

THE PROBLEM OF WAGE DETERMINATION
IN ETHIOPIA: A CASE STUDY OF THE
STATE-OWNED TEXTILE INDUSTRIES

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ABSTRACT

The objective of this study has been to identify inter-industry and inter-personal wage differential and to explain the determinants of mean wages and individual wages in the state-owned textile industries. The necessary information was obtained through sample survey and secondary sources.

The coefficient of variation, simple range, percentages, standard deviation, coefficient of variation, Lorenz curve, Gini coefficient, multiple linear and semi-logarithmic regression, and principal component methods were used to analyse the data.

The results indicate that 1) the institutional variables such as the government legislations and directives influence the wage determination process in the state-owned textile industries. 2) there exists high inter-industry and inter-personal wage differential. 3) production, profit and fixed assets jointly affect the mean wage differential between the industries. 4) Education and experience within an industry are increasing function of wages. Moreover, the variables sex, marital status, occupation, experience outside the industry, and change of jobs influence the level of wages in the state-owned textile industries.

The paper suggests for the restructuring of the existing wage system particularly the introduction of wage policy on the needs of the economy not only for the textile sector but also for the whole economy.

CHAPTER I
INTRODUCTION

1.1 Statement of the Problem

In any economy, incentives are used as an instrument of economic policy, because they are important in achieving certain objectives. In developing countries there is a primary need for a rapid growth in labour productivity as well as improvements in the quality of work. The solution to these problems presupposes a skillful utilization of different methods of which an appropriate wage policy is one.

In the developing countries, the employees within the government sector account for a large proportion of total employment in the modern sector. Several writers have noted that, in many of these countries, the wage system of the government constitutes a major influence on the wages and salaries of the modern sector. But while the importance of pay policies have been recognized, there had been little systematic study of the actual course of these policies. Consequently, the analysis of wage structures are usually very complex. Such a complexity arises because, apart from involving many problems of a technical or strictly economic character, the question also involves the problem of reconciling different social, economic and political objectives. These objectives are often in conflict with each other.

Providing due emphasis to the problem of wage determination and the problem of formulating sound and effective wage policy is important in Ethiopia in order to realize an

"equitable" income distribution; to reduce frustration on job; to retain the right personnel in the right position; and to increase labour productivity; ie, to realize the direct dependence between the size of wages and the actual results of labour. Solving the above problem is indispensable for a government concerned in improving the standards of living of the whole society.

Undesirable wage differential between industries and within an industry results in a disincentive to workers. Workers in some industries and occupations believe that their wages are low in relation to the wages paid to other workers. Such disincentives could hamper economic development in various ways.

The draft of the Ethiopian Ten-Years Perspective Plan has indicated the need for drafting and implementing wage and incentive policy aimed at increasing labour productivity by providing incentives to increase efficiency in production. The draft plan has also stated that since wages and other benefits were not interwoven with labour productivity, they have significantly affected the development of the economy. This has also resulted in a distortion between the job content and the skill need for certain job. For the above reasons, the plan stressed the need for drafting a national wage and incentive policy that is based on productivity of labour.¹

Moreover, the Chairman of the Provisional Military Administrative Council (P.M.A.C.), addressing the May Day celebrations (1986) stated the problem of wage systems in Ethiopia as follows:

Another objective of the revolution was to formulate a policy through which salary increments could be equated with productivity and profitability In short, the aim of the revolution is to do away with the old wage system and improve the standard of living of the workers in conformity with the growth in productivity and profitability. The study will be completed and conditions for its implementation be paved in very near future.²

The Wage Board was established to introduce uniform wage grades in the government sector. The Board is now in the process of regrading and reclassifying all jobs within the public sector and state enterprises.

The time and resource available do not permit for a detailed study of the problem of wage determination in the whole Ethiopian economy. A case study of the textile sector, particularly the state-owned textile sector, will therefore be examined in order to provide an insight to a comprehensive and systematic analysis of wages to the manufacturing sector. This type of case study can also suggest some of the issues to be investigated in other similar studies, and facilitates the formulation of hypotheses relevant to further investigations.

The state-owned textile industries were owned by foreign nationals, Ethiopians and the government before the revolution.

These industries, which were fully nationalized after the revolution, are now under the Ministry of Industry. In all these industries there had been different types of wage structures before nationalization. Nowadays, the inherited wage structures are reflected in each industry. One of the difficulties in the state-owned textile industries is how to establish an appropriate pay system.

Moreover, the Ethiopian government has made a clear declaration of committing itself to a socialist development strategy. Part of this strategy is achieved by minimizing the income disparity in the society. The problem is how the benefits have been distributed among the different income groups particularly in the state-owned textile industries after the revolution.

1.2 Objectives

The central objectives of this paper are as follows:

1. To analyse the existing wage structure in the state-owned textile industries:- the existing procedures for wage fixing will be studied. Wage policies in pre-and post-revolution will be analysed. Information is generated from, The Negarit Gazeta, various directives of the government, the institutions directly or indirectly involved with wage and labour, the collective agreements of enterprises and other directives of the enterprises. In summary, this part of the paper investigates the institutional variables affecting wages in the state-owned textile manufacturing industry.

2. To examine the pattern of wage distribution:- the main emphasis here is to see whether wage differential exists between the textile industries and within a textile industry (ie, inter and intra-industry wage differential within the state-owned textile industries).

3. To assess the determinants of wage in the publicly-owned textile industries other than the institutional variables:- what factors affect the level of wages in these industries?. How do factors such as profit, capital stock, production, employment and initial capital affect the level of wages?. To what extent do the human capital and personal variables such as education, experience, occupation, family background, sex and the like influence the level of wages in this sector?. The above mentioned questions are the main theme of the third objective.

After discussing the factors that determine the level of wages and inter-personal as well as inter-industry wage differentials, an attempt will be made to outline the possible solutions to the problem of wage and incentive systems in the Ethiopian Textile Industry.

1.3 Method of Study

The technique of analysis basically followed in the study is quantitative. However, with the inavailability of relevant statistical data, some qualitative analysis is unavoidable.

The coefficient of variation is used to study the inter-industry wage differential. The simple range, percentages,

standard deviation, coefficient of variation, Lorenz Curve and Gini Coefficient are utilized to show the inter-personal wage differentials.

The multiple linear regression model and the principal component method are utilized to estimate the determinants of mean wages in the state-owned textile industries.

The determinants of individual wages in the industries are analysed using the least square regression technique. Both linear and semi-logarithmic functions with dummy and continuous regressors are entertained and see which one would provide the best fit. Moreover, the Beta Coefficient is used to observe the relative importance (rank) of the variables. All the above methods will be discussed in detail at the appropriate sections.

1.4 Data Source and Sampling Method

Data Sources

Conceptually one hopes to study wage determination, wage differential and wage distribution using good quality surveys corresponding to different points in time. Such surveys, involving comparable and sufficiently rich and detail, permit testing a variety of hypotheses. This type of data base, however, does not exist in Ethiopia. Given the above constraint, maximum effort is made to get primary and secondary data as follows:

1. The information source for labour and wage policies in Ethiopia are the various proclamations, government directives, labour unions and collective agreements, government institutions which have direct or indirect relations with wage and the directives of the enterprises.

2. The data for the determinants of wage are obtained from questionnaire that was distributed to 300 employees in the publicly-owned textile industries. The available data in the National Textile Corporation are also used for this purpose.

3. The data source for the inter-industry and intra-industry wage distribution are the publications of the C.S.O. (Results of the Survey of the Manufacturing Industries), the Ministry of Industry, the Ministry of Labour and Social Affairs, the National Textile Corporation and the textile industries.

Sampling Method

The decision to collect the required data on sample basis, is based on the fact that sampling provides timely statistical information at reasonable costs. Resources needed for collecting, processing and analysing data are minimal with sampling than with census or complete enumeration. The attempt here is to provide the details of sampling design utilized in the research.

The sampling technique used in this survey is a two stage sampling. The first stage involves the selection of establishments while the second stage is selecting the employees from

the sampled establishments. The reasons for using this two stage sampling are:

a) It would reduce costs by restricting the selection in the sample than otherwise.

b) It would also reduce the costs in preparing a frame for sampling employees (ie, it would not be necessary to make a list of all the employees in all establishments).

The first stage consists in selecting primary sampling units from the 18 state-owned textile industries. The usual practice is to divide the establishments into strata.³ In this study the establishments are stratified into three strata depending on the size of employment. And two establishments from each stratum are selected by simple random sampling.

Accordingly,

1st Stratum:- establishments employing less than 1250 employees,

- i) Ethiopian Thread Factory,
- ii) Progress Cotton Factory;

2nd Stratum:- establishments employing 1251-2500 workers,

- i) Meher Fiber Factory,
- ii) Adey Ababa Cotton Factory; and

3rd Stratum:- establishments with more than 2500 employees

- i) Bahir Dar Textile Factory
- ii) Akaki Textile Factory are selected.

Stratifying the establishments into two, three, four, ... is subjective aspect, ie, one should scrutinize the population under study and decide the number of strata which best fits the objectives.

The second stage sampling is the selection of secondary sampling units, ie, employees. Fifty employees from each establishment are selected by simple random sampling.

The sample size (300) of the employees can be determined by different mathematical and statistical methods. Some of the statistical methods determine the size based on relative costs (Cost of travel, generating a list of employees, transport cost, enumeration cost, etc.) and the variance between establishments and between employees. In the non-availability of such information, one attempts other methods. The method used to determine the sample size for this study is the non-centrality parameter method.⁴ (For the detail on this method see appendix i).

1.5 Scope and Limitations of the Study

A research in the area of wage policy and wage determination, in the whole industrial sector could have been very important to formulate an appropriate pay system. But the availability of time, financial resources as well as accessibility of data have limited the researcher from undertaking such a study. The option that is left open is thus, to consider a case study from the industrial sector. The industry to be studied in this research is the textile industry, particularly the state-owned ones. Textile industry here includes those industries producing textile products and hard fiber.

It needs to be emphasized that this paper does not attempt to describe the structure of income distribution and

its determinants in the Ethiopian economy as a whole. The paper restricts itself to the discussion of wage determination in the state-owned textile industries only. Here wage means simply the earned income received by a worker from an industry as a result of expending his labour; ie, income from employment. For most of the purpose of this research, the distinction between wages and salaries is ignored.

Some limitations are imposed by scanty nature of data. The data covering a long period of time in the textile industries, particularly before the revolution, are limited. In addition, the available data are not detailed and consistent to allow researchers to undertake wage study, which is the prerequisite to restructure wage systems and other policy considerations.

1.6 Review of Literature

Wage and salary structure in developing countries has both economic and political interest. There is, in many developing countries, a wide gap in income among workers within an industry and between industries with equal qualification and experience. Classical economics conceived labour markets as being highly competitive. By the late nineteenth century, Cairnes and Mills had described labour markets as a set of "non-competing groups" bounded by geographical, occupational, and institutional forces. Present writers have extended the taxonomy and analysis to systems called internal labour markets that are confined to the establishment, the firm or industry.⁵

The theory of labour markets which considers that the level of wages and employment are determined jointly by supply and demand does not actually reflect conditions in the labour market of developing countries. Wage structure in the developing countries are so much a reflection of their underlying socio-economic structure. There is an actual failure of the market to fix wage and allocate labour.

If one turns to the patterns of wages and salaries for various categories of workers, differentials in wage rates are very striking. The spread of wages and salaries is wide in the developing countries. Significant differences in wage levels based on major characteristics of the labour force are observable. Thus, many wage differentials originate from differences in the skill or occupation, sector, firm, industry, geographic locations, educational qualifications, institutional factors, demographic characteristics, customs, etc.⁶

The most important aspect of wage structure is perhaps, the wage setting mechanism. But as already noted, wage structures in most developing countries is not determined simply by demand and supply. Of the numerous explanations offered, the following are the most frequently encountered:

- 1) Institutional factors
 - a) Minimum wage legislations
 - b) Public sector/Private firm leadership
 - c) Trade Union strengths
- 2) Accidental or historical elements and economic circumstances

- 3) To some extent the market pressure and ability to pay.⁷

Various wage determination theories have attempted to examine the problem of wage setting from different aspects. The empirical research on the determinants of inter-industry and inter-personal wage differential has gradually increased in the last two decades. But such a study is very limited in Ethiopia.

To the knowledge of the researcher, there is no study that examines the inter-industry and inter-personal wage differential in the state-owned textile industries. But very few studies are available that treat the problem in the overall manufacturing ~~sector or in the~~ relatively modern sector.

Teshome's study on the review of income distribution questions in six Eastern African Countries (1975) shows the following:⁸

- 1) Rural-urban earnings differential was high in Ethiopia, whereby the ratio of urban to rural earnings was equal to four.

- 2) High average wage differential existed between the nine categories of occupation in the study. The professional, technical and related workers earned 324 Birr, while miners, fishermen, hunters and related workers received 20 Birr.

- 3) The study also revealed the existence of inter-sectoral average wage differential in Ethiopia. Construction workers earned the least mean wage of 57 Birr, while manufacturing workers got 75 Birr, at the same time transport and communications workers received the highest average of 189 Birr.

4) The male employees in Ethiopia earned twice as much as female workers.

Although the study clearly shows the wage differential existing in occupation, sex and sector, it did not cover the determinants of the wage variations.

The same author, in his study on employment and wages in the manufacturing sector, showed the existence of considerable differentials in inter-industry wages using the coefficient of variation and standard deviation. The researcher also attempted to see the relationship between employment and wage. The results indicate an insignificant relationship between the two variables. However, as the author himself indicated, "A major shortcoming of the wage data from this source is that it does not reveal earning differentials within an industry."⁹

JASPA's study on the patterns of industrialization and impact on employment and incomes in African Countries: the case of Ethiopia (1983) depicts the existence of a marked inter-industry wage differential in the manufacturing sector.¹⁰ The study does not examine the wage differential between individuals and the **factors** which influence such differentials.

C.S.O's Staff Report No.8 shows the distribution of wages among central government employees in Addis Ababa using the Lorenz Curve and percentages. The findings reveal the existence of high wage variation among these employees. In addition, the study shows the improvements in the distribution of wages in 1974 as compared to 1969.¹¹

The research in the area of determinants of individual wages is also limited. A study made by Fassil G/Kiros, et al, using the human capital variables (education and experience) and one additional variable showed the following result:- ¹²

$$\text{Log } Y = 2.36039 + 0.01135X_1 + 0.08025X_2 - 0.13765D + \mu$$
$$(.01787) (.00052) (.00096) (.00997)$$
$$R^2 = .945$$

Where X_1 and X_2 are age (experience) and schooling respectively, Y is the annual cash income and D is a dummy variable used to distinguish the effect of public versus private sector employment. All variables are significant at 1 percent level. The above results could be interpreted as follows:

- a) Given the starting income of 229.50, each year of age (experience) in 1971-72, increases income on the average by 2.65 percent.
- b) Each year of schooling raises income by 20.29 percent.
- c) Employees in the private sector receive an average of 37.29 percent higher salaries than the individuals in the public sector. This study considers a very small sample size (476 individuals) from the whole country and does not show the occupational, sectoral and sex wage differential in the system.

For comparative reasoning, it is important to assess the problem of inter-personal wage determination in other countries. The studies of determinants of wage in various developing countries show the existence of inconsistency in the findings. For instance, in Tunisia using the least square regression method, it was found that informal education is a better predictor of earnings than formal education.¹³

A research in Kenya indicates that employers, in setting earnings of skilled and semi-skilled workers, pay very little attention to the amount of schooling and form of training. The most effective route to higher earnings is through frequent changes in jobs. Every change of job might be said to be worth an extra 100 shilling in monthly earnings, whereas each additional year of work brings an increment of only 17 shillings per month. There is also high monthly coefficient for "tribe", suggesting 48 shilling premium for Kukuyu over non Kukuyu.¹⁴ In the Sudan experience played an important role in determining wages.¹⁵

The study in Pakistan revealed that human capital (experience and education) are highly significant in determining income. Here income is an increasing function of education and experience. On the average, human capital variables explain 45.25 percent of the income distribution and the basic variables explain 61.65 percent.¹⁶

A similar study in Thailand has shown the importance of age, sex and education in explaining the variation of personal earnings in urban areas.¹⁷ The basic earnings in Uganda's civil service is explained largely in terms of education and age. Annual basic earnings are associated, on average, with extra 124 shillings for each additional year of education beyond primary school and with extra 87 shillings for each additional five years experience in the civil service.¹⁸

FOOTNOTES

1. የኢ.ጊ.ጢ.ጦ. የጠጠራ ዊ አጠባባቢ ዎርት ዘመቻና የጣዕከላዊ ፕላን ጠቀላይ ጠዎሪያ የአስረ ዓመት ጠሪ ዕቅድ /1977-1986/ ረቂቅ ጥራዝ 1፣ አጠቃላይ፣ አ.አ. የካቲት 1976 ዓ.ም. ገጽ 124
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CHAPTER II

THE EVOLUTION OF LABOUR AND WAGE

POLICY IN ETHIOPIA

It is important to recognise that each country has its own institutional framework which affects the level and structure of its wage. Many of the institutional factors affecting the wage structure cannot be measured in figures. But the wage system in a given country reflects the influence of institutional, market, demographic, historical, customs **etc**: This part of the paper attempts to examine the labour and wage policy in Ethiopia in general, and the wage policy in the state-owned textile industry in particular.

Every policy is characterised firstly, by its aims and secondly, by the means used to attain these aims. Similar methodology is used to the labour and wage policy in Ethiopia.

The aims of the labour and wage policies in Ethiopia could be abstracted from the various proclamations, decrees, orders, guidelines and directives of the government. The means used to attain the aims of the policy are the formal machinery established in the system such as, the ministry responsible for labour and wage, the labour union, C.P.A., employer's associations, Wage Board and other institutions which have direct or indirect relations with labour and wage.

2.1 Legal Provisions and Government Directives
Related to Labour and Wage in Ethiopia

With the rapid growth of industrialisation, the increasing awareness of the workers of the benefits arising from association with one another, the incidence of protests to management at alleged unfair treatment and with mounting complicated labour problems, the government became more and more interested in labour affairs. In 1944 The Factories Proclamation was issued. It established a factories board consisting of the Ministry of Commerce and Industry, The Director General of Medical Services and an engineer, whose duty was the supervision of all factories and machinery in the Empire. The proclamation also gave the Ministry of Commerce and Industry power to make rules concerning health and safety, hours of work and appointment of inspectors for implementing the provisions of the proclamation.¹

The Revised Constitution of Ethiopia issued in 1955 contains, in Article 47, an important labour provision. It states that, "Every Ethiopian subject has the right to engage in any occupation and, to that end, to form or join associations, in accordance with the law".² Although other articles of the Revised Constitution do not specifically mention labour, they do incorporate individual civil rights and liberties in a very generous way.

The Civil Code of 1960, in addition to the general regulations on civil contracts, contains a number of articles on labour conditions such as wages, holidays, safety precautions to be taken by the employer, work of employees, formation and termination of employment contracts, etc. Particularly chapter XVI of the Civil Code lays down provisions on the conclusions of individual contracts of employment and collective agreements, the general contents and character of employment relationship, the grounds for and termination of contracts, holidays, absence and sickness pay. Other clauses deal with the employers' obligations in connection with employment accidents or occupational diseases. Another Chapter (III) contains provision on associations which were to take on some importance when employers' organizations and trade unions came to be established.³

Order No.23 of 1961, provides for the creation and functions of the Imperial Ethiopian Central Personnel Agency. The objective of the establishment of this agency is to formulate grading and salary structure of the public service based on classification system and make studies to secure efficiency of administration with minimum necessary expense.⁴

The Public Employment Administration Order No.26 of 1962, assigned the main objectives of the public employment administration so as to mobilize the country's manpower resources for general economic development, to improve the workers' level of performance, and to provide each one with

a job corresponding to his wishes and abilities. The principles of free occupation by the worker and voluntary engagement by employer are fully maintained. The administration also issues work permits to foreign nationals, under regulations which require that Ethiopians be trained to replace such foreign staff in due course.⁵ Tripartite employment advisory committees were provided for in the 1962 legislation to advise the public employment administration.

The Labour Relations Decree of 1962 legalised trade unions and employers' associations. "Plant Unions" may be formed in enterprises of over 50 employees, while employees in small enterprises may join "General Unions". The organizations of workers and employers are required by the legislation to register with the appropriate Ministry and to negotiate freely and voluntarily on labour conditions, but are forbidden to pursue political aims or activities. They are required to settle disputes peacefully and are encouraged by the law to include the requirement for voluntary conciliation in collective agreements.⁶

The Public Employment Administration (No.1) Regulation No.267 of 1962 contains the establishment of employment offices and the employment advisory committees in Addis Ababa and Dire Dawa.⁷

The Labour Relations Proclamation No. 210 of 1963 deals with the worker and employer organizations and their registration, collective bargaining, labour relations board and compulsory arbitration prohibiting unfair labour practices. The proclamation empowered the minister for National Community and Social Affairs to, inter alia, promote joint negotiations, establish further inquiry and arbitral boards, extend the scope of agreements or awards, petition for dissolution of associations, fixed labour conditions, including wages, and regulate provident funds their law being applicable to the private sector, but also excluding domestic servants and those employed on farms with less than ten permanent workers.⁸

The Minimum Labour Conditions Regulation No.302 of 1964 prescribed the general minima in relation to leave, public holidays, hours of work, overtime rates and severance pay, and superseding and slightly modifying the Civil Code in such respects and in relation to those employed in industrial, commercial or other profit-seeking enterprises and who are within the scope of proclamation No.210 of 1963.⁹

The Labour Inspection Service Order No.37 of 1964 state the establishment of labour inspectorate as an independent administration under the National Community and Social Affairs with its own budget. The order also prescribed the staff and the responsibilities of the inspectorate which is only applicable to the private sector.¹⁰

The Labour Standard Proclamation, No.232 of 1966 empowered the above mentioned Minister to, inter alia, prescribe welfare and safety measures, occupational diseases, dangerous trades, materials and machinery, and to prescribe records and collect statistics of labour conditions. The proclamation stated the establishment of Labour Standards Advisory Board and prescribed the powers, duties and restrictions of the Labour Inspectorate; required employers to provide safety, health and welfare protection, to report accidents and occupational diseases, and to ensure against such, when so ordered; assured equal pay for women. This was to be applicable to the private sector in relation to industrial enterprises, agricultural enterprises conjoined with industrial processes, and construction work".

The Public Employment Administration (No.2) Regulation No.320 of 1966 contains the establishment of provincial employment office at Asmara and local offices at Massawa, Assab, Keren and Aqordat, as well as a provincial employment advisory committee at Asmara.¹²

The Eritrean Labour Relations Board Establishment Regulations, Legal Notice No. 414 of 1971 contains the establishment of the board which exercises the jurisdiction on labour disputes and complaints of unfair labour practices in the province.¹³

The Public Service Position and Salary Scale Regulations, Legal Notice No. 419 of 1972 presents the pay scales and details of incremental scales for the public service. The service is classified into six different types: administrative service, professional and scientific service, sub-professional service, clerical and fiscal service, trades and crafts service, and custodial and manual service.¹⁴

The above labour policy can be summarized in the following phases:

In the first phase, government took no initiative in the labour field and intervened only when law and order was disturbed. This was a period which was for the advantage of the employers. Labour was treated just as a commodity.

In the second phase, labour began to make demands, and where employers refused this, strikes took place. In the third phase, the government has taken the initiative through its legislation to mold the pattern of industrial relations in the country.¹⁵

The Labour Proclamation No.64/1975 is the most important labour proclamation after the revolution. This proclamation states that every Ethiopian citizen is provided an equal opportunity to be employed in, and work where, he can contribute to the development of his country according to his skill and capacity and be fairly remunerated for his work without discrimination on the basis of race, tribe, and religion, in line with socialist principle.¹⁶

The Labour Proclamation No.64 of 1975 also indicates that there should be equal pay for equal work. Moreover, the wages shall be determined by the contracting parties, but shall not be less than the minimum wages in accordance with the law or collective agreement.

The above law excludes the employees in state administration (civil service, ie, ministries, education, health, and ~~veterinary~~ workers) who come under the Central Personnel Agency (CPA), the armed forces and police, and domestic servants. It also discusses the employment exchange, contract of employment, employment of Ethiopians abroad and foreigners in Ethiopia, contract of apprenticeship, minimum labour conditions, establishment of unions, administration of unions, trade dispute settlement, lock-out and strike and miscellaneous provisions.

The Trade Unions Organization Proclamation No.222/1982 prescribes the objectives and functions of labour unions and All Ethiopian Trade Union. The proclamation states that workers have the right to organize and form trade unions.¹⁷ The objectives of the trade unions is to make every effort to protect the rights and interests of the workers as well as the laws issued from time to time and fulfill, stage by stage, their social needs. The functions of these unions is given as:

- 1) to make the necessary effort to satisfy social needs of the workers, such as increasing higher standard of occupational safety and health, recreational facilities, kindergartens, as well as negotiating and signing collective agreements.
- 2) to implement decisions, directives and orders transmitted to it through higher authorities.

In addition to the above laws, the government has issued various directives to determine the size and the increment of wages in the state-owned sector excluding civil administration, armed forces and police, and domestic servants. The main objectives of these wage directives are:

- a) to safeguard the position of the lowest paid, and to reduce income inequality; and
- b) to control the growth of the total wage bill.

The 1976 Directives of Wage Guidelines for collective agreements established for the public sector a minimum wage of Birr 50 per month, with the provision that workers whose wages were below the minimum wage should have their wages increased to that amount.

The Council of Ministers since 1975-76 has periodically issued guidelines of annual increments to those establishments covered by the 1975 labour proclamation. The summary of the directives is presented in the following table.

Table 1

Directives for Wage Guidelines

	Year	Permitted increase (percent)	Salary Maximum Birr per Month
Directive I	1975/76	15	450
	1976/77	7	450
	1977/78	8	450
No Directive	1978/79	-	-
Directive II	1979/80	7(5+1+1)	450
No Directive	1980/81	-	-
Directive III	1981/82	7(5+1+1)	650

Source: I.L.O., Socialism from the Grass Roots:

Accumulation, Employment and Equality in Ethiopia, Vol.II, Working Paper II, (Derk Robinson), JASPA, A.A., September, 1982, P.29.

The first directive provided an increase in wages for a three year period. If the undertaking was not profitable in the first year of the three year period, the permitted wage increase was reduced to 8 percent in the first year. If it became profitable in the second and third years the permitted increase of 7 percent and 8 percent, respectively, in the two following years was allowed. The possible combinations of permitted increase over the three year period assuming the collective agreement was signed in 1975/76 was therefore as follows ¹⁸

1975/76	15	8	8
1976/77	7	7	0
1977/78	8	8	0

It is not known as to what percentage of the agreements or employees came under these three combinations.

The second directive (II) 1979/80 permitted 7 percent increase in wages which consisted of three elements: 5 percent increment, if there had been an increase in output in the undertaking, output measured in physical terms; 1 percent increment for an increase in productivity; and 1 percent increment for an increase in profitability. The permitted wage increments, in both directives I and II is for employees earning less than 450 birr per month. There was no directive and no wage increment in 1980/81.

The third directive (III) permitted a 7 percent increment (5+1+1). The composition of this percentage was similar to directive II. The third directive raised the maximum salary of receiving the wage increment from 450 birr to 650 birr. The directive also stated that unless a new directive was issued, the same one-year provisions would apply to the succeeding years.

For the civil service, which is not included in the 1975 labour Proclamation Order, there has been no general salary adjustment since 1975/76. Incremental steps were allowed to employees whose salaries were not more than birr 285 a month, and this limit was extended to birr 600 in 1981/82. Salaries above birr 285 in 1975/76 or birr 600 in 1981/82 have been frozen at their 1975/76 level.

The Council of Ministers issued the starting salary of new graduates who are going to be employed in the government sector from universities, College, and institutions in Ethiopia and abroad, in February 1984, as follows.

L.L.B. and B.Sc. in Engineering	Birr 600:-
M.D. (internship complete)	" 835:-
D.V.M.	" 835:-
B.A. or B.Sc. in other disciplines	" 500:-
L.L.M. or M.Sc. in Engineering	" 710:-
M.Sc. in Geology	" 636:-
M.Sc. or M.A. in other disciplines	" 600:-
Ph.D. in Law and Ph.D. in Engineering	" 835:-
M.D. (Specialist)	" 980:-
Ph.D. in other disciplines	" 710:-
Engineering diploma (3 years and above)	" 420:-
Law and other diplomas	" 347:-
Junior College graduates	" 347:-
Technical School graduates	" 285:-
Secondary school graduates	" 182:-

The government has also established institutions which would follow up the fulfillment of the above proclamations and directives. In what follows we shall try to assess these institutions one by one.

2.2 Institutional Bodies Concerned with Labour and Wage

The industrial and commercial development of Ethiopia has resulted in an appreciable increase in salaried and wage employment, and has thus created labour problems that are

similar to those in other developing and advanced countries. The Ethiopian government has taken both legislative and administrative measures in order to solve these problems.

Before 1962 some services, for the protection of workers' and employers' interests, and for regulations of labour conditions, had been provided on a small scale by the Ministry of Commerce and Industry in Addis Ababa.

After 1962, the responsibility for employment and labour matters has been vested to the Ministry of National Community and Social Affairs. A specific department of labour was formed to administer the new labour legislation promulgated in that year (1962). The objective of this department was to serve as an important medium of understanding between the government and the working population. Its primary function was to implement government policies on all questions related to labour, including such intricate matters as regulation of wages and working conditions, settlement of industrial disputes, employment policy and manpower planning. Moreover, the Eritrean Labour Department, established after World War II, was brought within the ambit of Ethiopia's Labour Administration with the integration of Eritrea into the Ethiopian Empire at the end of 1962.

During 1962-64, the Labour Department had three departments; namely, Public Employment Administration, The Labour Relations Service, and Labour Inspection Service. In 1966,



the department was reorganized in two divisions, each headed by an assistant minister. The department, after 1967, had seven sections; namely,

- 1) Manpower, Research and Statistics Section,
- 2) Employment Service Section,
- 3) Foreigners' Employment Section,
- 4) Vocational Training Section,
- 5) Legal and International Liaison,
- 6) Labour Relations Section, and
- 7) Labour Inspection Service Section.

In 1967, there were three tripartite advisory bodies available for considering labour and employment matters. These were the Central Employment Advisory Committee, the Manpower Information Advisory Committee, and the Labour Standards Advisory Board.

The Labour Relations Board, which was established in 1963, dealt with disputes that the Labour Relations Section does not resolve. The Labour Relations Board was an independent statutory authority having the power in both conciliation and arbitration. Decisions and awards issued by the board were legally binding. The labour legislation requires the employers' association and labour unions shall be invited to nominate candidates for appointment to the board.

The Labour Standard Advisory Board was intended to provide advice and recommendations on general or specific issues relating to labour conditions.

The Manpower Information Advisory Committee was aimed at securing cooperation between the chief authorities of the government, and the private sector, for the collection of data on manpower and employment of foreign nationals.

A further step in modernizing employment in government services, was the establishment of the Central Personnel Agency (C.P.A.) in 1961. The Agency has several duties, among which are recruitment, examination, and hiring of all white-collar government employees upto the rank of assistant minister, whose salaries must come from the budget of each ministry and the establishment of uniform civil service through the formulation of payment scales and job classification applicable to all ministries and agencies. The agency has been performing the first of these duties for several years.

After the 1975 Labour Proclamation was promulgated, the Ministry of Community Development and Social Affairs was substituted by the Ministry of Labour and Social Affairs with increased responsibilities. The functions assigned to the Minister of this Ministry are given in Proclamation No. 127 of 1977, which include, inter alia, the following.

- Undertaking studies of manpower employed in the country and preparing occupational classification in cooperation with the concerned institutions.

Studying and taking all necessary and appropriate steps in all areas regarding employment, working conditions, foreigners' work permits, participation of workers in management, social welfare programmes and social security schemes.¹⁹

The Ministry has two important departments. The Department of Labour is one of them, and has three sections and several branches in the administrative regions.

The Manpower Division of the Office of the National Committee for Central Planning is aimed at preparing the general policy, issuing guidelines and establishing national strategy to coordinate human resources. The ministries and government institutions are attempting to plan their manpower development based on the guidelines of the division.

In addition to the above mentioned institutions, the Ethiopian government has established the Wage Board after the revolution to systematize and institute uniform wage grades. The objective of the Board is to exercise and ensure that all jobs with the same classification and job content have the same remuneration. Merits and piece rates systems are to be introduced. The Board is in the process of regarding and reclassifying all jobs within the public sector and state enterprises.

Modern labour organization is a comparatively recent phenomenon in Ethiopia. Earlier examples are on the Franco-Ethiopian Railway and Eritrea, where the British encouraged trade unionism during their administration in the province

after the Italo-Ethiopian War. Following this, unions started to appear in other industries. The labour organizations were given legal basis by the Labour Relations Decree of September 1962. By 1964, there were some fifty Trade Unions in Ethiopia.

The Confederation of Ethiopian Labour Unions (Co.E.L.U.) to which most of the unions were affiliated, although tentatively formed earlier, was established officially at the beginning of 1963. In 1968, it represented forty-six unions in Eritrea, and sixty-three in the rest of Ethiopia. The Confederation was an active coordinating body among the otherwise isolated labour unions. It was responsible for the protection and development of the economic, social and moral interests of the member unions and for representing them at the industrial, national and international level.²⁰

The Labour Proclamation promulgated in December 1975 provided nine industrial (sectoral) unions and for an All-Ethiopian Trade Unions to replace the former Confederation of the Ethiopian Labour Unions. The All-Ethiopian Trade Union was established at the beginning of 1977. The main functions of the AETU are: to give central leadership to workers and trade unions, to participate in the preparation of the political, economic, social and cultural plan of the economy, to participate in the study and preparation of labour laws, regulations and directives, to establish and expand centres for training workers, and to represent workers and trade unions of Ethiopia.

There was also the Federation of Employers of Ethiopia that was formed in 1964, for the purpose of representing employers on labour questions. It was represented on the Labour Relations Board, the Labour Advisory Committee, the Manpower Advisory Committee, the Labour Standard Advisory Board and the National Advisory Council for Vocational and Technical Education. Its objectives include encouragement of "the principles of development and preservation of good relations between employers and employees and the maintenance of conditions of employment which are fair and appropriate". The Federation had forty members in 1966.²¹

2.3 Wage Determination Guidelines in the State-owned Textile Industries

The wage determination process and wage increment guidelines are similar for the whole industrial sector. 64/68 Labour Proclamation is the most important proclamation in determining starting wages and other benefits. Despite this proclamation and the guidelines, there is a wide differential between industries and within an industry. This could be attributed to many factors such as, the structure of payment inherited from the owners of the textile industry before nationalization, the non-existence of wage scale in most of the industries, or the existence of inappropriate wage scale which is not based on any scientific wage study, etc.

The criteria of recruiting new employees, their starting salaries, promotion of employees from one grade to another grade, training, employing foreigners and criteria of selecting labour heroes in the textile industry are based on the administrative guidelines of the Ministry of Industry, 64/68 Labour Proclamation, and their respective collective agreement.

According to the administrative guidelines of the Ministry of Industry,²² the wage of any worker is determined according to the scale of the industry. If there is not a wage scale in the industry, wage is determined after considering the minimum and maximum wage payment of such a job in the industry. The manager of the textile corporation has the right to employ new employees and decide their salary upto a wage ceiling of 600 Birr per month. For employees earning more than 600 Birr, their employment and wage must be decided by the Ministry of Industry. The guideline also specifies the level of wages for new employees graduating from universities and institutions under Higher Education Commission.

The administrative guidelines of the Ministry of Industry also indicate the system of wage increase and promotion as follows. The promotion of employees must be based on the wage scale of the industry. If there is no wage scale in the industry, wage increase for a certain promotion shall be based on a percentage of the workers' salary. The guideline here, underlines the careful examination of this type of wage increase,

so that it will not distort the wage structure in the industry. If the employee receiving the promotion and the salary increment had a salary less than 450 Birr before the increment, the corporation manager can approve the wage increment. If the wage increment is more than 25 percent of his total wage, the manager should report to the Ministry. If the employee getting the promotion and wage increment earns wage between 450 and 700 Birr per month, the corporation manager can approve wage increases upto 25 percent of his salary. But the wage increases should not exceed 150 Birr. If the employee receiving the promotion earns more than 700 Birr, all the necessary documents should be provided to the Ministry of Industry for approval. The above promotion must firstly be approved by the promotion committee of the industry and the corporation.

The collective agreements also directly affect the wages and other benefits of the employees in the industries. The agreements cover the growth of the undertakings, the type of trade union, the length of the agreements, the type of compensation for industrial injury, whether uniforms are issued or not, hours of work, probationary periods, disciplinary procedures, sick leave, maternity leave, wage increases and other benefits. The emphasis here is on the wage increases and other benefits of workers specified in the various collective agreements.

The increments in wages of the workers in the textile industry apply only to individuals who fall within the specified salary bands of the collective agreements and not to occupational wage rates as such. All the collective agreements must be approved by the Ministry of Industry and Ministry of Labour. The permitted wage increases, according to the directive of the government since 1981 has been 7 percent (5+1+1); whether the industry gets the permitted wage increase or less depends on the production, profit and labour productivity of the industry. The performance of the industry is assessed by the management and the labour union. The Labour union has to submit the wage increases approved by both groups to the Ministry of Labour. The Ministry of Labour then evaluates the proposed wage increase in contrast to the directives and objectives of the government, and if permitted, the wage increase would be clearly stated in the collective agreement. Table two indicates the wage increase in 1977 E.C. in the state-owned textile industries.

Table 2

Permitted Wage Increase in the State-owned
Industries in 1976 EC (in Percentage)

Name of Industry	Total Wage Increase	Break-down Wage Increase		
		Increase in Productivity	Increase in Profit	Increase in Production
Asmara Textile Factory	5%	-	-	5%
Adey Ababa Cotton Factory	5%	-	-	5%
Akaki Textile Factory	7%	1%	1%	5%
Asmara Sack Factory	7%	1%	1%	5%
Asmara Sweater Factory	7%	1%	1%	5%
Bahir Dar Textile Factory	6%	-	1%	5%
Meher Fiber Factory	7%	1%	1%	5%
Debre Berhan Wool Factory	7%	1%	1%	5%
Dire Dawa Textile Factory	7%	1%	1%	5%
Ethiopian Fibrics	7%	1%	1%	5%
Ethiopian Thread Factory	7%	1%	1%	5%
Augusta Garment Factory	7%	1%	1%	5%
Ethiopian Textile Industry	6%	1%	-	5%
Progress Cotton Factory	5%	-	-	5%
Ethiopian Fiber Factory	7%	1%	1%	5%

Source: National Textiles Corporation.

The above table depicts that production has increased in all industries. Four enterprises did not get the 1% increment as a result of decreased labour productivity. Profit decreased in four industries and the industries failed to obtain the 1% increase. In three industries, both profitability and labour

productivity decreased and these industries got the 5% wage increase due to increased production. Two industries got 6% wage increment and the rest received 7% wage increment. The 5 percent wage increase in all the textile industries might not necessarily indicate a real increase in production. The reason for this is that, there could be external problems to the industry, such as shortage in raw materials, fuel power, etc. Such problems are taken into account when the Ministry of Industry assesses the increase in production.

After a certain percentage, say 7% wage increase is permitted by the government, the question is, how do the industries allocate the permitted wage increase to the workers?. The labour union and the management would first calculate the 7% (permitted) of the total wage of the workers within the specified salary bands and then distribute this amount in such a way that the workers within the lower wage brackets receive the highest percentage of wage increment and those in the higher wage bracket get lower percentage of wage increment. The table below illustrates the percentage wage increase for specific wages in six industries.

Table 3

Percentage Wage Increase for Specific Wages
(in 6 industries) 1976

Wage	Bahir Dar(6%)	Adey Ababa(5%)	Ethiopian Thread(6%)	Progress Cotton(7%)	Meher (7%)	Akaki 7%
50	15.0	12.480	8.85	10.09	11.96	11.0
75	15.0	8.320	8.85	6.93	11.96	11.0
125	9.0	4.784	6.25	3.98	8.84	8.4
175	8.0	3.417	4.25	2.67	6.06	6.8
225	6.2	2.196	3.30	2.25	4.68	5.4
275	5.0	2.796	2.65	1.87	3.85	4.9
325	4.5	1.36	1.65	1.57	3.38	4.4
375	3.0	1.179	1.40	1.39	2.97	3.9
425	2.4	0.979	1.25	1.20	2.80	3.3
475	2.0	0.876	1.15	1.06	2.66	2.8
525	1.8	0.693	1.12	0.95	2.60	2.2
575	1.5	0.633	1.00	0.90	2.51	1.6
625	1.5	0.582	1.00	0.85	2.38	1.4
650	1.5	0.560	1.00	0.85	2.38	1.4

Source: The Collective Agreements of the Six Industries in 1976 EC.

Eventhough the percentage wage increase in table 3 indicates a higher rate for lower wages and a lower rate for higher wages, the rate in increment for similar wages vary from industry to industry. Workers who earned 50 Birr per month in 1976 at Bahir Dar Textile Factory received a 15 percent wage increase, while workers earning the same amount in Adey Ababa Cotton Factory, Ethiopian Thread Factory, Progress Cotton Factory, Meher Fiber Factory, and Akaki

Textile Factory received a wage increase of 12.48%, 8.85%, 10.09%, 11.96% and 11% respectively. Similarly, workers earning 650 in Bahir Dar, Adey Ababa, Ethiopian Thread, Progress, Meher, and Akaki Textile Factory obtained a wage increment of 1.5%, 0.56%, 1%, 0.85%, 2.38% and 1.4% respectively. The table, generally indicates that the percentage wage increases for the same salary varies very significantly from industry to industry.

Though table 3 indicates a higher percentage of wage increase for lower wages and vice versa in each industry, the actual wage increase does not necessarily show such a trend.

Table 4: Actual Wage Increase for Specific Wages in 1976EC (in Birr)

Wage	Bahir Dar	Adey Ababa	Ethiopian Thread	Progress	Meher	Akaki
50	7.50	6.24	4.425	5.45	5.98	5.5
75	11.25	6.24	6.6375	5.1975	8.97	8.25
125	11.25	5.98	7.8125	4.975	11.05	10.50
175	14.00	5.98	7.4375	5.3025	11.605	11.90
225	13.95	4.94	7.425	5.0625	10.53	12.15
275	13.75	4.94	7.2875	5.1425	10.5875	13.475
325	14.625	4.42	5.3625	5.1025	10.985	14.3
375	11.25	4.42	5.25	5.2125	4.1375	14.625
425	11.20	4.16	5.3125	5.1	11.9	14.025
475	9.50	4.16	5.6425	5.035	12.635	13.3
525	9.45	3.64	5.88	4.9875	13.65	11.55
575	8.625	3.64	5.75	5.175	14.4325	9.2
625	9.375	3.64	6.25	5.3125	14.875	8.75
650	9.75	3.64	6.50	5.525	14.47	9.1

Source: Computed by the Author from the Collective Agreements of 1976 E.C.

The above table is derived from table 3 in order to illustrate the actual wage increase for individuals in the six industries earning the same wage. Firstly, the workers receiving higher rates did not get higher wages in absolute terms. For instance, in Bahir Dar Textile Factory workers earning 50 Birr obtained 7.50 Birr wage increment, while workers earning 325 Birr and 650 Birr received 14.63 Birr and 9.75 Birr respectively. Such type of wage increase might not reduce the wage differential among workers in an industry.

Secondly, the absolute wage increase for workers earning the same amount of wages varies very significantly from industry to industry. This is shown by the fact that workers earning 325 Birr, in 1976 E.C, in Bahir Dar Textile Factory, Ethiopian Thread Factory, Progress Cotton Factory, Meher Fiber Factory and Akaki Textile Factory received a wage increase of Birr 14.63, 4.43, 5.36, 5.10, 11.14, and 14.63 respectively.

With such a treatment let us pass to see the differences in benefit obtained by workers in the different industries, based on their collective agreements.

Most of the items described in the collective agreements, such as status and scope of the agreement, obligation of the employee and the employer, probation, hours of work, annual leave, maternity leave, medical expenses, group insurance, safety devices, and uniforms are more or less

the same in all the industries, which are mainly based on the 64/68 Labour Proclamation. But there are differences in the collective agreements particularly on bonus, educational expenses, marriage leave, medical expenses for non occupational diseases, funeral expenses and the like.

Factories like Akaki Textile Factory, Meher Fiber Factory and Progress Cotton Factory provide monthly bonus to the workers. Akaki Textile Factory and Progress Cotton Factory provide a monthly salary and 9 days salary respectively as bonus, while Meher Fiber Factory gives bonus on the following conditions:

If profit is 60,000-200,000	9 days salary
" " " 200,001-300,000	15 days salary
" " " 300,001-400,000	20 days salary
" " " 400,001 and above	30 days salary

Bonus is not paid in Bahir Dar Textile Factory, Ethiopian Thread Factory, and Adey Ababa Cotton Factory.

Industries such as Akaki Textile Factory and Bahir Dar Textile Factory cover part or all educational expenses. Bahir Dar pays all educational expenses upto grade 6, while Akaki covers any educational level on the following basis:

<u>Employee's Wage</u>	<u>Percentage Covered</u>
Less than 100 Birr	80
101-200 "	75
201-450 "	50

The above educational expenses should not, however, exceed 180 Birr.

Medical expense coverage for non-occupational diseases varies from industry to industry. Akaki Textile Factory and Bahir Dar Textile Factory pay all medical expenses, while Progress Cotton Factory covers only 60% of the expense for employees earning less than 125 Birr per month, and 50% of the medical expenses which is stated in the 64/68 Labour Proclamation.

The money made available to the family of the worker for funeral expenses significantly varies in the industries. These expenses are Birr 500, 75, 125, 20 and 75 for workers in Akaki, Adey Ababa, Meher, Progress and Ethiopian Thread respectively. Moreover, although sick leaves and maternity benefits in the textile industries are based on the 64/68 Labour Proclamation, there is a slight variation in these benefits at Akaki Textile Factory.

FOOTNOTES

Chapter II

1. Proclamation No. 58 of 1944.
2. Revised Constitution of Ethiopia, 1955, Negarit Gazeta, 15th year, No.2
3. G.Graf Von Bandissin, "An Introduction to Labour Development in Ethiopia", Journal of Ethiopian Law, Vol. 11, No.1, Summer 1965, P. 103.
4. Order No. 23 of 1961.
5. Order No. 26 of 1962.
6. Decree No. 49 of 1962.
7. Order No. 267 of 1962.
8. Proclamation No. 210 of 1963.
9. Proclamation No. 302 of 1964.
10. Order No. 37 of 1964.
11. Proclamation No. 232 of 1966.
12. Order No. 320 of 1966.
13. Legal Notice No. 414 of 1971.
14. Legal Notice No. 414 of 1971.
15. International Institute for Labour Studies, Labour Problems in the Economic and Social Development, Working Paper No. 7, Nairobi, P.17.
16. Proclamation No. 64 of 1975.
17. Proclamation No. 222 of 1982.
18. ILO., JASPA, Socialism From the Grass Roots: Accumulation, Employment and Equity in Ethiopia, Vol. II, Working Paper 11, AA, September 1982, P. 30.
19. Proclamation No. 127 of 1977.

20. ILO, Report to the Government of Ethiopia on Labour Administration
(Mimeograph) Geneva, 1969, P.5.
21. International Institute for Labour Studies, Op. Cit., P.15.
22. See የሕብረ ተሰቦስ ዊት ኢትዮጵያ ጊ.ቡ.ጠ. የኢንዱስትሪ ግብር ተር
የአስተዳደር ስራ አጠራር ጠመሪያ፣ አ.አ.፣ የካቲት 1974 ዓ.ም.

CHAPTER III

Inter-Industry and Intra-Industry Wage Differential in the State-Owned Textile Industries

3.1 The Role of State-Owned Textile Industries in the Overall Economy

Ethiopia is basically a rural economy. In 1981/82, industrial production accounted for only 17 percent of the GDP and the manufacturing sector for only about 7 percent. Employment in the manufacturing sector may be less than 1 percent of the labour force. Out of the manufacturing industries, the publicly-owned industries accounted for 90 percent of production and 87 percent of employment.¹

Most of the state-owned industries, which are now under the control of the Ministry of Industry, were nationalized in 1975. The industries are now organized under 13 corporations and 5 share companies.

The textile industry is one of the leading manufacturing industries in Ethiopia. Its contribution in terms of employment, gross value of production, investment and wages and salaries **within** the manufacturing sector is very significant.

Table 5

Estimated Employment, Gross Value of Production, Wages and Salaries, and New Capital Expenditure of the Textile Sub-Sector as Percentage of the Entire Manufacturing. (1964/65 - 1982/83)

Year	Employment	Gross Value of Production	Wages and Salaries	New Capital Expenditure
1964/65	33.3	28.5	28.2	20.9
1965/66	40.2	29.3	30.8	19.2
1966/67	41.6	28.9	30.4	27.2
1967/68	44.6	33.7	33.5	17.7
1970/71	48.3	35.3	39.3	N.A.
1971/72	44.1	33.1	32.4	33.7
1972/73	43.6	31.1	30.7	18.4
1973/74	41.1	30.9	32.2	45.2
1974/75	39.8	31.9	37.7	30.3
1975/76	44.0	28.5	32.2	31.0
1976/77	43.9	26.2	35.1	10.1
1977/78	43.3	23.8	30.5	23.5
1978/79	37.1	19.8	27.3	18.5
1979/80	38.2	19.7	32.7	16.4
1980/81	37.2	17.6	32.6	32.2
1981/82	38.6	16.4	33.2	35.4
1982/83	38.5	15.4	32.4	11.0

Sources: C.S.O., Statistical Abstract and Results of the Survey of Manufacturing Industry; AID Bank; World Bank Tables.

The above table depicts that the textile industry is an important sub-sector in the manufacturing industry in terms of employment, gross value of production, wages and salaries,

and new capital expenditure. The distribution of the wages and salaries in the textile industry is shown in the following table.

Table 6

Distribution of Permanent Employees in Selected Textile Industries by Income Groups in Percentage (Public and Private). 1979-1980.

Income Group	Public (%)	Private (%)
Under 99	86.8	51.9
100 - 299	10.9	45.1
300 - 499	1.4	0.4
500 - 699	2.8	0.6
700 - 999	0.4	0.4
Over 1000	0.2	0.2

Source: C.S.O., Results of the Survey of Manufacturing Industries.

About 87 percent of the employees in the publicly-owned textile industries earn less than 100 Birr. From the above table, the presumption that private wages are lower than public ones is weakened. The private sector has a lower proportion of workers receiving less than 100 Birr per month than the public sector; and it has correspondingly a higher proportion earning between 100 and 500 Birr per month.

There are 19 state-owned textile industries under the National Textile Corporation. These industries constitute 97 percent of value added, 98 percent of gross value of production, 98 percent of total employment and 40.1 percent of the number of establishments of the entire textile sub-sector in 1981/82.

The age of the state-owned industries varies from 47 years (Dire Dawa Textile Factory) to one year (Kombolcha Textile Factory). The capital advanced at the year of establishment also varies from 50,000 Birr, in Ethiopian Textile Factory (1964) upto 222,000,000 Birr, in Kombolcha Textile Factory (1985). The year of establishment, initial capital, number of employees at the starting point of the factory and the spatial distribution of the 19 state-owned textile factories is shown in the following table and map.

Table 7

Year of Establishment, Initial Capital, and Number of Employees During the Establishment of the State-owned Textile Industries.

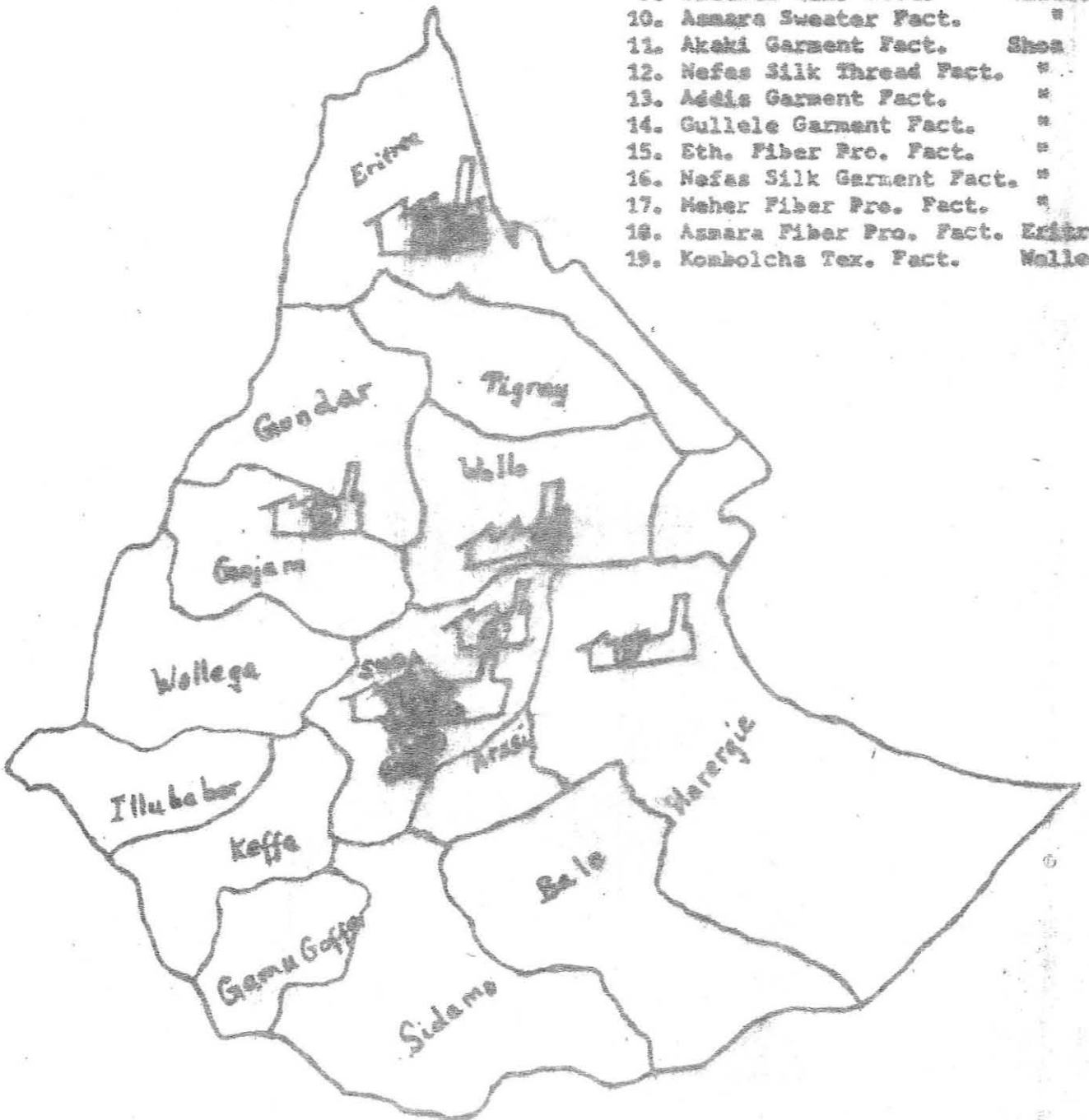
No.	Name of Factory	Year of Establishment (G.C.)	Initial Capital (Birr)	No. of Employees
1.	Dire Dawa Textile Factory	1939	500,00	400
2.	Akaki Textile Factory	1954	1,125,000	500
3.	Bahir Dar Textile Factory	1962	1,650,000	552
4.	Asmara Textile Factory	1954	1,200,000	250
5.	Ethiopian Textile Factory	1964	50,000	500
6.	Adey Ababa Yarn Factory	1961	1,200,000	631
7.	Edget Yarn Factory	1954	500,000	600
8.	Debre Berhan Blanket Factory	1963	2,800,000	68
9.	Akaki Garment Factory	1968	600,000	120
10.	Eritrean Textile Factory	1964	900,000	N.A.*
11.	Asmara Sweater Factory	1954	1,000	10
12.	Addis Garment Factory (Augusta)	1953	201,000	69
13.	Addis Garment Factory (Nefas Silk)	1984	800,000	134
14.	Ethiopian Fiber Products Factory	1941	499,000	200
15.	Meher Fiber Products Factory	1947	2,000,000	250
16.	Asmara Fiber Products Factory	1958	1,250,000	246
17.	Gulele Garment Factory	1983	1,600,000	420
18.	Nefas Silk Thread Factory	1967	800,000	120
19.	Kombolcha Textile Factory	1985	222,000,000	1080

Source: National Textile Corporation.

* N.A. Not available.

Figure 1
REGIONAL DISTRIBUTION OF TEXTILE
FACTORIES

NAME OF THE FACTORY	REGION
1. Dria Daw Tex. Fact.	Hareghe
2. Akaki Tex. Fact.	Shoa
3. Bahir Dar Text. Fact.	Gojam
4. Asmara Tex. Fact.	Eritrea
5. Ethiopia Tex. Fact.	"
6. Adal Aheba Yarn Fact.	Shoa
7. Edjat Yarn Fact.	"
8. D. Berhan Blanket Fact.	"
9. Eritrea Tex. Fact.	Eritrea
10. Asmara Sweater Fact.	"
11. Akaki Garment Fact.	Shoa
12. Nefas Silk Thread Fact.	"
13. Addis Garment Fact.	"
14. Gullele Garment Fact.	"
15. Eth. Fiber Pro. Fact.	"
16. Nefas Silk Garment Fact.	"
17. Maher Fiber Pro. Fact.	"
18. Asmara Fiber Pro. Fact.	Eritrea
19. Kombolcha Tex. Fact.	Wollo



The above table indicates the wide differences in the age of the industries, initial capital and number of employees during their establishment. Moreover, there is an uneven distribution of these industries in the country. Eleven industries are located in Shoa Administrative Region, five industries in Eritrea, and the rest three industries are located in three administrative regions, namely, Wollo, Gojam and Harerghe.

3.2 Inter-Industry Wage Differential in the Sub-Sector

Wage differential depends not only on the type of work performed and institutional variables, but also often on the type and size of industry. Lack of data prevents an examination of inter-industry skill differentials in the textile industry. Instead, we have to rely on the average wage paid in different industries.

The principal measure of dispersion employed in studies for inter-industry wage differentials is the coefficient of variation - the ratio of the standard deviation of wages divided by the mean level of wages. The following table will help us to examine the wage differential between industries before and after the revolution.

Table 8

Average Yearly Wages in the Textile Industries
1965, 1971 and 1976 E.C. (in Birr)

Industry	1965 E.C.	1971 E.C.	1976 E.C.
Ethiopian Textile Industry	614	710	1891.46
Ethio-fil Spinning Plant	626	610	
Edget Yarn Factory	776	1160	1852.32
Adey Ababa Yarn Factory	783	1556	2693.85
Negas Silk Thread Factory	868	1262	1850.34
Asmara Textile Factory	932	1450	1789.18
Debre Berhan Blanket Factory	1070	1832	1936.85
Akaki Textile Factory	1092	1807	2703.80
Addis Garment Factory (Augusta)	1116	1883	1880.70
Dire Dawa Textile Factory	1214	2025	2605.60
Baher Dar Textile Factory	1215	2329	3633.31
Akaki Garment Factory	1348	1009	1323.00
Ethiopia Textile Factory	1647	880	1530.57
Asmara Sweater Factory	1812	1450	2127.52
Ethio-Japanese Nylon Textile Factory	2112	3442	
Addis Garment Factory (Nefas Silk)	-	-	1850.34
Gulele Garment Factory	-	-	1331.75
Ethiopian Fiber Products Factory	-	-	1884.40
Meher Fiber Products Factory	-	-	2384.40
Asmara Fiber Products Factory	-	-	1602.80
Mean yearly wages	1148.33	1595	2099.04
Coefficient of Variation	37.7%	46.9%	27%

Source: National Textile Corporation

The mean wage in the state-owned industries increased from 1148.33 (1965) to 1595 (1971) and to 2099 (1976) per year. The coefficient of variation indicates a substantial increase in the inter-industry wage differential within the sub-sector. The coefficient of variation increased in 1971 E.C. (46.9%) as compared to that of 1965 E.C. (37.7%). The table also shows a substantial decline in the coefficient of variation to 27% in 1976 E.C. The increase in the coefficient of variation from 37.7% (1967) to 46.9% (1971) is very striking, ie, while the objective of the government had been to minimize the inter-industry wage differential, after the revolution, the data reveals the opposite direction.

A close scrutiny of the average wages of 1965 and 1971 could give us hints for the cause of such a marked increase in the coefficient of variation. After the revolution one expects the mean wage to increase due to the rise in the minimum wage to 50 Birr and a 15 percent wage increase in earnings of workers getting 50 to 450 Birr in 1969 E.C. But the mean wages in Ethio-fil Spinning Plant, Ethiopian Textile Factory, Asmara Sweater Factory and Akaki Garment Factory have declined. The reason for this decline was the fact that, the highly skilled workers in the industries, particularly foreigners, earning high wages left their jobs, and consequently resulted in a decrease in mean wages. On the other hand, there is a significant rise in mean wages, in the rest of the industries, due to the setting of the minimum wage, the permitted

wage increase, and shift to piece wage system in some industries. Such a decline and a rise in the mean wage increased the coefficient of variation in 1971 E.C. It is also evident from the above table that the coefficient of variation declined substantially to 27% in 1976 when things were normalized.

The coefficient of variation of the textile industry in 1971 (46.9%) was very much higher than the coefficient of variation for the whole manufacturing sector which was 28% (based on C.S.O. data) and 36% (based on SSI data).²

Table 8 indicates the existence of mean wage differential among the state-owned textile industries. The question is, what are the possible sources of inter-industry differential? Studies in both developed and developing countries have found a fairly strong relationship between firm size and wages.³ The attempt here is to examine the relationship between mean wage and factory size in these industries. Factory size is measured in terms of employment, fixed assets, production, profit and other variables.

The method of analysis initially utilized to examine the relationship between mean wage and the size of industry (in terms of the number of employees, production, total fixed assets, and profit) is multiple regression with continuous regressors. Since linear relationship is assumed, a linear equation of the form:

$$Y = a + \sum_{i=1}^4 b_i X_i + \mu \dots\dots\dots(3.1)$$

Where y = is the dependent variable, which is the average yearly wage per worker.

X₁ = Production

X₂ = Employment

X₃ = Fixed assets

X₄ = Profit

and, b₁, b₂, b₃, and b₄ are coefficients

was fitted in the Cross sectional data (for data base on the regression see appendix II). Consequently, the result obtained is:

$$Y=1475.59+0.52776X_1-0.071098X_2-0.0313936X_3-0.133689X_4\dots\dots(3.1a)$$

(.0329) (.2468) (.0186) (.1025)

R² = .5480 F ratio = 3.941

The correlation matrix and other multi-collinearity tests suggest a serious multi-collinearity among the three independent variables (X₁, X₃, and X₄). The reason for such multi-collinearity is that these variables are describing related dimensions of the same phenomenon. The principal component method is utilized as a solution to the incidence of multi-collinearity.

The method of principal component is a special case of the more general method of factor analysis. Factor analysis is the attempt, based on statistical observation, to determine the quantitative relationship between variables, where the relationships are due to separate conditioning

factors, or general causal factors. By relationship is meant a certain pattern of motion between two or more of the variables under explanation. Such a pattern of motion is expressed in coefficients or percentages which indicate to what extent the variances of the variables in question are influenced by a certain causal factor. This factor is common to the variables which form part of a specific motion.⁴

With the principal component method, we construct some artificial orthogonal variables (form linear combination of X's). We thus transform the multicollinear X's in orthogonal variables. The transformation provides a defensive solution to the multicollinearity problem because in this case we achieve a meaningful reduction in the parameters of the original model.⁵ The Priston University Package available at A.A.U. Computer Center was used to process the data. Employment (X_2) variable was withheld from the principal component analysis and inserted directly into the regression equation, the results obtained are as follows:

$$Y=1483.17-0.071099X_2+0.020391P_1-0.120843P_2+0.008908P_3\dots(3.2)$$

(.2468)	(.0204)	(.0966)	(.0051)
---------	---------	---------	---------

$R^2=.5480$ F ratio= 3.941

The employment variable in the above equation is insignificant ie, the decrease or increase of the size of employment does not have significant relation with the mean wage in the state-owned textile industries. On the other hand, the other variables (production, size of fixed assets

and profit) jointly influence the mean wages. As measured by the percent explained, the above regression analysis (1b) is fairly successful. The variables explained about 54% of the variation in mean wages.

3.3 Inter-Personal Wage Differential in the State-Owned Textile Industry

The preceding section presented a quantitative discussion on the distribution of mean wages among the state-owned textile industries. In this section an attempt is made to explore the personal wage differences within the industries.

Table 9

Percentage of Employees in the State-Owned Textile Industry by Wage Group(1975 E.C.).

Wage Group	No.of Employees	%	Wage Group	No.of Employees	%
50 - 99	15301	49.3	750 - 799	37	0.1
100 - 149	6434	20.7	800 - 849	15	0.05
150 - 199	3970	12.8	850 - 899	22	0.1
200 - 249	2893	9.3	900 - 949	15	0.05
250 - 299	951	3.1	950 - 999	13	0.04
300 - 349	535	1.7	1000 - 1049	5	0.02
350 - 399	327	1.1	1050 - 1099	6	0.02
400 - 499	90	0.3	1200 - 1299	10	0.03
500 - 549	66	0.2	1300 - 1399	5	0.02
550 - 599	50	0.2	1400 - 1499	7	0.02
600 - 649	34	0.1	1500 - 1599	1	
650 - 699	34	0.1	1600 - 1699	1	
700 - 749	32	0.1	1700 & above	1	

Source: National Textile Corporation

The wage distribution data presented in table 9 shows that about 50 percent of the employees earn less than 100 Birr per month. About 82 percent of the total employees in these industries receive less than 200 Birr per month. On the other extreme, about 8 percent of the total employees receive more than 300 Birr per month.

The wage differential within an industry could be crudely illustrated using the range. The minimum wage in the state-owned industries is defined as 50 Birr per month. This minimum wage varies from 16.5 percent to 59 percent of the average wage in the textile industries. The worker earning the highest wage at Debre Berhan Wool Factory earns 40 times the minimum wage and 12 times the average wage.

Since it is difficult to deal with the distribution of wages in each factory, six factories were selected from the state-owned factories utilizing stratified simple random sampling (See Appendix i for the detail on sampling).

The inter-personal wage differentials in the six textile industries are shown in the following standard deviation, coefficient of variation, Lorenz Curve and Gini Coefficient (See Appendix iii for the definitions).



Table 10

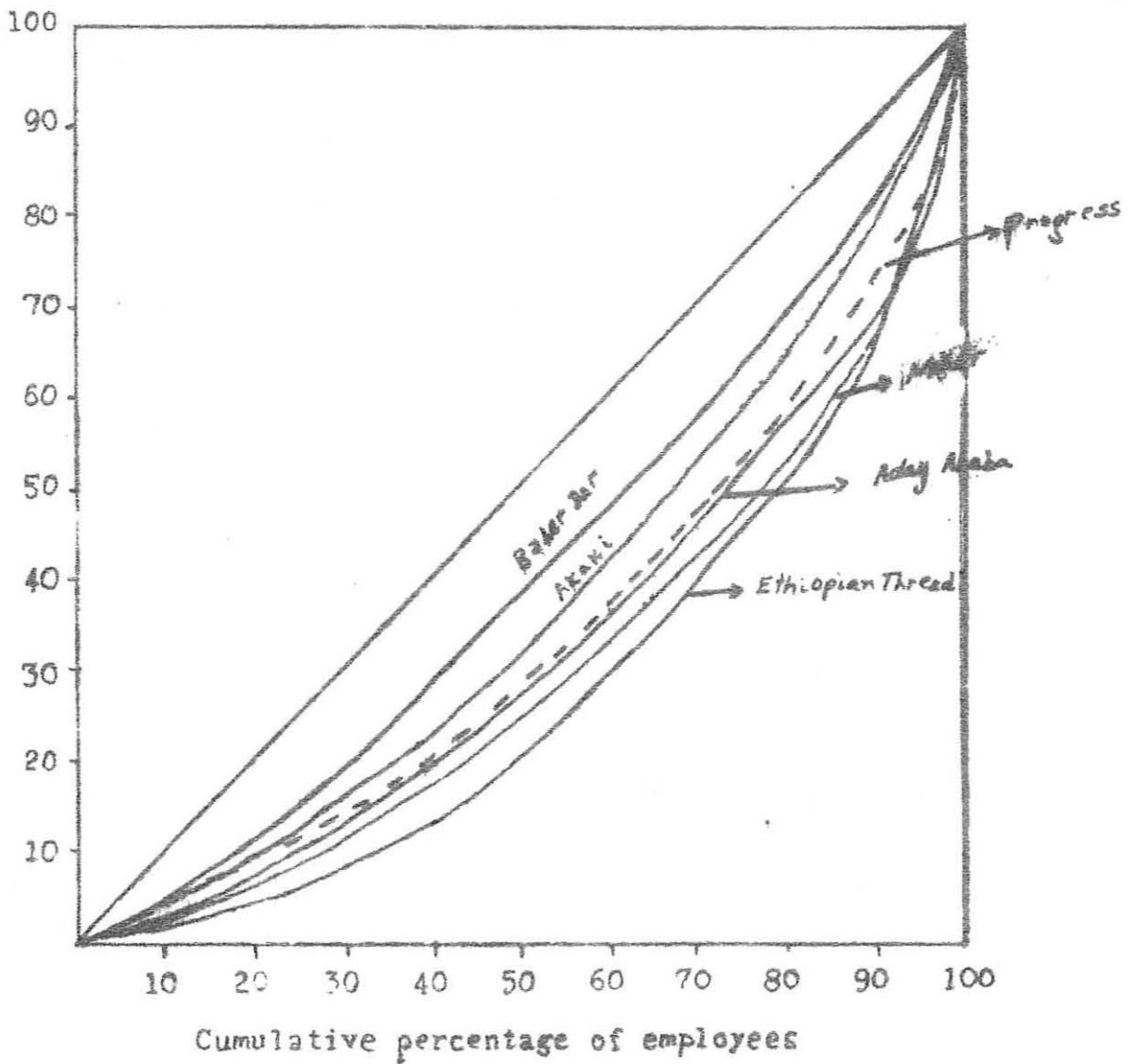
Standard Deviation (σ), mean and Coefficient of Variation (C.v) of the Total Population in the Six State-owned Textile Industries (1978 E.C.)

Industry	σ	c.v.	Mean
Aday Ababa Cotton Factory	108.48	.97	111.9
Baher Dar Textile Factory	101.82	.44	232.4
Progress Cotton Factory	111.91	.97	115.4
Ethiopian Thread Factory	132.42	1.08	122.6
Meher Fiber Factory	87.84	.89	98.7
Akaki Textile Factory	99.12	.62	159.9

Using the wage data from the six state-owned industries have computed the standard deviation and the Coefficient variation. Table 10 shows the existence of inter-personal wage differential in the state-owned textile industries. Moreover, the inter-personal wage differential varies from one industry to another industry. For instance the coefficient of variation in Bahar Dar Textile Factory (44%) is smaller compared with the Ethiopian Thread Factory (108%) and the rest of industries. The inter-personal wage differential could also be illustrated using the Lorenz curve and the Gini coefficient as follows:

Cumulative
percentage
of wage bill

Figure 2



"Lorenz" Curve of Employees Wage Distribution
in Six Textile Industries.

Figure 2 is a graphic presentation of the wage distribution in terms of the Lorenz Curve. The cumulated wage shares have been plotted on the vertical (y) axis against the corresponding cumulative frequency of employees on the horizontal (x) axis.

By definition, we have perfect equality if every income receiving unit gets the same income. In this extreme case, the Lorenz Curve will be a straight line, coinciding with the diagonal. If there is any inequality, then the curve would lie below the diagonal, at least from a certain point. Curves lying to the extreme right of the egalitarian line, by definition of convexity, signify a greater wage inequality. It can be seen that the curves in figure 1 take their position to the right of the egalitarian line.

The Lorenz Curve of the Ethiopian Thread Factory lies to the extreme right of the egalitarian line. To the left of this curve is the Progress Yarn Factory, and the closest curve to the egalitarian line is the Bahir Dar Textile Factory. The economic interpretation of these curves is that, distribution of wages is more equitable at Bahir Dar Textile Factory as compared to the other industries under consideration.

The use of the Lorenz Curve for comparison purposes is limited. In fact, Lorenz himself recognized the possible ambiguity in comparing two curves of varying distributions particularly if intersected. Therefore, it would be difficult to compare the remaining curves of the state-owned textile industries.

The income concentration ratio play a decisive role in overcoming the problem of intersecting curves, and in making it possible to draw firm conclusions about the trend of wage distributions.

Table 11

Concentration Ratios (G) of the Six State-Owned Textile Industries

Industry	G
Adey Ababa Cotton Factory	0.637
Baher Dar Textile Factory	0.188
Progress Cotton Factory	0.681
Ethiopian Thread Factory	0.676
Meher Fiber Factory	0.764
Akaki Textile Factory	0.245

A remarkable difference in the concentration ratios is observed in table 11. The concentration ratio for Baher Dar Textile Factory is 0.188, while for Meher Fiber Factory is 0.763. The afore-mentioned Lorenz Curves and concentration ratios indicate the existence and the degree of inter-personal wage differentials in the state-owned textile industries.

In the light of the existing wage disparities within industries, it may be asked whether any simple relation exists between the wage distribution, and the educational, experience and age distribution in these industries. This could provide a starting point for the explanation of the determinants for the inter-personal wage differential in these industries.

Table 12

Age Distribution of Employees in the State-Owned
Textile Industries (1976 E.C.)

Age Group	Male	Female	Total	Percent
50 - 54	707	158	865	2.9
45 - 49	1456	509	1965	6.5
40 - 44	1763	850	2613	8.6
35 - 39	2520	1814	4334	14.3
30 - 34	2835	2940	5793	19.1
25 - 29	2929	3450	6379	21.0
20 - 24	2930	3070	6600	21.0
15 - 19	735	1054	1789	5.9

Source: National Textile Corporation.

The age distribution in table 12 clearly shows that 67.8 percent of the employees are below 35 years of age. And 2.9 percent of the employees are beyond the age of 50.

Table 13

Distribution of Experience of Employees in the
State-Owned Textile Industries (1976 E.C.)

Experience	No. of Employees	Percent
More than 40	2	
35 - 39	30	0.1
30 - 34	404	1.3
25 - 29	525	1.7
20 - 24	2639	8.5
15 - 19	4448	14.4
10 - 14	5895	19.1
5 - 9	8005	25.9
0 - 4	8946	29.0

Source: National Textile Corporation

Table 13 gives the experience of workers in the state-owned textile industries. The distribution shows that 3.1 percent of the workers have served in the industries for more than 25 years. Employees with less than 10 years service accounted for 55 percent of the workers.

Table 14

Educational Distribution of Employees in the State-Owned Textile Industries (1976 E.C.)

Level of Education	No. of Employees	Percent
Reading and Writing	14,817	48.0
Elementary Education (1-6)	9,732	31.5
Junior Secondary (7-8)	3,090	10.0
Secondary (9-12)	2,151	7.0
Secondary Complete	471	1.5
Technical School Graduates	360	1.2
Commercial School Graduates	53	0.2
Poly-Technic Graduates	102	0.3
University Incomplete	17	0.1
University Complete	63	0.2
Masters Degree	14	0.04
Ph.D.	1	

Source: National Textile Corporation

The frequency distribution by educational level in table 14 shows that very few employees have passed the junior secondary level of education. About 80 percent of the employees in these industries have primary level of education.

Having established the existence of earnings gap, it would be necessary to ask what caused it. How much of this gap can be ascribed to the differences in experience and education. How much of the wage variation is explained by variables other than education and experience. The empirical analysis undertaken in the next chapter addresses these question.

FOOTNOTES

CHAPTER III

1. I.L.O., JASPA, Socialism from the Grass Root: Accumulation, Employment and Equity in Ethiopia, (Mimeograph) Vol. 1. (A.A. 1962) P. 126.
2. I.L.O., JASPA, Pattern of Industrialization and Impact on Employment and Income in African Countries: The Case Study of Ethiopia (A.A. 1963) P.66
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4. J.H.F. Schilderlinek, Factor Analysis Applied to Developed and Developing Countries (New York: John Wiley and Sons Inc. Co., 1964) PP 197-198.
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CHAPTER IV

DETERMINANTS OF INTER-PERSONAL WAGE

DIFFERENTIAL IN THE STATE-OWNED TEXTILE INDUSTRIES

The preceding section showed the existence of inter-industry and inter-personal wage differential and the factors influencing the mean wage variations in the state-owned textile industries. In what follows, an attempt is made to investigate the factors that influence inter-personal wage differential using econometric technique.

A number of variables, such as education experience within an industry, occupation, sector, location, marital status, experience out of the industry, sex, change of jobs, union power, etc., influence of the distribution of wages in the textile industry (the distribution of these variables in the sample survey is shown in appendix V). The use of multiple regression analysis will allow to separate the effect of a number of independent variables on the particular dependent variable.

The model used in this section is the Classical Least Squares Equation with both dummy and continuous regressors. The semi-logarithmic and linear equations are utilized as follows:-

$$Y = a + \sum_{i=1}^{22} b_i X_i + \mu \dots\dots\dots (4.1)$$

$$\ln Y = a + \sum_{i=1}^{22} b_i X_i + \mu \dots\dots\dots (4.2)$$

Where Y = wage (after tax)

X_1, X_2, \dots, X_{22} are variables which are dummies and continuous to explain Y. b_1, b_2, \dots, b_{22} are coefficients. μ is the random observed disturbance term

The variables:

Y is the dependent variable.

The independent variables are the following:

Sex	$X_1 = \text{Sex. 1 if female}$	0	Otherwise
Marital Status	$X_2 = \text{M.S. 1 if single}$	0	"
Age	$X_3 = \text{Age}$		
Education	$X_4 = \text{Edu.}$		
Elementary (1-6)	$X_5 = \text{Edu. 1, if primary}$	0	"
Junior Sec. (7-8)	$X_6 = \text{Edu.2, 1 if Secun.}$	0	"
Secondary (9-12)	$X_7 = \text{Edu 3, 1 if Secun.}$	0	"
Diploma & Cert.(13-14)	$X_8 = \text{Edu4, 1 if Cer. Dip.}$		"
Above Diploma (>14)	$X_9 = \text{Edu 5, 1 if above Dip.}$	0	"
Experience Within Ind.	$X_{10} = \text{Exp.}$		
1-3 years experience	$X_{11} = \text{Exp 1, 1 if 1-3 years}$	0	"
4-8 " "	$X_{12} = \text{Exp 2, 1 if 4-8 years}$	0	"
9-14 " "	$X_{13} = \text{Exp 3, 1 if 9-14 years}$	0	"
15-22" "	$X_{14} = \text{Exp4, 1 if 15-22 years}$	0	"
22-28" "	$X_{15} = \text{Exp 5, 1 if 22-28 years}$	0	"
Professional & Tech, Workers	$X_{16} = \text{Occ. 1, 1 if Prof.}$	0	"
Production & re- lated Workers	$X_{17} = \text{Occ.2, 1 if Prod.}$	0	"
Administrative & Manag. Workers	$X_{18} = \text{Occ.3, 1 if Adm.}$	0	"
Clerical & related Workers	$X_{19} = \text{Occ.4, 1 if Clerical}$	0	"
Service Workers	$X_{20} = \text{Occ.5, 1 if Service}$	0	"
Experience Outside Industry	$X_{21} = \text{Exp.6}$		
Changes of job.	$X_{22} = \text{C.J.}$		

The sub categories which have been excluded are:for sex, male;for martial status, the married;for education, the illiterate;for experience, above 28 years of experience and for occupation, the sales workers.

4.1 Empirical Findings of the sample survey

The Model which consists of both continuous and dummy regressors is estimated by Ordinary Least Square (OLS) for the whole sample and for the disaggregated samples. The above mentioned equations are tested to find the best statistical explanation of the variation in earnings. In this section, the estimation of the equations is performed using the P.Stat. 8 Package and Stepwise Regression², available at A.A.U. Computer Centre.

Table 15

Results with Education and Experience
as Continuous Variables

Variables	Linear Model		Semi-Logarithmic	
	Coefficient	Standard Error	Coefficient	Standard Error
Sex	-44.6330*	14.6071	-0.2102*	0.0541
M.S.	-41.9485**	18.3412	-0.1656*	0.0678
Edu.	24.2037*	1.8002	0.0917*	0.0067
Exp.	8.3916*	1.0123	0.0455*	0.0038
Occ. 1	41.3589	67.2055	-0.0070	0.1967
Occ. 2	-6.0686	66.9370	-0.2674**	0.1954
Occ. 4	-39.3904	71.2491	N.P.	N.P.
Occ. 5	-15.0476	73.0003	-0.1741	0.2237
Exp. 6	14.5030*	3.0668	0.0350*	0.0114
C.J.	12.2347***	9.0004	0.0851*	0.0336
Constant	-58.109		4.1208	
R ²	0.6804		0.6826	
\bar{R}^2	0.6673		0.6706	
F ratio	51.989		57.24	
N.	305		305	

* Significant at 1 percent level
 ** Significant at 5 percent level
 *** Significant at 10 percent level

The above results (for the whole sample) indicate that many of the variables used are significant. In the linear regression model, basic earnings are associated, on the average, with an extra 24.20 Birr for additional year of

schooling and with 8.39 Birr for each additional year of experience in the state-owned textile industries.

Since the dependent variable in the semi-logarithmic regression is in the natural logarithm (\ln), it is possible to interpret the variables as a percentage in the wage effect associated with a particular variable. Given the starting wage of 61.61 Birr, therefore, it could be said that each year of experience increases wage, on the average, by 4.6 percent, while each year of schooling raises it by 9.5 percent.

The variables of sex, marital status, experience outside the industry and change of jobs are also significant variables influencing the level of wages in these industries. In the linear regression model, out of the eleven variables used, five variables have coefficients that are significant at the 5 percent level and one at 10 percent level, while 4 are insignificant. In the semi-logarithmic model, out of the eleven variables, seven have coefficients significant at 1 percent level, one at 10 percent level, with the rest being insignificant. The Not Printed (N.P) indicates the variables tried but rejected by the programme on the basis of a partial F-test, with 95 percent confidence interval.

From the Multiple Correlation Coefficient (\bar{R}^2), we see that about 67 percent of the variation in wages in both equations is explained by most of the variables used.

In addition to the above analysis, we have tried to show a comparative picture of the explanatory power of schooling and experience in the Ethiopian State-Owned Textile Industry with that of advanced and developing countries in what follows.

Table 16

Comparative Performance of Experience (T) and Schooling (S) Variables in Different Countries

Country	Coefficient of (S) %	Coefficient of (T) %	R ²
U.S.A. (1960)	0.107	0.081	0.285
Britain (1972)	0.097	0.091	0.316
Malaysia (1970)	0.140	0.098	0.492
Uganda (1965)	0.135	0.134	0.540
Ethiopia (1972)	0.203	0.027	0.945
Ethiopia (1986) (Textile Industry)	0.092	0.046	0.486

Source:Malaysia:Anand, Inequality and Poverty in Malaysia, Table 7.1. Britain:Psachara poulos and Layard, "Analysis of the 1972 General Household Survey Data", P.492. United States:Mincer, Progress in Human Capital Analysis: Uganda:Knight, Determinants of Wages and Salaries in Uganda:Bulletin of O.U.I of E.and S., Vol.29, No.3 (1967) P.256. Ethiopia:Fassil G/K, Educational Outcome Measurement in Developing Countries, P. 126.

Table 16 indicates that schooling and experience appear to be important variables explaining wage variation in these countries. The Multiple Correlation Coefficients of Malaysia, Uganda and Ethiopia depict a stronger influence of the

independent variables (education and experience) on wages, as compared to that of Britain and the United States. In the above comparison, there are differences in sample size, sector and time of studies. Regardless of these differences, however, table 16 indicates the significance of education and experience in wage determination in the above mentioned countries.

Moreover, the above comparisons are made on the assumption that age and experience, more or less, explain the variation in income equally. When direct information on experience was not available, many U.S. studies have taken experience as age less the number of years in schooling, minus five. This implicitly assumes that the groups of individuals with a given level of education complete their education at the same age and enter the labour market without waiting period. Some studies in Ethiopia and other developing countries too considered age to estimate experience.

Such an approximation gives different results if one estimates the regression model separately by substituting age for experience. The difference is shown using the data from the state-owned textile industries in Ethiopia as follows.

$$Y = -238 - 19.0X_1 - 27.4X_2 + 3.8X_3 + 26.4X_4 + 16.2X_{16}$$

(14.7) (18.5) (1.0) (1.8) (52.4)

$$\begin{aligned} & -26.6X_{17} + 212.2X_{18} - 84.5X_{19} - 60X_{20} + 6.0X_{21} + 14.3X_{22} \\ & (52.2) \quad (67.2) \quad (56.7) \quad (59.5) \quad (5.0) \quad (8.9) \end{aligned}$$

$$\bar{R}^2 = .68 \quad F \text{ ratio} = 58.92$$

$$\begin{aligned} \ln Y = 3.3 - .10X_1 - .12X_2 + .04X_3 + .10X_4 + .03X_{16} \\ & \quad \quad \quad (.05) \quad (.07) \quad (.004) \quad (.007) \quad (.20) \end{aligned}$$

$$\begin{aligned} & -.21X_{17} + .20X_{18} - .12X_{19} - .24X_{20} - .003X_{21} + .03X_{22} \\ & (.20) \quad (.26) \quad (.22) \quad (.23) \quad (.01) \quad (.03) \end{aligned}$$

$$\bar{R}^2 = .64 \quad F \text{ ratio} = 51.26$$

The above results indicate that a unit change in education is followed by higher wage increment when compared with the regression results in table 15 (page 71). Moreover, the above regression equations have got better fit than the results of the regression equations in table 15.

The approximation of experience by age could be relevant in the developing countries. In this particular study on the state owned textile industries.

i) the respondents did not either know or tell their exact age.

ii) the age of entry to the job generally differs from individual to individual, and

iii) schooling while working in the industry (night school) is widespread.

Therefore, the conclusion that could be drawn from the above different results, it would be difficult to use age as a substitute of experience in Ethiopia.

The preceding discussion showed education and experience dominating the explanatory power of the model. The variables, education and experience were taken as continuous variables. Using such a continuous education and experience variables is of only limited value because it measures the average effect of additional schooling and experience over the entire spectrum of education and experience ie, the model assumes that every unit change in education results a change in wage. But in actual fact this might not be true. The wage increase in most of the cases could be a result of completing a certain level of education or a certain years of experience. It would be more useful to establish the amounts of additional wages which result from schooling and experience of different levels. In this section, multiple regressions with sets of dummy variables for the catagories of education, experience occupation, sex, martial status and continuous variables such as number of change in jobs and experience outside the industry are incorporated in the model to see the variation in wage. (The classes within each group are presented on page).



Table 17

Regression Analysis Results with Education and Experience as Dummies

Variables	Linear Model		Semi-log Model	
	Coefficient	Standard Error	Coefficient	Standard Error
Sex	-39.28217*	14.00366	-0.08694*	0.02385
M.S.	-20.73431	18.03598	-0.03771	0.03072
Edu 1	36.42426**	18.17403	0.09596*	0.03095
Edu 2	55.49945**	26.40587	0.11349*	0.04497
Edu 3	132.18753*	22.88841	0.27049*	0.03898
Edu 4	303.82837*	27.74959	0.54640*	0.04726
Edu 5	454.91187*	38.79344	0.59352*	0.06607
Exp 1	-48.65698	82.59407	-0.14987	0.14067
Exp 2	11.63752	79.70184	-0.03096	0.13578
Exp 3	29.27089	78.54625	0.04856	0.13373
Exp 4	94.37067**	79.27399	0.21303**	0.13501
Exp 5	170.95001**	81.27553	0.31609**	0.13842
Occ 1	29.16704	64.73015	0.02923	0.11024
Occ 2	-9.66495	64.49422	-0.07924	0.10984
Occ 3	213.90553*	78.41512	0.15130	0.13355
Occ 4	-24.97444	68.77232	0.02557	0.11713
Occ 5	-24.50734	70.29042	-0.07126	0.11971
Exp 6	15.34196*	2.94917	0.01795*	0.00502
Ch J	7.37010	8.72147	0.02992**	0.01485
Constant	59.72275		1.98651	
F-Ratio	83.326		31.425	
R ²	.7181		.6880	
\bar{R}^2 (adj.)	.6994		.6716	

* Significant at 1 percent level
 ** " " 5 percent "
 *** " " 10 " "

The above table again indicates wage as an increasing function of the categories of education. In both models, higher level of education result in higher wages. The difference between secondary and junior secondary level of education is higher than the difference between elementary and junior secondary level of education. Among the educational categories, Edu 5 (above diploma) has got the highest coefficient and primary education the lowest coefficient. The incremental effect the successive level of education could be shown as follows:-

Table 18

Differences in Values of Coefficients for
Successive Educational Categories

Educational Level	Linear Model	Semi-log Model
No schooling	base	base
Elementary (1-6)	36.42426	0.09596
Junior Secondary (7-8)	19.0752	0.11753
Higher Secondary (9-12)	76.68807	0.157
Post Secondary (13-14)	171.64079	0.27591
Post Diploma (above 14)	151.0835	0.14712

Both models reveal similar trend. After the elementary level of education the increments show an increasing tendency upto the level of post secondary (13-14) level. Eventhough there is an increase in wage as a result of after diploma level of education, wage increases at a decreasing rate.

The first three experience groups (1-3), (4-8) and (9-14) are insignificant. The coefficient of workers with experience of more than 22 years is higher than the coefficient of those with experience between 15 and 22 years.

Amongst all occupations, the administrative and managerial workers category is the only significant variable. The variation between occupations will be discussed when we fit separate regression for the different categories.

The coefficients for both sex and marital status in both models is with the expected negative sign. This is consistent when compared with similar research done elsewhere- the coefficient of sex is significant while marital status is not. The findings imply how the female workers in the textile industry are differentiated in terms of wage compared with the male workers.

Other important variables which influence wage in this study are experience outside the industry and number of change of jobs. One year experience outside the industry increases wage by 15.34 birr and one time change of job raise wage by about 3.0 percent.

The variables employed in the model explain about 70 percent of the variation in wage. Such R^2 (ie. 699 in the linear model and .672 in semi-log model) is very reasonable compared with other studies.³ The F test indicates significant overall relationships between wage and the independent variables in the study.

The coefficients of exp 1 (1-3), production and related workers, clerical and related workers, and service workers have negative signs implying lesser returns compared with the rest of the categories in their group. The coefficients of these groups are insignificant. The observed negative signs may be because of the lesser number of observations in each of these qualifications. However, it could also be that most of these incumbents may be young and recent entrants to the industries and hence may have less wage, *ceteris paribus* compared to all other qualifications.

When using a large number of variables especially as most of them are in the binary form, there is a likelihood of multicollinearity affecting the result. Several checks were made to detect its presence. First, an inspection of the correlation matrix (see appendix iv) for the independent variables showed that there was no cause for alarm. Second, some of the independent variables were regressed on the other independent variables to test for linear dependence. The R^2 was not more than .50. Third, the size of the regression coefficients was not changed much by the addition or deletion of variables from the regressions. We may conclude that multicollinearity doesn't affect the above results.

The size of the least squares coefficients in the classical linear model is not a reliable measure of relative importance of the independent variable in determining the variation in wage.

The size of these coefficients can easily be varied by changing the unit of measurement. I have chosen the Beta coefficient to measure the relative importance of the independent variables in influencing wage.⁴ The Beta coefficients are simply regression coefficients multiplied by the ratio of the standard deviation of an independent variable to the standard deviation of the dependent variable. The Beta coefficients for the models are shown in the following table.

Table 19

Beta Coefficient Results

Variables	Linear Model		Semi-log Model	
	B.coefficients	Rank	B.coefficients	Rank
Sex	.1059	9	.131469	8
Edu. 1	.1192	8	.1476745	7
Edu. 2	.0904	10	.1050962	9
Edu. 3	.2839	4	.3437474	3
Edu. 4	.5259	1	.5632162	1
Edu. 5	.4859	2	.3642427	2
Exp. 4	.2473	6	.3088462	5
Exp. 5	.3009	3	.3295896	4
Occ. 3	.1566	7		
Exp. 6	.2681	5	.18796	6
Ch. J			.1040776	10

In all the two regression models, post higher secondary education (13-14) Edu. 4, and above diploma level of education (above 14) Edu. 5, head the ranking. Thereafter the ranking shows higher secondary education, above 22 years

of experience, between 15 and 22 years of experience, experience outside the industry, elementary level of education, and change of jobs. In the linear model administrative and managerial occupation is ranked as the 7th important variable to explain wage. Thus, again we find that experience and education are the two important variables in affecting the level of wages in the textile industry.

4.2 Some Additional Findings

Separate regressions were fitted to see the influence of the variables explained earlier on the three categories of occupation ie. 1) Professional and technical related works, 2) Production and related workers, and 3) Administrative, managerial, clerical, sales service and related workers. The results are presented in the following tables.

Table 20

Results of the Sub-sample Regression. Professional and Technical Workers. (n=60)

Variables	Linear Model		Semi-logarithmic	
	Coefficients	Standard Error	Coefficients	Standard Error
Sex	54.21968	129.51927	.11841	.13451
M.S.	-33.51662	56.14178	-.04472	.06794
Edu. 1	-55.87454	69.30927	-.02409	.08268
Edu. 3	142.74146**	71.16579	.23124*	.08490
Edu. 4	259.06201*	69.74302	.83909*	.08320
Edu. 5	480.85693*	80.07053	.48916*	.09552
Exp. 1	-137.86903***	95.00098	-.00619	.09361
Exp. 2	- 40.98720	73.12996	N.P.	N.P.
Exp. 3	N.P.	N.P.	.01139	.08724
Exp. 4	100.80072	80.17212	.20623**	.09411
Exp. 5	212.10985*	77.84239	.39263	.09237
Exp. 6	17.76430*	6.27812	.02333*	.00749
CL.J.	8.88745		.02487	.02083
Constant	146.12372		2.08433	
F. ratio	7.330		7.369	
R ²	.6517		.6529	
R ² (adj.)	.5673		.5643	

When Education and Experience are Continuous Variables				
Sex	4.8258	114.6196	0.1368	.3255
M.S.	-18.0443	50.7987	-0.0618	.1443
Edu.	44.1433*	5.2135	0.1187*	.0155
Exp.	18.0683*	3.5156	0.0569	.1040
Exp. 6	13.9931*	5.6921	0.0339**	.0166
CL.J.	3.6474***	5.3888	0.0578***	.0446
Constant	-323.5417		3.7016	
R ²	.6681		.6507	
R ² (adj.)	.6306		.6104	
F. ratio	17.734		16.148	

Table 21

Results of the Sub-sample Regression. Production and Related Workers. ($n=202$)

Variables	Linear Model		Semi-logarithmic	
	Coefficients	Standard Error	Coefficients	Standard Error
Sex	-50.88834*	10.84544	-0.11050*	.02497
M.S.	4.16951	15.86632	.00399	.03652
Edu. 1	35.14706*	12.01536	.08691*	.02766
Edu. 3	86.34247*	16.75612	.20712*	.03857
Edu. 4	391.83619*	27.34485	.76016*	.06295
Exp. 1	-149.29007**	79.79326	-.43009*	.18368
Exp. 2	-126.29172***	77.97548	-.30899**	.17950
Exp. 3	- 87.30193	76.56516	-.16370	.17625
Exp. 4	- 24.93546	76.57436	-.00020	.17627
Exp. 5	24.59653	78.43050	.00020	.18055
Exp. 6	- 0.58277	4.76467	.06550*	.01097
CL.J.	27.49731**	14.54889	.03938	.03349
Constant	190.82686		2.17074	
F. ratio	26.204		23.571	
R^2	.6233		.5982	
R^2 (adj.)	.5994		.5727	

When Education and Experience are Continuous Variables				
Variables	Coefficients	Standard Error	Coefficients	Standard Error
Sex	-56.0192*	12.6399	-0.2698*	0.0610
M.S.	-33.2655**	18.3468	-0.1955**	0.0895
Edu.	17.3092*	1.7116	0.0851*	0.0083
Exp.	6.8025*	0.9201	0.0454*	0.0044
Exp. 6	- 2.3892	5.5442	0.0042	0.0268
Cl. J.	38.2739**	16.8140	0.1545*	0.0810
Constant	- 0.4473		3.9243	
R^2	.4601		.5224	
R^2 (adj.)	.4435		.5078	
F. ratio	27.834		35.736	

Table 22

Results of the Sub-sample Regression. Administrative Managerial, Clerical, Sales, Service and Related Workers. ($n=43$)

Variables	Linear Model		Semi-Logarithmic	
	Coefficient	Standard Error	Coefficient	Standard Error
Sex	-12.83173	40.28148	0.00313	0.05918
M.S.	-30.87595	53.35124	-0.03374	0.07840
Edu. 1	- 2.36869	146.71465	-0.17731	0.21559
Edu. 3	113.86848	141.66335	0.05882	0.20817
Edu. 4	272.66895**	145.10403	0.29014***	0.21423
Edu. 5	725.32861*	165.10403	0.61169*	0.24261
Exp. 1	87.11526	148.45926	0.18813	0.21815
Exp. 2	192.19676***	135.41704	0.33349***	0.19899
Exp. 3	193.72676***	137.26434	0.34247***	0.20170
Exp. 4	337.96240*	147.14140	0.51739**	0.21622
Exp. 5	396.14038**	196.32079	0.61339**	0.28848
Exp. 6	18.39969*	7.51551	0.02369**	0.01104
CL. J.	28.09554	25.85835	0.03168	0.3800
Constant	-143.81075		1.81662	
F ratio	9.493		6.624	
R^2	.8097		.7481	
R^2 (adj.)	.7336		.6473	

When Education and Experience are Continuous Variables				
Variables	Coefficient	Standard Error	Coefficient	Standard Error
Sex	- 60.1056***	42.7214	-0.1264	0.1185
M.S.	- 78.4264***	56.4662	N.P.	N.P.
Edu.	32.0621*	5.6059	0.1030*	0.0149
Exp.	15.0078*	4.6059	0.0457*	0.0117
Exp. 6	10.2143***	7.6230	0.0446**	0.0208
Ch.J.	64.4802*	23.9913	0.1412**	0.0670
Constant	-209.46		3.76215	
R^2	.6904		.7132	
R^2 (adj.)	.6388		.6745	
F. ratio	13.382		18.403	

The above three tables indicate the variation of wage, with respect to sex, marital status, education, experience within the industry, change of jobs and experience outside the industry in the three forms of occupational categories. Four separate regressions were fitted for each category of occupation. The regression results indicate a difference in the coefficients and in the multiple correlation coefficients.

Education does not equally explain the variation of wages in the three occupational groups. One unit change in schooling results in an increase of Birr 44.14 in wages to the professional and related workers, Birr 32.06 to the administrative, managerial, clerical, sales, service and related workers and Birr 17.31 to the production and related workers. The semi-logarithmic regression model indicates that each additional year in education for (1) the professional and technical workers (2) administrative, managerial, clerical, sales, service and related workers and (3) production and related workers increases wage by 11.97%, 10.30% and 8.51%, respectively.

The coefficients of experience within the industry show similar trend when they are compared with the coefficients of education in the mentioned occupational categories. Each year of experience would increase wages in (1) the professional and technical workers (2) administrative, managerial, clerical, sales, service and related workers and (3) production and related workers by 18.06 Birr, 15.01 Birr (4.6%) and 6.80 Birr (4.5%), respectively.

The above results reveal that the most paying occupation is the professional and related workers category while the least paying is the production and related workers category.

Sex is a significant variable in the production and related worker category and in the administrative, managerial, clerical, sales, service and related workers category. Experience outside the industry is not a significant variable in the production and related workers. And the variable in change of jobs is significant in all the three categories.

The above econometric models with sets of dummy and continuous variables have relatively good fits. The variables employed explain about 61 percent of the variance of wages in the professional and technical workers category. While 50 percent and 67 percent of the variation of wages in production and related workers category and administrative, managerial, clerical, sales, service and related workers respectively is explained by the variables in the regressions.

Again the influence of experience and education on wage in these three categories of occupation is high. The two variables alone explain 54 percent of the variation in wages for the professional and related workers category, 45 percent for production and related workers category and 42 percent for the administrative, managerial, clerical, sales, service and related category.

FOOTNOTES

CHAPTER IV

1. There is no rule on the number of categories of education and experience. The classification in this study is based on the educational and pay system of the country and the distribution of variables in the sector.
2. The stepwise regression package at the AAU Computer Centre begins by printing out the arithmetic mean and standard deviations of all variables and then calculates the simple correlation coefficients between all pairs of variables, including the dependent variable. It then enters into the regression equation, the independent variables and computes the regression equation. Next, it enters the independent variable with the next correlation coefficient, and in so doing computes the regression equation. It repeats this pattern for each independent variable until they are exhausted and, at every step, it accepts or rejects an independent variable on the basis of a partial F test with 95 percent confidence limits. The final equation may or may not include all the independent variables.
3. Our R^2 of 0.699 and 0.672 may be compared with the best R^2 achieved by other investigators of earning functions: M. Blaug, 0.512; Hansen, Weisbord, and Scanlon, 0.15; Bowles, 0.15; Weiss, 0.16; Reed and Miller, 0.18; Stroup and Hargrove, 0.24; Ashenfelter and Moong, 0.29; Griliches and Manson, 0.31; Hause, 0.34; Morgan and others, 0.35; Rogers, 0.40; Hanoach, 0.40; Hunt, 0.41; Hirsch and Segerlhost, 0.41; House, 0.46; Carroll and Ihnen, 0.55; Tolles and Helichar, 0.58; Larnoy, 0.79; Netcalf and Bibby, 0.80; and Thias and Carnoy 0.89 (See H. Plaug, *Op cit*, P. 18)
4. See A.S. Goldberger, *Econometric Theory* (New York: John Wiley and Sons Inc., 1964) PP. 197-198.



CHAPTER V

SUMMARY AND CONCLUSIONS

The scope of this study has been a fairly narrow one, namely, to identify inter-industry and inter-personal wage differentials and to explain the determinants of mean wages and individual wages in the state-owned textile industries. On the basis of the available data and the sample survey, the following are some of the summary results.

i) No government wages and incomes policy has been announced after the revolution. However, some directives of the government which directly affected wages were introduced.

- a) The introduction of minimum wages (50 Birr) in the publicly owned institutions.
- b) A uniform wage increase directives by the Council of Ministers to state owned enterprises excluding employees under the Central Personnel Agency.
- c) The Council of Ministers also issued the starting salary of new employees graduating from universities and colleges in Ethiopia and abroad.
- d) The establishment of a Wage Board to institute a uniform wage grading in the public sector.

These limited directives issued after the revolution, however, did not result in a radical institutional change for wage determination process in the Ethiopian publicly-owned textile industries.

ii) The distribution of the authorised percentage wage increases in the textile industries is inconsistent between industries. In spite of the fact that low wage earners are awarded higher percentage wage increase than employees earning higher wages, the actual wage increase is higher for employees in the middle wage bracket and sometimes it is highest for workers earning the highest wages. Moreover, the percentage wage increase for the same salary brackets varies significantly from industry to industry.

iii) The introduction of the minimum wage in the textile industry has got a negative repercussion on the wage grades immediately above it, particularly, in those textile industries where there were relatively lower wages. The implementation of minimum wage abolished the wage differential in the lower levels of the pay pyramid (or made it insignificant). This certainly has adverse effects on incentives in acquiring skill and assuming responsibility. Minimum wage should serve as the floor to wages, or taken as unity. Labour performed by more skilled workers should be weighted by appropriate wage coefficients based on the minimum wage.

iv) The analysis of wage variation among the state-owned textile industries tend to confirm that there are significant mean wage differentials between industries. The coefficients of variation 33.7% (1965 E.C.), 46.9% (1971 E.C.) and 27% (1976 E.C.) indicate the instability of the wage differential among these industries in the past decade.

v) The mean wage in the state-owned textile industries is influenced by the size of the industry measured in terms of production, size of fixed assets and profit. The findings of the study also reveal that about 55 percent of the mean wage variation is explained by the above mentioned three variables. Moreover, the study reveals that the size of employment does not have a significant influence on mean wages in these industries.

iv) The inter-personal wage distribution is highly skewed. On the other hand in some industries one observes a relatively higher equity in wage dispersion. Such inter-personal wage variation is a result of the inherited wage structure before the revolution. The only changes after the revolution are explained in (i).

vii) From our analysis of the determinants of wage distribution in the textile industry, we may conclude that the human capital variables (experience and education) explain large part of income differential as expected. The return of education and experience followed the same pattern in the three categories of occupation ie, 1) professional and technical workers, 2) production and related workers and 3) administrative, managerial, clerical, sales, service and related workers. Variables such as sex, marital status, experience outside the industry and change of jobs also influence the level of wages in these industries. The Beta Coefficients which show the relative importance of variables ranks them

in the following way 1st) higher secondary education
2nd) 22 to 28 years of experience 3rd) 15 to 22 years of
experience 4th) experience outside the industry 5th) sex
6th) junior secondary education and 7th) change of jobs.

One of the main objectives of the government at present
is social equality, ie, more equitable income distribution.
Obviously, an overall equality among persons of differing
skills and responsibilities is unattainable. Differences
in wages that are associated with differences in effort are
generally regarded as fair. The results of this study, however,
indicate higher wage differential among workers and industries.

To alleviate the above anomaly one needs

- a) to rationalize wage determination with a view
of ensuring equivalence between work done and
wages;
- b) the right proportion must be established between
the growth of wages and labour productivity;
- c) the reduction of inequity within industries
and between industries by properly treating
the complex problem of equity and incentives.

What type of wage policy should be adopted in Ethiopia
at present cannot, of course, be inferred wholly from this
study. But we could nevertheless state some of the basic
policies and identify areas for further research as follows:-

- 1) Introduction of wage policy which establishes a
wage structure based on the needs of the economy not only
for the textile sector but also for the whole economy. Such

a policy should allow the establishment of job classification which covers the whole public sector and determine wages by job content rather than individual characteristics which in other words means that it is the post and not the employee which is to be graded. There should be proper assessment of the work load for each grade. This type of a unified job grading and salary ranges will lead to stronger and better inter-relationships between manpower planning needs and the provision of educational and training facilities.

Difficult though this task will be, it is suggested that it is preferable to face it than to continue with the present situation where industries and government institutions have very considerable degree of freedom regarding their level of pay, so that there is undue divergence in the effective pay for similar types of jobs in different industries.

2) The distortions that have emerged in pay scales can not simply be eliminated by increasing wages. The increase in general level of pay must correspond with the increase in the productivity of labour, efficiency and equity objectives. If wage is going to be increased at present, it should be done on the basis of the thorough assessment of the present rates of pay and work loads of the various jobs.

3) Integrating wage policy into overall development policy:- proper coordination is needed between wage policy and policies such as monetary policy, investment policy, fiscal policy, pricing policy, etc.

4) Another suggestion is that more information on the structure of earnings in different sectors and survey of employees' earning by occupation is necessary to see how employees in similar jobs in different sectors of the economy are in line with each other. Occupational earnings and job content surveys are important to compare the job content of different individuals.

Appendix i

The non-centrality parameter method

$$F = \frac{PV_s / u}{PV_E / v} \quad (df = u, v)$$

Where, PV_s = The proportion of Y variance for by that source (s)

$$F = \frac{PV_s}{PV_E} \times \frac{v}{u} \quad (df, u, v)$$

PV_E = is the proportion of error (E) or residual variance

u = The number of independent variables for the source (degree of freedom for the numerator)

v = v is the number of degree of freedom for the error variance

$\frac{PV_s}{PV_E}$ = The measure of effect size (Es) in the sample which is f^2

Since the same F sampling distribution is used here as in the analysis of variance, the same effect size index, f , is employed. However, since multiple regression and correlation analysis system proceeds more naturally with PV_s , (ie squared correlation values), it is more convenient to work directly with f^2 rather than f .

$$f^2 = \frac{PV_s}{PV_E}$$

$$f^2 = \frac{R^2}{1-R^2}$$

If the above formula is inverted one obtains

$$R^2 = \frac{f^2}{1+f^2}$$

The determination of power as a function of other parameters is different from others. Whereas for the other tests, the power tables were entered with effect size index and sample size, Here, a function of these, L (the non centrality parameter), is used. This approach makes possible good coverage of the range of interest of the parameters using only three tables and does so at the cost of a very small amount of computation.³¹

L is a simple function of f^2 and the error
(denominator) df, v

$$L = f^2 v$$

Three tables prepared for this purpose yield power values for the
F tests on proportion of Y variance accounted the tables are with a, L
and u.

(i) Significance criteria (a) = .01, .05 and .10 respectively.

(ii) The non centrality parameter (b)

$$V = N-u-1$$

$$L = f^2 v$$

$$L = \frac{R^2}{1-R^2} \times (N-u-1)$$

$$V = \frac{L}{f^2}$$

$$N-u-1 = L \frac{(1-R^2)}{R^2}$$

$$N = L \frac{(1-R^2)}{R^2} + u + 1$$

To determine N, enter the table for the (a) specified in the row for
the number of independent variables, u, and the column for the desired
power, and read out L. L is then entered together with the alternate
hypothetical R^2 and u, and N is computed.

For this specific study the sample size is estimated using the non
centrality parameter as follows.

a) What is needed from the result of the study?

To determine whether the coefficients of the regression in the study or
significant or not.

b) Is there a similar type of research in the country or else where?. If yes what is the R^2 .

In Ethiopia the R^2 is .945. Researches elsewhere indicate R^2 from .98 up to .15. The relationship between R^2 and the sample size is inverse. i.e. when R^2 increases the sample size needed decreases. For this study the lowest $R^2 = .15$.

c) The level of significance 95 percent

d) The number of independent variables = 23

Given the above information one can plug these values in the above method and estimate the sample size.

$$a = .01 \quad u = 23 \quad R^2 = .15 \quad \text{power } .95$$

From the table at row $u = 23$, column power = .95

$L = 41.32$ Substituting in the formula

$$N = \frac{41.32 (1-.15)}{.15} = 28 + 1$$

$$N = 234 + 23 + 1$$

$$N = \underline{\underline{258}}$$

Appendix 11

Production, Sales, Cost, Total Employment, Wages, Assets,
and Profits in the State-owned Textile Industries

Industry	Production (['] 000) (Birr)	Gross Value of Sales	Industrial & non Industrial	Labour Cost (['] 000)	Total Employees	Average Annual Wage	Total Assets (['] 000)	Net Fixed Assets	Profit (['] 000)
1. Dirs Dawa Textile Factory	77016	93152	59740	16100	6179	2606	87331	30960	1892
2. Akabi Textile Factory	61914	73419	40385	17334	6411	2704	52008	12364	1478
3. Baher Dar Textile Factory	35850	38769	20754	11258	3098	3633	24429	3697	458
4. Amara Textile Factory	20018	19103	13553	4863	2718	1789	33956	4082	-3712
5. Adet Ababa Yarn Factory	25887	32459	23794	8986	2494	2649	37403	23738	-4125
6. Akaki Garment Factory	19669	23484	16165	2620	1323	2096	15364	1184	1538
7. Ethiopian Textile Factory	16301	11993	8495	1795	949	1891	14262	1897	538
8. Edget Yarn Factory	7183	9210	6109	1085	1077	1832	4169	485	-240
9. Debreberhan Blanket Factory	8725	10186	5922	1687	871	1937	11903	2030	273
10. Eritrea Textile Factory	7407	7648	4504	1477	965	1162	4805	742	-7
11. Addis Garment Factory (Augusta)	5015	8213	3926	741	394	1881	6456	640	982
12. Nefas Silk Thread Factory	3714	5921	4002	816	441	1850	3866	315	103
13. Asmera Sweater Factory	2144	2359	1031	634	298	2128	3211	254	209
14. Gulels Garment Factory	5631	5144	5097	582	422	1332	6589	1636	1015
15. Ethiopian Fiber Products Factory	13525	14754	8641	3373	1790	1884	15492	1617	1040
16. Meher Fiber Products Factory	10726	13600	8095	3382	1589	2384	12216	1867	715
17. Amara Fiber Products Factory	7893	12357	5095	1372	816	1603	12600	886	1388
18. Nefas Silk Garment Factory	2669	1504			152	1850	1808	975	206

Appendix iii

Lorenz Curve: this is a technique most commonly used to indicate the differences in the degree of inequality of different income distribution. It is a simple graphic device which depicts the relation between cumulative income shares and cumulative income receivers.

Gini coefficient (G) or concentration ratio is defined as the ratio of the area between the curve and the egalitarian line divided by the total area under the egalitarian line. The value of the concentration ratio varies from zero to one. For perfect equality Gini coefficient is zero and for perfect inequality Gini coefficient is one. The Gini coefficient may be approximated either (i) from the Lorenze Curve itself, (ii) from the mean differences or (iii) from Pareto's α . However, the estimation of the Gini Coefficient in this study mainly depends on the Lorenz Curve. In those cases where a table has been produced in order to graph the Lorenz Curve, it is simpler to use the following formula.

$$G = 1 - \sum (f_{i+1} + f_i) (y_i - y_{i+1})$$

Where G = Gini coefficient

f_i = the share of recipients in the i^{th} group.

y_i = the share of income of i^{th} group.

CORRELATION MATRIX

Appendix iv

- 100 -

VARIABLE NUMBER	1	2	3	4	5	6	7	8	9	10
1	1.000									
2	-0.292	1.000								
3	-0.002	0.023	1.000							
4	-0.265	0.080	-0.249	1.000						
5	-0.077	-0.062	0.170	-0.258	1.000					
6	-0.014	0.057	0.231	-0.399	-0.163	1.000				
7	0.431	-0.070	0.137	-0.294	-0.120	-0.187	1.000			
8	0.521	-0.141	0.066	-0.125	-0.065	-0.102	-0.023	1.000		
9	0.005	0.054	0.193	-0.095	-0.029	0.059	0.222	0.107	1.000	
10	0.116	-0.095	0.280	-0.186	0.049	0.110	0.162	0.159	-0.184	1.000
11	-0.184	0.069	-0.114	0.054	-0.060	0.095	-0.116	-0.114	-0.183	-0.304
12	-0.056	0.035	-0.171	0.154	-0.042	-0.118	-0.178	-0.096	-0.212	-0.374
13	0.164	-0.055	-0.165	0.027	0.013	-0.116	-0.018	-0.025	-0.122	-0.215
14	0.388	-0.327	0.099	-0.188	0.121	0.038	0.145	0.239	0.037	0.101
15	-0.460	0.206	-0.111	0.238	0.001	-0.111	-0.341	-0.242	-0.116	-0.160
16	0.381	-0.061	-0.023	-0.076	-0.050	-0.077	0.144	0.307	0.025	0.116
17	0.038	0.147	0.097	-0.210	-0.086	0.229	0.267	-0.053	0.140	0.157
18	0.117	-0.057	-0.041	-0.064	-0.026	-0.041	0.219	-0.016	-0.026	-0.046
19	-0.077	0.076	-0.033	0.148	-0.071	-0.033	-0.033	-0.044	-0.017	-0.072
20	0.487	-0.210	-0.053	-0.139	-0.012	-0.028	0.161	0.204	0.058	0.167
21	0.444	-0.157	0.037	-0.159	0.020	-0.059	0.147	0.309	0.111	0.222
VARIABLE NUMBER	11	12	13	14	15	16	17	18	19	20
11	1.000									
12	-0.354	1.000								
13	-0.213	-0.247	1.000							
14	-0.087	-0.108	0.089	1.000						
15	0.090	0.133	0.003	-0.078	1.000					
16	-0.086	-0.053	0.009	-0.076	-0.210	1.000				
17	-0.026	-0.116	-0.100	-0.131	-0.364	-0.040	1.000			
18	-0.046	0.124	-0.031	-0.040	-0.111	-0.012	-0.021	1.000		
19	0.059	0.061	-0.032	-0.108	-0.301	-0.034	-0.058	-0.018	1.000	
20	-0.029	-0.087	-0.117	0.377	-0.380	0.122	0.023	-0.037	0.014	1.000
21	-0.061	-0.049	-0.111	0.307	-0.348	0.251	0.040	-0.036	0.003	0.732
VARIABLE NUMBER	21									
21	1.000									

APPENDIX V

The distribution of variables in the sample survey

Sex

Female..... 102
Male..... 203

Martial Status

Single..... 63
Married..... 242

Education

Illiterate 50
Elementary (1-6)..... 118
Junior Secondary (7-8).... 29
Secondary (9-12)..... 61
Diploma (3-14)..... 38
Above diploma..... 9

Mean = 7

S.D = 4.87

Experience within the industry

Experience 1-3 years..... 29
Experience 4-8 years..... 65
Experience 9-14 years..... 71
Experience 15-22 years..... 90
Experience above 22 years..... 38

Mean = 13 years

S.D. = 7.42

Occupation

Professional and technical workers..... 60
Production and related workers..... 200
Administrative & Managerial workers..... 8
Clerical and related workers..... 20
Sales workers..... 2
Service workers..... 15

Change of Jobs

Those who changed jobs.....	30
Those who did not change jobs.....	225

Age

16 - 20	7
21 - 25	42
26 - 30	61
31 - 35	72
36 - 40	58
41 - 45.....	30
46 - 50.....	29
51 +	6

Mean = 34.34

S.D. = 8.76

Wage

50 - 100.....	92
101 - 200	83
201 - 300.....	55
301 - 400.....	25
401 - 500	14
501 - 600	16
601 - 800	9
801 - 1000.....	9
1001 +	2

Mean = 226.57

S.D. = 195.70

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