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Notes on labour statistics

1973

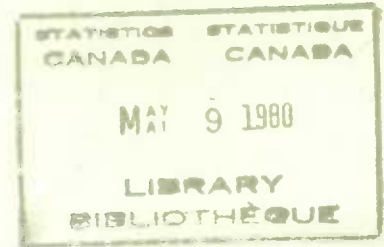


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STATISTICS CANADA
Labour Division
Manpower Research and Development Section

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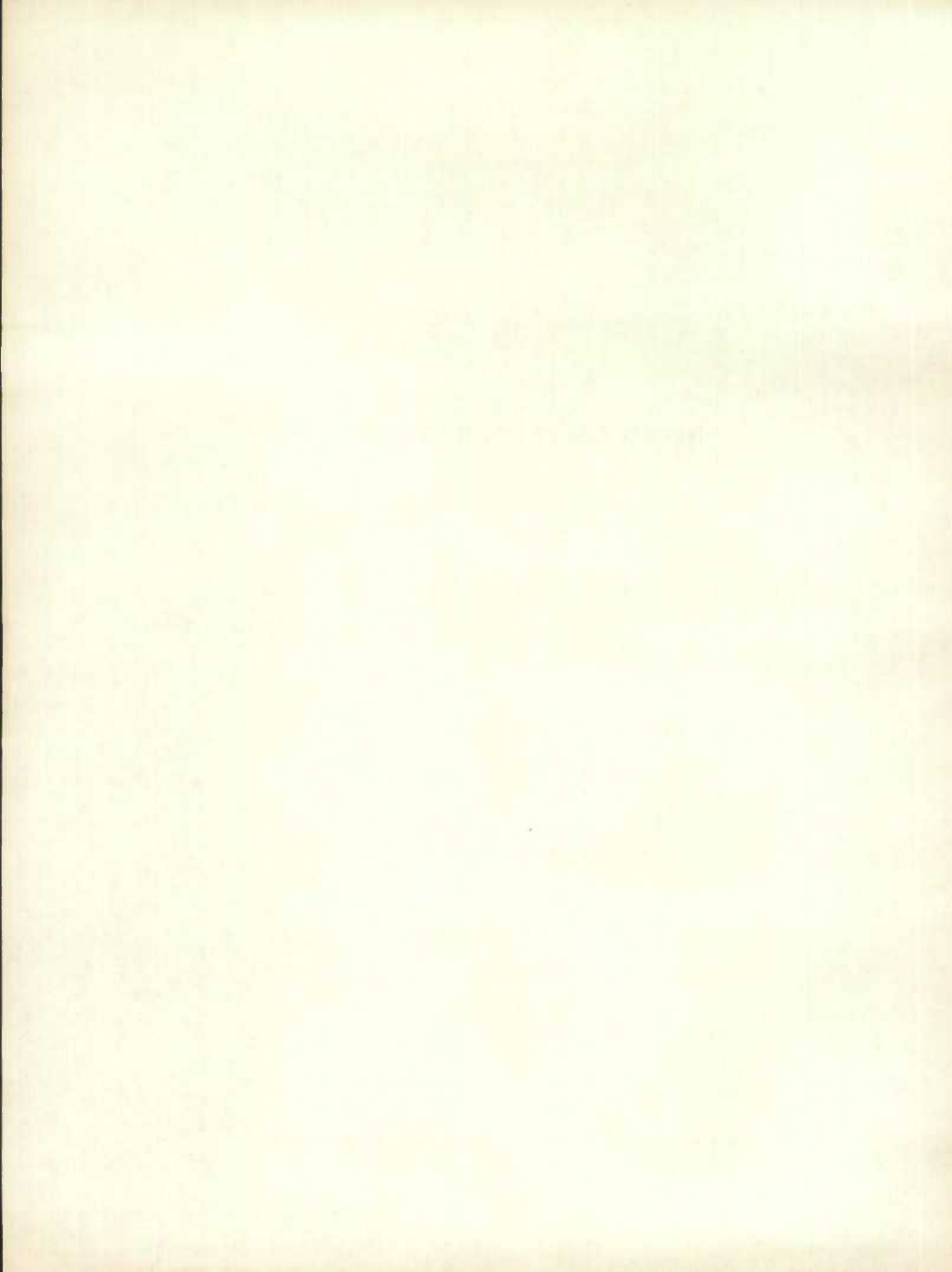
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PREFACE

Notes on Labour Statistics was designed to meet a need for the reporting of results of analytic studies and developmental projects undertaken by the Labour Division, Statistics Canada.

The main work of the Division is represented in its statistical publications, all well known to users in the labour field. Perhaps not generally recognized is that modern data production involves a substantial research activity – as adaptations are made to changing circumstances, as new technology is brought into play, and as new techniques of analysis give rise to demands for new data series. In our view, some of the research and development work would be of interest to a wider audience and it is the purpose of this publication to make it available.

Frank Whittingham, Acting Co-ordinator, Manpower Research and Development was the editor for this edition of the publication.

SYLVIA OSTRY,
Chief Statistician of Canada.

THE DECLINE IN THE FEMALE-MALE UNEMPLOYMENT RATE DIFFERENTIAL IN CANADA, 1961-72

N.K. Tandan*

Introduction

The rising level of labour force participation among women in Canada has received a great deal of attention in recent years, but another important phenomenon, the rise in unemployment among females relative to males, has received relatively little attention. The female and male unemployment rates were 3.7 and 8.4% respectively in 1961 and in 1972 the corresponding rates were 5.3 and 6.8%. Factors that may explain the decline in the differential between female and male unemployment rates are explored in this article.

Female-male Unemployment Rate Differential

The relative increase in the female unemployment rate has occurred in both Canada and the United States,¹ but there is an important difference between the two countries. In the United States the female unemployment rate had been higher than the male rate, hence the gap has widened. In contrast, Canadian females have had

* Manpower Research and Development Section, Labour Division. The author wishes to thank his colleagues in the Manpower Research and Development Section for helpful comments and suggestions, especially Christiane Talbot and Frank Whittingham for their contributions.

¹ For a review of the differences between female and male unemployment in the United States see: 1973 Economic Report of the President, Chapter 4, pp. 99-100.

a lower unemployment rate than males² and, consequently, there has been a decline in the unemployment rate differential.

While the gap between female and male unemployment in Canada consistently declined between 1961 and 1972, there are two distinct sub-periods. Between 1961 and approximately 1966 there was no upward trend in the female rate (see Table 1). There was, however, a substantial downward swing in the male unemployment rate, which appears to be the main explanation for the decline in the unemployment rate differentials during the first six years of the period. With the exception of one year (1969), both the female and male unemployment rates rose each year after 1966 and the female rate increased at a greater pace than the male rate, which brought about a continued decline in the unemployment

² There has been no completely satisfactory explanation of why Canadian females have historically recorded lower unemployment in Canada in marked contrast to the experience of women in most developed countries. There is a widespread suspicion that at least part of the difference is due to the wording and enumeration procedure in the Canadian Labour Force Survey. This suspicion is strengthened by the significantly higher unemployment rate for females as reported in the Census as compared to that in the Labour Force Survey. For instance, the 1971 Census recorded a female unemployment rate which was even higher than the male rate.

TABLE 1. Female and Male Unemployment Rates, Canada, Annual Average, 1961-72

Year	Unemployment rate		Unemployment rate differential ¹
	Female	Male	
1961	3.7	8.4	.44
1962	3.3	6.9	.48
1963	3.3	6.4	.52
1964	3.1	5.3	.58
1965	2.7	4.4	.61
1966	2.6	4.0	.65
1967	3.0	4.6	.65
1968	3.4	5.5	.62
1969	3.6	5.2	.69
1970	4.5	6.6	.68
1971	5.1	7.0	.73
1972	5.3	6.8	.78

¹ Ratio of female unemployment rate to male unemployment rate.

Source: Monthly Labour Force Survey, Statistics Canada.

rate differential. This difference between the two sub-periods suggests that the decline in the unemployment rate differential after the mid-sixties may be attributable to supply and demand factors that were not operative in

the earlier part of the decade, an observation that influenced the approach taken in the empirical analysis. Hypotheses are tested for the complete period and the two sub-periods, 1961-66 and 1967-72, in a later section.

Demographic Changes and Unemployment

It is natural to ask if changes in the age and marital status composition of the female labour force can wholly or partly explain the rise in the female unemployment rate. The age composition for 1961 and 1972 is shown in Table 2. No perceptible change occurred in the proportion of the labour force accounted for by women 25 years of age and over. Females 20-24 years of age increased their share by about 3% while the share of the youngest group (14-19 years) declined slightly. Since the participation rate for teenagers remained steady, at around 32%, their relative decline in the labour force was due to their reduced share of the population as the children of the post-war baby boom passed into their

twenties. The relative increase of the 20-24 age group is attributable to a higher level of labour force participation as well as to an increase in their share of the population. The participation rate for this group rose from 48.7% in 1961 to 60.5% in 1972. With respect to married women, their share of the female labour force rose from 47% in 1961 to 57% in 1972.

One would not expect the changes described above to bring about an increase in the female unemployment rate. Teenage females, whose share in the labour force declined, experience relatively high unemployment rates. Further, married females, whose share in the labour force has grown, have a low unemployment rate relative to all females.

TABLE 2. Participation Rates and Per Cent Distribution of Female Labour Force by Age, 1961 and 1972

Age group	1961		1972	
	Participation rate	Distribution	Participation rate	Distribution
14-19 years	32.3	16.0	32.0	13.8
20-24 "	48.7	16.5	60.5	19.6
25-44 "	29.2	40.1	42.8	39.7
45-64 "	28.5	25.1	36.3	25.6
65 years and over	5.9	2.3	4.3	1.3
All ages		100.0		100.0

Source: Labour Force Survey, Statistics Canada.

Economic Determinants of Higher Female Unemployment

After establishing that demographic changes are not a source of rising female unemployment over the last decade, one has to turn to economic variables to seek an explanation. In this section factors on both the supply and demand side are incorporated, on *a priori* grounds, into a model to explain the higher incidence of unemployment.

The formal structure of the model is:

$$Y = \alpha_0 + \alpha_1 G + \alpha_2 A + \alpha_3 F_t + \alpha_4 U + \alpha_5 U_s + \alpha_6 I + \alpha_7 d_1 + \alpha_8 d_2 + \alpha_9 d_3$$

Where:

- Y = Ratio of average female to male unemployment rate during the quarter.
- G = Annual growth rate of the female labour force.
- A = Degree of labour force attachment.
- F_t = Ratio of full- to part-time female workers.
- U_s = Relative male unemployment in occupations with a high concentration of female workers.
- U = Unemployment rate for total population.
- I = Dummy variable for the Unemployment Insurance Act Revision.

d₁ = Dummy variable for the third quarter.

d₂ = Dummy variable for the first quarter.

d₃ = Dummy variable for the second quarter.

α's are the parameters of the regression relationship.

The rationale for including these variables is presented below:

(G) Annual growth rate of the female labour force – The increase in the female labour force during the sixties and the seventies is regarded as one cause of higher female unemployment. The number of women in the labour force rose at a compound growth rate of 5% per annum – from 1.7 million in 1961 to nearly 3 million in 1972. While it is a tautology to state that an increase in the labour supply unmatched by a proportional increase in employment would lead to a higher unemployment rate, higher unemployment is a plausible but not a necessary consequence of the high rate of growth in the female labour force, especially if growth in the labour force is a response to higher demand for female workers.

Year to year percentage changes in female labour force and employment are shown in Table 3 for the 1961-72 period. Moving from 1961 to 1966, there is a very close correspondence between changes in labour

force and employment. Also, when any divergence occurs during this period labour force growth is below employment growth. After 1966 changes in labour force

and employment still parallel one another, but year to year changes in the female labour force are consistently higher than female employment.

TABLE 3. Percentage Change in Female Labour Force and Employment¹ 1961-72, Canada

Year	Labour force	Employment
	% change	
1961-62	3.3	3.8
1962-63	4.1	4.1
1963-64	5.5	5.7
1964-65	5.3	5.7
1965-66	7.3	7.4
1966-67	6.2	5.9
1967-68	4.7	4.1
1968-69	5.1	4.9
1969-70	3.4	2.4
1970-71	5.2	4.6
1971-72	4.3	4.1

¹ Based on annual average data.

Source: Monthly Labour Force Survey, Special Table. Labour Force Survey Division, Statistics Canada.

This comparison provides some support for the position that female labour force growth is a response to growth in employment opportunities for female workers. In the later part of the 1960's and early 1970's, however, growth in female employment fell short of growth in the female labour force, a situation that would contribute to a rise in the level of female unemployment.³

Changes in the female labour force participation rate or the female labour force could be used to capture the influence of labour supply growth. The latter was chosen as it provides a trend-free variable⁴ and also reflects changes in population as well as the level of labour force participation. The variable chosen, G, is based on quarterly data: $(L_t - L_{t-1})/L_{t-1}$ where L_t and L_{t-1} are the female labour force in the same quarter of the (t) and (t-1) years.

(A) Degree of labour force attachment - Unemployment is partly a function of the degree of commitment of workers to the labour force. When faced with loss of a job an "uncommitted" worker may not initiate a serious job search, perhaps dropping out of the labour force altogether. These persons may

³ This divergence would not lead to a higher level of female unemployment if adjustments in the labour market took place through a depression of relative wages for females and a substitution of female for male workers. There is no evidence to suggest, however, that such adjustments took place.

⁴ It was important to avoid variables with linear time trends because they would have shown a spurious correlation with the dependent variable which has a strong linear time trend in it.

also lack the motivation which plays an important role in retaining a steady job. Among females there are many who can be classed as "secondary" workers, that is, they are not in the labour force in a regular, continuous way. If these workers developed a stronger labour force attachment whereby they no longer left the labour force after losing a job, there could be an increase in the female unemployment rate. To measure this change, it was decided to make selective use of the gross flow data from Statistics Canada's Monthly Labour Force Survey. "Attachment" was defined as the proportion of "stayers" to "out-movers". "Stayers" consisted of women who continued to be in the labour force from one month to the next; "out-movers" are women who were in the labour force in the previous month but moved out of it in the current month. "Stayers" and "out-movers" were averaged over a three month period to obtain quarterly estimates.⁵

⁵ The components of "stayers" and "out-movers" are as follows:

$$\begin{aligned}
 \text{Stayers} &= \text{employed in current and previous months} \\
 &+ \text{employed in previous, unemployed in current month} \\
 &+ \text{unemployed in previous, employed in current month} \\
 &+ \text{unemployed in previous and current months} \\
 \text{Out-movers} &= \text{employed in previous, not in labour force in current month} \\
 &+ \text{unemployed in previous, not in labour force in current month}
 \end{aligned}$$

(F_t) Ratio of full- to part-time female workers – The upsurge in the number of part-time workers is another factor that is frequently mentioned as causing higher unemployment. The number of part-time female workers went up from 315 thousand in 1961 to 695 thousand in 1972, an increase of 120%. The proportion of part-time to total female workers rose from 19% to nearly 25%. Thus, the rise in female unemployment did coincide with a rise in the proportion of part-time workers.

For this development to contribute to an increase in the overall female unemployment rate, however, the incidence of unemployment among female part-time workers would have to be greater than among their full-time counterparts. An examination of unpublished data⁶ revealed that this was the case for the period under study. Consequently, the compositional change described above has contributed to the rise in the female unemployment rate and the ratio of full-time to part-time female workers was introduced as an explanatory variable.

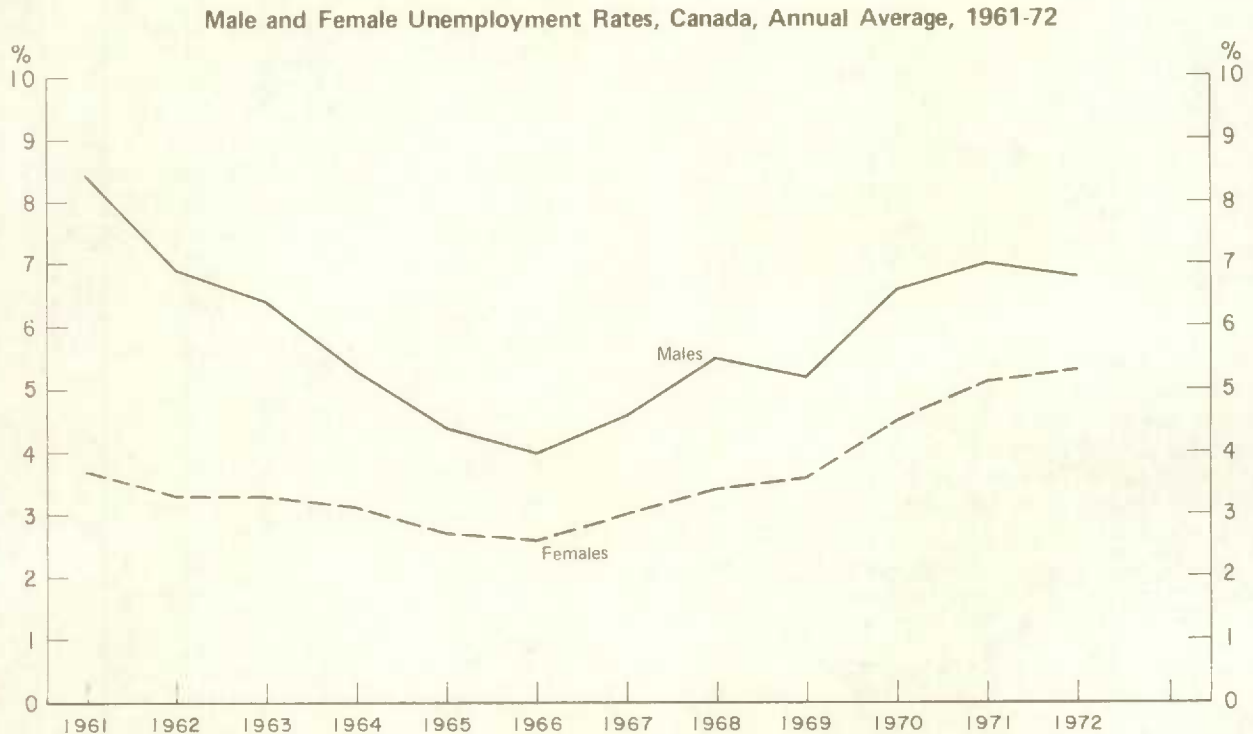
(U_s) Relative male unemployment in occupations with a high concentration of female workers – The first step in constructing this variable was to compute the

⁶ Unemployment rates for full-time and part-time female workers were derived from tabulations provided by the Labour Force Survey Division of Statistics Canada.

male unemployment rate for workers in clerical, sales, service, recreation, professional and technical occupational categories. Next, this unemployment rate was expressed as a proportion of the total male unemployment rate. The variable is meant to provide an indirect measure of demand for those occupations which employ an overwhelming majority of female workers; the above account for nearly 80% of all female employment. It can be argued, and rightly so, that specific occupations within broad groupings are sex-specific and that the labour market for male-dominated occupations is not typical of the market for female workers. Even in such a situation, however, the male rate will serve as a good proxy for the demand for female occupations provided that the male and female occupations in the group are complementary, that is, a higher demand for male-dominated occupations (such as bus boys and dishwashers in restaurants) also means a higher demand for female-dominated occupations (such as waitresses).

(U) Unemployment rate – For the period under review male unemployment is cyclically more sensitive than female unemployment (see Chart 1). It falls and rises faster during periods of economic upturn and slack compared with the female unemployment rate. It is important to take account of this cyclical influence in order to explain the secular rise in the ratio of female to male unemployment rates. This was done through the introduction of the overall unemployment rate as an independent variable in the model.

Chart -- 1

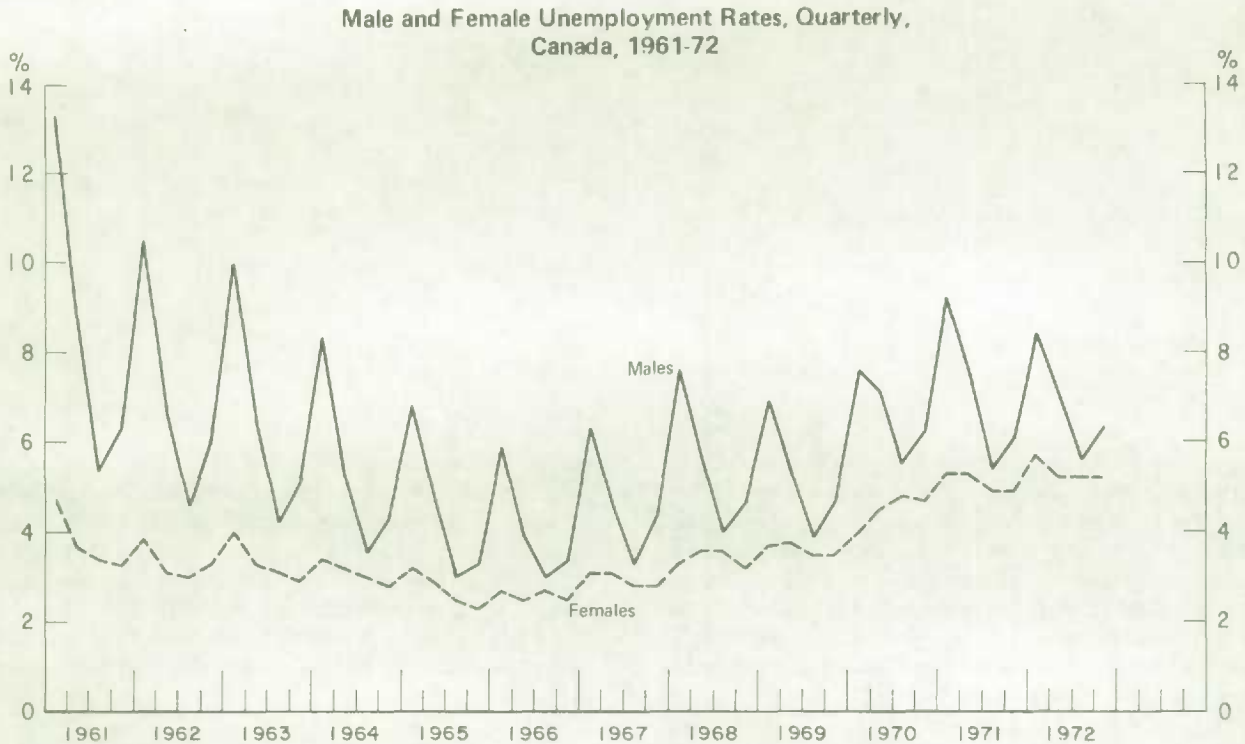


Source: Labour Force Survey Division, Statistics Canada

(I) Unemployment insurance revision – Revisions to Canada’s Unemployment Insurance Act in 1971 may have contributed to an increase in female labour force participation and unemployment. The new provisions of the Act, whereby eligibility requirements were “liberalized” and benefit levels increased, could provide an economic incentive to “secondary” workers to remain in the labour force and search for a new job when they are laid off rather than leaving the work force. A dummy variable was introduced to capture the effects of the new provisions of the Act – it takes a value of one in all quarters following the introduction of the new Act in July 1971 and a value of zero in the earlier quarters.

(d_1, d_2, d_3) Seasonality – Seasonal factors affect male and female workers differently. Females are less vulnerable to seasonal fluctuations in unemployment than males (see Chart 2). Three dummy variables are introduced into the model to take account of the seasonal variations in the dependent variable; d_1, d_2 and d_3 take a value of one in the third, first and second quarters, respectively, and a value of zero in other quarters. The seasonal influence of the fourth quarter is accounted for in a residual manner.

Chart – 2



Source: Labour Force Survey Division, Statistics Canada

Results of Regression Analysis

The analysis covers the period from the beginning of 1961 to the second quarter of 1972. The variables are quarterly averages based on monthly observations. As noted earlier, this period can be divided into two sub-periods. The first, 1961-66, was marked by a downward swing in unemployment, with the decline in the female-male unemployment rate differential attributable to the greater fall in the male unemployment rate.

The second period, beginning in 1967, was one of rising unemployment for both females and males, with the decline in the unemployment rate differential attributable to a more rapid increase in the female

unemployment rate. This difference between the sub-periods suggests that the decline in the female-male unemployment rate gap can be attributed to factors which affect the supply and demand for female workers only after 1966.

As a result it was decided to undertake three regressions. One for the overall period and separate regressions for each sub-period. The same variables were included for the two sub-period regressions with one exception. The dummy variable (I) used to capture the influence of the Unemployment Insurance Act revisions was only incorporated in the regression for the total time period as it was not applicable to the first sub-period.

Regression Results for Complete Period

Two sets of results are presented for the overall period. The first encompasses the results of the model as specified in the preceding section. The coefficients are retained and interpreted regardless of their level of statistical significance. For the second set, the process of backward stepwise regression is used to select the "best" model by eliminating those variables which contributed least to explaining variation in the dependent variable.

The results of the regression analysis based on the original model are shown in Table 4. Generally speaking, the model has a high explanatory power. The coefficients of the independent variables show the expected signs and most of them are statistically significant at 5% level of significance. The error standard deviation is low and the Durbin-Watson statistic is well within the acceptable limits.

TABLE 4. Analysis of Variance of Female-male Unemployment Rate – Original Model

Variable	Regression coefficient	Standard deviation	Null T
F _t	- 2.7738	0.4336	- 6.40
I	7.7446	2.7631	2.80
U	- 1.6469	0.7592	- 2.17
A	0.0052	0.0043	1.21
U ^s	0.1830	0.1901	0.96
G	0.4671	0.4477	1.04
d ₁	24.6435	4.1994	5.87 ¹
d ₂	- 10.2965	3.4212	- 3.01 ¹
d ₃	- 2.3732	2.5118	- 0.94 ¹
Constant	259.637	43.6501	5.95

R² = 0.9261 \bar{R}^2 = 0.9095
 Error standard deviation = 4.8006
 Durbin-Watson = 1.606

¹ The 't' coefficient for seasonal dummy variables measures significance relative to the missing quarter.

F_t, used to capture the influence of growth in part-time workers, turns out to be the most significant structural variable affecting the ratio of female to male unemployment. This indicates that growth in part-time relative to full-time workers had a powerful impact on the dependent variable, an impact that is attributable to the higher incidence of unemployment among part-time female workers noted earlier in the article. Although the hypothesis is supported, the strength of this variable appears suspect. An examination of the vector of

coefficients of correlation of this variable with other independent variables (Table 5) reveals a significant negative correlation with the labour force attachment variable A and variable I which was used to capture the influence of the revision to the Unemployment Insurance Act. Due to multicollinearity F_t has probably captured some of the variation due to changes in labour force attachment and the Unemployment Insurance Act revisions.

TABLE 5. Vector of Correlation of F_t with Other Independent Variables

Independent variables	Coefficient of correlation
A	- 0.42
U ^s	- 0.16
G	- 0.05
I	- 0.44
U	- 0.08
d ₁	0.42
d ₂	- 0.04
d ₃	- 0.17

The results also suggest that the revised Unemployment Insurance Act has had some influence on relative

female unemployment. The amendments to the Act appear to have affected women more than men and had

a positive effect on the female-male unemployment rate differential.⁷ This would also be consistent with the fact that the Act has had a greater impact on secondary and low-wage workers, categories where female workers have a higher concentration than males.

The significance of the unemployment variable, U, confirms the hypothesized cyclical behaviour of the dependent variable suggesting that male unemployment shows greater cyclical movements as compared to female unemployment. However, this variable is multicollinear with A and U^s and may be capturing some of the variation due to these two variables, both of which are apparently statistically insignificant.

Three variables – A, U^s and G – show up as statistically insignificant. Nevertheless, the direction of relationship in all three cases is consistent with the

⁷ Due to the social importance of this variable it bears mentioning that the significance of the revised Unemployment Insurance Act is not sensitive to changes in model specification.

hypothesized relationships. It was suggested earlier that A and U^s are collinear with other statistically significant variables and this might be responsible for weakening the regression coefficients for these two variables. In this respect it is pertinent to note that in a regression without the cyclical variable U, both U^s and A come out to be statistically significant.⁸

Finally, the ratio of female to male unemployment shows a distinct seasonal pattern. Both d₁ and d₂, dummy variables for the third and the first quarter, are statistically significant.

Table 6 gives the results of the “best” regression model based on backward stepwise regression. This model eliminates one by one all those variables from the equation which do not add to R² in a statistically significant way. The remaining variables also capture the effects of the excluded variables.

⁸ The regression coefficients for A and U^s in this equation were 3.21 and 4.43 respectively. R² was 0.88 and the error standard deviation was 5.56.

TABLE 6. Analysis of Variance of Female-male Unemployment Ratio – Stepwise Regression

Variable	Regression coefficient	Standard deviation	Null T
U ^s	0.2748	0.1478	1.86
F _t	- 2.6016	0.3940	- 6.60
I	9.0839	2.5258	3.60
d ₁	19.9057	2.7710	7.18
d ₂	- 9.1231	2.1525	- 4.24
U	- 1.4615	0.6571	- 2.22
Constant	251.563	36.6766	6.86

R² = 0.9298 \bar{R}^2 = 0.9098
 Error standard deviation = 4.7929
 Durbin-Watson = 1.540

The process of stepwise regression led to the exclusion of the variables A, G and d₃. However, U^s, which was insignificant in the first equation, becomes statistically significant. The other significant variables, F_t, I and U, become more significant than before.⁹

Sub-period Regression Results

The results of the regressions for the two sub-periods, 1961-66 and 1967-72, are presented in Table 7.

⁹ The stepwise method is useful if the object is forecasting since it prevents “unnecessary” use of such data as would not improve the accuracy of prediction. However, an examination of the relationship as estimated by the original set of variables is more helpful in understanding relationships between the dependent and the independent variables.

The explanatory power of the model, as measured by R² and the error standard deviation, is substantially less during the first period 1961-66, as compared to the second, 1967 onwards. Further, none of the behavioural variables, such as labour force attachment, are significant at a 5% confidence level for the first period, and only one, F_t, is significant at a 10% level. Most of the variation in the dependent variable is explained by the dummy variables accounting for seasonal variation.

During the second period, labour force attachment, A, is the most important factor responsible for the trend towards equalizing unemployment rates between men and women. The increasing proportion of part-time workers among women, which was significant at the 10% level in the first period regression, becomes significant at a 5% confidence level. Another variable that becomes

TABLE 7. Sub-period Analysis of Variance of Female-male Unemployment Rate

Variable	Regression coefficient		Standard deviation		Null T	
	1961-66	1967-72	1961-66	1967-72	1961-66	1967-72
A	- 0.003	0.021	0.008	0.004	- 0.32	4.86
U ^s	0.032	0.455	0.305	0.283	0.11	1.61
F _t	- 3.399	- 2.691	1.987	1.154	- 1.71	- 2.33
G	0.471	0.435	0.677	0.700	0.70	0.62
U	- 0.953	- 1.217	2.070	1.499	- 0.46	- 0.81
d ₁	18.501	40.892	7.920	6.120	2.34	6.68
d ₂	- 14.213	- 7.402	6.557	5.835	- 2.17	- 1.27
d ₃	- 5.630	- 0.721	4.424	3.473	- 1.27	- 0.21
Constant	335.239	193.398	145.484	94.059	2.30	2.06

For 1961-66,
 $R^2 = 0.917$
 $\bar{R}^2 = 0.872$
 Error standard deviation = 5.470
 Durbin-Watson = 1.433

For 1967-72,
 $R^2 = 0.951$
 $\bar{R}^2 = 0.928$
 Error standard deviation = 3.727
 Durbin-Watson = 2.425

significant (at a 10% level of confidence) in the second period is U^s which represents the relative labour market tightness for occupations with a concentration of female workers. It would appear that after 1966 the supply of workers to these occupations grew faster than demand.

Conclusions

The main finding from this analysis is that the upward swing in the female unemployment rate after 1966, and associated decline in the female-male unemployment rate differential, appears to be attributable, in large part, to a strengthening in the labour force attachment of females. Further, while the behavioural changes began well before the 1971 revisions to the Unemployment Insurance Act, the evidence suggests that the revisions had a positive influence on this behavioural change. The results also reveal that the change on the supply side began during a period when labour demand in female-dominated occupations did not grow at a rate sufficient to absorb all those seeking employment. Another contributing factor has been the substantial increase in the relative importance of part-time workers in the female labour force. For the period under review, these workers had a higher unemployment rate than full-time female workers.

What of the future? There is no reason to expect the female labour force participation rate to stabilize in the foreseeable future. Nor is there any reason to expect the strengthening of their labour force attachment to diminish. As a result it seems reasonable to expect that, all other things equal, the female-male unemployment rate differential will continue to decline. In fact, it would not be surprising to observe the female unemployment rate rise above the male rate before the ratio stabilizes.

A development that could dampen the rise in the female unemployment rate would be occupational diversification of female employment. Although male-dominated occupations have been potentially opened to females through the passage of equal opportunity legislation by a number of Canadian jurisdictions in recent years, there is a strong expectation that market forces, rather than institutional, will be the more important determinants of developments. In this regard, because of the shortage of prime-age male workers at the present time, certain employers have been forced to recruit females for jobs traditionally held by males. If this becomes general, diversification will undermine the upward trend in the female unemployment rate.

LABOUR MARKET EXPERIENCE OF OUT-OF-SCHOOL YOUTH

M. Daniel and F. Whittingham*

The position in the labour market of out-of-school youth has received a great deal of attention in recent years because of the high incidence of unemployment among them. Their above average unemployment has been attributed to such factors as inadequate education and training, the high rate of job change as young persons look for the "right job", a reduction in the number of entry level jobs for inexperienced workers, and minimum wage laws which may deter employers from hiring workers with little training or experience. There is a dearth of information on the impact of most of these factors. However, some analysis of the influence of work experience and type of educational background on the labour market experience of out-of-school youth can be undertaken with data collected through a special series of questions appended to the Labour Force Survey questionnaire in November 1972.

For young persons who had left school, information was collected on the following characteristics:¹

- (a) level of education and whether the person had any technical or vocational education or training;

* Manpower Research and Development Section, Labour Division.

¹ Approximately 2.2 million persons in the 14-24 age category who had left school were identified through the special questions. Excluded from this estimate are persons who were reported as apprentices or trainees as of November 1972.

- (b) year completed education or training;
 (c) number of months employed and unemployed during the previous six months;
 (d) number of hours usually worked during the previous six months.

Data from this survey are presented in this article to obtain a better understanding of the problems faced by out-of-school youth. After establishing the importance of this group in the labour force, the impact of work experience on their employment-unemployment experience is examined. Also, the relationship between type of educational background and labour market experience is briefly reviewed.

Out-of-school Youth in the Labour Force

The level of labour force participation among out-of-school youth was 81% in November 1972. This represented approximately 1,790,000 workers, and they comprised one fifth of the total labour force. Among these young workers, 220,000 were unemployed and their share of total unemployment was disproportionately high, 42%.

The out-of-school group dominate the total labour force (students plus non-students) for persons 14-24 years of age. They accounted for 83% of the total. Further, they constituted 81.6 and 95.2% of the employed and unemployed categories (see Table 1).

TABLE 1. Persons Out-of-school as a Proportion of Total Labour Force for Persons 14-24 Years of Age and as a Proportion of the Employed and Unemployed,¹ November 1972

Labour force	83.0
Employed	81.6
Unemployed	95.2

¹ The estimates used for this table exclude persons reported as part-time students, apprentices or trainees.

Work Experience and Level of Education

One would expect both work experience and level of education to have an important influence on the employment-unemployment experience of young workers. As work experience increases, skills should accrue through on-the-job training and one would expect an improvement in work habits, factors that should improve a person's competitive position in the labour market. With respect to level of education, many employers tend to set minimum educational attainment levels as a prerequisite even for employment in low level entry jobs, while for most of the better employment opportunities higher educational levels are mandatory.

In the analysis, length of time out of school is used as a proxy for work experience. After controlling for level of education there is a definite relationship between length of time out of school and incidence of unemployment. For persons with some high school education or less, the unemployment rate falls from 25.3 for those who left school in the year of the survey (1972) to 14.1% for persons out of school approximately 2 years or more (see Table 2). The same pattern holds for persons in the educational category "completed high school or more", and the relationship is also distinct for males and females in each educational attainment category.

TABLE 2. Unemployment Rates for Out-of-school 14-24 Year Olds by Year Completed Schooling, Level of Education and Sex, November 1972

Sex and year completed schooling	Level of education	
	Some high school or less	Completed high school or more
Both sexes:		
1972	25.3	14.0
1971	19.0	10.5
Before 1971	14.1	7.1
Male:		
1972	28.6	16.9
1971	19.8	13.9
Before 1971	15.2	8.0
Female:		
1972	19.4	11.3
1971	17.5	7.1
Before 1971	12.1	6.3

This negative relationship between incidence of unemployment and length of time in the labour force suggests there is a serious transition problem in moving from school to the work force. Individuals do not enter into a stable employment pattern when they leave school. Rather, they experience difficulties in finding satisfactory jobs and adjusting to the demands of the labour market.

The positive influence of educational attainment on a person's position in the labour force is also evident

from Table 2. For each year completed schooling category the unemployment rate drops dramatically as one moves from the lower to the higher level of education.

Level of education is also related to level of labour force participation. As can be seen from Table 3, level of education, when year completed school is held constant, is positively related to the propensity to participate in the labour force. Further, this relationship holds for both males and females.

TABLE 3. Labour Force Participation Rates for Out-of-school 14-24 Year Olds by Year Completed Schooling, Level of Education and Sex, November 1972

Sex and year completed school	Level of education	
	Some high school or less	Completed high school or more
Both sexes:		
1972	84.1	93.2
1971	81.8	91.9
Before 1971	72.5	84.0
Male:		
1972	92.2	94.8
1971	93.4	96.4
Before 1971	95.4	98.1
Female:		
1972	72.5	91.8
1971	65.2	87.9
Before 1971	50.4	74.2

For males, length of time out of school also has a positive influence on labour force participation. For females, however, the labour force participation rate declines as length of time out of school increases. This divergence reflects the influence of marriage and child care which reduces female labour force participation and imposes responsibilities on males that require greater labour force participation.²

Labour Market Experience Between June and November 1972

The employment-unemployment experience of out-of-school youth for the six month period prior to

² The accumulation of work experience and skills as length of time out of school increases may have a positive influence on labour force attachment among males. Length of time out of school is also acting as a proxy for age in this case and the expectation is that marriage and related responsibilities underly the rise in the male labour force participation rate.

November 1972 is reviewed in this section. Again the focus is on the influence of work experience and level of education.

At each level of education category a higher proportion of males who had been out of school two or more years were employed the full six months preceding the survey compared to those who left school in 1971 or 1972. Undoubtedly, this pattern reflects many factors such as an increase in maturity and personal responsibilities as length of time out of school increases, and it also suggests that a more stable employment pattern emerges as work experience accumulates.

The same pattern is not evident for females, which is attributable to data limitations. To obtain meaningful results, one would have to control for marital status. The estimates are too small, however, to permit this procedure.

TABLE 4. Percentage of Out-of-school 14-24 Year Olds Employed the Full Six Months Between June and November 1972 by Year Completed School, Level of Education and Sex

Sex and year completed school	Level of education	
	Some high school or less	Completed high school or more
Male:		
1972	25.4	35.6
1971	42.9	61.1
Before 1971	60.5	73.6
Female:		
1972	--	34.5
1971	30.6	60.0
Before 1971	30.7	56.8

-- Estimate too small to be reliable.

With respect to education, this factor has a positive influence on success in the labour market. For each year completed school category, the proportion that worked the entire six month period increases with level of education, and the pattern holds for both males and females.

Another aspect that can be examined is the usual number of hours per week worked by individuals when they were employed. This measure provides a rough approximation of whether persons were fully employed when they held jobs. Table 5 shows that, for males in both educational categories, a greater proportion who had been out of school two years or more worked a full work week (35 hours or more) than those who left school either one year before the survey or in the year of the survey.

Again, a similar pattern is not evident for females. Rather, the reverse is the case, which probably reflects an increase in the importance of part-time jobs for females after marriage.

The positive influence of level of education on employment is also apparent from Table 5. Controlling for length of time out of school, the proportion who usually worked 35 hours or more tends to increase with level of education. This relationship is very distinct for females but must be qualified for males. While there is a definite difference between the two educational categories for males who left school in the survey year, it narrows very substantially for those out of school approximately one year or more. This suggests that, as work experience accumulates, the acquisition of higher levels of formal education becomes less important in obtaining full-time employment.

TABLE 5. Percentage of Out-of-school 14-24 Year Olds Who Worked 35 Hours or More When Employed Between June and November 1972 by Year Completed School, Level of Education and Sex

Sex and year completed school	Level of education	
	Some high school or less	Completed high school or more
Male:		
1972	73.0	84.6
1971	87.1	88.9
Before 1971	89.1	93.1
Female:		
1972	58.1	74.3
1971	55.1	81.0
Before 1971	43.9	67.7

An examination of data on the unemployment experience of out-of-school youth over the six month period June to November 1972 reveals that both the incidence and duration of unemployment are inversely related to length of work experience (see Table 6). For both educational categories, the proportion who experi-

enced no unemployment during the six month period rises substantially as length of time out of school increases. There is also a marked decline in duration of unemployment as one moves from those who left school in 1972 and 1971 to the group who left school before 1971.

TABLE 6. Percentage Distribution of Out-of-school 14-24 Year Olds by Number of Months Unemployed Between June and November 1972

Level of education and unemployment	Year completed school		
	1972	1971	Before 1971
Some high school or less:			
No unemployment	52.4	60.7	78.0
Unemployed 3 months or less	34.7	26.2	14.0
Unemployed 4 months or more	12.9	13.1	8.0
Total	100.0	100.0	100.0
Completed high school or more:			
No unemployment	60.2	76.3	85.3
Unemployed 3 months or less	31.0	17.7	10.6
Unemployed 4 months or more	8.8	--	4.1
Total	100.0	100.0	100.0

-- Estimates were too small to be reliable.

To briefly summarize, all three measures – proportion employed six months, weekly hours usually worked and unemployment – reveal that length of time out of school has a positive influence on a person's ability to obtain stable employment. These results support the contention that individuals find themselves in a better position to compete for jobs as work experience and job related skills accumulate. Further, as length of time in the labour market increases many persons presumably find jobs they are prepared to

hold for longer periods of time with a consequent increase in seniority and decrease in the risk of layoff.

School Leavers by Type of Educational Background

The influence of type of education on the labour market experience of persons 14-24 years of age who are out of school is examined in this section. Respondents were distributed according to whether they had only an academic education or had some further education or

training of a vocational or technical nature.³ Before proceeding it is necessary to make a few observations on the characteristics of these two groups.

³ This would include training as a result of attending non-degree granting courses in private trade schools, private business colleges, technical institutes, community or junior colleges, CEGEP, schools of nursing, apprenticeship, Canada Manpower Institutions, College of Applied Arts and Technology, etc. A small category of persons who were reported to have some "other" additional education or training besides the usual academic but who were unable to identify the type were excluded.

The age-sex composition of the two groups is somewhat different. Males constitute 55% of those with some vocational or technical education while females comprise 53% of those with only an academic background. With respect to age, the academic group contains a higher proportion of teenagers and a lower proportion of 20-24 year olds than the group with a combination of academic and vocational education (see Table 7). This difference in the age distributions arises because few teenagers would have finished their academic program and completed some additional vocational or technical training.

TABLE 7. Age Composition of Out-of-school Youth by Educational Background

Age	Academic	Academic plus vocational or technical
	per cent	
14-19 years	30.5	12.2
20-24 "	69.5	87.8
Totals	100.0	100.0

There are marked differences between the two groups with respect to level of academic education and length of time out of school. Almost 71% of the individuals with some additional vocational education had completed high school but only 47% of those with a pure academic background had finished their secondary education. This variation in educational attainment is reflected in length of time out of school. The proportion that left school before 1971 was 86.5% for the academic group compared to 78.3% for those with some additional vocational or technical education or training.

The higher level of educational attainment among those with some vocational or technical background is partly attributable to the fact that entry into many vocational and technical programs requires high school completion. For example, it is a prerequisite for entry into the two and three year vocational programs offered

by community colleges. Also, a number of craft unions in the construction industry and employers in the manufacturing sector make completion of high school an entrance requirement for apprenticeship programs.

Given the differences just described, in analyzing labour market experience by type of educational background one should control for level of academic education and length of time out of school because both these factors have an influence on a person's success in the labour market. Since the estimates were too small to permit this approach for analyzing the incidence of unemployment, it has been necessary to use a different measure of labour utilization in this section, an employment rate. This is defined simply as the percentage of a group of persons in the labour force who are employed in a specified reference period.

TABLE 8. Employment Rates¹ for Out-of-school 14-24 Year Olds by Educational Background, Level of Academic Education and Year Completed School, November 1972

Educational background and level of education	Year completed school		
	1972	1971	Before 1971
Academic:			
Some high school or less	74.6	84.4	87.2
Completed high school or more	85.2	88.9	92.3
Academic plus vocational or technical:			
Some high school or less	--	--	88.2
Completed high school or more	85.7	93.1	94.8

¹ Employment rate is defined as the proportion in a group employed as of the reference period.
 -- Estimate too small to be reliable.

Employment rates by level of education and length of time out of school are presented in Table 8. After controlling for these two factors, those with some vocational or technical training have a higher employment rate than their counterparts in the academic category. It should be stressed that this comparison is based on very broad groupings. For example, the category "academic - completed high school or more" contains persons with Bachelor of Arts and Science degrees as well as persons with post-graduate degrees. Also, the category "academic plus vocational or technical - completed high school or more" includes persons who took a secretarial course in a private business college after completing high school as well as graduates from apprenticeship and industrial training programs and community colleges.

Given the lack of homogeneity, however, the data still suggest that, on average, persons with some vocational or technical education have a better employment experience than their counterparts with a pure academic education. Because of their additional training one would expect them to be in a better position to compete for jobs. Further, one would expect employers to prefer persons with some vocational or technical education because it reduces the training investment the employer has to make.

In addition to using the employment rate as a measure of performance some comparisons between

those with and those without some vocational education or training can be made for the six month period June to November 1972.

Data on the proportion of persons who were employed the full six month period, the proportion with no unemployment during the period and the proportion of the employed who usually worked 35 hours or more per week are shown in Tables 9, 10 and 11 respectively.

Based on these statistics, it appears that persons who completed high school or more and have some additional vocational education are more successful in the labour market than persons with only an academic education. For those who did not complete their high school education, however, there is no clear pattern. Persons with an academic background do somewhat better than those who have some additional vocational education when one uses the percentage who experienced no unemployment in the six month period (see Table 10); but the other two measures (Tables 9 and 11) reveal little difference between the two groups. The reason for this may be the fact that persons with only the academic education tend to leave school at an earlier age. Consequently, they would be in the labour market for a longer period of time than those who have some additional vocational or technical training which, for high school drop-outs, may tend to offset the advantage bestowed by additional vocational or technical education.

TABLE 9. Percentage of Out-of-school 14-24 Year Olds Employed Sometime Between June and November 1972 Who Worked the Complete Six Month Period, by Level of Education and Educational Background

Level of education	Educational background	
	Academic	Academic plus vocational or technical
Some high school or less	57.0	56.9
Completed high school or more	64.3	70.4

TABLE 10. Percentage of Out-of-school 14-24 Year Olds Who Experienced No Unemployment Between June and November 1972, by Level of Education and Educational Background

Level of education	Educational background	
	Academic	Academic plus vocational or technical
Some high school or less	73.7	69.5
Completed high school or more	78.2	80.7

TABLE 11. Percentage of Out-of-school 14-24 Year Olds Employed Sometime Between June and November 1972 Who Usually Worked Thirty-five Hours or More Per Week, by Level of Education and Educational Background

Level of education	Educational background	
	Academic	Academic plus vocational or technical
Some high school or less	90.7	90.2
Completed high school or more	90.4	93.3

Summary and Conclusions

Two main points emerge. First, the analysis supports the widely held contention that a serious transition problem exists for young people in going from school to the labour force. Both in the week of the survey and in the six months preceding the survey, the unemployment rate for those persons who finished their full-time education before 1971 was found to be substantially lower than for those individuals with the same level of education who finished in 1971 or 1972. The second major finding concerns the effect of educational background on labour market experience. For persons with at least a high school diploma, individuals with technical or vocational training in addition to their academic education appear to do significantly better in the labour market than those with a pure academic education. The technical and vocational group had a higher labour force participation rate and employment rate. Also, they had a better employment record over the six month period June to November 1972. This

conclusion, however, has to be qualified for persons who left school before completing high school. Persons in this category with some vocational or technical education had a higher labour force participation rate and better employment rate as of November 1972; but there was little difference between their labour market experience over the six month period June to November 1972 and that of their counterparts with only academic education.

The above findings have a number of implications. It would appear that the difficult transition from school to work could be reduced by additional investment in occupational and career counselling, especially at the high school level. Further, the transition problem could be eased by providing students with an opportunity to obtain a better understanding of the world of work in terms of the actual characteristics of jobs and their requirements through co-operative programs between industry and educational institutions.

THEORIES, CONCEPTS AND THE ART OF MEASUREMENT: ECONOMIC THEORIES' RELATIONSHIP TO THE LABOUR FORCE SURVEY CONCEPTS

Kim Farrall*

Introduction

The general meaning of the terms unemployment and employment are well understood by most people, but for use in household surveys operational definitions of these key concepts are not easily devised. How these concepts ought to be defined depends primarily on the purpose for which the measurement is intended.¹ Also, how the concepts actually are defined depends heavily upon prevailing economic theory.

Variables chosen for measurement in a household survey must reflect prevailing theory, since theory establishes both the key variables to measure and the framework for interpreting the resulting figures. Economic theory, however, changes over time. As well, interpretation of the causality between variables as perceived through economic theory can also change. Accordingly, if the adequacy of a set of statistics depends upon its use, changes in economic theory should have an impact upon the perceived meaning and validity of labour force statistics. What proved to be an adequate measure for one set of perceived problems may prove to be inadequate for another, necessitating a change in concepts or methods of measurement.

The main concern of the paper is to trace the effect of developments in economic theory upon the concepts of employment and unemployment and the related work to operationalize these concepts for household surveys. This intriguing question is rarely examined, but some appreciation of how changes in economic theory may affect concepts and the methods adopted to measure these concepts is needed if policy-makers' demands for accurate, reliable and meaningful labour force statistics are to be met.

The paper is divided into two main sections. A brief overview on the theoretical foundations underlying labour force classification concepts and an examination of the influence of pre-Keynesian, Keynesian and post-Keynesian theories upon labour force classification concepts are presented in the first part. The implications of recent neoclassical theory for operational concepts of unemployment are also made explicit. The second

section of the paper deals with select aspects of the problems and deficiencies in using activity-based concepts of unemployment and employment in household surveys.

I. Overview of the Theoretical Foundations of Labour Force Classification Concepts

Theoretical developments surrounding labour force classification concepts fall conveniently into three main periods with changes between the periods paralleling major crises of economic theory. While roughly chronological, these changes partly overlap due to the nature of developments in economic theory. To organize the discussion they can be viewed as:

- (a) the relationship of the "gainfully-occupied" concept to pre-1930's theory (pre-Keynesian theory);
- (b) the relationship of the "activity-based" concepts to Keynesian and neoclassical macro models (theories) of the economy; and
- (c) the relationship of recent economic research (theoretical) to the modified "activity-based" concepts used to measure the labour force. This may be sub-divided into:
 - (i) developments surrounding the Gordon Committee approach; and
 - (ii) post-1967 micro economic or flow approach.

An adequate assessment of the main competing theories of how a market economy behaves would be too space consuming; consequently, the discussion is restricted to those elements of the theory which help explain how the concepts developed.

Pre-Keynesian Theory

Under the classical economist's view of the economy, unemployment was believed to reflect only the excess of casual labour available. The classical macro-economic model of full employment equilibrium concluded that no serious unemployment could occur, since the market mechanism ensured that everyone who desired employment at the going wage would be employed. Hence, both the government's non-concern with persons unemployed and neglect of the unemployment concept prior to the 1930's rested upon the conclusion drawn from classical economic theory that full employment automatically occurred. Being unemployed was a result of individual choice rather than the result of any flaws in the economic system. In the English tradition of economics, concern for the problem of persistent unemployment as a reflection of frictions in the economy did develop; but American thought

* Manpower Research and Development Section, Labour Division.

¹ See Stewart, G., "The Definition of Unemployment", *Review of Economics and Statistics*, XXXII (February 1950), p. 56. Stewart, in stressing the many-sided nature of the unemployment concept, suggested that "any controversy as to the volume of unemployment . . . turns primarily on questions of concepts and definitions". This point was first recognized by Long when he argued that "it is a basic mistake to assume there is only one concept, definition and statistical measure of unemployment". See Long, C., "The Concept of Unemployment", *Quarterly Journal of Economics*, LVII (November 1942).

treated persistent unemployment as a vagrancy problem.² While it was recognized that there may be some persons who did not want to work and that some persons may be temporarily unemployed as they moved from one job to another, nevertheless, owing to the self-regulatory nature of the economic system, both classical and neoclassical argued that there could never be any serious unemployment due to malfunctions in the economic system. This is clearly illustrated by Pigou's 1913 study of unemployment which suggests, like any modern neoclassical textbooks based upon a similar conceptual framework, that if wages were flexible unemployment would be unimportant. As a result, classical theory avoided the problems associated with identifying the characteristics, elements, or types of unemployment.

The first attempts at obtaining labour force statistics reflected the above view of the world. Because both classical and neoclassical theory stressed employment's role as an economic indicator, the Census concepts such as the "gainfully-occupied" were developed primarily to measure secular changes in the occupation and industrial composition of the work force. The "gainfully-occupied" concept did not distinguish unemployment. Under this concept workers were not required to be either working or looking for work to be counted as part of the labour force. Moreover, the "gainfully-occupied" measures status via occupation and not via employment.

No reference is made by this concept to either the time dimension or to labour force flows. As a result, for seasonal, part-time and new workers – all persons without unique occupational roles – the concept was not useful. Any actual unemployment that occurred in the real world could be explained away as a voluntary and temporary phenomenon, a residual that fluctuated with the volume of employment.

Keynesian Theory and the Measurement of Labour Force

S. Kuhn in his book *The Structure of Scientific Revolutions* examines the question "how does the ruling theory of a science get displaced by a new theory?". He argues that the displacement of one theory by another – of neoclassical by Keynes General Theory for example – occurs abruptly when the new theory explains the key phenomenon or major crises unaccountable for by the old theory. The occurrence of the Great Depression, combined with the development of Keynesian economics, drastically changed many of the ways in which economists and policy-makers viewed the

nature of unemployment in the economy.³ Policy-makers' data demands also changed drastically.

The switch to Keynesian theory reflected the failure of neoclassical theory to explain large-scale mass unemployment: a failure Joan Robinson has called the first crises of economics.⁴ Moreover, the development of the Keynesian analysis of the labour market gave an explicit theoretical concept of unemployment applicable to measuring large-scale involuntary unemployment that persists in a state of demand deficiency. All persons who offered their labour at the current market price but who were unable to find a buyer were involuntarily unemployed. This definition of unemployment marks a sharp break with the neoclassical view of unemployment as voluntary whereby unemployment resulted from an individual's choice rather than from market forces. The essential difference between the two theories results from the Keynesian re-evaluation of the determinants of labour market behaviour – control over the level of aggregate demand became the key factor determining the level of unemployment. While only frictional unemployment was possible under the neoclassical model, Keynes' approach presented a different conceptual framework for viewing labour supply⁵ by directing attention at the stock of unemployment occurring in a deficient demand economy.

The first direct attempts to measure unemployment in both the United States and Canada reflected policy-makers' needs to measure and understand what appeared to be the stock nature of unemployment. In practical terms the concept of activity rather than the concept of status by occupation became the key element in policy-makers' data demands.

However, pragmatic considerations placed restrictions on the activity concept and the operational procedures adopted. By 1938 the criteria, priorities and

³ By itself, not much causality can be attached to the depression of the 1930's. There were earlier depressions just as bad which economic theory ignored. Moreover, pre-Keynesian business cycle theory implicitly recognized that large scale unemployment would occur, even if it was not integrated into mainstream economics. Stigler refutes the idea that every important advance in economic theory spring from major social or economic developments. "It may be (although I somewhat doubt it) that Keynes General Theory was the product of the Great Depression, but if so it is one of the very few great events that have affected the basic theory." See Stigler, G.J., "The Influence of Events and Policies on Economic Theory" in *Essays in the History of Economics* (University of Chicago Press, 1965).

⁴ Robinson, J. "The Second Crises of Economic Theory", *American Economic Review*, 1971.

⁵ See Leijonhufvud, "Effective Demand Failures", *Swedish Journal of Economics* 1973, where he argues that "Keynes' pre-occupation with the involuntary unemployment states of the system allowed him to split the traditional model of household behaviour (which underlies neoclassical theory) down the middle, separating the consumption decision from the labour supply decision... Traditional determinants of the labour supply decision may then be ignored...".

² See Mills, F.S., "Contemporary Theories of Unemployment and Unemployment Relief", Appendix II select list of references, in *Studies in History, Economic and Public Law*, ed. by Faculty of Political Science of Columbia University (New York: Longman, Green and Co., 1917-18).

definitions for the activity concept of unemployment, as developed for the United States Public Works Program, became centered on the degree of attachment to the labour force.⁶ The pragmatic "seeking-work" criterion, which demonstrates willingness and availability of the unemployed, was taken from the eligibility rules of the United States Unemployment Insurance Act. In a similar fashion the conceptual problem of determining the minimum number of hours of work to classify a person as employed was adopted from payroll accounting methods – as was the definition of a job, the treatment of self-employed, etc. With the conceptual test of job seeking, three categories of exceptions became acceptable in the operational measure of unemployment. These were:

- (i) temporary interrupted, e.g. illness, etc. . . ;
- (ii) postponed, e.g. layoffs (which raised the problem of how to handle the distinction between temporary and indefinite layoffs); and
- (iii) abandoned, e.g. in the belief that no job was available.

Of the various sorter concepts on "activity" – many institutionally derived – tried by the United States Bureau of the Census during the 1930's, only the behavioural criteria of seeking work was adopted for use in the household surveys developed in the 1940's.

The Labour Force Surveys established in both Canada and the U.S. in the 1940's rapidly became enshrined as policy tools of major importance for the effective running of the economy. Because the definition of unemployment was based upon recent job seeking activity, and the definition of employment was orientated around job possession, labour force concepts could serve as a proxy for labour supply. Accordingly, given the assumption that any job is better than no job at all, these labour force measures were used to focus on the Keynesian based policy question of involuntary unemployment. Unemployment figures were interpreted as a measure of the amount of excess labour supply existing in the economy due to deficient aggregate demand and hours of work data assisted in analysis of the amount of under-utilization of labour in the economy.

Recent Economic Research and Labour Force Classification Concepts

For a number of years the Keynesian theory provided a pattern within which labour force data from household surveys appeared intelligible, explainable and usable for the purposes of forging economic policy. But in the late 1950's and early 1960's a dispute over the cause of unemployment seriously affected the use of the data as a policy tool.

⁶ See Webb, J.N., "Concepts Used in Unemployment Surveys", *Journal of the American Statistical Association*, XXXIV (March 1939), pp. 49-59.

Structural change in the economy was introduced as an alternative to deficient aggregate demand as a cause of unemployment. This unleashed a host of background theoretical problems underlying the measurement of unemployment. In particular, it brought into question the peculiar co-existence of neoclassical and Keynesian theory, the latter being the macro side of a macro-micro split in economic theory that developed in the early 1950's. This in turn reopened the debate over the appropriateness of the Keynesian concept of involuntary unemployment for measuring unemployment, and raised the issue of whether measurements were being based on concepts that ignored real world phenomena.

Most of the difficulties that arose from the neoclassical-Keynesian theory conflict were a reflection of the fact that macro models of labour markets were, by necessity, quite simplistic. In addition, economists failed to integrate micro model insights on the determinants of labour supply with the macro behavioural assumption. A clearer picture of macro labour market operations involved a substantial rethinking of economic theory, a development which was not to occur until the late 1960's.⁷ This meant that neither the neoclassical school of economics nor the Keynesian stream of thought adequately captured what was happening in the real world. Existing procedures appeared to ignore the problem of discouraged workers and the problem of hidden unemployment which empirical research suggested existed. Thus, the theoretical conflict over the correct formulation of the concept of full employment and unemployment raised the issue of how closely the survey concept should be tied to Keynesian-based criteria. Both theories agreed upon the desirability of retaining the activity-based concept, given that an economic rather than hardship criterion was required for measuring unemployment. What could not be agreed upon was whether labour force measurements were based on concepts that ignored certain real world phenomena.

The debate over the causes and appropriate cures of unemployment, together with the problem of determining if hidden unemployment⁸ could exist, posed

⁷ For example, consider Eckstein's and Corina's assessment of recent research. Eckstein's discussion of the search-model approach to unemployment suggests that such theories are "as remote from the central employment problem of our time as the classical theory was in the 1930's". See Eckstein, O., "Discussion: New Micro-Economics of Inflation and Employment Theory", *American Economic Review*, LIX, 1969. Corina contends that the labour market theories emerging from revised neoclassical economics in the 1960's have not revolutionized labour and analysis but rather reformulated the Marshall-Robbins-Hicks short-run labour supply. See Corina, J., *Labour Market Economics* (London: Heineman Educational Books, 1972), p. 163.

⁸ See Mincer, J., "Determining Who are the Hidden Unemployed", *Monthly Labor Review*, XCIV, No. 3, U.S. Department of Labor (March 1973). He points out that the notion of hidden unemployment became popular in the context of the business cycle during the early sixties. Hidden unemployed were viewed as persons who wanted work but were not actively looking for it.

several problems about the adequacy of unemployment figures. Was the level of unemployment real or did it reflect poor measuring techniques? The problem of how to determine the line separating the various labour force categories, among others, led in the early 1960's to the first large scale review of labour force classification concepts and methods. In Canada, the Report of the Committee on Unemployment Statistics was released in August 1960. In the U.S., the now famous Gordon Committee was formed to assess the unemployment figures.

The issues raised by these committees, as yet not satisfactorily resolved, centred on the question of how to develop tests of labour force status or, more specifically, determining the criteria for unemployment. Briefly the three problem areas raised were:⁹

- (a) the problem of defining part-time casual and secondary worker status;
- (b) the problem of defining the state of being unemployed. Several sub-questions of key interest here are: (i) if a person is not working, under what terms would he be willing to accept a job if he is to be counted as unemployed. If he is willing to work only at his former wage while a job is available of a lower wage should he be counted as unemployed? (Under neoclassical theory this is the correct operational test to apply.) (ii) what sort of action should be taken by this person to demonstrate availability for work and in what period of time;
- (c) the problem of whether to include unemployables among the unemployed status.

One of the most troublesome questions faced by the Gordon Committee related to the issue of determining what a person should have done to look for work. Not only was there doubt about what constituted work seeking but doubts also existed about how to determine availability for employment.

As well, conceptual difficulties centred on the deficiencies of the employment concept. For example, the definition of employment in the present Canadian household survey is based on work activity or job attachment during a specific calendar week. The survey includes under this definition all part-time workers, regardless of the number of hours worked or the reasons for part-time status. As a result, the number of persons recorded as employed depends upon the time period used to assess status; but, for policy purposes, changes in the dichotomy between part-time and full-time work can

affect policy-makers' assessment of how tight the labour market is.

As well, because the main purpose of the household survey is to determine a person's status for a specific reference period it does not allow for the allocative functions of the labour market. A key element in the complex theoretical treatments of inter-related labour markets is, therefore, basically neglected by the survey. A stock measure of unemployment assumes constant the influence of money wage changes or other income changes on labour supply offered. Hence, in terms of measurement, this conceptual problem results in the labour force figures reflecting a "point on a theoretical labour supply function, not the function itself".¹⁰

A third problem with the existing figures resulted from the fact that no measure of the potential or the quality of the unemployed is given by present procedures, yet clearly they occupy an important role in theoretical models. The extent to which measurement based upon the market place criterion of current activity (but using a natural unit for measurement can reflect theoretical concept) remains an unsolved problem.

In 1967 the United States attempted to implement the basic recommendations of the President's Committee to Appraise Employment Statistics by making large changes in some of their procedures or methods of measuring unemployment in the Current Population Survey. These changes occurred mainly in the approach and type of question asked to extract unemployment data from the basic activity concept. In short, the definition of unemployment was sharpened and clarified in an attempt to clean up the gray areas in labour force status. Specifically, their objective was to obtain a more restrictive definition of unemployment by removing the category of "inactive seeker" from the unemployed. The concept of unemployment "still related to jobless individuals who are currently available for work and seeking work".¹¹ The employment concept was retained with some minor changes.

In retaining the Keynesian-based concept of current activity, the key revisions required to make the unemployment measure more useful and consistent were:

- (a) respecifying the time period for job seeking and asking specific questions on job seeking methods. Availability for work became an explicit condition of unemployment;

⁹ See *Measuring Employment and Unemployment*, President's Committee to Appraise Employment and Unemployment Statistics (Washington, D.C.: United States Government Printing Office, 1962). For a brief summary of the committee's work see Gordon, R.A., "Employment and Unemployment", an article in *International Encyclopedia of the Social Sciences*, D.L. Sille (ed.) (The MacMillan Company and the Free Press, 1968), pp. 49-59.

¹⁰ Ostry, Sylvia, quoted in the Maki background paper to Statistics Canada's Labour Force User Conference, Ottawa, October 1973.

¹¹ See Ross, A.M., in *News*, U.S. Department of Labor, 1966.

- (b) establishing an experimental set of questions for persons not in the labour force to provide new data on select aspects of the size and composition of labour reserves; and
- (c) re-examining the duration of unemployment, hours of work and self-employed status of workers.

These revisions should be viewed as a major alteration in methods of measuring unemployment. Of particular importance is the switch to the direct question approach. Prior to these revisions, the Current Population Survey questionnaire asked of respondents general questions about their primary or secondary activity. Probing or detailed questions were not used. But this procedure only picked up those unemployed who responded to the secondary activity question. By switching to direct question interviewing the revised United States procedures not only instituted a major alteration in the methods of measuring unemployment but also allowed a more precise measure of unemployment to emerge. For this reason the new United States procedures placed the concept of activity in a more definable zone than previous procedures allowed.

Post-1967 Macro-economic or Flow Approach

After the Gordon Committee's recommendations had been acted upon in the United States, empirical developments in the labour market and theoretical developments again interacted to raise further questions about the nature of unemployment. Recent neoclassical theory attempts to classify unemployment by the nature of frictions, uncertainties and motives existing in the economy. Neoclassical theory also points out that the Keynesian-based definitions possess a strong subjective element because no objective survey method existed to distinguish idle workers from the unemployed. Moreover, with frictional unemployment varying with aggregate demand, involuntary unemployment figures based on Keynesian criteria can have only limited relevance to the measurement of any unemployment existing near full employment. Policy-makers, therefore, could no longer ignore the problem of frictional unemployment; the level of frictional unemployment became the new problem to be faced.

To briefly reiterate, the key pressing problem up to the end of the 1950's was to establish the degree of utilization of the labour force at a point in time and the development of a stock measure of unemployment which reflected Keynesian theory was appropriate. However, the changing nature of the unemployment problem during the 1960's pushed considerations towards flow considerations and analysis of the content of the unemployment figure and gave rise to dissatisfaction with the stock based unemployment figure as an economic indicator. To focus more directly on this problem it is useful to briefly discuss why current Canadian estimates do not give information on the dynamics of the labour market or on the movement of the active margins.

The Canadian unemployment figures do not capture the flow process of labour market activity because they are monthly snapshot figures and they are, after all, stock measures. The unemployment rate can be viewed as a product of the frequency and duration of unemployment. Accordingly, this rate can present a good indirect indication of flow behaviour – the change between two stocks of unemployment given sequential monthly labour force figures – only if either duration or frequency is stable over a given period. But monthly labour force figures cannot be related in a meaningful flow way if both frequency and duration may fluctuate indeterminantly. Moreover, utilizing a natural unit of measurement – simply counting bodies – without taking into account the varying labour force composition, or variations in the type of labour service offered as preferences of individuals change, implies an averaging process occurring over all dimensions of the labour market. This automatically conceals any imbalances or uneven unemployment experience among groups and neglects the character of labour market flows. On this point, the revised household survey in the United States (post-1967) does permit better insights into the flow process by collecting information on entrants and re-entrants and reasons for neither working nor looking for work. By utilizing data from this revised survey, recent search models, such as Perry's and Holt's, have "provided an improved structure for analyzing these previously ill understood aspects of unemployment".¹²

Furthermore, a classification by entrants, re-entrants, quits and layoffs has implications for the development of both economic and social policy. As both Hall and Kaitz¹³ have established, large amounts of unemployment among individuals or groups reflect either frequent short spells of unemployment or infrequent long spells. In the second case, the unemployed have a hard time finding a job, whereas in the first case their problem is one of keeping a job rather than finding one.¹⁴ Therefore, an understanding of long term unemployment and who are the long term unemployed is required. The difficulty with duration statistics is that there is no way of telling how much short-duration unemployment is itself the start of long-duration unem-

¹² See Perry, G., "Changing Labor Markets and Inflation", *Brookings Papers on Economic Activity*, No. 3 (Washington: Brookings Institution, 1970).

¹³ See Kaitz, H., "Analyzing the Length of Spells of Unemployment", *Monthly Labor Review*, XCIII, No. 11, U.S. Department of Labor (November 1970), pp. 11-20, and "The Duration of Unemployment" presented at the American Statistical Association Conference, Montreal, Canada, August 14-18, 1972.

¹⁴ To evaluate the implications of the reserve-labour hypothesis we need to know how much of the high turnover in labour force status is voluntary or involuntary, i.e. a reflection of quits or layoffs. If high turnover of employed and unemployed is a problem endemic to the "secondary labour force" then Solow argues that the direct policy implication is that the nature of the jobs offered rather than the characteristics of the unemployed should be changed. See Solow, R., "What Happened to Full Employment", *The Quarterly Review of Economics and Business*, Vol. 13, Summer 1973.

ployment. Since there is no clear correspondence between the average duration of unemployment and structural unemployment, determining what types of unemployment can occur is difficult. Classification by entrants, re-entrants, quits and layoffs enables a partial solution to the problem of identifying types of unemployment.

Solow, however, argues that the new theories' data demands differ from previous theories'. Whereas the old structural unemployment theory wanted improved unemployment data on the inter-relationships of unemployment by occupation, industry and education, the emerging new structural unemployment theories – where demographic characteristics are substituted for skill and education to explain unemployment – require data on the nature and behaviour of labour turnover, in addition to simultaneous classification by age, sex and education.¹⁵

The diverse and conflicting theoretical explanations of the possible causes and sources of unemployment have given rise to different conclusions on what the state of being unemployed involves. Moreover, such theories differ radically in their interpretation of what form legitimate tests of unemployment should take within an activity-based labour force classification framework. Thus, it is appropriate to consider some of the difficulties of adapting the theoretical concepts of recent neoclassical theory for survey use.

Implications of recent neoclassical theory for operational concepts – Neoclassical theory appears to advocate the exclusion of some active seekers from unemployment status if they:

- (a) represent speculative, precautionary (wait) or search unemployed;
- (b) have unreasonable reservation-wage demands, i.e., failure to search in all avenues of job mobility; and
- (c) lack the necessary qualifications for the jobs they are seeking.

Search theory views frictional unemployment as occurring because individuals voluntarily sacrifice present wages for the higher wages of another superior job. Precautionary unemployment is interpreted as an investment cost, the cost of keeping liquid for a new job opportunity.¹⁶

Accordingly, recent neoclassical theory again centres attention on the types of job search considered acceptable, only this time it puts forward reasons for its proposed treatment. Indeed, much of the present

dispute occurring between the Keynesians and neo-classicists over the interpretation of unemployment and the nature of full employment rests upon the alternative view of unemployment creation given by the neoclassical treatment of job search theory. Yet many of the categories of unemployment suggested above are essentially untestable.

A brief discussion of the uncertain areas in recent neoclassical unemployment theory will indicate the difficulties faced in designing operational criteria to allow for these types of exclusions listed above.

Uncertainties exist over:

- (i) Whether the determinants of wage-aspiration levels can be established. Do wage aspirations depend on different skill, occupation or unemployment experiences? Do wage aspirations necessarily decline in any systematic way as unemployment increases? ¹⁷ The problem remaining with the neoclassical definition is that if some, or even all, the unemployed are indifferent between employment and unemployment at a given real wage, are they voluntarily unemployed? ¹⁸ Hence, a key operational problem of the neoclassical treatment of unemployment lies in the fact that no acceptable evidence could be developed to exclude from the unemployed those persons who, while declining a job, were still looking for work.
- (ii) How does the job search proceed? Here uncertainties exist due to data deficiencies.¹⁹ For example, what are the characteristics and behaviour of successful job holders as compared with job changers? To what extent does job changing lead to unemployment? Among which groups in the labour force? How important is voluntary job changing as a reason for unemployment? Is there a stable sequence of job search methods?
- (iii) What factors determine when job search stops? For example, present United States procedures do not establish how many people become "discouraged" after looking for work without success for some

¹⁷ Data are needed to investigate directly the relationship between unemployment and workers' labour supply function: specifically, if: (a) the unemployed are willing to accept a lower wage and (b) asking wage declines over duration of unemployment. See Kasper, H., "The Asking Price of Labour and the Duration of Unemployment", *Review of Economics and Statistics*, XLIX, No. 2 (May 1967).

¹⁸ See Bronfenbrenner, M., *Income Distribution Theory* (London: John Wiley and Sons, 1972).

¹⁹ Bradshaw remarks that in the revised United States Survey, only the methods mentioned by the respondent are noted even though other ways may have been tried. A true measure of job search intensity is not available because: (a) there is not information on total time spent on job hunting, or upon the combination of methods used and (b) the data do not yield any information on which job search methods are effective since questions are asked only of the current unemployed. See Bradshaw, T., "Jobseeking Methods Used by Unemployed Workers", *Monthly Labor Review*, XCVI, No. 1 (February 1973), pp. 35-40.

¹⁵ *Ibid.* pp. 7-20.

¹⁶ See Phelps, E., *Inflation Policy and Unemployment Theory* (New York: W.W. Norton, 1972). Phelps notes that, of the types of unemployment distinguished, only speculative unemployment could not be considered a sub-category of "involuntary unemployment" as Keynes defined it.

time. How many were discouraged without having looked at all? Without information on the intensity or the frequency of different search techniques, adequate testing of hypotheses concerning job search behaviour given by different market theories is difficult.²⁰

Without knowing either the intensity or the frequency of job search, determining whether "inactive seekers" are voluntarily or involuntarily inactive is impossible. Difficulties exist, therefore, in determining why people shift from one labour force category to another. The Canadian concept does not yield information on either potential work seekers or the effects of production cutbacks, nor does it handle the problem of interrupted work schedules. Phelps also suggests that under conditions of job rationing there may be an involuntary aspect to prolonged job search for openings at the normal wage. Empirically, this has been found to be true of small area and city markets.

- (iv) In addition to the problems associated with the labour force classification concepts, when they are viewed within the framework provided by recent theory, there exist other problems associated with the concept of occupation, industry, unemployment duration, and the concept of part- and full-time workers. These non-sampling size problems occur in the main because the type of information which can be generated from a household survey is limited. For example, data on occupation and industry relate to the last job held, so that there is no way of knowing what type of job an unemployed person is seeking.

Recent theories, therefore, often require impractical tests of unemployment status in addition to demanding data which household based surveys cannot provide.

The uncertainties regarding the application of neoclassical theory outlined above reinforce the value of the Gordon Committee's recommendations that tests of unemployment, involving persons quitting a job to look for another or only accepting certain job offers, or not qualifying for certain jobs applied for etc., not be used for determining a worker's status. If one accepts this position, then, it would not be necessary to accept the neoclassical conclusion that, on average, society should tolerate more unemployment today than in the past.

²⁰ See, for example, the following authors' hypotheses: Alchian, A., "Information Cost, Pricing and Resource Unemployment", in Phelps, E.S., et al., *Micro-Economic Foundations of Employment and Inflation Theory* (New York: W.W. Norton, 1970); Holt, C., "Job Search, Phillip's Wage Relation and Union Influence: Theory and Evidence" in Phelps, et al., *op. cit.*; Gronou, R., "Information and Frictional Unemployment", *American Economic Review* (June 1971).

II. Problems and Deficiencies of Activity-based Labour Force Classification Concepts

The following discussion of limitations associated with activity-based measures of the labour force draws upon the experience in the United States with the Current Population Survey. This is done for two reasons. First, the revised Current Population Survey is the most recent attempt to incorporate new theoretical concerns into labour market measurement. Second, it appears that the United States approach will be adopted by Statistics Canada as a model for its Revised Labour Force Survey.²¹

Legitimacy of Job Search as a Test of Unemployment Status

Most conceptual interest since the United States revised its procedures in 1967 has been directed to the questions asked of persons not in the labour force, and to the issue of whether or not these questions do provide useful information. Present Canadian procedures are similar to the pre-1967 approach in the United States whereby "inactive job seekers" are counted as unemployed only when they volunteer the information that they would have been looking for work except for their belief that no work was available.

This approach does not allow for the explicit identification of the category "discouraged workers" (defined as those who did not look for a job because they did not think they could find one or because they were not qualified) into either the unemployed or not in the labour force categories. The Gordon Committee was responsible for the United States' decision to collect and publish data on "discouraged workers" separate from the "unemployed". The purpose of extracting discouraged workers as a group was to distinguish them from the rest of the unemployed.

Nevertheless, this procedure raised new questions which could not be answered. Attempting to measure discouragement means isolating the subjective phenomena of desire to work and one's perception of the likelihood of getting a job. "Wanting work" has long been recognized as an unreliable concept²² for data collected by enumeration. Yet it is inherently involved in the approach taken in the Current Population Survey to identify "discouraged workers" who are treated as labour force withdrawals. In adopting this approach it was argued that the question of whether discouraged workers should be included in the unemployed category was an empirical matter. "If and when we develop

²¹ See, for example, papers distributed at Statistics Canada's Labour Force Survey Data Users Conference, Ottawa, October 1973.

²² See Lebergott, S., "Measuring Unemployment", *Review of Economics and Statistics* (November 1954).

accurate and meaningful data on the discouraged, it will be time to consider whether they should be included among the unemployed".²³

Objectivity and subjectivity measurement problems – Questions concerning the measurement of attitudes and intentions, such as those posed by measurement of discouraged workers, will always be difficult to resolve. In a market-based economy where individuals' actions are supposed to reflect free choice, the survey procedures adopted, in effect, ask respondents to classify themselves in terms of labour force status. The response of individuals with a weak labour force attachment may vary when their perception of their status changes. Some people when first contacted answer the labour force questions differently than on subsequent visits even though those questions are on activities rather than intentions. This so-called rotation group "bias" is an example of the difficulty found in obtaining a clear cut distinction between objective and subjective questions. The response to labour force survey questions appears to be sensitive to (i) their phrasing and placement, and (ii) the survey structure including the enumerators training and quality control, although the "subjective" questions undoubtedly have the greater sensitivity. Because of this sensitivity, estimates of the number of people in a given labour force status may appear somewhat fuzzy. But, once one adopts a set of procedures, useful time series of the data will result provided the questionnaire and structure of the survey are maintained over time.

Boundary problems – Characteristics of job markets often determine the type of job seeking activity required. Specialized job markets or small area labour markets do not require "information-based" job search activity whereas in large cities such overt action is needed. Yet the answers to the direct questions asked of respondents on job seeking activities is used to determine their unemployment status.

Hence, for small area employment markets based on a single industry, which may be seasonal in nature, the activity-based "search criterion" breaks down as a filter for determining unemployment. As the United States labour force concepts are essentially the same as the present Canadian ones, the grey area in present United States procedures reflects a criticism of the activity concept itself.

Problems associated with the revised United States approach – A number of comments can be made on other problems encountered with the Current Population Survey but, unfortunately, there are not many solutions to offer. It was expected that the revised questionnaire in the United States could affect the various employment and unemployment series in their:

(a) levels;

(b) seasonal patterns; and

(c) cyclical patterns.

No proof exists that business cycle patterns in labour force data have been changed by the 1967 questionnaire, but some difficulty has been experienced in interpreting some of the trends and patterns occurring in post-1967 data. While some of the particular patterns which appear to be occurring may have arisen from the wording of the questionnaire, others are a result of changed operational procedures.

Examples of these effects are the significant drop in unemployment among 16-19 year olds, because of the "availability test", and the suspicion that seasonal patterns were behaving somewhat differently after 1967, particularly for adult women. Because weather-based seasonal employment patterns are more important in Canada compared to the United States, and given the United States experience, it seems reasonable to conclude that there is a definite need for more data and analysis on the Canadian dimension of seasonality vis-à-vis the discouraged worker and hidden unemployment problem.

Classification and Priority Schemes

Both the reference period problem and the priority scheme needed to classify persons with more than one activity require substantial rethinking. Existing procedures provide an inadequate classification system for handling flow unemployment behaviour. For example, if the bulk of persons classified as outside the labour force for unusual reasons reflect persons who will shortly be looking for work, then the usefulness of the distinction between unemployed and out of the labour force becomes questionable. This type of inability to handle flow questions occurs in the revised Current Population Survey in that the question on "reasons for looking for work" is asked only of current unemployed, implying that new labour force entrants must pass through unemployment on their way to becoming employed.²⁴ Because no alternative priority scheme or reference period appears as a plausible alternative to the revised United States approach, there is a need to recognize any limitations inherent in this approach.

Further examples of the problems posed in determining status can be seen in the United States procedures. Questions asked about those in the labour force seeking temporary jobs are restricted to new entrants and re-entrants among the unemployed, whereas all the unemployed should be asked the question whether or not they seek temporary work.

Employment Concept

Another set of conceptual problems relates to the murkiness of the employment concept which, like the

²³ Ross in News, *op. cit.*

²⁴ See the Department of Manpower and Immigration's background paper submitted to the Statistics Canada Labour Force Survey Data Users Conference, Ottawa, October 1973.

unemployment concept, has many grey areas. Employment in some cases is a group phenomenon, as in the case of small, family-owned businesses. Operationally this relates to the problem of how to classify unpaid family workers if employment is defined as "a situation in which remuneration in cash or in kind is received in exchange for active direct personal participation in the production process".²⁵ The difficulties faced also in classifying workers on their own account relates to the problem of defining employment. An excellent example is the frequently-cited problem of how to classify a truck driver-owner who is sitting at home waiting to be called for work: is he employed or unemployed? Another aspect of the group nature of employment is the geographic limitations a husband's place of work may impose upon the wife's opportunity to find work. Because of these problems, alternative concepts of employment, under-employment and unemployment based on family characteristics – the family group being considered the economic unit rather than the individual – have been suggested by Mouly and others.²⁶

All of this relates to the present dispute on the correct interpretation of unemployment and the determination of possible sources of unemployment.²⁷ What should be the definition of employment and unemployment in the face of institutional changes in the eligibility rules for unemployment insurance and welfare schemes? While it is doubtful whether the group concept would aid policy decisions, it does indicate that among the first difficulties encountered in measuring unemployment²⁸ is to decide what to measure.

Because the concept of unemployment is somewhat intangible, "how much unemployment is regarded as either acceptable or inevitable depends on what is described as unemployment".²⁹ The dispute over both

²⁵ Mouly, J. "Some Remarks on Concepts of Employment, Underemployment and Unemployment", *International Labour Review* (February 1972).

²⁶ Mouly, *ibid.*

²⁷ This varies between different theories and between different interpretations of empirical evidence. Consider the statements of Perry, Hall and Mincer compared with Friedman's statement as given in the January 31, 1972 issue of *Newsweek*.

Friedman criticized the use of an aggregate unemployment figure as a numerical goal of economic policy. He argued that the size of the unemployment pool is unimportant as long as the unemployed were not suffering but were being retrained for more productive work. See Friedman, M., *Wall Street Journal*, February 3, 1972.

²⁸ Moore notes that the recent *President's Commission on Federal Statistics*, Vol. 1, 1971, p. 75 argues "methods that yield the best estimate of the level of a variable such as unemployment do not necessarily yield the best estimate of its change. The Commission recommended that attention be given to more precise estimates of change even though these might be inconsistent with changes derived from the best estimates of level". See Moore, J., "On the Statistical Significance of Change in Employment and Unemployment", *Statistical Reporter* (March 1973), p. 138.

²⁹ See Wood, J., *How much Unemployment: The Methods and Measures, Dissected*, Research Monograph No. 28 (London: Institute of Economic Affairs, 1972).

the correct interpretation of data and the type of data needed to assess alternative theories reflects the fact that conceptual issues may be raised by both theoretical and empirical considerations. Not only does this point to the need to recognize the frailties of adopted definitions and concepts, but it also makes it difficult to predict future problem areas in any revised labour force survey.

Conclusions

Our concern in this paper has been with tracing out how developments in economic theory have influenced labour force concepts and how these concepts are transferred into operational measures. To recapitulate, the switch from a neoclassical-based conception of the labour market, with an explicit full employment assumption, to the Keynesian model of disequilibrium and adjustment costs in the labour market focused attention on the concepts and types of unemployment. The long unresolved dispute between the structural versus the demand deficient explanation of the level of unemployment was conducted under the ground rules implied by the Keynesian definition of unemployment. No attention was given until the late 1960's to the effects on unemployment of the flows set up by different adjustment processes to varying degrees of disequilibrium. These latter developments in theory that occurred after the revisions to the United States Current Population Survey involved a switch from viewing unemployment as a stock to acknowledging its flow nature.

As a result, the revised Current Population Survey's definition of activity can only partly reflect this changing theory.

The discovery of new patterns of explanation, however, frequently require the development of a new ruling theory with consequent impact upon measurement. Hence, the major insight resulting from this paper is the realization that both the unemployment and employment figures are essentially creatures of economic theory. Observation and fact finding are a theory-laden undertaking. Theories provide the frameworks within which data appear intelligible. Thus, not only are observations and data built up into general systems of explanation but systems based on economic theory are also built into one's observations and appreciation of data.³⁰ As a result, Keynesian and the new neoclassical theories, although they appear to have a similar theoretical structure, do provide a different frame of reference for interpreting statistics. For this reason, it is true to say that without the information needed to establish the degree to which concepts can make economic statistics uncertain we "cannot make the division between what we really know and what we think we know but we don't".³¹

³⁰ Hanson, N.R., *Patterns of Discovery* (Cambridge, England: Cambridge University Press, 1969).

³¹ Coddington, A., "Economists and Policy", *National Westminster Bank Quarterly Review* (February 1973).

ERRORS ASSOCIATED WITH GROSS FLOW ESTIMATES

S. Bertrand*

Introduction

Each month Statistics Canada produces estimates of employment, unemployment and labour force participation on the basis of a sample of households. These are stock measures and are useful for monitoring changes in the size of the labour force and its component parts (employment and unemployment), but because they are net measures they do not provide any information on the sources of month to month changes. For example, a change in unemployment between two months of 30,000 could be attributable to the following types of movements: 60,000 persons moved from employment to unemployment, 50,000 moved from unemployment to employment, and 20,000 persons entered the labour force to look for a job. The types of changes just described are known as gross movements and are defined

* Mr. Bertrand is an economist with the Canada Department of Manpower and Immigration. During 1973 he undertook research in Statistics Canada on the errors in gross flow data.

as the month to month flows of persons between various states (employment, unemployment, labour force and not in the labour force).

The matrix shown in Table 1 shows the relationship between gross and net movements in a more precise way. From this matrix the following relationships for unemployment can be constructed:

$$\text{persons unemployed in } t-1 = U_{t-1} = U_e + U_u + U_n;$$

$$\text{persons unemployed in } t = u_t = E_u + U_u + N_u;$$

$$\text{net movement in unemployment} = \Delta U = u_t - U_{t-1};$$

$$\text{by substitution, } \Delta U = (E_u + U_u + N_u) - (U_e + U_u + U_n).$$

The net change in unemployment between two months, ΔU , may be small but the gross movements underlying the net change can be very large. Since it is possible to construct the same relationships for each characteristic, the analytic value of gross movements data is obvious.

TABLE 1. Matrix of Gross Movements

Status in month t-1	Status in month t			Total
	e	u	n	
E	E _e	E _u	E _n	E _{t-1}
U	U _e	U _u	U _n	U _{t-1}
N	N _t	N _u	N _n	N _{t-1}
Totals	e _t	u _t	n _t	

E, e = employed.
 U, u = unemployed.
 N, n = not in the labour force.

While gross movements data are produced each month by Statistics Canada, they are not released because there are a number of sources of bias associated with these data that lead to a lack of consistency with the stock estimates. The sources of bias are reviewed in this article and alternative methods of calculating gross flow data are discussed. Also, the problem of error additivity associated with the data is examined and a number of suggestions are made on further research to obtain a better understanding of the errors associated with gross movements data.

Alternative Estimation Methods

A sample of approximately 30,000 households is used in the Monthly Labour Force Survey. A household remains in the sample for six consecutive months and approximately 5,000 households enter and leave the sample each month. The labour force status of all individuals 14 years of age and over in the sample households is determined through the survey. Gross movements can be calculated in two ways. First, the

movement of an individual can be determined by comparing the status he declared in one month with that of the preceding month, the **matching method**. This method gives estimates for only 5/6 (maximum) of the sample because of the rotation system, that is, the 5,000 households entering the sample in each month cannot be matched. Second, a person who has reported his status for one month can be asked to recall his status in the previous month, the **recall method**. The principal disadvantage of this method is that people have a tendency to declare that their status in the previous month was the same as in the current month. This phenomenon results in the most important systematic bias in the results obtained by the recall method.

Sources of Error

Gross movements data can be subject to bias associated with population change in the sample, non-response, matching bias attributable to identification errors and response variability. Each of these is discussed in more detail later.

Population Change Bias

Gross movements data obtained from either the matching or recall method are subject to population change bias. This bias occurs because some changes in the labour market between two months are accounted for by immigration or by individuals who reach age 14 while others leave as a result of death or emigration and gross movements data does not take these population changes into account. The bias attributable to these population changes is difficult to determine because of the co-existence of sampling variability, that is, one does not know the extent to which observed changes in stock estimates between two months is attributable to population change relative to sampling variability. This is not a serious problem, however, because population change does not have a decisive effect on the reliability of the estimates.

Non-response Bias

The bias in gross flow data associated with non-response depends on the method used to compensate for units who were chosen to be in the sample but who did not respond. The present method introduces a bias because it compensates for non-response at the household unit level, while, ideally, for gross movement estimates one should compensate at the individual level because gross movements are obtained by matching individuals rather than households.

There are three causes of non-matchability:

1. non-response at point in time t-1 and (or) at time t;
2. rotation of households into the sample;
3. coding errors.

To completely compensate for non-matchability it would be necessary to allow for all three possibilities; but the present system compensates for non-response only at time t. As a result, a bias is introduced into the gross movement estimates.

Matching Bias

A matching bias arises when interviewers make identification errors. For example, take a situation where there are two sons in a family unit, one is employed and the other is a student and the interviewer makes an error by interchanging the identification numbers of these two sons from one month to the next. Since the matching method consists of comparing an individual's status in the current month and the previous month, this error gives rise to two false movements; one individual leaves the labour force (employed) and returns to school and a second leaves school to enter the labour force and becomes employed. The bias is obvious.¹

The present method of matching introduces some bias into gross movements estimates because only the

¹ It has been estimated that approximately 3% of month to month comparisons are faulty.

identification number is used for matching. It would be possible to correct this bias by using a matching method that takes into account not only the identification number of an individual, but also age, sex and relationship to the head of the household. When these four criteria all match, it would be practically impossible to compare different individuals.

Response Variability Bias

Response variability can occur as a result of persons misunderstanding the questions used in the survey.² What is usually called "rotation bias" also falls within the category. This refers to the process whereby a respondent develops a better understanding of the questions after being in the sample for one or two months and, consequently, gives different responses to the questions. Errors attributable to response variability are not peculiar to gross movements data. They also occur in stock estimates, but the errors tend to cancel out in stock estimates. In contrast, it is believed that these errors are additive in the case of gross movements estimates, and this is the prime reason why these estimates are not considered reliable.

Estimates based on recall data are subject to both response variability bias and recall errors. The latter occur through faulty memory when persons recall their labour force status in the previous month and because of a tendency for persons to declare the same status for the previous month as the current month. This phenomenon results in the most systematic bias in gross flow data obtained through a recall question and creates an over-estimate in the elements of the principal diagonal in the matrix of gross movements.

Effect of Response Variability on Matched Data

Response variability errors may be measured with the help of a quality control program (re-interview). By comparing the results of a re-interview with those of the original interview, this error is measured by calculating the net difference rate (NDR) and gross difference rate (GDR).³ A re-interview program is in existence in Canada and the GDR and NDR are calculated monthly. This program, however, was implemented principally to control the quality of new interviewers and cannot be used as a measure of the quality of the survey results as a whole.

² A related aspect is the "proxy respondent" problem whereby errors can arise because one member of the household responds to the questions on behalf of other members of the household.

$$NDR = \frac{(B - C)}{A + B}$$

$$GDR = \frac{(B + C)}{A + B}$$

A = Number of cases in which the re-interview is identical to the interview.

B = Number of cases added to a category by the re-interview.

C = Number of cases removed from a category by the re-interview.

However, this type of program is used in the United States' Current Population Survey as a measure of quality. Based on this program, it has been observed that the NDR was small and that estimates of stocks were not significantly biased by this type of error because of its tendency to cancel out. It was also observed that the GDR was relatively high. For example, in the case of unemployed persons it was about 20%, whereas the rate of gross movements calculated in the same manner was 100%. Relating these two percentages, it was concluded that gross movements data were not reliable due to the principle of error additivity in estimates of flows.⁴ This argument is one of the principal reasons why gross movements data are not generally considered reliable.

Effects of the Rotation System

Response variability due to the rotation system creates a special type of response bias which is related to the conditioning of respondents over the six month period they are in the survey. Some people respond differently to the questionnaire depending on whether they are being interviewed for the first time, second time, third time, etc. For example, in the United States it was observed that the unemployment rate was higher amongst persons being interviewed for the first time

than amongst those being interviewed for the second through the sixth times. This phenomenon resulted in an exaggeration of the number of withdrawals from the labour force between the first and second comparison months.⁵

It is easy to see that rotation bias can have a very strong impact on the reliability of gross movements estimates. Accordingly, analysis of this phenomenon is pursued a bit further with Canadian data for 1972. Since the data are weighted, the reader is alerted to the possibility that the weighting bias described earlier may have affected the results obtained. Monthly gross movements by rotation group were estimated for each possible movement. The results for five rotation groups are shown in Table 2. For the five rotation groups the following matched interview months were used: 1.2, 2.3, 3.4, 4.5, 5.6. The problem is to determine whether there is a different number of persons, for a given movement, in each matched rotation group. For example, if one concludes that there is the same number of persons who made the movement $E_{t-1} + U_t$ in each of the five rotation groups, one would also conclude that rotation bias does not affect this movement. Table 2 suggests that movements within the labour force (movements between E and U) are not much overestimated or underestimated from one rotation group to another,

⁴ Hilaski, H.J., "The Status of Research on Gross Changes in the Labor Force", *Employment and Earnings*, United States Department of Labor (October 1973), pp. 6-13.

⁵ Pearl, R.P., "Gross Changes in the Labor Force: A Problem in Statistical Measurement", *Employment and Earnings*, United States Department of Labor (April 1963).

TABLE 2. Gross Movements by Matched Interview Months Expressed as a Percentage of the Average of All Matchable Interview Months, 1972

Labour force movement	Total	Matched interview months				
		1.2	2.3	3.4	4.5	5.6
		Rotation group				
		1	2	3	4	5
Population 14 + to: t-1 and t	100	98.2	100.9	100.6	100.0	100.3
Employed at t:						
E_{t-1}	100	97.2	100.7	100.7	100.4	101.1
U_{t-1}	100	101.8	103.3	98.2	97.4	98.9
N_{t-1}	100	106.0	102.9	100.0	96.2	94.4
Unemployed at t:						
E_{t-1}	100	101.4	99.7	99.7	101.4	97.3
U_{t-1}	100	98.9	101.3	100.4	100.3	98.9
N_{t-1}	100	110.7	102.3	92.6	103.7	90.4
Not in the labour force at t:						
E_{t-1}	100	108.5	105.2	100.3	94.3	91.7
U_{t-1}	100	117.8	96.0	96.0	93.4	102.1
N_{t-1}	100	98.0	101.0	100.7	100.1	100.2

E = employed
U = unemployed
N = not in the labour force.

which implies an absence of serious rotation bias. Movements into and out of the labour force (movements between N and E, N and U), however, are subject to large variations from one rotation group to another which implies significant rotation group bias. These implications were tested statistically by using each pair of months as an observation. The object of the tests was to determine whether there is a significant difference between the matched rotation groups. Analysis of variance, X^2 test, and a test on the sign of the differences were conducted at a 5% confidence level, and for each of the possible movements the following hypotheses were put forward:

- HO - There is no difference between rotation groups, and hence no rotation bias.
- H1 - There is a difference between rotation groups and hence a rotation bias.

The results of these tests are shown in Table 3.

The tests tend to confirm the conclusions drawn from examining Table 2. They support the presence of rotation group bias in movements between E and N and U and N. There was one unexpected result; the presence of rotation group bias is supported in the movement $E_{t-1} \rightarrow E_t$. Multiple comparisons show, however, that in this case there is a difference only between rotation Group 1 and the others; that is, there is no difference between Groups 2, 3, 4 and 5 (see Table 2). This raises the possibility that the homogeneity of Groups 2 to 5 in conjunction with the slight difference between them and Group 1 results in the statistical test providing support for the existence of a significant difference between the groups, but it does not imply the existence of a rotation group bias problem.

TABLE 3. Results of Statistical Tests for Differences Between Rotation Groups

Movements $t-1 \rightarrow t$	Analysis of variance	X^2 Test	Sign of the differences
E → E	x	x	x
E → U	:	:	:
E → N	x	:	x
U → E	:	:	:
U → U	:	:	:
U → N	x	:	:
N → E	x	x	x
N → U	:	:	:
N → N	:	:	:

An X indicates rejection of HO and thus acceptance that rotation bias is present.

Summary

To summarize, gross flow estimates are subject to a number of sources of errors and some of them are more easily corrected than others. For example, matching bias that arises from identification errors could be substantially removed by using demographic characteristics in addition to an identification number when matching individual records and non-response bias could be corrected by using an adequate compensation system for non-response in gross flows estimates. With respect to rotation group bias, it has a serious impact on estimates of movements into and out of the labour force. While it has not been possible to demonstrate it empirically, response variability not attributable to the rotation system appears theoretically to be the most important source of bias in gross flow estimates. To

obtain an adequate understanding of how these errors are distributed and how they bias the estimates, it would be necessary to undertake a re-interview program designed specifically for this purpose.⁶ While some of the present problems are difficult to overcome, the future for gross flow estimates is promising because of the new questionnaire that will be introduced as part of the Labour Force Survey Revision. The revised questionnaire will be much more structured and should lead to a reduction in response variability with a consequent improvement in the reliability of gross flow estimates.

⁶ As noted earlier in the article, the present re-interview activity is used primarily as a check on the work of new interviewers and it does not allow information on the same respondent for two consecutive months.

PRIVATE PENSION FUND RESERVES

Harry Weitz*

Introduction

In Canada a system of both public and private pension programs has been developed to provide income support during the years of retirement. The public component is primarily a combination of the universal Old Age Security benefit and the wage-related Canada/Quebec Pension Plan (C/QPP). The public income sources are supplemented by the private component made up of the pension plans run by employers on behalf of their employees. Private plans have grown at a tremendous pace over the past three decades or so, and with the vast pool of funds accumulated in their reserves they have become a major financial institution in Canada and have a considerable impact on the basic economic processes of savings and capital formation. This article will be confined to a study of the fiscal operations of these private plans and their participation in the capital markets.

Historical Background

Since their inception, the growth pattern of pension plans and their funds has been due to a number of factors. Evolutionary social and economic developments in the twentieth century, and more particularly over the past three or four decades, have produced significant changes in patterns of work and leisure. Over this period population shifted from countryside to city as industry replaced agriculture as the primary employer. Industrialization combined with improved technology to increase labour productivity and create a flow of goods and services capable of supporting a standard of living to surpass all previous levels. Concurrently, scientific and technological developments increased life expectancy. Within this longer life span the ratio of work to leisure changed dramatically, work-life expectancy decreased and non-working years increased. Juanita M. Kreps in a recent study points out that in advanced industrial countries, the major declines in lifetime working years appear at the beginning and the end of the work-life span.¹ Young people tend to spend more time at school and in training, while at the end of the spectrum, older workers tend to leave the labour force at an earlier age which gives them a longer period of retirement.

In a paper prepared for a conference on aging held by the Canadian Welfare Council in Toronto, January 1966, Sylvia Ostry found that the average retirement period in Canada had doubled since the turn of the century and concluded that, barring any radical institutional or economic upheavals, the decline in years of

working life and increase in the retirement period is likely to be a continuing pattern.² This trend towards shorter working-life expectancy is reflected by the declining rate of labour force participation by the older population. Fewer persons are remaining in the labour force after their 65th birthday. In 1941 less than half of the men aged 65 or over were in the labour force; twenty years later less than one third participated, and in 1973 the rate had fallen still further with less than one fifth economically active. This increasing proportion of the population over age 65 who are not economically active have a substantial number of non-working years ahead of them. According to the Canadian Life Tables a man aged 65 can expect to live almost another 14 years, and a woman of the same age, 16 years. Leisure at retirement therefore is no longer a short-term phenomenon; indeed, the lengthening retirement period introduces a new life stage bringing with it pressing economic problems, not the least of which is to provide some continuing source of income over the last decade or so of the normal life span. Arising out of these developments is the increase in formal, systematic, private arrangements to provide a means of support over the lengthening retirement years.

The private pension system in Canada is of relatively recent origin experiencing its major growth during and since World War II.³ Until 1966 when the Canada/Quebec Pension Plan (C/QPP) was first introduced, private plans were the only wage-related pension programs available. As such, private pension programs have become an increasingly important element in the total pay package. Over the past decade alone pension plans have increased from 8,900 in 1960 to over 16,000 plans by the beginning of 1970, while over the same period membership grew from 1.8 million to over 2.8 million workers. In terms of the total labour force, however, coverage remains rather limited. Presently only about one in three paid workers participates in an occupational pension plan.

² See Sylvia Ostry, "Labour Force and Employment Patterns" in *The Economic Status of the Aging* by Sylvia Ostry and Jenny Podoluk, Statistics Canada (Ottawa: Information Canada, 1966), p. 22.

³ For purposes of this study the private pension component in Canada is composed of all group occupational plans operated by employers, groups of employers, unions, religious and charitable organizations as well as plans designed for employees of all levels of government. Thus the federal superannuation plan covering federal employees, the Armed Forces and RCMP plans, pension plans for employees of boards, Commissions and Crown corporations as well as those for provincial or municipal employees are all included in this category. Specifically excluded are the Canada/Quebec Pension Plans as well as the individual savings programs known as "Registered Retirement Savings Plans", contributions to which enjoy the same income tax deferral privileges as do pension contributions.

* Chief, Pension Section, Labour Division.

¹ Juanita M. Kreps, *Lifetime Allocation of Work and Income, Essays in the Economics of Aging* (Durham, North Carolina: Duke University Press), p. 64.

Role of Private Pension Plans in the Economy

Notwithstanding their relatively limited coverage private pension plans have come to assume a significant role in the economy. Well over \$750 million annually is paid out to retired workers, and as time goes on and pension plans organized in the past few decades come into maturity, this payment can be expected to increase dramatically. Payments of this magnitude require the systematic accumulation of funds and cash flows have indeed been enormous. In 10 years total contributions have more than doubled from \$800 million in 1960 to over \$1.7 billion in 1970. The magnitude of these fiscal flows comes into sharper focus when it is realized that the \$1.7 billion in contributions was by and on behalf of the one third of the paid workers in private plans while virtually the entire labour force contributed \$1.2 billion to the C/QPP in the same period.

In economic terms pension plan contributions represent a major share of personal savings. In a study published in 1968, Roger F. Murray concluded that pension savings represented a net addition to personal savings. He also pointed out that participation in a plan stimulated further savings because of the "recognition effect"; that is, the participant "recognizes that a reasonable degree of financial independence in retirement is attainable for him when a program is made available to him in addition to his social security income prospects."⁴ Recognition thus motivates additional savings because of the realization that financial security is possible. Murray quotes a study by Phillip Cogan in which it was found that the recognition effect tends to be more pronounced in contributory than in non-contributory plans. This conclusion is of particular importance to Canada because most plans in this country are contributory, so that the savings for pension purposes can be assumed to be a net addition to other personal savings.

Since these plans represent such an important element of personal savings their administration takes on special significance. Participants are concerned that enough funds will ultimately be available to them when they are ready to retire and cash in on their savings, and

⁴ Roger F. Murray, *Economic Aspects of Pensions: A Summary Report*, National Bureau of Economic Research, Inc. (New York: Columbia University Press, 1968), p. 58. In this context Murray refers to a study by Phillip Cogan, "The Effect of Pension Plans on Aggregate Savings", NBR (New York, 1965). In a paper *The Effect of Pension Plan Membership on the Level and Composition of Household Wealth* prepared for a Financial Brokers Conference in Toronto in 1968, Prof. W.R. Waters presents the first tentative contradictory conclusions to those reached by three other researchers, one Canadian and two American, saying "portfolio adjustments to accommodate pension wealth appear to take the form of an across-the-board reduction in the quantity of all other assets held". He does, however, point out that this is a tentative conclusion which could be revised on further study.

so administrators are charged with the responsibility of handling these funds to maximize the return on investment. Finally, when these savings are channelled into investments they have an enormous impact on capital markets. Pension funds not only perform the role of a savings medium but they also act as a financial intermediary which channels these vast accumulations into the capital markets. In recent years pension funds have become a major institutional investor and it appears that they will become an increasingly important source for investment capital in future years.

Funding Agency

Pension funds are of course not all alike and the way they participate in the capital markets can vary widely. To a large extent their role as a financial intermediary is determined by the type of funding agency used in the accumulation and management of the funds. Broadly speaking, the 16,100 plans are classified into three main funding agency categories: insured, trustee and government consolidated revenue funds.

Insured Plans

Insured plans are those funded by premium payments to a life insurance company and as can be seen in Chart 1, they constitute the largest category in terms of number of funds. Nearly 70% of the plans in force are insured, but these tend to be the smaller plans and cover less than 15% of the members - 398,700 persons out of a total of 2.8 million. Over two thirds of the insured plans had less than 15 members each and the largest fewer than 10,000 members.⁵

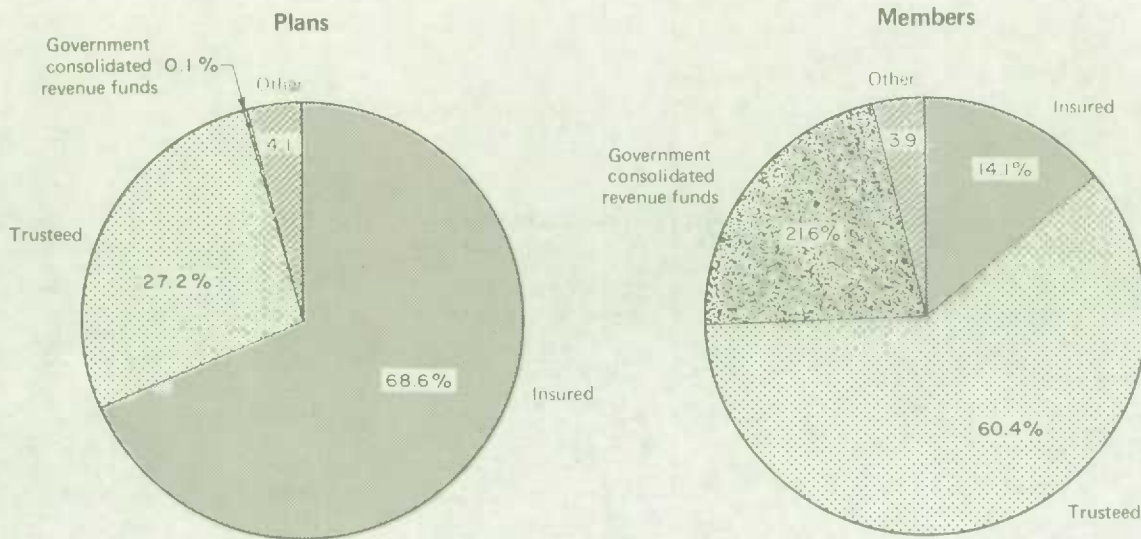
Trusteed Plans

Whereas typically most small plans tend to use insurance companies as the funding agency, large ones use the trust arrangement. About one quarter of all private plans use this method for the management of their funds but they account for nearly two thirds of the members, some 1.7 million persons in all. Trust companies are funding agencies for three out of four of these plans and most of the balance are managed by the companies themselves. With accumulations of over \$12 billion in assets at book value in 1971 and a current average growth rate of nearly 12% annually, they represent the most significant group in terms of coverage, annual contributions, and growth of accumulated assets.

⁵ *Pension Plans in Canada, 1970*, Statistics Canada (Catalogue 74-401 Biennial) (Ottawa: Information Canada), p. 14.

Chart - 1

Plans and Members by Funding Agency



Government Consolidated Revenue Funds

The smallest category in terms of plans – only 19 in all – is the group classified as “Government Consolidated Revenue Funds” which includes some of the largest plans in the country such as the Federal Superannuation Plan, the Armed Forces, RCMP, provincial employee plans in some of the largest provinces, etc. Together they account for nearly 608,000 participants, some 22% of all members in Canada. As the name implies, all contributions are paid into the Consolidated Revenues of the applicable governments and the funds are used for general government purposes. Characteristically, these plans have no invested assets in the superannuation accounts and none of the funds are channelled into the financial markets. However, funding within this group varies widely from plan to plan.

For example, in the Federal Superannuation Plan, one of the largest employer-employee plans in the country, the Government not only matches employee contributions but also credits the superannuation account with interest and assumes responsibility for any actuarial deficits. The amounts held in this account are not in the form of cash or invested securities but are paid into the government’s Consolidated Revenue Fund. The government thus uses all the money for general government purposes and credits the account with interest quarterly for its use. The government’s contributions are recorded as budgetary expenditures and these

amounts are raised through taxes. The interest paid on the accounts is recorded and charged in the same way as interest paid on bonds, that is the government’s undertaking to pay both pension benefits and bond redemptions is recorded in the statements of Assets and Liabilities in the Public Accounts.

Benefits payable are guaranteed as a right by legislation just as are the payments in respect of Government of Canada bonds. Although bonds are not actually issued for the superannuation account, the government commitments and guarantees have the same force as if bonds had been issued. Current excesses of receipts over disbursements not needed for immediate payment of pensions are invested in book liabilities of the Government of Canada and are used for general purposes of the Government of Canada similar to the proceeds from the sale of government bonds and earn interest at the same rate as long term government bonds.

While similar funding principles are followed by some of the provincial plans in this general category, a few use other funding methods. For some, the government commitment covers only the shortfall between contributions from employees and benefits paid out to pensioners. If employee contributions are equal to, or greater than, the payout in benefits, the government makes no contribution and will deposit any excess into their consolidated revenues.

Pension Funds with Invested Assets

As noted above, the government consolidated revenue fund plans do not participate in the capital markets and consequently investment activity is limited to the insured and trustee plans. These two categories over the years have generated considerable reserves.

As shown in Table 1, their holdings quadrupled and in aggregate some \$12 billion were channelled

through the capital markets over the 1960's. Obviously, then, private insured and trustee pension plans have become important financial intermediaries. Their role in the financial markets, particularly the kinds of financial instruments they buy, varies according to the type of funding agency controlling the funds. Investment policies for the insured plans tend to be different from those of the trustee plans which makes it necessary to analyse their portfolios separately.

TABLE 1. Reserves of Insured and Trustee Funds, Book Value, 1960-71

Year	Book value of insured and trustee funds	Distribution by type of funding	
		Trustee	Insured
	millions of dollars	per cent	
1960	4,791	75	25
1961	5,433	74	26
1962	6,136	74	26
1963	6,945	74	26
1964	7,873	73	27
1965	8,968	73	27
1966	9,880	73	27
1967	10,954	74	26
1968	12,122	74	26
1969	13,373	75	25
1970	14,742	75	25
1971	16,830	75	25

Insured Plans in the Capital Markets

Insured plans may be underwritten by a variety of individual and group contracts with an insurance company. These may range from a fully insured arrangement to the deposit administration or segregated fund arrangement whereby the adequacy of the fund to meet the costs of the benefit is not guaranteed. For purposes of this analysis the form of the contract is not material since the primary consideration in this context is the actual process of mingling the funds from this source with all other insurance company income for use in the capital market. (The only qualifications are the "Segregated Funds" which will be discussed later.) When funds from different sources are co-mingled it is impossible to identify separately how pension funds were invested. As a result, for this part of the analysis it is necessary to assume that the insurance companies' investment strategy also reflects their application of income from their pension business.

The main concentration of insurance company investment has been in mortgage loans and real estate. Investments in these areas accounted for about 45% of their total portfolio in 1971, while investments in bonds and debentures constituted approximately 35% of their portfolios. Stocks play a minor role in their general investment strategy with only about 8% allocated to this

type of investment.⁶ As noted earlier it is assumed that this pattern also reflects the allocation of pension funds.

Although insurance companies do not carry the bulk of the pension business in Canada, they have nevertheless experienced considerable growth in pension accounts. In 1960 the book value of insured pension fund assets was estimated to be \$1.2 billion and by the end of the decade they had grown to over \$3.1 billion. With the emphasis in mortgage lending, pension arrangements through insurance companies have made a major contribution to the expansion in the stock of housing.

One phase of the insurance company pension business that falls outside the pattern discussed above is the group classified as Segregated Funds which allows insurance companies to diversify their pension business by offering clients a vehicle for unrestricted investments in equities. They were first introduced in 1961 when federal laws were amended to free insurance companies from the restrictions which applied to their investments in common stocks. The funds, however, must be segregated from regular insurance and annuities business, hence the name "Segregated Funds".

⁶ Report of the Superintendent of Insurance for Canada, 1972, Volume 1, page 22A.

Since their introduction in 1961 these "Segregated Funds" were used primarily for group pension business, but recently they have been used to develop other forms of contracts as well. Some life insurance companies are offering life insurance policies that have variable benefits related to the value of the company's segregated funds. Also, these funds are used for the registered retirement savings plans sold by insurance companies.

In their ten years of existence segregated funds have shown a tremendous increase with the book value

of accumulated assets reaching nearly \$827 million by 1971. Over half of these funds were invested in common and preferred shares; 25% of the portfolios were in bonds concentrated largely in corporate issues with little in government securities other than about 4% in provincials. Of particular interest is the fact that over 18% of the assets were in mortgages, far lower than the proportion of the main body of insurance company investments, but a much higher ratio than in the trustee plans.

TABLE 2. Asset Distribution of Segregated Funds, 1971

Assets	Book value	
	\$'000	%
Bonds	207,460	25.1
Stocks	424,277	51.3
Mortgages	152,938	18.5
Real estate and leasebacks	1,304	0.2
Miscellaneous	40,921	4.9
Totals	826,900	100.0

Source: *Trusteed Pension Plans, Financial Statistics*, Appendix B, Statistics Canada (Catalogue 74-201 Annual) (Ottawa: Information Canada).

Trusteed Funds and Their Investment Patterns

Trusteed funds have attracted a great deal of interest and discussion in recent years and small wonder! About three quarters of the invested assets held by private pensions are concentrated in the trustee funds (see Table 1), and with a net annual cash flow at well over one billion dollars since the late 1960's their investment activities are big business in the financial markets. With a cash flow of this magnitude, the total value of assets held by these funds has been climbing steadily. Over the past twelve years there was more than a threefold increase in assets from \$3.5 billion in 1960 to over \$12.4 billion in 1971 (see Chart 2). This continuing growth rate is significant in that the Canada/Quebec Pension Plan introduced in mid-decade (1966) has relatively little dampening effect on overall asset growth. During the first half of this period the funds increased at an average annual rate of nearly 13% but in 1966 when the Canada and Quebec Pension Plans were introduced it dropped to 11%. In real terms, the net year to year increase in book value of assets ranged from \$416 million in 1960 to over half a billion dollars in 1963 and by 1971 trustee pension funds were increasing by over \$1.4 billion a year. With accumulations of this magnitude trustee pension funds have been heavy purchasers of corporate securities, government bonds and mortgages, and are generally a major source

for new capital investment. They have become one of the fastest growing financial intermediaries in the country and their projected continuing growth assures them of being a major force in the financial markets for some time to come.

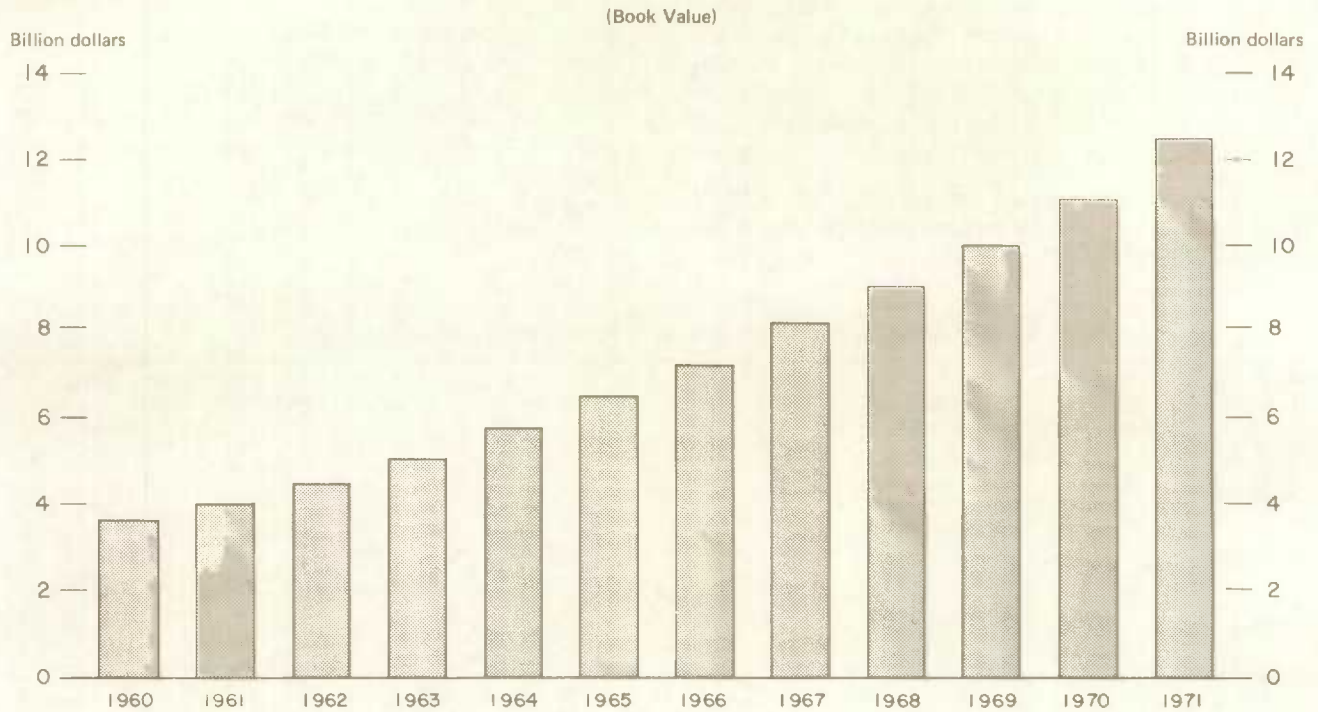
The pension trust, in essence, is a bundle of assets managed to provide maximum returns with minimum risk over a long term to meet commitments already made or likely to be made in the future. One would expect that with a common objective, a distinctive pension portfolio profile would emerge, but consistency does not prevail. Investment management is not a science and, therefore, investment policies and results vary widely according to assessments of individual managers.

Perhaps the most impelling factor underlying investment policy and the ultimate aggregate pattern of investment is the size of fund, and in this respect, the range is wide and the effects far-reaching.

Characteristically, trustee pension plans in Canada consist of an overwhelmingly large number of very small funds and relatively few large ones. For example, out of nearly 4,000 trustee pension funds in operation during 1971 only 731 funds had portfolios valued at \$1 million or over (at book value) but in

Chart - 2

Assets of Trusteed Pension Funds, 1960-1971



aggregate these 731 funds accounted for nearly 95% of the \$12 billion held by trusteed pension funds (see Table 3). In other words, most of the pension reserves are concentrated in relatively few large funds, and some are very large indeed. Although two thirds of the 731 funds have assets of between \$1 million and \$5 million each there are as many as 23 funds with holdings of over \$100 million, with individual portfolios in this group ranging from \$100,700,000 to \$896,500,000. As may be seen in Table 3, these 23 pension funds accounted for nearly half of the total assets accumulated in trusteed funds. By contrast, just under \$570 million which represents 5% of

all trusteed pension fund reserves, is held by a total of 3,215 funds. The bulk of the trusteed funds, therefore, tend to be small with an average portfolio of approximately \$176,000. This pattern has prevailed for some time, and over the years pension reserves have increasingly been concentrated in the larger funds with assets of \$1 million or over. Indeed, in the past few years large funds have gradually increased their share of total assets from 92% in 1966 to over 95% in 1971, with every indication that they will continue to account for the lion's share of total funds accumulated for pension purposes.

TABLE 3. Trusteed Pension Funds by Size of Fund, Book Value, 1971

Size of fund	Number of funds	Percentage of funds	Total value of assets \$'000	Percentage of total assets
Under \$100,000	1,664	42	63,227	1
\$ 100,000-\$ 999,999	1,551	39	504,490	4
1,000,000- 4,999,999	459	11	1,004,198	8
5,000,000- 24,999,999	189	5	2,080,309	17
25,000,000- 99,999,999	60	2	2,904,512	23
100,000,000 and over	23	1	5,904,334	47
Totals	3,946	100	12,461,070	100

Source: *Trusteed Pension Plans, Financial Statistics*, Appendix B, Statistics Canada (Catalogue 74-201 Annual) (Ottawa: Information Canada).

Since trustee pension funds in aggregate are such a heterogeneous group they must be examined in terms of their component parts. Therefore, to facilitate analysis, pension funds were divided into fairly homogeneous groups by using size of fund as a criterion.

The first category is composed of funds with assets of less than \$1 million. Typically, they use pooled pension funds as their primary investment vehicle because the volume of investments tends to be too small to justify expenditures on individual investment analysis or investment counsellors. Since professional services are indirectly available through the pooled funds, the small funds tend to direct most of their money into this vehicle. While some of the smaller funds do engage in the management of their own assets and invest in both fixed income securities and equities, about 60% of the total assets in this size category are in the form of pooled funds. In recent years trust companies managing pension funds have tended to use pooled units for the smaller funds until they reach a level where individual management is economic and, at that time, establish an individually managed fund arrangement and remove the assets from their pooled funds. Fund growth has been remarkable and the shift to individual management has been so pronounced that the net value of some trust company pooled funds has declined perceptibly while corresponding increases were registered in their individually managed portfolios.⁷

For an analysis of larger funds, those with assets of \$1 million and over, it is necessary to categorize them according to the degree of flexibility they have with respect to investment practices. Some of the largest and fastest growing funds are subject to severe legislative restrictions in their investments, and these restrictions are so significant that they distort the portfolio composition for the group. To eliminate this distortion, large funds were divided into two groups - those with inflexible and those with flexible investment policies.

Funds with Inflexible Investment Policies

These pension funds are almost exclusively for programs covering employees of provincial, municipal or civic governments and it is this characteristic which shapes their investment policies. Most of them are required by law to invest in government obligations so their role in the capital markets is limited. An examination of individual funds shows that they tend to be heavy purchasers of their own obligations. Thus, municipal plans tend to have a large portion of their holdings in municipal securities and provincial plans tend to have mostly provincial paper.

While virtually their entire portfolio holdings are in bonds - some 90% - the distribution by types of

bonds held reflects the prevailing policies. Nearly three quarters of the aggregate portfolios are in provincial bonds, with the municipals accounting for about one eighth of the holdings and less than 1% of the assets in Government of Canada bonds. Some of the funds in this group apparently relaxed their restrictions to permit the purchase of mortgages and consequently mortgage purchases increased from \$9.7 million in 1966 to over \$26.4 million in 1971 (see Table 4). None of these funds carried any common or preferred stocks in their portfolios, contrasting sharply in this respect from the funds with flexible investment policies.

Funds with Flexible Investment Policies

Funds with flexible investment policies, which are confined largely to industrial pension plans, give managers considerable freedom to shift their investment strategies and to diversify their portfolios. The interest in equities as an appropriate investment medium has predominated non-insured pension funds in the United States where as much as 50% of the holdings are in stocks, and now it appears to be taking hold in Canada as well. Over the six year period from 1966 to 1971, the book value of stocks held by these funds rose nearly threefold from \$1.3 billion to \$3.1 billion. By 1971 stocks accounted for 32.5% of the assets held compared to 23.5% in 1966. Holdings of foreign securities were 6.1%, well below the 10% maximum allowable under the new Income Tax Act.

With this shift to stocks there was a sharp drop in the proportion of assets held in bonds from 55% in 1966 to 45% in 1971 (see Table 5). Contributing to this change in the portfolio profile was the decline in Government of Canada and municipal bonds which declined sharply in relative terms and by the end of the period began to decline in real terms as well. The book value of Government of Canada bonds which stood at \$421 million in 1966 peaked at \$478 million in 1969 and then dropped sharply each year thereafter to just under \$397 million in 1971; but in relative terms they declined steadily each year from 7.5% in 1966 to 4% in 1971. A similar pattern was evident in municipal bonds. What little new monies were channelled into these securities from 1966 onwards stopped entirely after 1969 when the value of municipals peaked at nearly \$495 million and they too started to go down in value. As with the Canada's, municipal bonds represented a declining proportion of total assets from 7.7% in 1966 to 4.7% in 1971. Over this same period the proportion in corporate bonds remained fairly constant at about 17%. Although provincial bonds increased slightly from year to year in real terms, they too fell in relative terms from a high of 23% of the total holdings in 1966 to just over 17% in 1971. The proportion of assets held in mortgages remained relatively constant at around 11% over this period but in real terms they increased sharply, and nearly doubled in value from \$651 million in 1966 to \$1,126 million in 1971.

⁷ This trend was observed in a review of individual trust company reports and confirmed in discussions with company investment managers.

TABLE 4. Funds with Assets of Over \$1,000,000 with Inflexible Investment Policies, 1966-71

Assets	1966		1967		1968	
	\$'000	%	\$'000	%	\$'000	%
Pooled pension funds	-	-	-	-	-	-
Mutual funds	-	-	-	-	-	-
Bonds:						
Government of Canada	7,337	0.7	10,160	0.8	10,966	0.8
Provincial Government	758,862	72.6	860,009	72.2	990,990	73.9
Municipal, School Boards	179,211	17.1	196,165	16.5	211,067	15.7
Other Canadian	14,568	1.4	14,803	1.2	17,060	1.3
Non-Canadian	507	0.1	498	--	546	0.1
Totals	960,485	91.9	1,081,635	90.7	1,230,629	91.8
Stocks:						
Canadian common	-	-	-	-	-	-
Canadian preferred	-	-	-	-	-	-
Non-Canadian common	-	-	-	-	-	-
Non-Canadian preferred	-	-	-	-	-	-
Totals	-	-	-	-	-	-
Mortgages:						
Ins. NHA	2,040	0.2	2,001	0.2	4,144	0.3
Conventional	7,656	0.7	8,140	0.7	9,275	0.7
Totals	9,696	0.9	10,141	0.9	13,419	1.0
Real estate and leasebacks	19	--	-	-	-	-
Miscellaneous:						
Cash on hand	53,814	5.2	4,366	0.4	4,611	0.3
Guaranteed investment certificates	191	--	328	--	470	--
Short-term investments	24	--	850	0.1	2,459	0.2
Accrued interest and dividends receivable	14,737	1.4	17,646	1.5	20,381	1.5
Accounts receivable	6,694	0.6	76,577	6.4	69,289	5.2
Other assets	-	-	33	--	-	-
Totals	75,460	7.2	99,800	8.4	97,210	7.2
Total assets	1,045,660	100.0	1,191,576	100.0	1,341,258	100.0
	1969		1970		1971	
	\$'000	%	\$'000	%	\$'000	%
Pooled pension funds	-	-	-	-	-	-
Mutual funds	-	-	-	-	-	-
Bonds:						
Government of Canada	11,601	0.7	10,347	0.6	9,976	0.4
Provincial Government	1,161,112	73.1	1,379,537	74.5	1,618,598	74.2
Municipal, School Boards	227,697	14.4	259,808	14.0	280,095	12.8
Other Canadian	27,473	1.7	11,700	0.6	16,455	0.8
Non-Canadian	590	0.1	396	--	206	--
Totals	1,428,473	90.0	1,661,788	89.7	1,925,330	88.2
Stocks:						
Canadian common	-	-	-	-	-	-
Canadian preferred	-	-	-	-	-	-
Non-Canadian common	-	-	-	-	-	-
Non-Canadian preferred	-	-	-	-	-	-
Totals	-	-	-	-	-	-
Mortgages:						
Ins. NHA	7,050	0.4	13,673	0.8	17,839	0.8
Conventional	9,105	0.6	9,821	0.5	8,630	0.4
Totals	16,155	1.0	23,494	1.3	26,469	1.2
Real estate and leasebacks	44	--	-	-	-	-
Miscellaneous:						
Cash on hand	4,890	0.3	8,999	0.5	4,756	0.2
Guaranteed investment certificates	692	--	545	--	1,116	0.1
Short-term investments	38,192	2.4	98,374	5.3	129,939	6.0
Accrued interest and dividends receivable	23,396	1.5	25,980	1.4	30,750	1.4
Accounts receivable	75,748	4.8	33,987	1.8	63,387	2.9
Other assets	-	-	-	-	25	--
Totals	142,918	9.0	167,885	9.0	229,973	10.6
Total assets	1,587,590	100.0	1,853,167	100.0	2,181,772	100.0

TABLE 5. Funds with Assets of \$1,000,000 and Over with Flexible Investment Policies, 1966-71

Assets	1966		1967		1968	
	\$'000	%	\$'000	%	\$'000	%
Pooled pension funds	286,951	5.1	348,692	5.5	404,635	5.7
Mutual funds	33,939	0.6	32,924	0.5	36,623	0.5
Bonds:						
Government of Canada	421,216	7.5	455,736	7.1	467,002	6.5
Provincial Government	1,286,430	23.0	1,479,653	23.2	1,518,798	21.3
Municipal, School Boards	432,229	7.7	489,780	7.7	483,200	6.8
Other Canadian	948,131	17.0	1,156,879	18.1	1,218,368	17.1
Non-Canadian	7,840	0.2	9,114	0.1	11,521	0.2
Totals	3,095,846	55.4	3,591,162	56.2	3,698,889	51.9
Stocks:						
Canadian common	1,021,143	18.3	1,087,809	17.0	1,338,782	18.8
Canadian preferred	29,093	0.5	36,651	0.6	47,812	0.7
Non-Canadian common	262,208	4.7	325,389	5.1	496,000	6.9
Non-Canadian preferred	1,283	--	2,652	--	7,098	0.1
Totals	1,313,727	23.5	1,452,501	22.7	1,889,692	26.5
Mortgages:						
Ins. NHA	370,621	6.6	361,237	5.6	373,639	5.3
Conventional	281,302	5.1	337,562	5.3	373,432	5.2
Totals	651,923	11.7	698,799	10.9	747,071	10.5
Real estate and leasebacks	37,651	0.7	45,100	0.7	47,080	0.7
Miscellaneous:						
Cash on hand	47,147	0.8	62,849	1.0	78,153	1.1
Guaranteed investment certificates	18,645	0.3	31,759	0.5	54,614	0.8
Short-term investments	26,498	0.5	43,646	0.7	70,154	1.0
Accrued interest and dividends receivable	48,154	0.9	48,786	0.8	53,463	0.7
Accounts receivable	26,675	0.5	33,486	0.5	39,976	0.6
Other assets	406	--	364	--	319	--
Totals	167,525	3.0	220,890	3.5	296,679	4.2
Total assets	5,587,562	100.0	6,390,068	100.0	7,120,669	100.0
	1969		1970		1971	
	\$'000	%	\$'000	%	\$'000	%
Pooled pension funds	459,840	5.8	499,053	5.7	545,640	5.7
Mutual funds	43,691	0.5	45,333	0.5	40,453	0.4
Bonds:						
Government of Canada	477,902	6.1	448,518	5.2	396,981	4.1
Provincial Government	1,523,883	19.3	1,568,406	18.0	1,666,911	17.4
Municipal, School Boards	494,769	6.3	491,422	5.7	451,995	4.7
Other Canadian	1,265,236	16.0	1,510,535	17.4	1,798,549	18.7
Non-Canadian	14,750	0.2	11,290	0.1	10,240	0.1
Totals	3,776,540	47.9	4,030,171	46.4	4,324,676	45.0
Stocks:						
Canadian common	1,668,501	21.1	1,974,932	22.8	2,459,541	25.6
Canadian preferred	61,242	0.8	61,833	0.7	69,976	0.7
Non-Canadian common	621,273	7.9	574,816	6.6	588,015	6.1
Non-Canadian preferred	6,224	0.1	9,466	0.1	7,821	0.1
Totals	2,357,240	29.9	2,621,047	30.2	3,125,353	32.5
Mortgages:						
Ins. NHA	428,297	5.4	506,673	5.8	620,690	6.4
Conventional	406,495	5.2	479,300	5.5	505,409	5.3
Totals	834,792	10.6	985,973	11.3	1,126,099	11.7
Real estate and leasebacks	47,406	0.6	44,968	0.5	44,240	0.5
Miscellaneous:						
Cash on hand	78,338	1.0	109,911	1.3	110,519	1.2
Guaranteed investment certificates	78,028	1.0	85,904	1.0	69,060	0.7
Short-term investments	122,510	1.6	166,524	1.9	108,445	1.1
Accrued interest and dividends receivable	55,581	0.7	62,499	0.7	71,151	0.7
Accounts receivable	34,553	0.4	37,135	0.5	44,629	0.5
Other assets	2,127	--	1,649	--	1,311	--
Totals	371,137	4.7	463,622	5.4	405,115	4.2
Total assets	7,890,646	100.0	8,690,167	100.0	9,611,576	100.0

It is interesting to note that nearly 6% of the assets were held in pooled pension funds. Generally speaking, these funds are aimed at serving the needs of the small pension funds that seek the same diversification, experienced management, trained investment counselling and other expertise available only to larger funds. It is evident, however, that some of the larger funds chose to purchase these services through pooled fund investments rather than set up their own investment facilities; also many funds, particularly those managed by a corporate trustee, use pooled funds units for specialized investments. This is particularly true of the mortgage funds where managers are often reluctant to buy mortgages directly because they may either lack the necessary expertise, or because of the unavailability of suitable mortgages.⁸ Similarly, foreign securities are purchased through these specialized funds. In general, most large funds that hold pooled fund units use them as a medium for mortgages and to a lesser extent for foreign securities which permit diversification into these areas without acquiring their own expertise in these types of investments.

⁸ Since some funds are "pooled mortgage funds" as a vehicle for their mortgage investments, mortgage holdings as shown in the portfolio profile tend to be understated.

Data on purchases and sales of securities for a given time period that would provide a clear picture of pension fund managers' overall investment strategies are not available. To obtain some understanding of investment strategies, however, one can examine year to year changes in aggregate portfolio holdings and asset distribution patterns. Since these changes represent the net results of the annual trading they provide some insight into what has been occurring. These changes were examined for funds that have flexible investment policies and, therefore, widely diversified portfolios, to see how these net changes were reflected in the investment portfolios.

Changing investment strategies of fund managers are not immediately reflected in the aggregate portfolios since these changes take effect gradually over a period of years. Policy shifts are normally implemented by a general change of emphasis in the kind of purchases made rather than a complete shift away from one type of security to another. In practice, over the short run, fund managers tend to react to variations in market conditions which may moderate the shift but do not reverse it. Thus, even though the general strategy may be to increase the stock portfolio, bonds may still be bought to a greater or lesser degree depending on prevailing market conditions.

TABLE 6. Net Annual Changes in Portfolios of Trusteed Pension Funds with Flexible Investment Policies, 1967-71

Asset category	Percentage of net annual portfolio change				
	1967	1968	1969	1970	1971
Pooled funds	11.8	7.7	6.7	4.5	7.0
Bonds	33.5	27.9	26.3	45.6	44.2
Stocks	36.3	48.7	45.7	24.1	38.1
Mortgages	5.8	5.7	8.5	15.1	10.1
Other ¹	12.5	9.8	12.9	10.7	0.2
Totals	99.9	99.8	100.1	100.0	99.6

¹ Largely cash on hand, guaranteed investment certificates and short-term securities.

Source: Unpublished data held by the Pensions Section, Labour Division, Statistics Canada.

This pattern of purchases is illustrated in Table 6. For the period 1967-71 an increasing proportion of the net new funds were channelled into equities but at the same time substantial proportions of the funds were still allocated to bonds as well as other securities. In 1968 and 1969 nearly half of the net new funds were put into equities with most of the decline occurring in the purchases of bonds. Only in 1970 was this general trend reversed. In that year less than one quarter of the new funds were put into equities while the proportion in bonds rose to over 45% of the total which reflects better anticipated bond income. In 1969 the average bond yields reached a peak of around 9% and stayed at this level over the following year, making bonds a more attractive vehicle for pension funds than they had been

in the past by providing a return competitive with the best mortgages. A similar pattern evolved in 1971 with about 44% of the new investments flowing into bonds but in that year the proportion channelled into equities also rose to over 38%. These high levels were attained, in part, by the commitment of the rather substantial liquid funds which managers over the previous four years had kept in the form of cash, guaranteed investment certificates and short term securities. The net result has been a shift in the general pattern of investments with increasing proportions of the total portfolios in common and preferred stocks (see Table 5).

Of particular interest is the evident expanded commitment to mortgages that started in 1967 and

continued in varying degrees over the following years. It would appear that fund managers have increasingly accepted mortgages as an ideal investment vehicle for pension funds. Mortgage loans combine relatively low risk (and virtually no risk for the government guaranteed NHA mortgages) with yields that are higher than those normally available from other fixed-income securities of comparable quality. Nevertheless, this shift was barely discernible in the total picture. Mortgages held by these large funds increased in value from \$834,792,000 in 1969 to \$985,972,000 in 1970 and to a record \$1,126,099,000 in 1971. In terms of total assets, however, mortgages increased only slightly in the aggregate portfolios from 10.6% in 1969 to 11.3% in 1970 and 11.7% in 1971. This apparently slow growth rate was due, in part, to the fact that annual repayments of mortgages tend to reduce the value of the outstanding amounts so that substantial purchases are needed if only to offset these repayments. Therefore, it takes a substantial increase in annual commitments to materially change the relative position among total assets.

Pension Funds Over the Next Decade

What about the future? Will the pension plans continue to accumulate funds at the same pace as in the past? If so, what is the probable extent and direction of this growth? Where will these vast funds be channelled and what will be the likely impact on capital markets?

As noted earlier, the reserves held by insurance companies for their pension plan business are part and parcel of the total pool of insurance company assets. Analysis of these pension funds cannot be separated from the overall life insurance company activity in the capital markets. Consequently, the projections presented here will be confined to the non-insured trustee fund sector of the system. Since these funds represent over 70% of the total pension funds channelled into the capital markets they, by sheer size alone, will have an enormous impact on the capital markets and, indeed, on the economy as a whole.

Long-run pension fund flows and the related economic impact depend upon a number of inter-related variables. On one hand, the general strength and stability of the economy has a direct effect on continued fund growth; on the other hand, because of the large pools of money involved the fiscal activities of these plans in themselves play an essential role in maintaining economic growth. Pension fund fiscal flows are affected by labour force participation rates (as commented on earlier), employment, coverage, contribution rates and benefit payments.

With respect to coverage, the growth rate of pension plans appears to have reached a plateau, particularly over the last half of the 1960's. Nevertheless, the upward trend has continued, though at a slower pace, and membership increases have kept pace with the

growing labour force. This largely reflected growing employment, particularly in the larger organizations with pension programs, rather than any significant expansion in pension plans.⁹

Contributions made by both the employers and employees constitute the major source of income. Directly affecting this flow would be any major changes in the Canada/Quebec Pension Plans. For example, in 1966 when these public plans were first introduced there was an immediate drop in asset growth of trustee pension plans in Canada for that year. In the following years the upward trend continued but from a lower level.¹⁰

What are the likely effects of the recent C/QPP amendments? In these changes the Year's Maximum Pensionable Earnings (YMPE) for which contributions are made will be increased from \$5,600 in 1973 to \$6,600 in 1974 and \$7,400 in 1975.

Although this undoubtedly will result in channeling some contributions from the private system into the public one, the effect on total flow of funds is expected to be marginal. YMPE increases reflect the inflationary pressures on wages and salaries and, consequently, as these increase so will all pension contributions. Furthermore, since over 85% of the plans in Canada are subject to Pension Benefits Legislation they are required by these Acts to fund all liabilities within a given period. Any "experience deficiencies" arising from inflation, or other factors for that matter, must be funded on a virtually current basis. These requirements, therefore, ensure a continuing and fairly high flow of monies to pension funds.

With the gradual maturing of pension plans and as more and more members reach retirement age and start to draw benefits, the payouts, the major drain on the fund, are bound to increase. Funds in Canada are rapidly maturing and annual payout in form of pension payments as well as lump sum withdrawals to buy annuities have been rising sharply so that they have more than doubled from \$238 million in 1966 to \$503 million in 1971. This upward trend in payouts points out the critical significance of maintaining a high earning capacity from investments. Indeed, pension funds to date, in aggregate, have managed to generate sufficient earnings to cover all or nearly all of their expenditures, including pension payments, lump sum withdrawals for annuities, repayments to terminating employees who leave for other jobs, administration costs and losses in sales of securities.¹¹

⁹ *Pension Plans in Canada, 1970*, p. 8.

¹⁰ See *Trusteed Pension Plans Financial Statistics*, Statistics Canada (Catalogue 74-201 Annual) (Ottawa: Information Canada, 1966), p. 8.

¹¹ Greater emphasis in recent years has been placed on increasing fund yields since it has generally been felt that the historical record was rather lackluster. As a result greater concentration has been placed on improved fund management.

Assuming that future fund earnings continue to grow in proportion to the fund costs, then the cash flows from contributions will be left free, as in the past, for the accumulation of assets to cover future pension liabilities.

The interplay of these forces, therefore, have a direct bearing on pension fund growth, but the direction and magnitude of this growth is materially affected by the general economic climate. In developing the projections of fiscal flows over the next decade it was assumed that there would be continued economic stability with no major crisis to force sharp employment cutbacks and widespread unemployment. A further assumption was that current population and labour force trends would continue.

Based on these assumptions it is reasonable to expect that pension funds will continue their upward trend, but the rate of growth is a matter for conjecture. In terms of the next decade or so, it can be assumed

Canadian funds will continue accumulating at about the average rate prevailing over the past few years. For example, the average year to year growth of trustee pension funds from 1966 to 1971 was calculated to be 11.7%. To provide some indication of future trends, growth rates of 10%, 11% and 11.5% were calculated and the results are shown in Table 7. These projections are based on book values so that the results do not reflect either inflation or unrealized capital gains of the assets already in the portfolios.¹²

¹² Daniel M. Holland in a study of pension funds in the United States concludes that "there is a real likelihood that the peak in pension funds' annual demands on capital markets will be reached sometime in the next twenty years". He goes on to say, however, that private pension funds in the United States will nevertheless continue accumulating at a healthy pace well beyond the twenty year period. Similar trends probably will develop in Canada but by considerable lags. Daniel M. Holland, *Private Pension Funds: Projected Growth*, National Bureau of Economic Research (New York: Columbia University Press, 1966).

TABLE 7. Estimated Trusteed Pension Fund Growth, 1971-85 (Book Value)

Year	Assumed growth rates		
	10%	11%	11.5%
	thousands of dollars		
1971	12,461,070	12,461,070	12,461,070
1972	13,707,177	13,831,787	13,894,093
1973	15,077,894	15,353,283	15,491,913
1974	16,585,683	17,042,144	17,273,482
1975	18,244,251	18,916,779	19,259,932
1976	20,068,678	20,997,624	21,474,824
1977	22,075,544	23,307,362	23,944,428
1978	24,283,098	25,871,171	26,698,037
1979	26,711,407	28,716,999	29,268,311
1980	29,382,548	31,875,868	33,191,666
1985	47,320,887	53,712,689	57,200,967

Assuming a growth rate of 10%, total assets currently running at \$12.4 billion (1971) are likely to be \$18.2 billion in 1975, \$29.3 billion in 1980 and \$47.3 billion by 1985. With an 11% growth rate, they would be \$18.9 billion, \$31.8 billion and \$53.7 billion respectively; at 11.5%, over the same period, assets would reach a total of \$19.2 billion in 1975, \$33.1 billion in 1980, and \$57.2 billion in 1985.

From these alternatives, 11% is the most likely growth rate. The degree of accuracy of these projections, of course, declines as one moves into the 1980's. While growth to \$18.9 billion in 1975 and \$31.8 billion in 1980 seems realistic there are too many unknowns to be able to say with any great confidence that assets will stand at \$57 billion by 1985, but nevertheless this is an

indication of the order of magnitude that may be expected.

Projected Portfolio Composition

Difficult as it may be to predict the future level of total assets, it is infinitely more difficult to say what the portfolio compositions may look like over this same period. Even if there were no changes in the portfolio composition and components were to remain in the same relative position there would be a tremendous demand for all forms of investments. As can be seen in Table 8, by 1980 stocks would more than double and over the next decade pension funds would also create a demand for some \$5 billion in stocks. Investments in bonds and mortgages would be \$10 billion and \$1.7 billion respectively.

TABLE 8. Projected Portfolio Composition of Trusteed Pension Funds, Book Value as of 1971 and 1980

Asset categories	Portfolio composition in 1971		Projected composition for 1980		
			1980 assets distributed as in 1971	Projected distribution of assets	
	Amount	Per cent		Amount	Per cent
	\$000,000		\$'000,000		
Pooled and mutual	945	7.6	2,423	2,232	7.0
Bonds	6,386	51.3	16,352	14,344	45.0
Stocks	3,214	25.8	8,224	11,156	35.0
Mortgages	1,170	9.3	2,964	3,506	11.0
Real estate and leasebacks	47	0.4	127	159	0.5
Miscellaneous	699	5.6	1,785	478	1.5
Totals	12,461	100.0	31,875	31,875	100.0

Prospects for an unchanging portfolio composition appear remote in the light of current trends. Generally speaking, stockholdings at current levels tend to reflect rather conservative investment policies, and continuation at the present proportionate levels of around 25% to 30% of assets would be valid only if the current energy crisis leads to a basic downward swing in the world economy. Discounting this rather frightening prospect, and in light of the trends over the past six years or more, stockholdings are more likely to increase in both real and relative terms. Again, the degree of change is subject to conjecture, but if the United States patterns are a guide, common and preferred stocks could go up to as high as 45% or 50% of total assets. Indeed some of the larger funds in Canada already have stockholdings of this magnitude.

Current trends indicate that when investment strategies are free to change there is considerable movement in the portfolio compositions. Large funds in particular are rapidly expanding their equity investments. There may be some dampening in the administrators' enthusiasm for common stocks in the light of the sad performance in the stock market during the energy crisis in late 1973 and early 1974. But assuming that long run expectations are for rapid adjustments to the crisis and continuing economic health, then pension plan administrators whose time horizons by definition are long run, stretching over thirty or forty years, should perhaps look at present stock prices as bargain basement opportunities.

In total, there are two key forces that will mitigate against too sharp a shift to stocks in aggregate holdings. First, and perhaps foremost, are the inflexible investment policies of those public sector funds which, because of legislative restrictions, must limit their investments almost exclusively to bonds.

Secondly, as noted earlier, in market situations when bonds produce favourable yields new monies are

channelled in this direction. These two factors tend to combine to keep the proportionate holdings in stocks down.

In addition to the apparent shift from bonds to stocks, there appears to be a slow but perceptible shift towards increased investments in mortgages. Over the past few years portfolio managers have come to recognize mortgages as an appropriate vehicle for long-term monies, and with their relatively high yields more funds are channelled in this direction.¹³

Given these long-run trends, it is expected that the portfolio distribution by 1980 will be as follows: pooled and mutual funds 7%, bonds 45%, stocks 35%, mortgages 11%, real estate and leasebacks 0.5% and miscellaneous 1.5%. Based on this projection, by 1980 stocks will increase to over \$11 billion, bonds to \$14 billion and mortgages to \$3.5 billion. The demand for stocks arising from pension fund growth alone will create enormous pressures on the Canadian equities market. Also because requirements in the Income Tax Act limit foreign stocks to 10% of the total portfolio, virtually all of this newly created demand will be for Canadian equities. This raises the question as to whether there are enough shares to meet the anticipated demand.

G.R. Conway, in a study produced for the Toronto Stock Exchange, pointed out that there was a very real likelihood that there would not be enough stocks around to fulfill this demand.¹⁴ He argues that, in Canada, "institutions are, in aggregate, relatively

¹³ Fund managers are currently examining the possibility of taking an ownership position in real estate projects giving pension funds a "piece of the action" rather than indirect involvement through mortgage loans. This approach is still in its infancy and is faced with some legal limitations which may initially inhibit this type of investment.

¹⁴ G.R. Conway, *The Supply of and Demand for Canadian Equities*, Toronto Stock Exchange, Toronto, Ontario, 1970.

conservative investors, concentrating their investments in larger corporations".¹⁵ Conway concludes that the demands created by pension funds will not only tend to thin out the market but will also tend to drive up the price of the shares. The American experience, however, seems to indicate that in the long run pension funds tend to expand their horizons and become somewhat more venturesome in their investments. Roger Murray points out that in the United States, fund managers tended initially to concentrate their investments in a relatively stable group of well-established companies, but ultimately as funds grew and matured, greater investment flexibility was introduced.¹⁶ A similar pattern may ultimately evolve in Canada.

¹⁵ *Ibid.*, p. 13.

¹⁶ *Ibid.*, p. 81.

As stressed in this article, the future distribution of funds into the range of available investment vehicles is open to considerable conjecture. Whether more money is channelled into the stock market, the bond market or mortgages, the fact remains that huge pools of funds from pension plans will be available for investment. With the enormous demands for developmental capital, housing, pipe lines and resource development facing Canada over the coming decade or so, pension funds will be in a position to play a prominent role as a major source for investment capital.

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APR 6 1981	FEB 20 1986	<i>Winnipeg</i>
OCT 22 1981		<i>Beauchamp</i>
FEB 1 1983		<i>Mont. Wilson</i>
SEP 26 1984		
MAY 18 1985		<i>Hudson</i>

LOWE-MARTIN No. 1137

