drawing from the earlier discussions of the 'wage-efficiency' relationship by Leibenstein (1957a; 1957b; 1958).

The primary work on the efficiency-wage theory appeared in the late 1950's with Leibenstein's work. In his recent contribution to the growing volume of literature on the theory, Basu (1984:96) notes how the recent years have

² One school of thought attributes these conditions mainly to institutional factors [see Berg (1962), Reynolds (1969), Frank (1971)].

³ The efficiency-wage hypothesis can be used to explain many important features of the labour market: involuntary unemployment, wage rigidity, segmentation, existence of wage distribution for workers of identical characteristics, and discrimination (Akerlof, 1984; Yellen, 1984). This study considers the first three of these attributes.

witnessed a resurgence of interest in the theory. This is evident in the contributions of Rodgers (1975), Mirrlees (1975), Stiglitz (1976a), Bliss and Stern (1978), Agarwala, (1979). The period in between Leibenstein's pioneering work and the mid-seventies was also not totally without some discussion of this interesting hypothesis as is evident in works of Ezekiel (1960), Wonnacott (1962), and also Myrdal (1968). In the 1980's, works of Malcolmson (1981), Akerlof (1984), Basu (1984), Yellen (1984), and Eswaran and Kotwal (1985) represent some of the most recent attempts to focus more attention and interest on the theory.

These authors exposed the theory to some depth, and some carried out interesting empirical illustrations. Our contribution lies in applying this important approach towards the study of a particular underdeveloped economy, thereby providing an additional way of using an existing paradigm to model a system which may be correct and hence useful.

1.2 PROBLEM FOCUS

Development economists have over the years observed that the accumulated knowledge of how labour markets function in the LDCs is too sparse and too fragmented to permit a more complete identification of the labour market problems in these countries.⁴ It is only when the operation of labour

⁴ Morawetz (1974) as well as Rempel and House (1978) carry comprehensive surveys of the relevant literature on this

markets in specific situations has been documented and analyzed will it be possible to spell out the needed policy requirements for any such situation (Rempel and House, 1978:4).

This study is deemed to meet this important requirement for addressing the LDCs' labour market problems. It provides a comprehensive documentation and analysis of the behaviour of wages and employment in the LDCs in general, against the background of the Nigerian economy. The Efficiency-Wage Hypothesis is applied: not that it is ipso facto the most appropriate model needed for that purpose, but rather because we recognize that its essential tenets seem to be the most reflective of the most commonly observed phenomena in the labour markets of LDCs.

The labour markets of the LDCs are, as emphasized earlier, characterized by certain peculiar circumstances which not only do not appear to fall in line with the predictions of economic theory, but also which do not obtain in the economies of the more industrially developed countries. This calls for the study and development of the necessary theoretical framework to be used to explain these phenomena, and which can be tested in the light of the existing evidence. The efficiency-wage hypothesis seems, in our opinion, to be an appropriate theoretical piece that can

observation. See also Hansen (1983) and Kannappan (1977) for supporting notions presented by several other writers.

be utilized for this purpose.

This dissertation essentially builds a model of the labour market of the underdeveloped "dual" economy, with Nigeria in particular perspective. It models the labour market in a way to provide a basis for harmonizing labour economics and development economics in an effort to obtain a more concise explanation of the labour problems. It represents an application of micro-theoretic methods to the study of LDCs' labour markets with a view to providing an additional way of looking at a world of labour market ambiguities which characterize these economies, and to explain them within the framework of modern labour economics.

1.3 LABOUR PROBLEMS OF THE UNDERDEVELOPED ECONOMY: THE NEED FOR ANALYSIS

Within the framework of neoclassical economics, the appropriate starting hypothesis in the analysis of a particular set of wages (and employment) is that competitive market forces determine these variables. But the traditional competitive model offers little insight into the realities of wage and employment determination in developing countries (Todaro, 1985). Wage rates are typically not flexible downward for reasons which still need to be more thoroughly understood. "Institutional" factors including labour union agitations and legislated government salary scales on the one hand, and private sector firm (including multinational

corporations) hiring practices on the other, have been identified. It is important that we clearly understand which of these factors (if any) is the most pertinent.

There are many more workers seeking employment at the going wage than there are jobs available. Involuntary unemployment (and underemployment) is pervasive; so that the application of competitive market forces to the LDCs cannot be very relevant (Rempel, 1981:215; Hansen, 1983).⁵ Further, rural-urban migration well in excess of the absorptive capacity of the urban economy do not reduce the levels of urban (formal activity) wage levels and only have insignificant effect on urban-rural income differentials (Rempel, 1981).

These observations have been documented to be the case for some specific LDCs: Weeks (1972), Diejomaoh and Orimalade (1971), Frank (1967), and Iyoha (1982), for Nigeria; Berry (1975) for Colombia; Rempel and House (1978) and Rempel (1981) for Kenya; House (1984) for Cyprus; Lim (1977) for Malaysia; Mulat (1977) for Ethiopia; and Bardhan (1977) for India.

⁵ In alluding to this condition, these authors have observed that the wage structure in LDCs is not seen to be responsive to changing supply and demand conditions in the labour market, and that rapid increases in the supply of labour do not exert downward pressure on industrial wage rates. Inter-industry and inter-district wage changes are caused by factors other than changing supply and demand forces in the labour market.

The several factors that could explain these labour market problems of the LDCs have been documented in the multiplicity of studies in this area that have emerged over the past two decades. Some of the most important factors identified include: the inherited colonial wage structure (Weeks, Rempel, Berry), labour union power (Weeks, Rempel, Rempel and House, Mulat, Lim), and government intervention (Weeks, Rempel and House, Rempel, Lim, House, Iyoha).

In our study, based on evidence provided by some of the above researchers, as well as by our own empirical investigations in the Nigerian economy, we show that none of the above factors is important in influencing the behaviour of wages and employment in the LDCs. Therefore we dwell on the analysis of the behaviour of the firm [a factor given much attention by Rempel and House (1978) and Rempel (1981) in the case of Kenya], and on the firm's own principal objective as an optimizing economic agent, in analyzing and explaining the observed labour market conditions. Our theme is the efficiency-wage hypothesis -- a notion that has gained increasing attention in the recent past with respect to LDCs, but which hitherto has not been utilized as a framework for modelling the observed labour market conditions for any particular LDC.

1.4 FORMAT OF PRESENTATION

The following sequence is adopted in presenting the findings of the research. In Chapter 2 the contemporary literature on the labour problems of the LDCs is examined critically, in a literature review that also attempts to suggest some improvements upon these contributions. This is followed in Chapter 3 by a detailed survey of the labour market conditions in the Nigerian economy as a prototype of the LDCs, in an effort to identify and emphasize these as the existing labour market conditions which this study seeks to address. The chapter also attempts to assess the labour market problem and to relate it to the existing conditions.

The key chapter of the thesis then follows. Chapter 4 presents the development and application of our model to the Nigerian (LDCs') labour market. The empirical foundation for the model is thoroughly examined and illustrated by explicit use of Nigerian data. This is followed by a chapter (Chapter 5) that attempts to give the model some "institutional" flavour: we consider the roles of unions, multinational corporations, capital intensity, profit levels, and capacity utilization within the model's framework. The chapter also contains the analysis of human capital and its role in the LDCs' employment problem within the efficiency-wage model.

In Chapter 6, the model is used to analyze the employment implications of the agricultural labour market. Both subsistence agriculture and commercial agriculture are considered.

The summary of the results of the study and their policy implications are presented in Chapter 7 to conclude.

Chapter II

THE LABOUR MARKET ANALYSIS OF LDC'S: A REVIEW OF THE LITERATURE

"It is not that uses cannot be found for a whole collection of pieces of 'economic theory' in the developing countries. It is that we have no theory which explains the most important problems facing the poor countries..." (Livingstone, 1976: 36).

This chapter is a review of what might be regarded as the contemporary labour economics literature of the LDCs. This broad label is used to refer to the works of the various notable economists who have addressed themselves to the detailed study and analyses of the labour problems of the less developed countries.⁶ We reckon that the contributions of these writers are together adequately representative of the bulk of the LDCs' labour market literature. Whether or not these contributions fall within the sub-field of development economics (as opposed to labour economics) need not be the crucial matter for our consideration here. For our purposes, the important issue is that whereas these

⁶ This includes the works of Lewis (1954; 1979), Leibenstein (1957a; 1957b; 1958; 1978), Stiglitz (1969; 1974; 1976a; 1976b), Todaro (1969; 1985), Harris and Todaro (1969; 1970), Morawetz (1974), Fields (1974a,b), House (1973; 1984a), House and Rempel (1976a,b,c; 1978a,b; 1980), Mazumdar (1959a,b; 1976a,b; 1977), Bardhan (1977; 1979a,b), Rempel (1978; 1979; 1981; 1982), Berry (1975); Berry and Sabot (1978); Hansen (1971; 1983); Knight (1967; 1975); Knight and Sabot (1983), to mention just a few.

contributions represent the existing ones that address the problems of the LDCs, they are not considered as part of mainstream labour economics.

The mainstream labour economics literature -- modern labour economics -- has of recent come under the spotlight regarding its applicability to the LDCs (Kannappan, 1977; Hansen, 1983; Kuttner, 1985), and it seems to be generally agreed that modern labour economics, as taught in Colleges and Universities all over the world, is still essentially a "labour economics of the developed countries" (Livingstone, 1976). This situation calls for the need to modify, or better still, integrate contemporary labour economics with the existing work on LDC labour markets, with a view to developing a body of literature that could be as much applicable to the LDCs as it is to the developed world.

Earlier proponents of this measure called attention to it in the proceedings of two conferences held on: (1) "The Teaching of Development Economics" (Manchester 1967) and (2) "The Teaching of Economics in Africa" (Dar-Es-Salam 1973),⁷ and both called for a "search for new tools and concepts appropriate to the analysis of problems of the less

⁷ Seers' (1965) thought-provoking paper was used as a starting point for the Manchester Conference, and the conference's complete report is contained in Martin and Knapp (1967), and in: "The Need for New Perspectives in Teaching and Research in Economics in Latin America", Social and Economic Studies, (March 1969). The complete report on the Dar-Es-Salam conference is contained in Livingstone et al (1973).

developed countries" (Livingstone, 1976:36; Livingstone et al, (1973).

The earlier feeling was that orthodox (labour) economic theory was inadequate for the needs of developing economies, and thus by implication suggested a "parting of ways" (Livingstone, 1976:3) between economic theory (applicable to the "mature" and industrially developed economies), and development economics (the study and analysis of the functioning of LDCs and of their development). However, those who supported this position did not seem to understand the importance each of the areas has for the other in further study and understanding of the LDCs' economic problems. The current feeling is that whereas economic theory represents the "tools for the job", which must therefore be applied to the job itself, development economics serves to identify the "job for the tools", to which the relevant tools must be applied (see Phelps-Brown, 1972).

The critical mind would ask: if labour economics does not address the LDCs adequately, why do we worry if the labour market treatment of the development economics sub-field does provide an adequate analysis? In answer to this, it can be viewed that, though the sub-field has generally been very useful in modelling underdevelopment, there still remains the need (for it) to provide answers to some of the important (albeit difficult) questions it raises (Basu,

1984).⁸ Its analytical methods of long-run (rather than short-run) studies of the process(es) of underdevelopment, besides being too ambitious, seem to make the studies and their findings a little unrealistic (Abumere, 1978; Aboyade, 1983). Its focus on the process of development, rather than on the problems and structure of underdevelopment, represents some of the concerns that need to be addressed by the application of modern labour economics to LDC labour markets (Basu, 1980; 1984). Its assumptions are neoclassical, but the models they yield are too aggregative, and are not based on plausible functional relationships between key variables in the LDCs (which relationships are generally not known) (Livingstone, 1976:37).

We recognize the need for a change in technique. LDCs' labour market analyses deserve an increased use of more rigorous methods and concepts and results from economic theory (Wickens, 1974; Hansen, 1983; Basu, 1984). The application of micro-theoretic methods in ways similar to the approaches of some of the more recent writers are some of the important new developments needed for the emergence of a more relevant 'labour economics' for the LDCs.

⁸ In alluding to a similar point, Basu (1984:8) observes that "...while it (development economics) raises innumerable important questions, it appears to have answers for very few, which gives rise to the suspicion that traditional development economics, in the name of asking difficult questions, often ended up asking questions impossible (for it) to answer ..."

We present a critique of mainstream labour literature and the LDC labour market literature, as a background to our study.

2.1 A PREVIEW ON MODERN LABOUR ECONOMICS

It is generally viewed that the apparent reason for the limited applicability of contemporary labour economic theory to the problems of the developing country is due to the widely acclaimed notion that the problems of such a country have to be treated on a different footing from that of an industrially developed country because the mode of organization of production is different in the two types of economies (Mathur, 1964). The typical unit of production in an industrially developed economy is a firm operating with the help of wage-labour, whereas in the case of the underdeveloped economy the basic unit of production in the dominant sector of the economy (the non-industrial sector) is a household drawing its labour supply mainly from the members of the family. Such unorganized nature of production and the predominance of self-employment on family farms and other multifarious small-scale informal activities facilitate the existence on a large scale of what has come to be known as "disguised unemployment", in contrast to open unemployment -- the form commonly found in the industrially developed economy.

The neoclassical theory of labour supply and demand for the individual and the firm respectively, follow the traditional paradigm of extending the optimization-subject-to-constraint behavioural assumption that has come to be one of the most useful hand-tools of rigorous economic analysis. In labour analysis, the individual (or household) supplier of labour is assumed to seek to maximize utility derivable from leisure hours and consumption facilities that is earned by giving up leisure (i.e. by supplying work hours), subject to income constraint available from sources including working and non-working (e.g. transfer payments). The firm (or producer) that demands labour services is assumed to seek to maximize profits (or minimize costs) arising from its (or his) production activity, subject to output constraint that should be met. These two agents acting and interacting to optimize in their respective spheres, help to generate the series of economic behaviour that govern the labour market activities upon which the society as a whole thrives.

There also is the "dual labour market" explanation of the events in the labour market. This approach does not see the various outcomes in the labour market in terms of their neoclassical (optimization tendencies of individual and group behaviour) underpinnings, but rather in terms of their institutional conditioning. The labour market is posited to be segmented into a primary and a secondary sector within

which districts workers and employers operate according to markedly different behavioural rules (Wachter, 1974). The primary sector constitutes jobs in the large firms and/or unionized occupations which tend to offer high wages, good working conditions, employment stability, chances of career advancement and "equity and due processes in the administration of work rules" (Doeringer and Piore, 1971; Cohen and Pfeffer, 1984). The secondary sector of the labour market is the one, relative to the primary sector, having less attractive jobs: low wages, poor working conditions, considerable amount of instability of employment (high turnover rates), little chance of promotion and/or career advancement, and often arbitrary management procedures. The literature presumes that there are barriers to mobility between the labour market segments, and such barriers emerge because of the existence of internal labour markets with limited ports of entry and because of the different availabilities of on-the-job training and the poor job histories of the secondary market workers (Hodson and Kaufman, 1982; Cohen and Pfeffer, 1984).

2.1.1 Modern Labour Economics and the LDCs

The mainstream theories of labour economics contain important tools of analysis that could be utilized for the LDC labour market, but they would not be adequate, given the LDC's peculiar economic structures (Phelps-Brown, 1972; Ikpeze, 1978; Hansen, 1983). This, however, is not to say

that the underdeveloped country has no important uses to which it can put contemporary labour economic analysis. What we wish to imply is that in terms of empirical validity, many of the theories of mainstream labour literature today would not stand up well when applied to the LDCs. Not that it lacks the requisite analytical methods for addressing the labour problems of the LDCs, what it lacks is the relevant material to which it can apply its analytical methods. For instance, the neoclassical approach has been put to important use by various authors in analyzing labour market conditions of LDCs.⁹ The dual labour market approach of modern labour economics can be extended to the analysis of the dual economies of the LDCs [see (House, 1984a); House and Rempel, 1976b)]. This approach will shed significant light on the understanding of the rural-urban, formal-informal, modern-traditional sector dichotomy encountered in the study of LDC labour markets.

In applying its neoclassical modelling to the LDCs, labour economics attempts to address the LDC's labour problems with the same tools of analysis (together with the assumptions used in building these tools) that it uses for the developed economies. The result is that its answers to the LDC's labour questions are far from satisfactory (Phelps-Brown, 1972; Abumere, 1978). High rates of urban

⁹ Works of Leibenstein, Stiglitz, Mazumdar, Basu, Eswaran and Kotwal among many others are good examples of this application.

unemployment, say, would be explained by the "natural rate" hypothesis as due to longer "search" attitudes on the part of urban job seekers; and Keynesian (neoclassical) theory would be applied to explain it in terms of deficiencies in effective demand in the economy. Also the unemployment problem could be explained as due to mismatch of urban labour to existing vacancies (structural unemployment). This in itself appears to represent a valid application of theory, and in fact, these explanations could be valid for the problem. But if, say, the appropriate policy actions as implied by the theory are adopted in tackling the problem, the result could be disappointing. This is because the underlying assumptions upon which the theory is founded are rather at variance with the set of assumptions required for building LDC labour market theories. Urban employment-creating policies may succeed in reducing urban unemployment by some margin, but it could lead to an increase in the absolute number of the unemployed (Harris-Todaro, 1970; Bairoch, 1973; Iyoha, 1975; Berry and Sabot, 1978; Bruton, 1978). Income-maintenance programmes could help alleviate the poverty of the urban unemployed, but it could lead to serious labour market consequences if adopted in a society with rigid institutional arrangements and inadequate accounting procedures required for administering such a programme.

In the LDCs, it has been found that workers' skill (human capital acquisition) and wage rate may not be the major factors determining the employability of labour (Fajana, 1973, Mulat, 1977). The labour market may be "segmented", so that the dual labour market literature might be appropriate in analyzing the problem. But hitherto labour economics has not provided any formal theoretical model in this regard.

In the LDCs, the concentration of poverty and underemployment in certain sections of the population indicates that, in the argument of the dual labour market approach of labour economics, neoclassical approach of self-adjustment mechanisms is inadequate for analyzing the problems. It also represents a proof that a non-neoclassical sector exists (Wachter, 1974). This view is supported by Vietorisz and Harrison (1973):

"When bad jobs are found to be so widespread that perhaps 60 percent of workers in the inner city fail to earn enough to support a family at even minimum levels of decency, conventional explanations based on individual differences in labour productivity become noncredible."

Though it might be argued that neoclassical economics does not claim that poverty will disappear, such an understanding is a necessary implication of its theoretical postulates (see Sobel, 1982). For instance, following the line of neoclassical interpretations, one would expect, say, that excess labour supply in the urban sectors of the LDCs should pull the wage rate down, warranting the absorption of the

excess labour until the labour market is cleared. Or, employers should be attracted to the low-wage rural sector to hire labour, so that there would be no incidence of vast rural-urban wage differentials as they obtain in these economies as perpetual features of the economy. Such outcomes, however, have not been realized. This would lead one to question the relevance of orthodox economic theory to the case of the LDCs.

Yet it is important that we do not lose sight of the fact that labour economics is not altogether lacking in applicability to LDCs. The institutionalist approaches to the explanation of economic phenomena seem to be readily applicable in dealing with the relative structureless secondary labour market (urban informal and rural). The wage in this sector seems to be fixed by the needs of society for low-paid workers to do menial jobs. The society (and the employers of labour in it) tend to become accustomed to the services supplied by cheap labour and have little or no inclination to pay "decent" (high) wages for such things as garbage collection, washing, etc. In the Nigerian society, where a great deal of sexual discrimination pertains in the labour market, the institutional degree of sexism plays a significant role in determining the wage rate and employment in the secondary sector (where most women in the labour force are allocated). Moreover, a blend of the neoclassical and institutionalist

approaches could be used to apply to the rural/subsistence sector wage determination. The wage rate in this sector may reflect a perfectly elastic supply curve of workers at some wage level determined largely by custom or subsistence living considerations (Mazumdar, 1959b; Hansen, 1966). Determinants of custom may be difficult to specify, but social legislation (especially governmental/public assistance) seems to be relevant (Wachter, 1974). The social minimum is dictated by the "reservation wage" of rural workers (Lewis, 1954; Sarkar, 1957; Hansen, 1966).

2.2 THE LITERATURE ON LDC LABOUR PROBLEMS

The principal objective of any theory is for it to be applied towards analysis, prescription and evaluation of policies, and eventual solution of practical problems. In the case of LDC labour market theories, this objective lies in applying them towards addressing the employment problem: increased employment for a country's labour force not only brings about a more equitable distribution of income, it also raises the overall living level of the population, and represents the basis for further economic growth and development.

We attempt here to present some of these theories, and to assess them critically on both a technical level and on their operational relevance. A categorization of the literature on LDC labour markets into three broad groups

(not necessarily reflecting their chronological order, but rather arranged to reflect their similarity in approach and material content) is adopted. The groups are the "Lewis-type" models, the "Leibenstein-Stiglitz-Mazumdar" group, and the "Harris-Todaro and the migration models". This latter group encompasses much of contemporary contributions in this field, and has come to represent the most powerful of the neoclassical body of literature that deal with the LDCs. It, however, still relies heavily on the background work and foundation laid by its predecessors -- the Lewis-type models and the contributions of the Leibenstein and Stiglitz era.

2.2.1 The Lewis-type Models

The pioneering work in the labour market analysis of the LDCs is that of Lewis (1954) and the subsequent "Lewis-type" models that developed out of it. The LDCs are posited as characterized by conditions of "labour surplus". In explaining this term, Berry (1975: 563) defines that part of the traditional sector labour force with marginal product below (wage) income as "surplus labour", which is available to the modern sector at a wage partly determined by non-market (institutional) factors. The modern sector in the "labour surplus economy" is defined as one where, in hiring labour, employers attempt to maximize profits (i.e. they tend to employ the "value of marginal product (or marginal revenue product) equal the marginal cost of the last worker" rule). The complementary traditional sector has marginal

cost of the last worker above the value of his marginal product. An economy with both modern and traditional sectors as defined above, is known as a dualistic one.

The Lewis-type models are thus dual-sector models in which the economy is dichotomised in the above fashion. They depict the absorption of an initial surplus by transference of labour from the traditional to the modern sector of the economy; the modern sector is the capitalist sector and the traditional sector is the subsistence sector. The capitalist sector is "that part of the economy which uses reproducible capital and pays capitalists for the use thereof" (Lewis, 1954: 148). The subsistence sector includes everything else, notably subsistence agriculture, petty trade, domestic services, and the like, all of which Lewis characterizes with the existence of surplus labour.¹⁰

An unlimited labour supply exists at the subsistence wage, and employers cannot bid up wages through expansion in employment. The average income level in the subsistence (rural) sector (W_r) must be somewhat less than the average

¹⁰ Surplus labour in the original Lewis' sense implies the case where the sector contains workers whose marginal productivity is negligible, zero, or negative, but who nevertheless receive some positive amount of income which enables them to achieve a given living level. Mathur (1964) provides a detailed explanation of how zero marginal productivity could be consistent with positive wage payment despite the validity of the marginal productivity theory of wages. For an account of this explanation as well as a thorough analysis of the marginal productivity theory in the context of a labour surplus subsistence economy, see Mathur (1964). See also, Sen (1966).

wage (income) in the modern (urban) sector (W_u) by, according to Lewis' suggestion, some 30 percent or more (Reynolds, 1965). The reasons for the existence of this wage gap are the incidence of higher living costs in the towns, psychic costs to workers who transfer from easy-going life in the traditional sector to the "tight-discipline" life of industry, and also the higher conventional living standards in the urban area (Reynolds, 1965; Leeson, 1979; Godfrey, 1979; Basu, 1984). Thus the urban-rural wage gap could therefore be seen as a strictly compensating differential.

We present the Lewis-type models' analysis of employment determination in the following framework:

Employment in the capitalist sector is determined on ordinary maximizing principles: with a perfectly elastic supply of labour at the existing $W_u > W_r$, the firm's problem is that of

$$(2.1) \quad \text{Max}_{\{L\}} pQ(L, K^{*1}) - W.L - rK^{*1}$$

where

p is price of output Q , L is labour input, K^{*1} is a given level of capital input in the first period (period 1), with rental rate r .

From the first order conditions for achieving (2.1) we obtain

$$(2.2) \quad W = pQ'(L, K^{*1})$$

from which the equilibrium amount of employment can be determined. Let the solution be given by

$$(2.2a) \quad L^{*1} = L[W^1, r, Q(L, K^{*1})]$$

in the first period.

Now the capitalist surplus,¹¹ $S = pQ - W^1L - rK^{*1}$, is bound to be reinvested, thereby the capital stock is increased from K^{*1} to, say, K^{**2} which then enters into (2.2a) to yield a higher level of demand for labour (employment) as

$$(2.3) \quad L^{*2} = L[W^2, r, Q(L, K^{**2})], \quad W^2 > W^1.$$

From this situation a higher amount of surplus will lead further to higher capital stock and higher labour demand, and the process will continue until all available surplus labour supply have been absorbed. The model views though that the era of unlimited labour may never end because labour supply is being expanded continuously through population increase. And unless the labour demand curve shifts out faster than the labour supply rises, surplus labour would continue to increase over time.

Meanwhile the average income in the traditional sector remains at Wr , and would not decline in the face of reduction of labour because there had always existed labour

¹¹ The assumption here is that the firms are monopolists making positive profits (Lewis, 1954). However, it could be wondered why there should be entry barriers perpetuating the monopolists' prolonged positive profit margins. Arrighi (1973) provides the explanations as to why this could be so, by noting that the modern sector firms are usually (foreign) oligopolists operating with high capital-intensive techniques. See also, Knight and Sabot (1983).

surplus. Nor will it be affected by the size of the labour surplus (for even though the labour surplus might reduce the subsistence sector's marginal productivity on which W_r depends (see Basu, 1980; 1984), W_r would never fall below its "fixed" level that is required for basic sustenance). Should a time come when the labour surplus is exhausted and labour becomes scarce in the capitalist sector, the labour supply in the latter becomes upward sloping: all disguised unemployment has been eliminated in the subsistence sector and the marginal productivity of all labour in this sector has now risen to W_u . This is the point which Ranis and Fei (1964) terms the "commercialization point". The subsistence sector must pay labour the value of its marginal product and must compete with the modern sector for "scarce" labour. The subsistence sector has now vanished by becoming "modern", and both sectors now operate on commercial principles since rural workers are now no longer rationed, and are able to move between sectors.

But the wage level in the industrial sector may have risen and been rising prior to the exhaustion of the labour surplus -- for reasons that include non-economic ones. It may rise in line with a rise in conventional standards of life, voluntary increases granted by capitalists on moral grounds, trade union pressure, or government regulation (Reynolds, 1965). Therefore the modern-subsistence sector wage gap would still always exist; and labour rationing and

rural-urban labour "immobility" would continue to be the order of events in the economy's labour market.

We note that W_r is not expected to increase while labour surplus still existed. If it does increase however (for some reason) this would lead to higher W_u and/or may postpone further the attainment of the "commercialization point". W_u is determined by the alternative available to those entering capitalist employment -- the standard of living in the subsistence sector (of which W_r is an approximate indicator). So W_u will be above W_r by at least a margin which is necessary to induce the labour transfer, and represents the amount required for the attainment of a conventional higher standard of living for capitalist workers and to compensate for higher costs of living in the capitalist modern sector (Godfrey, 1979; Leeson, 1979) -- the compensating differential.

2.2.2 Leibenstein, Stiglitz, Mazumdar

The work of these authors is slightly different from the Lewis-type models to the extent that the former seem to concentrate mainly on the modern sector of the economy. They appear to take the wage level in the traditional sector as determined by some average level of subsistence production income (Stiglitz, 1969; 1974; Mazumdar, 1959a,b), and employment there as characterized as usual by disguised unemployment. Other than these, the other further pre-

occupation with the subsistence sector as such by these authors is in attempting to explain why the earnings of labour are often substantially higher in industry than in agriculture even after allowance is made for the higher cost of living in the towns. Mazumdar (1959a) views that such a vast earnings disparity ought not obtain in the absence of any strong labour union organizations and the presence of a large and mobile surplus of labour both in agriculture and in the urban districts (which therefore should depress the industrial wage rate through excess supply). But as it is, this observation has not been realised, and the persistence of the disparity therefore casts doubts as to the relevance of such neoclassical-based theories as these.

Some other authors in this group (See Bauer and Yamey, 1957) seem to provide some answers to the issues raised by Mazumdar. It is stated that in subsistence economies the extended family system provides for a form of collective production and consumption which in effect establishes a reserve price for labour. This implies that there will be a floor to the wage rate given by the income per capita in agriculture. So that in order to attract sufficient amount of labour, the industrial sector has to offer a real wage greater than the level of this income per capita in agriculture. But an alternative and seemingly more explanatory answer is provided by Leibenstein (1957) who postulated that whereas in the developed economy the purpose

of increasing production is to increase the level of consumption which is desirable for its own sake, in the underdeveloped economy an additional reason for wishing an increase in production exists: such an increase will not only make possible an increase in consumption, but, also, by adding to the health and vitality and hence productive vigour of the working population, it will make possible a further increase in production. Hence an increase in consumption is desirable not only for its own sake but also for its stimulating effects on production (Mazumdar, 1959b, Wonnacott, 1962). If a country is poor and under-nourished, an increase in consumption will increase the working vigour of the labour force, and entrepreneurs will find that the quality of the labour hours they are purchasing is not independent of its price, the wage rate. So, firms will tend to set the wage rate at that level which minimizes the cost per unit of man-effort employed. But the main issue here is that this wage level is very likely to be higher than the average agricultural wage level (defined by W_r in the previous section) available in the subsistence sector. This explains the modern-traditional sector earnings vagaries in this model.

With regard to employment determination, the implication from the Leibenstein position is that if a "surplus" labour situation (in the Lewis sense) is assumed, then at the chosen wage level there is bound to be an excess supply of

labour, and involuntary unemployment would exist in the modern sector, co-existing with the already existing disguised unemployment in the subsistence sector.

The work of Stiglitz (1974) appears to provide the supplementary framework needed to knit the works in this group together in a more comprehensive fashion. Stiglitz's work on this is a general equilibrium model. It provides for the explanations simultaneously of the determination of wage differentials, urban unemployment, and the allocation of labour between the urban and the rural sectors.¹²

Turnover costs (recruitment and training) are greater in urban sector than in the rural sector (probably because of, say, the formal processes of application processing and interviewing which are observed in the urban area and need not be observed in the rural area where on-the-spot recruitments are likely to be the practise. Stiglitz may also have in mind the idea that the urban labour market belongs to the primary segment of the labour market while the rural sector belongs to the secondary segment; and in the secondary labour market, recruitments are arbitrary and there is not much training required for the worker). The turnover rate is a decreasing function of the wage rate in the urban sector relative to the wage rate in the rural sector, so that it pays each competitive firm in the urban

¹² Stiglitz refers to the model as a "labour turnover model" because of the central role that labour turnover plays in it.

sector to offer more than the rural wage.

It is clear then that the incidence of hiring and training costs is the factor behind the reason why urban wage level is higher than its rural counterpart. It also explains why the urban employed could be expected to be more productive than his counterpart in the rural sector. The Stiglitz analysis, viewed together with the Leibenstein and Mazumdar treatments, provides the insight as to why the amount of labour demand in the urban sector could always fall short of the labour supply: the labour supply depends on the relatively high urban wage rate coupled with the existing amount of unemployment in the urban sector; labour demand, on the other hand, is restricted to the level which the firm could absorb and train, and would not necessarily increase if the wage rate falls since it also would depend on whether the firm would be willing to incur the further training costs. Furthermore, the urban wage rate could be expected to experience downward rigidity for most of the time, for employers would be unwilling to offer any "lower" wages that could depress efficiency and productivity. Involuntary unemployment would hence persist in the urban sector.

Contributions focusing on the Rural Labour Market Sector

Relatively more recent contributions to the explanation of the labour market problems of the agricultural sectors of the underdeveloped economy exist in works of Bardhan (1979a, b), Hansen (1983), House (1984 a,b), Eswaran and Kotwal (1985), Ahmed (1983) to mention just a few.

Earlier treatments of the issue of rural labour supply exist in works of Mazumdar (1959a), Berg (1961), and Kilby (1961). These authors generally agree that the individual labour supply curve is negatively sloped, because (they reckon) rural dwellers have relatively low want schedules and therefore are likely to have higher preferences for leisure as against income.

Bardhan (1979a) tested this notion in his empirical study in which he analyzed a large set of cross-sectional data for agricultural workers in rural West Bengal region of India in estimating farm labour supply functions. His results led him to conclude that the supply of agricultural labour is positively related to the wage rate and negatively related to the square of the wage rate. We can represent this finding in a linear model:

$$N = a + \beta W - \gamma W^2,$$

where N is labour supply, W is wage, and $a, \beta, \gamma > 0$ are parameters.

From this, $dN/dW = \beta - 2\gamma W = 0$ for $W = \beta/2\gamma$

and $d^2N/dW^2 = -2\gamma < 0$. These indicate that the labour supply curve increases at a decreasing rate with the wage rate, and will eventually bend backward at the wage rate given by $W = \beta/2\gamma$.

It is interesting to observe from the foregoing that rural labour supply can be modelled with the use of standard mainstream labour economic theory.

On the demand side, this sub-set of the literature attempts to explain wage and employment determination in the context of both casual and permanent agricultural workers. Bardhan's (1979b) empirical work here addresses the conditions of wage and employment in a model where there exists an "incentive payment" by the employer when supervision and continuous monitoring of work effort is costly for him. This is given a more thorough theoretical treatment by Eswaran and Kotwal (1985) who utilized a "shirking model" to explain the incidence of non-market-clearing wages for agricultural employment contracted on a somewhat permanent basis. These models bring both the supply and demand sides together to determine the equilibrium wage and employment between casual and permanent agricultural labour.

The employer seeks to elicit loyalty and trustworthiness from hired permanent workers in order to entrust them with important tasks that are by nature difficult to monitor.

The employer accomplishes this by providing for them a utility level from employment higher than that which could be obtained from elsewhere in an alternative employment. This creates a process of what the writers termed "two-tier" labour market within a homogeneous labour force. Any evidence of shirking on the part of the employee results in the termination of the otherwise permanent contract. Such a possibility and the resulting losses in utility from it, holds the worker loyal most of the time to the benefit of the employer. Based on this theoretical underpinning, the authors established a system of demand for labour equations for "permanent" and casual workers, and their wages; and demonstrate that wages and general conditions of employment are superior for the permanent employees as compared to the casual workers.

The models clearly illustrate how, even the agricultural labour market, is ("segmented") divided into a "primary" (permanent) sector with high wages and a "secondary" (casual) sector with low wages and high turnover rates. A critique of this analysis is carried out in a subsequent section of this chapter.

2.2.3 Harris-Todaro and the Migration Models

Models of rural-urban migration and the functioning of the urban labour market have attempted to explain the phenomena of large scale urban in-migration and open

unemployment by recourse to implications from the Lewis postulate, and by a seemingly direct application of the Stiglitz (1969; 1974) postulates. Todaro (1969), and Harris and Todaro (1970) hypothesized a two-sector model in which the individual decision to migrate is a function of the urban-rural real income differential and of the probability of finding a modern or formal sector job. If the present value of the discounted expected real income gain from migration, after taking account of the chances of being unemployed, is positive, then migration is worthwhile. Works by House and Rempel (1978a; 1980), and Rempel (1979) on the empirical examination of this migration model (using Kenyan data) have tended to confirm the model's underlying functional relationship (House, 1984b). We present a brief outline of the model in the following framework.

It is assumed that the rate of rural-urban migration is a positive function of the differential between expected earnings in the urban sector and the average expected earnings in the rural sector (Harris and Todaro, 1970; Iyoha, 1975). Let the expected urban earnings be represented by the urban wage rate modified by one's expectations of finding employment. The most important factor governing expectations is the existing urban employment rate, E_u , which is a proxy for the probability of getting an urban job.

Following these specifications we can write a Harris-Todaro differential equation of rate of rural-urban migration as

$$(2.4) \quad \dot{M} = k_1 \{W_u(L_u/N_u) - W_r\}$$

where

$\dot{M} = dM/dt$ is the rate of migration with respect to time, t .

M is the amount of migration,

k_1 is a positive constant,

W_u is average real wage (income) in the urban sector,

W_r is average real wage (income) in the rural sector,

L_u is urban employed labour force,

N_u is total urban labour force (employed and unemployed).

Now W_u is expected to be greater than W_r in real terms (i.e. adjusted for cost-of-living differences, etc.), for various reasons (see above): the urban sector is the more capitalist sector, and capitalistic production raises the productivity of labour, enabling labour to receive higher wages (Lewis, 1954; Leibenstein, 1957). Also, because of the low level of productivity in rural agriculture (which dominates economic activity in the rural sector), average rural earnings fall far short of its urban counterpart (Umo, 1975). This situation is aggravated by the operations of agents like the Nigerian Produce Marketing Boards (see next Chapter).

Based on the validity of this relationship, we note that the urban unemployment rate affects the probability of finding an urban job (L_u/N_u) -- higher urban unemployment rate reduces this probability. Hence, there would normally exist some level of urban unemployment rate, (denote this level by U^*), sufficiently high to equilibrate the expected earnings in both sectors, thereby causing migration to cease. For this rate of unemployment, (2.4) becomes

$$(2.5a) \quad k_1 [W_u.(L_u/N_u)^* - W_r] = 0,$$

from which we obtain

$$(2.5b) \quad W_r = W_u.(L_u/N_u)^*.$$

This shows that equality of inter-sectoral expected earnings could only come about when the urban unemployment rate is sufficiently high to cause migration to cease.

Now let us define:

π_1 = the probability of getting a job in the
urban sector,

π_2 = the probability of being employed in the
rural sector.

Then (2.4) can be written as

$$\dot{M} = k_1 \{ \pi_1 W_u - \pi_2 W_r \}$$

with the assumptions that

$\pi_1 = L_u/N_u$ (according to the original Harris-Todaro (1970) version, and according to Shaw (1971),
and

$\pi_2 = 1$ (i.e. assuming that there is certainty of one being "employed" in the rural sector, either

in commercial agriculture or in subsistence activity or in both).

Therefore (2.5a) becomes

$$(2.6) \quad k_1[\pi_1 W_u - W_r] = 0,$$

from which (2.5b) is obtained.

Any event that disturbs the equilibrium (2.6), such as an increase in urban labour demand (L_u), whether or not it increases W_u , would increase π_1 and thus make dM/dt positive, until the system comes to rest at a new equilibrium with a new unemployment level $U^{**} > U^*$.¹³

But what factors are responsible for making equation (2.6) to hold? Why would the expected earnings in the two sectors be equated under given π_1 and π_2 with $W_u > W_r$ given the notion of neoclassical economic theory that rational individuals and economic agents tend to behave in such a way as to exploit all available gains from trade?

¹³ This represents a very disturbing dilemma for the LDC. Attempts to create any additional employment in the urban sector has the effect of increasing (rather than decreasing) the urban unemployment. A simple numerical example could illustrate this. Suppose $N_u = 9000$, and $L_u = 6000$. Then absolute number of unemployed is 3000, while $E_u = 2/3$ or 66.7%. If an additional 800 jobs is created, while N_u increases to 10000 (just by 1000), the absolute number of the unemployed has risen (to 3200) with the rise in L_u (to just over 67%). This is a dilemma of "creating additional unemployment with employment": this example indicates that a less than 2% employment led to over a 6 percentage point increase in unemployment.

The answer to the above question is crucial to our investigation. Both the Lewis postulates and its followers, as well as Leibenstein, Stiglitz, Basu and many others among the contemporary writers attempt to provide answers and explanations to the persistence of the intersectoral wage gap. A critical look will be taken at these explanations shortly, and it is envisaged that a possible (perhaps alternative) explanation will emerge from our study.

Before this, let us attempt a more in-depth analysis of the process of equilibrium determination in the Harris-Todaro model.

2.2.4 A Microeconomic Analysis of the Harris-Todaro Model

Let outputs in the urban and rural sectors respectively be

$$(2.7a) \quad Q_u = Q_u(L_u); \quad Q_u' > 0, \quad Q_u'' < 0$$

$$(2.7b) \quad Q_r = Q_r(L_r); \quad Q_r' > 0, \quad Q_r'' < 0.$$

The total labour available in the economy is L , and is distributed to both sectors such that

$$(2.7c) \quad L_u + L_r \leq L.$$

Now assuming that the society wishes to maximize social welfare which depends on the total output produced in the economy, $Q_u + Q_r$; the problem becomes the optimal way of distributing labour between the sectors under the constraints (2.7a), (2.7b) and (2.7c).

This maximization problem can be depicted as a simple Lagrangean exercise:

$$(2.8) \quad \text{Max } Q_u(L_u) + Q_r(L_r) + \lambda_1\{Q_u - Q_u(L_u)\} \\ + \lambda_2\{Q_r - Q_r(L_r)\} + \lambda_3\{L - L_u - L_r\}$$

where the λ 's are Lagrangean multipliers.

This yields the following first-order conditions:

$$(2.8a) \quad Q_u' - \lambda_1 Q_u' - \lambda_3 = 0$$

$$(2.8b) \quad Q_r' - \lambda_2 Q_r' - \lambda_3 = 0$$

$$(2.8c) \quad Q_u - Q_u(L_u) = 0$$

$$(2.8d) \quad Q_r - Q_r(L_r) = 0$$

$$(2.8e) \quad L - L_u - L_r = 0.$$

Solving these:

(2.8a) and (2.8b) yield

$$\frac{Q_u'}{Q_r'} = \frac{(1-\lambda_2)}{(1-\lambda_1)}$$

as (2.8c), and (2.8d) are just the definitional equations already stipulated in (2.7a) and (2.7b) respectively.

Assuming $\lambda_1 = \lambda_2$ (i.e. assuming changes in Q_u and Q_r have identical effects on social welfare),¹⁴ then

$$(2.9a) \quad Q_u' = Q_r',$$

and

$$(2.9b) \quad L = L_u + L_r \quad (\text{from (2.8e) as against inequality (2.7c)}).$$

Denote the solutions to these as L_u^* and L_r^* .

Then by substituting these values into (2.7a) and (2.7b)

we obtain the optimum values:

¹⁴ By definition, the Lagrangean multiplier is the measure of the sensitivity of the objective function (in this case social welfare) to the constraint (Q_u and Q_r).

(2.10) $\{Lu^*, Qu^*\}, \{Lr^*, Qr^*\}$.

(2.10) represents the "maximum-welfare" equilibrium solution, and can be compared with the Harris-Todaro equilibrium solution by the aid of the digrammatic illustration in Figure 2.1.

The length of the horizontal axis, O_u-O_r represents the total available labour force. The vertical axes measure W_u and W_r on the left-hand side and the right-hand side respectively. The curves MP_u and MP_r are the marginal product curves of labour in the urban and rural sectors respectively, drawn with origins O_u and O_r respectively.

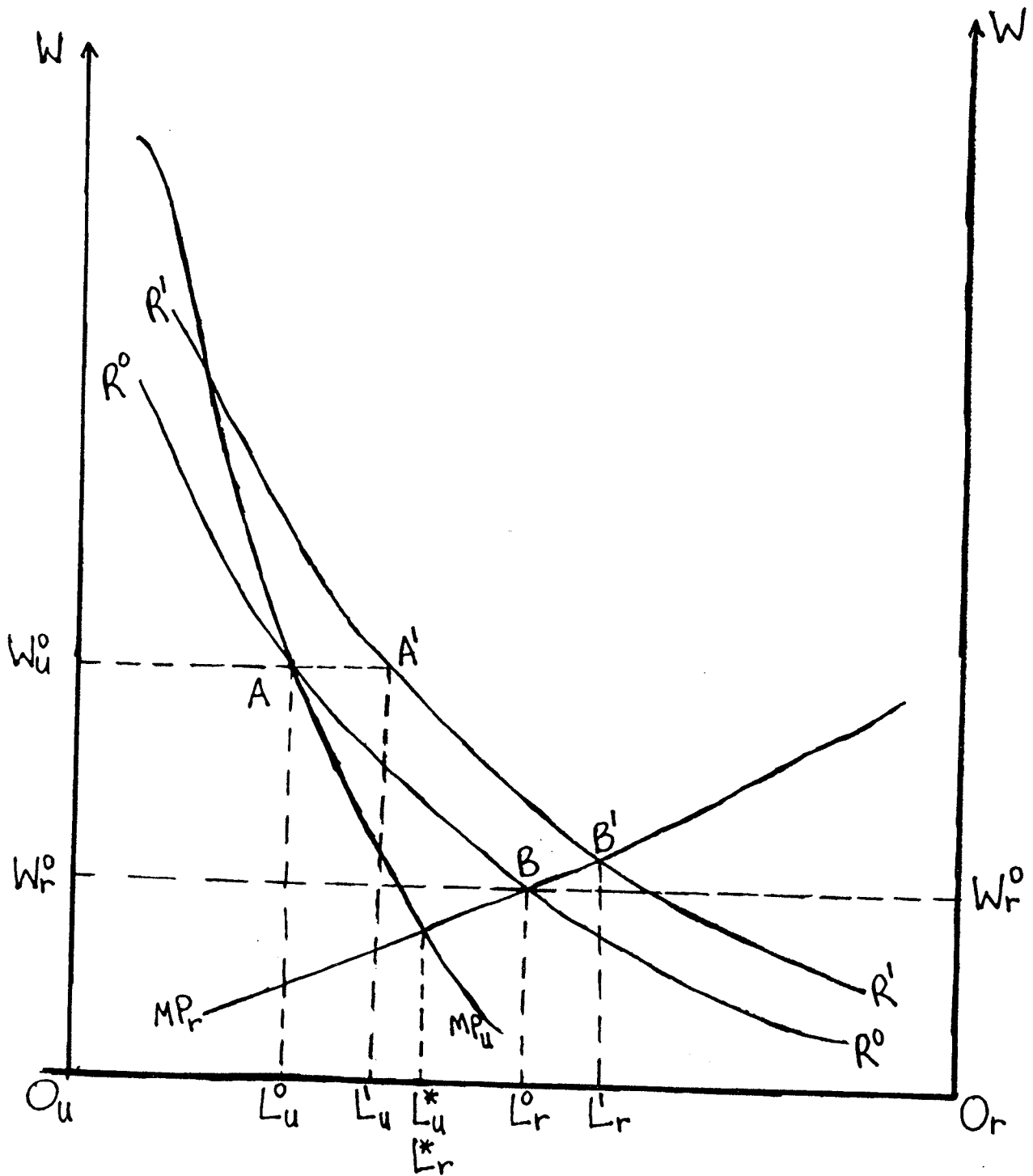
According to the welfare-maximization equilibrium solution, output is maximized by allocating labour between the two sectors according to the point of intersection of the two curves, i.e. employing Lu^* in the urban sector and Lr^* in the rural sector.

According to the Harris-Todaro solution, the urban sector has an institutionally fixed minimum wage W_u^0 , and this means that the urban sector employs $Lu^0 < Lu^*$. The difference, $Lu^0 Lu^*$, represent urban unemployment.

To determine what happens to rural employment as a result, consider the rectangular hyperbola $R^0 R^0$,¹⁵ constructed through the point A.

¹⁵ This technique is adapted from Basu (1980) and (1984).

Figure 2.1
General and Optimal Equilibrium within a Harris-Todaro Framework



The area Wu^0ALu^0Ou ($= Wu^0Lu^0$) is equal to the area Wr^0BLr^0Ou
 $[= Wr^0(L-Lr^0)] = Wr^0Nu$.

i.e.

$$(2.11) \quad Wu^0Lu^0 = Wr^0(L-Lr^0)$$

or

$$(2.12) \quad Wr^0 = \frac{Wu^0Lu^0}{(L-Lr^0)}$$

$$= \frac{Wu^0Lu^0}{Nu}$$

(2.12) is the same as (2.5b).

Hence the amounts (Wu^0, Lu^0) and (Wr^0, Lr^0) represent the Harris-Todaro equilibrium position for the urban wage level Wu^0 . This shows that rural employment reduces from Lr^* to Lr^0 as a result of the urban-rural wage gap $(Wu^0 - Wr^0)$. The amount of labour $Lr^* - Lr^0$ represents an additional urban unemployment (rural-urban migrants).

Consider now an increase in urban employment (at the fixed wage Wu^0 , say).¹⁶ The corresponding rectangular hyperbola R^1R^1 indicates a reduction in rural employment to $Lr^1 < Lr^0$. The amount of labour $Lr^0 - Lr^1$ migrates to the urban sector and increases the urban unemployment level, and likely its rate also.

¹⁶ Note that even if Wu^0 alters at a higher urban employment level, the result will not change.

2.2.5 Stability Analysis of the Harris-Todaro Equilibrium Solution

We attempt to establish that the above solution of the model is stable, and that the underlying assumptions for which this stability is established is a subject which this study will investigate.

Define the time rate of increase of migration as determined by the "excess demand" in urban employment, i.e.

$$(2.13) \quad \frac{dM}{dt} = \dot{M} = k_2(Lu - M),$$

where

$$k_2 > 0 = \text{is the speed of adjustment.}$$

For simplicity assume that urban labour demand (employment) is a linear function of the urban wage rate:

$$(2.14) \quad Lu = aWu + \beta, \quad a < 0, \beta > 0.$$

(2.14) into (2.13) yields

$$(2.15) \quad \dot{M} = k_2(aWu + \beta - M).$$

Substituting Wu from equation (2.4) into (2.15) we have

$$(2.16) \quad \dot{M} = \frac{ak_2Nu}{k_1Lu} \dot{M} + \frac{ak_2Wr}{k_1Lu} + k_2M - \beta k_2$$

Simplifying, we obtain the first-order, first-degree differential equation

$$(2.16a) \quad \dot{M} = - \frac{k_1 k_2 Lu}{(k_1 Lu - ak_2 Nu)} M + \frac{k_2 Lu}{(k_1 Lu - ak_2 Nu)} \frac{(aWr + \beta k_1 Lu)}{k_1 Lu}$$

The solution to (2.16a) is given by the sum of the solutions of the 'homogeneous part' and the 'particular part'.¹⁷

For the homogeneous solution:

$$\dot{M} + \frac{k_1 k_2 Lu}{(k_1 Lu - a k_2 Nu)} M = 0,$$

or

$$\dot{M} = - \frac{k_1 k_2 Lu}{(k_1 Lu - a k_2 Nu)} M$$

Integrating both sides:

$$M(t) = A e^{-vt}$$

where

$A =$ a positive constant,

and

$$v = \frac{k_1 k_2 Lu}{(k_1 Lu - a k_2 Nu)}$$

For the particular solution:

putting $\dot{M} = 0$ into (2.16a)

$$-vM + \frac{v(aWr + \beta k_1 Lu)}{k_1 Lu} = 0$$

so that

¹⁷ The reader who is interested in the complete methodology of differential equations may wish to see Chiang (1974:466-495).

$$M = \frac{aWr + \beta k_1 Lu}{k_1 Lu} = M^*$$

The complete solution of (2.16a) is therefore given by

$$(2.17) \quad M(t) = Ae^{-vt} + \frac{aWr + \beta k_1 Lu}{k_1 Lu}$$

Equation (2.17) is the time-path of rural-urban migration.

The stability conditions for (2.17) requires that the limiting value of $M(t)$ as t approaches infinity be finite. Given that the second term of the right-hand side of (2.17) is finite for given values of Wr and Lu , then

$$\lim_{t \rightarrow \infty} M(t) = M^* \text{ if and only if } v > 0.$$

But

$$v = \frac{k_1 k_2 Lu}{(k_1 Lu - a k_2 Nu)} > 0 \text{ for given values of } Lu \text{ and } Nu$$

since $k_1, k_2 > 0$, and $a < 0$.

Therefore

$$\lim_{t \rightarrow \infty} M(t) = \frac{aWr + \beta k_1 Lu}{k_1 Lu} = M^*.$$

Stability is established for the Harris-Todaro solution illustrated in the model above.

However, the condition $a < 0$ is required for this stability i.e. the urban labour demand curve is required to be negatively sloped. In other words, it is required that urban employers react to wage reductions with increased labour demand, and to wage increases with reduced labour demand.

But do urban (industrial) employers actually act according to this rule?

Our study of the labour market by the application of the efficiency-wage model will attempt to examine this requirement and to provide some answer to this question.

2.3 CRITIQUE OF THE LITERATURE

The abundance of literature and the significantly high rate at which additional research output is emerging in respect of LDC labour markets represents an encouraging development towards the quest for a more thorough understanding of the LDCs' economic conditions. It is important that the literature on the underdeveloped economies be made to have sufficient micro foundations required for a more rigorous and more thorough exposition of the facts, preparing the ground for the evolution of more deep-rooted and viable policy prescriptions.

With respect to the LDCs' labour market literature, the elegant pioneering contributions of the Lewis-type models are clearly the most important first attempts in applying neoclassical analytical methods in the development of LDC labour economics. These efforts set the stage, and laid the general background upon which the subsequent work in this direction were based.

However, it has been argued that the Lewis approach does not go far enough in its utilization of the (neoclassical)

rationality axiom (Leeson, 1979; Basu, 1984); and also that the models are based on certain unrealistic premises such as the premise of competitive product markets (Abumere, 1978; Livingstone, 1976). The models' presumption that capitalists reinvest their surplus implies that monopoly situation is supposed, and such a supposition is incompatible with the models' (implicit) assumption of a constant output price level.

If firms accumulate surpluses, and are monopolists or oligopolists [see Herman (1975), Reuber (1973), Arrighi (1977), Knight and Sabot (1983)], then increased capitalist investment of profits, leading to higher output (shifting the marginal product of labour curve outward), will depress output prices and reduce capitalist profits (depending of course on the price-elasticity of output demand; but even if we assume a very moderately inelastic demand situation, profits will still be adversely affected). Moreover, wages may be increased due to the increased labour demand.

Therefore, given that entrepreneurs "are not fools", it will be more reasonable to suppose that they should spend (some of) their profits on consumption instead of investing it under such circumstances in which investment in the first period diminishes profits in the second period.¹⁸ The

¹⁸ Basu (1984) makes this point by use of an explicit diagrammatic illustration. A different set of very interesting points evaluating the Lewis model is contained in this Basu's (1984) impressive volume (chapter 5). The interested reader may also wish to refer

models' rationality assumption is therefore inconsistent in its use for analyzing the workings of the labour market and employment determination in it. That firms mechanistically reinvest all their profits does not seem to be a valid assumption in line with the rationality axiom.

The "compensating differential" explanation given for the phenomenon of urban-rural wage gap does not seem to be a very convincing argument. It is not only ad hoc in terms of how the employer is supposed to determine the exact amount of wage level which will be sufficient as a compensating differential, but also appears to be at odds with the workings of the "marginal productivity theory" which is supposed to have governed the choice of the appropriate wage offer. How does the model explain the possibility that an employer's profit maximization criterion (value of marginal product equals wage rate) might be achieved at a wage level close to (or even less than) the rural wage? Must the employer then arbitrarily decide to violate such an optimal wage choice in order to raise his wage offer to reflect the "compensating differential"? If so, why must the employer find such an action profitable? The model clearly compromises the fundamental tenets of neoclassical modelling by not providing a firm basis for explaining why urban wages will not fall in the face of increased intake of rural workers. Its systematic device of "rationing" of rural

to Leeson (1979) as well as Godfrey (1979) for some critique along similar lines.

workers seems to be explicable more in terms of a social choice framework than in terms of economic behaviour.

The Stiglitz era brought some improvements into the basic foundations laid by the Lewis-type contributions. The crucial issue of the urban-rural wage differential emerging as a perpetual feature of the labour market is explained by Stiglitz (1969; 1974) in terms of 'labour turnover' factors (see above). Harris-Todaro and the latter migration models that grew out of it attribute the higher urban wage levels to "the tendency for urban wages to be fixed by institutional and/or minimum wage rules" above their rural counterparts (see Basu, 1984:73). The literature thus tended to treat the rural-urban wage gap as exogenously determined (based partly on the Lewis arguments) until Stiglitz (1974) attempted to provide more indepth analysis into factors determining how the wage gap actually emerges and is sustained (namely, the "turnover" analysis).

However, what these authors establish is not the absolute rigidity of the urban wage but merely establish why the urban wage may tend to equilibrate above the rural one (Basu, 1984:76). It is not clear as to why the urban wage must be "fixed" above the rural one. Also the question of the downward rigidity of the urban wage arises. Recent contributions to the growing literature on this by House (1984a), Hansen (1983), Knight and Sabot (1983), Rempel (1981), House and Rempel (1978a; 1978b) attempt to analyze

the factors causing the rural-urban wage differential and the urban wage inflexibility. Various factors are identified as possible explanatory factors for these phenomena; the role of the firm in fixing high wages as a result of its market power and in order to minimize (high) turnover costs are the major explanations offered.

We observe that a thorough neoclassical analysis has not been provided for explaining both the reasons and sources of urban wage rigidity and inferiority of rural wages relative to urban wages. It will be illuminating to see the Harris-Todaro mechanism adapted to incorporate a model that sheds light on how the system will work if wages in the two sectors of the economy are allowed to fluctuate in such a way that wage parity is achieved. Furthermore, the model should address the question that may arise if full employment happens to obtain in the urban sector: for then will the probability of finding an urban sector job be unity, thereby making it impossible for equilibrium to establish.

Our contribution in establishing stability for the Harris-Todaro solution represents a strong indication that the model can be applied towards the analysis of the LDCs under the given assumptions. Therefore it is essential for the Harris-Todaro type migration models of LDC labour market analysis that the factors responsible for the formation of the urban wages, and for these wages to be always superior

to rural wages (in real terms), and also to be inflexible downward, be thoroughly analyzed and explained within the neoclassical framework of economic analysis. We consider this requirement crucial for an on-going durability of the Harris-Todaro and its associated migration models in analyzing LDC labour markets, and for formulating the relevant policy prescriptions. This dissertation attempts to address this requirement.

The urban informal sector and its interactions with, and influences on, the overall labour market has come to pose an additional question needing to be addressed. The Harris-Todaro supposition that people in the urban sector either find jobs at the (formal sector) wage W_u or they remain unemployed, seems to be no longer tenable when cast in the light of the operation of the informal sector at offering alternative employment at wages below W_u (but generally above W_r) [see Sethuraman (1976; 1981), Amin (1982), Rempel (1982), Mazumdar (1976)].¹⁹

The literature on rural (agricultural) employment analysis represents an important break-through to the extent that they have pioneered the application of micro-theoretic methods to the modelling of agrarian labour markets. The

¹⁹ The omission of the urban informal sector operation need not, however, be a serious flaw for the Harris-Todaro model, since the main difference it makes is that its inclusion raises the probability of finding urban jobs (and lowers W_u). Such a situation does not alter the fundamental postulates of the model.

works of Bardhan (1977; 1979a,b) and Eswaran and Kotwal (1985) are particularly worth mentioning.

However, one major premise utilized by these models seems to be suspect. The assumption that the employer can use an "incentive payment" system to attract higher work effort from the employees (and thereby reduce costly supervision and continuous monitoring) does not seem to be tenable for the agricultural sector. Given the nature of agricultural job tasks, one would suppose that worker productivity is easily verifiable, so that shirking on the part of any employee is readily detected. Moreover, agricultural job tasks are relatively non-capital intensive, therefore no significant "worker discretion and personal judgement" (emphasized by Eswaran and Kotwal (1985: 162-165)) is required by the worker in his/her job routine. Rather, it is expected that such requirements characterize employment and production in the industrial (manufacturing) sector where some degree of worker sophistication is likely to be needed because of the high capital-intensity and modern technological requirements of the production activity in this sector.

This condition is utilized in our study of the agricultural sector and its employment implications, as well as in modelling the LDCs' overall labour market conditions under the framework of the efficiency-wage hypothesis. The analyses, the results, and their empirical illustrations,

form the bulk of the contents of this thesis, and are provided in the subsequent chapters.

2.4 SOME CONCLUDING REMARKS

In this chapter we have presented both a brief review of mainstream labour economics and a more indepth critical evaluation of the labour market literature of the underdeveloped economies. We have noted the extent to which the main theoretical constructs of modern labour economics have applicability in analyzing the problems of the LDC labour markets. We observed that the neoclassical and dual-labour market analyses of modern labour economics can be applied usefully to the explanation of LDCs' labour market conditions.

We also noted that the contemporary LDC labour market literature which has developed over the years under the pioneering lead of Lewis, Leibenstein and others, represents an important base upon which a complete "Labour Economics of the LDCs" can be founded. An important requirement for transforming the existing contributions into a comprehensive body of "LDC labour economics" is the need for modification and adaptation of concepts to identify entities of decision-making and thus provide clearer policy prescriptions, in the fashion exemplified by the works of Basu (1980; 1984), Stiglitz (1974; 1976a,b), Eswaran and Kotwal (1985), Hansen (1983).

The existing LDCs' labour market literature is reviewed, and we attempted to emphasise some of the pertinent flaws needing attention (and do suppose that our study shall succeed in attempting to provide answers needed for addressing these flaws). We have also established stability for the Harris-Todaro model of LDC labour market analysis, and discovered that the stability condition requires that the urban labour demand curve be negatively sloped. Our study shall attempt to investigate the extent to which this condition is satisfied in LDC labour markets.

We believe that this exercise is a contribution towards the emergence of a more representative labour economics analyses reflecting the economies of the developing world. It is envisaged that this critical review of literature shall enable the reader to appreciate some of the important issues requiring attention in the labour problems of LDCs, and to be able to place in perspective some of the basic contributions this dissertation attempts to make.

Chapter III

CONDITION OF NIGERIAN LABOUR MARKET: A PROTOTYPE OF LDC'S

As a less developed economy the Nigerian labour market is characterized by certain important peculiarities that set it apart from that of a developed economy. This condition calls for the development of specific measures of labour market conditions which reflect the country's own special circumstances. It necessitates the search for the development of alternative methods of measurement in order to obtain a more accurate view of labour market conditions in Nigeria.

Some of these peculiarities have been widely discussed by a number of writers²⁰ with respect to LDCs in general. We attempt to highlight some of the pertinent ones with respect to the Nigerian economy.

Nigeria contains an area of 924,000 square kilometres (357,000 square miles) stretching between Cameroun (to the east) to Benin (to the west) on the West African coast to about 14°N. inhabited by a racially homogeneous population.

²⁰ See, for example Mouly (1977), Bruton (1978), Udall and Sinclair (1982).

Full-time wage employment is not a general feature of the Nigerian labour market. A substantial proportion of the population undertake seasonal work, part-time work, or are engaged in family enterprises, and as such would most likely not exert any consistent influence on such key labour market variables as employment/unemployment, wages, and participation rates. The use of informal methods of labour allocation is common practice. Unlike workers in developed countries who gain relatively more labour market information from formal sources such as employment agencies and classified media advertisements (Rees, 1966), and relatively less from family and friends, the majority of workers in Nigeria rely on information from relatives and friends regarding job availability.²¹

In this chapter we first present a general background by way of discussing some of the socio-economic conditions that contribute in shaping the labour market factors. The general labour market characteristics are then discussed, followed by a complete survey of the economic conditions in the labour market.

²¹ Such a situation is not irrational, seeing that people will tend to avoid the more expensive methods of job search -- regular purchase of newspapers, mailing applications, and the like. And moreover, in a community dominated by very low income persons, the most inexpensive methods of job search appears to be the most sensible ones to be adopted.

3.1 BACKGROUND TO THE LABOUR MARKET CONDITIONS

3.1.1 Attitudes to Wage-Employment

Colonial administration needed cheap unskilled labour in the plantation farms and mines; and as the products were to be exported, roads and railways had to be constructed: further requiring unskilled labour. It turned out to be extremely difficult for such labour to be forthcoming willingly from the populace who appeared content with their traditional peasant livelihood, so that certain forms of subtle and overt coercion had to be used to attract labour (Seibel, 1973).²² Hence involuntary work, or work for motives entirely external to the job, governed labour supply, so that very little adaptation took place, and workers returned to their home villages as soon as they could.

However, as time went on new motives for working and for staying in towns or at other employment sites developed: work for wealth (as the "International Demonstration Effect" took place (Meier, 1964)), work for education expenditure, and work for social status. As part of the wages have to be consumed in town, workers have to stay there beyond the point in time where the amount of wages equals the amount of money needed for taxes and fees and acquisition of few items. And as needs and wants increase and prices rise, the

²² Such techniques included the colonial government's insistence that tax be paid only in cash and in British money (see Seibel: 4). Prior to this, taxes were paid in kind, in labour, in cowry shells (a form of an exchange medium) and other forms of primitive money.

period spent in town has to be extended further. Thus a stage is rapidly developing through prolonged and intensified contact with modern money, modern commodities, and modern amenities of city life.

Nor are the rural areas left immune from all these. In fact, in the rural areas the need for tax payment, bride-price, school fees, etc., aggravate more and more the motives for wage-labour. People increasingly tend to move to the city in search of wage labour, and occasionally return home to their families.

Finally, the stage is reached where a more permanent stay in the town/work-place is necessitated. Wage employment had become fully integrated into the normal life of the Nigerian worker, and for a great many Nigerians (in absolute rather than relative terms), wage-employment has replaced agricultural and/or craft work carried out on an extended family basis. Wage labour has become a socially recognized section of life, regarded as a superior substitute for work in the village.²³ Workers' attitudes to work shifted dramatically from negative to positive, in such a way that, Seibel (1973) found that over 63 percent of all respondents showed highly positive attitudes towards their job, 19 percent had negative attitudes, and 18 percent showed

²³ From the author's close contact and experience among Nigerian villagers and town-dwellers alike, it is reckoned that most Nigerians express positive attitudes to wage-employment, and tend to regard it as an end in itself and not only as a means of earning one's living.

ordinarily positive attitude or were neutral.

3.1.2 Labour turnover and Job Prestige

Because of the type of work in which many were (and still are) employed in Nigeria: construction (road, railway, building, etc), mining, plantation farming and the like, high turnover is to be expected. The tendency is for workers to be given only limited contracts and to be dismissed after their contracts have expired.²⁴ In Seibel's (1973) study of Southern Nigeria, it was found that among the workers below 18 years of age, the mean employment duration per job is 0.9 years, and this increases with age up to 6.2 years among workers 45 years of age and above. (This finding may not be very different from what obtains in most developed countries, though).

In Nigeria (and perhaps most LDCs), white-collar jobs have the highest prestige, while manual and technical jobs are generally rejected.²⁵ Even as recent as the early

²⁴ Such experiences tended to make workers reluctant to sever their family ties at home, and to regard wage-employment and town-living as transitory.

²⁵ The roots of this attitude have been attributed to the emphasis of the colonial rulers on ordinarily academically-trained personnel needed for colonial administration only [see: Kilby (1961); Weeks (1972)]. Since there was no need for gearing the educational objectives of the colonial system towards long-term economic developmental purposes (as such purposes are divorced from the short-term colonial policies), there was no need to give any emphasis to training of the local populace in technical and semi-skilled/skilled qualifications.

1970's, the high-prestige of white-collar jobs were really in harmony with the economic structure: when senior (high-paying) work could mainly be found only in government and administration, when strong incentives were still attached to positions in the bureaucracy, and when the proportion of Nigerians employed in industry and technology was still relatively meagre (Damachi, 1973). In the past decade, occupational prestige has changed greatly in line with the structure of the economy which has increased the number of technical and other jobs in industry. However, in the rural sector where changes often occur later than in the towns, the old attitudes still prevail.

In a survey on this subject, the author found that out of 166 respondents drawn among villagers in six villages in Southern Nigeria, only about 13 percent give technical and related jobs as their first choice for themselves and their children. As high as about 52 percent favour non-technical academic jobs, and about 35 percent favour other white-collar office jobs -- a total of about 87 percent. Compared to the workers themselves (wage-workers settled in towns), the trend is almost the same among 220 respondents, except that there is a significant number here, about 26 percent, (unlike among the rural dwellers) who indicated the choice to become independent and establish their own business or trade (mainly in the informal sector presumably).

The overall picture now is that of an overwhelming thirst for general education as well as for further technical training -- a striving for occupational advancement, and a rush into any type of "modern" occupation. This is now presenting a very serious labour market problem, because there are many more being educated (but lacking the requisite experience) than can find jobs. In the rural sector, the consequence has been that production has fallen to an all time low, mainly as a result of rural exodus (but also as a result of very low productivity) [Umo,1975].

3.1.3 The Overall Background

The typical Nigerian would move out of home in search of work in the towns after acquiring secondary school education. Anybody from the age of 14 and above is employable. Even people with an ordinary elementary school education tend to leave the village in search of work in the urban areas. Most of these end up in the towns either working as self-employed informal sector labour market participants or as unemployed. The informal sector economic activities represent a substantial portion of Nigeria's economic life, and such a condition renders it even more difficult for one to measure the true level of employment/unemployment in such a society.

In Nigeria the government (whether Federal, State, or Local) constitutes the largest single employer of labour,

providing jobs for mostly educated people in the civil service, and the public enterprises. There is a shortfall in the supply of trained and experienced manpower at management, professional and intermediate levels. The shortfall is most acute for all kinds of construction engineers, irrigation and agricultural engineers, architects, surveyors, doctors, farm managers, technicians, and skilled artisans of all grades (Nwosu, 1979). The shortage of professional manpower is worsened by the country's apparent preference for more academic qualifications signalled by the fact that most of the country's institutions are biased towards providing training in the purely academic fields (Diejomaoh, 1979).

The socio-cultural and political factors that underlie the Nigerian society have a significant bearing on the labour market conditions of the economy. The country's population of almost 90 million [ILO Statistics, 1984] mainly resides in the rural sector and subsists on agricultural and related rural occupations (see below). Most economic activities are carried out upon a family unit basis. The male members of the population dominate the labour force as increased female participation in the labour force has been a relatively recent development.

Exports of palm produce (palm nut and palm oil), cocoa, and rubber, together with subsistence foodstuff production has been the core of the economy of the Southern section of

the country. This area was penetrated thoroughly by the colonial trading firms; and since most of the cash-crop production are not locally consumed, they possess only an exchange value overseas, and thus the farmers are largely dependent on the world market price vagaries (given the operations of the domestic Marketing Boards).²⁶

Largely isolated from colonial conquest and influence, the Islamic Northern section of Nigeria is inhabited by groundnut cultivating peasants, who, unlike their Southern counterparts, do rely on their groundnut production for food as well as for export earnings (Lubeck, 1977).

As in any community dominated by the rural sector, wives and children in the small farming family unit do not consider themselves to be active members of the labour force despite the fact that they perform a multitude of productive activities. This is because they are not paid a "wage" or do not receive any other income from the work done. For this reason, the appropriate definition of the labour force in the society would be a complex problem.

It is important to indicate the influence of oil production. Petroleum oil was produced in Nigeria as early as 1958 (Lubeck 1977), but by 1972 it had become a dominant factor in national economic life. Oil now accounts for

²⁶ The influence of Marketing Boards is explained shortly. Marketing Boards are statutory agencies solely authorized to purchase cash crops from domestic producers for export.

nearly 93 percent of Nigeria's export earnings, 75 percent of foreign exchange earnings, 87 percent of total government revenues, and over 45 percent of Gross Domestic Product. By contrast, prior to 1970 agriculture employed about 85 percent of the population and accounted for about 80 percent of exports. Unlike agriculture or manufacturing, oil production employs very few workers -- only 1.3 percent of Nigeria's total modern sector employment as at 1977.

3.2 GENERAL LABOUR MARKET SITUATION

3.2.1 Population, Labour Force, and Unemployment

The size of the Nigerian population is uncertain. The official estimate for mid-1980 is 84.7 million, obtained by increasing at an annual rate of 2.5 percent the 1963 census result of 55.67 million. It is estimated at 88.1 million in 1984 (and 84.2 million in 1983) with per capita GNP of \$US 870, and the population growing at an annual rate of over 2 percent.²⁷

A census taken in 1973 which produced a provisional total of 79.7 million was annulled. In the period 1970-1977 the annual rate of increase is now said to have been 2.8 percent (Third National Development Plan, 1975-1980). The general consensus seems to have settled on the above stated 1984

²⁷ As reported by Population Reference Bureau, 1984 World Population Data Sheet, Washington D.C. 1984. In 1968 the Nigerian population was reported to be growing at an annual rate of 2.3 percent, as contained in Federal Office of Statistics Documents, Lagos.

figure of 88.1 million [see: Todaro (1985)]. And there is no dispute whatsoever that the population is increasing at a relatively high rate: for while advancements in modern medical technology has drastically reduced the mortality rate and increased the survival rate, the birth rate itself has remained relatively high. United Nations demographers estimate Nigeria's death rate in 1970-1975 at 22.7 per thousand, and the birth rate at 49.3 per thousand. The consequence of this high birth rate is a relatively youthful population, estimated at about 45 percent being under 15 years of age (Yesufu, 1974).

The Labour force, defined for Nigeria as all persons between the ages of 15 and 55 years who were economically active and wished to work, minus the armed forces and inmates (Third National Development Plan, 1975-80), was estimated at 29.2 million in 1975.²⁸ Of these, wage and salary earners was only 2.18 million according to the 1975 estimate: they included 1.5 million attributed to the "modern" sector of enumerated employment,²⁹ about 1 million

²⁸ The basis of this estimation was a rural demographic survey undertaken, of which it was deduced that 64 percent of the nearly 28 million persons thought to be gainfully employed was attributed to agriculture. (See Table 3.1 below).

²⁹ Only wage and salary earners in establishments employing ten or more persons are enumerated. These are classified as large-scale and medium-scale establishments, and constitute the modern (formal/organized) sector. Small-scale establishments are those engaging one to nine employees, and enumerated for the formal sector as 680,000 for 1974 [Federal Office of Statistics, 1977].

in the various forms of public employment, and 0.5 million in private business.

Table 3.1 depicts the sectoral distribution of

Table 3.1
Sectoral Distribution of Employment in Nigeria,
1967 and 1975.

Sector	1967	1975	
	%	(000)	%
Agriculture	71.7	17,860	64.0
Mining (including oil)	-	110	0.4
Construction	0.6	250	0.9
Manufacturing	9.6	4,690	16.8
Commerce	12.9	3,400	12.2
Transport & Communic.	0.8	170	0.6
Electricity, Gas & Water	-	30	0.1
Services	3.9	1,400	5.0
Others	0.2	-	-

Source: Ministry of Information, Lagos: Third National Development Plan, 1975-1980.

employment.

Agriculture had a share of 71.7 percent in total employment in 1967, followed by commerce with a share of 12.9 percent. Manufacturing had a share of 9.6 percent. Within the next eight years the share of agriculture had declined relatively, but it still had a very commanding lead; manufacturing increased its share in employment by a significant amount within the eight years period (1967-1975)

but it still had only about 17 percent of total employment compared to 64 percent which agriculture had. Manufacturing offered jobs to 4.69 million people in 1975, an increase of 7.2 percent from its position eight years earlier; agriculture reduced its employment share from its 1967 high, by 7.7 percent within eight years. The relative decline in the share of agriculture is attributable to the structural changes that obtained: higher productivity and higher incomes in the modern sector brought about a differential that drew workers from the agricultural sector to the modern sector; and the expansion in education within the period served to accelerate this tendency.

Reallocating the migrating agricultural workers poses a major problem for the labour market. Most of the rural migrants are illiterate, and firms might not be willing to bear the additional training costs necessary to acquaint them with the requisite rudimentary skills (see next Chapter). This absorption problem is aggravated by the observed differences in the work habits of rural migrants (Olaloye, 1981: 28). Rural workers not accustomed to the regulated work rules of industrial life and the "tending of machines", would not only tend to lose their jobs if they found any, but would also tend to be less productive, thereby reducing total productivity in the economy.

While the annual growth rate of population of Nigeria

between 1952 and 1963 was estimated at 3 percent³⁰ the growth rate of her urban population was 12 percent (Nigerian Census, 1962/63) within this same period. During the 1952 and 1963 census decade, different urban areas in Nigeria naturally exhibited differing growth rates, as seen in Table 3.2.

The urban growth rate between 1952 and 1963 ranged from 2.9 percent for Ibadan to 11.5 percent for Lagos. Looking at the projected figures as shown in the fourth column of Table 3.2, it could be inferred that the growth rate for most of the urban centres over the last two decades must have exceeded their 1963 figures - pointing at such cities as Lagos, Enugu, Ilorin, and Benin City as those whose population was about double that of the 1963 figure.

It is reasonable to expect that if the projections had taken post-civil-war migration outbursts into account, the figures would most probably have been higher. In the absence of any current reliable population data, a detailed and reliable analysis of urban growth trends would be impossible; and the best we could do is to fall back on available proxies. But more recent statistics (Newland, 1980) indicate that Nigeria's annual urban growth rate in the 1970's stood at about 7 percent (and the share of migration

³⁰ Given the controversial nature of the Nigerian population figures for 1952 and 1963, experts had estimated the growth rate at 3%. See: "Nigeria: Population Models for National and Regional Planning" (1952-1967); Ibadan, NISER Interim Report, March 1969.

Table 3.2
Population of Major Urban Centres in Nigeria (1952-1972)

Cities	1952	1963	1972*	Growth Rates 1952/63 (%)
Lagos	328,900	1,089,900	2,100,000	11.5
Ibadan	459,169	627,379	893,000	2.9
Kano	130,173	295,432	420,000	7.7
Abeokuta	84,451	187,297	-	7.5
Port Harcourt	71,634	197,563	214,000	8.7
Zaria	53,974	166,170	-	10.8
Onitsha	76,921	163,032	-	7.1
Kaduna	38,794	149,910	232,000	13.1
Enugu	62,764	138,475	277,000	7.5
Aba	57,787	131,003	-	7.7
Illorin	40,994	108,546	297,000	9.2
Benin City	53,753	100,694	201,000	5.9
Jos	38,527	90,402	130,000	8.1
Calabar	46,705	76,418	119,000	4.5
Sapele	33,638	61,007	-	5.6
Total	1,614,444	3,639,548	-----	---

Source: Federal Office of Statistics, Nigerian Census Publications, 1952-1963.

* This column gives Projections: projected figures from Third National Development Plan (1975-1980), p.301.

in the urban growth rate was 64 percent).

Some of the relevant proxies that could be taken here are the growth of industrial establishments and employment in the major centres of Nigeria between 1965 and 1971. Table 3.3 depicts those trends.

It is seen that most urban centres were having substantial gains in both the number of industrial establishments and employment between 1965 and 1971. The absolute gain in employment, for instance, was double for cities like Lagos, Calabar, and Benin City.

Generally, the high urbanization rates as well as the lopsided distribution of their growth potentials (See Table 3.2) have created internal growth problems for the urban areas and the rural areas alike. Such problems reflect the heavy congestion existing in most of the urban areas, the ever increasing widening of rural-urban wage differential and development gap, persistent urban unemployment, and the other social problems attached to these.

Over the last two decades, urban growth in Nigeria has progressively resulted in rural-urban wage/income and development differentials. All available studies suggest that the sectoral distribution of income in the 1960's consistently favoured the urban oriented sectors. The Teriba-Phillips³¹ findings as shown in Table 3.4 indicates

³¹ As reported by Teriba and Phillips in their study

Table 3.3: Industrial Establishment and Employment in Major Urban Centres in Nigeria, 1965 and 1971.

City 1965	No. of Establishments	%	No. of Employees	%
Lagos	216	33.28	30,975	35.61
Abeokuta	16	2.46	2,006	2.37
Ibadan	47	7.24	3,785	4.35
Benin City	23	3.54	1,443	1.65
Sapele	20	3.08	7,623	8.76
Aba	36	5.54	3,204	3.68
Calabar	13	2.00	2,291	2.63
Enugu	24	3.69	3,849	4.42
Onitsha	57	8.78	2,027	2.33
Port Harcourt	55	8.47	4,276	4.91
Kano	72	11.09	9,964	11.45
Jos	22	3.38	1,087	1.24
Zaria	14	2.15	1,411	1.62
Kaduna	31	4.77	7,704	8.85
Illorin	4	0.61	3,260	3.74
Total	649	100.00	86,961	97.61
1971				
Lagos	493	42.46	77,656	41.02
Abeokuta	16	1.37	2,409	1.27
Ibadan	76	6.54	6,003	3.17
Benin City	48	4.13	2,277	1.20
Sapele	27	2.32	10,274	5.42
Aba	58	4.99	5,022	2.65
Calabar	28	2.41	4,847	2.56
Enugu	33	2.84	3,692	1.95
Onitsha	47	4.04	2,753	1.45
Port Harcourt	86	7.40	9,039	4.77
Kano	95	8.18	22,459	11.86
Jos	102	8.78	31,481	16.63
Zaria	9	0.77	1,541	0.81
Kaduna	32	2.75	7,770	4.10
Illorin	11	0.94	2,064	1.09
Total	1,161	100.00	189,287	100.00

Source: Compiled from Federal Office of Statistics, Surveys 1965 and 1971.

this trend. It is apparent that the per capita earnings in urban-oriented sectors of the economy (refer to the 6th column): manufacturing (26%), construction (23%), commerce (69%), services (21%), were higher than the per capita income in rural-oriented sectors such as agriculture and

Table 3.4
Sectoral Indices of Average Per Capita Income, 1960-67
(1960=100)

Sector	1962	1964	1965	1967	Share of p.c.i.*
Agriculture , Forestry	106	108	110	113	9.25
Mining	100	106	111	93	2.50
Manufacturing	108	130	136	130	26.00
Construction	107	121	133	133	23.00
Electricity & Water	104	106	118	129	14.45
Commerce	130	174	180	192	69.00
Transport	111	111	115	125	15.50
Services	107	120	125	130	20.50

Source: Adapted from Umo (1975).

* p.c.i.= per capita income. This column shows the percentage of total per capita earnings determined by the sector.

forestry (9%), or mining³² (3%).

One major cause of this disparity has been historically attributed to the pricing policy of the Nigerian Produce Marketing Boards (Essang, 1971). These Boards are statutory

conducted on the same subject in 1971; pp.88.

³² Although the mining sector is supposed to have been recently boosted by earnings from oil production, its impact on rural income is still limited because the capital-intensive nature of oil production precludes a substantial employment effect. The profit taxes and royalties now accrue to the Federal Government.

monopsonists of export produce and have over the last three decades of their establishment siphoned funds from the rural areas (rural agricultural sector producers) to the urban centres where investments are concentrated. Essang (1971) noted that the Marketing Boards had become the primary "vehicle for widening the rural-urban income gap", for substantial proportion of the funds accumulated by the Boards are invested in projects which largely benefit the non-farm sector. And also, on the same issue earlier on, Lewis (1967) noted that while the prices paid by the Marketing Boards to the farmers went down from 100 percent to 73 percent in 1961-1963 using 1950-52 prices as a base, the minimum wages received by unskilled urban labour went up from 100 percent to 297 percent.

Since 1967 when Lewis made his observation, there have been three major wage commissions in Nigeria that have raised urban wages, and thus helped widen further the rural-urban income gap.³³ There was the ADEBO COMMISSION in 1970 which awarded about 50 percent of measured cost of living increases since 1964 (Umo, 1975). There also was the UDOJI REVIEW COMMISSION in 1975 which awarded salary hikes ranging

³³ The reasons for setting up these wage commissions and for their raising wages were more politically motivated than economic. These were ad hoc commissions set up by the government to address the growing unrest (as it were) of the (public sector) labour unions and their growing agitations for wage hikes. Therefore, it is not surprising that the commissions' recommendations seemed not to take adequate considerations of the rural sector wage conditions.

from 30 percent to 130 percent for various categories of urban workers (Nigerian Economic Survey, 1975, pp.53-55). And while the latter did more than double the wages of unskilled urban workers in an effort to bridge the wage gap between the skilled and unskilled labour force (that was a primary government objective), it also succeeded in further aggravating the widening rural-urban wage differential. Nor were the rural farmers likely to have received a 'fair share' of the "Udoji boom" through sale of their food crops since the existing poor transportation and distribution system facing food marketing in Nigeria meant that they could not obtain adequate earnings for their products. And what is more, the Marketing Boards are not likely to increase their offer prices to the farmers since they base their offer prices largely on world export market prices, which are unresponsive to domestic wage policies.

And we may note that to the extent that wage-induced migration accounts for much of the migration pattern that obtain in Nigeria (Mabogunje, 1970; Iyoha, 1975), the rural areas are likely to face decreased agricultural output because of manpower losses through migration to urban centres. It may be that the absolute size of the rural labour force is not declining despite the migration [as shown in the case of Kenya (see Rempel, 1978)], but it is understood that the rural labour supply is lower than it would be if there was no such high rural-to-urban drift, and rural output is also lower as a result.

The labour market figures for 1970-1974 is given in Table

Table 3.5
Labour Market, 1970-1974

Category	1970 (millions)	1974 (millions)	Change (millions)
Labour force	26.080	28.560	2.480
Gainful occupation	24.054	27.316	3.262
Unemployment gap	2.054	1.250	-0.780
Agric. empl.	16.790	17.881	1.091
Non-agric. empl.	7.264	9.435	2.171
Medium & Large scale	0.695	0.905	0.210
Small-scale	6.569	8.530	1.961
Wage-employment	1.385	1.790	0.405
Agric.	0.170	0.190	0.020
Non-agric.	1.215	1.600	0.385
Medium & Large scale	0.765	0.985	0.220
Small-scale	0.620	0.805	0.185
Small-scale (non-agric.)	0.522	0.694	0.172
Self-employment, Unpaid domestic, & Apprentices	22.669	25.526	2.857
Agric.	16.620	17.691	1.071
Non-agric.	6.049	7.835	1.786

Source: 2nd National Development Plan, 1970-1974
[Adapted from: Damachi, 1973; p.86].

3.5. It provides the evidence for the relative dominance of agricultural occupation in the labour force, and the relative smallness of nonagricultural (including industrial manufacturing) employment. Whereas the 1974 data indicates a high employment level for the labour force overall (27.3 million employed in a labour force of 28.5 million), the fact remains that a vast majority of these are employed in agriculture (almost 18 million); leaving only about 10 million to be shared by all non-agricultural avenues. And more so, wage-employment accounts for a relatively meagre

1.8 million approximately [and we note that non-agricultural employment -- 1.6 million -- dominates agricultural employment -- 0.2 million -- in total wage-employment]. Out of the total agricultural employment of about 18 million (out of 28 million), a vast majority of them (over 17 million) are self-employed. We notice also the importance of self-employment in non-agricultural sector (almost 8 million out of the approximately 10 million).

The geographical distribution of the population is that of high densities in the Southern States and more sparse distribution for the Northern States, with unusually high densities for the cities. Urban population is growing at an average of about 5 percent annually (see Table 3.2).

Unemployment:

Studies by Bairoch (1973) indicate that whereas there was no reported figure for rural unemployment rate in Nigeria by 1963, the country's urban unemployment rate in that period stood at 12.6 percent. It should be noted however, that this need not imply that there is no rural unemployment: rural unemployment exists as well, but not in open form as the urban which contains the greater concentration of the unemployed, and hence attracts more attention. The urban unemployed are mainly young school-leavers (Diejomaoh and Orimalade, 1971).

The 1963 census yielded an unemployment figure of 1.9 percent for the total labour force population (Federal Ministry of Information: 1963 Population Census, Vol.III, 1968; p.41). It was 2.0 percent among males and 1.6 percent among females, overall; but 3.0 percent for the urban labour force, 3.4 and 2.0 percent for urban males and females respectively. For the rural areas, the corresponding rates were 1.6 percent overall, 1.6 percent for males, 1.6 percent for females.³⁴

The 1966/67 labour force survey of the National Manpower Board indicates a 1.7 percent overall unemployment, 8 percent for urban areas and 0.5 percent for the rural. The 1974 data from the Manpower Board Surveys is given in Table 3.6. The overall high urban unemployment rate is revealed. Though the rate is disproportionately very high only for the Southern areas of Calabar, Port Harcourt, Enugu, and Benin; and moderately high for Lagos, Ibadan, Jos, and Kaduna, these figures are to be viewed with the realization that this (1974) period was a period of the so-called "oil boom" in the country. For such high unemployment figures to have obtained over this period implies that the situation would have been worse without the sudden stimulus on the economy of the oil wealth.

³⁴ These figures should be taken with a great deal of caution considering the high degree of unreliability associated with the census itself.

Table 3.6
Urban Unemployment rates by States and State Capitals
(1974)

State	Unempl. Rate (%)	Capital	Unempl. Rate (%)
Lagos	7.2	Lagos (Metro)	7.2
Western	5.4	Ibadan	5.7
Mid-Western	12.2	Benin	13.1
Kwara	2.7	Illorin	1.5
Kano	2.0	Kano	2.2
Nort-Eastern	4.3	Maiduguri	5.0
North-Central	4.7	Kaduna	6.1
East-Central	7.2	Enugu	11.5
Benue-Plateau	5.9	Jos	6.2
Rivers	12.7	Port Harcourt	13.3
South-Eastern	19.3	Calabar	22.3

All States	6.4	All Capitals	7.0

Source: Federal Office of Statistics:
Manpower Board Survey, 1974.

The 1966/67 data by age and sex distribution of urban unemployment is given in Table 3.7. It shows that over 88 percent of the urban unemployed were concentrated in the age group 15-29 years (the youth). It also indicates that among the youth, male unemployment rate is higher than that of females. And particularly among the 18-23 years age group, the unemployment rate is extraordinarily high (51 percent for males and 27 percent for females).

With regard to their qualifications, the 1966/67 survey indicates that 7.1 percent of the urban unemployed of both sexes were illiterate, 64.6 percent had at least primary

Table 3.7
Percentage Age and Sex Distribution of Urban
Unemployment, (1966/67)

Age group	Male (%)	Female (%)	Total (%)
15 - 17	18.6	25.3	20.1
18 - 23	50.9	27.5	52.5
24 - 29	16.5	12.5	15.6
30 - 35	7.4	2.0	6.3
36 - 40	2.4	2.3	2.4
41 - 45	2.0	0.0	1.6
46 - 50	1.4	0.3	1.2
51 - 55	0.6	0.1	0.5
Total	99.8*	100	100.2*

Source: Federal Office of Statistics: Handbook, 1972.

* Do not add up to exactly 100 due to rounding-off errors.

education but below high school graduation, and 9.7 percent were high school graduates. There was apparently no university-graduate unemployment in 1967.

3.2.2 Education and Manpower

Nigerian economists have identified an important factor in the labour market problem: the fact that the "educational system is not yet completely geared towards meeting the specific manpower requirements of the economy" (Diejomaoh, 1979).³⁵ The link between education and manpower needs in

³⁵ Blaug (1973) provides an excellent discussion of the relationship between education and labour markets in LDCs. Also, see Fields (1974a) and (1974b) for very interesting models of demand for education and resource allocation to education in LDCs. The contributions of

Nigeria seems to be a loose one. The educational system places greater emphasis on the humanities' courses relative to science and technological training (see Table 3.8 below).

The ratio of enrolments in the humanities to the enrolment in science and technology and related training in Nigerian Colleges and Universities stood at 52.5:47.5 as at 1979 (Diejomaoh, 1979). The result has been that many of the arts graduates coming out into a world where the employment avenues are mainly open to persons with technological oriented training, face unemployment of a painful kind. This has given rise to the peculiar problem facing Nigeria (and many other developing countries): while there are surpluses of certain skills (such as administrative and office secretarial skills), there are acute shortages, at the same time, of some critical skills (such as engineers, scientists and technicians). And the educational system in Nigeria has been rather sluggish in reacting to this situation (for reasons of inappropriate political and economic planning). The result has been the existence on a massive scale of underutilization and underemployment in the labour market.

The most serious manpower problem in Nigeria is the rising unemployment and persistent underemployment. Presently, it has been felt that the country's educational

both authors are very insightful. See also our model in Chapter 5 below.

and training system has not succeeded in meeting her needs of the requisite high-level manpower (technological and professional) [Diejomaoh,1979]. It has also been felt that the problem is not that of under-investment in manpower resources, but rather that of misplaced emphasis and priority with regard to the pertinent type of manpower needs which suits the country's peculiar circumstances (Yesufu,1974; Falae,1971). This position is supported by

Table 3.8
University Graduates (1966)

Field	Number (000)	%*
Humanities	311	7.9
Languages	376	9.5
Social sciences	1228	31.1
Law	161	4.1
Total Arts*	2076*	52.5*
Agriculture	573	14.5
Natural Sciences	242	6.1
Total Science*	815*	20.6*
Education	600	15.2
Fine Arts	109	2.7
Engineering and Technology	321	8.1
Other	28	0.7
All*	3949*	99.9*#

Source: National Register of High Level Manpower,
Ministry of Labour, Lagos.

* Not included in the original Table.

Does not sum up exactly to 100 due to our
rounding-off errors.

the evidence shown in Table 3.8.

Whereas over 52 percent of the total number of university graduates in 1966 specialized in the arts and social sciences, only 8.1 percent specialized in engineering and technology-related fields; about 14.5 percent in agriculture and 6.1 percent in the sciences. The overwhelming number of the arts and related graduates clearly implies a sharp disproportionality in the mix of university trainees. One would have expected that since Nigeria is an agrarian economy, agricultural training would have received far more than the 14.5 percent it had. And being underdeveloped, engineering and technology as well as the natural sciences ought to have had more than the mere 8.1 and 6.1 percent respectively.³⁶ One rather observes that the country's formal education system is oriented mainly to the non-agricultural sector occupation which provided employment to only about 33 percent of the labour force in 1974, as Table 3.5 indicates. [See also, Damachi (1973)].

3.2.3 Labour and Industrial Relations

Labour unions in Nigeria date back to 1912, and came into full operation with the passage of the Trade Union's Ordinance in 1939 which gave unions legal status and provided for freedom of organization (Umo, 1985; Damachi,

³⁶ The most serious consequence of this policy now is the high rate of university-graduate unemployment currently existing, reported at about 20 to 30 percent in 1985 (West Africa, October 7, 1985).

1973; Weeks, 1972).

As of 1962 total wage-employment in Nigeria stood at approximately 930,000 persons. Of these, about 300,000 or 2 percent of the total economically active population belonged to a union (Kilby, 1967). This represents about 32 percent of total wage-employment, but since wage-employment in itself accounts for a very small proportion of total employment, it is more relevant to use the economically active population and its percentage that is unionized.

Both Weeks (1972), Sonubi (1973), and Kilby (1967) found that unionization is limited to the civil service, and public corporations; and that Nigerian unions are not only small overall, but also are almost "non-functioning" in the private sector. Of the total number of labour disputes reported by Sonubi (1973): 150 for 1967/68 financial year, 133 for 1968/69, 170 for 1969/70, and 270 for 1970/71, over 97 percent of each case involved the public sector only, and even then, the private sector ones were noted to have not gone beyond mere "vocal demands made by workers in respect of non-wage related grievances", and settled at once.³⁷

³⁷ Kilby's (1967: 496) study of strike statistics reveals an exceedingly short duration of the average stoppage: about 75 percent of these stoppages have ranged from 3 hours to 2 days maximum. While such a situation can be attributed to both weak unions and government intervention, both Umo (1985), Rimmer (1981), Sonubi (1973), and Kilby (1967) attribute it to union weakness. Kilby particularly feels that once management has fully been informed about the grievances in most disputes, there have usually followed quick settlements, mainly because unions would not be capable of "holding out" in the event of a strike.

Kilby (1967:494) attributes the weakness and ineffectiveness of Nigerian unions to certain "conditioning" factors ranging from the lack of country-wide co-ordination due to the relative vastness of the country and the problems of communication that jeopardize the effective organization and administration of national or even regional unions, to the social ethnic differences among the labour force, and to the ability of the government to surpress unionism generally.³⁸

In a more recent study of Nigerian unionism, Rimmer (1981) found that unions have grown weaker and weaker in the past decade. Accounts from this study indicate that employment in large-scale manufacturing and the other quantitatively more important activities in the modern sector is given in a context of formalised industrial relations. Kilby's (1967) study found that the apparent official intention was to build a replica of what was then the British system (of which Kilby terms the "Anglo-Saxon model") of industrial relations, with wages and other conditions of employment determined by collective bargaining between employers and unions (with the government acting only in provision of conciliation or arbitration with the consent of both parties). Rimmer (1981:104) points out that this purpose was to a great extent to be frustrated by the

38

Labour unions within the context of our study will be treated again in a subsequent chapter.

"weakness of Nigerian trade unions, their small average size, unstable membership, and lack of secure finance".

During the civil war (1967-70) the government made major changes in the forms of industrial relations: decreeing strikes to be illegal, and resort to compulsory arbitration when negotiating procedures had been exhausted (Sonubi, 1973; Rimmer, 1981; Umo, 1985). This was replaced in 1976 when a new Trade Disputes Decree laid down a detailed and obligatory procedure for resolving industrial disputes through mediation, conciliation, arbitration and adjudication, thereby so strongly inhibiting the freedom of employees legally to strike (Umo, 1985). Requirements for registration of unions were made more stringent by a decree in 1973, which was clearly intended to discourage proliferation of labour organizations. Rimmer (1981) found that, in practice, wages and other terms of employment have been altered in Nigeria less through collective bargaining and union influences than as outcomes of other factors.³⁹

Generally, the consensus is that, unions have been relatively active in the public sector, though they lack sustained political influence and are ineffective in

³⁹ Such factors include government commissions of inquiry set up from time to time in response to social, political or labour agitation. It is important to note that such commissions mainly looked into the affairs of unskilled rather than skilled labour market, and that strikes in Nigeria have been related to the recommendations of these commissions rather than to the organization of unions against firms.

negotiation with the government. In the private sector, union activity is mildly visible within the unskilled category of the formal sector, and even then, they are generally inactive. Private sector unions are not known to exist for the semi-skilled and skilled category of the labour force, even though wages and conditions of employment in this category are the best in the whole labour force. The following statement from a Federal Ministry of Commerce and Industry document (1982) goes to emphasize this situation:

"...Employers still fix wages and conditions of employment without reference to trade unions, and it is not common practice for unions and employers to negotiate and sign contracts which fix wages and other conditions of service for a given period of time..." [Federal Ministry of Commerce and Industry: Industrial Labour Gazette (1982), p.63].

Kilby (1967: 496) also noted a similar statement from the Ministry. This indicates that collective bargaining has not, for a long time, been a common characteristic of the employment relationship.

3.3 GENERAL ASSESSMENT OF THE LABOUR MARKET PROBLEM

The Nigerian labour market is very clearly divided into a high wage, high productivity and "protected" primary sector and a low wage, low morale, high turnover and low productivity secondary labour market. This condition provides the structural basis for the observed wide disparities of income among the members of the society -- between salary and wage levels, between wage-employment in

the "organized" private and public sector and self-employment in the "unorganized" sector (encompassing small-scale informal activities and rural agriculture). Differences in skills among the members of the different segments and differences in technology in the different segments of the labour force only go to widen the disparities further. The workers of the primary sector tend to be more skilled and engage in capital intensive activities which require that they be relatively far more trained/educated. The secondary workers undertake casual-type work and require very little or no capital and training [see House (1984a); House and Rempel (1976b)].

Nigeria's population is among the largest in Africa and grows at a relatively high rate of about 2.5 percent per year. Real wages have not been rising in recent years, even though money wages have increased [see: Yesufu (1974)]. The result has been that of an overall stimulus on labour demand, but new labour force entrants had to be absorbed in low-wage employment of the small-scale and informal type. The average household income in the small-scale unorganized sector has been generally lower than that of the organized sector despite the fact that the unorganized segment has greater access to the services of unpaid apprentices and family workers. The bulk of the "gainfully-occupied" population is still in agricultural employment of either the peasant-subsistence type or the market-wage type (see Table

3.5). This is followed by employment in the urban unorganized (informal) sector.

The volume of wage-employment and the growth in real household incomes have however been the greatest for the modern "organized" (formal) sector participants, namely: the large-scale to medium-scale private and public enterprises as well as the medium-scale self-employment.⁴⁰

Rough estimates indicate that wage employment in manufacturing industries in Nigeria constitutes about 0.6 percent of total labour force, as at 1970 (ILO Yearbook of Labour Statistics, Geneva, 1973). [See Table 3.5 above].

Employment in the modern sector is associated with relatively higher wages and relatively lower turnover rates. The employer-employee link is durable and labour productivity is relatively high. Such relatively favourable conditions associated with the modern sector labour market appear to be a factor determining the nature of the supply side in this sector. In this sector in Nigeria, there exist several establishments of various sizes, and the sector is dominated by multinational firms, with most firms characterized by capital-intensive technology (which then

⁴⁰ By definition of the unorganized (informal) sector as that in which employment and economic activities are not reported or measured by the official government employment statistics, private concerns employing less than ten workers belong in this sector, and are referred to as small-scale enterprises by official Federal Government of Nigeria Office of Statistics' stipulation.

means that labour productivity is high and rising, relatively).

In the formal sector, the public sector labour force tends to be unionized, and government employment tries to be at par with the large-scale private sector. Weeks (1972) found that governmentally-set wage rates are not, and have never been, statutorily enforced in the private sector in Nigeria, though they can be taken as the "key" rates for the economy's wage sector. All available evidence indicates that government acts very much as a wage-leader (Warren, 1966; Kilby, 1967; Weeks, 1972).

Within the formal sector itself, there has been declining share of wage-employment in agriculture (caused by the gradual but significant disappearance of the plantations and/or increasing sub-division of large farms and the increased growth of family-labour small-scale farms). There has also been slower growth of manufacturing wage-employment relative to the growth of manufacturing output, as well as a higher share of wage-employment in the public sector. Industrial output growth has been high (Fajana, 1973), but the employment-elasticities of increases in industrial output are quite low (Frank, 1967; Fajana, 1973; Umo, 1975; Olaloye, 1981; Iyoha, 1982). Most of the large-scale firms in Nigeria adopt capital intensive modes of production,⁴¹

⁴¹ They also tend to operate under excess-capacity and are characterized by high profit rates (Phillips, 1972). This situation is attributed to the very high proportion of

such that {assuming there is capital-skill complementarity [Griliches, (1969); Hamermesh and Grant, (1979)]}, there can be little or no room for unskilled labour engagement. Moreover, the government policy of "sheltering" domestic firms against stiff competition from well-established foreign ones", puts most industries behind "tariff walls" where they neither see the need nor the incentive to adopt labour-intensive cost-saving techniques of production [see Fajana (1973)].

Entry criteria into stable modern sector employment include the possession of experience and some level of skill, and formal education (proven by possession of the requisite and appropriate certificates). Most employers insist on at least an elementary school education for new recruitment even for the lowest category manual jobs. One might understand this practice to mean that employers believe that some level of literacy enables the worker to be more adaptable to industry conditions, and be more capable of receiving and adequately carrying out instructions (both written and verbal), and thus have better chances of being upgraded and/or promoted, and of improving their skill levels.

foreign capital in the investments that established these industries [see Vielrose (1971) for a complete empirical analysis in this regard]. Though excess capacity may or may not be connected with it, high capital intensity is related to the high profit rates [see Arrighi (1973); Lim (1977); Knight and Sabot (1983)]. See also, our analytical model in a subsequent chapter.

The major implication of the employment practices discussed above is that of higher wages and job protection and "segmentation" that is likely to characterize modern sector employment. This means that too few people in the labour force would be employed as employers choose the attributes which best predict desired performance and productivity among a large number of potential employees. There will be a creation of small numbers of "more productive" and better-paid employees, and these will be the ones better able to compete well in the employment queue. One sees that the strategy of employment promotion for the economy as a whole has to address the employment practice within the modern sector, and any employment policy has to be geared first towards ensuring that modern sector employment practices are modified to suit greater industry demand for labour.

Generally, the unorganized sector is the most important in terms of size. It is also noted to be remarkably dynamic and adaptable in respect of its employment-absorbing capacity [see: House (1984); Rempel (1982)]. It is characterized by relative ease of entry,⁴² reliance on indigenous resources, unregulated competitive product

⁴² See Rempel (1982) for a divergent position on this in respect of Kenya. In absolute terms, entry may not be easy, to the extent that some "starting" capital is needed, and the entrant may have to face certain entry barriers imposed by those already in that particular line of activity. But our view is that, relative to entry into the formal sector, entry in this one is easy.

markets, flexibility of operation and the ability to blend well with traditional values and social practices (Aboyade, 1983). In Nigeria, the unorganized sector is unfortunately not well recognized with regards to its labour market importance. Wage policy and employment are tuned more to the dictates of the organized (formal) sector than to the requirements of the informal sector, and this factor underlies the main reasons why the latter's potential for employment generation has not been effectively tapped, as it can actually be made to be a source of well-paying employment for the vast majority of the labour force that are engaged in it. Unlike their large-scale counterparts, Nigeria's small-scale industrial establishments are labour-intensive [see Kilby (1962); Fajana (1973)], and labour costs form a sizeable proportion of their total costs, so that the hiring practices of employers in this sector are likely to result in market-clearing (Weeks, 1972). But over 90 percent of the small scale firms in Nigeria operate in the informal sector where their impact on the employment situation is not well recorded (Celestin, 1983).

Combined with increasing rural-urban migration and the relatively small size of the modern sector in terms of labour force absorption, Nigeria's high rate of population growth has led to a large increase in the size of open unemployment (though still even greater numbers are underemployed and unproductive). The problem of urban

unemployed school-leavers has become very acute, not only for the obvious waste of human resources they represent, but also for the social and political repercussions of such continued idleness among the country's youth. Also, the very high growth rate of the population may be disturbing for an economy whose industrial firms tend to adopt capital-intensive rather than labour-intensive techniques of production.

Structural changes in the economy are such that the modern sector expands faster, and develops faster, while the traditional sector seems to contract (Todaro, 1985). Redundancy of agricultural manpower in the traditional sector is the main bottleneck besetting the labour market. Such redundancy has particularly damaging adverse effects in the economy because of the preponderance of agricultural occupation in the total employment in the country (as depicted by the evidence in Table 3.1).

3.4 SUMMARY

Given the background of the Nigerian labour market: the social and cultural factors of the people, external factors (such as colonialism), the country's population, and size, the labour market conditions is seen to reflect the common characteristics of that of most LDCs. Open unemployment is high in both relative and absolute terms, (though the extent of underemployment is more difficult to ascertain).

Industrialization has had very little impact on employment generation, as still the majority of the population is made up of agrarian peasants. Next to agricultural self-employment, the informal sector is the largest employer of the population in the modern sector.

Granted that industrialization is akin to economic development, a sound labour economic policy would seem to be that agricultural development should be coupled with establishment of more labour intensive industries. In that way industrialization will make greater contribution in absorbing labour, and agricultural employment will become a more gainful employment avenue. But availability of cheap labour has not led to establishment of the needed amount of labour intensive industries because the multinational corporations which control industrialization do not see labour intensive industries as "quick-yielding" enough, and as profitable enough (see Arrighi, 1973; Herman, 1975; Reuber, 1973; -- also see Chapter 5 below).

The industrial sector is capital intensive in technology, rather than labour intensive. Labour unions are inactive generally, and specifically have not been seen to have much role to play in wage determination. Wage-employment is relatively small in the entire population; self-employment dominates. But then, relative to self-employment, wage-employment is very high-paying, as employment in large-scale capital intensive manufacturing and other modern sector

establishments is associated with high wages. But again, next on the ladder of high-wages is wage-employment in the public sector, followed by other employment in the modern sector (both wage and non-wage). The least on the wage-ladder is agricultural employment.

In the face of these high wages, there exist massive amounts of unemployed labour (labour surplus), and one wonders why the high wages should not be driven down by the surplus labour. The labour market is segmented into primary and secondary sectors, but the source of the segmentation is neither clear nor does the segmentation seem sufficient in explaining the source of the entry barriers between the various categories of workers in the two segments.

We would proceed to develop in the subsequent chapters, some pertinent theories of the labour market that may be applied to explain these observed labour market conditions for Nigeria and LDCs in general.

Chapter IV

THE FRAMEWORK FOR MODELLING LDC LABOUR MARKETS

Disequilibrium models in microeconomics depict labour market imbalances as due to excesses in one of either sides of the market: the supply or the demand side. The employment problem must therefore have its roots from either the demand or the supply side of the market: deficient demand for labour, or/and excess supply of labour, at the existing market wage (Pack, 1974; Addison and Siebert, 1979; Kreps et al, 1980).

Equilibrium models in macroeconomics would postulate the familiar notion of equilibrium "full-employment level of unemployment" in the economy, in the long run -- the natural rate of unemployment (Salop, 1979; Rosen, 1982).

The dual labour market approach of "segmentation" literature would characterise labour market imbalance as a consequence of the "badness" of the conditions in the secondary labour market (low wages, poor working conditions, high turnover, etc.) which results in higher "search" unemployment among secondary sector workers (Hall, 1971; 1975; Rubery, 1978; Rosenberg, 1980; Cohen and Pfeffer, 1984).

Our aim here is to provide a disequilibrium model of non-market-clearing in the LDC's labour market that can adequately shed light on the behaviour of profit maximizing firms in creating employment avenues for workers. This is a neoclassical framework that we believe conditions economic behaviour of individuals and groups.

4.1 THE BASIC MODEL

4.1.1 Background to the Model: The Efficiency-Wage Theory

Some writers have stressed the view that the literature on wage determination for the underdeveloped economy should stress a new element in the theory of labour markets, namely the notion that output per man-hour will tend to vary according to the wage rate (Leibenstein, 1957a, Moes and Bottomley, 1968; Stiglitz, 1976). Two variants of this wage-productivity hypothesis can be specified: the 'nutritional' variant and the 'motivational' variant.

The nutritional variant of the model can be seen as that analyzed by Leibenstein (1957a,b; 1958) and furthered both theoretically and empirically by Rodgers (1975) and Bliss and Stern (1978). It essentially holds that employers can benefit by paying higher wages, for as wages rise, a better diet and an improved and more positive attitude towards the job task will cause workers to increase their productivity. Therefore, both the number of hours offered for hire (labour

supply) and the output (number of work units per labour time, such as, number of bricks laid per hour, say) will vary positively with the wage rate. At a high wage, each man-hour will contain more work-units than it does at a low wage (Malcolmson, 1981; Basu, 1984).

The motivational variant of the wage-productivity relationship can be seen as that emphasized in the works of Akerlof (1982; 1984), Yellen (1984), and also utilized by Eswaran and Kotwal (1985) in their "shirking model" of employment and wage determination in a "two tier" agrarian labour market. It explains that higher productivity may result from higher wage payments because a worker would be motivated to put in his/her best in the job not only because of an innate motivation of the higher remuneration flowing from the job, but also for fear of losing the job (and the higher "utility" it confers) if fired as a result of "shirking". Let us elaborate further on this "shirking model" aspect of the motivational variant of the hypothesis.

It can be postulated that there is a divergence between the formal authority and work rules of the industry set up and the actual authority and work-rules that does obtain in the work place (Akerlof, 1984). Workers tend to set their own informal work rules which are often different from the official ones. The ability of the management or employer to make workers conform to the official rules (which are assumed to be the rules that must be observed in order to

enable the firm to maximize labour use and hence necessary for profit maximization), is highly questionable. Not only do such enforcement of the rules require the employment of additional supervisors and therefore raise costs, such enforcements do not guarantee that the worker will actually put in his/her "best" in the work process.

Instead, the employer may succeed in "enforcing" work rules through the use of higher wage payments that not only appeal to the individual worker's own zeal, but also raises the work-group's morale, and thus elicits the maximum productivity potential that the group has. This is obviously very advantageous to the firm. It can be viewed that given the practical impossibility of negotiating all aspects of the worker's performance in hiring contracts, and of policing the worker all the time, the payment of a wage in excess of the worker's opportunity earnings represents an effective way to give workers the incentive to put in their maximum potential work-effort on the job (Akerlof, 1984; Yellen, 1984; Eswaran and Kotwal, 1985). Moreover, such a high wage makes it unattractive for a worker to shirk, since the alternative earning open to him (assuming he is fired if caught shirking) is inferior to the high wage that he would earn on the job by putting in his best.

On the basis of the above postulates, an "effort function" is construed to attach to the production function of the employment relationship. The effort function is of the form

$$e = e(W), e'(W) \geq 0; e'' \leq 0,$$

where

e is the effort the worker puts in the work process,
 (the number of efficiency units he produces),
 W is the money wage rate.

The relevant production function for a typical firm would then be given in the form

$$(1) \quad Q = Q\{L \cdot e(W), K\}; Q' > 0, Q'' < 0,$$

where

Q is output,
 L is labour employed (labour time),
 K is capital input.

With the above production function in view, and on the basis of the "conventional" neoclassical production function of (labour) economic theory, of the form

$$(2) \quad Q = Q(L, K),$$

one readily infers that the implication for any employer operating with the function (2) is that

$$e(W) = 1, \text{ so that } e'(W) = 0.$$

That is to say that the employer operates on the belief (or implied assumption) that all labour time employed is necessarily utilized in work-activity. In other words, the employer acts as if all work hours employed automatically transfers to productivity-augmenting activity (whether supervised or not). Is this a realistic supposition? The answer is no if an "effort function" does exist for the

economy, i.e. if $e(W)$ is not constant in the economy's industrial set up. For if, indeed, $e(W)$ is not constant -- if $e'(W) > 0$ for at least some sector(s) of the economy -- then a more relevant production function would be the one depicted by (1) above. Therefore the conventional function $Q=Q(L,K)$ which neither recognizes the necessity of taking measures for "extracting" actual work-effort from employed labour, nor incorporates an 'effort function' that is dependent on the wage rate, must be inadequate.

We assume that over a certain range, the increase in productivity is proportionately greater than the increase in the wage itself, to explain the employment and wage-setting behaviour (in the private sector at least) within the Nigerian labour market scene. It is assumed that employers, in their own interests, will hire labour according to a rule not governed by the objective of paying the lowest wage at which a quantitatively sufficient supply will be forthcoming, but by the objective of paying wage which will minimize their labour cost (that is, the cost of the work-unit). Such a wage level is termed an "efficiency-wage".

We model a situation in which firms, aiming to minimize costs, tend to transform workers into loyal workers by keeping them at a higher wage rate than that which could clear the labour market. The rationale for this modelling for the Nigerian case lies in the fact that, as an underdeveloped economy, the average income level in Nigeria

is not high enough to rule out the possibility of workers tying their work efforts to the immediate remuneration flowing from the work place (the wage rate). In fact it is viewed that employment decisions by firms is governed by the universal recognition of such a condition (Leibenstein, 1957a; Stiglitz, 1976; Malcolmson, 1981). In a developed economy on the other hand, the average income level is relatively very high, enabling the average worker to achieve a certain standard of living considered as the basic minimum, so that there is less likelihood that increases in the worker's wage rate would necessarily lead to increased work-effort from the worker. But the case for applicability of the efficiency-wage model can still be made for such a society on a different postulate (see Akerlof, 1984).⁴³

Still, hiring and discharge processes in Nigeria are carried out somewhat arbitrarily -- there are no formal contract rules nor are there official bodies that oversee that any contractual obligations (specified work performance on the part of the worker, or job security provision on the part of the employer) are strictly adhered to (Olaloye, 1981). Moreover, industrial job tasks are those that require the worker's continued use of his/her own judgement and discretion from time to time in the work process, as opposed to menial job tasks that are just routine duties and

⁴³ In this case it is expected that the "motivational" aspect of high wage payment (see above) be more applicable than the "nutritional efficiency" aspect, even though both may be highly applicable for the LDCs.

require little judgement; so the employer has to ensure that the worker would have the innate tendency to put in the necessary work effort required for the job without having to be very closely supervised or monitored. To achieve this the employer needs to provide the worker with the motivation by employing "a subtle supervision technique that avoids resorting to continuous monitoring" (Eswaran and Kotwal, 1985). The firm thereby minimizes total labour costs by offering such "efficiency wages", for in an underdeveloped economy with largely uneducated and hence difficult-to-supervise labour force, the firm could use such a high-wage "reward" to entrust responsible tasks to the workers who are otherwise apt to be prohibitively expensive to supervise. The wage that minimizes the total labour costs (including wage and supervision costs) is higher than the wage that would minimize the wage costs alone (Eswaran and Kotwal, 1985).

The implication here is that the industries in which this will pertain are those involving production tasks for which worker discretion is needed (House, 1984a:406); i.e. it is more likely to hold in manufacturing and service sector firms {utilizing "modern" technology and high capital intensive techniques of production [see Arrighi (1973); Langdon (1975); Mazumdar (1977); Knight and Sabot (1983)]} where it is essential to attract a more responsive and

structured labour force.⁴⁴ Our inclination here, therefore, is to emphasize that skill-acquisition of workers (human capital) is a key factor. The employer faces substantial "quasi-fixed" labour costs in hiring labour [as is the case in some developed economies like the U.S. (see Oi, 1962)]. On the other hand, such fixed costs are not encountered by (secondary) firms such as those in construction, relying mainly on casual labour which does not require worker discretion in task performance.⁴⁵ Mazumdar (1977), while not really touching upon its human capital implications, makes this point clear: only some firms engage in this type of wage-behaviour. [Also see Rempel and House (1978: 84)]. We shall return to this point in a subsequent chapter.

⁴⁴ By structured labour market (as against structureless one) is meant the one characterized by strong binding attachments between employers and employees. On the other hand, the only attachment between employer and employee in the unstructured labour market is the wage [see below; also see Sobel (1982)]. Mazumdar (1977) as well as Rempel and House (1978a) have attempted to provide the complete analysis dealing respectively with LDCs in general, and Kenya in particular.

⁴⁵ Other writers have also emphasized this notion strongly. Yellen (1984) asserts that the wage-productivity nexus, while important in some sectors of the economy, is not important in others: it is relevant for the primary labour market (where we find job rationing and voluntary payment by firms of wages in excess of market clearing). It is weak or non-existent in the secondary labour market where neoclassical behaviour is fully observed in the sense that the market (for jobs in this sector) clears, and anyone can obtain a job in this sector (at a relatively lower wage, though). But the snag is that the existence of the secondary labour market does not eliminate unemployment because, (following Hall [1975]), the primary-secondary wage differential will induce

The efficiency-wage theory is developed and applied to the labour market situation in the industrial sector in Nigeria. First we develop the model in a theoretical framework, detailing both an intuitive basis and a more explicit presentation. We then use the model to address the way the employment decision is made in the economy by the profit seeking firms that operate in it. The policy implications arising from the analysis, and some empirical illustrations of the model, are briefly discussed to conclude.

4.1.2 An Intuitive Preview

The efficiency wage hypothesis, applied to the LDCs, would essentially hold that labour productivity in the underdeveloped economy depends on the real wage paid by the firm; and this has important implications for explanation of the most pertinent factors causing disequilibrium unemployment in the economy. It has been observed that even in the face of a large dose of demand stimulus, in the LDCs, the labour market might still not clear, and in fact has been noted to remain in apparent disequilibrium (Malcolmson, 1981). Even if unemployed workers are prepared to accept lower wage rates, the wage rate is still not bid down as employers/firms do not find it attractive to pay lower wage

search unemployment among job-seekers (who choose to "wait" for primary job vacancies). See also, Knight and Sabot (1983), Weeks (1972).

rates below some particular level, W^* , termed the "efficiency wage". Firms find it unprofitable to cut wages in the presence of involuntary unemployment (Leibenstein, 1978), even though at a first impulse one is liable to expect that such wage cutting ought to raise profits.

Thus a downward wage rigidity situation obtains even in the absence of a labour union. But then it is not supposed that the wage rate will be raised indefinitely. In fact, the efficiency wage is supposed to be determined by the firm acting to maximize profits. But an efficiency wage as a profit-maximizing wage is different from one that is determined outside the wage-productivity nexus, i.e. where the "effort function" is ignored. For instance, we know that under the usual neoclassical assumptions of profit maximization for a firm operating with a production function $Q = Q(L)$ assumed to be a function of only one input, labour, in the short run, the profit function is

$$\Pi = p.Q(L) - WL$$

where p is price of output Q , L is labour employed, and W is wage. Profit maximization requires that $p.Q'(L) - W = 0$, giving $W = pQ' = W_0$ as the profit maximizing wage. Now $dW_0/dL = pQ''(L) < 0$ implies wage flexibility (at least from the firm's point of view). It is viewed that W_0 is different from the efficiency wage, W^* , in at least two respects: W^* should be rigid downwards; W^* should be at least as high as W_0 , and can be equal to W_0 by sheer

coincidence (that is, if supply of labour happens to equal labour demand at the efficiency wage).⁴⁶

It is supposed that a firm can have labour available to it provided it offers a wage that is at least equal to the supply price of labour. Therefore the above profit function is maximized subject to a binding constraint that the wage offer be at least as high as the supply price of labour. In standard theory, if an employer is faced with an option of paying a wage greater than or equal to W_0 , he is expected to opt for the lowest, W_0 . However, within the context of the efficiency-wage model, this choice is no longer considered as necessarily the most rational because a higher wage may ensure a larger number of efficiency units from each hour of labour and therefore from each worker.

It is expected that the efficiency-wage be greater than or equal to the supply-price of labour in the LDCs because the low-income characteristic of such a society makes it unlikely that the supply price of labour could exceed the efficiency-wage. In the developed countries, on the other hand, it is likely that the supply price of labour could exceed the efficiency-wage given the high-income character of the society. We proceed now to explore deeper into the theoretical framework.

⁴⁶ It is possible (albeit unlikely in the LDCs) for W^* to be less than W_0 . For an analysis of this possibility, see Basu (1984: 98-101).

4.1.3 The Model

Consider a situation in which the economy is characterized by firms with fixed capital stock in the short run, each employing labour at wage W .

The firm is assumed to seek to minimize average cost per efficiency unit, c ,:

$$(4.1) \quad \min_{\{W\}} c = W/e(W),$$

where

e = effort per worker (see above),
 $e' \geq 0$, and $e'' < 0$ given the assumption of
diminishing returns.

To achieve (4.1),

$$(4.1a) \quad [e(W) - W \cdot e'(W)]/[e(W)]^2 = 0.$$

and

$$d^2c/dW^2 = \{-We^2e'' - 2e'e^2 + 2We'e^2\}/(e^2)^2.$$

From (4.1a), $e = W \cdot e'$; and substituting

$$d^2c/dW^2 = -e^2e''W/(e^2)^2 > 0.$$

The second-order condition for cost minimum is satisfied.

Now with

$$e(W) = W \cdot e'(W) \quad (\text{from (4.1a)}),$$

dividing through by $e(W)$,

$$(4.2) \quad \frac{W \cdot e'(W)}{e(W)} = 1$$

(4.2) is by definition the wage-elasticity of effort.

The solution to (4.1a) is the wage rate which minimizes costs, and as we see from (4.2), is the wage rate for which the wage-elasticity of effort is unity. That is, a proportionate change in the wage rate draws an exact proportionate change in work effort of the worker. This wage rate is the efficiency-wage rate, W^* . It minimizes labour costs per efficiency unit, and is rigid downwards. This can be illustrated as follows:-

for all $W < W^*$, objective (4.1) is not achieved. That is

$$[e(W) - W \cdot e'(W)] / [e(W)]^2 < 0, \text{ (as opposed to (4.1a))}.$$

Then

$$e(W) < W \cdot e'(W)$$

and it follows that

$$e'(W) \cdot W / e(W) > 1.$$

This indicates that work effort is wage-elastic over wages less than W^* ; and the firm should continue to raise wage in order to minimize cost until W^* is reached. So, the position of the supply curve of labour at W^* would then determine whether the amount of employment, L^* , offered at W^* , is the most desirable for the economy or not. As long as the aggregate demand for labour falls short of aggregate labour supply and W^* exceeds labour's reservation wage, the firm will be unconstrained by labour market conditions in pursuing its optimal policy. Equilibrium will therefore be characterized by involuntary unemployment (Stiglitz, 1976; Malcolmson, 1981; Yellen, 1984).

Now, the (short-run) production function, assumed to be continuous, twice differentiable, increasing and strictly quasi-concave in its arguments, is of the form

$$(4.3) \quad Q = Q[e(W).L]; \quad Q' > 0, \quad Q'' < 0$$

where Q is output,

L is the labour employed (labour time).

The firm's profit function is given by

$$\Pi = p.Q - WL ;$$

$p = p(Q)$ is price of output;

$p' = 0$ under competition,

$p' < 0$ otherwise;

and the firm's objective to maximize⁴⁷ Π is attained where

$$(4.3a) \quad L: \quad pQ'[e(W).L].e(W) + Qp'Q'e(W) - W = 0 ;$$

$$(4.3b) \quad W: \quad pQ'e'(W) + Qp'Q'e'(W) - 1 = 0 .$$

Hence

$$\text{from (4.3a),} \quad W^* = p e(W^*) Q' [e(W^*).L] + Qp'Q'e(W^*);$$

i.e.

$$(4.4) \quad W^* = Q'e(W^*) [p + p'Q]$$

$$\text{or} \quad W^* = pQ'e\{1 + (p'Q/p)\}.$$

From (4.3b),

$$Q'e'(W)\{p + Qp'\} = 1,$$

or

$$pQ'e'\{1+(p'Q/p)\} = 1.$$

These together yield, upon further simplification

$$(4.3c) \quad \underline{W/e(W) = 1/e'(W)}$$

⁴⁷ It can be verified under certain simplifying assumptions that the second-order conditions are satisfied. See the Appendix to this Chapter for the exercise.

and this is the same result given by (4.2) above.

Equation (4.4) states that the firm needs to equate wage rate to the marginal revenue product/marginal value product (as the case may be) as a necessary condition for profit maximum.⁴⁸ We note that the marginal physical product as shown in (4.4) is a function of effort per worker. Assuming the employer recognizes this, he has every incentive to keep e high (at least to the minimum level required to sustain Π at its appropriate level) by augmenting W which is the most important argument in the functional form of e .⁴⁹

From (4.4) we can express W as

$$(4.4a) \quad W = pQ'e(W) \left| \frac{1 + \eta}{\eta} \right|$$

where

$-\infty < \eta < -1$ is the price-elasticity of demand of output.

For simplicity let

$$\psi = \frac{(1+\eta)}{\eta} > 0, \text{ (i.e. assume } \eta \text{ constant).}$$

Then (4.4) becomes

$$(4.4b) \quad W = \psi Q' \cdot e(W) \cdot p.$$

We would consider, each in turn, the two cases of

(a) competition ($p'=0$);

⁴⁸ Note that under competition, the limiting value of W^* as p' approaches zero is $pQ'e$ =marginal value product, and under imperfect competition, the bracketed term in (4.4) is the marginal revenue, such that $W=\{eQ'(p+p'Q)\}$ =marginal revenue product.

⁴⁹ The functional form of e is $e=e(W)$, contained in (4.3).

(b) imperfect competition ($p' < 0$).

(a) The Competitive setting:

The equilibrium wage in this case is

$$(4.5) \quad W^* = pQ' \cdot e(W^*)$$

[Note that if $p'=0$, then $\psi=1$].

In this model, since W^* is simply a "choice variable" which the employer uses to reach his employment decision, it is important to determine the sign of dW^*/dL (or dL/dW^*) to enable us ascertain the behavioural response of the employer (in terms of wage setting) to changes in labour demand. In short, the sign of dW^*/dL would indicate the "slope of the demand curve for labour", and would show whether or not the employer would alter employment in response to changes in W^* .

Taking a total differential of (4.5)

$$dW^* = p[eQ''(L \cdot e' dW^* + e dL) + Q' e' dW^*];$$

and rearranging, we have

$$dW^* [1 - pe'(eQ''L + Q')] = pQ' e^2 dL ;$$

from which we obtain

$$(4.6) \quad \frac{dW^*}{dL} = \frac{pQ' e^2}{\{1 - pe'(eQ''L + Q')\}}$$

It can be shown that (4.6) is not unequivocally negative given the signs of e' , Q' and Q'' , as expected in conventional economic theory. This implies that the only thing that can induce the firm to reduce the wage it offers to expand employment should be a change in the functional form of $e(W)$, such as $e'(W)=0$.

If $e' = 0$, then

$$(4.6a) \quad dW^*/dL = pQ''e^2 < 0.,$$

as in conventional theory.⁵⁰

But according to the prime case of our model that e' is actually positive, we proceed to determine the behaviour of the firm with respect to the efficiency-wage in equilibrium, as well as what the relevant wage level the efficiency-wage would be.

Define

$$(4.7) \quad N = L.e(W)$$

as the effective labour force engaged by the firm.

Then

$$dN = L.e'dW + e(W)dL$$

so that

$$\delta N/\delta W = L.e' > 0; \text{ and } \delta L/\delta W = -L.e'/e(W) < 0 .$$

These results show that whereas the firm's labour demand curve is downward sloping, its effective manpower utilization (i.e. actual work time utilized as opposed to available labour time in the firm) will increase at higher wages.

⁵⁰ Note that the assumption that $e'(W)=0$ implies that the effort-function, $e(W)$, having a zero first derivative, is therefore a positive constant (see preceding explanation). This would indicate that, as alluded to earlier, the firm reckons that the employee has a positive work effort, but does not link it to any factor (or may link it to a factor other than wage). Such an assumption appears to be implicit in conventional analysis, but the question then arises as to how realistic it is. This is assumed to be the case for secondary labour market firms [see Yellen (1984)]. We also assume that this holds for some public sector firms in the LDCs (Ikpeze, 1978; House, 1984a), for reasons to be explained later.

Now substituting (4.5) into (4.7) and differentiating totally:

$$dN = L.e'p\{Q'e'dW^* + e^2Q''dL + e'eQ''LdW^*\} + edL ;$$

and collecting terms we obtain

$$dN = dW^*(Le'^2pQ' + L^2e'^2peQ'') + Le'e^2pQ''dL ;$$

and rearranging we have

$$dL = \{dN - dW^*(Le'^2pQ' + L^2e'^2peQ'')\}/Le'e^2pQ'' ;$$

from which it follows that

$$\frac{\delta L}{\delta W^*} = \frac{-(Le'^2pQ' + L^2e'^2peQ'')}{[Le'e^2pQ'']} ;$$

simplifying this gives us

$$\frac{\delta L}{\delta W^*} = \frac{-[(Q' + L.eQ'')]}{e'(W)Q''} ;$$

that is

$$(4.8) \quad \delta L/\delta W^* = - [Q'/e'Q'' + L.e/e']$$

But from (4.5) we know that

$$Q' = W^*/p.e ;$$

now substituting this into (4.8)

$$(4.8a) \quad \delta L/\delta W^* = - W^*/p.ee'Q'' - L.e/e'$$

Now we want to constrain (4.8a) to be negative;

i.e. for the wage level W^* , the "efficiency-wage", it is expected that an upward variation in it leads to a reduction in the employment of labour.

Hence

$$\frac{-W^*}{p.e(W)e'(W)Q''} - \frac{L.e(W)}{e'(W)} < 0 ;$$

so that

$$-W^* < \frac{L \cdot e(W)}{e'(W)} ;$$

$$p \cdot e(W) e'(W) Q''$$

solving this yields

$$(4.9) \quad W^* \geq -L \cdot e^2 p Q''$$

Now this solution shows us that the efficiency-wage cannot fall below a certain minimum level if profit maximum is to be maintained. But the efficiency-wage is also supposed to be greater than the market-clearing wage W_0 ; so we deduce that the solution to the problem is that the wage rate must be at least as high as a certain minimum level determined by the firm according to its optimizing behavioural conditions under the efficiency-wage rule. This analyzes the specific case of competition in the product market. We now consider the more generalised model.

(b) Imperfect competition: Monopoly⁵¹

In this case the equilibrium wage offer is

$$W^* = \psi Q' p \cdot e(W^*).$$

Differentiating totally:

$$dW^* = \psi \{ p e Q'' [L \cdot e' dW^* + e dL] + p Q' e' dW^* + e Q' p' Q' (L e' dW^* + e dL) \}$$

and rearranging

⁵¹ This section is a general model and can be applied to all oligopoly situations as well (e.g. duopoly or monopolistic competition) since each of these cases is characterized by $p'(Q) < 0$. Note that even though this is the condition in the product market, the labour market is still fairly competitive among the various firms (bidding together for workers in the common labour market). The case of monopsony will be considered in relation to the agricultural sector in a subsequent chapter.

$$dW^*[1 - \psi e'p(eQ''L + Q') - \psi eQ'^2 p'Le'] = \psi \{pe^2Q''dL + Q'^2 p'e^2\}dL$$

from which

$$(4.10) \quad \frac{dW^*}{dL} = \frac{\psi [pQ''e^2 + p'e^2Q'^2]}{\{1 - \psi e'p(eQ''L + Q')\} - e'p'LeQ'^2\psi}$$

Again the sign of (4.10) is indeterminate. However, putting $e'(W) = 0$, we have

$$(4.10a) \quad dW^*/dL = \psi e^2 \{pQ'' + p'Q'^2\} < 0.$$

This again reduces to the conventional case of the usual downward sloping demand curve for labour. But with $e'(W) > 0$, to resolve the problem:

substituting $e'(W) \cdot W = e(W)$ {from either (4.2) or (4.3c)} and $Q'e(W) = W/\psi p$ {from (4.4b)}, into (4.10)

we have

$$\frac{dW^*}{dL} = \frac{\psi p e^2 Q'' + (\psi p' e Q' W^* / \psi p)}{\{1 - (W^*/e)e' - \psi e'^2 W^* p Q'' - \psi (W^*/\psi p) p' Q' Le'\}}$$

and simplifying,

$$(4.11) \quad \frac{dL}{dW^*} = \frac{-\psi Q'' ee'p - (W^* p' Q' Le'/p)}{\psi e^2 p Q'' + (W^* p' e Q'/p)} < 0.$$

From this relation, now, the efficiency-wage level can be solved for:

$$-\psi Q'' ee'p - (W^* p' Q' Le'/p) < 0,$$

$$\text{i.e.} \quad W^* p' Q' Le'/p > \psi Q'' ee'p;$$

from which

$$(4.12) \quad W^* \geq \frac{\psi Q'' e p^2}{p' Q' L} = W'.$$

(4.12) gives the efficiency-wage as that wage level which minimizes cost per efficiency-unit (maximizes profits), but

for which the employer's response to increases in it would be to reduce the amount of labour employed. It is rigid downwards because any reduction in it would yield less productivity, higher costs, less net revenue, and hence prove suboptimal for the firm even though there may be excess labour supply at W^* .

This simple model seems to indicate an explanation for the industrial sector wage rigidity and unemployment observed in such developing countries as Nigeria (Diejomaoh and Orimalade, 1971; Falae, 1971). And it is no wonder that, even barring the activities of labour unions, wages have not been observed to exhibit downward flexibility as a way of encouraging more employment of labour. We now proceed to apply this model in addressing the employment question.⁵²

4.2 APPLICATION OF THE MODEL

Employment demand at the firm level in the private sector, characterized by $e'(W) > 0$ for wage-employment in the large-scale formal (organized) sector, and $e'(W) = 0$ for others, is first analyzed. We then extend the model to cover the cases of the public sector and the "unorganized" (informal) sector within a framework of the aggregate (market) economy. In this latter case we attempt to explain how wages and

⁵² The following analysis applies to plantation agriculture as well, given its relative capital-intensive character. In this respect it is to be viewed differently from the 'agricultural sector'.

employment in the various sub-sectors are determined simultaneously within the (complex) system.

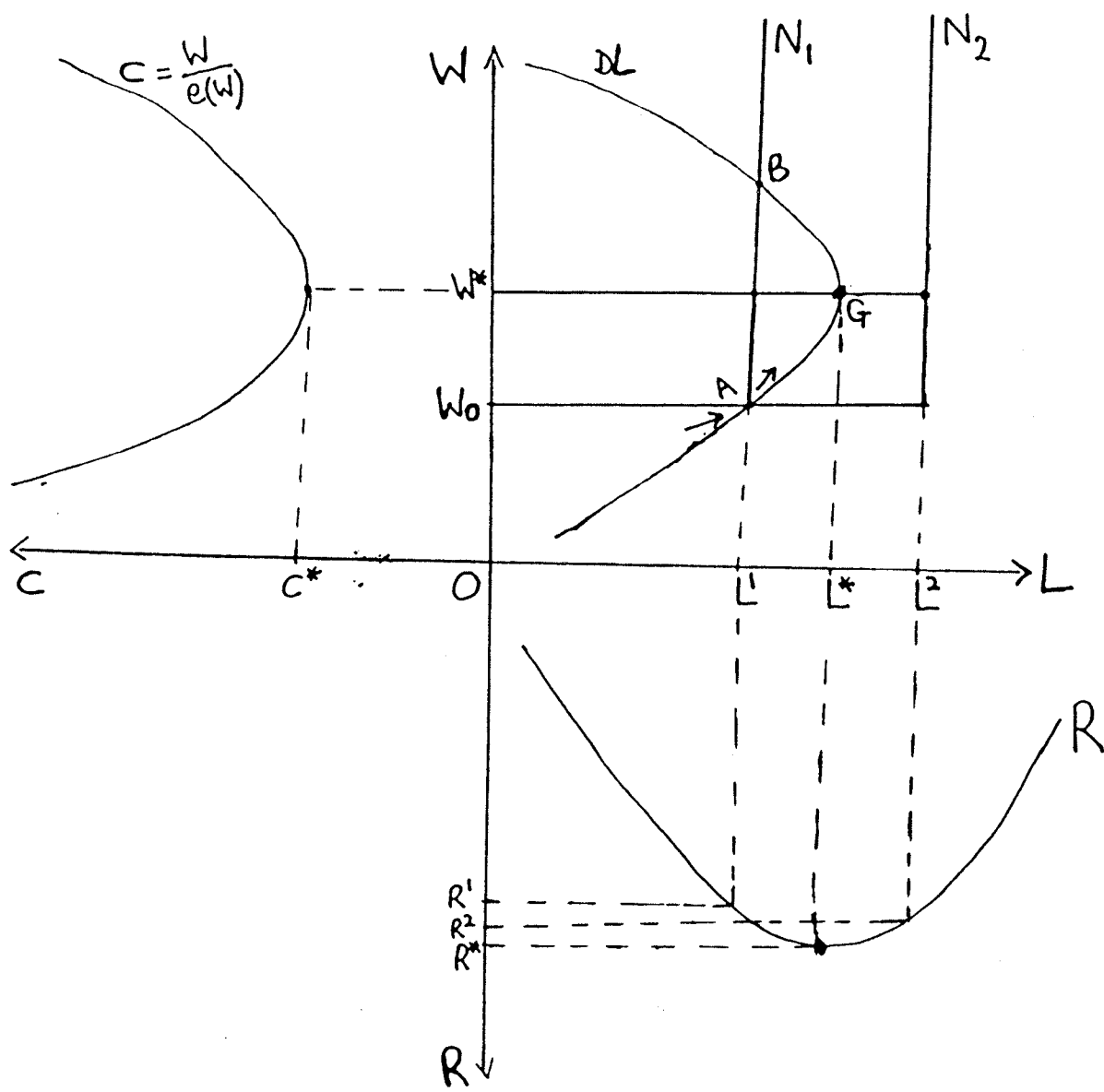
4.2.1 Employment in the Private Non-Agricultural Sector

Consider the three-quadrant diagram in Figure 4.1. The first quadrant shows the efficiency wage, W^* , as the wage that minimizes cost per efficiency unit. The firm's demand for labour is shown in the second quadrant as the curve DL: it is positively sloped over the range of the wage rate less than W^* , and negatively sloped for all $W > W^*$. DL is to be interpreted in the following manner: the firm is aware of a wage W^* which maximizes profits. Therefore it offers that wage and employs the optimal number of labour L^* . The firm will not offer any wage less than W^* , and apparently does not have any clear-cut employment decision at such wages. However, if for some reason it must offer some employment at such wages, it will just employ some amount of labour less than L^* , and will employ successively fewer workers as wage falls, because lower wages yield lower productivity.

For wages greater than W^* , cost per efficiency unit is rising because each worker's productivity increase is less than proportionate to the wage increase that brings it about. Accordingly, the firm believes that each worker employed at such wages would not be as "efficient" as those employed at W^* , so it employs fewer workers than L^* .⁵³

⁵³ Viewed from the firm's standpoint, it is unnecessary to

Figure 4.1
Employment and Wage Determination



At W^* the firm's optimal labour demand is determined as L^* . It is assumed that at W^* , the firm faces a certain number of job-seekers at its gates wishing to be employed [see Lewis (1954)]. In accordance with its optimal employment needs, the firm will settle for the point G, employing the amount of labour L^* .

The third quadrant shows the net-revenue curve R .⁵⁴ It is maximized when L^* is employed.

Now if the amount of labour seeking employment in this representative firm is N_1 , then, an excess demand situation arises, and all workers seeking jobs will be employed, with vacancies remaining to be filled in the firm.⁵⁵ We note that at the market-clearing wage W_0 , an equilibrium employment demand situation obtains at the point A. But this equilibrium is unstable, in that, for any $W > W_0$ equilibrium does not gravitate back to A (as wages are inflexible downwards). The point B is also unstable since all wages greater than W^* will not be offered.

pay such a high wage when a lower wage (W^*) is all that is required to obtain optimum efficiency.

⁵⁴ Net revenue is given by the difference between total revenue and total wage bill, i.e. the area under the DL curve minus $W.L$.

⁵⁵ Under such a condition, competition by firms for the scarce labour will drive up the wage, and firms would be operating sub-optimally. Such a situation is, by definition of a labour surplus economy, ruled out for the Nigerian economy and for most LDCs [see Weeks (1972)].

If, however, the amount of job-seekers facing the firm is N_2 , then, there is open involuntary unemployment. The number employed, L^* , are "protected" in employment by the "efficiency-wage" phenomenon, which also acts as a permanent barrier to entry into employment by the unemployed. The firm will offer on-the-job training to its employed, and the lack of this training will act as an additional barrier facing the unemployed.

This indicates a "segmentation" situation. The "segmentation" here, though, does not relate to the characteristics of the workers; it is a result of the firm's optimizing behaviour. The unemployed (secondary workers) are faced with a few options: they could continue searching for jobs in these firms; they could enter into self-employment in informal activity (either in the urban area or in the rural area's subsistence agriculture and/or other rural activities), or they could continue to move in and out of other low-paying casual jobs within the industrial sector.

Hence this analysis provides a basis for demarcating the labour market into a primary (protected) sector with high wages, good working conditions, low turnover rates, etc. (Mazumdar, 1977; Rempel and House, 1978); and a secondary sector (constituting the "bad jobs" industry, and informal employment including subsistence activities), with

relatively lower wages and higher turnover rates.⁵⁶

4.2.2 The Public Sector

Employment in the public sector is characterized by both $e'(W) > 0$, and $e'(W) = 0$. We make this assertion because of the following prevailing conditions in the sector. The public sector may be distinguished from the private sector by the nature of the former's operating environment which is largely marked by the absence of strict market forces (Gunderson, 1979). In the public sector the profit constraint of the private sector needs not be a consideration because public firms are mainly natural monopolies and invariably face inelastic demand curves.⁵⁷ So it can be assumed that firms can not only easily raise output prices with little or no consequence for output and employment (Gunderson, 1979; House, 1984a), but also do not operate according to the "effort-function" of our model's production function. Firms can offer relatively high wages and better conditions of service according to the tastes of

⁵⁶ Rempel and House (1978: 84-85) note that this results from firms in an industry characterized by differentiated products, and among industries, so that a dual labour market is apt to emerge: "In the 'protected' part of the labour market a limited number of employees will receive a wage above that available to those who fail to gain access to the protected portion of the market. Protection is defined in terms of the production techniques used by certain firms."

⁵⁷ See House (1984a) for empirical support of this in the case of Cyprus. Gunderson (1979) illustrates it for Canada, and Ehrenberg and Goldstein (1975) provide a support for this point using U.S. data.

the government without profit and efficiency considerations (Ikpeze, 1978). We consider the two cases of "high wages" and "market wages" respectively.

Case 1: $e'(W) > 0$.

Within the high-wage public firms (whether or not profit maximization is pursued) employees tend to increase their work-effort and hence productivity as a result of the high wages. In such circumstances, the employment rule would be similar to that of the private sector efficiency-wage firms just analyzed: high wages, high profits, and fewer employment.

However, this result has not been observed to characterize the public sector firms in Nigeria (Fajana, 1975; Ikpeze, 1978); in Kenya (Rempel, 1981); in Colombia (Berry, 1975); and in most LDCs in general (House, 1984a). In Nigeria, the public sector employs more wage-labour than the private sector (Damachi, 1973; Rimmer, 1981), but public sector wages are not as high as private sector wages, and public firms are not associated with making positive profits (Weeks, 1972; Vielrose, 1971; Phillips, 1972). This implies that optimizing labour market policies are not being followed by public firms; as, within the framework of our model, it implies that public firms are offering non-efficiency-wages, viz:

$$W_0 < W^*.$$

This means that cost per efficiency unit is not minimized by the firm,

$$\text{i.e.} \quad \frac{[e(W) - W \cdot e'(W)]}{[e(W)]^2} < 0$$

for the firm's chosen point of operation.

That is

$$e(W) < W \cdot e'(W),$$

so that

$$\frac{e'(W) \cdot W}{e(W)} > 1$$

This indicates that the firm operates at the range of wages over which work-effort is elastic with respect to wage changes, yielding a suboptimal employment policy: net revenue will be smaller, employment will be small or large depending on the labour policy of such a public company (and/or the government that directs it). The firm might as well (and usually does) decide to offer the higher "efficiency-wage" to some of its employees on the basis of such factors as seniority/experience, credentialism [see House (1984: 406)], and other bureaucratic evaluative considerations (as well as for political reasons).

Case 2: $e'(W) = 0$.

As indicated earlier, this implies the case of a constant effort "function". Workers supply positive work-effort which does not have a direct link with the wage paid.

In certain segments of the public sector, particularly in the civil service,⁵⁸ the majority of the employees are middle-level, semi-skilled and unskilled workers having generally academic qualifications equivalent to High school certificate. These belong to a labour market where the conventional wage-employment relationship governs: labour demand is inversely related to wage rate. No particular skill acquisition is necessary for employment, and the firm needs not raise wages to encourage higher productivity, for such a policy, besides not being necessary (since workers would generally not react to it in the desired fashion given their inherent attitudes to government work [see below]), has no theoretical basis for being applied in this sector of the labour market.

To ascertain worker attitudes to work among this category of the labour force, we carried out a survey in the Lagos area among civil service employees of the Federal and Lagos State governments. Of the 161 respondents, almost 88 percent replied that vast increases in their salaries would not make them to "work harder" (i.e. to be more punctual to work, to stay at their posts for all of the 8-hour working day for which they are paid, and to be more honest in

⁵⁸ Employees in the civil service are known to be characterized by "nonchalant" attitudes to work (Kirk-Green and Rimmer, 1981). High wages do not necessarily lead to more work-effort from workers, given that the civil service is perceived as a "no man's land" where inefficiency "does not matter". (See the empirical evidence discussed within the main text).

carrying out their (public) duties); nor would higher wages make any much difference in their general attitudes to government work (which is that of general apathy to duty).

Consider equation (4.10) of the model:

$$(4.10) \quad \frac{dW}{dL} = \frac{\psi[pQ''e^2 + p'e^2Q'^2]}{\{1 - \psi e'p(eQ''L + Q')\} - e'p'LeQ'^2\psi}$$

Putting $e'(W) = 0$, we have

$$dW/dL = \psi\{pQ''e^2 + p'Q'^2e^2\} < 0.$$

This indicates an inverse relationship between employment demand and wage rate of the "usual" type postulated by neoclassical theory.

Under this setting therefore, the labour market would clear under normal circumstances. Even if the public firm wishes to "maximize profits", it can adopt a wage policy (W_0) which enables it to do so. But since profit maximization is not a usual consideration, the firm can employ as much labour as it wishes at the wage⁵⁹ W_0 (the "secondary labour market" wage).

The actual amount of employment offered is illustrated below.

⁵⁹ Note that senior civil servants are supposed to belong to the category analyzed under Case 1.

4.2.3 The Aggregate Labour Market

The foregoing analysis relates exclusively more or less to wage employment in the formal sector. We attempt now to apply the model to the overall labour market, encompassing both the formal (organized) and informal (unorganized) sectors.

From (4.12), employment in an efficiency-wage firm i is found, so that total employment by all non-competitive efficiency-wage firms (say, f of them) is

$$\sum_{i=1}^f \frac{\psi Q' 'i e_i}{W^* i p' i Q' 'i}$$

Similarly, employment in each competitive efficiency-wage firm j can be found from (4.8), so that total employment by all competitive efficiency-wage firms together (say, h of them) is

$$\sum_{j=1}^h \frac{-W^* j}{e_j^2 p Q' 'j}$$

Therefore, aggregate employment, E^{**} , for all the $(f+h)$ efficiency-wage firms in the labour market is

$$E^{**} = \sum_{i=1}^f \frac{\psi Q' 'i e_i}{W^* i p' i Q' 'i} + \sum_{j=1}^h \frac{-W^* j}{e_j^2 p Q' 'j}$$

Now let us assume homogeneity for each category of labour. The demand for labour for all efficiency-wage firms taken together, E^{**} , can be obtained by horizontal summation of the curve DL (of Figure 4.1); but adding the negatively-sloped demand curve of all other firms taken together to

this, we obtain the aggregate labour market demand curve -- the kinked curve DmD_0 -- shown in Figure 4.2.

The amount $L^{**} = E^{**}$ are the "protected" employees employed by the efficiency-wage firms in the organized sector. The wage W^{\wedge} is the average level of the earnings in rural agriculture and other activities, and for all $W > W^{\wedge}$ the economy's supply curve of labour is the positively-sloped curve SL .⁶⁰ The total labour supply to the market (less those already employed in the efficiency-wage firms, L^{**}), is SN .

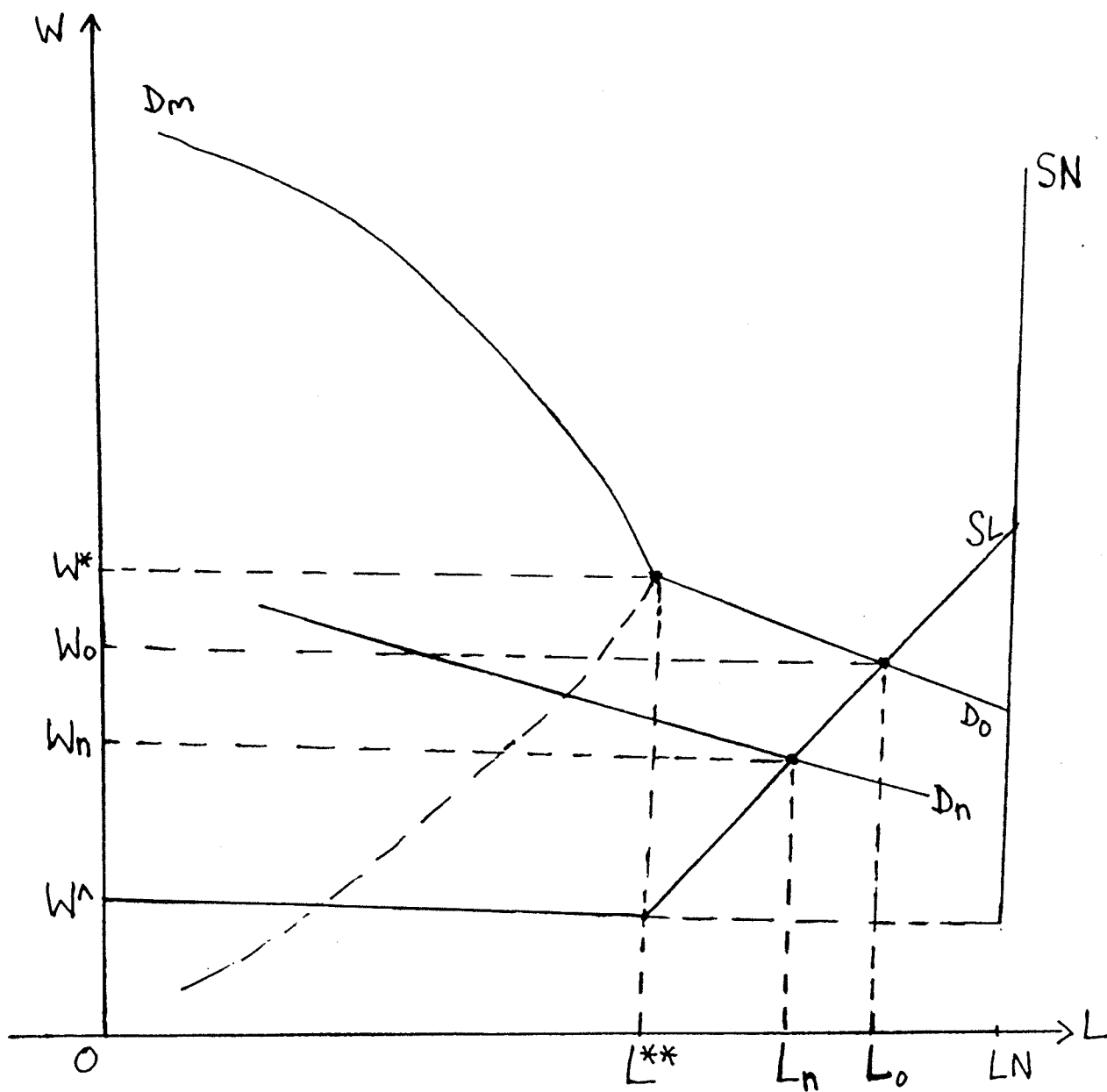
The curve Dn is the labour demand curve of the unorganized sector.

The amount of labour $L^{**}L_0$ is the total employed in both the private and public sectors by all non-efficiency-wage firms: the amount $L^{**}Ln$ employed in the unorganized sector, receiving Wn ; and the amount LnL_0 in the public sector, receiving W_0 .

It follows that the critical determinant of the wage rate in the unorganized sector (Wn), as well as the extent of unemployment in it, is the rate of flow of labour from the agricultural sector to the non-agricultural sector; and the factors influencing this flow include the level of W_0 , (the average wage level in the public sector, which are

⁶⁰ Because of a possible labour supply aggregation problem that may arise because of the non-uniqueness of wages (since different wages prevail in equilibrium), we assume that leisure is a normal good for all categories of the labour force -- both the organized (high wage) and unorganized (low wage) categories.

Figure 4.2
Aggregate Labour demand in the economy



influenced by institutional forces of government policy such as minimum wage legislation); W^{\wedge} , the corresponding earnings in agriculture; and π , the weighted average of perceived probabilities of obtaining high-wage employment by potential urban-bound migrants for any given W_0 [see Harris and Todaro (1970); Todaro (1969)].

4.2.4 Employment in Agriculture

The agricultural sector being the dominant sector of the labour market in the LDCs deserves a special treatment, and we shall devote a Chapter to it in this thesis.

Within the framework of the efficiency-wage model, however, agricultural employment is illustrated using the two cases of

- (a) $e'(W) > 0$ for subsistence agriculture,
- (b) $e'(W) = 0$ for commercial agriculture.

That $e'(W)=0$ for commercial agriculture is not only because agricultural production is not capital-intensive, but also because activity in it is of a seasonal character, so that there is no wisdom in any employer maintaining a consistent wage-employment policy (though some labour-tying arrangements may be necessary between the employer and some of the employees (but not all)) [Bardhan, 1979b; Eswaran and Kotwal, 1985]. Therefore, if the employer adopts an efficiency-wage policy, say, there would be no means for him to fully utilize the high productivity that would be

forthcoming from his workers, since the services of the workers (all of whom are paid the same wage) would be lost to him during the slack cropping season. So, the rational employer would not adopt an efficiency-wage policy.

Moreover, agricultural work tasks are of the menial category. No personal judgement is required of the worker, and there is no reason for him/her to be "encouraged" by a high wage offer to put in his/her best. The employer needs no "subtle supervision technique that avoids resorting to continuous monitoring" because usually the nature of the job is of a piece-rate type. It is not easy for the worker to shirk, as his/her productivity is readily observable.

Therefore, we would adopt the conventional neoclassical (implicit) assumption (of $e'(W)=0$) in addressing agricultural wage-employment. This is more so because the agricultural labour market is normally associated with market-clearing [see Bardhan (1979b)], and by assuming $e'(W)=0$, we would verify whether our model will yield such a market-clearing situation.⁶¹ Also, the agricultural sector is characterized by many other peculiarities which set it apart from the non-agricultural sector, and this necessitates our having to tackle the analysis here from a

⁶¹ Using $Q=Q(L)$ is quite distinct from using $Q=Q[L.e(W)]$ and then putting $e'(W)=0$. Using $Q=Q(L)$ (assuming p is constant) will yield $dL/dW = 1/pQ''(L) < 0$; using $Q=Q[L.e(W)]$ yields equation (4.6) in the text, whose sign is indeterminate, but upon putting $e'(W)=0$ becomes $dL/dW = 1/pQ''.[e(W)]^2 < 0$.

slightly different angle.

On the other hand, the employment implications of subsistence agriculture is to be analyzed using the assumption that $e'(W) > 0$. This is because the subsistence family head (employer) bases productivity of his family members (employees) on their nutritional intake (wage), despite the fact that production techniques in this situation is not capital-intensive. Also, and more importantly, shirking is highly likely to pertain among subsistence workers because of the cultural behavioural ethics that do not permit shirking to be punished (by, say, denial of "payment"). There will therefore be a moral hazard problem in family employment, and the head has to counter this by offering "high wage"; in fact, by offering the highest "wage" possible to encourage higher work-effort.

We return to the analyses of agricultural employment in a subsequent chapter, but before which we proceed to consider some empirical analysis of the model.

4.3 AN EMPIRICAL FRAMEWORK FOR THE MODEL

4.3.1 About the Data

In a study of the type being undertaken here, the empirical illustration of the analysis is confronted with one major problem -- that of availability of data. Like most LDCs, Nigeria has an acute shortage of economic data,

particularly on employment and wages. Such a situation has confronted several researchers in this area of the Nigerian economy, and has compelled many a researcher to rely heavily on proxies and estimates (Phillips, 1972; Fajana, 1973; Weeks, 1972).

The data we utilize in our study are either data obtained in a few surveys,⁶² or data from the Industrial Surveys conducted by the Federal Office of Statistics (FOS), Lagos. Unfortunately, for reasons ranging from inadequacy of research methodology and lack of finance [see Phillips (1972)], to the severe difficulties of obtaining information from people who usually tend to withhold such information to avoid taxation and the like, sufficient time-series data is generally not available for Nigeria, and we shall be relying mainly on cross-section data.

The FOS Industrial Surveys, their shortcomings notwithstanding, are said to constitute the most comprehensive and authoritative source of data and information on the Nigerian industrial sector (Fajana, 1973; Vielrose, 1971). The Industrial Surveys, as a rule, cover only establishments with ten or more employees; the exclusion of smaller establishments will make it difficult to generalize any findings that may result from the use of

⁶² Severe constraints could enable us to carry out just a few of these surveys. The author is grateful to Mr. Jonas Lemchi of the University of Nigeria, Nsukka, for his invaluable assistance in this respect.

such data. Establishments with fewer than ten employees, which are quite numerous, and are known as a whole to account for at least as much (if not more) employment as the larger establishments, are thus not directly covered. But we believe that this apparent handicap needs not deprive our conclusions of its relevance when used to address smaller establishments, as any relevant inference for an establishment with ten employees should hold reasonably also for one with smaller number of employees. And moreover, such validity depends on the type of inference being examined; for instance, we would be examining the relationship between establishment size and wage differentials, and in such case the lack of relevant data for establishments with fewer than ten employees would not appear to jeopardize our chances of getting reasonably reliable conclusions regarding small/large-scale establishments wage differentials. The bulk of enterprises with fewer than ten employees are known to be family businesses characterized by an apprenticeship system, and relatively very low wages [see Kilby (1962; 1969)], and hence there is no reason to suppose that their inclusion in the analysis would significantly alter the results to be had.

4.3.2 The Analysis

We would establish an empirical basis for our model by carrying out the following empirical analysis which has been

adapted to suit our purposes according to the data available to us.

We begin by noticing from Table 4.1 that industries with high wages tended to have higher levels of value added.⁶³

It is possible that the line of causation is from productivity to wages, or vice versa. The important thing, however, is that employers tend to recognize the close link between wage level and worker productivity (Rodgers, 1975). Both Harris and Todaro (1969) and House (1973) obtained positive and significant coefficients for the productivity variable when regressed on the wage rate, using Kenyan data; and both researchers cite a similar result for Latin American countries [see Erickson (1969)]. These pieces of evidence go to support the notion of a situation where the wage rate has a highly positive influence on worker productivity in LDCs.

Using Nigerian data and ranking the various industries according to their value added and wage levels, we establish a rank correlation of 0.75, significant at the 5 percent level. This indicates a high degree of positive correlation between value added and wages.

⁶³ Value added is used as a proxy for productivity (efficiency); value added is measured as gross output less non-labour costs [see: Phillips (1972); Fajana (1973)]. This is the definition used by the FOS researchers in their computations.

Table 4.1
Average Annual Wages and Value Added per Worker in Nigerian
Industries, 1963-1965

Industries	wage (Pounds)	Valued Added (Pounds)
Meat pdts.	213	513
Diary pdts.	273	871
Grain mill pdts.	393	2709
Bakery pdts.	94	379
Distillery	126	112
Sugar Confectionary	158	784
Misc. food pdts.	306	4389
Beer Brewing	369	3405
Soft Drinks	180	856
Textiles	191	570
Footwear	146	513
Wearing Apparel	110	296
Made-up Textile gds.	126	216
Sawmilling	176	393
Wood products	84	86
Furniture and Fixture	157	384
Paper pdts.	220	733
Printing	240	339
Tanning & travel gds.	216	777
Rubber pdts.	181	572
Basic Industrial Chem.	326	1923
Vegetable oil milling	167	1214
Paints	315	1623
Misc. Chemical gds.	320	1412
Bricks and Tiles	156	343
Pottery and Glass pdts.	221	112
Cement	255	1674
Concrete pdts.	249	774
Basic Metals	290	761
Metal pdts.	225	744
Electrical Equipment	226	646
Boat Bldg. & Repairs	189	189
Automobile and bike Assem.	251	644
Automobile Repairs	270	750
Misc. manufactured gds.	226	809

Source: Federal Office of Statistics, Industrial Survey, 1966.

To investigate the basis for the firms' continued practise of offering higher wages, we estimated the profits of the industries of Table 4.1. The profit data is shown in Table 4.2.⁶⁴ It indicates that most of the high-wage industries enjoyed the highest level of profits, while the lowest-wage industries tended to have very low profit levels.

Table 4.1 shows that the highest wages tended to be paid in such industries as the food products and chemical industries, i.e. Miscellaneous Food products (such as margarine, cooking fats, tinned foods, etc.), Grain milling, Beer brewing, Basic industrial Chemicals, Pharmaceuticals, etc.; and these industries have the highest profits, as shown in Table 4.2. (Sawmilling, and Furniture and fixture are the only exceptions).

Further, Tables 4.3 and 4.4 show that these high-wage and high-productivity industries have relatively very high capital intensity and low labour costs as a proportion of total costs, respectively. Again the exceptions are Sawmilling and Furniture, and their situations can be

⁶⁴ Actual information concerning profits in Nigerian manufacturing is non-existent. To overcome this difficulty, estimations are used. It is considered that profit is equal to value added minus labour costs minus depreciation (Vielrose, 1971). The FOS Industrial Surveys give figures on value added and labour costs (wages and salaries), but not depreciation. Figures on depreciation are estimated by using the value of fixed capital and rate of depreciation provided by the Surveys. Vielrose (1971) adopted this exercise, and our own computations are based on his methods.

Table 4.2
Profits in Nigerian Manufacturing Industries, 1965

Industry	Z ('000 Pounds)	Industry	Z ('000 Pds)
Meat Products	324	Printing	266
Diary Pdts.	70	Tanning & Travel gds.	469
Fruit Canning	-30	Rubber Products	2,895
Grain Mill pdts.	1,759	Basic Industrial Chem.	367
Bakery Products	854	Vegetable Oil Milling	3,631
Sugar Confectionary	638	Paints	505
Distillery	-213	Miscell. Chem. Pdts.	3,980
Misc. Food pdts.	10,042	Bricks and Tiles	85
Beer Brewing	9,488	Pottery and Glass Pdts.	-115
Soft Drinks	633	Cement	3,248
Textiles	-580	Concrete products	338
Footwear	415	Basic Metals	1334
Wearing Apparel	271	Metal products	3,351
Made-up Textiles	368	Electrical Equipment	475
Sawmilling	1,484	Boat bldg. & Repairs	-54
Wood Products	0	Auto. & bicycle Assembly	1,005
Furniture & fixture	1,058	Automobile maintenance	3,028
Paper Products	375	Miscell. manufactures	871

Source: Federal Office of Statistics, Industrial Survey, 1966.

Adapted from: Vielrose (1971).

Key: Z = profit

explained by the fact of their necessarily being labour-intensive in character (Table 4.4).

In only four of these industries (Fruit canning, Printing, Sawmilling, and Furniture) was the ratio of labour costs as a proportion of total costs higher than 20 percent. Even traditionally labour intensive industries such as Made-up textiles and Wearing Apparel, seem to share in this low labour cost ratio characteristic [see, Fajana (1973)].

These indications not only support the fundamental postulate of our model that high wages characterize the manufacturing sector (which is further characterized by high capital intensity), but also clearly support the theoretical implication of our model that profits (and productivity) are high in this sector.⁶⁵ And since the high-wage characteristic cannot be attributed to the existence of high profits (because such an argument does not only lack sound theoretical basis but also does not make economic sense, for the fact that an employer makes high profits does not mean that he has to "give it away" to his employees), and since union activities are not the cause of the high wages (see Chapters 3 and 6), one is safe to imply that the high wages are a result of "efficiency-wage behaviour" on the part of the firms. This inference seems too early to make, but let us proceed to examine how it may be supported by the other

⁶⁵ Fajana (1973: 369) states that a "...basic characteristic of Nigerian manufacturing sector worth noting is the relatively high levels of profits that firms enjoy.."

Table 4.3
Average Annual Percentage Increase in Capital-intensity* and Wages
of Nigerian Manufacturing Sector (1963-1969)

Industry	K'	W'
Meat Products	64.8	1.7
Dairy products	33.5	5.3
Fruit canning	-29.8	-2.5
Grain Mill Products	83.3	1.3
Bakery	82.2	1.5
Beer	27.8	3.3
Soft Drinks	28.8	8.7
Made-Up Textiles & Wearing Apparel	110.5	6.2
Sawmilling	3.7	14.4
Furniture & Fixture	0.3	5.0
Textiles	3.3	2.2
Paper Products	24.3	10.2
Tanning and Travel Goods	22.5	6.0
Basic Industrial Chemical	33.0	9.0
Vegetable Oil Milling	88.0	16.3
Paints	-7.0	-5.8
Cement and Concrete products	43.8	9.8
Basic Metal and Metal Products	-1.8	11.8
Electrical Equipment	36.2	3.2
Footwear	61.0	13.7
Sugar Confectionary	123.3	10.2
Printing	35.5	6.0

Source: Federal Office of Statistics, Industrial Survey 1963-1969.
Adapted from: Fajana (1973: 368).

* As a proxy for capital intensity, we take net capital expenditure per employee (Fajana 1973).

Key:

K' = Annual Growth Rate of Capital Intensity (%).

W' = Annual Growth Rate of Wages.

The table indicates that all but a few of the various manufacturing industries had substantial growth rates of capital-intensity. The few here are the Fruit-canning, Paints, and Basic Metal/Metal products (all of which actually experienced negative increases in capital-intensity over the period), and the Sawmilling and Furniture (all of which are labour-intensive by their nature).

Table 4.4
Labour Costs as a Percentage of Total Costs
in Nigerian Manufacturing Sector, 1966

Industry	Percentage
Meat Products	16
Diary Products	15
Fruit Canning	23
Grain Mill Products	4
Bakery	9
Beer	12
Soft Drinks	17
Made-up Textiles & Apparel	13
Sawmilling	27
Furniture and Fixture	21
Textiles	17
Paper Products	13
Tanning and Travel Goods	9
Basic Industrial Chemicals	10
Vegetable Oil Milling	2
Paints	12
Cement and Concrete Products	19
Electrical Equipment	8
Basic Metal and Metal Products	7
Footwear	14
Sugar Confectionary	13
Printing	41
All	11

Source: Computed from Federal Office of Statistics,
Industrial Survey data, 1966 (Tables 5 and 13).

evidence that we have.

Establishment size and Wage Differentials:

Next, we attempt to investigate the relationship between intra-industry wage vagaries and establishments size in the

Nigerian manufacturing sector.⁶⁶

To enable us construct an intra-industry wage structure map, we resorted to following the lead of Fajana (1975) in dividing all the industries covered by the FOS surveys into six groups:⁶⁷

<u>Establishments Group</u>	<u>No. of Employees</u>	<u>Midpoint</u>
1	500 or more**	750**
2	300 - 499	399.5
3	100 - 299	199.5
4	50 - 99	74.5
5	20 - 49	34.5
6	10 - 19	14.5

[** We have taken the upper boundary in this Group to be 1000, for reasons to be explained shortly].

The results we have are shown in Table 4.5, covering the period 1976-1981. It suggests a clear pattern of wage differentials (average wages)⁶⁸ by establishment size.

⁶⁶ We adopt this approach on the basis of the fact that the data available to us could only enable us to test our model via this approach. Significant wage differentials across industries by size of establishments would indicate that large firms tend to behave according to the efficiency-wage postulates.

⁶⁷ The group number may be taken to represent the ranks of the various group sizes. Whereas Fajana (1975) used 1964-1970 data, we have used 1976-1981 data which is all that is available to us.

⁶⁸ The average wages for each group is obtained by dividing the total wage (and salary) bill of all establishments in each group by the total number of employees in that group.

Table 4.5
Average Wage and Wage Differential by Size of Manufacturing
Establishments in Nigeria, 1976-1981.

Group ^b	Est. Size ^a	1976		1977		1978		1979		1980		1981	
		w	w _i /w ₁	w	w _i /w ₁	w	w _i /w ₁	w	w _i /w ₁	w	w _i /w ₁	w	w _i /w ₁
6	10-- 19	297	0.49	291	0.47	293	0.47	299	0.45	314	0.47	311	0.46
5	20 - 49	440	0.72	451	0.73	450	0.72	455	0.69	453	0.68	455	0.67
4	50 - 99	498	0.81	512	0.83	499	0.80	499	0.76	507	0.76	513	0.76
3	100 - 299	586	0.96	590	0.95	599	0.96	602	0.92	611	0.91	602	0.89
2	300 - 499	577	0.94	595	0.96	618	0.99	623	0.95	649	0.97	660	0.98
1	500 and over	612	1.00	616	1.00	622	1.00	654	1.00	667	1.00	675	1.00

Source: Computed from Federal Office of Statistics, Industrial Surveys data, 1976-1981.
* Establishment size measured by number of employees.

Key:

w = Average wage

w_i = Average wage of Group i, i=1,2.....6.

All values are in Nigerian Naira.

It is evident from a casual inspection of this data that, generally, average wages vary directly with the size of establishment, with workers in the large (efficiency-wage) establishments enjoying substantial wage differentials over those in the smaller establishments. In 1979, for example (see the w_i/w_1 column), employees in Group 6 establishments had an average wage amounting to just 45 percent of the average wage of workers in Group 1. Similar percentages in that year were 69, 76, 92 and 95 respectively for Groups 5 to 2. This reveals substantial differentials (except for among the high-wage category of establishments -- Groups 3, 2 and 1).⁶⁹

To further highlight the strength of the relationship between establishment size and average wage, we attempt to correlate the two variables. The coefficients of correlation⁷⁰ we computed between establishment size and average wages were: 0.73 for 1976; 0.71 for 1977; 0.73 for

⁶⁹ Fajana (1975), whose analytical methodology we have followed in applying our data for this analysis, used the FOS 1964-1970 data to generate percentage wage differentials of 42, 65, 83, 90, and 90 respectively between Groups 6-2 establishments and Group 1 establishments, for the year 1967. A comparison between his results and ours indicate some reduction in the differentials over time, although no consistent pattern can be established.

⁷⁰ In estimating the coefficient of correlation, the midpoint of each group interval was taken to represent an average size of its establishments. [For Group 1, which is open, the midpoint used is that between 500 and 1000. We justify this by noting that very few establishments exist that had more than 1000 employees (see Fajana, 1975)].

1978; 0.78 for 1979; 0.80 for 1980; and 0.80 for 1981. These coefficients are positive, fairly high, and are each significant at the 5 percent level.

This confirms the high correlation between average wages and establishment size depicted in Table 4.5.

It is highly probable that the larger an establishment, the more likely it is that a higher proportion of its labour force will be in the highly-paid professional, administrative, and managerial category (the "hierarchy-effect"). Expatriate (non-Nigerian) labour -- which on the average earns substantially more than Nigerian labour -- is to be found mainly among the larger establishments. On the other hand, the proportion of relatively low-paid unskilled labour tends to be higher for small-scale establishments (where production processes are less complex) (Phillips, 1972; Fajana, 1973; 1975).

The incidence of wage differentials between the large and small-scale establishments may therefore be due to the different skill compositions of their labour forces. This requires that we adopt a method which is able to isolate the effect of skill composition (human capital element) of the labour force on wages in order to obtain a true picture of wage differentials which is due to the size of establishments. So, in order to eliminate the effect of these skill differences, we consider the various industries. This is done (for an industry) by relating the size of an

establishment with the average wage of a given skill category rather than with the average wage of the entire labour force.

The relevant data for this were available for a few industries (from the FOS). The coefficient of correlation between size of establishment and average wage of four categories of labour skills [unskilled, semi-skilled and skilled; clerical; and professional and/or administrative and/or managerial (PMA)] were computed for each of the industries. The results are given in Table 4.6.

It is seen that, though the coefficients are in all cases less than those previously estimated, they are still fairly high. A comparison would bear out the suspicion that the differentials observed earlier on are partly (but not mainly) due to differences in skill composition of the labour force. However, a strong positive correlation still exists between establishment size and average wage when allowance is made for the skill-mix factor, as indicated by the still relatively high correlation coefficients we obtained in Table 4.6.

The evidence of wage differentials by establishments size we have seen in the Nigerian manufacturing sector implies that, even among the efficiency-wage firms themselves, the very large-scale ones tend to offer higher wages (perhaps in line with labour productivity and capital intensity).

Table 4.6
Relationship between Establishment size and Average wage by Skill Categories in Selected Industries, 1979.

Industry	No. of Establishments	Coefficient of Correlation between Establishment size and Average wage			
		Unskilled	Semi-skilled/ Skilled	Clerical	Prof./Adm./Man.
Bakery	33	0.69	0.62	0.63	0.48
Sawmilling	46	0.67	0.56	0.61	0.46
Textiles	49	0.62	0.60	0.66	0.52
Furniture and Fixture	45	0.48	0.51	0.38	0.35
Printing and Paper Pdts.	39	0.56	0.55	0.64	0.59

Source: Computed from Federal Office of Statistics, Industrial Surveys data, 1979.

Table 4.7 relates average wages to labour productivity and capital intensity by size of establishments for the year 1979.⁷¹

It shows a parallel movement of average wages, productivity and capital intensity with respect to the size

Table 4.7
Average Wage, Labour Productivity and Capital Intensity by Establishment Size, 1979.

Est.*Size	w	q	k
10 - 19	299	894	110
20 - 49	455	2021	130
50 - 99	499	2360	172
100 - 299	602	2743	188
300 - 499	623	3992	235
500 and over	654	3998	296

Source: Computed from Federal Office of Statistics, Industrial Surveys data, 1979.

Key:

- w = Average wage
- q = Labour productivity (Net value added per worker).
- k = Capital intensity (Net capital expenditure per worker).

* Establishment size measured by number of employees.

All values are in Nigerian Naira.

⁷¹ Due to the lack of data on output and of physical capital size by establishments, we resort to using value added and net capital expenditure per employee as proxies for labour productivity and capital intensity respectively [see Iyoha (1982); Fajana (1973; 1975)], in this case as well.

of establishment.

If labour markets were competitive, there would be a tendency, irrespective of productivity differences, for wages to equalize for workers of the same skill category in all establishments despite size. The larger firms' higher wages would be reduced (by the excess labour supply) to the same level with the smaller establishments. That this has not been so in Nigeria (and in most LDCs) is due to the influence of the "non-market" mechanism of the efficiency-wage rule {given that most of the non-market institutional forces (such as labour unions) that could have also been the cause of this situation, have been discounted [see Chapter 6 below; see also Rempel (1981) and Rempel and House (1978) for a vivid account of the relative unimportance of these institutional factors in influencing wages in the Kenyan economy]}. The foregoing evidence therefore indicate some significant support for the efficiency-wage postulate.

Some Regression Analysis:

To complete our exercise, we would provide the following regression analysis to test the extent to which there may or may not exist some degree of causality among wages, capital intensity, productivity, and employment. If it can be established that the relationship between these factors and wages is significant, then it would indicate that the labour market is more influenced by these factors than the efficiency-wage postulate is implying. But a weak

relationship between these factors and wages would leave efficiency-wage-fixing and other factors (see below) as the most plausible "explanatory variables" of wage changes. The following model is tested:

$$(4.13) \quad WGE = \text{INTCPT} + \beta_1 \text{CAPIN} + \beta_2 \text{PROD} + \beta_3 \text{EMPL} + \epsilon$$

where

WGE is percentage increase in average wages (across industries),

INTCPT is the intercept term,

CAPIN is percentage increase in capital intensity,

PROD is percentage increase in productivity (value added),

EMPL is percentage increase in employment,

ϵ is the error term,

β_i 's are parameter estimates, ($i=1,2,3\dots$).

The regression equation is:

$$(4.14) \quad WGE = 5.9442 + 0.308\text{CAPIN} + 0.2202\text{PROD} - 0.0335\text{EMPL}$$

$$\qquad\qquad\qquad (0.8982) \qquad\qquad (0.4867) \qquad\qquad (0.0613)$$

$$R^2 = 0.0877; F = 0.577$$

(t statistics in parentheses).

First, we notice that the very low value of the coefficient of determination, R^2 , indicates a very poor fit; i.e. all the explanatory variables together explain only about 9 percent of the total variations in wage changes. This would indicate that there must be other "unexplained" factors that are more important in explaining the variations in the wage rate. Such factors would presumably include labour union activities, the level of unemployment, the rate of

inflation, profit levels, government wage policies (apparently in the public sector), skill acquisition, and other such considerations.

The positive coefficient of the capital-intensity variable (though very low) points to a direct relationship between the wage changes and changes in capital intensity (granted that both the changes due to productivity and employment changes have been accounted for).⁷² This therefore seems to have a bearing to our notion that firms tend to increase wages in line with capital intensity.

But the fact that none of the parameter estimates is significant (and supported by the very low value of the F ratio) indicates that wage changes are far more dependent on other factors than those used in this regression. Several other writers have reached this conclusion in the recent past: Phillips (1972); Weeks (1972); Fajana (1973); Yesufu (1974); Olaloye (1981); Iyoha (1982). But these writers have not identified the pertinent factors that would most satisfactorily explain the wage changes, though a few pointed to capital-intensity (Iyoha; Phillips) and high profit rates (Weeks; Phillips). This provides an indication that some other pertinent factors such as the employer's tendency to fix wages at "efficiency-levels", say, could be relevant in explaining the wage changes. The regression

⁷² All the parameter estimates are not significant at the 5% level.

results are not expected to capture wage changes due to "efficiency-wage-fixing" since the firm tends to fix such wages irrespective of what productivity and employment levels are, and irrespective of the absolute amount of capital-intensity it uses. What is important for the firm is that the worker put in his/her best; the fact that the firm employs a certain amount of physical capital is all that is required, the absolute amount of such capital would not matter very much in influencing the firm's wage-fixing decision.

4.3.3 The "Turnover" Approach

Basu (1984:105) argues that labour turnover in the industrial sector is generally more costly to the employer than such turnover in the agricultural sector. This implies that employers in this sector would pay higher wages not only to encourage higher work-effort but also to reduce turnover. For this reason Basu (1984: 105) believes that the observed rural-urban dualism that exists would be sharper than is usually reckoned, so that the actual wage gap between the two sectors could be seen to be having two components: one part being a response to turnover costs, the other to productivity.

Since turnover rates affect productivity (and not vice versa), we believe that the employer, in offering high wages, is more driven by the productivity factor than by the

turnover factor. If high wages lead to higher productivity, then it means that high wages lead to lower turnover rates.

Labour productivity can be indirectly measured by absenteeism and turnover among employees. Absenteeism represents an impairment of plant efficiency, and hence lower levels of output (Kilby, 1961). Substantial turnover means that the worker finds the job non-enriching, uninteresting, unattractive (reward wise), and unworthy to maintain. Absenteeism and turnover rates are more often functions of the wage rate and the condition of work; they represent indices of the industrial commitment of the labour force, the commitment of which in itself is dependent on the remuneration flowing from the job.

Following Kilby's (1961) approach, we analyzed data on absence and turnover rates for 14 firms of various sizes (in terms of number of employees) for 1979. Firms with similar work hours per week (40 hours), and having similar average distance to work (about 5 miles), and employing 100 persons or more, were selected. The data is shown in Table 4.8.

Gross absence includes voluntary absence and excused absence. Genuine sickness appeared to be just 1 percent. Gross turnover includes terminations and quits.

First we observe that voluntary absence and voluntary turnover are generally not as high as one would expect in such a low-wage setting. But they are relatively very high

Table 4.8
Absence and Turnover (1979)

Type of Firm	No. empl.	Daily wage index# N1 = 100	Gross absence	Gross turnover
Brewery	134	110	4	3
Tobacco (Cigrts.)	380	140	3	3
Soap	642	200	1	1
Textiles*	1120	140	2	3
Construction**	200	100	9	17
Peanut oil mill	208	100	7	5
Flour mill	1280	145	1	2
Cement	386	150	2	1
Tin-mining	2550	100	6	7
Coal-mining	800	150	4	3
Cannery	122	110	5	4
Rubber-shoes	270	120	6	4
Rubber processing	155	90	9	33
Bldg. materials	100	90	12	20

Source: Federal Office Of Statistics,
Industrial Surveys, 1979.

Not included in the original data source.
*Transportation to and from work provided.
**Characterized with seasonal redundancy.

for both the construction and rubber-processing and building material firms who have the lowest wage levels. Second, we note that there is an obvious negative correlation between the wages and absence and turnover rates.

Table 4.9 contains the findings of a monthly survey of 3 establishments regarding their employee absence and turnover rates for the year (1961).

Firm A represents the "permanently established" staff of the Nigerian Ports Authority, averaging about 4,100 persons for all the units that constitute the entire industry.⁷³ Wages are high and conditions of work are favourable.

Table 4.9
Analysis of Monthly Absence and Turnover (1961)
[percentages, (%)]

Firm A			Firm B			Firm C		
Sick	Absent	Left	Sick	Absent	Left	Absent	Left	
3.1	0.08	0.4	0.3	0.7	1.0	7.4	4.6	
3.8	0.10	0.5	0.5	1.3	0.1	12.1	9.7	
2.7	0.08	0.4	0.4	1.8	0.6	16.1	17.0	
2.7	0.07	0.6	0.4	2.5	0.2	12.7	15.9	
3.1	0.06	0.5	0.6	2.0	0.8	7.8	11.1	
3.8	0.07	0.3	0.3	1.5	0.6	9.7	11.3	
1.9	0.04	0.5	0.5	1.7	0.8	7.5	6.7	
2.4	0.04	0.3	0.9	1.6	1.2	5.3	10.4	
2.6	0.06	0.5	0.7	1.9	0.8	5.7	6.8	
2.3	0.02	0.8	0.7	1.3	0.2	5.5	2.1	
2.3	0.03	0.4	0.3	1.6	-	4.8	3.0	
2.8	0.04	0.3	0.4	1.2	0.9	16.4	5.0	
Annual turnover		5.5				7.2	93.6	

Source: Adapted from Kilby (1961).

Turnover rates are seen to be low, and absence rates also appear quite low. Firm B represents the staff of the Central Bank of Nigeria, also having high wages and favourable conditions of service. Again turnover and absence rates are relatively low.

⁷³ That is: Lagos, Port Harcourt, Warri, and Calabar.

Firm C processes rubber. Low wages prevail. Conditions of service are poor. The result is high absenteeism and excessive turnover per month.

4.3.4 Evidence from Other Studies

The pioneering works on the efficiency-wage hypothesis did not have any important empirical scrutiny because a thorough empirical test of the hypothesis is difficult to devise (Basu, 1984). Leibenstein (1957a) provides some piecemeal evidence to support the theory. But important empirical support for the model are found in Rodgers (1975) and Bliss and Stern (1978), both establishing strong evidence for the validity of the wage-productivity nexus aspect of the model. However, the most important empirical requirement of the theory seems to lie in establishing an empirical evidence that supports the notion that firms clearly behave according to the model's postulates. In this regard, Bliss and Stern (1978) carried out some indirect tests: their approach to the efficiency-wage hypothesis was in applying it to agricultural employment. Therefore they suggested that an appropriate approach to testing the theory empirically would be to compare the wages of those workers to whom the theory could be thought to apply -- permanent labourers -- to the wages of those to whom it is unlikely to apply -- casual labourers. Permanent labourers would receive higher wages since permanency allows the employers to

capture the resulting long-term (high) productivity benefits [see Bliss and Stern (1978:391)]. Their finding, based on Indian data, appeared to support the theory very well. We have used Nigerian data for the same purpose, and our finding also is quite favourable to the theory.

Rempel and House (1978) considered business firms operating under imperfectly competitive (monopolistic or oligopolistic) conditions, using as explanatory variables (a) an index of the product market concentration, and (b) a firm's "ability to pay" (as reflected by value added per worker). These factors are used as measures of the degree of the firm's intervention (and influence) on wage and employment levels. A series of regression tests were run, and these two variables were consistently found to be significant explanatory determinants of inter-industry wage differences [see regression equations and results in Rempel and House (1978: 124,141)]. This finding led the authors to conclude that some firms operating under imperfectly competitive conditions (in the product market) maintained higher wages that were not responsive to labour market supply and demand conditions (in Kenya).

This finding means, in other words, that manufacturing firms acted according to 'efficiency-wages' principles in formulating their wage and employment policies (given that unions are not responsible for forcing up wages [see Chapter 5]).

Appendix A

We verify that the second-order conditions for profit maximum is satisfied for the firm's optimal employment conditions discussed in the chapter.

We make the simplifying assumptions that the product market is competitive: i.e. that $p'=0$; and further assume that $p=1$. With these assumptions, (4.3a) and (4.3b) reduce to

$$(A4.3a) \quad Q'e(w) - w = 0$$

$$(A4.3b) \quad Q'e'(w) - 1 = 0.$$

[It is interesting to note that solving (A4.3a) and (A4.3b) simultaneously yields equation (4.2) in the text].

For simplicity let $e''(w) = 0$, i.e. assume the effort-function is linear in its argument w (though making it non-linear, that is putting $e''(w) < 0$, would not alter the results besides making the simplification more cumbersome). Note that e'' cannot be positive [see Leibenstein (1957a; 1958)].

The sufficiency condition for a maximum is satisfied if the Jacobian determinant obtainable from (A4.3a) and (A4.3b) can be shown to be non-negative:

$$J = \begin{vmatrix} Q''e^2 & (eQ''Le' + Q'e' - 1) \\ Q''e'e & Q''Le'^2 \end{vmatrix} \geq 0$$

Expanding

$$Q''^2 e'^2 e^2 L - Q'' e' e \{e Q'' L e' + Q' e' - 1\} \geq 0,$$

and simplifying

$$- Q'' e'^2 e Q' + Q'' e' e \geq 0,$$

or

$$(A4.4) \quad - e' Q' + 1 \geq 0.$$

But from (A4.3b), we know that $e' Q' = 1$.

And substituting into (A4.4), we obtain zero.

This establishes that the determinant is non-negative.

Also, that the Jacobian determinant vanishes establishes linear dependence among the system of equations depicted by (4.3a) and (4.3b) [See Chiang, 1979]. This alone is not a sufficient condition for optimum, but together with the quasi-concavity assumption for the production function (4.3), sufficiency is established.

Now from both (4.3a), (4.3b), and (4.2), it is clear that

$$w = Q' e$$

under the given assumptions

i.e. the equality of wage and marginal productivity of labour.

In conventional neoclassical theory, the implication is that

$$e(w) = 1.$$

If, however, $e(w) > 1$, then

$$w > Q'$$

for the above "marginal productivity theory" to apply.

But it does not make economic sense for the employer to pay his workers wages greater than the marginal product of labour. Therefore, the conventional neoclassical production function imbedding the notion of $e(w)=1$ cannot be relevant for societies where the effort function is operational -- the LDCs.

Table 4.10
Average Annual Percentage Increases in Employment, Value Added,
and Wages of Nigerian Manufacturing, 1963-1969*

Industry	E'	q'	W'
Meat Products	8.5	12.3	1.7
Diary Products	12.7	22.5	5.3
Fruit Canning	11.7	54.0	15.3
Grain Mill Products	7.8	27.0	1.3
Bakery Products	10.7	22.5	1.5
Sugar Confectionary	39.2	65.2	10.2
Beer Brewing	8.5	23.5	3.3
Soft Drinks	12.5	6.2	8.7
Textiles	21.2	38.3	2.2
Footwear	16.7	44.8	13.7
Made-up Textiles & Apparel	24.8	149.2	6.2
Sawmilling	14.8	41.0	14.4
Furniture and Fixture	13.5	24.3	5.0
Paper Products	35.5	46.5	10.2
Printing	7.7	14.8	6.0
Tanning and Travel Goods	11.8	20.5	6.0
Basic Industrial Chemicals	20.3	34.2	9.0
Vegetable Oil Milling	22.5	17.2	5.3
Paints	117.8	39.5	-5.8
Cement and Concrete Products	14.7	18.2	9.8
Basic Metals and Metal Pdts.	18.8	27.8	11.8
Electrical Equipment	39.2	81.3	3.2

* Excluding the Eastern States (affected by civil war).

Source: Federal Office of Statistics, Industrial Survey, 1963-69.

Key:

E' = percentage changes in employment

q' = percentage changes in value added

W' = percentage changes in wages

Table 4.11
Capacity Utilization in Nigerian Manufacturing Industries, 1965.

Industry	k/K (% Average)	Industry	k/K (% Average)
Meat pdts.	60	Textiles	38
Diary pdts.	100	Footwear	29
Fruit Canning	100	Wearing Apparel	63
Bakery pdts.	45	Sawmilling	27
Grain mill pdts.	100	Made-up textiles gds.	100
Sugar Confectionary	100	Wood Products	100
Distillery	100	Furniture & fixture	71
Misc. food pdts.	88	Paper pdts.	89
Beer brewing	64	Printing	86
Soft drinks	-	Tanning & travel gds.	92
Rubber pdts.	90	Concrete pdts.	35
Basic Industrial Chem.	24	Basic Metals	100
Vegetable oil milling	92	Metal pdts.	74
Paints	45	Electrical equip.	44
Misc. Chemical pdts.	100	Boat bldg. & repair	100
Bricks and Tiles	100	Automobile Assembly	71
Pottery & glass pdts.	100	Auto. repairs	50
Cement	20	Misc. manuf. goods	100

Source: FOS, Industrial Surveys, 1965.

Key:

k/K = Capital Intensity

Chapter V

FURTHER CONSIDERATIONS IN THE APPLICATION OF THE MODEL

So far we have considered the main theoretical framework and its applications in addressing wage and employment determination. In this chapter we attempt to link the model with the other important issues of labour problems, namely: the role of unions; the role of physical capital (regarding its influence in the technique of production); the influences of foreign (multinationals) operations in the economy; and the implications for human capital formation of the efficiency-wage phenomenon.

Attempts are made to integrate these issues within the notion of the efficiency-wage principle, and thus provide the explanations of these issues as they apply to the LDCs.

5.1 UNIONS AND INSTITUTIONAL ARRANGEMENTS

Explanations of persistent inter-firm wage differentials for apparently homogeneous labour can be set out in either of the two possibilities: employers are forced by employees to raise wages above the competitive level; or employers may have reason voluntarily to raise wages (Knight and Sabot, 1983). Under the first view, wages are seen as the outcome of a process of collective bargaining: the outcome depending

partly on the bargaining power of workers (the greater their degree of organization and their cohesiveness, the greater their ability to impose "costs" on employers through industrial actions), and on the bargaining power of firms (the ability to pay high wages -- due to existing high profits, say, -- may reduce the will of employers to resist worker pressures).

The second view of firm-related wage determination is that employers unilaterally raise wages above the floor provided by competitive market forces (or by government through minimum wage legislation). The explanation for this focuses on the effect of wages on labour productivity, and this is the essence of the efficiency wage model.⁷⁴

The various reasons why employers may perceive a relationship between wages and productivity may range from the case that increases in wages can improve the health, energy and morale of workers, and hence their productivity (Leibenstein, 1957; Malcolmson, 1981; Stiglitz, 1976a; Yellen, 1984), to the "labour turnover" hypothesis whereby higher wages are posited to be capable of diminishing labour turnover in the firm, and hence reducing training costs (Oi, 1962; Stiglitz, 1974), and even to the hypothesis that by

⁷⁴ One explanation for the firm's tendency to behave in this way focuses on non-productivity benefits that may accrue to certain employers as a consequence of wage increases. We shall examine such cases below. See Knight and Sabot (1983), Lim (1977), Arrighi (1973), for further details of these analyses.

raising wages relative to those in other firms, an employer can 'cream' the most productive members of the labour force (Knight and Sabot, 1983).⁷⁵

It is important to provide some further explanations based on certain institutional arrangements in the economy, and to draw on such explanations to complement our modelling of the efficiency-wage principle. We begin by considering labour unions.

5.1.1 Unions and Labour Contracts

It is commonplace to view that unionized firms pay higher wages than nonunionized firms, and that firms with strong unions or a high proportion of the labour force unionized will pay higher wages than firms with weak unions or a low proportion of workers unionized. Implicit in this analogy for the LDCs is the assumption that labour unions function much as they do in developed countries. However, the

⁷⁵ Any wage differences among firms under this efficiency-wage rule may be explained by differences in the productivity of their workers which is due to 'other' personality productivity-enhancing differences. Because of such differences in their characteristics, firms are likely to differ in the extent to which they wish to raise the wage for efficiency-wage reasons or for labour turnover reasons, and the extent to which they may find it profitable to 'cream' workers. In this 'creaming' case, the labour market is not segmented in so far as the wage differences reflect differences in personal productivity. In the other cases, however, the labour market is segmented among firms, in the sense that there are no differences in labour productivity at the time of hiring, and yet there is no tendency for wage differences to be reduced through competition. See, House (1984); Knight and Sabot (1983).

prediction of the effect of unionization on wages could be reversed if there is reason to believe that unions have rather become an instrument for implementing a government wage-restraint policy. Such a policy has not been uncommon in LDCs (Smith, 1969; Knight, 1967; Warren, 1966; Weeks, 1972).

One way for explaining the rationale for the efficiency wage modelling for the LDCs is to consider that labour is largely non-unionized, particularly in the private sectors of most LDCs. In Nigeria, unionization is a prerogative of the public sector (Umo, 1985). Private sector unions are rare, and where they exist they have been very weak, ineffective and fragile (Umo, 1985; Rimmer, 1981; Warren, 1966). Labour unions in Nigeria (and perhaps most LDCs) are not only generally ill-organized and lack financial and political power, they are also weakened by the abundance of unemployed and poor workers keen to step into wage jobs. Even in the public sector where unions are apparently observed to function (Umo, 1985), they do not have the impact that is apparent from their actions and statements [see: House and Rempel (1976); Rempel (1981)]. And since in many instances the government has clashed with the unions and "defeated" them in most cases (Sonubi, 1973), they have ceased to play an effective role in wage determination. And having become instruments of government wage-restraint policy, they have even become effective in depressing wages

in the public sector (Knight and Sabot, 1983; House and Rempel, 1976; Weeks, 1972).⁷⁶

It is important to note, however, that even though unions are not able to exert significant pressure on wages via the bargaining process, it does not necessarily mean that they do not have some impact via the political process. In fact unions do have very significant input in getting the government to accede to periodic reviews of the civil service pay structure, the reviewing of the minimum wage levels, and other such types of union pressures. But the impact of unions have not been sufficient in preventing the declining of real wages in LDCs during periods of high inflation [for example: late-1970's in Nigeria (Rimmer, 1981), and mid-1970's in Kenya (Rempel, 1981)].

Given these circumstances, implicit contracts rather than explicit contracts can be seen to be more relevant in analyzing the employment relationship. Important work agreements are therefore not set out in formal written agreements between workers and employers [for example, regarding the specification of what transactions and/or events should be carried out when some contingency arises (Ehrenberg and Smith, 1985)]. Such "agreements" are governed

⁷⁶ Weeks (1972) found that unskilled wages in Nigeria have been much more responsive to economic conditions than ordinarily stated, and that the role of government and unions in wage determination have been largely overstated. Note that this finding relates only to unskilled labour.

by implicit contracts: that is, a set of shared/recognized and informal understandings by both parties about how the firm and the workers will respond to contingencies. For instance, workers are paid according to work hours rather than according to output produced. And the nominal wage is not commonly reduced, nor are workers ordinarily laid off, except under circumstances of severe depression or worker inability to perform. Barring such circumstances, and given that there is asymmetry of information, either party can make declarations designed to mislead the other.⁷⁷ Such a moral-hazard problem would require the procurement of a more self-enforcing implicit contract to govern the employment relationship.

The efficiency-wage principle seems to be readily on hand to lend itself towards modelling such a self-enforcing contract [given that monitoring by either party is not only costly, but also has no guarantee of success (Akerlof, 1982)]. The efficiency-wage principle provides a way of postulating a built-in incentive into labour contracts that induce both parties to refrain from cheating the other when each has the opportunity to do so.

⁷⁷ For example, the firm might declare that it is incurring losses during a downturn, whereas it is in fact making huge profits, and would go ahead and reduce wages and/or lay-off workers. On the other hand, the worker might feign sickness, whereas he is healthy, and thereby be able to shirk on the job. This presents a moral-hazard problem.

However, we would point out that other alternative incentive mechanisms are possible: piece-rates payment, profit-sharing, commissions, and the like. But it appears that these seem inferior to the efficiency-wage hypothesis, in that, large-scale enterprises generally are not in the habit of using these incentive methods. Secondly, and more importantly, whereas the efficiency-wage phenomenon can be modelled in a neoclassical fashion and shown to be consistent with the optimization-subject-to-constraint behavioural rule of rational economic agents (firms), these other incentive principles do not appear to be equally amenable to consistent modelling beyond ordinary description of the facts.

5.2 CAPITAL INTENSITY AND THE EFFICIENCY WAGE PRINCIPLE

The preceding analysis indicates a case of "segmentation" which has been revealed by our analysis. We indicated in the previous section that the efficiency wage principle appears to be more important for manufacturing and service sector firms utilizing modern technology. The literature in development economics make it clear that formal sector firms in LDCs fall in this category, while the urban informal sector and the agricultural sector are dominated by firms utilizing relatively lower levels of modern technology (Sethuraman, 1976; 1981; Knight and Sabot, 1983).

Capital intensity seems to be a highly relevant factor in determining the type of response a firm will have (in terms of wage setting) with regards to wage-productivity relationship among its workers. It appears that firms with high capital-intensive production methods (and thus having lower proportion of wage costs in total costs) will have their profits less sensitive to any given wage increase, and therefore can afford to offer higher wages in order to encourage higher productivity (Lim, 1977; Arrighi, 1973; Knight, 1975). For this reason, technological dualism is sometimes said to give rise to labour market dualism (Knight and Sabot, 1983).

It is necessary to understand that the choice of technique in Nigeria (and in most LDCs) has not been in response to any existing high wages. It is fairly well established that most large-scale enterprises in Africa are foreign oligopolies (Herman, 1975); and also that foreign investment in Africa (and other underdeveloped regions of the world) have strong capital-intensive bias (Arrighi, 1973; Lim, 1977; Knight, 1975; Reuber, 1973; Herman, 1975; Knight and Sabot 1983).⁷⁸ Evidence abounds that wages were generally relatively very low at the time of the establishment of most industrial concerns (Weeks, 1972;

⁷⁸ For a complete discussion and analysis of the capital-intensive bias and the reasons for it in the African countries, see Arrighi (1973: 227-229). For LDCs as a general rule, see Herman (1975), and Reuber (1973). See also Lim (1977).

Phillips, 1972), so that high wages could not have been the reason for the high capital intensity.

In the case of Nigeria, the bias in favour of capital may be traceable to the government's fiscal and tariff policies which have tended to have the effect of relative cheapening of capital (Iyoha, 1982; Diejomaoh and Orimalade, 1971; Fajana, 1973). The emphasis in Nigeria's industrialization strategy has been more on output growth than on employment generation (Fajana, 1973),⁷⁹ hence the bias of policies in favour of capital intensive production methods. Moreover, it is the government's policy that the eligibility of firms for pioneer status, size of the "capital allowances", and tax relief, be determined to a considerable extent, by the size of capital invested in fixed assets.⁸⁰ Nigeria uses the granting of import tariff concessions for capital goods as one of her policy instruments to furthering its industrialization drive.⁸¹ These various policy measures are the sources of the relative "cheapening" of capital which lie behind the high capital intensity of industrial production in the Nigerian (and presumably most LDCs') economy.

⁷⁹ See: Federal Ministry of Information: Statement on Industrial Policy, Sessional Paper No.4, 1964.

⁸⁰ As stated in: Federal Gazette, Vol.58, No.25, May 13, 1971: Industrial Development: (Income Tax Relief) Decree 1971.

⁸¹ See: Central Bank of Nigeria, Annual Report 1966, p.67.

A high degree of capital-intensity among firms in the economy will mean that the type of labour force category that will be required for employment will be, at least, the semi-skilled⁸² category. Such a category of labour force is necessary because of the need to stabilize a section of the labour force to ensure a stable availability of the requisite labour. The capital-intensive nature of production requires a stable labour force able to man the capital input. Arrighi (1973) found that the large-scale foreign corporations which pioneered industrial establishments in Africa (LDCs) adopted such capital-intensive methods of production not only as a response to the technological and management constraints they faced, but also because they were (and still are) oligopolies in their home countries having considerable financial strength. In Nigeria, it appears that the high capital-intensity has persisted (Fajana, 1973; Iyoha, 1982), and even the few purely indigenously owned industries have tended to adapt themselves to the situation and have been highly capital-intensive as well (Phillips, 1972; Iyoha, 1982; Arrighi, 1973).

⁸² Labour can be classified as: (a) Unskilled: characterized by versatility and lack of adaptation to the "discipline" of wage employment (Kilby, 1961; Arrighi, 1973),-- it can be readily put to varied unskilled activities. (b) Semi-skilled: characterized by greater specialization, regularity, and identification with the job (Arrighi, 1973; Ehrenberg and Smith, 1985). (c) Skilled: characterized by more complex skills. (d) High-level manpower: characterized by specialization and higher educational qualifications and training (Arrighi, 1973).

The degree of capital intensity in a sector will therefore provide us with a way of determining the degree to which the efficiency-wage principle will be binding among firms in the sector. In the highly capital-intensive manufacturing sector, it is apparent then that the situation is such that

$$e'(W) > 0.$$

This is because cognitive skills are generally required for job-task performance in this sector [see Thurow (1975)]. Workers are trained/educated and thus possess productivity-augmenting potentials which can be used to the benefit of the firm. Therefore it pays the firm to elicit the maximum use of this potential from each worker by use of an "incentive mechanism" -- the payment of "efficiency-wages".

In the menial-jobs sector, the small-scale dominated urban informal sector (see Rempel, 1982; Sethuraman, 1976), and the agricultural sector,⁸³ labour-intensive techniques of production is supposedly dominant; and because of the observed wage flexibility (enabling the labour market to clear) in these sectors (see Yellen, 1984; Hansen, 1983; Rempel, 1982), the implication is that

$$e'(W) = 0,$$

⁸³ We have referred to these sectors together as the 'unprotected' (secondary) sector of the labour market (see Chapter 4), as opposed to the 'protected' (primary) efficiency-wage sector.

and this will be in accord with the relationship established in equations (4.6a) and (4.10a) of our model (see Chapter 4).

Jobs in these sectors, being non-capital intensive, are assumed to require just ordinary routine-type production activities. Non-cognitive skills are sufficient for the job performance, and there is no need for the firm to pay high wages to elicit work effort because the going (market) wage is sufficient for that. Workers in these sectors belong to the unskilled category, therefore it is not necessary from the firm's point of view, to attempt to use the payment of higher wages to "stabilize the requisite work force" (see above).

It appears that the degree of capital-intensity is a crucial factor in the division of the labour market into a protected (primary) and unprotected (secondary) sector in the LDCs. Capital-intensive firms are more likely to practise efficiency-wage rules while non-capital intensive firms (apparently labour-intensive) are more likely to be characterized by labour market-clearing behaviour.⁸⁴

⁸⁴ Note that labour-intensive firms are likely to have very significant proportion of their total costs of production determined by wage costs, and therefore have reason not to pay high wages.

5.3 HIGH PROFITS, MULTINATIONAL CORPORATIONS, AND CAPACITY UTILIZATION

One may be tempted to view that highly profitable firms may pay higher wages than firms operating at the margin simply because they make high profits and therefore can afford to pay higher wages. But we note that since such firms are profit-maximizing, it is not consistent with their profit-maximizing objective that they offer "high" wages if such a policy would not go to promote their objective. Also, one can argue that the will to resist high wages may be greater in highly profitable firms if their high profits is a result of paying low wages.⁸⁵ This, however, seems implausible in case of many manufacturing firms in which wage costs are a small proportion of total costs, as we analyzed in the previous section in respect of capital intensity.

The ability to pay high wages may be positively associated with size of firm (House, 1984; Knight and Sabot, 1983). Large firms may reap greater economies of scale, have more monopoly power and be more likely to be protected by government commercial policies (Arrighi, 1973; Reuber, 1973). In that case, they are likely to be capital-intensive firms, with production techniques requiring a more sophisticated labour force, necessitating the payment of high wages in accordance with the efficiency-wage rule. Moreover, they can easily recoup their wage costs through

⁸⁵ It will be shown shortly that this is generally not so for most LDC firms.

the ease with which they can sustain profits by passing on cost increases to consumers (Knight and Sabot, 1983; Herman, 1975). Nigerian manufacturing firms' profits are high (Vielrose, 1971; Fajana, 1973); and Phillips (1972) shows that most of the high-wage industries in Nigeria enjoyed the highest level of profits, while the lowest wage industries tended to enjoy very low or even zero profits (see Table 4.2). Herman (1975) also establishes the same case for LDCs in general.

We establish a line of causality here between high profits and high wages: that high profits are a result of high wages, in efficiency-wage firms. This sounds odd in the frame of "usual" economic wisdom; but in the LDCs this seems to be the explanation for the equally "odd" state of (economic) affairs in the labour market and in the economy as a whole.

Further to their "efficiency-wage" behaviour, one can postulate the various reasons why foreign firms (multinational companies) that dominate manufacturing industries in LDCs (Reuber, 1973; Arrighi, 1973) are willing to pay higher wages than local firms. Multinational companies may see the payment of high wages as a form of insurance in a "hostile" environment, or as a way of securing the loyalty of employees, or of avoiding the charges of 'exploitation', and of reducing political pressures for nationalization (Lim, 1977; Knight, 1975;

Knight and Sabot, 1983). The government is likely to choose not to discourage wage increases in multinationals if they regard such higher wages as a means of wresting from foreign owners a bigger national share of value added (Knight and Sabot, 1983).

It is asserted that the multinationals operating in LDCs tend to be highly profitable as a result of their monopoly/collusive oligopoly positions (Arrighi, 1973; Herman, 1975), and that they tend to use more capital intensive techniques of production for reasons unrelated to wage consideration (White, 1978; Reuber, 1973; Arrighi, 1973), so that profits are made less sensitive to wages. [See the section on 'Capital Intensity' above]. This is in line with the arguments we established for the efficiency-wage rule as the one governing the labour market policies of these firms.

Fajana (1973: 364) observes that there is a constraint imposed on LDCs by their dependence on capital equipment which have been designed to economize the use of labour.⁸⁶ This constraint involves severe limitations in the labour absorptive capacity of their industrial development. White

⁸⁶ The capital equipment used in these countries have to be imported from the industrially developed countries which design their capital equipment specifically to fit their own factor endowments. Labour being the relatively scarce and more expensive factor of production in most industrially developed countries, the production techniques embodied in their equipments have tended to be labour saving [see Fajana (1973); Iyoha, 1982)].

(1978) found that it is the practice of the multinational corporations to be tied to their capital-intensive technology in the developed countries, and rarely consider adaptations since such adaptations do not serve their interests (which presumably is in reaping as much profits as possible). And that since they can obtain their capital abroad at "cheaper" rates, they would have less incentive to adapt, and frequently pay higher wages needed to ensure a stable labour force required to tend the capital equipments [see also, Knight and Sabot (1983); Lange (1963)].⁸⁷

A survey of the ownership pattern of Nigerian industrial establishments indicate a situation in which private sector ownership dominates, and the situation is similar in most LDCs. Although the attainment of rapid industrial growth is the usual major economic objective of LDCs' governments, government efforts to achieve this objective have consisted mainly of providing the necessary fiscal incentives, infrastructure and support activities (Ikpeze, 1978). Direct participation by the public sector has thus been minimal,

⁸⁷ Lange (1963) traces the roots of the behavioural patterns of the multinationals in LDCs to their ultimate motives for operating in the LDCs in the first place. "With the development of large capitalist monopolies in the leading capitalist countries, the capitalists of those countries lost interest in developmental investment in the LDCs because such investment threatened their established monopolistic positions. Consequently, investment in LDCs of capital from the developed countries acquired a specific character ..." This "specific character" supposedly implies that such investments must be in "quick-yielding" industries [see Arrighi (1973) for analysis of such industries].

and the number of public sector-owned establishments is, in the case of Nigeria, relatively small (Kilby, 1969: 266; Helleiner, 1966: 318). Further, on the same subject, Aluko (1969: 14) notes that Nigerian (indigenous) industrialists engage mainly in small-scale industries, while the large-scale and complicated industries are almost exclusively owned and managed by foreign investors. Also, Fajana (1975: 533) had a similar finding: stating that "...in fact most of the big businesses in the country's industrial sector are no more than Nigerian branches of foreign companies, relying mainly on the imported advanced technologies of their parent foreign-based companies ...". This evidence is a pointer to the fact that the typical large-scale industrial establishment in the LDCs is likely to behave according to the postulates of the efficiency-wage hypothesis, namely: capital-intensive, high-wage, and high-profit oriented; resulting in the employment practices analyzed in Chapter 4.

Regarding capacity utilization, in Nigeria the existing capital stock is not utilized at capacity (Vielrose, 1971).⁸⁸ There is a large degree of under-utilization of existing capacity, and one would wonder why firms would not expand by employing "cheap" labour, under such a condition. It is important to note that, though such an option seems economically viable, the multinational corporations which dominate the firms in the manufacturing sector may not find

⁸⁸ See Table 4.3.

it "economical" to expand, given their fundamental objective of operation in LDCs -- namely to maximize profits whether or not their operation is agreeable with general economic efficiency. It is not surprising, therefore, that (as revealed in Table 4.11) there is such a substantial degree of under-utilization of existing capacity. And that this tendency has continued as a long term phenomenon is a pointer to the fact that firms do not find it "worthwhile" to expand (by reducing wages and employing more labour).⁸⁹

5.4 HUMAN CAPITAL IMPLICATIONS OF THE EFFICIENCY WAGE MODEL

The efficiency-wage firms are expected to be the ones that invest more in training of workers than firms operating under flex-wage conditions. It has been indicated in the earlier chapters that the job tasks for which efficiency-wage rules are most likely to apply would be those requiring individual worker-discretion and personal judgement in job performance. To enable workers to acquire the requisite techniques to apply to the job tasks, the firm will emphasize human capital acquisition. And in order to "hold" workers once training has occurred, firms must offer even higher wages. Thus, it can be viewed that firms in the protected sector are more likely to invest in training than

⁸⁹ Within the framework of our model, this means that firms find it unprofitable to offer any wage less than W^* , for such a wage will reduce "efficiency", not minimize cost per efficiency unit, and will have the firm operating sub-optimally and receiving a net revenue less than R^* (see Figure 4.1).

are firms in the unprotected sector; and that protected firms are more likely to follow policies aimed at minimizing layoffs and voluntary quits (turnover) (Stiglitz, 1974; Basu, 1984). The standard understanding in labour economics is that it is because of the need to insure against incurring such "quasi-fixed" labour costs that the firm would be offering wages higher than the market-clearing one to its workers (Ehrenberg and Smith, 1985; Gunderson, 1980).

Our view is that it is still necessary to find a way of determining what the optimal "high wage" will be; -- what model would govern the determination of a wage high enough not only to minimize quasi-fixed (turnover) costs, but also to maximize profits and efficiency. This is one major feature of our model as it is applied to the LDCs.

5.4.1 Some Background: A Note on the Demand for Education

Regarding individual investment in human capital, the implication is that human capital acquisition enables the individual to enter the protected sector. This underlies a major difference between our model's results and that of the dual labour market approach of modern labour economics.⁹⁰

⁹⁰ According to the dual labour market literature, human capital acquisition is not supposed to enable the secondary worker to enter primary sector jobs, though it increases a worker's employability in that sector (see Thurow, 1975). Our model will imply that in the LDCs, human capital acquisition in effect "transforms" a secondary (unprotected) worker into a primary (protected) sector worker.

The primary factor motivating citizens to demand education in LDCs is the enhancement of their own personal economic and social status (Blaug, 1966; 1973; Fields, 1974a). The demand for a given level of education may therefore be presumed to be determined by the size of the expected private return to that level of (schooling) education, as well as for the consumption or non-pecuniary investment benefits education confers (Fields, 1974:922). In Nigeria, both factors appear to be very important in education demand. Psacharopoulos (1973:62) collected cross-country evidence for the LDCs,⁹¹ that shows that private returns to investment in education are very high. Of the three education levels (primary, secondary, and college/university) for each of the eleven LDCs covered, average rate of return is over 20 percent in all but one country (India).

We can explain this situation from both the "cost" and the "benefit" sides. In most LDCs, education costs are heavily (and often entirely) subsidized, so that private costs of education are small (see Blaug, 1973; Fields, 1974a). On the benefit side, the very high percentage wage differentials between different skill levels in LDCs (see Chapter 4 for the case of Nigeria) relative to the developed countries (Blaug, 1966), may explain the high private rates

⁹¹ The countries studied are Nigeria, Ghana, Philippines, Kenya, India, Venezuela, Mexico, Columbia, Brazil, Thailand, and Puerto Rico. It is interesting that this list reflects LDCs in all underdeveloped continents.

of return to education in LDCs relative to the developed countries. This very high private rate of return is readily translated into a very high private demand for education.⁹²

In Nigeria (and in most LDCs) the actual observed reality is that the individual demand for formal education (general training) among the populace is insatiable (Yesufu, 1974; Damachi, 1973; Diejomaoh, 1979). And this is besides the high rate of return factor. Education is viewed as both a socially prestigious and an economically elevating factor, and people tend to invest in formal education without necessarily considering the potential monetary rate of return.

This high demand for education does not mean high demand for the educated individual by employers in the economy. This depends on a different and more complex set of factors. It is the firms' demand for the 'educated' labour that becomes the crucial factor in labour allocation in the economy. It is in this aspect of the problem that our study

⁹² We do not imply that private individuals actually compute such returns, but rather that, following Friedman (1953), they behave as if they do. [The interested reader may wish to see: Milton Friedman's "The Methodology of Positive Economics", in his "Essays in positive Economics", University of Chicago Press, Chicago, Ill., 1953.] Also it is not meant that the size of the private return is the sole determinant of the demand for education, as social status and power, and the prestige of being educated may be of greater importance than monetary considerations. However, we view the non-monetary factors as determining a minimum amount of demand for education, and then high private returns increases demand above this minimum (base) level.

is more interested.⁹³ We address this problem by use of the following model constructed within the framework of the efficiency-wage principle.

5.4.2 An Illustrative Model

The protected sector utilizes skilled labour and these skills are assumed to be complementary with physical capital (Hamermesh and Grant, 1979; Griliches, 1969). Firms invest in skills accumulation through training programmes, and such investment decision is made by comparing the discounted flow of augmented profits to the current training cost⁹⁴ (Kelley and Williamson, 1980; Becker, 1974). The accumulation of human capital by the firm is thus determined by the return the firm realises from human capital. It also depends on the demographic trends influencing the stock of potential trainees; and this stock is determined jointly by demography and government policy towards formal education (Kelley and Williamson, 1980).

⁹³ For a very thorough treatment, and modelling, of private demand of education in LDCs, see Fields (1974a). Also, Blaug (1966) provides a general analysis of educational demand, and Blaug (1973) carries an interesting analysis of education and the employment problem in LDCs.

⁹⁴ The cost is assumed to be the average return to investment in physical plant and equipment (since the opportunity cost of investment in human capital to the firm is investment in physical capital). We shall assume that this cost is constant.

We assume that the training is financed by the firm which utilizes skilled labour, and because of the lack of funds implied by the imperfections that characterize the capital market, and due to the inadequacy of sufficient private schools, individuals cannot gain access to training unless selected for such training by firms who find it profitable to make such investments.

We define:

σ = returns to physical capital

K = capital employed

ξ = corporate (profit) tax rate

T = number of trainable workers

Φ = number of trained workers

t = time (in years)

ρ = discount rate

c = cost (average) of training

The firm's after-tax total profits can be specified as

$$\sigma[1-\xi]K$$

and is augmented by the marginal addition of one more trained worker as

$$(5.1) \quad \frac{\delta\{\sigma[1-\xi]K\}}{\delta\Phi} = \frac{K[1-\xi]\{\delta\sigma\}}{\{\delta\Phi\}} + \frac{\sigma[1-\xi]\{\delta K\}}{\{\delta\Phi\}}$$

Assuming that the capital stock is fixed in the short run as K^* , then

$$(5.2) \quad \frac{\delta\{\sigma[1-\xi]K\}}{\delta\Phi} = \frac{K*[1-\xi]\{\delta\sigma\}}{\{\delta\Phi\}}$$

and this is the marginal (after-tax) revenue from addition of one trained worker.

The present value of the benefit stream to the firm generated by current investment in training (where ρ is the economy-wide discount rate taken as the average of returns to physical capital) is

$$(5.3) \quad V = \sum_{t=1}^z \frac{\{K[1-\xi][\delta\sigma/\delta\Phi]\}}{\{1+\rho\} \exp t}$$

where z is the period of employment.

The cost to the firm is largely dependent on

- (a) the level of formal education possessed, F , (which in turn depends on government policy regarding scholarships, etc).
- (b) the stock of potential trainees available, T^* , which depends on the ratio W/w -- W is the average urban wage level, and w is the average level of rural earnings -- such that $T^* = \phi(W/w)$, $\phi' > 0$. [This is essentially the Harris-Todaro (1970) postulate on migration choice].
- (c) the opportunity cost (in terms of returns from alternative investment -- assumed to be equivalent to the average returns to investment in physical capital) -- $\sigma = h(\Phi)$, $h' > 0$.

Therefore, the firm will invest in training if (see Becker, 1974)

$$(5.4) \quad V \geq c\{F, T^*, \sigma\}$$

where

$$(5.5) \quad c = c[F, \phi(W/w), h(\Phi)]; \quad c_1 < 0, \quad c_2 < 0, \quad c_3 > 0.$$

Given that F and T^* are exogenous in our model, we observe that it would be attractive to the firm to invest in Φ since the left-hand-side of (5.4) implies a "life-time" flow of continuous returns, while c is a one-time expenditure. The implication then is that Φ would be the crucial factor on which σ would depend: the term $\delta\sigma/\delta\Phi$ is positive -- the flow of returns from investment in physical capital is increased by a unit increase in skill training of workers. Investment in training is therefore very profitable to the firm. The relation $\delta\sigma/\delta\Phi > 0$ is necessarily implied by the efficiency-wage relationship -- a worker with skill training is more productive in an industry with modern (capitalistic) technology, and needs to be paid a relatively higher wage not only to reduce the tendency to quit but also to ensure that his "high-productivity potential" will be consistently applied by him to the work process to the benefit of the firm.

5.4.3 Implications

The above illustrations indicate that the acquisition of education/training has the primary function of enabling the individual to gain entry into the efficiency-wage (protected) sector. But the possession of formal education, though necessary, is not sufficient in guaranteeing employment once in the sector. The model shows that some job-related training is required, and it is the firm itself which provides such job-related training. Therefore, since (by assumption) cognitive job skills are not acquired before a worker enters the labour market but rather after he has found employment through on-the-job training (Thurow, 1975), the most sensible step would seem to be to create more favourable conditions for firms to provide more such training. Thurow's (1975) concept of job-competition (as opposed to wage competition) among workers illustrates the situation. Each worker's relative cost of being trained for the job is the most important relevant factor influencing his employability by the efficiency-wage firm.

The most painful form of unemployment is the unemployment of a highly educated individual. This type of unemployment differs from that arising from the efficiency-wage firm's unwillingness to employ an "unskilled" worker at a "low wage" (i.e. the unemployment suffered by a secondary worker who is thus unable to enter the protected efficiency-wage sector). This type of unemployment is suffered by a primary

worker within the primary (protected) sector. In this case the reason for being unemployed is from the demand side: the firm is simply not able to absorb the worker. However, any policy that enables the firm's labour demand curve to shift outward succeeds in reducing (or eliminating, depending on the size) this type of unemployment (whereas such a policy may not affect the firm's decision not to employ secondary workers).

Thus within the framework of the efficiency-wage analysis, one can attempt to explain the high incidences of unemployment among educated people in some LDCs such as Nigeria as simply a question of insufficiency of labour demand. Such an explanation differs from that offered for the unemployment of uneducated (and presumably unskilled) labour: the disequilibrium unemployment situation explained in Chapter 4, which is the dominant form of unemployment that exist in most LDCs.

5.5 CONCLUSION

The foregoing discussions have served to broaden our analysis by providing an alternative (albeit institutional) basis to supplement the theoretical postulates of the efficiency-wage model. This Chapter is, therefore, essentially one that ties together the various ideas that have been developed in the model. It relates exclusively to the analysis of the industrial sector employment, and has

been a pivotal framework upon which our theory of the efficiency-wage phenomenon rests.

The focus has thus far been on the non-agricultural sector of the economy. The efficiency-wage hypothesis applies to both agricultural and non-agricultural sector employment. It is to the analysis of its application to the former that we now turn.

Chapter VI

THE EFFICIENCY-WAGE HYPOTHESIS AND EMPLOYMENT IN LDC AGRICULTURE

This chapter analyzes the agricultural sector and its labour market implications. The requirements for labour in agriculture are not evenly distributed throughout the year as is the case in most non-agricultural activities. Periods of prolonged idleness are followed by periods of intense activity when labour input is required intensively, and insufficiency of labour at such times has serious consequences for output (and employment in the next period).

Wage-employment in agriculture is labour-intensive and the efficiency-wage principle is applied with the assumption that $e'(W)=0$ (see the explanation in Chapter 4). However, in subsistence agriculture, the setting is different. The peasant self-employed farmer (employer) needs to ensure that he "pays" his household (employees) adequately enough to encourage them to perform, in a fashion similar to that described in the framework for the basic model in Chapter 4. Hence, in analyzing the employment implications of subsistence agriculture, we employ the premise that $e'(W)>0$. In wage-employment, on the other hand, there is no need for the employer to pay a high efficiency-wage, for such a policy would be unnecessary given the nature of the job

task, and moreover no skill acquisition is required for agricultural employment.

A different set of circumstances associate with the employment relationship in agricultural wage-employment: the turnover problem still faces the employer, but it is addressed from a slightly different perspective from that of industrial sector employment. There is a distinction to be drawn between the employer's more permanent workers and his temporary (casual) workers, but the basis of this distinction is quite different from the efficiency-wage implications. We would address these issues in the text.

6.1 EMPLOYMENT IMPLICATIONS OF SUBSISTENCE AGRICULTURE

6.1.1 Microeconomics of Subsistence Farming

The majority of families in Nigeria, like in any other underdeveloped economy, still plan their output primarily for their own subsistence. Their experience demonstrates the principles which underlie subsistence production and the basis of the migratory tendencies that is inherent with rural dwellers.

The basic fact is known to all farmers that a large village cannot be fed from, say, five acres of land by adding more and more workers to this fixed area; for after a point the addition of more workers will bring a diminishing output per worker.

Consider the case of a farmer who employs four relatives on a fixed portion of land, and who might employ a fifth, paying them by an equal share of the output of the farm. From previous experience, the farmer no doubt has a fairly clear idea of how much extra output he will obtain in an average season from employing a fifth man; this extra worker is likely to add less to the output than the fourth worker, but will add more than he takes by way of the real wage (average share of the output). Everyone will be better off if the fifth labourer is employed; but a sixth or seventh worker may add less to the total output than an average share, and the relatives already employed will be worse off if these extra relatives must be employed on the farm, unless the extra workers can be paid only what they add to the output (their marginal productivities).

The existence of diminishing returns is the basis for the decision made by rural farmers about the quantity of land to be cultivated by their families. Consider what may happen in districts where land is scarce in relation to the demand for it, so that farmers with growing families cannot acquire extra land. An example may be taken from a study by Haswell (1963) of the inputs of labour and outputs of groundnuts in a Gambian village, where the families who could not obtain more land applied more hours of work to their small plots. Haswell's findings are shown in Table 6.1.

Table 6.1
Inputs and Outputs in Groundnut Production
in Genieri, Gambia (1949)

L	Q	MPL	APL	MC
130	250		1.92	67
150	280	1.5	1.87	67
170	310	1.5	1.82	67
190	340	1.5	1.79	67
210	370	1.5	1.76	57
230	425	2.8	1.85	50
250	465	2.0	1.86	50
270	505	2.0	1.87	50
290	545	2.0	1.88	56
310	580	1.8	1.87	67
330	610	1.5	1.85	67
350	640	1.5	1.83	77
370	665	1.3	1.80	

where:

L = Hours worked per acre;

Q = Total output in lbs.;

MPL = Marginal product of labour in lbs.;

APL = Average product of labour in lbs.;

MC = Marginal cost in hours per 100 lbs. of nuts;
i.e. the MC shows how many hours must be
worked to obtain an extra output of 100 lbs.
of nuts.

[That is: $(150-130)/(280-250) \times 100 = 67$,
for the first row in the Table.

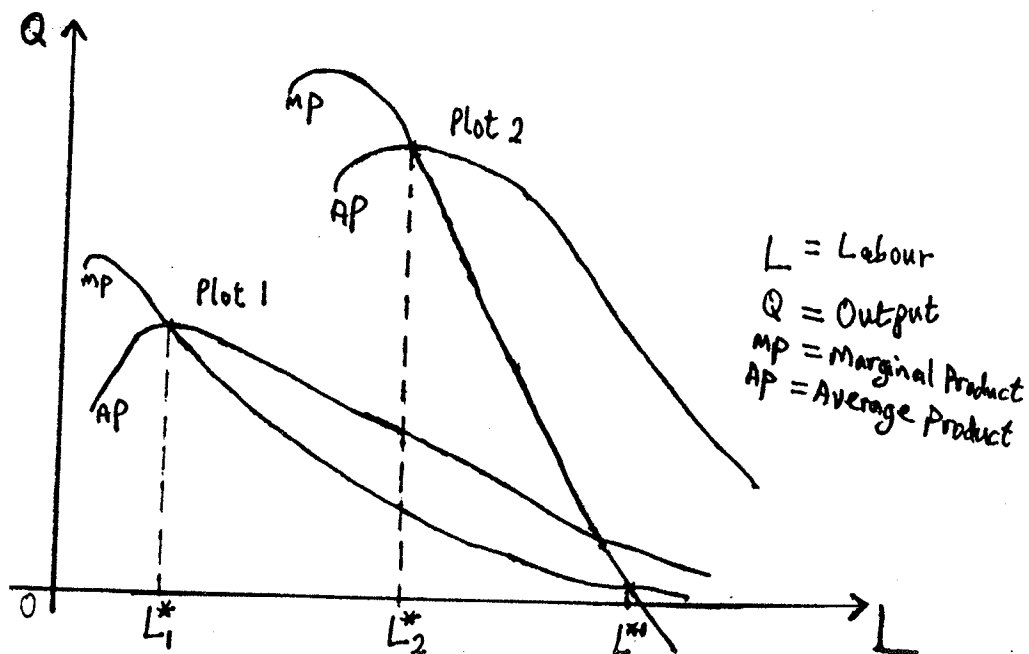
The unit here is 100 lbs.].

Here we have a demonstration firstly of increasing returns, when the marginal product is rising, and marginal cost in terms of hours per 100 lbs of nuts, is falling; then of constant returns when the marginal product is constant; and finally of diminishing returns when the marginal product is falling, and the marginal cost is rising. The average output per hour also shows us why some large families on

small plots of land are relatively poor, in terms of farm yields (in this case, groundnuts).

In farming, the relationship between inputs of labour and the output of crops is complicated by the varying degrees of fertility found within quite small areas of land; and the appropriate use of labour between plots of differing fertility, suitable for different crops and requiring different methods of working, is part of the local knowledge of farm families. Certain plots with good water supplies and deep soils are known to yield a higher output for the same quantity of work than less fertile plots; they can therefore be worked with more intensity -- more inputs applied to them -- before the onset of diminishing returns. Such a variation

Figure 6.1
Marginal and Average Product Curves
in Subsistence Farming



between two plots is illustrated in Figure 6.1.

If a farmer has two such plots and only a few workers, he will obviously concentrate his inputs upon the most fertile land, which gives the maximum output for his inputs. But if he has more than L^* workers, then some of them should be moved to Plot 1, since the marginal output for an extra worker upon Plot 2 will be less than that obtained by one or two workers upon Plot 1. In order to obtain the maximum output from a given quantity of resources subject to diminishing returns in two or more uses, the input should be applied so that equal marginal returns are obtained from all the alternative uses, so that output cannot be increased by moving one unit of output between the different uses. Fertile land will therefore be worked intensively until diminishing returns reduce the marginal product to that obtained from applying labour to the less fertile plots.

Hence, families which applied labour intensively to their plots for a comparatively low output would be unable to find a more profitable alternative use for their labour, either by working for their richer neighbours, or by acquiring more land, or by engaging in some other occupation. This can be deduced by looking again at Table 6.1. Inputs are not applied to the land so as to secure equal marginal returns, and thus to maximize output for equal division among all workers. Family rights to the occupation of particular plots of land, the unequal size of families, and

difficulties in finding a more profitable alternative occupation, keep some workers cultivating plots for a relatively low output; so the individual becomes prone to migrating to the urban area that then happens to be the only other avenue for any hope of higher future prospective earnings.

The majority of subsistence families derive their living from the crops they grow on their land, supplemented by occasional paid work, by trading, or by the sale of some handicraft. Full-time paid workers are relatively few, and many of these may spend most of their lives on family farms.

Labour here consists of all persons available for work -- gainfully employed wage earners, members of farm families, the traders, the craftsmen found in villages and towns, and the unemployed. The labour market in the African society, just like in any other low income society, has peculiar characteristics. The number of workers in paid employment is a small proportion of those gainfully employed, most of whom work on farms. In a sense, therefore, the number of people seeking paid employment is capable of a large expansion in short periods, not merely from the pools of the unemployed and half-employed to be found in most towns, but also from persons still engaged in the cultivation of crops for themselves and their families. One might then wonder why this is so. The pertinent reasons why the self-employed farmer (as well as the hired farm labourer) should tend to

prefer to abandon his industry to take up paid employment in the urban/industrial sector if he has reasonable grounds to believe that he has a high probability of being employed in the latter sector, is in fact a pivotal question that needs to be addressed.

6.1.2 A Model of Optimum Labour Allocation for Subsistence Households

In the community, land is owned and farmed by the family under the leadership of the family-head. There is always increasing pressures upon the landowner/"employer" to provide work for more labour than he really needs; and in such circumstances labour's marginal productivity will tend to fall below a "living wage" (subsistence wage). This implies that the landowner must be prepared to sacrifice to labour some of what would otherwise be surplus return (property income). Given this pressure to employ, however, it is in the interest of the employer to pay a wage which is high enough to minimize the cost of each 'work unit'.

It is important to note that in Nigeria (quite unlike some other LDCs) peasant landlessness has not been a major problem. The typical household tends to have access to a reasonable portion of land for cultivation, as the system of land relations is such that land is commonly owned among families in a relatively evenly distributed manner. However, there is no unlimited access to land by any family unit; additional land acquisition beyond the normal family holding

is possible mainly through renting or leasing or outright purchasing of land by one family from another.⁹⁵

Consider a peasant household under pressure to permit a family of, say, six persons of working age, to farm a given area of land. Let the decision-maker here be the "father" of the family, whom we simply refer to as the employer/landlord: the employer's level of employment of labour is thus determined for him by the family size - the family having grown to this working size (six) at this particular time period. The society's norms as well as the landlord's own obligations require that he provides for all members of the family. The landlord's choice then lies in the "wages" he will pay, i.e. what he will leave to the family after he has removed his "left-over" (a sort of rent) that he needs to appropriate from the total yields from the land per time period.⁹⁶

⁹⁵ The general situation in Nigeria contrasts sharply with the situation observed in some other LDCs: for instance, it is well documented in Rempel (1981: 209) that while approximately 30 percent of Kenya's households do not have access to land, approximately 25 percent of the smallholder families do not have access to a sufficient amount of land to be able to produce a subsistence income. This means that for these households, some other form of labour activity (presumably wage-employment in agriculture and/or migration to the cities [see: Knight (1967); Rempel (1978)]) is necessary to enable the family to support itself.

⁹⁶ The practise is for the landlord to remove a portion of the produce for re-planting during the next planting season. This portion, which is determined by experience and the anticipated quantity needed for the next season, as well as by the landlord's propensity to save, is regarded by him as a "left-over" which he has to save for unforeseen contingences and for future needs, and part of

The family is assumed to have a certain desired level of "aspiration wage" (earnings) for each of its members, such that the relevant comparison is between the household's level of aspirations (desired) and its realised (actual) income [Lobdell and Rempel, 1978]. Where desired income exceeds the level of income generated on the farm the household will re-examine its labour allocation (Rempel, 1978; Knight 1967).⁹⁷

We designate this "wage" level as the "efficiency-wage" (which is required to elicit the maximum work-effort from each member).

We assume only one factor input, labour L , and define

w = wage rate

C = total wage bill

y = total farm yields

S = surplus or "left-over"

e = effort per worker (say, number of yam-tubers planted per time period); and

$$E = e.L$$

which he has to 'plough back'.

⁹⁷ We recognize that although it would be rational to re-allocate labour in this way, it is possible that not all households will necessarily pursue this objective in the face of such labour market imperfections as inadequate information, geographical immobility, and socio-cultural impediments that beset some particular types of activities (see Rempel, 1978). However, for simplicity of modelling, we assume that the representative household acts according to this objective.

is the total labour effort available from all workers together, and that is applied to the production process. All values are in real terms.

We can write

$$(6.1) \quad e = e(w), \quad e' > 0.$$

We note that there must be a limit to the amount of effort which an individual worker can put, and follow Leibenstein (1957a), Moes and Bottomley (1968), and Bottomley (1971) in assuming that $e''(w) < 0$. Also, y is an increasing function of E , and is also assumed to satisfy the law of diminishing marginal productivity. Hence

$$(6.2) \quad y = y(E), \quad y' > 0, \quad y'' < 0.$$

Now, for any given value of L we can determine the landlord's optimal wage, as that wage level for which any marginal increase in per worker output equals the increase in such a wage level that brought about the output increase; i.e.

$$(6.3) \quad d[y/L] = dw.$$

It follows from (6.3) that

$$dw = [L \cdot dy - y \cdot dL] / L^2;$$

so that

$$\delta w / \delta y = 1/L.$$

Hence

$$(6.4) \quad \delta y / \delta w = L.$$

But by definition, $S = y - C$; so that at maximum S ,

$$dS/dw = dy/dw - dC/dw = 0,$$

therefore

$$(6.5) \quad dC/dw = dy/dw = L \quad [\text{by (6.4)}].$$

Now substituting $y = y(E) = y[L.e] = y[L\{e(w)\}]$, we have

$$d[y\{L.e(w)\}]/dw = L,$$

so that

$$y'\{L.e(w)\} L e'(w) = L ;$$

and hence

$$(6.6) \quad y'\{Le(w)\} = 1/e'(w).$$

Now both sides of (6.6) are functions of the wage rate w , so for the Left Hand Side (LHS) we can deduce that

$$y''\{Le(w)\} L e'(w) < 0$$

i.e. this is a decreasing function of w .

And for the R.H.S. we can deduce

$$-e''(w)/\{e'(w)\}^2 > 0^{98} \text{ i.e. this is an increasing function of } w.$$

The optimum wage level is therefore given by the wage level for which (6.6) holds, that is, where the two curves depicted by the two sides of (6.6) intersect.

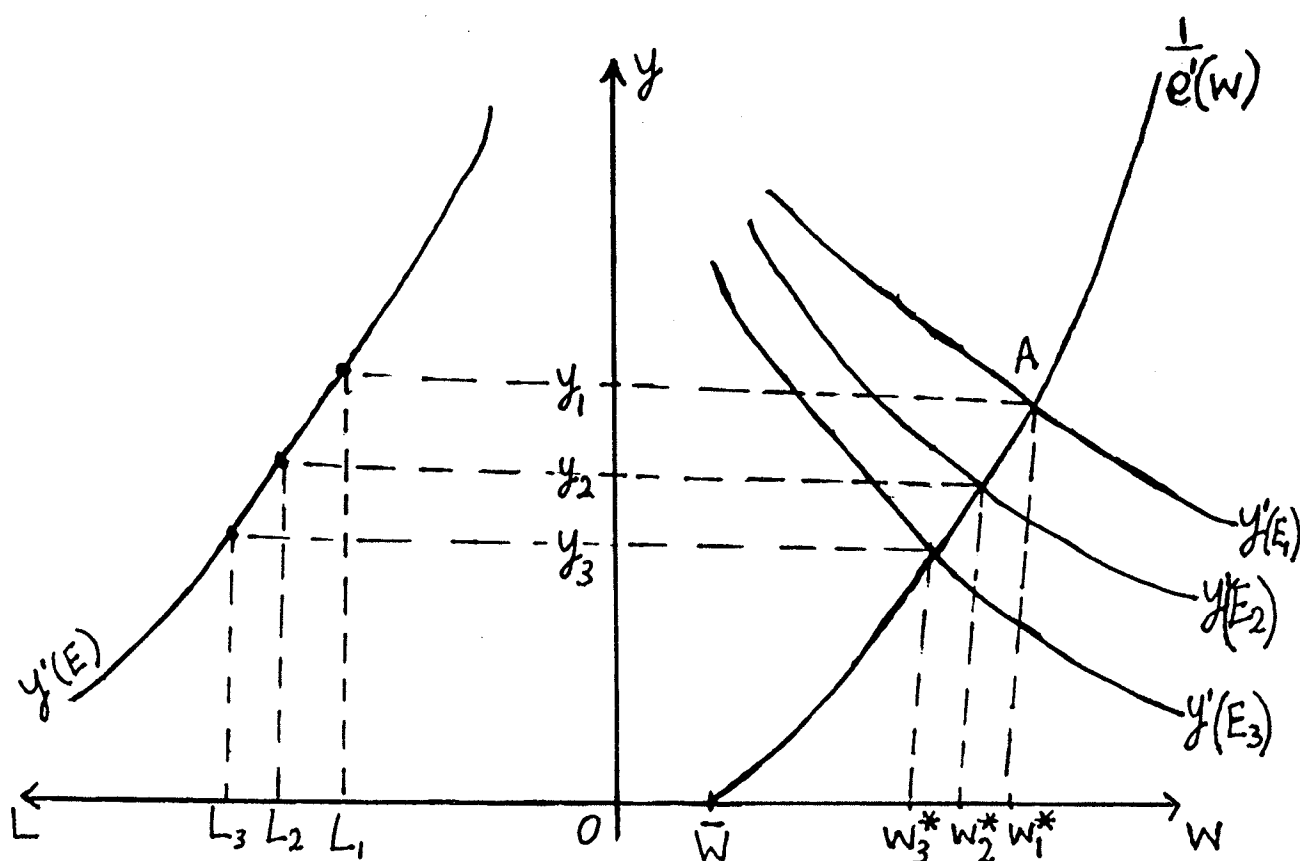
Figure 6.2 illustrates this exposition. The point A, for instance (in the right hand quadrant of the figure), indicates the optimum wage w^* , and the corresponding output yield y_1 . These are associated with the optimum labour requirement L_1 (shown in the left hand quadrant).

Since

$$\underline{y''(E) < 0, \text{ and } E = L.e = L.e(w),}$$

⁹⁸ This is obtained by differentiating $1/e'(w)$ with respect to w . Note that since $e'(w) > 0$, it has an inverse, so that the expression $1/e'(w)$ can be rewritten as $[e'(w)]^{-1}$.

Figure 6.2
Labour Allocation in Subsistence Farming



then

$$d[y'\{L.e(w)\}]/dL = y''\{L.e(w)\}.e(w) < 0 .$$

This shows that the function y' decreases with L at a given wage level, so that there exist a family of curves - y 's - (one for each L level), with varying (increasing) negative slopes, for increasing values of L . It then follows that the optimum wage decreases as L increases. This suggests that the absorption of extra labour in the family farm reduces productivity, and reduces "earnings" per individual member.

The locus labelled $y'(E)$ in y - L -space (the left hand quadrant) depicts the various optimal labour requirements and their corresponding output levels, each connected with an associated optimal wage (shown in the y - w -space loci in the right hand quadrant).

Given $y = y(E)$ and $E = e.L = e(w).L$, the solution of (6.6) can be substituted into this to solve for the optimal labour input required, L^* . This yields the optimal number of family members that the household can sustain under its given resource constraints. We are therefore able to determine the level of underemployment in a household type i as

$$(6.7) \quad N_i - L(\omega)_i - L^*_i \geq 0 \text{ for all } i$$

where

N = the number of the household's employables

$L(\omega)_i$ = the number of the household's members in agricultural wage-employment.

The model thus enables an estimation of the level of gainful employment in the society's subsistence agriculture, which in turn is an important factor determining the number of potential migrants to the urban sector.

6.1.3 An Empirical Illustration

Because of the nature of subsistence production, it is difficult to carry out any successful empirical tests of most of the models of economic behaviour in this sector. However, we attempt to present some empirical facts that are established in relation to subsistence activity, and recognize that this does not directly support the efficiency wage hypothesis per se, but lends support to the basis of our modelling this sector with the use of the efficiency wage theory.

In their "Pilot project" that studied rural production activities in a large community of Western Nigeria,⁹⁹ Meuller and Zevering (1971) found that agriculture is "entirely in the hands of smallholders", whose average area under cultivation was estimated to be 4.9 acres. The average cultivated area of family heads in the villages with no other occupation than farming was estimated as 5.8 acres. While 65 percent of total estimated number of farm holdings belonged to family heads having no other gainful occupation than farming, 23 percent belonged to farmers who had a

⁹⁹ It can safely be assumed that given the relative homogeneity of all of the communities of Southern Nigeria, the findings of this study could easily be assumed to hold for most of the region. Northern Nigeria is slightly different to the extent that a considerable proportion of adult males in this area tend to engage in sedentary livestock rearing as against ordinary peasant household subsistence farming. But even then, the practice is that these sedentary herdsmen leave behind their wives and children in settled peasant land cultivation -- a similar lifestyle to that practised in the South.

subsidiary occupation, and 12 percent to those having a non-farming job (such as craftmanship) as their main occupation with farming, nevertheless, as a subsidiary source of income.

The researchers found that, overall, structural underemployment of human resources in agriculture (measured in man-days of 7 hours) was prevalent. Actual working time per farming day was estimated to be between 4.5 and 5 hours. Seasonal underemployment was widely reported -- the peak seasons: March to July (planting and weeding), and October to November (harvesting), had the average working time of 4.5 to 5 hours. The remaining months of the year are "idle" periods -- a marked feature of agriculture in the community.

This study establishes fully the conditions of supply and demand for labour: the basic economic unit on which the farmer relies is not a large, extended type of family, but the resident family nucleus, comprising on the average of about 4 persons. And there exists a rather high degree of division of labour within the normal farm household set up, with the farmer's wife often engaged only marginally in actual farming compared to the farmer himself and the children. So that, despite an overall apparent favourable labour supply balance the study found, the large farms (7.5 acres and over, which account for about 20 percent of the farms), often find difficulty in securing their labour needs during certain months of the peak seasons.

Peak labour demand is partially satisfied by hiring of farm hands, by mutual help of friends and/or relatives, by small farmers offering their spare time, and by working longer hours and more days in the month. But in each case there are accompanying difficulties ranging from the unwillingness of the helpers to offer genuine help to farmer's own inability to plan ahead and start seeking the needed help in ample time. The study reports that there are serious difficulties in meeting the needed labour requirements, particularly during the peak seasons, thus setting limits to the expansion of the large farms, and restricting the ability of farmers to expand their cultivation acreage. The problem is further compounded by the migration of able-bodied youths from the villages due to their lack of interest in farming; and the fact that the agricultural population is aging: 84 percent of the farmers were over 30 years old, and 50 percent were over 45.

6.2 WAGE-EMPLOYMENT IN AGRICULTURE: A LABOUR MARKET ANALYSIS

We had earlier argued that under the efficiency-wage framework, employment in commercial agriculture is assumed to be characterized by $e'(w)=0$ (see Chapter 4). This assumption is to be used in many important ways in the following analysis.

Wage-employment in agriculture in most LDCs is characterized by incidences of monopsonistic power that the

employer wields in view of the extremely unequal land distribution, low labour mobility, and lack of alternative opportunities that the labourer faces in the village community (Bardhan, 1979b; Hansen, 1983). And agricultural production is known to be characterized by long and disjointed activities with intervals of hectic activity periods and relatively idle periods (Ahmed, 1983). This is compounded by the dependence on weather conditions, that therefore renders the timing of agricultural production unpredictable. It also means that whenever the time comes for the job to be done, it must be done quickly, for there are risks faced by the employer of higher costs of delay.

The employer is therefore usually keen on entering into some sort of labour-contract with the workers regarding a dependable and consistent supply of labour at the "right time", and is aware of the substantial hiring/recruitment costs he will incur whenever such hiring is necessary. The notion of quasi-fixed cost of labour is implied here.¹⁰⁰ The employer clearly puts a high value on his expected hiring costs (Hansen, 1983), even though the prevailing unemployment of workers in the community should have made recruitment easier than otherwise. The employer does not

¹⁰⁰ Such non-wage costs are costs per worker rather than costs per hour worked, and do not vary at the margin with the number of hours worked (Oi, 1962; Ehrenberg and Smith, 1985). Economists thus consider them as quasi-fixed, in the sense that once an employee is hired, the employer is committed to a cost that does not vary with the employee's hours of work.

only provide a kind of "unemployment insurance" to his permanent labourers, he also often supplies them with plots of land for their own individual cultivation as income supplements, and/or builds them living houses, and grants them wage advances long before the crop harvesting -- all these in an effort to keep and ensure a ready availability of dependable labour supply in a community where the supply of labour is a function of not only the income-leisure trade-off but also of various other socio-cultural factors. This implies that the real wage, as well as the level of employment, is likely to be understated if measured just by the observed values that are transacted.

6.2.1 The Theoretical Model

The following theoretical model is envisaged within the framework of the efficiency-wage theory.

We assume that agricultural production is according to a usual production function,¹⁰¹ and that the employer aims at profit maximization, and employs relatively meagre quantities of capital input (which can therefore be conveniently omitted in the short-run production function).

Consider a village agricultural employer employing labour L and paying wage rate ω , and having the objective function

¹⁰¹ A usual production function is one that is concave and has positive and continuous first derivative and negative second derivative.

$$(6.8) \quad \text{Max}_{\{L, \omega\}} \Pi = p \cdot \Omega Q\{L, e(\omega)\} - \omega L - c(U, v) \cdot \mu L ;$$

where

Π is profit;

p is the price of output (assumed fixed);

Q is output; $Q' > 0$, $Q'' < 0$.

Ω is an "efficiency" parameter; a shift parameter in the production function (see Hansen (1983), and Bardhan (1979)).

c is the average recruitment cost of each new (additional) labour hired;

U is local unemployment level;

v is some exogenously determined cost-increasing parameter, defined as "quasi-fixed" cost factors (see the explanation above),

and

μL is a certain proportion of L , where

$$0 < \mu < 1 .$$

L is labour employed,

ω is the money wage rate.

Given the monopsony situation, we are applying the standard monopsony model that

$$\omega = \omega(L), \quad \omega'(L) > 0.$$

We posit that hiring of agricultural labour would be easier in a slack labour market than in a tight one, such

that we can assume that the average cost of hiring, c , is a decreasing function of the extent of unemployment, U , in the community. That is

$$(6.9a) \quad \delta c / \delta U = c_1 < 0, \text{ and } c_{11} > 0.$$

This also implies that c declines at an increasing rate with the local unemployment rate (Bardhan, 1979b). This seems to be a reasonable theoretical presumption.

Also, by definition of v , we assume

$$(6.9b) \quad \delta c / \delta v = c_2 > 0.$$

It is important to note here that even though the employer is apt to exercise some monopsony power in the local labour market (in determining the wage rate and the unemployment level), such power is not enough to eliminate the incidence of quasi-fixed cost problem facing him. Thus it would be in the employer's interest to have a high unemployment level in the community in order to ensure low hiring costs of additional labour¹⁰² (μL).

The necessary conditions require

$$(6.10a) \quad p \cdot \Omega Q' e - \omega - \omega' \cdot L - \mu c = 0;$$

$$(6.10b) \quad p \cdot \Omega Q' L e' - L = 0.$$

Substituting $e'=0$ into (6.10b), we obtain

¹⁰² This hiring cost is essentially constituted of the wage paid to them plus the "fringe benefits". These are expected to be higher during peak seasons because the employer has to offer higher returns in order to attract the labourers from their alternative pursuits. On the other hand, his permanent workers are expected to continue to accept the wage rate ω in return for being kept in permanent employment throughout the year.

$$L = 0,$$

indicating that no effective labour force is engaged by the manipulation of the wage variable.¹⁰³

From (6.10a) therefore the optimal wage rate is

$$(6.11) \quad \omega^* = p.\Omega Q'e - \omega'.L - \mu c.$$

This indicates that the value of marginal product ($p.\Omega Q'e$) is greater than the wage rate, since $\{\omega'(L).L + \mu c\} > 0$. That the equilibrium marginal value product of labour is higher than the wage rate, remains to be verified empirically, and we shall carry out such an exercise in the empirical analyses that follow. However, one implication for wage being less than the marginal product is that the equilibrium level of employment will be lower than it ought to be under the standard case where the wage rate equals the marginal product. And in this model, we note that even if non-monopsony situation is assumed, (i.e. $\omega'=0$, competition in the labour market), still the equilibrium wage rate will be less than the marginal product of labour. In this case, it is due to the "fixed cost" factor alone, i.e. $\omega'(L).L=0$.

¹⁰³ This is confirmed empirically by Adekun *et al* (1984:29) in their labour market study of the Southern Nigerian agricultural town of Ife. Among other things the researchers noted that "...The most striking feature of the private sector is the priority given to the profit motive...this is in sharp contrast to the service-orientation of public sector enterprise; expansion of the enterprise is done on the basis of the nature of current activity, and the margin of profit derivable from taking additional employees. Next to the manipulation of number of employees, the profit motive is pursued by the employer through manipulation of employees' remuneration."

Totally differentiating (6.11) and collecting terms (assuming a linear labour supply curve, i.e. $\omega' = 0$),

$$(6.11a) \quad d\omega\{1 - p\Omega e'(Q' + eQ'L)\} = (pe^2\Omega Q'' - \omega')dL + peQ'd\Omega - \omega'dL - \mu(c_1dU + c_2dv)$$

so that

$$(6.11b) \quad \frac{\delta\omega}{\delta L} = \frac{pe^2\Omega Q'' - \omega'}{\{1 - p\Omega e'(Q' + eQ'L)\}}$$

and putting $e' = 0$, it is clear that (6.11b) is negative, indicating the standard notion of a negative relationship between employment demand and the wage rate.

Figure 6.3 illustrates the equilibrium condition.

L^* is the employment offered, as against L_0
 ω^* is the wage rate. ω^1 ought to have been paid, but the employer keeps $\omega^*\omega^1 = \mu c + \omega^1.L$ (to cover his "fixed" costs, and as monopsony rent). We note that the magnitude of this "exploitation" depends on the elasticity of labour supply, the magnitude of the existing unemployment level, and the extent to which the employer is expected to "maintain" his labourers (i.e. factors that determine the parameter v).

Wage conditions:

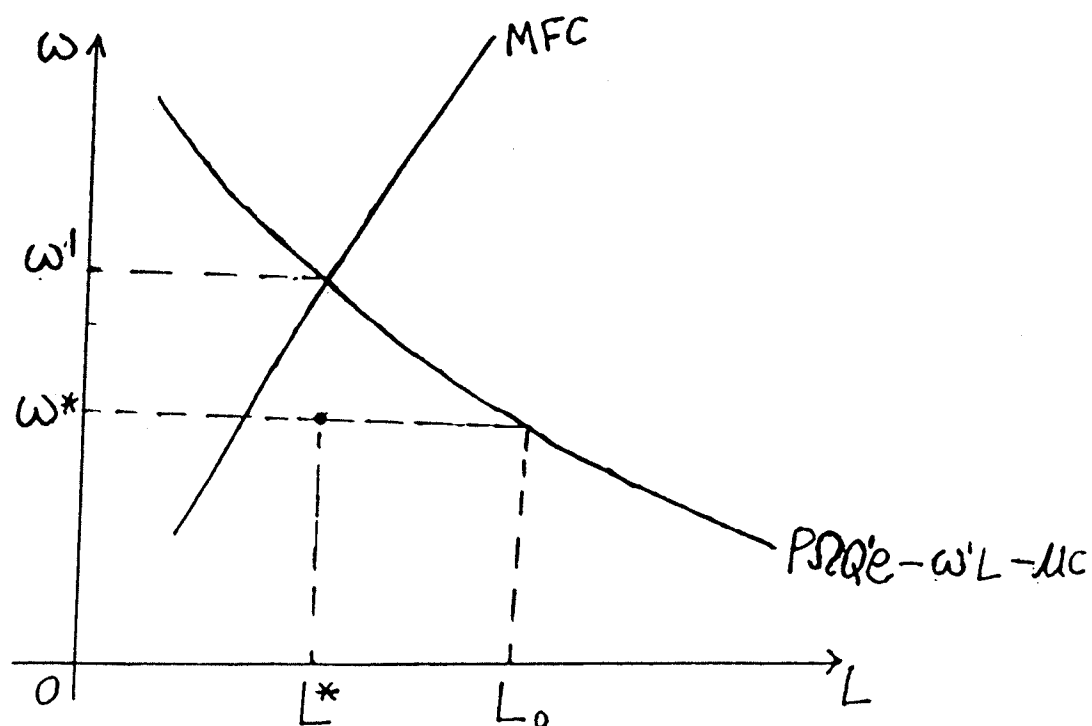
We can now analyze the wage rate behaviour in this model.

It is easy to obtain from (6.11a) that

$$(6.12a) \quad \delta\omega/\delta\Omega = pQ'e > 0$$

$$(6.12b) \quad \delta\omega/\delta v = -\Omega c_2 < 0.$$

Figure 6.3
Wage and Marginal Productivity in Agriculture



The above relations indicate how the wage rate would be influenced by variations in the parameters: (6.12a) implies that an outward shift of the demand for labour curve - an increase in the demand for labour (i.e. an increase in the parameter Ω) - would lead to an increase in the wage rate. One may interpret a rise in Ω as due to such things as improved agricultural technique or practices, use of fertilizer, more irrigation and/or rainfall, higher cropping intensity, or agricultural development factors in general,

and one or a combination of these has a compelling influence on the employer to raise the demand for labour to keep abreast with the increased cultivation. One may also perceive Ω as a purely seasonal factor -- implying a higher wage rate in the busy crop seasons when the above factors most likely come into play. Whichever of these interpretations one chooses to adopt, this theoretical finding appears to be supported by empirical evidence as we shall discover shortly.

By the same token the wage rate will fall during the slack crop season. Implication for this then is that any policy that aims at keeping the agricultural wage rate stable must address the issue of seasonality and agricultural "development" factors.

(6.12b) holds that under normal conditions the incidence of higher "quasi-fixed costs" of agricultural labour will lead to a lower wage rate. The lower the recruitment costs of agricultural labour the higher will be the level of the agricultural wage. We can attempt explaining this in the context of, say, the association between the labourers' wage and the numbers of their dependents. In a community characterized by very high dependency ratios (like Nigeria), agricultural labourers are expected to have very low hiring costs (since they are usually in desperate need for wage employment in order to earn money for paying children's school fees and the like). But despite this situation, the

employer still has to incur the fixed costs by way of providing meals-on-the-farm, shelters and sometimes entertainment, so that the money wage rate is reduced. This is indicated by the gap between ω^* and ω' in Figure 6.3, and is demonstrated empirically by empirical findings reported below.

It may be interesting here also to examine the relationship between the wage rate and the elasticity of labour supply. A familiar result from the theory of discriminating monopsony is that labourers with a lower elasticity of supply would receive lower wages. Such workers have low bargaining power in their contract with the monopsonist employer, and the stronger the monopsony power (as the case is likely to be in the highly concentrated village community land distribution), the lower the wage rate (Bardhan, 1979a).

To illustrate this,

(6.11) can be re-written as

$$\omega = p\Omega Q'e - (\omega'L/\omega)\omega - \mu c$$

or

$$\omega = \frac{\xi}{1+\xi} (p\Omega Q'e - \mu c)$$

where

ξ = elasticity of labour supply with respect to the wage rate.

This expresses the wage rate in terms of the elasticity of labour supply.

Differentiating both sides totally and rearranging

$$\begin{aligned} d\omega \left\{ 1 - \frac{\xi}{1+\xi} p\Omega e'Q' (eL+1) \right\} &= \frac{\xi}{1+\xi} p\Omega Q'' e^2 dL \\ &+ \frac{d\xi(1-\xi)}{(1+\xi)} p\Omega Q' e^{-\mu c} - \frac{\xi}{1+\xi} \mu (c_1 dU + c_2 dv) \end{aligned}$$

so that

$$\frac{\delta\omega}{\delta\xi} = \{p\Omega Q' e^{-\mu c}\} \frac{(1-\xi)}{(1+\xi)} .$$

Now since

$$\{p\Omega Q' e^{-\mu c}\} > 0,$$

the above expression will be positive or negative according as

$$1-\xi > 0 \quad \text{or} \quad 1-\xi < 0,$$

i.e. according as labour supply is inelastic or elastic.

For labourers with inelastic labour supply, $1-\xi > 0$,

then $\delta\omega/\delta\xi > 0$.

This indicates that such workers will receive higher wages only if their labour supply elasticity increases (becomes more elastic). If their labour supply continues to be wage-inelastic, they will continue to receive lower wages.

It is also important that we point out the distinction that should be emphasized between the impact of v on the wage rate and the impact of the elasticity of labour supply on the wage rate. A large value of v (caused by, say, irregularity in labour availability) need not imply that such a group of farm labourers are inelastic in supply, for

a casual labourer may have wage-inelastic supply but need not necessarily be irregular in supply and hence more difficult and expensive to hire. A farm worker burdened with a large number of mouths to feed may have low supply elasticity of his labour effort (which tends to lower his wage rate), but he may be easily available to the employer for hiring, and this enables the employer to be able to economize on his hiring costs and to offer a higher wage to such a labourer. But since such a worker at the same time has inelastic supply of work effort, the net effect on wage will depend on which of the aspects of v and elasticity is stronger. A female labourer may have higher elasticity of labour supply than some male counterparts (for she is more likely to withdraw her labour supply more readily in response to a wage decline, because she readily substitutes domestic work for "market" work), but because of the constraints that make her more difficult to hire (high v), she may not receive a higher wage rate than her male counterpart.

The idea here is construed to be different from, though analogous to, Nelson's (1973) model for the developed economies, in which real wage variation is determined by the distance workers must travel to work. In our model, the "distance" factor is implied by the factors that affect the worker's availability: those that reduce v . These factors are rather inversely related to the magnitude of the wage rate.

Therefore we observe from the foregoing that the agricultural wage rate is not invariant to the various economic forces that operate. We have seen that the wage rate is sensitive to both changes in the demand for labour and the level of existing level of employment in the agrarian sector. We also note that the wage rate is sensitive to both productivity factors and the labour market conditions governing incidental hiring costs and labour availability. We turn now to investigate the employment arena.

Employment conditions:

The analysis of employment in the agrarian sector will involve both sides of the labour market: the supply and the demand sides. We shall adopt a particular strategy here in presenting this analysis: first we shall adopt what may be termed a "simple" depiction of the labour supply function, and then later follow up with a more detailed depiction of the labour supply function. We shall also address the employment problem from both an "employment point of view" and an "unemployment point of view". The reason for this approach will be seen and explained in the course of the analysis.

Consider the agricultural labour supply function as depicted by the relation

$$(6.13a) \quad N = N(\omega) ; \quad N' > 0 ,$$

N is labour supply at the wage ω .

Now labour demanded at the equilibrium wage ω^* can be deduced from solving for L in equation (6.11).

Substituting (6.11) into (6.13a)

$$(6.13b) \quad N = N(p\Omega Q'e^{-\omega'}.L - \mu c)$$

which is the total amount of labour supplied at the equilibrium wage rate.

For simplicity, let us assume $e = 1$ (since $e' = 0$), so that we can omit e in our solutions without affecting the outcome.

Total differentiation of (6.13b) and rearrangement gives

$$dL = \frac{dN}{N'p\Omega Q' - \omega'} - \frac{pQ'd\Omega - \mu(c_1dU + c_2dv)}{p\Omega Q' - \omega'}$$

and from this we obtain

$$(6.14a) \quad \delta L / \delta \Omega = - Q' / (\Omega Q' - \omega') > 0$$

$$(6.14b) \quad \delta L / \delta v = \mu c_2 / (p\Omega Q' - \omega') < 0$$

The above results show us how employment would respond to agricultural improvement and fixed labour costs. (6.14a) implies job creation in the agrarian sector can be achieved by agricultural development policy that, as earlier discussed, stabilizes the demand for agricultural labour or eliminates the peak-slack season cycles.

(6.14b) implies that employment would increase if hiring costs are reduced. This calls for attention towards training of agricultural labour: for such training would tend to not only raise productivity of the worker and thereby reducing the effective cost of hiring him, but also to make the worker more readily available for hiring because his wage is bid up and therefore other alternative pursuits are made less attractive.

The above results and their policy implications are deduced from our analysis of a simple labour supply function that depends only on the agricultural wage rate. Let us examine a labour supply function that takes account of not only the agricultural wage rate but also an exogenously determined alternative non-agricultural earning possibility, which we would depict as ω^{\wedge} . We now define the labour supply function in the form

$$(6.15) \quad N = N(\omega/\omega^{\wedge}), \quad N' > 0.$$

(6.11) into (6.15)¹⁰⁴

$$N = N[(p\Omega Q' - \omega' \cdot L - \mu c)/\omega^{\wedge}]$$

and differentiating totally and simplifying

¹⁰⁴ We might conceive of ω^{\wedge} as the opportunity cost of labour supplied in agriculture. Note that although the employer dominates the labour market by his quasi-monopsony power, a worker still has the option for an alternative use of his/her labour time: the worker could decide to use his/her labour time to go hunting, fishing, and/or engage in self-employment in subsistence family farms. ω^{\wedge} therefore represents more or less a subjective index of what the worker envisages that he could earn elsewhere.

$$\frac{N'p\Omega Q''-\omega'}{\omega^{\wedge}} dL = dN - \frac{N(pQ'd\Omega - \mu c_1 dU - \mu c_2 dv)}{\omega^{\wedge}} - d\omega^{\wedge}(p\Omega Q' - \mu c);$$

or

$$dL = \frac{\omega^{\wedge} dN}{N'p\Omega Q''-\omega'} - \frac{d\omega^{\wedge}(p\Omega Q' - \mu c)}{\omega^{\wedge} p\Omega Q' - \omega'} - \frac{(pQ'd\Omega - \mu c_1 dU - \mu c_2 dv)}{p\Omega Q' - \omega'}$$

from which

$$(6.16a) \quad \delta L / \delta \Omega = - Q' / (\Omega Q'' - \omega') > 0$$

$$(6.16b) \quad \delta L / \delta v = \mu c_2 / (p\Omega Q' - \omega') < 0.$$

These results are similar to those implied by (6.14a) and (6.14b).

However, approaching the problem from an unemployment¹⁰⁵ standpoint: define

$$(6.17) \quad U = N(\omega) - L = N(p\Omega Q' - \omega' \cdot L - \mu c) - L$$

such that

$$dU = N'(p\Omega Q'' - \omega') dL + pQ' d\Omega - \mu c_1 dU - \mu c_2 dv) - dL;$$

or

$$dU[1 + \mu c_1 N'] = N'[(p\Omega Q'' - \omega') dL + pQ' d\Omega - \mu c_2 dv] - dL.$$

¹⁰⁵ An important question confronting us in this study is that of how to define unemployment in agriculture. The conventional yardstick in economic theory is to investigate whether a person is seeking employment in agriculture. We realize, however, that the agricultural sector is one in which there are "idle" periods (when there is practically no labour demand), and there is no reason why the individual should look for work when he knows that there is none available. The concept of "seasonal" or "hidden" unemployment is then referred to; or a worker is classified as inactive because he is not seeking employment. But one wonders whether this is really a relevant classification, since conventionally such a worker is not regarded as underemployed, either.

Hence

$$(6.18a) \quad \delta U / \delta \Omega = N' p Q' / (1 + \mu c_1 N')$$

$$(6.18b) \quad \delta U / \delta v = - \mu c_2 N' / (1 + \mu c_1 N')$$

The signs of these results are indeterminate since their common denominator is neither unequivocally positive nor negative. But we realise that the common denominator

$$1 + \mu c_1 N' < 0 \text{ if } N' > 1.$$

Hence, if this condition is satisfied, (6.18a) would be negative and (6.18b) would be positive. These show that agricultural improvement will reduce unemployment, and lowering labour recruitment costs will also reduce unemployment, provided agricultural labour supply is elastic. Approaching the problem from this angle thus reveals an interesting fact: the elasticity of labour supply is a factor in employment determination. This fact did not come out when we tackled the problem from the employment angle. To buttress this finding, we could obtain from (6.17):

$$dL = dU \{ (1 + \mu c_1 N') / \{ N' (p \Omega Q' - \omega') - 1 \} - [(N' p Q' d\Omega) / \{ N' (p \Omega Q' - \omega') - 1 \} + \mu c_2 N' dv / \{ N' (p \Omega Q' - \omega') - 1 \}]$$

from which we have

$$(6.18c) \quad \delta L / \delta \Omega = -N' p Q' / \{ N' (p \Omega Q' - \omega') - 1 \} > 0$$

$$(6.18d) \quad \delta L / \delta v = \mu c_2 N' / \{ N' (p \Omega Q' - \omega') - 1 \} < 0.$$

Hence, even by utilizing the "unemployment" approach we still obtain results confirming what we have in (6.18a) and (6.18b).

Now applying our definition of labour supply of equation (6.15), equation (6.17) becomes

$$(6.19) \quad U = N[(p\Omega Q' - \omega' \cdot L - \mu c) / \omega^\wedge] - L ;$$

so that

$$dU = N' \left[\frac{\omega^\wedge \{ (p\Omega Q'' - \omega') dL + pQ' d\Omega - \mu c_1 dU - \mu c_2 dv \} - (p\Omega Q' - \mu c) d\omega^\wedge}{\omega^{\wedge 2}} \right. \\ \left. - dL \right]$$

Collecting terms and simplifying

$$dU = N' [(p\Omega Q'' - \omega') dL + pQ' d\Omega - \mu c_2 dv - (p\Omega Q' - \mu c) d\omega^\wedge] / (\omega^\wedge + \mu c_1 N') \\ - \omega^\wedge dL / (\omega^\wedge + \mu c_1 N') ;$$

and from this

$$(6.19a) \quad \delta U / \delta \Omega = pQ' N' / (\omega^\wedge + \mu c_1 N')$$

and

$$(6.19b) \quad \delta U / \delta v = -\mu c_2 N' / (\omega^\wedge + \mu c_1 N')$$

Again we observe that the signs of these results are indeterminate.

But from (6.19a)

$$\lim_{N' \rightarrow \infty} \frac{pQ' N'}{\{\omega^\wedge + \mu c_1 N'\}} < 0$$

and from (6.19b)

$$\lim_{N' \rightarrow \infty} \frac{\{-\mu c_2 N'\}}{(\omega^\wedge + \mu c_1 N')} > 0$$

What we have above are limiting cases where N' approaches infinity. They show that, in this case, to obtain the desired results the supply of labour should be perfectly elastic. If agricultural labour supply is not perfectly elastic, while labourers base their decision as to whether

or not to offer labour time on the relative levels of the agricultural wage and an alternative earning possibility, unemployment can only be reduced by increased labour demand if there is massive abundance of labour; i.e. if there is "labour surplus". The implication is that several agricultural development policies have not succeeded in significant employment creation in societies such as Nigeria because a large proportion of the agricultural labour force tend to desert the agricultural sector and move to other sectors, thereby rendering labour supply in the sector less than perfectly elastic. Hence a policy that encourages labour to remain in the sector coupled with one that increases the demand for agricultural labour and/or reduces hiring costs would help reduce unemployment in the sector.

Agricultural production is of a seasonal nature in Nigeria. The employer, in order to save on his hiring costs during the busy crop/harvesting seasons, is assumed to have the tendency to enter into explicit or implicit contracts with a group of labourers on a permanent basis (Eswaran and Kotwal, 1985; Ahmed, 1983; Bardhan, 1979b). These labourers are retained in employment both in the slack season and the busy season, and the employer does not mind even if he has to pay them a wage higher than their marginal product (during part of the year) provided they offer him a dependable supply of labour when the need arises for it in the busy seasons. In such circumstances, there will always

be a situation of unemployment in the community during the slack season given by

$$(6.20) \quad U_s = (L^* - L_p) + u^* ,$$

where

U_s is seasonal unemployment,

L^* is the level of employment in the busy season,

L_p is the amount of permanently employed workers.

u^* is some average level of unemployment as suggested by equation (6.17). Now, whereas u^* can be eliminated by the requisite changes in the product/labour market (the appropriate changes in v , ω , ω^{\wedge}), the amount $(L^* - L_p)$ cannot be totally eliminated because of the monopsony situation. So, a policy of increased mobility could ease this problem.

The results

It is clear from the foregoing that the agricultural labour market can be effectively analyzed within an appropriate framework of neoclassical modelling. When applied to the Nigerian setting, we posit that the agricultural practise analyzed in this model closely depicts the actual situation. Not only do landlords tend to hire labour in a "two-tier" fashion as explained by the model, peasants also tend to behave according to the model's postulates in terms of their labour supply and availability conditions. Empirical support for the phenomenon of the marginal productivity being higher than the wage rate in Nigerian agriculture has been demonstrated by Diejomaoh and

Orimalade (1971) in their study of cocoa production in Western Nigeria. Theoretical explanation for the phenomenon is attempted here.

One reason why the employer may operate optimally at a point where the marginal product is higher than the wage rate is the quasi-fixed cost element of the labour force employed. Costs are incurred in employing people in addition to the real/money wage paid to them - food supplied, health care, housing, and the like - and the employer tends to include these costs in the worker's earnings. Secondly, there may be "exploitation" in the strict sense, when the employer is paying less than the marginal product simply because the worker is ignorant of it or because the worker has weak bargaining power; in such a case an employer with a number of workers equivalent to L^1 in Figure 6.3 above, only pays a wage equal to ω^* instead of one equal to ω^1 . Thirdly, there is a certain vagueness often about the marginal productivity attributable to any one unit of resource in combination with others, such as a group of unskilled men working under a supervisor, or a farm tractor and its driver. The marginal product of a group depends very much on its supervisor, and a driver without his tractor is reduced to hand labour. These are joint costs made by the employer; the amount they must pay for each unit of the combination will be determined roughly by the market price for each component, but the actual price paid will be

determined by individual bargaining within the limits set by the marginal productivity and the current profits of the employer. Fourthly, individual skills differ, and a uniform wage may both over-pay the weaker workers and under-pay the stronger ones, in proportion to their output. This variation between individuals is one reason for the variety in methods of payment which complicate comparisons of earnings between occupations and between individuals in a subsistence society. Employers may pay "time-rates" offering a fixed sum each hour, day or week of a stated number of hours. Alternatively, workers may be paid "piece-rates", an agreed sum for each unit of output. Farmers may thus pay workers for each basket of groundnut picked, or for each plot weeded; the workers can then take their own time about the job, and the fast workers may either earn more, or enjoy more leisure.

· Finally, the general level of productivity is itself conditioned by the whole social and economic structure. In most of Africa, for instance, there is a sufficient flow of labour between a variety of unskilled occupations to equalize marginal productivities over this wide range of employment, and the general level of productivity of unskilled labour is therefore set by the low level of output and of earnings obtained in the ordinary family farms worked by hand tools; such that any particular worker may find himself being paid a wage far less than his marginal

productivity. Given this dominant influence, differences in earnings between different occupations can often be explained by the relative scarcity of different skills, by the length of training required, and by other natural and artificial barriers which restrict the flow of persons between occupations and between regions.

The policy implications of the model will be considered in the final Chapter of the thesis, but some preliminary suggestions would help to relate some policy issues to some of the model's illustrations. Shifting the labour demand curve upward seems to be an important policy option. But it would be unsuccessful if it is met with the "non-availability" problem. Our model predicts that the elasticity of supply of labour would be a very important factor in increasing agricultural employment. Labour supply could be made more elastic by the appropriate rural development programmes that encourage peasants to remain in the rural sector instead of emigrating to the urban areas. In this way the availability problem would be solved, and any agricultural improvement policy implemented then would be more likely to succeed in raising employment in the sector.

Since agricultural earnings are relatively low in Nigeria, this policy would also improve agricultural wage rate as the model predicts.

6.2.2 Some Empirical Foundation

Some important findings regarding the conditions of wage and employment in agriculture have been documented by several researchers. We would consider three such findings: Sarkar (1957), Bardhan (1979), and Ahmed (1983).

In a study of rural Ceylon (now Sri Lanka), Sarkar (1957), using a cross-sectional data, obtained the equation:

(6.21)

$$\ln Q = -0.0141 + 0.0802 \ln A + 0.5570 \ln L + 0.2453 \ln C$$

where

Q = yield of rough rice in bushels (1 bushel = 20.5 kg).

A = area of land cultivated in acres

L = labour input in man-days of 8 hours

C = all other costs, measured in Rupees.

In explaining his equation, Sarkar assumes that the marginal product can be equated to the subsistence wage paid in the agricultural districts, which was 1.9 Rupees per day (equivalent of 3.92 kilograms of rough rice).

Utilizing Sarkar's equation for a given area of land and a given level of miscellaneous costs, we can write

$$(6.21a) \quad \ln Q = \tau + 0.5570 \ln L$$

where τ is a constant.

We can rewrite (6.21a) as

$$\ln Q = \ln [\tau L^{0.557}] ;$$

from which it follows that

$$Q = \tau L^{0.557} ;$$

thus giving us the marginal product of labour, MPL, as

$$MPL = \tau_1 L^{-0.443} ;$$

where $\tau_1 = 0.557\tau$ is a constant.

Therefore

$$(6.22) \quad \ln MPL = \ln \tau_1 - 0.443 \ln L$$

Using equation (6.22) for the known values of τ_1 and L we can obtain the appropriate values of the marginal product of labour. Sarkar obtained the marginal productivity of labour as 0.49 kilograms of rough rice per man-hour, and compared it to the then going real wage of 0.41 kilograms per man-hour. That is, given the going subsistence wage rate of 1.9 Rupees per man day equivalent of rough rice, we deduce that the 0.49 kilograms per man-hour marginal product (which yields 0.49 times 8 = 3.92 kilograms per man-day since there is an 8-hour working day) would yield an amount of money wage given by

$$\{1.90 \times 3.28\} / 3.92 = 1.59 \text{ Rupees.}^{106}$$

This wage rate of 1.59 Rupees/day is lower than the marginal product of 1.90 Rupees per day; hence we observe that the marginal product of labour is higher than the wage rate in the agricultural sector. This supports the results obtained in the model (equation (6.11)).

¹⁰⁶ We note that the 0.41 kg./man-hr x 8 hrs/day yields 3.28kg./day.

Further empirical work on the labour market issues of the agrarian sector in the underdeveloped economy was carried out by Bardhan (1979b). He presented the following linear regression equations for wages and unemployment in his study of agrarian West Bengal region of India:

(6.23)

$$\begin{aligned} \omega = & 1.7803 - 0.3487A + 0.0041G + 0.0842D + 0.0052V \\ & (0.1272) (0.1185) (0.0014) (0.0128) (0.0013) \\ & - 0.4001f + 0.1592X_1 + 0.1901X_2 - 0.1258X_3 \\ & (0.0508) (0.0469) (0.0504) (0.0531) \\ & - 0.5985U \\ & (0.1589) \end{aligned}$$

$$R^2 = 0.108,$$

$$F = 36.2$$

(standard errors in parenthesis).

(6.24)

$$\begin{aligned} U = & 0.9540 - 0.0005V - 0.0324Rg + 0.3413f - 0.0378MCR \\ & (0.0210) (0.0002) (0.0124) (0.0109) (0.0067) \\ & + 0.0766X_3 \\ & (0.0080) \end{aligned}$$

$$R^2 = 0.217,$$

$$F = 187.2$$

(standard errors in parenthesis).

where

ω is daily wage rate received by the labourer in the week;
A is per capita land cultivated by the labourer's household;
G is the age of the worker in years;
D is number of dependents per earner in the labourer's family;
V is a composite agricultural development index (such as governmental aid and positive commercialization policies);
f is a dummy variable indicating a female labourer;
 X_1 is a dummy variable to indicate if cultivated land is irrigated;
 X_2 is a dummy to indicate peak planting season;
 X_3 is a dummy to indicate slack crop season;
U is weighted average unemployment rate in the region;
 R_g is the percentage of cultivated area irrigated;
MCR is the village dummy to represent multiple cropping.

First, the low values of R^2 for both equations can be explained by the fact that Bardhan utilized cross-sectional data in his regressions. Moreover, that the variables in the wage equation together explain only about 10.8 percent of variations in the wage rate cannot be altogether surprising, since most of the important variables that influence the wage rate in the labour market are conspicuously absent in this equation: variables like the level of employment and the rate of change of the price level (which may however be less important in cross-sectional studies). Also, the wage variable is not included

in the unemployment equation (though it need not be, since U is correlated with V, f , and X_3 with which ω is also correlated); and together with other "important" variables as the rate of change of the price level and the growth rate of productivity, the wage variable could account for most of the variation in the unemployment rate. So the low level of R^2 in equation (6.24) that implies that all the explanatory variables together explain only about 21.7 percent of the variations in the unemployment rate ought not imply a "bad fit" per se.

Bardhan's action in excluding these other "important" variables from the regressions is understandable. The rural labour market is being dealt with, and data availability is a major constraint in any study of such a sector. The included variables appear to be the most relevant ones under the circumstances, and many of them are dummy variables which are vital in explaining the behaviour of the sector. The inclusion of the so-called "important" variables would be more vital for a study of an urban or a formal sector labour market, as data would presumably be easier to get, and measurement of the variables would be simpler.

Using the standard error test, we observe that all the coefficients of the explanatory variables of both equations (6.23) and (6.24) are significant. The values of the F -ratios also confirm an overall significance.

Thus, it appears that the wage rate is positively associated with the age of the worker (possibly indicating higher productivity of experienced farm labourers), the workers level of subsistence requirements (i.e. the number of dependents), and the relatively busy seasons of farming; while negatively associated with the relatively slack cropping season, the farmer's own household land cultivation, the female worker, and the current unemployment rate in the region.

Hence, contrary to the constant wage implication of the subsistence theory of wages [which views agricultural wages as determined largely by the subsistence requirements of the worker (see: Ahmed (1983); Mazumdar (1959))], the agrarian wage rate seems to be quite sensitive to the relevant economic factors. But we would expect that whereas the wage rate could be flexible upward, it be rigid downward; at least it cannot fall below the given subsistence wage level. Both Sarkar's study and other related studies¹⁰⁷ tend to support this view.

¹⁰⁷ Clark and Haswell (1970) found that an unemployed countryman in India will be maintained at subsistence level by his family at the cost of about 1.8 kilograms of grain per day; and to induce him to start work even in his own village, he will have to be offered a wage of 3 kilograms of grain per day. Further, to induce him to work outside his own village, he will have to be offered 5 kilograms of grain per day. The same study showed that off-farm employment opportunities in a cement factory about 10.6 kilometres from the village were attracting labour in abundance when the wage rate was an equivalent of 9.3 kilograms of grain per day -- more than thrice the subsistence wage -- indicating a supply response positively related to wage rate.

The positive coefficients of X_1 and X_2 in the wage equation go to support the theoretical underpinnings implied by changes in the parameter Ω (see inequality (6.12a)), of our model.

The negative coefficient of A in the wage equation can be explained by the model as: the larger the per capita land area cultivated by each labourer's household, the more difficult and hence costly it would be to recruit workers (the higher is v) and hence the lower would the wage rate be.¹⁰⁸ Also, it could be inferred that the negative coefficient of the f variable in equation (6.23) indicates that female labourers are costly to recruit and hence receive lower wage rates. This can be explained in the sense that, even if we assume that male and female workers have equal productivity on the farm, the latter are often constrained in their availability by factors ranging from marriage conditions and attachment to household/domestic chores to traditional beliefs regarding the status of the female in the society.

¹⁰⁸ Note that in the absence of the v factors, the wage rate would be higher instead -- the employer has to pay higher wages in order to attract workers who would otherwise be engaged in their own farms. [Ahmed's (1983) study reflects this situation: equation (6.25b) below has a positive coefficient for the TNCY explanatory variable. Ahmed's study covers the case where, even, workers are not provided with food].

Production Uncertainty in Agriculture

A more recent study was that of Ahmed (1983) on Bangladesh. It was found that (money) wages are not only responsive to demand of workers, but also to prices of the agricultural produce. Also it is found that prices tended to set a floor beyond which wages could not fall. Thus this implies a downward real wage rigidity.

The findings of the study are summarized in the two equations:

$$(6.25a) \quad \omega = 7.69 + 0.024L + 0.558p$$

(2.80) (3.52)

$$R^2 = 0.76$$

(t statistics in parenthesis)

and

$$(6.25b) \quad \omega = -0.004 + 0.24LND - 0.035LLS + 0.098p + 0.001CRPIN$$

(3.16) (3.57) (2.17) (0.34)

$$+ 0.15TNCY - 0.046UNCTY$$

(1.36) (0.45)

$$R^2 = 0.71$$

(t statistics in parenthesis).

where

L = labour employed in 100 man-days per month

p = price of the produce

LND = land distribution per worker

LLS = landless workers (defined as workers owning less than 0.5 acres of land)

CRPIN = cropping intensity (measured as the total cropped area as a percentage of the net sown area)

TNCY = incidence of tenancy (expressed as the proportion of leased-land to the total cultivable land)

UNCTY = production uncertainty (measured as the deviation of production around the trend).

A very important aspect of the study is the inclusion of an uncertainty¹⁰⁹ variable in the wage regression equation. Existence of production uncertainty may arise from such factors as fluctuations in rainfall and the likelihood of a drought in areas without irrigation facilities, and this may influence the extent and pattern of investment in agriculture depending on the attitudes of agricultural entrepreneurs towards risk. If we assume risk aversion on the part of agricultural entrepreneurs (employers), then such uncertainty may make them less keen on investing in agriculture, and they may instead resort to land-leasing/share-cropping. And this is possible if the prospective tenants are assumed not to be risk averse, for if they are risk averse, not much land-leasing and/or share-cropping may result, as tenants have another alternative provided in the form of possible migration to the urban sector. Land might just lie fallow -- there would be low demand for agricultural labour.

¹⁰⁹ Uncertainty in agriculture can be measured as the degree of deviations of production around a predetermined trend (Ahmed, 1983). To measure such a deviation, the variance of the output variable could be used.

The uncertainty factor is to be considered unimportant in modelling agricultural employment. In Ahmed's (1983: 317) equation, the uncertainty variable is found to be statistically not significantly different from zero (based on a two-tailed test). And moreover, its parameter estimate itself is insignificant, though having the "correct" expected negative sign (indicating that higher uncertainty reduces the wage).

In most LDCs, it is commonplace to have these peculiar aspects of uncertainty (and risk) in agriculture insured against by most agricultural entrepreneurs. Mueller and Zevering's (1971) study seems to suggest some aspects of this situation in Western Nigeria.

In our study, we have assumed that the uncertainty element is a relatively unimportant factor influencing agricultural wage employment.

6.3 CONCLUDING REMARKS

This chapter can be considered an extension of Chapter 4 in the sense that it considers the application of the model developed in that Chapter to agricultural employment, and its implications for the labour market, in some detail. Policy measures concerning the labour market in the traditional (agricultural) sector is essential in addressing the overall labour market problems of the developing country, and it is pertinent therefore that we have labour

market theories that are modelled in accordance with the prevailing conditions and characteristics (and peculiarities) in this sector.

Our theoretical modelling is accompanied by empirical evidence that have been established in the recent past by various researchers. Data constraints do not permit us to carry out empirical tests of our own based strictly on the Nigerian economy. But we would submit that given similar data as those available to, say, Sarkar and/or Bardhan (see above), it is likely that we would obtain the supporting empirical evidence we expect.

It is believed that the postulates contained in this study do provide the envisaged adequate representation of the real world of the underdeveloped agricultural sector in Nigeria.

Appendix B

B.1 THE "AVAILABILITY" PROBLEM OF AGRICULTURAL LABOUR

The idea one gets from a review of contemporary approaches to labour market issues of the traditional sector of a developing country is that the emphasis is to be placed on the factors responsible for insufficiency of demand for manpower without having to probe as deeply into the determinants of supply. As a result, the recommendations made for improving the conditions of employment and incomes of the rural population generally only indicate the conditions necessary for production units to operate, such that assuming the existence of high degree of underutilization of labour (as appears to be the case in the traditional sector), a simple increase in demand for manpower will absorb the underutilized labour. This is based on the supposition that involuntary "idleness" exists.

It could be misleading, however, to suppose that any unutilized manpower in existence would be available for other work if the demand for it existed. For reasons of a structural nature as well as the effects of underdevelopment and poverty in general, the availability of manpower and the underutilization of manpower are not the same thing. To

illustrate this point, consider the case of someone working on his farm four hours a day and "resting" the remainder of the time. He is clearly underemployed by conventional standards of an 8-hour working day. But we should realise that this worker might not be available for work during the other half of the working day. Various reasons could lead to such inavailability. He may have to do other jobs which, in conventional practice, may be regarded as unproductive, but which are vital for his on-going production process. For instance, his house may be needing repair, food has to be prepared, or even, the farm may need to be surrounded with a high fence to prevent entry of animals which destroy the crops.

Klein (1983) cites the example of Peru where, of the 212 days that the cultivation of maize on the Northern coast lasts, 32 days are spent by the farmers acting as "human" scarecrows (being present in the sown fields preventing birds from eating the maize before it is harvested). Klein notes that although the typical small farmer does not regard this as constituting real work, it is interesting to note that the farmer would be prepared to pay someone else to do it when he could not by himself. In Nigeria, the typical farmer spends about half of his labour time carrying out other activities that, while "unproductive" in the context of the production at hand, are absolutely essential. Therefore, even though it is obvious that labour is

underutilized, it is clearly not available to be engaged elsewhere. Hence any analysis that compiles the total amount of labour utilized and uses it as a proxy upon which to base the amount of employed manpower resources in such a traditional society, is apt to be grossly inaccurate.

Another aspect of this situation concerns the number of days workers are sick. In Nigeria, peasants who have to stand up to their knees in water for over 12 hours at a stretch in order to irrigate their land, spend many of the following days recovering from the health problems arising out of these working conditions. Cleave (1974) found that the heads of families in a village in Uganda were sick for 20 days a year on average; while for Cameroun¹¹⁰ it was found that men were sick for 10 percent of their available time of a ten month period (Dasgupta 1977).

Important policy issues arise out of this availability question, and we shall examine them fully when we address the policy analysis of this section of the study.

¹¹⁰ Cameroun borders closely with Nigeria. It occupies the Southeastern flank of West Africa. This finding could hold equally for Nigeria, seeing that the same ethnic group of peoples co-habit this region of Africa, despite political barriers.

Chapter VII

CONCLUSION

7.1 OVERALL CONCLUSIONS OF THE STUDY

The main purpose of this thesis has been to undertake a study of the LDCs' labour markets with a view to contributing towards the development of the requisite theoretical modelling that could be applied to the explanation and a fuller understanding of their conditions. Such an undertaking is called for because of the continued emphasis on the need for the development of "more realistic paradigms in LDC labour market analysis" (Livingstone, 1976; Livingstone et al, 1973; Hansen, 1983). The basis for the study is the Nigerian economy, supplemented by evidence from studies of other LDCs carried out by several other researchers in the recent past.

Although interest in this area has arisen over the past two decades against the emergence of some specific studies which have been directed towards the explanation of some of the LDCs' labour market characteristics, questions were increasingly raised regarding the narrowness in focus of some of the studies -- in the sense that there is still the need for explaining the fundamental basis of most observed (or theorized) phenomena in LDC labour markets within the

framework of modern labour economics. By the late 1970's several studies had been done, and several of the LDCs' labour market conditions had largely been addressed (see Chapter 2). But still there remained the need for an explanation of these conditions within the framework of mainstream labour economics and within the contexts of broader microeconomic foundations.

This dissertation has therefore attempted in the main to provide a theoretical explanation, based on the traditions of neoclassical labour economics, for the observed labour market phenomena in the LDCs. Such phenomena include the high incidences of (i) urban open unemployment in the face of very high and inflexible wage rates; (ii) the relative unattractiveness of agricultural employment (in terms of very low earnings, and the persistence of vast differentials between urban and rural wages); and (iii) the "segmentation" of the labour market.

The outcome of this endeavour has generally pointed to an appreciable degree of success, in that our study has to a significant extent been able to put most of the observed phenomena in place by way of yielding some pertinent models that are used to explain them. The empirical evidence of the study has served not only to lend support to the overall applicability of the theoretical models, but also to lead us to reach an interesting conclusion: the employment problem in Nigeria (LDCs) arises more from the supply side of the

labour market than from the demand side. This conclusion is based on the several results emerging from our study of the general structure, conduct, and functioning of the LDCs' labour markets.

This study finds that conditions of excess labour supply permeate the various parts of the labour market, particularly the non-agricultural sector which is largely characterized by firms governed in their employment decisions by efficiency-wage rules. But that real wages do not adjust downwards in the way that, as would be predicted by conventional economic theory, would enable increased absorption of the excess labour to take place, can be better and more reliably explained by neoclassical economic modelling using the efficiency wage theory, rather than by recourse to the largely descriptive tradition of "institutional economics" (see Doeringer and Piore, 1971; Wachter, 1974; Sobel, 1982). This study has found that this condition comes as a necessary result of the optimizing actions of firms/employers operating in the labour markets, rather than of "institutional" factors. Therefore, to stimulate increases in employment of the abundant labour, action should be focused on changing the characteristics of the labour force (the supply side) rather than attempting to influence prices (the wage rate) or the so-called "institutional factors" which are themselves unresponsive to governmental manipulations.

We summarize the general results of the study below, and attempt to provide some policy implications of these results.

7.2 SUMMARY OF RESULTS AND SOME POLICY IMPLICATIONS

The efficiency-wage theory enables us explain both the coexistence of high wages and high rates of open involuntary unemployment, and the downward inflexibility of these high wages in the face of massive quantities of unemployed labour, in the LDCs. The tendency for firms to follow the "efficiency-wage" rule represents a barrier to entry into high-paying jobs for members of the unemployed. Also, both the individual and market demand curves for labour in the private non-agricultural sector of the economy are negatively sloped only for a certain range of domain of wage levels. This holds important policy implications, in that, it indicates that wage policies would not be effective in this sector for countries where wages are "low". This study thus contributes in providing us with clearer understanding of the employment problem in LDCs.

The model also explains the division of the LDC labour market into a "primary" and a "secondary" sector: the former characterized by high wages, low turnover rates, better prospects for promotion and career advancement, and generally better conditions of service; the latter characterized by low wages, high turnover, and generally

poor conditions of service. Moreover, the model reveals that the existence of this division necessarily has its roots more in the optimizing behaviour of firms than in the workers' observable characteristics and attitudes to work. For whereas the high-wage characteristic of the primary sector of the labour market is symptomatic of the "segmentation" that is conditioned by factors originating elsewhere (according to the dual labour market literature),¹¹¹ the efficiency-wage model enables us to reach the finding that high wages are a cause rather than an effect of the labour market division, in the LDCs.

The vast and persistent urban-rural wage gap is explained by this study. Urban (industrial) employers base their wage and employment policies on the wage-efficiency nexus, and thus pay higher wages and employ relatively fewer workers. Wage-employment in the rural sector is primarily in the hands of monopsonist agricultural employers who, acting according to profit maximization criterion, "exploit" their workers by paying them (low) wages far short of labour's marginal productivity. That this wage is low (in absolute

¹¹¹ The dual labour market literature attributes the labour "dualism" to institutional factors that work to allocate each member of the labour force to either the primary sector or the secondary sector, and to the operation of "administered prices" in wage fixing in each labour market sector. Labour union activities and discrimination in the labour market are other institutional agents at work in maintaining the division. Some more recent contributions have emphasized the role of "quasi-fixed" labour costs in segmenting and protecting the labour markets [see Gunderson (1980)].

terms) is due to the fact of employers not recognizing the existence of any relationship between wage and (efficiency) productivity in agriculture. This, in turn, is because agricultural production is non-capital intensive and characterized by seasonal variations (we elaborate further on the monopsony and seasonality factors below).

Subsistence agriculture, which employs the greater proportion of the total rural labour force, is characterized by low productivity because of its reliance on ordinary family labour with virtually no application of capital or any improved (modern) modes of agricultural production. The subsistence family therefore attempts to optimize its labour allocation by accommodating the required number of family members, and allowing the rest to "migrate" to the urban sector. Even under such "optimum" labour allocation setting, the subsistence family's (productivity) income is still so inferior to the average urban income that the former loses its members to the latter at a very rapid rate. The two categories of rural earnings together yield very low average rural earnings level. This also explains the unattractiveness of agricultural (rural) employment relative to employment in the urban sector (whether or not such urban employment is in the formal or informal activity).

The nature of subsistence agriculture is such that the pattern of labour allocation in it affects the country's overall labour market situation to a significant extent.

Given the continued dominance of the "family farm" in being the principal source of employment in the LDCs, the course of events in this sector (regarding its ability to serve as an avenue for gainful employment) has serious implications for the labour market in the country. The degree of the rural-urban migration which Harris and Todaro (1970), Todaro (1969), Rempel (1979), Iyoha (1975) and other writers showed to be the key adverse factor in the employment problem of the LDCs, largely depends on the ability of the subsistence sector to "sustain" the family unit. Our model of labour allocation in the subsistence sector, developed upon the efficiency-wage postulate, attempts to provide a framework for a better understanding of the basis for the rural-urban movement. The model further enables us to reflect upon the underlying importance of the subsistence sector as the prime source of the urban unemployed labour in the LDCs.

Wage-employment in the agricultural sector reveals itself as occupying a central position in LDC labour markets. The unattractiveness of agricultural wage-employment relative to employment in the non-agricultural sector can be traced to the two main factors already alluded to: the monopsony situation governing the employment relationship in this sector, and the seasonal nature of agricultural activity. The monopsony factor necessarily means that labour exploitation (in terms of payment of wages lower than labour's marginal productivity) would obtain. The

seasonality of agricultural production gives rise to a situation where the employer's bid to optimize leads him to labour-tying arrangements with some of his workers, while maintaining some of them as casual labourers on a temporary basis. Such arrangements render agricultural employment not only unattractive but also undesirable (regarded as "poor peoples' job").

Our model of wage and employment analysis in agricultural employment enables us determine the pertinent factors that influence these variables, and to highlight the importance of agricultural labour market forces. The role of "quasi-fixed" labour costs is once again emphasized, in agricultural employment. The nature of labour supply elasticity is seen to be crucial in determining both the wage rate and employment demand. Wages are more flexible in the agricultural sector, but such flexibility does not mean that the labour market would be led to clear, because of the seasonality factor, and the attached "quasi-fixed" costs of labour demand.

One of the major findings in this thesis is that formal education in the LDCs is essentially an "input" rather than an "output" in the human capital formation process (see Chapter 5). Formal education is thus not the end in itself, but rather a means to the end. The end is the firm-specific training skills which the firm provides and which is an essential ingredient for continued profitability of

investment in physical capital (see Thurow, 1975). The specific contribution made by the application of the efficiency wage model is to find that an individual who acquires formal education in the LDCs and therefore belongs to the "protected" sector of the labour market is not automatically guaranteed employability. Employment in this case depends on the firm's size of demand for labour (which it then trains for efficiency-wage jobs).

Even though the acquisition of formal education by individuals merely serves as a screening device for employment positions, education can be considered as an effective long term solution to the employment problem to the extent that it enables the applicants to become more employable by not only the efficiency-wage private sector but also by the public sector. It also makes labour more mobile in such a way as to reduce the effects of monopsony power on earnings. So, policies for educational expansion seem to be appropriate. But increased investment in human capital by firms themselves appears to be the most effective remedy. Governmental support to firms by way of, say, subsidizing training in firm-specific skills, seems to be a key policy action. (We address some further policy considerations of the study shortly).

Also the study indicates that wages would be more flexible in the informal sector of the labour market. This means that the market could be able to adjust to enable full

employment to obtain in this sector. However, this has not been the case. The level of wages in this sector are so low that workers prefer to "search" rather than to accept jobs in the sector. Moreover, activity in the sector has not been made more viable and attractive enough to enable productivity and wages to rise appreciably in the sector.

This study opens up some different policy implications against the current policy actions that exist in Nigeria. The current employment policy guideline followed in the country are mainly demand side policies that usually attempt to restrict wages as a way of encouraging more employment demand by the existing firms. We have shown that such actions would not succeed in addressing the employment problem because private non-agricultural sector firms will not offer low wages. (Workers may be prepared to accept lower wages, but firms will not employ them). The success of such an approach will be limited to the ability of the public sector to absorb the excess labour supply.

One is tempted to assert that the different options that this theory offers include the idea of concentrating on finding ways to encourage firms to abandon their adherence to efficiency-wage rules in their employment decisions, so that government incentives that persuade them to agree that their profits would not be too adversely affected if they accepted more workers at lower wages might be needed. Such incentives could be in form of tax concessions tied to the firm's volume of employment expansion.

But such a suggestion is tantamount to encouraging firms to behave non-optimally and therefore deviate from their pursuits of "efficiency paths". And such a situation is hardly ever acceptable, nor is it even recognized in neoclassical economics as a probable recourse for the search for a solution.

It seems that this study has identified a sensitive approach to the study of the labour problems of the underdeveloped economy, but it may not have the ultimate solutions that are being sought. We are therefore left to indicate that to the extent that the scope of this thesis is not meant to reach as far as providing all the needed answers to the problem it poses, further study and research are necessary for trying to fully utilize the results emanating from this study.

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