Employment Expectations and Labour Force Participation in Canada

Les prévisions de l’emploi et le taux de participation de la main-d’oeuvre au Canada

Arthur Donner and Fred Lazar

Article abstract
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INTRODUCTION

Classical labour supply theory postulates that the individual chooses the number of hours per period that he will offer to work by equating the marginal utility to be derived from an additional hour of leisure to the prevailing real wage. The calculus of this decision is more complex in the real world of imperfect markets and non-homogeneity. In all likelihood, the short-run aggregate labour supply schedule may not be a smoothly rising function — as usually postulated in the textbooks — but, may have discontinuities, reflecting such vagaries as minimum wage laws, discrimination, legislated hours of work, etc. Moreover, long-run labour supply theory suggests that the choice to work or not to work may not be the relevant one faced by an individual. This theory (neo-classical in scope) proffers the principle that the individual attempts to maximize his net return on human capital. That is, he chooses the occupation that yields the highest monetary and non-pecuniary rate of return. Yet even this

1 The work-leisure choice is inherent in this more global decision.
theory abstracts from the labour supply decisions of a large segment of the population for whom labour force participation (hereafter referred to as LFP) is not automatic. Active LFP by this group of persons is a short-run decision, strongly influenced by cyclical factors.

This paper incorporates a role for expectations in the short-run behaviour of labour supply decision. A theory is presented which introduces labour market expectations as a variable influencing labour supply. The concluding section of this paper discusses the relative merits of the expectations model vis-à-vis the traditional model using the empirical results derived in the paper.

**DISCUSSION OF ISSUES**

The marginal or secondary work force consists primarily of married females, teen-agers, young adults, retired and semi-retired persons. Their labour force affiliation is usually casual and consequently exhibits volatile changes. *A priori*, one should expect this type of LFP behaviour since the permanent status of two of these groups (i.e. their being married or retired) depends upon fairly binding constraints. Their long-run choices are influenced by «trends in socio-economic conditions and attitudes involving such things as... the desirability of women being housewives» or by pension funds and social security. Their membership in the labour force is also subject to short-run influences; that is, it reflects the short-run supply elasticity to the real wage differential between labour market and non-market activities.

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2 This statement, perhaps, requires some qualification since not all prime-age males are full-time members of the labour force. Indeed, some are probably sensitive to the additional or discouraged worker effects. It should also be pointed out that the distinction between males and females that we have presented is in no way intended to exhibit male chauvinism on our part. It simply reflects commonly accepted practices in this area of economics.

3 The simplistic categorization of persons between the ages of 14 and 24 years as being in this group is questionable. It can be argued that this treatment is inconsistent with the dichotomy between the short-run LFP decisions of the secondary labour force and the longer-run occupational choice of the primary labour force. It would seem more appropriate to include only those teenagers as well as all other students whose labour force involvement is of a short-term nature within the definition of the secondary labour force. This is the position we adopt throughout the paper.

4 J.G. CRAGG (2).

5 «In addition to pecuniary conditions involved in market alternatives are the ease of finding a job, its locational and other conveniences, and attractiveness of the job wanted». Mincer (4).
Many economists have focused their research on the discouraged worker-added worker effects on the LFP of the secondary labour force.\(^6\) The main thrust of their empirical studies has been to examine the short-run responsiveness of LFP of these various demographic groups to the cyclical variation in employment conditions in order to distinguish between the additional worker and discouraged worker hypothesis. The additional worker hypothesis maintains that unemployment of the main earner in a family will reduce family income and thus encourage other family members to enter the labour force. The other hypothesis — the discouraged worker effect — maintains that the secondary workers enter or leave the labour force when they feel that market alternatives are more or less favourable relative to non-market alternatives. The concern with this form of labour supply theory is intimately related to the concept of \textit{« hidden unemployment»}.\(^7\)

**THE MODEL**

The unemployment rate is regarded as the key explanatory variable in the short-run LFP relationship. In its simplest form, this relationship is usually specified as:

\[(1) \quad \pi_t^i = f^i \left( u_{nt} \right), \]

where \(\pi_t^i\) is the LFP rate of group \(i\), and \(u_{nt}\) is the national unemployment rate.

In this specification, the two effects — the additional worker effect and the discouraged worker effect — cannot be empirically separated out. Only the net effect can be measured; i.e. if

\[(2.1) \quad \frac{df^i}{du_{nt}} > 0, \]

\(^6\) BOWEN and FINEGAN (1), DERNBURG and STRAND (3), MINCER (4), OFFICER and ANDERSON (5).

\(^7\) «To the extent that prolonged periods of unemployment discourage LFP, there is a kind of \textit{« hidden unemployment»} which ought to be taken into account in assessing the true economic costs on unemployment and in estimating the change in demand necessary to push the official unemployment rate to any prescribed level. How much of a social problem as well as an economic problem is entailed in \textit{« hidden unemployment»} depends in part on the particular groups whose LFP is most sensitive to the over-all level of unemployment.» BOWEN and FINEGAN, (1), pp.
the additional worker effect is said to predominate, if

\[
(2.2) \quad \frac{\text{df}_i}{\text{d}u_{nt}} < 0
\]

the discouraged worker effect is stronger.

Mincer has pointed out that equation (1) is a mis-specification of the true relationship. More specifically, it is under-identified. He has stated that:

"... these two effects coexist... Additional workers may enter the labour market to bolster family income in a recession, but at the same time some unemployed workers may give up the apparently hopeless job search and withdraw from the labour market, whereas potential labour force entrants or re-entrants may be inhibited from even starting to look for jobs."

The following variant of equation (1) allows separately for each of the two side effects:

\[
(3) \quad \pi^i_t = f^i (u_{it}, u_{Ht}),
\]

where \(u_{it}\) is the unemployment rate of group \(i\) and \(u_{Ht}\) is the unemployment rate of the head of the household. Intuitively, \(\delta f^i / \delta u_{it} < 0\) and \(\delta f^i / \delta u_{Ht} > 0\).

Even though the association of the LFP of a group with the same group's unemployment rate is intuitively attractive, this specification is seldom used in empirical work. \(\delta^i\)

First of all, conditions in the various sub-labor markets tend to move in the same direction. This tends to result in a high degree of intercorrelation among the various unemployment rates. Hence, the use of two or more unemployment rates as regressors will yield ambiguous

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8 If \(\frac{\text{df}_i}{\text{d}u_{nt}} = 0\), neither effect predominate, i.e. the two effects either cancel out in the aggregate or are non-existent to begin with.


10 The discouraged worker effect reduces the participation rate of group \(i\).

11 The additional worker effect augments the participation rate.

12 A notable exception is the work of J.G. CRAGG (2), Chapter 2.
and inconclusive results. This problem has been circumvented in previous empirical work by substituting an alternative variable for either one of the unemployment rates.

A second reason is offered by Dernburg and Strand:

« (The purpose of LFP studies is to examine) cyclical effects on LFP and since the discouraged worker hypothesis relates to total labour market tightness, we prefer to utilize the aggregate employment ratio rather than the group specific employment ratios. »

Their position is strengthened by Bowen and Finegan's observation that « the overall unemployment rate is likely to be of some significance to almost all prospective labour force participants. »

Since active or potential labour market participants form expectations concerning wages and other conditions of employment, they may also decide to participate or not to participate in the labour force on the basis of the probability of finding a satisfactory job. More precisely, we postulate that in period t, the decision to participate in the labour force in period \( t + 1 \) is a function of currently held expectations of future labour market conditions. That is,

\[
(4) \quad \Pi^1_t = h^1_t (U_{nt+1}, T),
\]

where the left subscripts represent the period in which the expectations are formed, the right subscripts represent the period for which the expectations are to be realized. T is a time trend.

In a time series analysis, it is impossible to segregate purely short-run phenomena from long-run influences. Since our interest is purely in short-run behaviour, we include a time trend to capture changing patterns in permanent LFP behaviour. In addition, we postulate that actual participation behaviour adapts to changing labour market conditions in the following manner.

13 In econometric terms, the use of OLS in the presence of multicollinearity among the independent variables will produce inefficient estimators of the structural parameters. That is, the separate influence of each of the variables may not be accurately reflected by the resulting parameter estimates.

14 For example, Dernburg and Strand (3), used unemployment insurance benefit exhaustions with a lead of two months in place of \( u_{Ht} \). OFFICER and ANDERSON (5), used unemployment duration variables in place of \( u_{Ht} \).

15 DERNBURG and STRAND (3), op. cit., p. 75.

16 BOWEN and FINEGAN (1), op. cit., p. 122.
in our empirical work we use the following multiplicative form of
the model.

\[ \Pi_{t+1}^i = \alpha_i U_{nt+1}^{\beta_i} e^{\lambda_{it}} \left( \frac{U_{nt+1}^i}{U_{nt+1}} \right)^{\gamma_{i}^{\text{t+1}}}, \]

where

\[ \Pi_{t+1}^i = \alpha_i U_{nt+1}^{\beta_i} \text{ and} \]

\[ U_{nt+1} = \sum_{j=0}^{m} \delta_i (1 - \delta_i)^j U_{nt-j}. \]

Equation (6) is estimated in the following log-linear form:

\[ \ln\left( \frac{\Pi_{t+1}^i}{U_{nt+1}^i} \right) = \ln\alpha_i + \beta \ln U_{nt+1} + \lambda_{it} + \gamma_i \]

\[ \ln\left( \frac{U_{nt+1}^i}{U_{nt+1}} \right) \ln \epsilon_{t+1}. \]

THE REGRESSION RESULTS

Equation (7) has been estimated using seasonally adjusted and raw quarterly averages of monthly data for twelve age and sex groups for the period 1955 : 1 to 1970 : 3. In the estimating equation we truncated the lag in equation (6.2) and used the following variable in place of \( U_{nt+1}^i \).

\[ m \sum_{j=0}^{m} \left( \frac{\delta_i (1 - \delta_i)^j}{\sum_{j=0}^{m} \delta_i (1 - \delta_i)^j} \right) U_{nt-j} \]

We experimented with values of \( \delta_i \), ranging between 0.15 and 0.95 at 0.05 intervals; together with three values for \( m \) (4, 8, 12 quarters). The equations reported in tables 1 and 2 are those with the highest explained variation for each of the 12 age-sex groups. The time trend variable commences with the value of unity in 1955 : 1, increasing to the value of 63 in 1970 : 3.

The estimated parameters for the twelve age-sex-groups of the model are reported in tables 1 and 2.

In an equilibrium situation, when actual and expected unemployment rates are equal in a given period, the \( \beta \) parameter measures the net additional or discouraged worker effect. The reported results in table 1
show a net discouraged worker effect for five of the twelve groups — males 14–19, females 14–19, females 20–24, males 65 +, and females 25–44. However, the $\beta$ coefficient is only statistically significant at the 95% confidence level in the first three cases. In the remaining seven groups the additional worker effect predominates, although for males 45–54 and 55–64 the effect is not statistically significant.\textsuperscript{17}

The adjustment process — represented by the $\gamma$ parameter — may reflect an additional aspect to the discouraged worker dichotomy. If $\gamma$ is positive, and the actual unemployment rate exceeds the expected rate, labour force participation will rise above planned levels of the previous quarter. Similarly, if $\gamma$ is negative, LFP would decline, ceteris paribus. With this interpretation it may seem reasonable to assume that the $\gamma$ and $\beta$ parameters should have the same sign. In eight of the twelve cases, the signs differ, but in six of those eight cases, either one of the coefficients is not statistically different from 0.

In five cases $\gamma$ is significantly different from zero (males 14–19, females 14–19, males 45–55, males 65 +, females 25–44) suggesting that the adjustment process postulated is relatively unimportant for the remaining seven groups.

CONCLUDING REMARKS

The crux of the problem posed in this paper revolves on the impact of labour market expectations, as reflected by movements in past unemployment rates on current labour force participation practices. This issue is highlighted when equation (6) is reduced into the following expression:

\textsuperscript{17} These findings differ from the results of a study by OFFICER and ANDERSON (5). OFFICER and ANDERSON detected a uniform discouraged worker effect for all male groups, and a uniform added worker effect for females. Part of the differences might reflect our emphasis on expectations as opposed to their emphasis on duration of unemployment.

However, they state that:

« a variable of greater intensity may be a better representation of the additional worker effect. »

(OFFICER and ANDERSON (5), op. cit., p. 281).

Thus, one would expect positive coefficients on the $S^3/u_3$ and $S^6/u_6$ variables when they appear in the regressions. A perusal of their table 1 indicates that this expectation is fulfilled only for the female age groups and even in these cases, one must be wary of the results since both employment effects do not appear to be present simultaneously.
When presented in this form our model differs from the traditional labour force participation model by the inclusion of the expected unemployment rate variable \( t^U_{n_t} \). The coefficient on this expectation variable \( [\beta_t-\gamma_t] \) is the key to testing our hypothesis.

If the estimated \( \beta_t-\gamma_t \) coefficient is not statistically different from zero then our expectations hypothesis would play no role in LFP decisions. If at the same time \( \gamma_t \) is significantly different from zero, the empirical results would support the traditional model. On the other hand, if the \( [\beta_t-\gamma_t] \) coefficient is significantly different than zero, then our expectations hypothesis would appear to be important. If this occurs in conjunction with a \( \gamma_t \) coefficient not statistically different from zero, then this would imply the primacy of our expectations hypothesis over the traditional model.

Table 3 summarizes the empirical validity of the two hypotheses. For nine of the twelve demographic groups, the expectations hypothesis appears supported. In four of these nine cases, expected conditions in labour markets dominate the LFP decision.

**Table 3**

**COMPARISON OF THE TRADITIONAL VERSUS THE EXPECTATIONS HYPOTHESIS**

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Note:—The data presented in the table are based on regression equations reported in Table 1. The information in parentheses is derived from table 2.

For none of the demographic groups did the empirical results support only the traditional model. Thus it appears that LFP models that include only the current unemployment rate may be omitting an important explanatory variable. This in turn implies that the statistical properties of the estimated parameter on the unemployment rate parameter would be biased.
If in table 1 the reader compares the relatives magnitude of the ‘t’ values of the estimated coefficients on the explanatory variables, and, hence their relative contribution to the total explained variation of the LFP rate, one notice the dominance of the long-run forces (that is, \( \ln \alpha_i \) and \( \gamma_i \)). Thus it is possible that the discouraged worker — added worker effect debate has missed the boat on relevant issues. In fact, we tend to agree with Mincer in his statement that «...powerful trend factors and institutional changes continue to dominate the behaviour of labour force groups... [and that] much more attention should be paid to those factors and changes.  

**Bibliography**


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### Table 1: Seasonally Adjusted Labour Force Participation Regressions, Equation 7

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Notes: The table presents the results of seasonally adjusted labour force participation regressions for males and females, with intercepts $b_i$, season dummy variables $\delta t$, and year dummy variables $\gamma_t$. The coefficients $\beta_t$ and $\beta_t - \gamma_t$ are given for each age group. The table is used to analyze employment expectations and labour force participation.
### Seasonally Adjusted Labour Force Participation Regressions: Equation 7

#### Table 2

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*Note: The table above presents regression coefficients for different age groups, with $\delta_i$, $\ln \omega_i$, $\lambda_i$, D1, D2, D3, $\gamma_i$, $\beta_i$, and $\beta_i - \gamma_i$ as the independent variables, and $\frac{\Sigma^2}{R}$ and DW as the dependent variables.*
Les prévisions de l'emploi et le taux de participation de la main-d'œuvre au Canada

La théorie classique en matière de l'offre de travail présume que chaque individu opte pour l'horaire qui peut lui procurer l'avantage d'une heure supplémentaire de loisir au cours de la journée. Cependant, il n'en est pas ainsi à l'intérieur de marchés du travail imparfaits et sans homogénéité sur lesquels se reflètent les caprices des lois sur le salaire minimum, la discrimination et la durée des horaires, etc.

De plus, même si, théoriquement, on peut affirmer que l'individu choisit l'emploi qu'il estime le plus convenable tant pour le salaire qu'il reçoit que pour les loisirs que sa tâche lui laisse, les choses ne se passent pas toujours ainsi dans la pratique. Il arrive que les décisions personnelles soient donc influencées par des facteurs cycliques.

Aussi les prévisions relatives au marché du travail peuvent-elles constituer une variable qui peut influer sur l'offre et, par conséquent, sur le taux de participation de la main-d'œuvre selon la théorie qui est exposée dans le présent article à partir des conditions du marché du travail au Canada entre 1955 et 1970. Il paraît ressortir de cette analyse que la main-d'œuvre marginale formée du groupe d'âge 14-19 ans (hommes et femmes), du groupe d'âge 19-24 ans (femmes), des femmes mariées et des personnes à la retraite est relativement sensible aux facteurs prévisionnels en matière d'emploi. Elles rechercheront du travail ou se retireront du marché selon que les conditions y seront intéressantes ou moins bonnes. Ainsi, il peut arriver que ces catégories de salariés, en périodes de récession, entrent sur le marché du travail afin de relever le revenu de la famille tout comme des employés depuis longtemps en chômage peuvent s'en retirer par découragement.

Ceci tend à indiquer que ce ne sont pas uniquement les contraintes économiques, c'est-à-dire la nécessité de travailler pour vivre, qui exercent une influence à la hausse ou à la baisse sur le taux effectif de participation d'une population à la main-d'œuvre. De multiples facteurs, qui parfois se contredisent d'une personne à l'autre, sont constamment à l'œuvre.

Le travailleur démoralisé par l'état mauvais du marché du travail contribue à réduire le taux de participation tandis que le travailleur motivé l'accroît.

Corrigenda

The authorship credit for the article « White Collar Unions in Denmark » should have read; by Albert A. Blum with Allen Ponak, volume 29, numéro 1, 1974, p. 65.