

AN ANALYSIS OF BASE WAGE RATES FOR  
SELECT BARGAINING UNITS IN  
BRITISH COLUMBIA

by

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## ABSTRACT

The purpose of this study was to explore, analyze and attempt to answer a series of questions involving changes in the negotiated base wage rates in three British Columbia Industries during the 1958-1969 time period. The three industries were the lumber and logging industry, the pulp and paper industry and the construction industry. Changes in the industry base wage rates were examined from the point of view of the bargaining units. In total seven bargaining units were included. One of the units represented the lumber and logging industry, another unit represented the pulp and paper industry and the remaining five units represented the construction industry.

The first question upon which the paper focused was how did the changes in the base wage rates compare with one another? After explaining the nature of the bargaining units and presenting the base rates, the base rates were then compared in both absolute and percentage terms. Among other results, it was found that the absolute base rate rankings remained unchanged during the 1958-1966 time period. But since that time the rankings and the relative positions of the construction industry bargaining units have changed quite markedly. It was also found that there was a positive correlation between the mean percentage increase in the base rate and the standard deviation of the base rates when all the industries were considered.

The second question of concern was how did the changes in the base wage rates move in relation to one another? The statistical tool of correlation

analysis was employed to find an answer to this question. The results of the analysis substantiated the often made assumption that the base rates in the lumber and logging and the pulp and paper bargaining units are closely related to one another. However the often made assumption that the base rates in the construction industry bargaining units are very closely related was not substantiated by the results of the correlation analysis.

The third question the paper focused on was how did the changes in the base wage rates move in relation to changes in select economic variables? The economic variables studied were the consumer price index, employment, unemployment, profits and productivity. As in the previous question, correlation analysis was employed to measure the relationships. In general the results of the analysis indicated that base rate changes move in close relation to changes in unemployment. The lumber and logging and the pulp and paper units correlated well with the equivalent year changes in unemployment. The construction industry units, on the other hand, correlated well with the one year lag changes in the unemployment variable. The results also indicated that the consumer price index variable correlated quite closely with most of the bargaining units. The other economic variables, in the majority of cases, showed weak or nonexistent relationships with base rate changes.

The final question upon which the paper focused was what was the explanation for the differences in the interindustry base wage rate changes? Five explanatory variables were considered. These were market or competitive conditions, productivity differences, differences in the degree of

concentration and unionization and differences in the proportion of labour costs to total costs. After a discussion of each of these explanatory variables it was concluded that the market or competitive conditions explain the differences in the interindustry base wage rate changes.

## TABLE OF CONTENTS

INTRODUCTION .....	1
CHAPTER I      THE BARGAINING UNITS- THEIR NATURE AND A COMPARISON OF THEIR BASE WAGE RATES .....	12
CHAPTER II     A CORRELATION ANALYSIS OF BASE WAGE RATES .....	37
CHAPTER III    A CORRELATION ANALYSIS OF BASE WAGE RATES AND SELECT ECONOMIC VARIABLES .....	51
CHAPTER IV     INTERINDUSTRY BASE WAGE RATE CHANGES - AN EXPLANATION .....	70
SUMMARY AND CONCLUSIONS .....	82
SOURCES CONSULTED .....	87
APPENDIX I .....	89
APPENDIX II .....	90

## LIST OF TABLES

Table		Page
I	Basic Hourly Wage Rate Data for the Forest Industrial Relations (F.I.R.) and International Woodworkers of America (I.W.A.) Bargaining Unit, 1958-1969 Inclusive.....	14
II	Basic Hourly Wage Rate Data for the Pulp and Paper Industrial Relations Bureau and the Pulp, Sulphite and Paper Mill Workers Bargaining Unit, 1958-1969 Inclusive....	17
III	Basic Hourly Wage Rate Data for the Amalgamated Construction Association and the Provincial Council of Carpenters Bargaining Unit, 1958-1969 Inclusive .....	20
IV	Basic Hourly Wage Rate Data for the Electrical Contractors Association and the International Brotherhood of Electrical Workers Local 213 Bargaining Unit, 1958-1969 Inclusive.....	22
V	Basic Hourly Wage Rate Data for the Master Painter Association and Painters, Decorators, and Paperhangers of America Local 138 Bargaining Unit, 1958-1969 Inclusive.....	23
VI	Basic Hourly Wage Rate Data for the Mechanical Contractors Association and the United Association of Plumbers Local 170 Bargaining Unit, 1958-1969 Inclusive....	25
VII	Basic Hourly Wage Rate Data for the Amalgamated Construction Association and the Construction and General Labourers Union Locals 602, 1070, 1093 and 169 Bargaining Unit, 1958-1969 Inclusive.....	27
VIII	Total Point Increases in the Indexes of Base Wage Rates for the 1958-1969 Period.....	34
IX	Mean Annual Percentage Increase in the Base Wage Rate and the Standard Deviation of the Percentage Increases in the Base Wage Rate for the 1958-1969 Period.....	35
X	Correlation Coefficients Between the Annual Percentage Change in Base Wage Rates, 1958-1969, for Select Bargaining Units.....	39

Table		Page
XI	Correlation Coefficients Between the Annual Percentage Change in Base Wage Rates and the Annual Percentage Change in Select Economic Variables, 1958-1959.....	58
XII	Total Point Increases in the Indexes of Base Wage Rates and the Mean Percentage Increase in the Base Wage Rate for the 1958-1969 Period.....	78



## LIST OF GRAPHS

Graph		Page
1	Basic Hourly Wage Rates for Selected Bargaining Units 1957-1969.....	29
2	Indexes of the Base Wage Rate for Selected Bargaining Units 1958-1969.....	32

## INTRODUCTION

The concept of a negotiated base wage rate will be the focal point for the remainder of this paper. This leads one to consider various questions. What is meant by the term base wage rate? How is a base wage rate determined? What is a negotiated base wage rate? What particular set of negotiated base wage rates will this paper be concerned with? One of the tasks of this introductory chapter is to answer these questions. In so doing it is hoped that a framework will be established within which the paper can be presented, analyzed, interpreted and understood.

The term wage rate has different meanings. These meanings must be explained before the statistics to be presented later in the paper can be fully understood. The following explanations deal with the case where a wage earner is paid by the hour. However the same explanations would also apply to a wage earner who is paid by the week, month or year.

Base wage rate: Almost all hourly paid workers have a minimum wage they earn per hour. This amount is usually referred to as the basic wage rate. The base wage rate applies regardless of the number of hours worked. However the base wage rate does not include bonus and supplementary payments.

Average wage rate: The average hourly wage rate is calculated by dividing the total dollar amount of money earned during a given period of time by the number of hours worked in that time period. Bonus and supplementary payments are included in this total. For this reason the average

hourly wage rate of pay is usually higher than the basic hourly wage rate of pay. Almost all of the published wage statistics relate to the average hourly wage rates rather than the base wage rates.

Average straight time wage rate: This rate is calculated by dividing the total dollar amount of money earned, excluding overtime payments, during a given period of time by the number of straight time hours (ie. regular hours, not overtime hours) worked in that time period. The average straight-time wage rate includes bonuses and supplementary payments earned during straight time hours but not those earned during overtime hours.

For the purposes of this paper the basic hourly wage rate is used to reflect annual wage changes. The reasons behind the selection of this particular rate over all the others are the following.

1. Average hourly wage rates may vary for many reasons unrelated to the change in the wage structure. For example average hourly wage rates will vary with changes in the proportion of employees at each level of wage rate, changes in some non pecuniary items, changes in the proportions of work performed, changes in the period of time over which the rate is averaged and changes in methods of tabulating hours of work.
2. Trade unions are frequently concerned more with maintaining the basic wage rate than with other terms of the wage settlement.
3. Changes in other terms of the wage settlement are probably easier to sell to the membership than unfavourable changes in basic wage rates.

4. In general it is felt increases in the basic wage rate are a better measure of the magnitude and effect of wage changes.

Now that the various meanings of wage rate have been presented and preference stated for the basic hourly wage rate, the next question to consider is how the basic hourly wage rate is determined? For simplicity and clarity this question will be considered in the context of an unorganized labour market and an organized labour market.

When one is considering the question of how base wage rates are determined in an unorganized labour market (absence of union) he is really considering the whole area of wage theory. Over the years wage theory has had distinct stages of development. The concept of a "just wage" was popular in the medieval period. During the classical economics stage the popular theories were Smith's labour theory of value, Ricardo's "iron law" of wages and Marx's exploitation theory of wages. The modern neoclassical stage is characterized by two theories of wages. These are the marginal productivity theory and the bargaining theory.

The marginal productivity theory is most widely held by today's economists. However, it has seldom been used as a basis of wage policy. Underlying the theory is the assumption of competition for the factors of production and a free labour market. Under competition, there is a tendency for each factor or production (labour) to be paid an amount (wage) equal to the value of the marginal addition to production of the last factor in the class to be employed. A firm can derive its marginal revenue function of its product for different levels of wages and employees and by combining

this function with its supply curve of labour, the equilibrium ( $MLC=MP$ ) wage rate can be determined.

One theory that opposes the marginal productivity theory is the bargaining theory of wages. The proponents of this theory believe that since wage determination is largely a matter of relative bargaining strength, unless employees organize they cannot hope to achieve desirable wages. The proponents of the bargaining theory have no faith in the competitive market. This theory leads us to consider the question of wage determination in an organized labour market.

In an organized labour market the basic wage rates are determined by the process of collective bargaining between the employer or its representative and a union representing the workers. The two parties bargain or negotiate, among other things, a base wage rate. This negotiated base wage rate may or may not be the same as would be determined by market forces in the absence of trade unions. The base wage rate statistics to be presented later have all been negotiated in a two party collective bargaining process.

A logical question gleaned from the above is what influencing forces are operating in the process of wage determination under collective bargaining? At the present time there are differing theories as to what forces are most crucial to the determination of wages under collective bargaining. Two such theories are those put forth by John Dunlop<sup>1</sup> and Arthur Ross<sup>2</sup>. Dunlop's

<sup>1</sup>John Dunlop, Wage Determination Under Trade Unions (New York: MacMillan Company, 1950).

<sup>2</sup>Arthur Ross, Trade Union Wage Policy (Berkeley: University of California Press, 1948).

theory emphasizes the economic forces while Ross's theory emphasizes the political forces. A more detailed look at these two theories is worthwhile.

In his book Dunlop develops a model of wage determination based largely on the traditional theory of the firm. Essentially the model states that wage rates are determined by two functions, the wage-membership function and the wage-bill-employment function. The wage rate established by these two functions will depend upon the objectives of the union. Dunlop discusses six possible objectives. Each objective maximizes some wage or employment dimension or some combination of the two.

In presenting his theory Dunlop does not deny that in some wage bargains political considerations are important. However, he rejects it as an overall explanation. Ross, on the other hand, does not deny the presence of economic factors in some wage bargains. However he feels economic considerations are secondary to political considerations. He feels economic forces are important to the union because they generate political pressures which have to be reckoned with by the union leader.

Carrying his argument further Ross states that the central objective of the union must be survival and growth. To accomplish this purpose Ross feels that a group of political pressures must be reconciled in the bargaining process. These pressures are experienced by the union leaders in their relationships with the rank and file, the employers, other organizations, rebels of the union, other unions and the government.

In the context of wage determination under collective bargaining the theories of both Dunlop and Ross have one shortcoming. That is, they both

are essentially theories of trade union wage policy and as a result give little consideration to the employer's wage policy. Collective bargaining is a bi-party process. By concentrating on the wage policy of one group there is a tendency to develop a myopic and distorted picture of the bargaining process. However, in all fairness to the proponents of the two theories, they were not put forth as theories of wage determination under collective bargaining, but rather as theories of trade union wage policy. Nonetheless the theories do give some insight into the many forces operating in the process of collective bargaining.

There are other theories as to what forces are crucial in wage determination under collective bargaining. There are some writers who believe the nature of bargaining power is crucial. They feel the final outcome of a wage bargain is determined in some way by the relative bargaining power of the parties concerned. For instance Chamberlain defines bargaining power as "the ability to secure another's agreement on one's own terms"<sup>3</sup>. He feels the willingness to agree depends upon the cost to one party agreeing with the other's terms. Other writers have concentrated on the actual process of collective bargaining as having some form of behavioral significance on the determination of wages. Walton and McKersie<sup>4</sup> have defined four different types of bargaining, each with their own functions, logic, and tactics. They incorporate these types of bargaining into a predictive model of how people will tend to behave in varying conditions.

<sup>3</sup>Neil W. Chamberlain, Collective Bargaining (New York: McGraw-Hill 1951), Chapter 10.

<sup>4</sup>R.E. Walton and R.B. McKersie, A Behavioral Theory of Labor Negotiation (New York: McGraw-Hill, 1965).

In summary, the wage statistics to be presented later are basic hourly wage rates that have been negotiated through collective bargaining in an organized labour market. The bargaining process is influenced by different forces. Individually the economic, political, behavioural and power forces have been emphasized as being most crucial to wage determination under collective bargaining. In reality, the bargaining process is probably characterized by the interaction of all these forces.

The concept of a negotiated base wage rate has now been defined. Before proceeding on to a discussion on the purpose of this paper, one last bit of explanation is required. The paper is concerned with annual changes in the negotiated base wage rates for three British Columbia industries. The base wage rate changes in the industries are presented in terms of bargaining units. A bargaining unit may be defined as a group of employees in a firm, plant, industry or craft that has been recognized by the employer and certified by an authorized provincial or federal agency. In the province of British Columbia the authorized agency is the Labour Relations Board. Its authorization is contained in section 12 of the Labour Relations Act of British Columbia.

The industries, the bargaining units, and the parties representing both employee and employer within each unit are the following.

British Columbia Coast Lumber and Logging

1. Forest Industrial Relations and International Woodworkers of America.

British Columbia Pulp and Paper

2. Pulp and Paper Industrial Relations Bureau and the Pulp, Sulphite and Paper Mill Workers.



British Columbia Construction

3. Amalgamated Construction Association and the Provincial Council of Carpenters.
4. Electrical Contractors Association and the International Brotherhood of Electrical Workers Local 213.
5. Masters Painters Association and the Painters, Decorators and Paperhangers of America Local 138.
6. Mechanical Contractors Association and the United Association of Plumbers Local 170.
7. Amalgamated Construction Association and the Construction and General Labourers Union.

It is felt that the base wage rate changes in these bargaining units are highly representative of the base wage rate changes in the industries as a whole. In fact, they are identical in some cases, as will be explained in the first chapter.

The Purpose and Methodology of the Study

The purpose of this study is to explore, analyze and attempt to answer a series of questions involving changes in the negotiated base wage rates in three British Columbia industries. The questions upon which the study will focus are the following.

- A. How did the changes in the base wage rates compare with one another during the 1958-1969 time period? (Chapter I)

The main reason for wanting an answer to this question is simply to determine how the changes did compare. So many biased statements concerning the base rate changes among the industries are put forth that the true facts tend to become hidden. This study should provide an unbiased, objective answer to the above question.

The method employed to answer the question was to compare the annual absolute and percentage changes in base rates during the 1958-1969 time period. The changes were calculated from base rate data obtained from many sources. A great deal of difficulty was experienced in gathering base rate data on the seven bargaining units. In fact, it was the almost complete lack of historical data that determined the 1958-1969 time period. Very little reliable data on base rates could be obtained for the years prior to 1958. The exact sources of data are listed in the tables presented in the first chapter.

Lack of data was also the reason for not including another measure of comparability. It was hoped that the base rate changes, as well as being compared to one another, would also be compared with a general standard of the growth and prosperity of the province as a whole. But unfortunately, a reliable general standard could not be developed.

B. How did the changes in the base wage rates move in relation to one another during the 1958-1969 time period? (Chapter II)

There are two main reasons behind the above question. First reason is to measure the relative strength of the base wage rate relationships between the bargaining units. The second is to substantiate or refute some of the more frequent hypotheses or assumptions that are made regarding the wage rate relationships existing between the bargaining units.

Correlation analysis was used to determine how the base wage rates move in relation to one another. The data for such an analysis was taken

from tables presented in Chapter I. This data was coded, programmed for analysis and run through the computer for computation.

C. How did the changes in the base wage rates move in relation to changes in select economic variables during the 1958-1969 time period? (Chapter III)

The answer to this question will provide some insight into what economic factors are important in wage determination under collective bargaining with respect to the seven bargaining units under consideration. The concentration on the economic variables in this study does not mean that the political, behavioural and power forces mentioned earlier are not important. On the contrary they probably do play a role. However, it was felt that the economic forces, as well as being more important than the others, were more readily measurable. In fact, it would be a difficult task, if not impossible, to measure the other factors.

Correlation analysis, as in the previous case, was the analytical tool used to measure the relationships between base wage rate changes and the changes in the economic variables. Four variables were included. These are the consumer price index, employment, unemployment, profits and productivity. With most of the variables it was difficult, and sometimes impossible, to provide data that corresponded directly with the bargaining units. The data was just not available. Other data was used and it is hoped that it was representative of the actual situation in the bargaining unit. The data that was used, along with its source, is listed in Appendix II.

D. What was the explanation for the differences in the interindustry base wage rate changes during the 1958-1969 time period? (Chapter IV)

As the question suggests the reason behind this question is to find an explanation for the differences. Five possible explanatory variables will be discussed. These are market or competitive conditions, productivity differences, differences in the degree of concentration and unionization and differences in the proportion of labour cost to total costs. The analysis will produce an explanatory variable.

## CHAPTER I

### THE BARGAINING UNITS - THEIR NATURE AND A COMPARISON OF THEIR BASE WAGE RATES

Bargaining units vary in their scope and orientation. The following is one possible classification of bargaining units, each having a different scope and orientation.

Industry wide unit - negotiations are conducted through one body representing the workers and another body representing the employer within a given industry.

Company wide unit - negotiations are conducted through one body representing the workers and another body representing the employer within a given company. The company may or may not have more than one plant.

Plant wide unit - negotiations are conducted through one body representing the workers and another body representing the employer within a given plant. Again the company may or may not have more than one plant.

Craft or technical unit - negotiations are conducted through one body representing the workers who have a particular craft or technical skill and another body representing the employer or employers who employ the workers possessing this particular craft or technical skill. It is possible for a craft or technical union to cut across industry, company and plant lines.

Each of the bargaining units mentioned in the introductory chapter pertain to one of the above types of units. To discover which type and to look more closely at the nature of the bargaining relationships within each unit is the next task of this chapter.

British Columbia Coast Lumber and Logging Industry

1. Forest Industrial Relations (F.I.R.) and International  
Woodworkers of America (I.W.A.)

In terms of industrial relations divisions, the forest industry in B.C. can be divided into lumber, plywood and logging on the one hand and pulp and paper on the other. Within the lumber and logging sector there are three main bargaining units based mainly on geographical considerations. These are the coast, southern interior and northern interior. The representatives of union and management in each of these units are as follows.

Coast

Management - Forest Industrial Relations (F.I.R.)  
Union - International Woodworkers of America (I.W.A.)

Southern Interior

Management - Interior Forest Labour Relations Association  
Union - International Woodworkers of America

Northern Interior

Management - Northern Interior Lumberman's Association  
Union - International Woodworkers of America

For the purposes of this paper the B.C. Coast bargaining unit has been selected. In the sense that the B.C. Coast Lumber and Logging is considered an industry, the bargaining unit is industry wide. F.I.R. represents almost all the employers in this industry and the I.W.A. represents all the organized workers in this industry. These two parties get together at regular intervals and negotiate a collective agreement. Among other things, they negotiate wage rates for numerous job categories. Data on the negotiated basic hourly wage rate for the years 1958-1969 inclusive is contained in Table I. The various hourly wage rates pertain to the job category of

TABLE I. - Basic Hourly Wage Rate Data for the Forest Industrial Relations (F.I.R.) and International Woodworkers of America (I.W.A.) Bargaining Unit, 1958-1969 Inclusive.

Year	Basic Hourly Rate at End of Preceding Year	Basic Hourly Rate at End of Current Year	Absolute Amount of Increase During Year	Percentage Change for the Year
1958	1.72	1.72	0	0
1959	1.72	1.82	.10	5.8
1960	1.82	1.92	.10	5.5
1961	1.92	1.92	0	0
1962	1.92	2.00	.08	4.2
1963	2.00	2.08	.08	4.0
1964	2.08	2.23	.15	7.2
1965	2.23	2.36	.13	5.8
1966	2.36	2.56	.20	8.5
1967	2.56	2.76	.20	7.8
1968	2.76	2.94	.18	6.5
1969	2.94	3.12	.18	6.1

Sources: Collective Agreements  
 Annual Survey B. C. Federation of Labour  
 Vancouver, New Westminster and District Building Trades Council  
 B.C. Dept. of Labour  
 Employer's Association of B.C.

common labour (men). The wage for this category is the lowest a male worker in the bargaining unit can be paid per hour. This rate is the base hourly wage rate.

At this point it may be useful to briefly explain Table I. Each of the other bargaining units will have a similar table listing the yearly basic hourly wage rate that did, does and will apply in the bargaining unit. The rates of pay were listed and the calculations made on the basis of a calendar year. Column 1 contains the calendar years under consideration. Column 2 is the wage rate that was in effect at the end of the year preceding the year under consideration. For example in Table I opposite 1959 under column 1 is listed the hourly rate of \$1.72. This rate was one in effect for common labour (men) at the end of 1958 (Dec. 31, 1958). Any wage increase coming after this date would occur in 1959. Column 3 in the 1959 contains the rate \$1.82. This rate was in effect at the end of 1959 (Dec. 31, 1959). Therefore the difference between column 2 and 3, either positive or negative, pertains to the calendar year 1959. In the example there was a \$.10 per hour increase during the year. Column 4 contains this ten cents and is the absolute amount of increase during the year. Column 5 contains figures on the percentage increase in the hourly wage occurring in a particular calendar year. The calculation was based on the figures listed in columns 2, 3 and 4. For the example, in the year 1959 the hourly wage rate for common labour (men) increased by 5.8 per cent over the preceding year.



### British Columbia Pulp and Paper Industry

#### 2. Pulp and Paper Industrial Relations Bureau and the Pulp, Sulphite and Paper Mill Workers

As mentioned in the previous section the forest industry of B.C. is composed of two major sectors - lumber, plywood and logging and pulp and paper. In the latter case the collective bargaining unit is truly industry wide. The Pulp and Paper Industrial Relations Bureau represents all the employers in the province in collective bargaining sessions with the Pulp, Sulphite and Paper Mill Workers. The latter union represents almost all the B.C. workers in the industry. A small rival union does have jurisdiction over some groups of employees. Table II contains data on the negotiated basic hourly wage rates 1958-1969 inclusive. The various hourly wage rates pertain to the job category of common labour (men). The base rates in pulp and paper and lumber and logging apply to jobs having similar requirements and are therefore comparable. As one would expect there is a close relationship between these two rates. This relationship will be explored in depth later in the paper.

### British Columbia Construction Industry

#### 3. Amalgamated Construction Association and the Provincial Council of Carpenters

The Amalgamated Construction Association is the bargaining agent for a large group of general contractors in the construction industry. The Association does not represent all the contractors but does represent the biggest contractors who employ a large number of workers. The Association's

TABLE II. - Basic Hourly Wage Rate Data for the Pulp and Paper Industrial Relations Bureau  
and the Pulp, Sulphite and Paper Mill Workers Bargaining Unit, 1958-1969 Inclusive

Year	Basic Hourly Rate at End of Preceding Year	Basic Hourly Rate at End of Current Year	Absolute Amount of Increase During Year	Percentage Change for the Year
1958	1.85	1.89	.04	2.2
1959	1.89	1.95	.06	3.2
1960	1.95	2.03	.08	4.1
1961	2.03	2.03	0	0
1962	2.03	2.10	.07	3.4
1963	2.10	2.18	.08	3.8
1964	2.18	2.29	.11	5.0
1965	2.29	2.44	.15	6.5
1966	2.44	2.64	.20	8.2
1967	2.64	2.84	.20	7.6
1968	2.84	3.02	1.8	6.3
1969	3.02	3.20	.18	6.0

Sources: Collective Agreements  
Annual Survey B.C. Federation of Labour  
Vancouver, New Westminster and District Building Trades Council  
B.C. Dept. of Labour  
Employer's Association of B.C.

membership is approximately 140 firms. The Association acts as a bargaining agent for the general contractors in negotiations with a number of craft unions. These unions include the Carpenters, Labourers, Teamsters, Operating Engineers, Boilermakers, Cement Masons, Floorlayers, Ironworkers, Machinists, Heat and Frost Insulators, and Pile Drivers. These unions have members working for firms who are not general contractors. But for those union members working for contractors who are members of the Association the unions bargain with the Association with respect to their conditions of employment. The bargaining unit of concern at the moment is the Association's relationship with the Provincial Council of Carpenters.

The Provincial Council of Carpenters is the bargaining agent for the Carpenters' Union. The Carpenters' Union is certified to represent all the organized carpenters employed in the construction industry of B.C. They have a membership of about 12,000. The Council bargains with approximately 700-800 contractors throughout B.C. About 140 of these contractors are represented by the Amalgamated Construction Association. However the Council's bargaining relationship with the Association is by far the most important. At regular intervals these two parties negotiate a standard agreement. This agreement would then be adhered to by all the Association's members. But more important, the Council takes this same standard agreement to all the other contractors, who are not members of the Association, but with whom they have bargaining relationships. These other contractors invariably sign this standard agreement. So in effect the Association is really negotiating a contract that will apply to 700-800 contractors and the Council is nego-

tiating for all the carpenters employed by these 700-800 contractors. As can be seen from above there is a tremendous concentration of power on the part of both parties which could have far reaching consequences.

The bargaining relationship between the Association and the Union is a craft one. Its unit cannot be considered an industry wide bargaining relationship because the Association does not represent all the employers in the construction industry and likewise the union does not represent all the workers in the construction industry. It should be pointed out that the Provincial Council of Carpenters was not formed until 1964. The Amalgamated Construction Association used to be known as the Heavy Construction Association. However even with these name variations the bargaining relationship remained essentially the same throughout the 1958-1969 time period. Data on the negotiated wage rates for this time period is presented in Table III. The rates pertain to the journeymen carpenter job category.

#### 4. Electrical Contractors Association and the International Brotherhood of Electrical Workers Local 213

The Electrical Contractors Association is a provincial association representing contractors in the electrical construction trade. It has a membership of about 200 firms. Its membership contains the largest firms in the trade. The I.B.E.W. is certified to represent the electrical workers employed in the construction industry. In the construction industry the union has 6 locals in the province. Local 213, the local under consideration, represents workers in the Vancouver and Lower Mainland area.

The Electrical Contractors Association at the present time negotiates

TABLE III. - Basic Hourly Wage Rate Data for the Amalgamated Construction Association and the Provincial Council of Carpenters Bargaining Unit, 1958-1969 Inclusive

Year	Basic Hourly Rate at End of Preceding Year	Basic Hourly Rate at End of Current Year	Absolute Amount of Increase During Year	Percentage Change For the Year
1958	2.51	2.68	.17	6.8
1959	2.68	2.80	.12	4.5
1960	2.80	2.92	.12	4.2
1961	2.92	2.92	0	0
1962	2.92	3.02	.10	3.4
1963	3.02	3.14	.12	4.0
1964	3.14	3.34	.20	6.4
1965	3.34	3.49	.15	4.5
1966	3.49	3.69	.20	5.7
1967	3.69	4.14	.45	12.2
1968	4.14	4.53	.39	9.4
1969	4.53	4.88	.35	7.7

Sources: Collective Agreements  
Annual Survey B.C. Federation of Labour  
Vancouver, New Westminster and District Building Trades Council  
B.C. Dept. of Labour  
Employer's Association of B.C.

agreements with the six different locals. This has not always been the case. In the past the union has bargained directly with employers or other trade associations throughout the province. Recently a centralized bargaining session was tried (ie. 6 locals of the I.B.E.W. bargaining at the same time with the Association) but broke down.

As was explained before the bargaining unit under consideration is a craft unit. Wage rate data for this particular craft unit is contained in Table IV. The various hourly wage rates pertain to the job category of journeyman electrician - inside wiremen.

5. Master Painter Association and Painters, Decorators,  
and Paperhangers of America Local 138

The Master Painters Association is the bargaining agent for approximately 50 painting contractors in and around the Vancouver area. The contractors are the largest firms and employ a large portion of the journeyman painters in the area. The Association bargains with the Painters, Decorators and Paperhangers of America. Local 138 is the Vancouver local of the Painters Union. The union has five other locals throughout the province. The Vancouver local is the largest of the locals. The bargaining unit is a craft one. The union is representing journeyman painters and the employers association is representing the firms who employ these painters. Data on the wage rates negotiated in this particular bargaining unit are presented in Table V. The rates apply to the job category of a journeyman painter (brush).

TABLE IV. - Basic Hourly Wage Rate Data for the Electrical Contractors Association and the International Brotherhood of Electrical Workers Local 213 Bargaining Unit, 1958-1969 Inclusive

Year	Basic Hourly Rate at End of Preceding Year	Basic Hourly Rate at End of Current Year	Absolute Amount of Increase During Year	Percentage Change for the Year
1958	2.99	3.10		3.7
1959	3.10	3.19	.09	2.9
1960	3.19	3.28	.09	2.8
1961	3.28	3.28	0	0
1962	3.28	3.43	.15	4.6
1963	3.43	3.53	.10	2.9
1964	3.53	3.80	.27	7.6
1965	3.80	4.07	.27	7.1
1966	4.07	4.34	.27	6.6
1967	4.34	4.75	.41	9.4
1968	4.75	5.45	.70	14.7
1969	5.45	5.80	.35	6.4

Sources: Collective Agreements  
Annual Survey B.C. Federation of Labour  
Vancouver, New Westminster and District Building Trades Council  
B.C. Dept. of Labour  
Employer's Association of B.C.

TABLE V. - Basic Hourly Wage Rate Data for the Master Painter Association and Painters, Decorators, and Paperhangers of America Local 138 Bargaining Unit, 1958-1969 Inclusive

Year	Basic Hourly Rate at End of Preceding Year	Basic Hourly Rate at End of Current Year	Absolute Amount of Increase During Year	Percentage Change For the Year
1958	2.45	2.60	.15	6.1
1959	2.60	2.70	.10	3.8
1960	2.70	2.80	.14	5.2
1961	2.84	2.84	0	0
1962	2.84	2.91	.07	2.5
1963	2.91	2.96	.04	1.4
1964	2.96	3.16	.20	6.7
1965	3.16	3.36	.20	6.3
1966	3.36	3.56	.20	5.9
1967	3.56	3.76	.20	5.6
1968	3.76	3.96	.20	5.3
1969	3.96			

Sources: Collective Agreements  
Annual Survey B.C. Federation of Labour  
Vancouver, New Westminster and District Building Trades Council  
B.C. Dept. of Labour  
Employer's Association of B.C.



6. Mechanical Contractors Association and the  
United Association of Plumbers Local 170

The Mechanical Contractors Association is the bargaining agent for approximately 200 firms in the mechanical construction or piping trade. These are not all the firms in the trade, but are the largest and employ a large portion of the workers in the trade. The Association represents firms throughout the province except in Victoria and Prince Rupert. These areas have their own employer associations.

The United Association of Plumbers local 170 is the bargaining agent for organized workers employed in the piping trade. This trade includes plumbers, pipe fitters, steamfitters, lead burners and other skilled occupations. These workers are employed in other industries as well as the construction industry. But for the construction industry local 170 bargains for its members, including plumbers, with the Mechanical Contractors Association. Two other locals deal with the employer association in Victoria and Prince Rupert. The bargaining relationship between the union and the Mechanical Contractors Association is a craft one.

The same type of relationship occurs in this bargaining unit as occurs in the carpenters unit. The Mechanical Contractors Association and local 170 negotiate a standard agreement to cover workers employed with the Association's 200 firms. However, the union takes the same agreement to those firms who are not in the employers association but with whom they have bargaining relationships. Again, only rarely do these non-association firms not sign this standard agreement. Wage data pertaining to this standard agreement is presented in Table VI. The rates apply to the job category of journeyman plumber.

TABLE VI. - Basic Hourly Wage Rate Data for the Mechanical Contractors Association and the United Association of Plumbers Local 170 Bargaining Unit, 1958-1969 Inclusive

Year	Basic Hourly Rate at End of Preceding Year	Basic Hourly Rate at End of Current Year	Absolute Amount of Increase During Year	Percentage Change For the Year
1958		2.90		
1959	2.90	3.02	.12	4.1
1960	3.02	3.14	.12	4.0
1961	3.14	3.14	0	0
1962	3.14	3.24	.10	3.2
1963	3.24	3.39	.15	4.6
1964	3.39	3.51	.12	3.5
1965	3.51	3.66	.15	4.3
1966	3.66	3.81	.15	4.1
1967	3.81	3.99	.18	4.7
1968	3.99	4.18	.19	4.8
1969				

Sources: Collective Agreements  
Annual Survey B.C. Federation of Labour  
Vancouver, New Westminster and District Building Trades Council  
B.C. Dept. of Labour  
Employer's Association of B.C.

7. Amalgamated Construction Association and the Construction and General Labourers Union Locals 602, 1070, 1093, and 168

In this case the concern is with the bargaining relationship the Amalgamated Construction Association has with the General Labourers Union. One agreement is negotiated for the whole province. Again it must be mentioned that the Amalgamated does not represent all general contractors in the construction industry. Of particular concern in this case is the Roadbuilders Association. The Roadbuilders used to be represented by the Amalgamated but now bargain on their own.

The General Labourers Union has four locals. These are 602 Vancouver, 1070 New Westminster, 1093 Vancouver Island and 168 Tunnel and Rock Workers (80 per cent of the members are in the construction industry). Prior to 1965 the union used to bargain jointly with the Operating Engineers and Local 213 of the Teamsters to sign a three way pact. This type of arrangement has since been discontinued.

The General Labourers Union negotiates a standard agreement to cover its workers employed with the Amalgamated Construction Association firms. As was the case with the carpenters and the plumbers, the union then takes this standard agreement to the firms who do not belong to the Amalgamated or the Roadbuilders Association, but with whom they have a bargaining relationship. These other firms invariably sign this standard agreement. Wage data pertaining to this standard agreement is presented in Table VII. The rates apply to the lowest pay category for a labourer in the standard agreement.

TABLE VII. - Basic Hourly Wage Rate Data for the Amalgamated Construction Association and the Construction and General Labourers Union Locals 602, 1070, 1093 and 169 Bargaining Unit, 1958-1969 Inclusive

Year	Basic Hourly Rate at End of Preceding Year	Basic Hourly Rate at End of Current Year	Absolute Amount of Increase During Year	Percentage Change For the Year
1958	1.81	1.95	.14	7.7
1959	1.95	1.89	-.06	-3.1
1960	1.89	2.01	1.2	6.3
1961	2.01	2.01	0	0
1962	2.01	2.27	.26	13.0
1963	2.27	2.37	.10	4.4
1964	2.37	2.47	.10	4.2
1965	2.47	2.67	.20	8.1
1966	2.67	2.94	.27	10.1
1967	2.94	3.24	.30	10.2
1968	3.24	3.69	.45	13.8
1969	3.69	4.07	.38	10.3

Sources: Collective Agreements  
Annual Survey B.C. Federation of Labour  
Vancouver, New Westminster and District Building Trades Council  
B.C. Dept. of Labour  
Employer's Association of B.C.

In the preceding pages, data on the base wage rates for each of the bargaining units was presented in tabular form. At this point in the paper it is worthwhile to combine this data in graph form in order to illustrate the relationships between the base rates in the seven bargaining units. The following graphs are used for this purpose and are discussed individually.

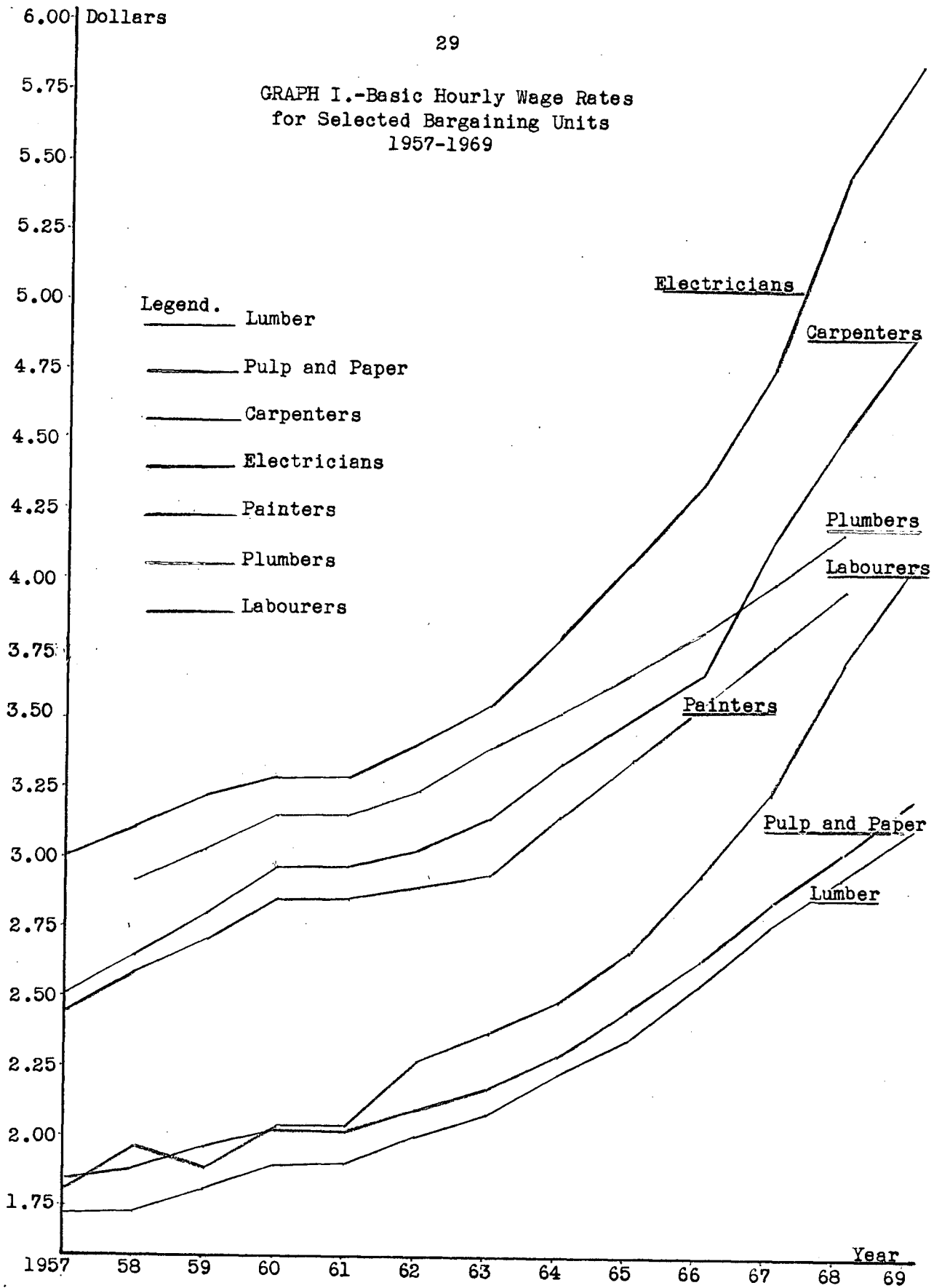
Basic Hourly Wage Rates for Selected Bargaining Units  
1957-1969 (Graph Number 1)

1. Graph 1 illustrates clearly the fact that from 1957 to 1966 the relative positions of the bargaining units, with respect to the absolute value of their base rates, remained constant. One exception to this was the labourers. At the end of 1957 their base rate was lower than the base rate for the pulp and paper workers. But by the end of 1966 this situation had been reversed. At that time the base rate for labourers exceeded the base rate for pulp and paper workers by \$.30 per hour.

The only other slight variation from an otherwise stable situation during the 1957-1966 time period was the electrician's widening of the absolute gap between their base rate and the base rates of the other construction trades. This widening occurred during the 1963-1966 time period.

2. From 1966 on the situation described above changed markedly. The relative base rate rankings among the construction trades changed. The carpenters have managed to outstrip the plumbers. At the end of 1958 the plumbers earned \$.22 per hour more than carpenters. But by the end of 1968 the carpenters were earning \$.35 per hour more than the plumbers. The car-

GRAPH I.-Basic Hourly Wage Rates  
for Selected Bargaining Units  
1957-1969



penters also improved their base rate position relative to the painters. At the end of 1957 the carpenters earned \$.06 per hour more than painters. But by the end of 1968 this margin had increased to \$.57 per hour more.

The electricians have also improved their base rate position relative to the plumbers and painters. At the end of 1958 the electricians earned \$.20 per hour more than plumbers. But by the end of 1968 this margin had increased to \$1.27 per hour. At the end of 1957 the electricians earned \$.54 per hour more than painters. But by the end of 1968 this margin was \$1.49 per hour.

Like the carpenters and the electricians, the labourers have improved their base rate position relative to the plumbers and painters. At the end of 1958 plumbers earned \$.95 per hour more than labourers. At the end of 1968 this margin had been narrowed to \$.49 per hour. At the end of 1957 painters were earning \$.64 per hour more than labourers. By the end of 1968 this gap had been reduced to \$.27 per hour.

An explanation for the relatively slower increase in base rates of the plumbers and painters is the fact that these two units have both been locked into five year agreements. In both cases the contracts expire early in 1969. Based on the facts presented above, one can expect that both the plumbers and painters will be seeking very large increases in order to "catch up" on the other trades. The plumbers would also like to regain their number two position in the trade hierarchy. In order to displace the carpenters to their traditional number three post the plumbers will require at a minimum a \$.72 per hour increase. This represents a 17.2 per cent increase in one year. Remember this

is a minimum. Their initial demands are bound to be much higher. One can expect some hard bargaining.

3. Graph 1 indicates that certain base rates over time move in the same manner as do other base rates. For instance the graph indicates that a strong correlation exists between the movements of the base rates in the lumber and pulp and paper units. This also seems to be the case with the electrician and carpenter units. Precise correlation coefficients between base rates will be presented later in the paper.

Still in the area of correlation between base rates, the graph indicates that prior to 1966 base rates of the two forest industry units moved in unison with the base rates of the construction units. But since 1966 the electricians, carpenters and labourers have received substantial increases and one can safely assume that the painters and plumbers will follow suit. Because of these substantial increases one can generally conclude that the construction units have improved their base rate position relative to that of the two forest industry units.

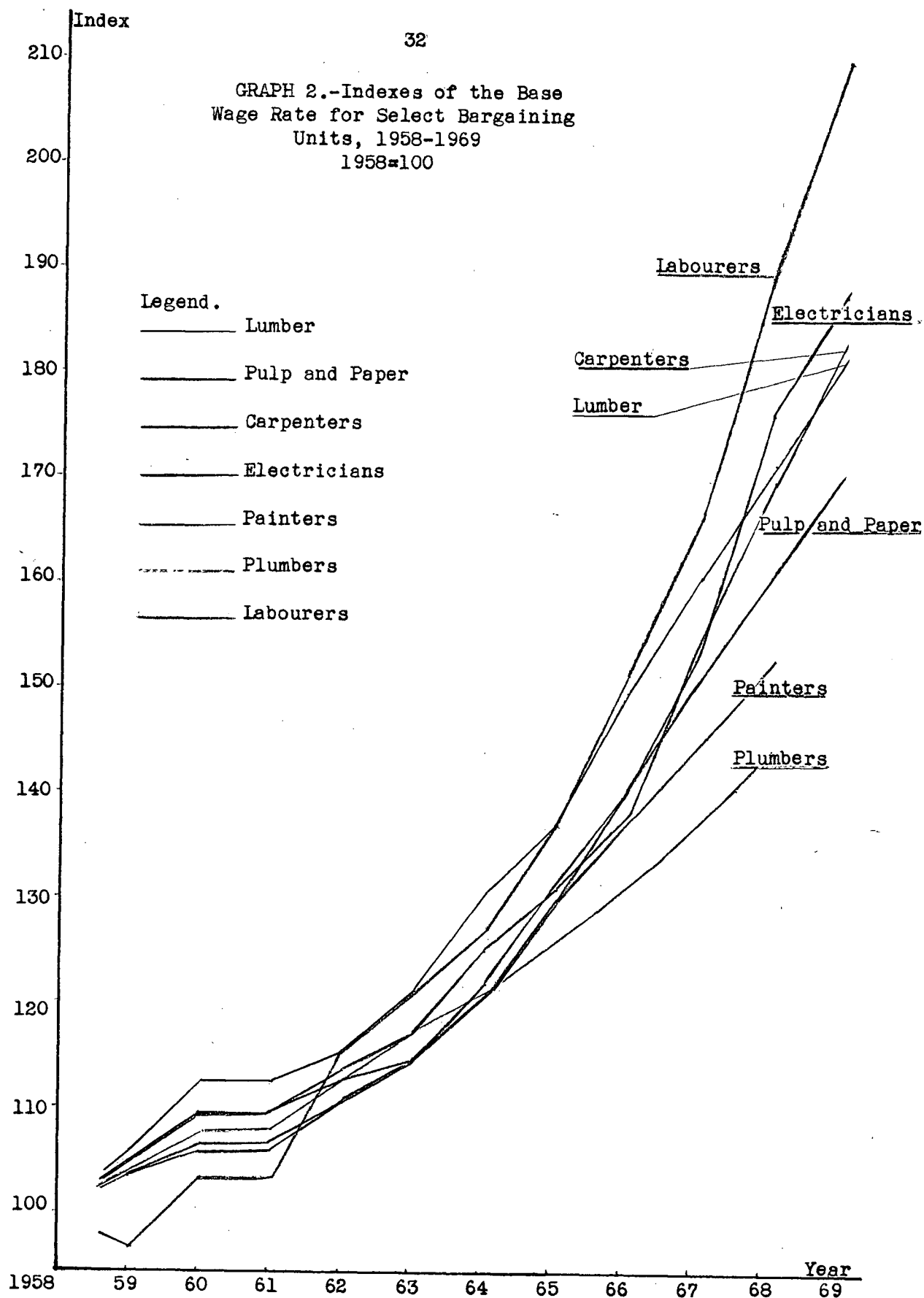
#### Indexes of the Base Wage Rate for Selected Bargaining Units 1958-1969 (Graph Number 2)

1. The graph indicates that the spread in index points between the highest and lowest bargaining units has increased substantially over the 1959-1968 time period. At the end of 1960 the difference between the highest and lowest was 9 index points or 9 percentage points. By 1968 this difference had increased to 45 index points. Two factors seem to have caused this widening.

The first factor is the substantial increase received by the electric-



GRAPH 2.-Indexes of the Base  
Wage Rate for Select Bargaining  
Units, 1958-1969  
1958=100



ians, carpenters and labourers in the last three years. In the period 1959-1966 (8 years) the labourers received increases amounting to 51 index points or 51 per cent, the electricians 40 points, and the carpenters 38 points. But in the period 1967-1969 (3 years), these units received increases of 58, 47 and 48 points respectively. In the last three years these three units have more than matched the increases they received in the eight years prior to this time period!

The second factor accounting for the widening spread between the highest and lowest units is the relatively slower rate of increase in the painter's and plumber's units. The reason for this, as mentioned earlier, was the five year agreement.

2. As far as index points are concerned the lumber-logging unit has fared quite well with respect to the construction units. During the period 1959-1969 it had an increase in index points of 81. During this same time period electricians, carpenters and labourers had increases of 87, 82 and 109 respectively. But it must be remembered that index or percentage increases are quite different from absolute increases. The latter were presented in the preceding graph.

3. The lumber-logging unit has gained slightly on the pulp and paper unit. During the 1959-1969 time period the lumber unit has had an increase of 81 index points while the pulp and paper unit has had an increase of 69 points. The following table summarizes increases in all indexes from the end of 1958 to the end of 1969.

TABLE VIII.-Total Point Increases in the Indexes of Base Wage Rates  
for the 1958-1969 Period

Bargaining Unit	Increase in Index Points
Labourers	109
Electricians	87
Carpenters	82
Lumberworkers	81
Pulp and Paper Workers	69
Painters*	52
Plumbers*	44

\* Does not include 1969. However relative positions will probably remain the same when the 1969 rates are included.

As Table VIII states and Graph 2 illustrates, the labourers unit has shown the greatest increase in their basic rate over the 1958-1969 time period. Their base rate has increased 109 index points or 109 per cent since the end of 1958. This represents a tremendous increase and explains why they have almost caught up to the painters in absolute terms. The electricians, carpenters and lumber workers have also shown substantial increases over the time period. The painters and plumbers have lagged, relative to the others, as was illustrated in Graphs 1 and 2.

TABLE IX. - Mean Annual Percentage Increase in the Base Wage Rate and the Standard Deviation of the Percentage Increases in the Base Wage Rate for the 1958-1969 Period

Bargaining Unit	Mean Percentage Increase	Standard Deviation
Labourers	7.1	5.1
Electricians	5.9	4.0
Carpenters	5.7	3.1
Lumber Workers	5.1	2.7
Pulp and Paper Workers	4.7	2.4
Painters*	4.7	2.3
Plumbers**	3.7	1.4

\* Figures pertain to 1958-1968 time period

Table IX indicates that the labourers unit had the highest average annual percentage increase in the base rate of all the units. Naturally this is what was indicated in Table VIII. Similarly the remaining units have the same relative ranking in Table IX as they had in Table VIII.

The interesting feature of Table IX is that there is a positive correlation between the mean percentage increase and the standard deviation. For instance the labourers had the highest mean increase as well as the highest standard deviation. The remaining units are similarly correlated. This would seem to indicate that the more variable the increase the higher overall increase one will achieve in the long run. One should perhaps make a point of bargaining annually and taking what the market will bear each year. The painters and plumbers had five year contracts

which called for fairly constant increases each year. But where did this attempt at stability get them? The lowest average increase of all the bargaining units under consideration.

The preceding pages have been concerned with comparing the hourly base rates increases of the seven bargaining units. It would be worthwhile and informative to compare these base rate increases with some general standard of the growth and prosperity of the province as a whole. By doing so, one could determine whether or not a unit has shared proportionately with others in the increased level of provincial wealth.

The biggest problem is to develop a general standard. This problem is even more difficult in terms of this paper since base rates have been used rather than average earnings. Most of the published data on wages is in the latter form. Ideally the best standard as far as this paper is concerned is an index of base rate increases of all employees or a good portion of them. But this is an enormous task and as a result no such index is available. Other general standards such as personal disposable income, personal disposable income per capita, productivity increases, wages and supplementary payments and equivalent real purchasing power were considered. But none of these measures proved to be anywhere near comparable to base wage rates. Therefore because of the lack of data no attempt will be made to relate base rate increases to some general standard of provincial wealth. However such a comparison would be valuable, and it should certainly be undertaken in the future provided adequate data is forthcoming.

## CHAPTER II

### A CORRELATION ANALYSIS OF BASE WAGE RATES

The previous chapter compared hourly base wage rates in terms of absolute and percentage changes over the 1958-1969 time period. In doing so the emphasis was on the differences between the base rates. This chapter will be concerned with similarities as well as differences. Its object will be to demonstrate how the annual percentage changes in the hourly base wage rates for each unit move in relation to one another over time. Are the movements quite similar or are they quite different? To answer this question, the relationships between the annual percentage changes in the base rates will be measured by using correlation analysis.

There are three reasons for performing the above correlation analysis. The first reason is to measure, by using correlation co-efficients, the relative strength of the base wage rate relationships between the bargaining units. Are the relationships strong or weak or nonexistent? The second reason is to substantiate or refute some of the more frequent hypotheses or assumptions that are made regarding the wage rate relationships existing between the seven bargaining units under consideration. The third reason, which is really an extension of the first, is to delineate more clearly, for the seven bargaining units, whether or not one unit is part of another unit's sphere of wage comparison. Or as Arthur Ross would say, to show if one

bargaining unit is within another unit's "orbit of coercive comparison".

The data on the annual percentage changes in the hourly base rate used for the correlation analysis was taken from the tables presented in Chapter I. This data was coded, programmed for correlation analysis, and run through the computer for computation. The resulting correlation coefficients by bargaining unit appear in Table X.

As indicated in Table X two sets of correlation coefficients were derived. The first set was derived by taking the 1958-1969 (inclusive) annual percentage change in the hourly base wage rate for one unit and correlating these changes with the 1958-1969 percentage change in the hourly base rate for all the other units. The resulting correlation coefficients are listed in the table under "equivalent year". The second set of coefficients were derived by taking the 1958-1969 percentage change in the hourly base wage rate in one unit and correlating these changes with the 1957-1968 percentage changes in the hourly base wage rate for all the other units. The resulting correlation coefficients are listed in the table under "one year lag". These one year lag coefficients were derived to try and account for the phenomena whereby one unit while negotiating new wage rates looks at what the percentage change in wages was for a comparable unit in the year preceding negotiations. An analysis of the various correlation coefficients by unit follows, but first a short note on the terms used in the chapter.

At certain points in the chapter the term "wage rate correlation" or just simply "correlation" has been used. The reader should be cautioned

TABLE II CORRELATION COEFFICIENTS BETWEEN THE ANNUAL PERCENTAGE CHANGE IN BASE WAGE RATES, 1958-1969, FOR SELECT BARGAINING UNITS.

BARGAINING UNIT	F.I.R. - I.W.A.			P.P.T.R.B. - P.S.P.W.			CARPENTERS			ELECTRICIANS			PAINTERS			PLUMBERS			LABOURERS		
	EQUIN.	1 YEAR	LAG	EQUIN.	1 YEAR	LAG	EQUIN.	1 YEAR	LAG	EQUIN.	1 YEAR	LAG	EQUIN.	1 YEAR	LAG	EQUIN.	1 YEAR	LAG	EQUIN.	1 YEAR	LAG
1 F.I.R. - I.W.A.				.88	.47		.55	.29		.66	.39		.56	.21		.79	.31		.32	.14	
2 P.P.T.R.B. - P.S.P.W.	.88	.52					.70	.36		.73	.56		.57	.36		.76	.32		.59	.28	
3 CARPENTERS	.55	.52			.70	.72				.82	.53		.58	.26		.70	.38		.54	.42	
4 ELECTRICIANS	.66	.51		.73	.66		.82	.62					.52	.21		.59	.30		.69	.29	
5 PAINTERS	.56	.38		.57	.46		.58	.36		.52	.48					.63	.42		.12	.14	
6 PLUMBERS	.79	.18		.76	.31		.70	.35		.59	.53		.63	.12					.43	.24	
7 LABOURERS	.32	.41		.59	.39		.54	.17		.69	.38		.12	-.09		.43	-.23				



that these terms refer to the correlation between the annual percentage change in the hourly base wage rates. The other terms are used to reduce the amount of repetition and redundancy. It is hoped that the accuracy of the paper has not been impaired.

### Correlation Results

#### 1. Forest Industrial Association and the International Woodworkers of America

The annual percentage change in the base wage rate in this particular unit correlated closely with the annual percentage change in the base wage rate in the pulp and paper bargaining unit. The equivalent year correlation coefficient that resulted from the calculations was .88. This correlation coefficient indicates a very strong, positive relationship between these two bargaining units.

The above results are not surprising. The market and competitive conditions as well as the working conditions are quite similar within the two industries. Both industries are highly oriented toward international markets as opposed to domestic or local markets. They produce goods largely for export for the United States and overseas markets in close competition with other countries. The competitive conditions within the British Columbia sectors of the industries are quite similar. The positions in both industries have a similar range and variety of skills. In general the conditions of employment lead workers within the two industries to look upon themselves as comparable. As such one would expect that their respective base rate changes would be quite closely related. An equivalent year correlation coefficient of .88 seems to indicate that they are.

The above information verifies the often made statement that the movement of percentage changes in base rates for the lumber and pulp and paper industries are closely related. One can also state with considerable reliability that the above two bargaining units are within each others "orbit of coercive comparison". However the real question is which of the two bargaining units sets the pattern of wage increases for the other.

The answer to this question is difficult to obtain. A rough estimate can be achieved by noting the effective date of each new collective agreement. For example, in the F.I.R. - I.W.A. bargaining unit the effective date for the new agreement is normally June 15. The P.P.I.R.B. - P.S.P.M.W. bargaining unit usually has a new contract effective date of July 1st. It follows that since the lumber-logging unit negotiates earlier in the year than does the pulp and paper unit, then it must be the pattern setter, ie. the pulp and paper unit will pattern their wage increases after those of the lumber-logging unit in any given year.

Determining the pattern setter among two units is not always this simple because of a number of factors that can potentially confuse the issue. However the answer obtained above is probably not far from reality. In other words, the lumber units wage increases probably do set the pattern for wage increases in the pulp and paper bargaining unit. Assuming for the moment that this is the case one can estimate for any year, the yet to be negotiated annual percentage increase in the base wage rate in the pulp and paper unit (P.P.I.R.B. - P.S.P.M.W.) given the percentage increase in the base wage rate for the equivalent year in the lumber and sawmill unit (F.I.R. - I.W.A.).

Using the method of least squares to fit a straight line to numerical data a linear equation can be derived to express the wage relationship between the two bargaining units. The standard linear equation for a line is:

$$y = a + bx$$

Using standard formulas, and wage rate data from Chapter I, the numerical constants a and b are found to be .75 and .77 respectively<sup>5</sup>. Substituting these numerical values into the above equation gives:

$$y = .75 + .77x$$

Now let y equal the annual percentage increase in the base wage rate for the P.P.I.R.B. - P.S.P.M.W. bargaining unit and let x equal the annual percentage increase in the base wage rate for the F.I.R. - I.W.A. bargaining unit. Assume a percentage increase in the base rate of 6.0 per cent is negotiated in the F.I.R. - I.W.A. bargaining unit. Substituting this value for x in the above equation, we obtain for y an answer of 5.37 per cent. This means that in the hypothetical year under consideration we can estimate that the pulp and paper unit will negotiate an increase in their base rate of 5.37 per cent, given the fact that the lumber-logging unit has already negotiated a 6.0 per cent increase in their base rate.

After this brief diversion a return to the analysis of the other correlation coefficients is in order. The relationships between the F.I.R. - I.W.A. bargaining unit and the construction units are fairly strong. The

<sup>5</sup>Refer to Appendix I for formulas and calculations.

equivalent year correlation coefficients are .55, .66, .56, .79 and .32. These coefficients lend some, but not conclusive support to the often made assumption that wage increase in the lumber industry are patterned after those in the construction industry.

An interesting situation could develop next year if the forest industry units do in fact compare their proposed wage rate increases with those increases obtained in the construction units. As was pointed out in Chapter I some construction units have received large wage increases in the last few years. Over the same years the forest units have not been able to match them. As a result the union negotiators in the forest industry are under pressure from the members to obtain wage increases equivalent to those received by union members in the construction industry. This situation could lead to strong wage demands by the lumber unions in the next negotiation session.

A particularly interesting relationship is the one between F.I.R. - I.W.A. and the plumbers. The equivalent year correlation coefficient is .79. This relatively strong relationship needs some explanation. In the year 1964 the plumbers negotiated a five year agreement. The agreement called for percentage increases on the base rate that showed little variation over the 1964-1968 time period. Over the same period the F.I.R. - I.W.A. negotiated percentage increases that showed little variation. Because of this lack of variability in the two sets of percentage increases the units correlated quite closely.

The relationships between the percentage increases in the F.I.R. -

I.W.A. unit and the one year lag percentage increases in the other units seem to be fairly weak or nonexistent. The correlation coefficients are .47, .29, .39, .21, .31 and .14. These results are similar to those obtained in the other bargaining units with respect to the one year lag coefficients. In almost all units the one year lag correlation coefficients indicate relatively weak or nonexistent relationships.

## 2. Pulp and Paper Industrial Relations Bureau and the Pulp Sulphite and Paper Mill Workers

As explained in the previous section there seems to be a strong correlation between this unit and the F.I.R. - I.W.A. There is a relatively strong relationship between this unit and the plumbers unit. The equivalent year correlation coefficient is .76. The explanation for this strong a relationship was given above.

Generally, there seems to be strong relationships between the pulp and paper unit and the construction units. The equivalent year correlation coefficients are .70, .73, .57, .76 and .59. These results give further support to the statement that wage increases in the forest industries are patterned after those that have been negotiated in the construction industry.

## 3. Amalgamated Construction Association and the Provincial Council of Carpenters

In this particular bargaining unit the equivalent year correlation coefficient of .82 indicates that there is a strong relationship between the carpenter's and electrician's annual percentage change in the journeyman's base wage rate. However, this is to be expected. The working conditions

in the two trades are virtually identical. The two trades have basically the same range and level of skill, although the electrician has to apprentice for a longer period of time than does the carpenter. The market and competitive conditions in the two bargaining units are the same since they are both in the same industry. As a result of these similarities one would expect the movement in base rates to be closely related. A correlation coefficient of .82 would seem to indicate that the base rates do move in relation to one another.

It is difficult to say which of the two trades is a pattern setter for the other. The effective dates of new agreements are usually April 1st in both cases. In the pattern of increases there is some indication that the carpenters set the pace for the electricians. For example in 1967 the carpenters had a 12.2 per cent increase on the base rate while the electricians had a 9.4 per cent increase. But in 1968 the electricians achieved a 14.7 per cent increase which seems to be following the carpenters lead. Also the one year lag correlation coefficient is higher in the electricians unit than in the carpenters unit when the units are compared with each other. The coefficients are .62 and .53 respectively.

The correlation between the annual percentage change in the base rate of the carpenters and those of the painters and labourers produced equivalent year coefficients of .58 and .54 respectively. To a certain degree these results are surprising. All three units face similar working conditions and their market and competitive conditions are the same. The range and variety of skills required vary a little but are roughly comparable. Because

of these similarities one would expect the base rate changes in the three units to move in close relation to one another. But the correlation coefficients obtained suggest that the relationship is not as strong as one would expect.

4. Electrical Contractors Association and the International  
Brotherhood of Electrical Workers Local 213

The .82 equivalent year correlation coefficient between this unit and the carpenters unit was explained in the previous section. The base rate relationships between the electricians unit and the painters and plumbers units do not appear to be that strong. The equivalent year coefficients are .52 and .59. As was mentioned above these results are somewhat surprising because one expects strong correlations between all the constructions units. But on the other hand a .69 equivalent year coefficient was obtained between the electricians unit and the labourers unit. This fairly strong result is probably due to the close wage change relationship between the two groups that has developed in the last few years. During the 1958-1965 time period the two units showed little correlation. But since 1965 their annual base rate changes have been quite similar.

5. Master Painters Association and the Painters, Decorators  
and Paperhangers of America Local 138

This particular bargaining unit is characterized by not having any one outstandingly strong correlation between its base rate changes and those in the other bargaining units. The highest equivalent year correlation coeffic-

ient is .63. This correlation coefficient measures the relationship between the painters and the plumbers. This fairly strong relationship is probably due to the fact that these two units both had five year agreements terminating in early 1969. The painters long term agreement probably accounts for the relatively low correlations achieved when the painters percentage changes were correlated with those of the carpenters, electricians and labourers. The latter units have been characterized by variable percentage changes while the painters, especially in the last five years, have had a more consistent and uniform pattern of percentage changes.

#### 6. Mechanical Contractors Association and the United Association of Plumbers Local 170

The most outstanding result in this bargaining unit is that its equivalent year percentage changes correlated strongly with the lumber and pulp and paper units. The explanation for this unusual result was put forth in the F.I.R. - I.W.A. section. Although the coefficients obtained between the plumbers and the other construction units were not as high as the lumber units, they none-the-less indicate that a relationship does exist. The equivalent year correlation coefficients are .70, .59, .63, and .43.

#### 7. Amalgamated Construction Association and the Construction and General Labourers Union

An equivalent year coefficient of .69 was obtained when the percentage changes in base rates in the labourer and electrician units were correlated. This result was explained in the electrician section. The other coefficients



in the labourers unit indicate relatively weak relationships. The labourers seem to be a unit unto themselves. During the 1958-1969 time period the labourers base rate changes fluctuated from a low of 3.1 per cent in one year to a high of 13.8 per cent in another year. Such a degree of variability cannot be matched by any other unit. As a result of this variability, the movement of the labourers percentage changes correlate poorly with the relatively more stable percentage changes in the other bargaining units.

The Amalgamated Construction Association bargains on behalf of a number of general contractors with both the carpenters union and the labourers union. As a result one would expect a close relationship between the wage movements in the two units. But such does not seem to be the case. The equivalent year correlation coefficient obtained between the percentage changes in the base rate in the carpenter and labourer units was .54. This is not a particularly strong relationship.

#### Conclusions and Comments

The correlation analysis supported the often made assumption that there is a strong relationship between the annual base rate changes of the F.I.R. - I.W.A. bargaining unit and the annual base rate changes of the P.P.I.R.B - P.S.P.M.W. bargaining unit. There is some evidence to suggest that the F.I.R.-I.W.A. unit is the "pattern setter" in this relationship.

In reference to the construction industry it is often stated that annual percentage changes in the base rates of the various bargaining units move in close relationship to one another. This statement is usually based

on the fact that the various features of the bargaining units are similar in most respects. The results of the correlation analysis appear to refute this statement. The correlation coefficients, with one exception, indicate relatively weak relationships in the movement of base rates over time. The one exception is the relationship between the carpenters unit and the electricians unit. The equivalent year coefficient of this relationship is .82. The remaining equivalent year coefficients range from .12 to .70 with the average being approximately .53. These coefficients represent much weaker relationships.

In the future one can expect the annual percentage increase in the base rates of all the construction units to move in a more similar manner than has been the case in the past. Why should this be the case? The percentage changes in the labourers unit should stabilize in the future. The painters and plumbers will probably avoid five year agreements in the future and stick with much shorter agreements that will allow them to keep pace with the other construction units. In the future there will probably be a move to centralize even further the collective bargaining in the industry. This will tend to standardize wage increases in the industry.

To try and measure the phenomena whereby one unit while negotiating new wage rates looks at what the percentage change in wages was for a comparable unit one year earlier, the one year lag coefficient was included. In all the units the one year lag coefficient results do not indicate any strong relationships. From this fact one can conclude that negotiators are

not too concerned about what happened in other units one year earlier with respect to base rate changes. Rather they are more cognizant of what is going on in the current year (equivalent year).

When a high correlation coefficient is achieved between the base rate changes in two bargaining units, it would be interesting to determine just which one of the two units is the "pattern setter". In most cases the answer to this question is difficult to find. Some indication can be achieved by looking at the effective dates of new collective agreements. However these dates are often not indicative since wage rate negotiations can occur at any time throughout the whole course of negotiations. The beginning and ending of negotiations in turn, can vary radically with respect to the effective date of the wage increase. Thus the time element makes it very difficult to determine the "pattern setter" between two closely related bargaining units.

### CHAPTER III

#### A CORRELATION ANALYSIS OF BASE WAGE RATES AND SELECT ECONOMIC VARIABLES

The goal of this chapter is to demonstrate how, for the years 1958-1969, the annual percentage change in the base rate of seven bargaining units, moved in relation to certain economic variables that are considered to be relevant to the collective bargaining process. Correlation analysis will be the analytical tool used to measure the relationship between the percentage changes in base rates and the economic variables. It is hoped that the correlation analysis will show that indeed there is some correlation between base rate changes in a particular bargaining unit and one or more economic variables. This being the case it provides some insight into what economic factors are crucial in wage determination under collective bargaining with respect to the seven bargaining units under consideration.

By utilizing the computing centre facilities the annual percentage change in the basic hourly wage rate for the years 1958-1969, in each bargaining unit was correlated with a measure of the following variables.

- A. Consumer Price Index
- B. Employment
- C. Unemployment
- D. Profits
- E. Productivity

The unit of measurement for these economic variables was the same as the measure for the base wage rate changes, that is the percentage change per year<sup>6</sup>.

For each bargaining unit annual percentage change in the base wage rate was correlated with both the equivalent year percentage change in each variable and the percentage change in each variable in the year preceding the wage change, or in other words, the variable was lagged one year. The one year lag was included because it was felt that the changes in the economic variables in the year preceding the wage change could have a significant effect on the actual wage negotiated. The one year lag correlation attempted to measure this effect.

With some of the variables it was not possible to provide data on the percentage change for certain years. The computer program did account for this missing data. However, the reliability of the correlation in such cases may have been impaired because of the fewer observations.

In most of the cases it was difficult, if not impossible, to provide data on the economic variables that corresponded directly with the various bargaining units. The data was simply not available. This being the case other data was used and it is hoped that it was representative of the actual situation in the bargaining unit. It should be kept in mind that an error factor may be operating because of this data deficiency.

The next section of the chapter is concerned with the explanation of

<sup>6</sup>The data for each variable used in the correlation analysis is contained in Appendix II

the economic variables used, their meaning, the data used to measure them and the source of this data.

#### A. Consumer Price Index

Unions contend that in a period of rising prices, wage increases are necessary to enable employees to catch up with prices and maintain their real standard of living. The amount of catching up is determined by a measure of the changes in prices of goods and services purchased by the consumer. The measurement most often used in collective bargaining is the consumer price index. Because of the union's desire to maintain a workers real wage the cost of living variable, of which the consumer price index is a measure, is often a focal point in contract negotiations. The consumer price index is frequently formally incorporated into union contracts in the form of escalator clauses and cost of living allowances.

There are numerous types of consumer price indexes. The index used in this correlation project is termed consumer price index (all items). It is an average of a number of other consumer item indexes. The consumer price index (all items) for both Canada and the Vancouver area were correlated with the wage changes. The Vancouver index was included because of its relevance to collective bargaining in the units under consideration.

#### B. Employment

The employment variable was included in the correlation mainly because it reflects the general level of business activity. Increasing employment levels usually indicate rising demand. On the other hand, declining employ-

ment tends to indicate slackening demand and lower levels of business activity. If employment during and before negotiations has been increasing there is greater pressure brought to bear on employers to grant wage increases. Declining employment levels before and during negotiations puts pressure on the unions to tone down their wage demands.

Unfortunately, it was not possible to obtain employment figures that related directly to the seven bargaining units. Therefore some other figures had to be used. The figures used were employment by industry for the province of B.C. The industries used were saw and planing mills, pulp and paper and construction. Since the employment figures used are not directly related to the seven bargaining units there may be an error factor operating. Even so, it is felt that the figures used were a reliable representation of the actual employment levels in the bargaining units.

### C. Unemployment

The unemployment variable was included in the correlation analysis for two reasons. First, the level of unemployment is a reasonable measure of the degree of idle capacity in the economy. As a result it tends to reflect the general level of business activity which in itself effects negotiations. Second, like employment, unemployment constrains both union and management only in a way opposite to that of employment. A situation of increasing unemployment generally indicates a slackening of demand and a slowing down of the economy. In the light of such conditions unions are under pressure to keep their wage demands down. On the other hand decreasing unemployment

generally indicates a strengthening of demand and better business conditions. In the light of such conditions employers are under pressure to grant union wage demands.

As was the case for the employment variable, statistics on yearly unemployment levels within each bargaining unit were not available. Even unemployment statistics for industries within each province were not available. The best possible set of statistics available, and the set used, was the yearly percentage of the labour force unemployed for the whole province of B.C. Thus an error factor will again be present. However it is hoped that the unemployment statistics for all of B.C. will be representative of the actual unemployment levels in the respective bargaining units. This is probably the case since the bargaining units are large ones and relate to the three largest industries in B.C.

#### D. Profits

In collective bargaining the level of corporate profits is often used as an indicator of the employer's ability to pay a demanded wage increase. If the employer's profits were high during the period preceding negotiations, the union will point to this as evidence that the employer can afford to pay and their wage demands should therefore be granted. On the other hand if the employer's profits were low during the period preceding negotiations, he will put this forth as evidence to indicate his inability to pay and therefore the union's demands, in his opinion should not be granted.

The profit statistics used in the correlation calculations are annual corporate profits before taxes, by industry, for all Canada. Statistics



were available only for the wood industries and the pulp and paper and allied industries. No profit statistics were available for the construction industry. Since the statistics used relate to all of Canada they are not directly related to the bargaining units under consideration in this study. As a result the findings of the correlation analysis should be interpreted with caution since it is possible for the error factor to have been quite large. It should also be pointed out that the profit statistics used were deflated by using an index of wholesale prices for each industry.

### E. Productivity

Productivity can be defined as a measure of physical output within a unit of time. An increase in productivity is a greater physical output within the same unit of time. Unions generally feel that productivity increases should be passed on to workers in the form of higher wages. The employer has two alternatives. He can pass on productivity increases to consumers in the form of lower prices or he can pass productivity increases on to his employees in the form of higher wages. The fact that wages can reflect productivity increases makes it an important variable in wage determination under collective bargaining. The productivity variable is often formally incorporated into the wage structure in the form of an annual improvement factor.

It is extremely difficult to develop a true productivity measure. Output per man hour is generally accepted as being the best available at the present time. Even this measure is very difficult to calculate because of the enormous problems involved in calculating the amount of

physical output and time involved. For this study, output per man hour data was not available. For the lumber and pulp and paper industries the measure of productivity used was the value added per man, by industry, for the province of B.C. For the construction industry the total value of work performed in B.C. was used. All the statistics on productivity for all the industries were deflated by their appropriate wholesale price index to try and eliminate the influence of price increases on the figures.

After the data on the annual percentage change in base wage rate for each bargaining unit and the annual percentage change in all the economic variables was compiled, it was organized, coded, programmed for correlation analysis and run through the computer for computation. The resulting correlation coefficients are presented in Table XI. Following is an analysis of these correlation coefficients by bargaining unit.

#### Correlation Results

##### 1. Forest Industrial Relations Association and the International Woodworkers of America

The annual percentage change in the basic hourly wage rate for this particular bargaining unit correlated quite closely with the equivalent year annual percentage of the labour force unemployed for all of B.C. The correlation calculations produced a coefficient of  $-.76$ . This coefficient indicates a strong negative correlation. While the annual percentage of the labour force unemployed is decreasing the annual percentage change in the base rate is rising and vice versa.

The above correlation appears to be quite understandable. The lumber

TABLE XI. - CORRELATION COEFFICIENTS BETWEEN THE ANNUAL PERCENTAGE CHANGE IN BASE WAGE RATES AND THE ANNUAL PERCENTAGE CHANGE IN SELECT ECONOMIC VARIABLES, 1958 - 1959.

BARGAINING UNIT	CONSUMER PRICE INDEX ALL ITEMS				EMPLOYMENT BY INDUSTRY FOR B.C.		UNEMPLOYMENT FOR ALL OF B.C.		PROFITS BY INDUSTRY FOR CANADA		PRODUCTIVITY BY INDUSTRY FOR B.C.	
	CANADA		VANCOUVER		EQUIV. YEAR	1 YEAR LAG	EQUIV. YEAR	1 YEAR LAG	EQUIV. YEAR	1 YEAR LAG	EQUIV. YEAR	1 YEAR LAG
	EQUIV. YEAR	1 YEAR LAG	EQUIV. YEAR	1 YEAR LAG								
LUMBER AND LOGGING	.46	.21	.36	.17.	-.37	.21	-.76	-.41	-.17	.43	.07	-.11
PULP AND PAPER	.78	.39	.61	.18	-.00	.45	-.81	-.75	-.66	-.27	-.40	.02
CARPENTERS	.73	.80	.83	.60	.14	.43	-.08	-.70			-.12	.52
ELECTRICIANS	.73	.51	.57	.22	.60	.55	-.78	-.69			.53	.60
PAINTERS	.60	.54	.50	.55	.20	.50	-.41	-.73			.03	.59
PLUMBERS	.51	.42	.62	.27	.52	.35	-.53	-.60			.27	.27
LABOURERS	.56	.09	.26	-.14	.15	.67	-.29	-.57			-.08	.73

and logging industry in B.C. employs a large percentage of the B.C. labour force and indirectly effects an even greater percentage. Unemployment percentages for all of B.C. would therefore reflect unemployment conditions within the lumber and logging industry. As unemployment is dropping, demand is rising, and business conditions in the industry are improving. If negotiations occur under such conditions the union (I.W.A.) is in a favorable bargaining position vis-a-vis the employers (F.I.R.) and thus can press for higher wages. If business is good the employers want to avoid having production stopped which would happen in the event of a strike. On the other hand if unemployment is rising, demand is generally slackening and business conditions in the industry are deteriorating. If negotiations occur under such conditions the union is in a less favorable bargaining position vis-a-vis the employers. As a result they cannot press too hard for higher wages. Since business is not that good the employers are not too concerned with the prospect of interrupted production. But the union with unemployment increasing among its members, wants to avoid a strike which would probably add fuel to the fire. Under such circumstances they would probably accept a lower wage increase to insure employment for some of their members.

A one year lag in the unemployment variable produced a correlation coefficient of  $-.41$ . This is a relatively weak relationship compared with the  $-.76$ . It probably indicates that some consideration is given to the unemployment level in the year preceding negotiations although not as much as the equivalent year unemployment level.

The annual percentage change in the base rate when correlated with the

consumer price index (all items) for Canada and Vancouver (equivalent years) produced coefficient of .46 and .36 respectively. These results indicate a fairly weak relationship. As the annual percentage change in consumer price index increases the annual percentage change in the base rate tends to increase and vice versa.

The correlation coefficient between the annual percentage change in the level of profits by industry for all Canada, (one year lag) and the annual percentage change in the base rate is .43. This may indicate that the profits levels of the lumber companies in the year immediately preceding negotiations do play a role in wage bargaining but not a major one.

A recent incident in the B.C. forest industry serves to illustrate the relationship between previous years profits and wage changes. Early in 1969 the largest companies in the B.C. forest industry reported 1968 fourth quarter profits that represented a sharp increase over the previous quarters. The I.W.A., which bargains on behalf of the lumber workers, immediately upon hearing the sharp increase in profits initiated a drive to have the current contract reopened in order that an upward wage adjustment could be obtained. Up to the time of writing the union has not been successful in their bid to reopen the contract. Although no wage increase has been received in the above example it none-the-less illustrates, to a certain extent, the relationship between previous years profits and wage changes.

The remaining correlation coefficients indicate weak or non-existent relationships. The variables that these coefficients apply to do not seem to bear any relationship to annual percentage change in the basic hourly wage rate.

## 2. Pulp and Paper Industrial Relations Bureau and the Pulp Sulphite and Paper Mill Workers

As was the case in above bargaining unit the annual percentage change in the base wage rate correlated strongly with the annual percentage of the labour force unemployed for all of B.C. (equivalent years). The correlation coefficient is  $-.81$  indicating a strong negative correlation. The explanation and rationale behind such a correlation coefficient is the same as that outlined in the F.I.R. - I.W.A. case.

It is interesting to note that unemployment (one year lag) coefficient is  $-.75$ . This indicates a fairly strong relationship, suggesting that during negotiations, consideration is given to what unemployment conditions were like in the preceding year.

The correlation between the per cent changes in the base rate and the equivalent years consumer price index for Canada and Vancouver produced coefficients of  $.78$  and  $.61$ . These results indicate a strong positive correlation. As the consumer price index increases so does the percentage increase in the base rate and vice versa. The fact that the index changes are reflected in the base rate changes in the same year indicates a rapid adjustment. This in turn may indicate that the contract has a built in cost of living formula based on the consumer price index.

## 3. Amalgamated Construction Association and the Provincial Council of Carpenters

In this particular bargaining unit the correlation coefficients indicate that there is a strong positive relationship between the annual per-

centage change in consumer price index. The four coefficients that resulted are .73, .80, .83 and .60. This strong a correlation suggests either a built in mechanism or that particularly close attention is paid to this economic variable.

The correlation between the annual percentage change in the base rate and the annual change in percentage of the labour force unemployed for all of B.C., one year lag, produced a coefficient of  $-.70$ . This indicates quite a strong negative correlation. If the percentage unemployed in the labour force of B.C. fell in the year immediately preceding negotiations then the percentage change in the base rate increased in the negotiation year. On the other hand if the percentage unemployed in the labour force increased in the year preceding negotiations then the percentage change in the base rate decreased in the negotiation year.

Generally speaking if unemployment is decreasing, employment will increase and vice versa. Since the one year lag unemployment variable correlated negatively with wage changes then one might also expect the one year lag employment variable to correlate positively with wage changes. This seems to be the case. The correlation coefficient obtained was  $.43$ .

It will be recalled that productivity in the construction industry was measured by the value of work performed. The correlation between base rate changes in the carpenters unit and the per cent changes in the value of work performed, one year lag, produced a coefficient of  $.52$ . This indicates a fairly strong positive correlation. If the percentage change in the value of work performed in the industry increased in the year preceding

negotiations then the percentage change in the base rate tended to increase in the negotiation year and vice versa.

#### 4. Electrical Contractors Association and the International Brotherhood of Electrical Workers Local 213

The strongest correlation in this unit is the one between the percentage changes in the base rate and the equivalent year changes in the percentage of the labour force unemployed. The coefficient is  $-.76$ . It will be recalled that the carpenters percentage changes in their base rate correlated well with the one year lag changes in the percentage unemployed. What accounts for these two units having strong negative correlations with different unemployment variables even though they are in the same industry? One possible answer to this question is the following. The electricians negotiation sessions occur late in the calendar year. As a result they would have knowledge about the general pattern of economic activity and the unemployment situation for the year in which they are negotiating. Under such circumstances it is not surprising to see percentage changes in the base rate correlate well with the equivalent year changes in the percentage unemployed. The carpenters on the other hand, negotiate early in the calendar year. As a result they would not be able to predict very accurately what the general pattern of economic activity and the unemployment situation would be like in the remaining part of the year. The negotiating of wage changes would therefore have to be based on what happened in the year preceding negotiations. Under such circumstances one is not surprised to see the percentage changes in the base rate correlate well with the one year lag changes in the percentage unemployed.



One would expect in the light of the above explanation, that since the percentage changes in the electricians base rate correlated well with the equivalent year changes in the percentage unemployed that the wage changes would also correlate with the equivalent year percentage changes in employment and value of work performed. This seems to be the case with the correlation coefficients being .60 and .53 respectively.

The percentage changes in the base rate seems to have a strong positive relationship with the equivalent year consumer price index for Canada. The coefficient is .73. This suggests that consideration is given during negotiations to maintaining the real purchasing power of the union members.

5. Master Painters Association and the Painters, Decorators,  
and Paperhangers of America Local 138

The most significant correlation in this unit is the one between the percentage changes in the base rate and the one year lag changes in the percentage of the labour force unemployed for all of B.C. The correlation coefficient is  $-.73$ . Following the same pattern as the carpenter and electrician units, there seems to be a significant correlation between the percentage changes in the base rate and the one year lag percentage changes in the level of employment, and the percentage changes in the value of work performed (productivity). As mentioned before, these results suggest that considerable attention is focused on the general economic conditions in the province in the year preceding negotiations, as well as on the volume of work performed and the level of employment in the construction industry in the year preceding negotiations.

The correlation coefficients under the consumer price index indicate that some relationship does exist. The remaining coefficients indicate weak or nonexistent relationships.

6. Mechanical Contractors Association and the United  
Association of Plumbers Local 170

This particular unit is unique among the other construction units because of the fact that it had during the years 1964-1969, a contract that based wage changes on a formula. This formula included a cost of living index and a productivity index. However during the other years under consideration in the analysis, 1958-1963, this unit was not locked into an agreement which included a formula for wage changes. Probably as a result of these two different types of contracts the correlation analysis produced relatively low coefficients. There is one sign that the cost of living index under the formula was working. The percentage changes in the base rate when correlated with the equivalent year percentage changes in the consumer price index for Canada produced a coefficient of .60. On the other hand the productivity index in the formula does not seem to show through in the results. The coefficients obtained under the productivity measure are .27 and .27 respectively. These low results could be a result of the measure used for productivity. The value of work performed in the construction industry is not what you would call directly comparable to increases in productivity within the mechanical trades section of the construction industry.

7. Amalgamated Construction Association and the Construction  
and General Labourers Union

A coefficient of .73 resulted from a correlation between the percentage changes in the base rate and the one year lag percentage changes in the value of work performed (productivity). This is a strong positive correlation. Since value of work performed is a good indicator of the general economic conditions in the province, one would expect a reasonable correlation between percentage changes in the base rate and other indicators of the general level of business activity ie. one year lag percentage changes in the level of employment and one year lag changes in the percentage unemployed. This is the case with the correlation coefficients being .67 and -.57 respectively. In other words this unit seems to fall into the same general pattern that exists in the other construction units listed above.

The correlation coefficient of .73 obtained under value of work performed (productivity) is probably suggestive of the type of wage policy that the labourers' union adheres to. That is, they will seek as much of an increase as the market will bear without too much concern for price level changes, unemployment etc. If the contractors had lots of work in the year preceding negotiations the labourers will press for high increases. If the contractors had little work in the year preceding negotiations the labourers will modify their wage demands proportionately. This type of policy seems to have paid off for the labourers. During the 1968-1969 time period the labourers have realized a 209 per cent increase in their base rate. This represents the highest increase of all the construction units.

All Bargaining Units - General Comments

In general the negative correlation between the annual percentage change in the basic hourly wage rate and the annual change in the percentage of the labour force unemployed in B.C. seems to be the strongest and most consistent. The highest correlation coefficients from bargaining units one through seven for these two variables are  $-.76$ ,  $-.81$ ,  $-.70$ ,  $-.78$ ,  $-.73$ ,  $-.60$  and  $-.57$ . The lumber and logging and pulp and paper units show a stronger relationship than do the construction units. This is probably due to the fact that these two industries are crucial to the B.C. economy, more so than the construction industry. How the forest industry goes, so goes the B.C. economy.

Assuming that the percentage of the labour force unemployed for B.C. reflects the degree of idle capacity in the B.C. economy and as such the general level of economic activity in the province, then one can conclude on the basis of the above correlation coefficients that wage determination under collective bargaining in the bargaining units under consideration is influenced to a considerable degree by the general economic conditions of the province. As business picks up, the annual change in percentage of the labour force unemployed will probably decrease and the percentage changes in the hourly base wage rates for the bargaining units under consideration will tend to increase in magnitude. On the other hand if the business activity drops, the percentage of the labour force unemployed will probably increase and the percentage changes in the base rates for the units under

consideration will tend to decrease in magnitude. The lumber and logging and pulp and paper bargaining units show strong correlations between the percentage changes in the base wage rate and the equivalent year changes in the percentage of the labour force unemployed. On the other hand, construction bargaining units, with one exception, generally show strong correlations between the percentage changes in the base wage rate and the one year lag changes in the percentage unemployed. This leads one to conclude that the forest industry bargaining units are more cognizant of the business conditions prevailing in the year in which the bargaining takes place ie. they are more current. The construction industry bargaining units rely more heavily it seems, on what the business conditions were like in the year preceding actual contract negotiations. They are concerned more with what has happened than with what is happening.

One possible explanation for the above phenomena is the timing of contract negotiations. If bargaining takes place at the beginning of the year it is fairly difficult to predict economic conditions for the rest of the year and therefore more attention is paid to what happened in the preceding year. If negotiations take place later in the year a reliable estimate can be derived of the economic conditions that will characterize the current year.

The relative stability and ease of predicting business conditions in an industry is another possible explanation. The forest industry is more stable and predictable than the construction industry which is quite unstable and volatile. In the former case current year business conditions are more easily estimated than in the latter case.

In general there seems to be fairly strong relationships between the annual percentage change in the base wage rate and some measure of the annual percentage change in the consumer price index. The highest correlation coefficients from bargaining units one through seven for the consumer price index variable are .46, .79, .83, .73, .60 and .56.

As far as the remaining variables are concerned there are some strong individual correlations (eg. .73 labourer's annual percentage change in the base rate and the one year lag percentage changes in the value of work performed) but in general the correlation coefficients indicate relatively weak or nonexistent relationships.

Since this chapter has concentrated on the relationship between base rate changes and certain economic variables one can be left with the impression that the economic variables are the only ones that influence wage determination under collective bargaining. This is not the case. A great number of political, behavioural and power variables are present during negotiations. A particular bargaining session is probably influenced by a combination of all variables rather than by only one type.

CHAPTER IVINTERINDUSTRY BASE WAGE RATE CHANGES - AN EXPLANATION

From time to time the following rationale has been put forth to explain interindustry base rate changes. In certain industries, market and competitive conditions allow member firms a considerable degree of control over product price. Under such conditions firms are not too concerned about matching wage increases with increases in productivity because they can always raise their product price to offset the wage increases. If the firms cannot increase productivity to maintain profits, they simply pass the wage increase on to a third party in the form of higher prices. This is particularly easy to do in a highly centralized bargaining where all firms in the industry are represented by one agency. In other industries the market or competitive conditions allow member firms a low degree of control over product price. Under such conditions the bargaining between union and management over wage increases is constrained since wage increases cannot be easily passed on to a third party in the form of an increased product price. Random increasing of the product price would probably mean loss of sales and marketing position. Either wage increases have to be offset by productivity increases or profits must be reduced to offset the wage increase.

It follows from the above rationale, that wage increases should be greater in industries where the member firms have control over price when

compared with industries where the member firms have little or no control over price.

It is the purpose of this chapter to either accept or reject the above rationale as an explanation for the differences in the interindustry base rate changes in the three industries under consideration in this paper. The seven bargaining units discussed in the previous chapters are considered for the purposes of this chapter as comprising the three industries. The workers in these seven units do not account for all the workers in the industries. However it is felt that they comprise a large and representative enough part to make the results of the chapter valid. Before proceeding to an analysis some further explanation is required.

The market and competitive conditions industries face is only one of a number of factors that have been put forth as explanations for inter-industry base rate changes. Productivity differences, differences in the degree of concentration and unionization and differences in the proportion of labour costs to total costs have all been mentioned by researchers<sup>7</sup> as being determining factors in interindustry base rate changes. For the industries under consideration in this analysis it is felt that these other factors either cancel themselves out or are of little importance when compared with the market or competitive conditions. This conclusion about the other factors will be substantiated later in the chapter.

<sup>7</sup> Joseph Garbarino, "A Theory of Interindustry Wage Structure Variation", "Quarterly Journal of Economics", Volume LXIV, May, 1950; Arthur Ross and William Goldner, "Forces Affecting the Interindustry Wage Structure", "Quarterly Journal of Economics", Volume LXIV, May, 1950.



## A. British Columbia Coast Lumber and Logging Industry

### 1. Product Market Orientation

The B.C. coast lumber and logging industry is highly oriented toward international markets as opposed to domestic or local markets. The industry produces goods largely for export for the United States and overseas markets in close competition with other producing areas. Because of this market situation a company or the industry has little or no control over the price it can charge.

### 2. Competitive Conditions

The number of firms competing in the same product markets is very large. This is probably due to the fact that entry into the industry is easy, especially for the small producer. No great amount of capital outlay is required to set up business. As a result of the large number of competitors no one firm produces enough output to influence the price of the product.

Another factor affecting the control a firm in the lumber industry has over price is the elasticity of product demand. By elastic product demand it is meant that a price increase for a product will cause the sale of that product to fall by a proportionately greater amount, thereby reducing the total revenue realized by the firm. The elastic product demand situation is caused by the large number of firms, the availability of good substitute products, the degree to which the product can be put to a wide range of uses, and purchases of the product tends to take a large portion of the consumers income.

### 3. Summary

Highly competitive industry with the individual firms having a low degree of control over product price. As a result firms cannot easily pass on wage increases in the form of higher prices without jeopardizing their competitive position in the product market.

#### B. British Columbia Pulp and Paper Industry

##### 1. Product Market Orientation

Like the B.C. lumber and logging industry the B.C. pulp and paper industry is highly oriented toward international markets. The industry produces pulp and paper products largely for export to the United States and overseas markets in close competition with other producing areas. It also produces for eastern Canada markets to some extent, but for the purposes of this paper this market is not considered to be a domestic or local market. The above market orientation is the biggest constraint on price facing the industry.

##### 2. Competitive Conditions

Unlike the lumber industry the number of competing firms in the pulp and paper industry is quite small. There are a few large and well financed companies in the B.C. sector of the industry. The scarcity of firms is due largely to the fact that entry into the industry requires a heavy capital investment. Recently a situation of oversupply in the industry has acted as a further deterrent to entry. Once a firm is operating it faces high fixed costs, another factor affecting entry decisions.

Because of the small number of firms there does exist a concentration of production. However this does not allow the firms to influence price since the competitive situation in the total world market more than offsets the concentration advantage.

Theoretically pulp and paper manufacturers face an inelastic demand for their product. This results from the having a small number of firms in the industry and the relative scarcity of substitute products. In practice however, if a pulp and paper manufacturer increased his price hoping that sales would not fall by as great a proportion and thereby reap in the benefits of increased total revenue, he would be disappointed. The above inelastic demand process would not materialize in practice due to the strong competition and recently because of the oversupply situation in the market. So the inelastic demand situation really does not exist in practice and therefore provides no degree of control over product price.

### 3. Summary

There are a few large firms in the B.C. industry but they face heavy market competition and have very little control over product prices. It is therefore difficult to offset wage increases by increasing prices.

#### C. British Columbia Construction Industry

##### 1. Product Market Orientation

The product being marketed in the construction industry is really a service. Firms or individuals contract out their services to construct

something for a customer who is willing to pay a price or fee. The market for this service is by and large a local or domestic market. The contractors largely confine themselves to the B.C. region. They don't normally seek business outside the province. In turn contractors from outside the province normally do not encroach on the B.C. market. As a result the product market in B.C. construction is relatively sheltered from outside competition.

## 2. Competitive Conditions

In the construction industry in B.C. as in other regions, there is a very large number of firms. Entry into the industry is easy, especially for the small producer. Very little capital is required to begin a business. No one firm in the industry is large enough to influence the price paid for construction services. However, collectively the firms have some control over the prices they can charge for their services.

A customer who wants a project done usually tenders the project out to bid. All interested firms put in a bid for the job, ie. what the firm would charge to complete the project. The bid is a summation of all costs, including labour, plus a standard rate of return for doing the job. The point to be made here is that if a particular cost that affects each firm in the same way should increase, then an individual firm's competitive bid position is not harmed. All the firms bids would be increased by the amount of the cost increase. The result is a price increase with no effect on the individual firms profits.

This above situation is what happens when the cost of labour (wages) increases. When the unions are granted increases the firms simply increase their bids by the same amount. No one firm suffers by the increase. But to the customer it means a price increase. This situation is particularly applicable to the case where in bargaining one group is representing the majority of the workers and one group is representing the majority of the largest firms in the industry. This is the case with collective bargaining in the B.C. construction industry.

### 3. Summary

The industry is characterized by a large number of firms who are highly competitive but who have some degree of control over product price.

A restatement of the explanation for interindustry base rate changes mentioned at the beginning of the chapter is as follows. Those industries facing market or competitive conditions which allow it control over product price tend to have greater base rate increases than those industries facing market or competitive conditions which dictate a low degree of control over product price. As explained the lumber and logging and the pulp and paper industries face market or competitive conditions which allows them little control over price. On the other hand the construction industry faces market or competitive conditions which allows control over product price. If the argument is valid then, the construction industry should have greater base rate increases than the lumber and logging and the pulp and paper industries. Is this the case?

Table XII presents the data that answers this question. In the first column of the table the bargaining units are arranged by industry. The painter and plumber units are not included under construction because no 1969 base rate data is available for these units. These two units have been the lowest of all the units in terms of base rate increases up to the end of 1968. This is a result of five year agreements. In the future they will more than likely improve their relative positions within the construction industry.

The second column contains the total point increase in the index of the base wage rate for the 1958-1969 time period. The changes in the index of base rates is the measure being used to illustrate interindustry base rate changes. The third column is the ranking of each unit with respect to total increase in index points. The fourth column contains the mean percentage increase in the base rate for the years 1958-1969 inclusive. The last column contains the ranking of each unit with respect to the mean percentage increase.

From the Table XII it is readily apparent that the construction industry units have received a greater percentage increase in their base rates than have the lumber and logging and the pulp and paper units. The construction units rank 1,2,3, in the total point increase in the index of the base rate and 1,2,3, in the mean percentage increase in the base rate. The lumber and logging and the pulp and paper industry units rank fourth and fifth in both cases.

TABLE XII. - Total Point Increases in the Indexes of Base Wage Rates and the Mean Percentage Increase in the Base Wage Rate for the 1958-1969 Period

Industry	Total Point Increase in Index of Base Rate for 1958-1969 Period	Ranking	Mean Percentage Increase in Base Rate for 1958-1969 Period	Ranking
Construction				
Labourers	109	1	7.1	1
Electricians	87	2	5.9	2
Carpenters	82	3	5.7	3
Lumber and Logging	81	4	5.1	4
Pulp and Paper	69	5	4.7	5

The above results are compatible with the rationale presented earlier to explain interindustry base rate change. The construction industry in B.C. faces market or competitive conditions that allows for control over product price and it does have higher percentage increases in its base rates than does the lumber and logging and pulp and paper industries. The latter two industries face market or competitive conditions which dictate a low degree of control over product price.

Whether or not the construction industry firms actually do pass on large wage increases in the form of higher prices is beyond the scope of this paper. But the above results suggest that there would be a low probability of error associated with an educated guess.

As mentioned earlier in the paper, market or competitive conditions is not the only factor that can potentially explain interindustry base rate variations. Other factors are differences in productivity, differences in the degree of concentration and unionization and differences in the proportion of labour cost to total costs. Following is a brief discussion of these factors with reference to the results obtained above.

Concentration in an industry can be described as the degree to which a small number of firms account for a large proportion of the total industry output. Relating this concept to base rate changes, the higher the degree of concentration in an industry the greater or higher will be the base rate increase. Applying this theory to the present analysis the lumber and logging and the pulp and paper industries should have higher base rate increases than the construction industry. But as the figures presented in Table XII



indicates this is not the case. So concentration does not seem to be a significant factor in explaining the interindustry base rate changes.

The same can be said of the degree of unionization. Supposedly, the higher the degree of unionization in an industry the higher the base rate increase relative to less unionized industries. In the industries under consideration the degree of unionization is about the same. If anything, the lumber and logging and the pulp and paper industries are more unionized than the construction industry. As a result one would expect to have equal base rate increases in the industries or high base rate increases in the lumber and logging and pulp and paper industries. As the wage data shows this is not the case. So the degree of unionization does not seem to explain the interindustry base rate changes under consideration.

It is often argued that the smaller the proportion of labour costs to total cost the greater is the tendency for base rates to increase. The percentage of labour cost to total cost in the lumber and logging industry is about 25 per cent. For the pulp and paper industry it is approximately 20 per cent and for the construction industry it is approximately 35 per cent. So if the above theory is correct the pulp and paper industry should have the highest base rate increases followed by the lumber and logging and the construction industries respectively. This is not the case. In fact the exact reverse is the situation. Therefore the proportion of labour costs to total costs does not seem to explain the interindustry base rate changes.

The last factor to consider is productivity. Things become fuzzy with respect to the role this factor plays because of the lack of data on pro-

ductivity for the various industries. A recent newspaper article on the construction industry stated that productivity increases were in the area of 2.1 and 3.4 per cent per year. No other data has been published to substantiate or refute these figures. So for the purposes of this paper it will be assumed that they are correct. No figures could be found for the lumber and logging and the pulp and paper industry but one could reasonably assume that the productivity increases in these industries are at least equal to the construction industry if not more. The argument states that the higher the productivity increases the higher the base rate increases. In terms of this analysis then one would expect approximately equal wage increases among the industries or possibly the lumber and logging and the pulp and paper industries to have higher base rate increases. This is not the case. So productivity, although subject to question because of lack of data, does not appear to explain the interindustry base rate changes.

In summary then, of all the variables considered it seems that the market or competitive conditions is the only variable of any significance. This variable and its relation to price control is the only one capable of explaining the interindustry base rate changes for the three industries under consideration in this paper.

## CHAPTER V

### SUMMARY AND CONCLUSIONS

Chapter I of the paper compared the absolute and percentage increases in the base rates of the seven bargaining units, for the 1958-1969 time period. The results showed that within the construction industry, the electricians unit, the carpenters unit and the labourers unit all had improved their relative position, in both absolute and percentage terms, when compared with the painters unit and the plumbers unit. This fact, when combined with the knowledge that base rate competition is fierce among the construction trades, leads one to certain conclusions.

It is highly probable, and almost certain, that in their next set of negotiations, both the plumbers unit and the painters unit will demand very large base rate increases. This will be necessary in order to "catch up" on the other construction units. Since it was a five year agreement that caused both the painters and plumbers to fall behind the other units, one can expect them to turn a deaf ear to any management proposals that would lock them into another long term agreement.

The analysis of Chapter I turned up another fact that will have a tendency to discourage long term agreements. There is a strong positive correlation between the mean percentage change in the base rate per year and the standard deviation among the annual percentage changes in the base

rate. That is, the unit with the highest mean percentage change (labourers) also had the highest standard deviation between the annual percentage changes etc. In terms of wage increases, it seems that the greater variability in the annual percentage changes in the base rate that a unit can achieve, the better off they will be in the long run. One year contracts give a unit the best opportunity for variability and long term contracts the least opportunity for variability. Therefore, unions recognizing this may tend to avoid long term contracts.

The results of the comparison of Chapter I also indicated that three important construction units had managed to increase the absolute gap between their base rates and those of the forest industry units, particularly in the last few years. One can conclude from this that the labour negotiators in the forest industry will be demanding large base rate increases in the future in order to keep pace with the construction units. To make this conclusion one would have to have evidence that the base rates in the two industries move in relation to one another. The correlation analysis of Chapter II provided this evidence.

The correlation results of Chapter II also substantiated the often made assumption that the base rates in the two forest industry units move in relation to one another. One can conclude that the two units ie. the lumber-logging unit and the pulp and paper unit, are within each others sphere of comparison. The latter statement also applies to the electricians unit and the carpenters unit within the construction industry. The correlation results indicated a strong relationship between the base rates of these two units.

The same cannot be said of the other base rate relationships in the construction industry units. The correlation results, with the above exception, indicated weak relationships between the various base rates. That is, the base rates of all the construction industry units do not move in close relationship to one another as is so often assumed.

The results of Chapter II showed low correlation coefficients on the one year lag variable for all bargaining units. One can conclude from this that the bargaining units under consideration do not pattern their base rate increases on what has happened in a comparable bargaining unit one year earlier.

The object of Chapter III was to demonstrate, by using correlation analysis, how the annual percentage change in the base rate in each of the seven units moved in relation to certain select economic variables. In general the results show that the closest relationships were derived between base rate changes and some measure of the annual change in the percentage of the labour force unemployed in B.C. Assuming that the percentage of the labour force unemployed reflects the degree of idle capacity in B.C., and as a consequence, the general level of economic or business activity in the province, then one can conclude on the basis of the correlation results that the most crucial variable affecting wage determination in the bargaining units under consideration is the general level of economic and business activity.

The forest industry units show strong correlations between base rate changes and the equivalent year changes in the percentage of the labour force

unemployed. On the other hand, construction industry units, with one exception, show strong correlations between base rate changes and the one year lag changes in the percentage unemployed. This leads one to conclude that the forest industry bargaining units are more cognizant of the business conditions prevailing in the year in which the bargaining takes place. The construction units it seems, rely more heavily, on what the business conditions were like in the year preceding actual contract negotiations. The timing of contract negotiations was put forth as one possible explanation for this phenomena.

The results of Chapter III indicate that there is fairly strong relationship between base rate changes in the units and some measure of the changes in the consumer price index. One can conclude from this that negotiators are concerned about maintaining the real purchasing power of employees. The wage rate increases tend to reflect this concern.

The other variables looked at in Chapter III are not important in so far as they show close relationships to base rate changes but rather, they are important because they show weak relations. In general the employment, profits and productivity variables did not correlate well with the base rate changes. However there were one or two exceptions to this generalization, the labourers unit in particular.

The purpose of Chapter IV was to explain the interindustry base wage rate changes for the units under consideration. The chapter was written on the assumption that the market or competitive conditions of industries is

the main explanatory variable. After discussing the market or competitive conditions of three industries (lumber and logging, pulp and paper and construction), other possible explanatory variables were considered. These variables were productivity differences, differences in the degree of concentration and the unionization and differences in the proportion of labour costs to total costs. The conclusion of the chapter was the same as the assumption upon which it was based. That is, the market or competitive conditions and its relation to price control is the main explanatory variable of the interindustry base rate changes for the three industries under consideration in this paper.

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APPENDIX I

Formulas for the calculation of numerical constants.

$$a = \frac{\sum_{i=1}^n y_i - b \cdot \sum_{i=1}^n x_i}{n}$$

$$b = \frac{n \left( \sum_{i=1}^n x_i y_i \right) - \left( \sum_{i=1}^n x_i \right) \left( \sum_{i=1}^n y_i \right)}{n \left( \sum_{i=1}^n x_i^2 \right) - \left( \sum_{i=1}^n x_i \right)^2}$$

n = number of pairs of observations

<u>x</u>	<u>y</u>	<u>x<sup>2</sup></u>	<u>x y</u>
0	2.2	0	0
5.8	3.2	33.6	18.6
5.5	4.1	30.2	22.6
0	0	0	0
4.2	3.4	17.6	14.3
4.0	3.8	16.0	15.2
7.2	5.0	51.8	36.0
5.8	6.5	33.6	37.7
8.5	8.2	72.2	69.7
7.8	7.6	60.8	59.3
6.5	6.3	42.2	40.9
<u>6.1</u>	<u>6.0</u>	<u>37.2</u>	<u>36.6</u>
61.4	56.3	395.2	350.8

$$a = \frac{56.3 - .77(61.4)}{12}$$

$$= \frac{9.02}{12} = \underline{\underline{.75}}$$

$$b = \frac{12(350.8) - (61.4)(56.3)}{12(395.2) - (61.4)^2}$$

$$= \frac{752.78}{972.44} = \underline{\underline{.77}}$$

APPENDIX II

Consumer Price Index  
 (All Items)  
 1949 = 100

Year	CANADA		VANCOUVER	
	Index	Percentage Change	Index	Percentage Change
1956	118.1		119.6	
1957	121.9	3.2	122.6	2.5
1958	125.1	2.6	125.6	2.4
1959	126.5	1.1	127.9	1.8
1960	128.0	1.2	129.0	.0
1961	129.2	.9	129.4	.3
1962	130.7	1.2	129.8	.3
1963	133.0	1.8	131.8	1.5
1964	135.4	1.8	132.7	.7
1965	138.7	2.4	135.1	1.8
1966	143.9	3.7	138.3	2.4
1967	149.0	3.5	143.5	3.7

Source: Summary of Economic Activity in B.C., 1966-1967.

Annual Average Employment  
by Province and Industry

1949 = 100

1961 = 100

Year	Saw and Planing Mills		Pulp and Paper		Construction	
	Index	Percentage Change	Index	Percentage Change	Index	Percentage Change
1956	125.3		143.4		148.1	
1957	115.0	-8.2	132.5	-7.6	159.5	7.7
1958	115.3	2.6	143.6	8.4	97.0	-39.2
1959	110.2	-4.4	165.4	15.1	102.5	5.7
1960	117.6	6.7	175.6	6.2	89.2	-13.0
1961	118.6	.85	188.0	7.1	78.6	-11.9
1962	122.6	3.4	198.3	5.5	82.8	5.3
1963	128.5	4.8	210.3	6.0	84.3	1.8
1964	129.7	.93	225.4	7.2	95.9/	13.8
					120.2	
1965	133.5/	2.9	246.4/	29.3	154.2	28.3
	108.7		126.4			
1966	108.3	-.37	143.4	13.4	176.7	14.6
1967	100.5	-7.2	144.9	1.0	196.0	10.9

Source: D.B.S. - Review of Employment and Payrolls 1959-1967

Annual Average of Unemployment  
for British Columbia

Year	Unemployment (in thousands)	Percentage of Labour Force
1956	14	2.8
1957	27	5.0
1958	47	8.6
1959	36	6.5
1960	49	8.7
1961	48	8.3
1962	39	6.6
1963	39	6.4
1964	34	5.3
1965	28	4.2
1966	32	4.5
1967	40	5.2

Source: Summary of Economic Activity in B.C. 1966-1967

Annual Corporation Profits Before Taxes  
by Industry in Canada  
(in millions of dollars)

Year	Wood Industries		Paper and Allied Industries	
	Amount	Percentage Change	Amount	Percentage Change
1956	106		289	
1957	35	-66.8	220	-23.9
1958	48	37.1	209	-5.0
1959	91	89.6	235	12.4
1960	72	-21.0	248	5.5
1961	72	0	255	2.8
1962	110	52.8	276	8.2
1963	130	18.2	250	-9.4
1964	139	6.9	276	10.4
1965	119	-14.4	235	-14.9
1966	128	7.6	188	-20.0
1967	117	-8.6	147	-21.8

Source: D.B.S. Corporation Profits 1956-1967

### Productivity

**Measures used:**

Wood and Paper Industries - annual value added per man for B.C.

Construction - Annual value of work performed for B.C.

Year	Wood Industries		Paper and Allied		Construction	
	Amount	Percentage Change	Amount	Percentage Change	Amount (in Millions)	Percentage Change
1956					878.6	
1957					1050.3	17.7
1958	1.91		4.44		803.5	-23.4
1959	1.97	3.1	5.67	27.7	820.3	.6
1960	2.01	2.0	5.38	-5.1	762.8	-7.4
1961	1.96	-2.5	5.93	10.2	753.7	-.3
1962	2.30	17.3	5.80	-2.2	759.8	.2
1963	2.46	6.9	5.77	-.5	830.5	6.7
1964	2.49	1.2	5.93	2.8	988.1	15.1
1965	2.46	1.2	5.83	-1.7	1224.6	17.8
1966						
1967						