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Article abstract

This paper explores some of the factors determining the relative magnitude of select wage supplements. While the first section provides some insights into the nature and magnitude of all wage supplements in Canadian industries, subsequent sections are limited to the analysis of private employee benefit plans, their determinants and of their determining factors.

The Economics of Employee Benefits

Robert Swidinsky

This paper explores some of the factors determining the relative magnitude of select wage supplements. While the first section provides some insights into the nature and magnitude of all wage supplements in Canadian industries, subsequent sections are limited to the analysis of private employee benefit plans, their determinants and of their determining factors.

The system of employee compensation that operates in a modern economy is considerably more complex than researches concerned with the general level and structure of wages choose to admit. The inclination to disregard the wide variety of fringe benefits that complements basic or straight-time earnings is understandable since such compensation creates a certain difficulty in the interpretation and measurement of the wage rate. There exists, however, considerable danger in ignoring non-wage compensation in the economic analysis of wage movements and structures for not only do fringe benefits satisfy a variety of employee needs and accomplish several employer objectives, they have a unique impact on the allocation of economic resources, the operations of financial institutions and the direction of social policy. Although the economic analysis of fringe benefits is in its infancy, the growing magnitude of benefits relative to basic earnings is a guarantee that they will command increasing attention.

The limited purpose of this paper is to explore some of the factors determining the relative magnitude of select wage supplements. While the first section provides some insights into the nature and magnitude of all wage supplements in Canadian industries, subsequent sections are limited to the analysis of private or employee benefit plans. In section II

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the discussion centers on the determinants of employee benefit plans and in section III it is limited to a statistical analysis of the determining factors.

The Nature and Magnitude of Fringe Benefits

Although there exists no generally acceptable rule as to what kind of remuneration constitutes a fringe benefit, the concept that it ought to involve an employer cost is universally accepted. Reid and Robertson [1] suggest that total labour cost may be categorized into :

(1) payments by the employer to his employees and

(2) payments by the employer on behalf of his employees.

The first category includes basic or straight-time pay, premium pay, paid absences and miscellaneous direct payments. The second includes payments to benefit plans and payments required by law. Broadly defined, fringe benefits would include all labour costs except basic or straight-time pay. Under a much narrower definition fringe benefits would be restricted to employee benefit plans.

The difficulty in achieving a universally acceptable classification of the various payments arises because each item is designed to fulfill a specific function and possesses a different set of characteristics. Overtime, shift and holiday premiums are payments for extraordinary work and reflect the wage necessary to attract a sufficient supply of labour. One nay view paid absence as a technique for increasing worker productivity ɔy establishing a better balance between work and leisure [2]. Both categories of fringe benefits result in current period money payments and are therefore indistinguishable from money wages.

Private benefit plans are security oriented in that they provide a specific service or a cash income in lieu of wages during a contingency. The eligibility conditions are well defined. One must be sick to draw sick benefits, laid-off to draw supplementary unemployment benefits, or be of retirement age and retire to draw a pension. The worker cannot himself determine how that part of his compensation will be used until the contingency against which it is designed to protect in fact occurs. An

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1 G. L. REID and D. J. ROBERTSON, « Introduction », *Fringe Benefits, Labour Costs and Social Security,* ed., Reid and Robertson, London, Allen and Unwin, 1965, p. 20.

2 See Donna ALLEN, *Fringe Benefits : Wages or Social Obligation ?* Ithaca, N.Y., Cornell University Press, 1964, Ch. 2.

additional distinguishing feature is that, unlike other fringe benefits, employee benefit plans generally have a private market counterpart. Thus they rather closely approach the concept of deferred wages.

The relative importance of supplemental pay as a form of labour remuneration has been growing steadily since 1947. On the national level supplementary labour income increased from 213 million dollars in 1947 to 1,818 million dollars in 1968, representing a respective increase from 3.4 to 5.3 percent of total wages and salaries [3]. If employer contributions to social insurance and government pension funds are included, supplementary labour income represented 4.8 and 8.7 percent of total wages and salaries in 1947 and 1968, respectively.

The absolute and relative costs of the fringe benefits accruing to production workers in manufacturing in 1968 are presented in Table I. The average cost of fringe benefits is estimated at 1,153 dollars, representing 23.4 percent of the cost of straight-time pay and 19 percent of the total labour costs of production. There exist, however, considerable differences among the two-digit industries. The cost of fringe benefits ranged from a low of 13.8 cents per paid hour in the knitting industry to a high of 95 cents in the petroleum industry. The means cost per paid hour was 46.9 cents and the standard deviation was 19.1 cents. By contrast the mean and standard deviation for average gross hourly earnings were 2.37 and .50 dollars, respectively. The resulting coefficients of variation were 40.7 percent for fringe benefits and 21.1 percent for gross hourly earnings.

The above calculations suggest that total hourly labour costs contain a greater degree of variation because of the inclusion of fringe benefits than do straight-time hourly earnings. Thus fringe benefits tend to create an industrial labour cost structure that is substantially wider than the basic wage structure. For example, the hourly labour cost differential between the petroleum and the knitting industry was roughly 142 percent whereas the basic wage differential was only 98 percent. Clearly, fringe benefits can exert an impact on the allocation of labour, and the magnitude of this impact will obviously depend on the worker's awareness of these benefits as well as the value placed on them relative to money wages.

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[3] Supplementary labour income includes employer's contributions to employee welfare and pension funds, to workmen's compensation and industrial vacation funds, and to the unemployment insurance fund. See Bank of Canada, *Statistical Summary*, Ottawa, Monthly.

Since the classification of employee benefit plans as fringe benefits is unquestionable, the foregoing analysis will be restricted to these items of labour cost. Although benefit plans represent only 25.2 percent of all cost items that can be loosely classified as fringe benefits, and only 5.2 percent of gross payroll, their economic and social impact far exceeds that of other fringe items. The economic and social implications of employee pension plans alone are major considerations in terms of saving behavior, economic growth, and the functioning of financial institutions. Clearly, employee pension plans may not only effect resource allocation by restricting labour mobility, they may also shape the direction of social policy with respect to income security.

TABLE I

ESTIMATED ANNUAL FRINGE BENEFIT COST IN DOLLARS AND AS A PERCENTAGE OF BASIC PAY FOR PRODUCTION WORKERS IN MANUFACTURING, 1968

Fringe Benefit	*Dollars per Employer*		*Percent of Basic Pay*	
Premium Pay	$191		3.9%	
Overtime and holiday		$140		2.9%
Shift Work		43		0.9
Other		8		0.1
Paid Absence	438		8.9	
Holiday Pay		163		3.3
Vacation Pay		257		5.2
Sick Leave Pay		16		0.3
Personal Leave Pay		2		—
Miscellaneous Direct Payment	50		1.0	
Private Benefit Plans	290		5.9	
Pension Plans		135		2.7
Life and Health Plans		148		3.0
Other Plans		7		0.1
Payments Required by Law	183		3.7	
Workmens Compensation		60		1.2
Unemployment Insurance		52		1.1
Canada/Quebec Pension Plans		71		1.4
Total	$1,153		23.4%	

Source : D.B.S. and Canada Departement of Labour, *Labour Costs in Manufacturing*, Ottawa, 1969.

The flow of funds into employee pension plans in 1968 was well in excess of 1.6 billion dollars [4]. By contrast, the total revenue of the Canada and Quebec Pension Plans amounted to roughly one billion dollars and payments out of the Old Age Security Fund approached 1.5 billion dollars. Total assets of employee pension funds reached 12.7 billion dollars in 1968, with almost 50 percent of the assets being held in government bonds, 20 percent in equities and more than 8 percent in mortgages. Only an estimated 5 percent of the assets were held in non-Canadian securities. It is thus obvious that employee pension plans play a major role, not only in the provision of retirement income, but also as a source of capital for economic growth.

The Determinants of Employee Benefits

The factors governing the relative growth of employee benefits may be generally categorized as :

(1) tax and price inducements,
(2) collective bargaining,
(3) human capital and production cost considerations, and
(4) the influence of social policy.

These factors and some of their implications are discussed in the above order.

TAX AND PRICE INDUCEMENTS

The available evidence, although fragmentary, suggests that in the ordinary market goods that satisfy the workers' guest for income security have an income elasticity approaching unity [5]. Employee benefits represent a form of protection against the hazards of income insecurity arising out of illness, death, unemployment or old age, and, thus, may generally be regarded as substitutes for the insurance and annuities available in the ordinary market. Workers have the option of purchasing the instruments of economic security in the private market or from their employers. The distinguishing feature is that the purchase from the employer requires group participation rather than individual decision-making.

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4 The following statistics on employee pension plans are obtained from D.B.S., *Trusteed Pension Plans, Financial Statistics,* Ottawa, 1968.

5 The income elasticity of life insurance sales in Canada estimated from a log-log regression for the period 1958-70 has a value of .84. P. J. FELDSTEIN, « The Demand for Medical Care, » *Report of the Commission on the Cost of Medical Care,* Vol. I American Medical Association, 1964 also estimated the income elasticity of family payments for health insurance in the U.S. to be somewhat less than unity.

Economic theory suggests that, all other things being equal, workers in general would maximize their utility by receiving compensation in wages rather than some benefit-wage mix, unless this mix coincided with their preferences. Since employee benefit plans are largely inflexible this is unlikely to be the general case. Several factors, however, combine to create a special market for employee benefit plans. First, the compulsory nature, automatic character and convenience afforded by an employee benefit program are attractive features to many employees. Capital and insurance markets are relatively sophisticated and workers do not, as a rule, possess the prerequisite knowledge for rational decision-making in such markets. Moreover, employee benefit plans eliminate the private costs involved in selecting appropriate security arrangements. An additional feature of paramount importance is that for certain employee benefits, such as group insurance, medical evidence and examinations are not required of the persons insured.

Second, the money cost per unit of protection, especially life insurance, is considerably lower if the protection is purchased through employee benefits on a group basis than if it is purchased privately by the worker [6]. This is partly because employees acting as a group can eliminate or reduce the per unit loading to cover the relatively heavy expenses of commissions. The savings through group purchase provides an additional incentive for employees to accept remuneration in the form of wage supplements rather than money wages. Third, under the Income Tax Act employee contributions up to a maximum of 1,500 dollars to registered pension plans are deductible from taxable income [7]. Moreover, employees are not taxed on the employers' contributions on their behalf, and the investment income of the pension funds is also not subject to taxation, providing at least 90 percent of the income is from sources in Canada. Group life insurance plans receive slightly less favourable treat-

[6] Under the University of British Columbia group life plan, 48,608 dollars of life insurance for a male faculty member aged 35 costs 78 dollars. Similar coverage obtained privately would cost an estimated 155 dollars.

[7] While there are no formal regulations governing the registration of pension plans, the major requirements are that; 1) cash withdrawal at retirement is not generally permitted, 2) some funding arrangements must be adopted, 3) the employer must be a contributor, 4) the plan contain a well defined formula for pension payments, and 5) the pension funds must not be invested in the employer's notes or bonds and investment in the employer's shares must not exceed 10 percent of the fund. For a detailed account of the tax treatment of employee benefits see William M. MERCER and Laurence E. COWARD, *Pension and Welfare Plans*, 3rd ed., Don Mills, Ont., CCH Canadian Limited, 1967.

ment in that only the employer's contribution is not added to the employee's income for tax purposes. Sick pay plans and supplementary unemployment benefit plans receive similar tax treatment.

These factors, but especially the tax preference under a progressive tax structure, have created a special market for annuities and insurance to which individuals have access only as employees. In effect, the savings through favourable price and tax treatment create effective levels of compensation above those that would have existed in the absence of employee benefits. Utility maximization implies a shift from the ordinary market for insurance and annuities to the special market of employee benefits. Moreover, assuming that they are normal goods, the decline in the effective relative prices of insurance related commodities available as employee benefits leads to a substitution of these commodities for all other goods and enhances their elasticity with respect to gross earnings [8].

Under a progressive tax structure the effective price of goods purchased through employee benefits varies inversely with earnings, leading one to expect an even higher earnings elasticity for employee benefits. The tax incentive for employee benefits such has pensions is, however, rendered less effective under restrictive vesting provisions. Where turnover is rapid and vesting provisions restrictive, employees in general stand to gain little from the employers' contribution on their behalf. Assuming that employee benefits are deferred wages, the tax incentive tends to encourage a system of compensation which contains a high probability of loss to employees. This suggests that the impact of tax concessions in encouraging employee benefits ought to vary positively with gross wages and negatively with turnover or separation rates. That is, the highest demand for employee benefits, particularly pensions, will occur in industries characterized by high wages and low turnover.

The intent of the tax relief for employee benefits is to encourage private provisions for economic security. Such concessions can be inter-

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[8] Let Y represent an employee's gross income or the employer's labour cost, t the proportional tax rate, A and B securiry-related and all other goods, respectively, and p_a and p_b their respective prices. If employee benefits do not receive favourable tax and price treatment the worker faces the budget constraint $Y = (p_a A + p_b B)/1-t$. Under the existing tax and price structure the budget constraint becomes $Y = (p'_a A + p_b B - t\, p'_a A)/1-t$ where $p'_a < p_a$. Assuming a utility function, $U = AB$, the elasticities of security-related goods with respect to gross income are $Y\ (1-t)/2p_a A$ and $Y/2p'_a A$; respectively.

preted as a subsidy from the taxpayers to a select group of employees [9]. It may be argued, however, that in the absence of specific incentives the state would be forced to institute public provisions financed out of general revenue, thus creating a greater general tax burden. While this argument may be valid, the substitution of public for private schemes may trigger an income redistribution that is more favourable to those taxpayers not represented in private schemes.

COLLECTIVE BABGAINING

A salient feature of employee benefits is that they cannot be negotiated independently by individual employees. The worker's aspirations to greater security can be realized only if unions and/or employers become aware and concerned with these aspirations. Historically, unions had been indifferent or even hostile to the concept of employee benefits for several reasons. First, unions viewed employee benefits as an instrument by which employers sought to win workers' allegiance, and several unions even established union pension plans partly to counter this force. Second, economic security was viewed as a state responsibility and unions considerd the establishment of employee benefits as undermining their demands for public action [10]. Whatever the reason, union attitudes began to shift in the late 1940's and 1950's with the result that employee benefits become an important issue at the bargaining table [11].

The current opinion, even among employers, is that unions play the dominant role in determining employee benefits. In his 1964 survey of employee benefit structures in U.S. manufacturing, Greene found that 58.6 percent of all employers felt that unions set the pace in employee benefits [12]. The survey also indicated that union shop stewards, and presumably union leadership, viewed employee benefits more favourably than the general membership. Given the bargaining structure, this may

9 At a marginal tax rate of 25 percent the estimated 1968 tax concession on industrial pension contributions amounts to 254 million dollars. This estimate excludes tax relief on investment income, which in 1968 amounted to 468 million dollars for trusteed pension funds alone. The subsidy is somewhat diminished by the fact that pensions earned are subject to tax.

10 H. A. LOGAN, *Trade Unions in Canada,* Toronto, McMillan, 1948. See pp. 116-17, 14-41, 593 and especially Ch. XXII.

11 Francis M. WISTERT, *Fringe Benefits,* New York, Reinhold Publishing Corporation, 1959, estimated that employee benefit issues were responsible for 26.4 percent of strike idleness in the U.S. in 1949. Wistert, moreover, claims that the pressure for benefits, largely from paternalistic international unions, cannot be in the best interest of the workers. See pp. 5-6.

12 Mark R. GREENE, *The Role of Employee Benefit Structures in Manufacturing Industry,* Eugene, University of Oregon, 1964, p. 41.

imply a higher benefit-wage ratio in unionized firms than that reflected in the distribution of employee's preferences. Since union members are generally asked to approve the entire agreement rather than its component parts, they can express their views on the benefit-wage distribution negotiated by their leadership only indirectly [13].

Moreover, even if unions cannot take credit for initiating employee benefits in many instances, they have nonetheless been instrumental in forcing changes in existing benefits [14]. One would thus expect that unionism exerts a positive influence on the magnitude of employee benefits. This influence may be difficult to detect statiscally, however, since benefits first gained by unionized employees are very likely passed on to non-union groups.

HUMAN CAPITAL AND PRODUCTION COST CONSIDERATIONS

Collective bargaining may be viewed as a two tier process involving both the level and the distribution of labour remuneration. Employers are not indifferent to either phase. Since labour costs are incurred with the specific intention that there be some return to the firm, employers will favour that distribution of labour costs between wages and benefits which best achieves certain economic, social and political objectives [15]. Certain items in the wage bill assume an attractive role ; some are mainly retentive in purpose ; and still other items have a bearing on labour morale and productivity.

Employee benefits presumably improve worker's productivity by inducing a feeling of security and by allowing older and less efficient workers to retire [16]. In this sense, employee benefits are a form of private

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13 The membership has been known to reject contracts negotiated because of the inclusion or exclusion of benefits. See Richard A. LESTER « Benefits as a Preferred Form of Compensation ». *Southern Economic Journal,* Chapel Hill, April, 1967, p. 489, f. 5.

14 See Gordon MILLING, « Labour's Interest in Pension Planning », *Pensions in Canada,* ed., Laurence E. COWARD, Don Mills, Ont., CCH Canadian Limited, 1964. The changes have been primarily in vesting provisions, early retirement, funding and contributions. The unions have also assumed a certain responsibility for administration.

15 A list of possible employer objectives may include removal from the payroll of older workers, creation of favourable employee attitudes, reduction of pressure for government intervention and maintenance of effective relations with unions.

16 In the survey conducted by Greene, 27.2 percent of the employers interviewed suggest improved employee morale as an objective and 21.6 percent suggested increased efficiency due to an increased feeling of security. See GREENE, *The Role of Employee Benefit Structures in Manufacturing Industry,* pp. 42-5.

investment by employers in their work force. It is unlikely however that the returns from such an investment are sufficient to offset its costs. Indeed, the social benefits derived from employee benefits may far exceed the private benefits.

Although employee benefits may also play an attractive role, it is their retentive role that has been most emphasized. Non-vesting pensions, in particular, have the economic function of restraining employees from quitting. If a worker quits, the non-vested portion of his pension is returned to the firm, thus providing an insurance against the capital loss incurred by that firm in hiring and training that worker. Since the annual investment by firms in on-the-job training of employees has risen dramatically in recent years [17], it is conceivable that employers would desire greater insurance against potential capital losses. If employee benefits prove more effective than higher wages in reducing turnover rates, the secular increase in benefits relative to earnings may be attributable, in part, to rising potential turnover costs.

There has been a scarcity of empirical studies which in fact demonstrate a relation between employee benefits and labour mobility. The factors affecting turnover rates are complex and employee benefits alone are unlikely to alter the existing pattern. Thus an ambivalent employer attitude towards benefits is conceivable. A high benefit-wage ratio may prove ineffective in retaining employees while simultaneously presenting a severe obstacle in the recruitment of new workers. If workers value benefits at less than cost the equilibrium total wage rate facing the firm will vary directly with the benefit to money wage ratio.

Employee benefits and money wages are equivalent with respect to regular time production costs but they are not equivalent if production involves overtime, shift or holiday work. If premium pay production is sizeable and unavoidable because of the nature of production, capital constraints, or unforeseen events such as absenteeism, breakdowns or temporary increases in demand, the profit maximizing employer would favour a higher benefit-money wage ratio since the premium is paid only on the wage component. One would thus expect a positive association between the benefit-wage ratio and the extent of production activity commanding premium pay.

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17 J. MINCER, « On-the-Job Training : Costs, Returns and Implications », *Journal of Political Economy*, Chicago, October, 1962 Supplement, estimated that aggregate annual investments in on-the-job training in the U.S. more than doubled between 1939 and 1958.

The inherent danger is that as fringe benefits and turnover costs increase relative to straight-time money wages, these costs commence to pose a barrier to expanding employment. While Garbarino has argued that this is unlikely to be true in the U.S. at present, a more complete study by MacDonald renders the fringe barrier hypothesis highly plausible [18]. Moreover, in an analysis of labour costs in Europe and Britain, Reid [19] finds strong evidence that the system of social charges in Italy has encouraged excessive use of overtime and the employment of highter skilled labour where lower skills would have sufficed. The incentive to employ overtime rather than expand employment in the Italian case was created mainly by a system of fringe benefits which were not proportional to wages but simply depended on the employment of a worker. A somewhat similar impact may result if the earnings on which benefits are paid are subject to a ceiling, as in the case of workmen's compensation and the Canada and Quebec Pension Plans.

THE INFLUENCE OF SOCIAL POLICY

When formal provisions for economic security are largely absent, the public and private sectors are virtually unconstrained in their efforts to meet the challenge of insecurity. As each sector expands in scope, there may arise a conflict between private and public plans. More precisely, an emerging public program of economic security may render the system of employee benefit plans redundant.

The objective of any system of income maintenance should be to ensure that those who need income protection are provided with it in the most efficient way. If the criteria used to assess the relative merits of different methods of providing security is economic efficiency and adequacy, the superiority of state schemes over private arrangements is fairly obvious. Only a state scheme is capable of comprehensive coverage,

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[18] Overtime would be profitable if $(F+T)/H > 1/2W$ where F represents fringe benefits, T turnover costs, H the number of hours of additional employment required and W the straight time wage rate for existing and newly hired workers. The premium on overtime is 1/2W and the output from derived from an hour of overtime is assumed equal to the output from an equivalent expension in employment. The fringe barrier theory asserts that since $(F+T)/H$ has been increasing more rapidly than W it is profitable to use an increasing amount of overtime. See Joseph W. GARBARINO, « Fringe Benefists and Overtime as Barriers to Expanding Employment », *Industry and Labour Relations Review,* Ithaca, April, 1964, and Robert M. MACDONALD, « The Fringe Barrier Hypothesis and Overtime Behavior : Comment, » *Industrial and Labour Relations Review,* Ithaca, July, 1966.

[19] G. L. REID, « Supplementary Labour Cost in Europe and Britain », *Fringe Benefits, Labour Costs and Social Security,* ed., Read and Robertson, pp. 112-117.

adaptability to different risks and circumstances and the provision of adequate benefits in a systematic manner. Private benefit schemes generally operate in a manner typical of private insurance and thus inherit its inflexible nature. In other words, public schemes have a social aspect which is largely absent in private benefit plans.

Even though private benefit plans are clearly inadequate in meeting the income security needs of society, the role played by public schemes will depend largely on the prevailing climate of political opinion [20]. If society believes that the state's function in providing security should be minor in a free enterprise system, private benefit plans will assume considerably more importance. As social and political attitudes change, whatever the reason, the encroachment of state provisions pre-empts the functions of employee benefits. Although this does not necessarily remove the cost burden from the employer, it does remove economic security as an issue in collective bargaining.

A state scheme may be exhaustive, leaving no role for private benefits, or it may allow an integration of the two systems. In either case employers and employees must re-assess the relevance of employee benefit plans. Under the Unemployment Insurance Act and Workmen's Compensation there is little scope for private arrangements, even if they were permissible. Provincial Hospital Insurance plans and the Federal Medical Insurance plan have replaced the arrangements made through employee benefits. Since OAS, CPP and QPP do not provide retirement benefits considered adequate there is scope for integration. The existence of public arrangements does, however, reduce the pressure for private plans as witnessed by the sharp increase in cash withdrawals following the introduction of the Canada and Quebec Pension Plans [21].

Some Statistical Evidence

Theoretical considerations suggest that the cost of employee benefits relative to money wages should vary directly with the level of money wages, degree of unionization, turnover costs and the extent of production

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20 See G. L. REID and D. J. ROBERTSON, *Fringe Benefits, Labour Costs and Social Security*, pp. 324-327. See also Robert TILONE, « The Impact of Social Insurance on the Development of Private Benefit Plans, » The Princeton Symposium on *The American System of Social Insurance*, ed., W. G. Bowen et. al. New York, McGraw-Hill, 1968.

21 Cash withdrawals from Trusteed Pension Funds averaged 41.2 million dollars during the period 1960-64. They increased to an average of 88.5 million dollars during the period 1965-68, reaching a peak of 106 million dollars in 1966. See D.B.S., *Trusteed Pension Plans, Financial Statistics*, p. 12, Table B.

activity commanding premium pay and inversely with turnover rates and the adequacy and scope of state income maintenance schemes. The Department of Labour has published annually since 1967 information on fringe benefits for 20 two-digit manufacturing industries [22]. The average expenditure as a percentage of gross payroll in each industry is available for pension plans, total life and health insurance plans and total benefit plans. The total includes, in addition to pensions and life and health insurance, supplementary unemployment benefits, severance or technological lay-off plans and savings and thrift plans. This data can be used for cross-sectional tests of the various hypotheses regarding employee benefit plans.

Money wages are represented by average gross hourly earnings by industry, the degree of unionization is estimated as the percentage of production workers organized and the turnover rate is measured by the separation rate for the first six months of 1966. The extent of production activity commanding premium pay is approximated by the percentage of employees by industry for whom some expenditure for overtime, shift work, etc., was made. This measure ignores the fact that the expenditure for premium work ranged from less than 1 percent to more than 10 percent of gross payroll.

The impact of social policy cannot be revealed in crosssectional analysis and adequate time series data is not available. The estimation of turnover costs presents obvious problems. Robert Rice [23] has attempted to capture such costs by constructing a « richness of skill mix » variable and by utilizing separation rates. The reasoning for the latter measure is that, according to Becker, separation rates and specific training are negatively correlated and such training is undoubtedly the chief element in turnover costs. On the other hand, Walter Oi [24] argues that turnover costs vary positively with earnings and, further, that the ratio of such costs to earnings increases with earnings. Since earnings and separation rates have already been included to reflect other influences, and since any measure of skill mix would be highly correlated with earnings, there appears no need for an additional proxy variable for turnover costs, even if one can be found. This will, however, tend to complicate the interpretation of any empirical results that are obtained.

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22 D.B.S. and Canada Department of Labour, *Labour Costs in Manufacturing*, Ottawa, Occasional, 1967 and 1968.

23 Robert G. RICE, « Skill, Earnings, and the Growth of Wage Supplements », *American Economic Review*, Evanston, May, 1966.

24 Walter Y. OI, « Labor as a Quasi-Fixed Factor », *Journal of Political Economy*, Chicago, December, 1962.

The nature of the problem suggests that regression analysis should be employed to sort out the independent influences of the explanatory variables and to ascertain their aggregate explanatory powers. However, the estimates of the coefficients would be complicated by the strong interdependence of the explanatory variables, and, while there exist techniques that would reduce this difficulty, the nature of the data does not warrant their use. The statistical analysis is thus restricted to gross correlations.

The computed correlation coefficients are generally consistent with the hypothesized relationships. As Table II shows, all employee benefits as percentages of gross payroll vary positively with earnings, unionization and the extent of premium pay activity and negatively with turnover. Earnings are most strongly associated with the ratio of pension plan costs to gross payroll. The elasticities of employer expenditures on pension plans, life and health plans and total benefit plans with respect to earnings estimated from a simple log-log regression are 3.53, 1.85 and 2.40, respectively. While their magnitudes are surprisingly large, the elasticities are consistent with the expectation that they exceed unity.

The degree of unionization is more strongly associated with life and health plans and with total benefit plans than with pension plans, but the distinction is minor. The weak correlation between turnover rates and employee benefits is surprising although the direction of the correlation is consistent with theory. One would expect a lower correlation for life and health plans than for pension plans since the former does not involve the possibility of a loss of deferred wages and does generally provide benefits irrespective of the permanency of employment.

TABLE II

ESTIMATES OF THE SIMPLE CORRELATIONS BETWEEN SELECT EMPLOYEE BENEFITS AS A PERCENTAGE OF GROSS PAYROLL IN MANUFACTURING INDUSTRIES IN 1967 AND SELECT VARIABLES

	Earnings	*Union-ization*	*Turnover Rate*	*Premium Pay Activity*
Pension Plans	.732*	.641*	—.554*	.749*
Life and Health Plans	.537**	.682*	—.259	.709*
Total Benefit Plans	.697*	.692*	—.465**	.769*

* Significant at the 1 percent level.
** Significant at the 5 percent level.

The strong correlation between the percentage of employees engaged in work commanding premium pay and employee benefit plans is consistent

with the argument that employee benefits are an employer technique for minimizing the labour costs of production. But the correlations are also consistent with the argument that higher fringe benefits have forced employers to resort to overtime. On the other hand, it may merely reflect the ability of unions to force employers to schedule overtime equitably and to provide a high level of employee benefits.

If the turnover rate serves as a proxy for turnover costs than such costs exert little influence on employee benefits. The notion that turnover costs and earnings are highly correlated is however more plausible. This would certainly be consistent with the observation that, not only are pensions more highly correlated with earnings than are insurance plans, but that the earnings elasticity of pensions is also considerably greater.

Information available on the prevalence of pension plans in 53 three-digit manufacturing industries in 1967 provides an opportunity for further testing of certain hypotheses [25]. The correlation between the percentage of employees covered by a pension plan and hourly earnings was .745, whereas the correlation between pensions and the percentage of employees covered by collective bargaining agreements was only .556 [26]. It thus appears that earnings, or whatever they represent, have considerably more influence on pension plans than do unions. On the other hand it may reflect a reluctance on the part of unions to pressure low wage employers into providing pensions in lieu of much desired higher earnings.

Conslusions

The analysis contained in this paper supports the conclusion that barring major changes in social policy, employee benefits will command a progressively expanding proportion of the increases in worker compensation. This tendency is ensured by the factors that complement workers' preferences for increased security. One cannot predict, however, shifts in social policy which would disrupt the wage-benefit mix that is prevalent in Canadian industries.

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25 Canada Department of Labour, *Working Conditions in Canadian Industry*, Ottawa, 1967.

26 A multiple linear regression of the percentage of employees covered by a pension plan (P) on hourly earnings (W) and the percentage of employees covered by collective bargaining agreements (U) yields the following equation (t = values in parentheses).

$$P = -27.5 + 0.314W + 0.298\,U$$
$$\quad (2.44) \quad (5.98) \quad (2.28) \qquad R^2 = .597$$

L'IMPACT ÉCONOMIQUE DES AVANTAGES SOCIAUX

Le poste des coûts de la main-d'oeuvre communément appelés avantages sociaux représente une part importante du coût global de la main-d'oeuvre dans les frais de production. Dans l'industrie manufacturière, en 1968, le coût des avantages accessoires s'établissait à $1,153.00 par employé ou à 23.4 du salaire de base. De plus, le coût de ces compléments sociaux a tendance à s'accroître par rapport au coût total de la main-d'oeuvre.

On estime, par ailleurs, que les plans de pension privés ne représentent que 25.2 pour cent de l'ensemble des coûts des compléments sociaux, mais l'impact social et économique de ces plans est autrement plus fort que celui des autres avantages sociaux. Par exemple, les sommes que les caisses de retraite ont drainées en 1968 dépassent 1.6 milliard et leur actif total s'élevait la même année à 12.7 milliards. Celles-ci exercent surtout une influence sur les habitudes d'épargne, la croissance économique, la mobilité de la main-d'oeuvre et le fonctionnement des institutions financières. En outre, dans la mesure où les plans de pension, tout comme les autres avantages d'appoint, atteignent les objectifs recherchés, ils tendent à orienter la politique sociale en matière de sécurité économique.

Cet article traite des facteurs qui servent à déterminer le rapport entre les compléments sociaux et les salaires en espèces dans le coût global de la main-d'oeuvre. D'une façon générale, si les biens octroyés aux employés sous cette forme étaient disponibles sur les marchés à prix identique en tant que partie intégrante de la rémunération du travail en espèces, les travailleurs seraient satisfaits quand même, car il y aurait ainsi compensation. Ils toucheraient leur pleine rémunération en espèces au lieu de recevoir une espèce de mélange de salaire et d'avantages sociaux. Toutefois, par ce moyen, le prix de certains de ces compléments, en particulier l'assurance sur la vie, est abaissé par l'achat de polices de groupe. De plus, en vertu de la Loi de l'impôt sur le revenu, les sommes versées aux caisses de retraite ne sont pas imposables comme les salaires en espèces. Aussi, l'épargne résultant du prix d'achat plus intéressant de l'assurance de groupe et de la soustraction des montants ainsi versés du revenu imposable est-elle un avantage réel qui n'existerait pas pour le salarié en l'absence de ces compléments sociaux. Sous un régime d'impôt progressif, plus les revenus sont élevés, plus la somme épargnée en ce cas est élevée. Toutefois, à cause des clauses restrictives dont sont assortis les régimes de caisses de retraite, il se peut que les travailleurs encourent des pertes considérables si le taux de roulement du personnel est fort. En effet, les travailleurs qui, pour une raison ou l'autre, laissent leur emploi, perdent la part de la contribution versée par l'employeur. En conséquence, plus les salaires sont élevés, plus il y a avantage à bénéficier de compléments sociaux nombreux ; plus la rotation du personnel est forte, moindre est cet avantage.

À l'origine, les syndicats s'opposaient aux compléments sociaux, mais ils en sont venus, à une époque plus rapprochée, à se faire les protagonistes de cette forme de compensation. Les données disponibles tendent à démontrer que les chefs syndicaux favorisent plus les compléments sociaux que les travailleurs eux-mêmes. Aussi, peut-on s'attendre à ce que l'augmentation du taux de *syndicalisation* favorise l'augmentation des compléments sociaux, qui constitueront dans l'avenir une part sans cesse accrue de la rémunération globale du travail.

Les employeurs peuvent envisager les compléments sociaux comme une espèce d'investissement dans la main-d'oeuvre. Quelques-uns de ces avantages, comme les caisses de retraite non contributoires, visent à la conservation de la main-d'oeuvre. Le travailleur qui bénéficie d'un tel avantage hésite à quitter son emploi. Si les avantages sociaux qu'ils accordent à leurs employés s'avèrent plus efficaces que les taux de salaires élevés pour réduire le roulement de la main-d'oeuvre et, par conséquent, le coût du roulement, les employeurs préféreront un mode de rémunération qui fait une plus large part aux avantages sociaux. De plus, si les exigences de la production requièrent beaucoup de surtemps, les employeurs désireux d'accroître leur marge de profit favoriseront l'accroissement des compléments sociaux car la prime qu'il leur faut ajouter dans la rémunération des heures supplémentaires se calcule à partir du taux de salaire de base. Aussi, dans ce cas, le rapport avantages sociaux–taux de salaire est directement proportionnel aux coûts de roulement de personnel et à l'importance des heures supplémentaires dans le travail de production.

Enfin, parce que les mesures de sécurité sociales étatiques relatives à la sécurité du revenu se substituent aux régimes d'avantages sociaux privés, ceux-ci peuvent dans l'avenir tendre à changer de nature et à représenter une moindre part de la rémunération du travail. Des mesures, tels les régimes des rentes des gouvernements du Canada et du Québec, l'assurance-hospitalisation et l'assurance-maladie, rendent les avantages sociaux moins nécessaires, même s'ils ne les remplacent pas entièrement.

Compte tenu de la disponibilité de statistiques pertinentes, la vérification de l'hypothèse précédente ne peut être que rudimentaire. Il est possible de voir pour l'année 1967 la relation qui existe, d'une part, entre les avantages sociaux (plans de pensions, assurance sur la vie, assurance-maladie et plans intégrés) et, d'autre part, des facteurs comme les revenus, le degré de *syndicalisation*, le roulement de la main-d'oeuvre et la prime de surtemps pour une vingtaine d'industries manufacturières. Tel qu'il fallait s'y attendre, il y a corrélation entre les deux séries de facteurs. Les revenus, le degré de *syndicalisation* et les primes de rendement exercent une influence positive sur les avantages sociaux, tandis que le taux de roulement du personnel exerce une influence négative plutôt faible. Ce sont les primes pour les heures supplémentaires qui influent le plus fortement, ce qui confirme l'opinion selon laquelle les avantages sociaux seraient une tactique des employeurs pour réduire le coût de la main-d'oeuvre dans la production. Mais ceci pourrait confirmer une autre hypothèse voulant qu'une augmentation de la part des compléments sociaux dans le coût total de la rétribution du travail ait forcé les employeurs à recourir au surtemps au lieu d'assumer les frais découlant d'un accroissement de personnel.