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Gender Differences in Union Membership Status: The Role of Labour Market Segmentation

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Introduction

'Organizing the unorganized' is a major challenge facing the Canadian labour movement. The union density, that is the total union membership as a percent of nonagricultural paid workers, has been declining steadily since 1983 (Labour Canada, 1988). The prospects of a marked revival also appear poor with the continuing job losses in heavily unionized sectors because of the growing emphasis on industry restructuring, an accelerated pace of technological change, privatization and contracting out, and the structural shift in employment from goods producing to service sector. Organizing new members, therefore, has become a top priority for most unions to offset current and potential losses in membership.[i]

Women workers, an expanding demographic group in the labour force, are the largest segment of the unorganized pool with the greatest potential for union organization. In 1986, the latest year for which data is available, women comprised 36.4 percent of total union membership although they constituted 42.9 percent of the labour force (Statistics Canada, 1988a). Only 31.0 percent of working women were organized compared to 39.1 percent of men, and almost three-quarters of women union members were in two industry groups--public administration and service. Unionization rates were extremely low, below 10 percent, in such large and expanding sectors as finance and trade where women dominate the workforce.[ii]

The question that perplexes union organizers is why more women do not organize when it is quite apparent that unionization provides significant monetary and non-monetary benefits. There is unambiguous empirical evidence that the earnings gap by gender tends to be smaller in unionized establishments than in non-unionized industries (Gunderson, 1985, 19). Encouragement of unionism and collective bargaining is considered a more effective policy option for pay and employment equity. As Gunderson (1985, 42) has noted in his study for the Commission on Equality in Employment, "unions may assist minorities by providing wage gains and job security, by narrowing wage dispersion, and by monitoring and helping to enforce legislative initiatives."

Several explanations have been put forward to account for the low level of unionization among women (Fiorito and Greer, 1986). While there appear to be no significant differences by gender in worker attitudes towards unions or in their predisposition to unionize,[iii] it is suggested that 1) women are less likely to be union members than men because they are in and out of the labour force more frequently; 2) a considerably higher proportion of women than men work part-time and part-year; and 3) women are concentrated in lower paying, less unionized industries and occupations. Although there has been voluminous research on the possible causes of gender differences in unionization in the United States (see for example Fiorito, Gallagher and Greer, 1986; Voos, 1983; Antos, Chandler, and Mellow, 1980; Farber, 1983a and 1983b; and Fiorito and Gallagher, 1986) very little work has been done on this subject in Canada.[iv] The need to gain a Canadian perspective on the question of underrepresentation of women in unions has become especially important for several reasons. First, it is possible that the U.S. evidence may not be applicable to Canada because of the marked differences in public policy framework, employer attitudes, and union strategies and approaches in the two countries.[v] Second, unions play a strategic role in Canada in determining wages, working conditions and other terms of employment. Finally, collective bargaining has been assigned a major role in legislative approaches to pay and employment equity in several Canadian jurisdictions.[vi]

Against this background, the purpose of this paper is to study the key determinants of the union status of workers in Canada and to evaluate the relative significance of labour market segmentation by gender, in explaining the lower incidence of unionization among Canadian women. Using a unique micro data set, this study assesses the respective roles of demographic/human capital factors and the industry-occupation of employment in explaining gender differences in union membership in Canada. First, a union status probability equation is estimated on a pooled sample using explanatory variables such as age, sex, marital status, education, job tenure, province of residence, part-time/full-time status of the worker, and industry and occupation of employment, on the assumption that only intercept coefficients differ between men and women. Following this, separate equations are estimated for males and females allowing for differences in slope coefficients. Next, we estimate three separate union membership status equations based on the pooled sample of individuals of both sexes. The first equation contains only demographic/human capital factors as explanatory variables. The second equation adds controls for occupation of the individual to the demographic/human capital vector of variables. Finally, the equation is augmented with controls for industry of employment. The estimated coefficient on the sex variable in the three equations is compared to evaluate the role of industry and occupation of employment in explaining the differential in the extent of unionization between men and women. As well, the likelihood ratio tests are performed to test the joint significance of industry, occupation and human capital/demographic variables as predictors of union membership.

I A Model of Union Status Determination and Estimation Procedure

The worker preference for union representation is presumed to be based on a comparison by a worker of relative utilities of jobs in the union and nonunion sectors. A worker will prefer to work in a sector which provides him/her the highest utility, that is, a job which provides the highest wage and non-wage benefits; job security; best working conditions; most satisfaction with work; co-workers and supervision; perceived equity and fairness of treatment; better opportunities for advancement, etc.

In the absence of explicit measures of utility for each worker in both a union and nonunion environment, it is hypothesized that these utilities are a function of workers' demographic, human capital and labour market characteristics (Farber, 1983a). If Y is an index of the difference in worker utilities between union and non-union jobs, and X is a vector of worker characteristics, then a worker preference criteria can be written as follows (Farber 1983a):

(1) $Y = f(X)$

If Y is positive (that is $Y > 0$) in the union sector, the worker will seek a union job. If Y is negative, the worker will choose to work in the non-unionized sector. Further, since workers are heterogeneous in their preferences, that is, they differ in their assessment of pecuniary and non-pecuniary benefits from unionization, Y will vary across workers.

It is difficult to estimate the parameters of the model in (1) since Y is not observed. All that is observed is the union status of the worker, whether he/she is a union member. An empirical model of the union status of the worker can be specified as follows (Farber, 1983a):

(2) $M = ßX + e$

Where M is an unobservable, latent variable determining union status, X is a vector of worker and job characteristics and e is a vector of random variables with a standard normal distribution of unmeasured aspects of the union status determination process: e may be correlated for any individual but is assumed to be distributed independently across different individuals. If M is positive, then the worker is a union member ($U = 1$) and if M is negative, the worker has no union affiliation. It implies that probability of a worker having union status, $Pr(U = 1) = Pr(M > 0)$, is $Pr(e > -ßX)$.

The purpose of this study is to estimate the model (2) using a unique micro data set to assess (i) if the probability of union status differs between men and women, after controlling for demographic and labour market characteristics of individuals, and (ii) to what extent these differences can be attributed to occupational and industrial labour market segregation by sex. The dependent variable is the union status of the worker, assuming the value one if the worker is a union member and zero otherwise. Explanatory variables (all dichotomous with a value of 1 and 0) are an individual's sex, age, educational level, marital status, full-time/part-time status, job tenure, industry and occupation of employment, and province of residence.

Due to the binary nature of the dependent variable, the model is estimated by Maximum Likelihood (ML) using a Probit estimator.[vii] This was done for the well-known reason that the Ordinary Least Square (OLS) coefficient estimates of such a model would not be constrained to lie between zero and one (Aldrich and Nelson, 1984).

Two sets of specifications are estimated. The first set examines the impact of all explanatory variables on a pooled sample of individuals and on subsamples of males and females. The second set of specifications examines the relative importance of human capital/demographic variables and the industry and occupation of employment. The first equation in this set relates probability of an individual being a union member to his/her age, sex, education, marital status, part-time/full-time status, job tenure and province of residence. In the second and third equations, occupation and industry status variables are sequentially added to the set of demographic/human capital variables. The change in the parameter associated with the sex variable in the two sets of equations indicates the effect of industry and occupation segmentation of labour market on the male-female unionization differential. The maximum likelihood (ML) estimates of the probit analysis are reported in Tables 2 and 3. The estimated coefficients measure the effect on the probability of a worker being a union member of a one unit change in an explanatory variable.

II Data Source and Sample Description

The data used in this study are from the Survey of Union Membership, conducted by Statistics Canada in December 1984 as a supplement to the monthly Labour Force Survey.[viii] The survey was designed to gather information on, among others, union membership and collective agreement coverage of paid workers employed in the year 1984. Individuals who were self-employed, working owners of incorporated businesses, unpaid family workers, and multiple job holders whose main job was not a paid job, were excluded from the survey. Two types of paid workers were covered in the survey. The first group consisted of persons who were employed at a paid job during the survey reference week of December 1984. The second group was comprised of those who were not employed during the survey reference week, but whose last job was a paid job held in 1984. Union status of the worker was determined on the basis of the question "was ... a member of a union or other group which bargained collectively [with the employer]?" The micro datatape included 84,676 individuals for whom it was possible to calculate or estimate an hourly wage. Excluded from the tape were respondents who reported their earnings on a piece-work basis, whose earnings were a function of mileage travelled, and persons who reported their entire earnings in terms of payment in kind, etc.

This study is based on a pooled sample of 28,107 individuals--14,647 men and 13,460 women--from the micro datatape. Excluded from the main sample are individuals not employed during the survey reference week of December 1984, those 65 years of age and over, employees of federal and provincial governments, workers in agriculture, fishing and trapping industries, and those classified as managerial employees or in religious occupations (generally, although not always, denied collective bargaining rights by legislation). The variables used in the study are described in Table 1 which also shows their means and standard deviations; all variables are dichotomous, assuming the value one if the respondent has the required characteristic, zero otherwise. Descriptive statistics are presented for the full sample and for male and female subsamples. In the chosen sample almost 38 percent of the workers belong to unions. By gender, 43.5 percent of males and 31.8 percent of females are union members.[ix] There is very little variation in age and marital status distributions by gender, but educational levels are different between men and women. A considerably higher proportion of women have post-secondary education than men. The proportion of women with only an elementary education is significantly lower, and fewer women than men work full time. The labour market segmentation by sex in occupational and industry employment is also evident in the distributions; while a majority of women are employed in trade and service industries and in clerical and service occupations, men are dominant in manufacturing and other goods producing industries, and in related blue-collar production and construction trades occupations. Women also have a lower permanent attachment to the workforce than men, judging by the length of job tenure.

III Analysis of Full Sample Estimates

Table 2 presents ML estimates of the probit regression for a pooled sample of individuals and for samples of males and females separately. Reported are estimates of coefficients and their student t-statistics, and LR test statistics for the joint significance of industry, occupation, and groups of demographic/human capital variables. Since the probability of union status of a worker is Pr (e > -13X), a positive coefficient on a variable implies that workers with higher values of that variable are more likely to be union members. The negative coefficient, on the other hand, indicates the probability of a worker not being a union member.

An overwhelming majority of coefficient estimates and LR test statistics of variables in the pooled sample, shown in columns (1) and (2), are highly significant and exceed their critical value at the 99 percent level of significance. The signs of individual coefficients in the pooled sample correspond to conventional notions regarding the incidence of union membership among various categories of workers (Voos, 1983). The impact of explanatory variables on probability of union status also confirm the results reported in earlier studies (Antos, Chander and Mellow, 1980; Grant, Swidinsky and Vanderkamp, 1987).

The results show that women are less likely to be union members than men. Older workers are expected to be in unions more than the younger workers in the 15-24 age group. Workers with post-secondary education are more likely to be union members than those with a university degree. Full-time workers have a higher probability of being union members than part-time workers. Married workers are more likely to be union embers than single workers. The estimates also show that job tenure has a marked influence on the union status of workers; senior workers, those with 11 or more years of seniority, have a higher probability of being a union member than those with 5-10, 1-5 or less than one year of job tenure. The province of residence is also an important factor in union membership status. Compared to Alberta (the reference category in the equation) which has the lowest proportion of paid workers unionized in Canada, workers in all other provinces, except Prince Edward Island, are more likely to be union members. The probability of a worker with a union affiliation is higher if the worker resides in the provinces of Quebec and British Columbia compared to other provinces.

The estimates clearly suggest that industry and occupation of employment are significant predictors of the union status of a worker. The LR-test statistics, verifying the joint significance of the two sets of variables, are well beyond their critical value at the 99 percent level of significance. Estimated coefficients indicate that the likelihood of a worker to have union status is higher in every industry group compared with the finance industry (the reference category). A worker is significantly more likely to be a union member if he/she is employed in manufacturing, educational and health institutions, and in service industries rather than in other industries. The probability that a worker belongs to a union also differs markedly by occupation. A worker is more likely to be a union member if he/she is engaged in the teaching or health profession, blue collar processing/assembling/fabricating occupations, construction trades, material handling, and in resource extracting occupations. However, a worker is less likely to have union status if he/she is a professional (other than a teacher or a health professional), clerical or sales worker, or is employed in artistic and related recreational pursuits.

Table 1

Frequency Distribution of Variables Used in the Study

		Full	Sample	Male	Sample	Female	Sample
Variable Names	Description	Mean	S.D.	Mean	S.D.	Mean	S.D.
Union*	Union Member	.379	.485	.435	.496	.318	.466
Sex	Respondent is Female	.479	.499			1.0	
Industry							
RES	Forestry or Mining	.037	.190	.065	.247	.008	.087
MANU	Manufacturing	.193	.395	.270	.444	.109	.312
CONST	Construction	.049	.216	.084	.277	.011	.105
TR	Transportation	.052	.222	.086	.280	.016	.124
UC	Communications/Storage or Utilities	.042	.201	.054	.222	.029	.168
TRIgH	Trade	.189	.392	.174	.379	.205	.404
FINA**	Finance, Insurance or Real Estate	.046	.209	.022	.147	.072	.258
ED	Education or Health	.095	.293	.077	.266	.115	.319
SERV	Services Other Than Education or Health	.271	.444	.135	.342	.418	.493
LGOVT	Local Government	.025	.156	.033	.179	.016	.127
Occupation							
PROF	Professional	.045	.206	.058	.234	.030	.170
TEACH	Teacher	.065	.247	.053	.223	.079	.269
HEALTH	Health Occupations	.069	.253	.017	.129	.125	.331
ARTS	Artistic, Literary and Rec. Occupations	.015	.121	.017	.128	.013	.112
CS	Clerical Yorker	.202	.402	.071	.256	.345	.475
SALE	Sales Yorker	.092	.289	.080	.271	.105	.307
SEA**	Service Yorker	.162	.369	.122	.328	.206	.404
RESF	Miner or Logger	.019	.138	.037	.188	.001	.027
PROD	Processing, Machining, Fabricating, Assembling & Repairing Occupations	.190	.392	.295	.456	.076	.266
CONS	Construction Trades	.063	.243	.120	.324	.001	.037
TRAN	Transport Equipment Operators	.046	.210	.083	.275	.007	.084
MATO	Material Handlers and Other Craft Operators	.031	.173	.049	.216	.012	.107
Age							
A15-24**	15-24 years of age	.257	.437	.243	.429	.273	.445
A25-34	25-34 years of age	.309	.462	.315	.465	.301	.459
A35-44	35-44 years of age	.218	.413	.217	.413	.218	.413
A45-54	45-54 years of age	.138	.344	.138	.345	.137	.344
A55-65	55-64 years of age	.079	.269	.085	.280	.071	.257

Table 1 (continued)

Variable Names	Description	Full Sample Mean	Full Sample S.D.	Male Sample Mean	Male Sample S.D.	Female Sample Mean	Female Sample S.D.
Education							
ELEM	Elementary Education	.119	.323	.147	.355	.087	.282
HIGHSCH	High School Education	.541	.498	.551	.497	.531	.499
SOMPOST	Some Post-Secondary Education	.092	.289	.086	.281	.099	.299
POSTSEC	Post-Secondary Education	.144	.351	.116	.320	.175	.380
UNIV**	Workers with University Degrees	.103	.304	.099	.298	.108	.309
FT	Works Full-Time	.809	.393	.096	.291	.703	.457
Job Tenure							
T12M**	Tenure of less than one year	.024	.456	.279	.449	.311	.463
T5Y	1 to 5 yrs. tenure	.296	.457	.266	.441	.329	.470
T1OY	6 to 10 yrs. tenure	.183	.386	.174	.379	.192	.393
T11YUP	11 yrs. *k* more tenure	.182	.386	.227	.419	.133	.339
Province							
NFLD	Newfoundland	.044	.206	.048	.213	.041	.198
PEI	Prince Edward Island	.020	.139	.016	.127	.024	.152
NS	Nova Scotia	.070	.254	.071	.256	.069	.253
NB	New Brunswick	.067	.251	.069	.253	.066	.248
QUE	Quebec	.176	.380	.187	.390	.163	.369
ONT	Ontario	.235	.424	.239	.427	.230	.421
MAN	Manitoba	.080	.270	.074	.261	.086	.280
SASK	Saskatchewan	.085	.278	.077	.267	.093	.290
ALB**	Alberta	.132	.338	.124	.330	.139	.346
BC	British Columbia	.092	.289	.094	.292	.090	.286
Marital Status							
MAR	Married	.647	.478	.670	.470	.622	.485
SING**	Single	.384	.486	.290	.453	.278	.448
OTHER	Other	.683	.252	.040	.195	.099	.299
Total Observations		28107		14647		13460	

* Dependent variable.
** Used as reference group in regression analysis. S.D. is Standard Deviation.

Table 2

Probit ML Estimates of the Pooled Sample Determinants of Union Status

Variable Name	Pooled Sample Coeff-icient	T-Ratio	Male Sample Coeff-icient	T-Ratio	Female Sample Coeff-icient	T-Ratio
	(1)	(2)	(3)	(4)	(5)	(6)
Sex	-0.126*	-5.64				
Industry						
RES	0.510*	6.80	0.498*	4.63	-0.025	-0.14
MANU	0.767*	13.87	0.665*	7.18	0.542*	6.66
CONST	0.392*	5.61	0.339*	3.29	-0.455*	-2.31
TR	1.100*	17.15	0.982*	9.89	1.010*	8.70
UC	1.420*	22.47	1.100*	10.87	1.820*	20.12
TRWH	0.044	0.80	-0.129	-1.38	0.130*	1.83
ED	1.470*	23.01	1.260*	11.36	1.540*	19.23
SERV	0.455*	8.38	0.168	1.75	0.550*	8.18
LGOVT	1.320*	18.59	1.220*	11.23	1.240*	11.52
LR-STATISTIC		2004.00		1060.20		1027.60
Occupations						
PROF	-0.230*	-4.60	-0.535*	-7.85	0.260*	3.33
TEACH	0.417*	7.00	0.393*	4.16	0.401*	5.13
HEALTH	1.110*	27.08	0.776*	8.33	1.120*	22.77
ARTS	-0.466*	-5.56	-0.399*	-3.77	-0.667*	-4.56
CS	-0.060	-1.72	0.039	0.64	-0.058	-1.30
SALE	-0.357*	-6.88	-0.418*	-5.91	-0.393*	-4.93
RESF	0.157	1.93	-0.132	-1.47	2.700*	4.40
PROD	0.315*	8.18	0.164*	3.23	0.610*	8.28
CONS	0.468*	8.69	0.283*	4.50	0.801*	2.23
TRAN	-0.027	-0.52	-0.149*	-2.40	-0.207	-1.30
MATO	0.473*	8.32	0.301*	4.32	0.844*	7.20
LR-STATISTIC		1588.00		452.20		993.20
Age						
A2534	0.158*	5.58	0.175*	4.48	0.129*	3.07
A3544	0.121*	3.70	0.178*	3.89	0.061	1.28
A4554	0.063	1.70	0.132*	2.57	-0.036	-0.67
A5564	0.531*	13.21	0.555*	10.12	0.473*	7.74
La-STATISTIC		206.00		111.10		87.00
Education						
ELEM	0.067	1.49	0.226*	3.58	-0.178*	-2.58
HIGHSCH	0.028	0.75	0.199*	3.59	-0.173*	-3.27
SOMPOST	0.064	1.44	0.174*	2.67	-0.055	-0.87
POSTSEC	0.136*	3.50	0.242*	4.07	0.012	0.23
LR-STATISTIC		20.00		17.80		26.80

Table 2 (continued)

Variable Name	Coeff- icient (1)	T-Ratio (2)	Coeff-icient (3)	T-Ratio (4)	Coeff-icient (5)	T-Ratio (6)
FT	0.292*	11.07	0.366*	7.03	0.255*	8.03
Job Tenure						
T5Y	0.268*	11.58	0.233*	7.29	0.325*	9.45
T1OY	0.544*	20.72	0.523*	14.52	0.604*	15.31
T11YUP	0.819*	27.94	0.761*	19.84	0.920*	19.41
LR-STATISTIC		894.00		450.20		446.20
Province						
NFLD	0.323*	6.73	0.411*	6.51	0.229*	3.03
PEI	0.065	0.95	0.081	0.81	0.008	0.09
NS	0.140*	3.40	0.256*	4.59	-0.009	-0.15
NB	0.167*	3.94	0.307*	5.40	-0.018	-0.28
QUE	0.390*	11.99	0.509*	11.56	0.260*	5.27
ONT	0.116*	3.73	0.272*	6.39	-0.070	-1.49
MAN	0.218*	5.53	0.272*	4.93	0.139*	2.45
SASK	0.300*	7.75	0.305*	5.63	0.265*	4.72
BC	0.472*	12.58	0.610*	11.95	0.304*	5.39
LR-STATISTIC		294.00		216.00		122.60
Marital Status						
MAR	0.128*	5.13	0.099*	2.89	0.183*	4.88
OTHER	0.160*	3.91	0.050	0.76	0.266*	4.87
LR-STATISTIC		28.00		8.60		29.80
Constant	2.160*	-27.84	-2.190*	-17.67	-2.120*	-20.74
Summary Statistics:						
Likelihood Ratio Test	9410.26	(44 DF)	4495.30	(43 DF)	5031.27	(43 DF)
Maddala R-Square	0.2845		0.2597		0.3119	
Percent of Right Predictions	76.28		73.40		80.02	

* Significant at the .01 level.

IV Differences by Gender

The ML estimates of separate probit regressions for males and females are shown in columns (3) to (6) of Table 2. The LR test statistics of the regressions, and of various groups of variables, show that estimates for both male and female samples are highly significant at the 99 percent confidence level.

The estimates suggest that although industry of employment is a significant determinant of union membership, its impact differs by gender. A randomly sampled male worker in the resource, manufacturing, construction, transportation, utilities, education, service and local government industries is more likely to be a union member than the one working in finance, insurance or the real estate industry (the reference category). A female worker is less likely to be a union member if she is employed in construction. However, like males, female workers are more likely to belong to a union if they are employed in manufacturing, transportation, utilities, education or in local government.

Similar findings emerge in relation to the impact of the occupation of employment on the probability of union status by gender. Like the industry variables, while the occupation of employment is a significant predictor of union status, as shown by LR-test statistics of joint significance, the impacts vary substantially by individual occupation. For example, female professionals are more likely to be union members, but male professionals are more likely to be nonunion. Women are also more likely to be unionized if they are miners or loggers. Both men and women are more likely to be union members if they are teachers, health professionals, production and construction workers or material handlers. They are less likely to belong to a union if they are clerical or sales workers, or engaged in artistic/recreational activities.

The estimates also reveal that some demographic characteristics and job tenure have different impacts on the union status probability between men and women. For example, males in all age groups over 25 years are more likely to be union members than younger males (15-24 age group), but older women are more likely to be union members than younger women if they are in the 25-34 or the 55-64 age groups: they are less likely to have union status if they are in the 45-54 age category. Similarly, while males without a university degrees are more likely to be union members, women without a university degree are less likely to have union affiliation. Our estimates also show that "other than married women" (e.g. divorced) are more likely to be in a union than men in this category in comparison with single men and women. However, both married men and women are more likely to be union members than those who are single. The impact of full-time labour market attachment on union status probability is the same for men and women; a male or female full-time worker is more likely to have a union status than a part-time worker. The same is true for job tenure. For both males and females, probability of being a union member increases markedly with job tenure, that is, the longer the job tenure, the greater the likelihood of a worker being a union member. The province of residence also has an impact on the probability of union status by gender. A male worker in every province outside of Alberta is more likely to be a union member, while a woman is more likely to have union status only in Newfoundland, Quebec, Manitoba, Saskatchewan, and British Columbia. The estimate coefficients for females residing in Nova Scotia, New Brunswick, and Ontario are negative and statistically insignificant, suggesting that women in these provinces are either less likely to be union members than those in Alberta, or, the differences in the union status probability between these provinces are insignificant for women.

V Role of Industry and Occupation of Employment

Results in Tables 2 indicated that (1) the industry and occupation of employment are important predictors of union status of a worker, and (2) their impact on the union status probability varies markedly by gender on account of the segmentation of occupation and industry employment by sex. These findings are not unexpected. As Fiorito and Gallagher (1986, 304) point out, for the United States, "...the occupational and industry control variables do help to explain membership patterns..." Fiorito and Greer (1986, 148) also suggest that "Occupational segregation based on gender may disproportionately assign women who are no less pro-union than men to non-union occupations." Voos (1983, 450) similarly notes, "... being female does not clearly decrease unionizing activity or predisposition in any study but it does reduce the likelihood of union status, according to most studies." She concludes that "lower rates of unionization among women do not reflect less demand for unionism ... but rather that the process of filling union jobs (occupational selection by women and hiring decisions by employers) creates the overall negative association."

The sample means in Table 1 show that close to 73 percent of women in Canada are employed in trade, education and commercial service industries, and over 65 percent are engaged in clerical, sales and service occupations where incidence of unionization is relatively low (Kumar, 1988). Men are more evenly distributed by industry and occupation than women, although their proportions are sharply higher in manufacturing and other goods producing industries, and in blue-collar production, construction, transportation and related occupations, the traditional stronghold of unions. Thus, women are concentrated in non-unionized industries (e.g. trade, finance and services) while a dominant proportion of men work in unionized industries.

The estimates of sequential probit regressions on a pooled sample, shown in Table 3, confirm that the labour market segmentation by industry and occupation does have a marked impact on the estimated differential in the probability of union status by gender. Columns (1) and (2) in Table 3 present the ML estimates of probit regression with only human capital-demographic characteristics of men and women as explanatory variables, excluding occupation and industry of employment. The estimated coefficient associated with the sex variable in the equation is -0.211 after controlling for age, education, marital status, job tenure, part-time/full-time status and the province of residence of a worker.

Columns (3) to (4) in Table 3 present the estimates of the regression with the addition of occupation of employment variables. The additional regressors significantly reduce the estimated coefficient on the sex variable from 0.211 to 0.183, suggesting that nearly 13 percent of the difference in the proportion of union membership between men and women may be attributed to the differences in the occupation of employment. The other estimated coefficients in the regression, except for coefficients on education, remain stable, indicating that demographic variables are not highly correlated with the occupation of employment variable and therefore the estimates are not seriously biased. Three of the four coefficients on education variables become statistically insignificant, and one changes sign on account of high multi-colinearity between occupation and education.

Columns (5) to (6) show the ML estimates of the regression with the addition of industry of employment variables, but excluding the occupation of employment variables. The estimated coefficient on the sex variable is reduced from 0.211 to 0.133, indicating that nearly one-third of the differential in union membership by gender may be accounted for by differences in industry employment. When both industry and occupation of employment are added to the regression (see the ML estimates of pooled sample in column (1) in Table 2), the estimated coefficient on sex variable declines to 0.126, suggesting that 40 percent of the differential in the proportion of union membership by gender (a reduction in the estimated coefficient from 0.211 to 0.126) may be attributed to occupation and industry of employment. Results also appear to indicate that the industry segmentation of employment by gender is a more serious barrier in women becoming union members than the differences in the occupation of employment. The stability of estimated coefficients of age, marital status, job tenure, full-time/part-time status and province of residence variables, in stepwise estimation of regression, confirm that industry and occupation of employment variables are not highly correlated with demographic and related human capital variables. Only the educational status variables are highly correlated with occupation and industry of employment; the estimated coefficients of education variables therefore change signs and become statistically insignificant when industry and occupation variables are added to the regression. This is not unexpected, since education is considered an important predictor of an individual's occupation of employment.

Table 3
Probit ML Estimates of Union Status Determination Using a
Squential Procedure

Variable Name	Coeff-icient (1)	T-Ratio (2)	Coeff-icient (3)	T-Ratio (4)	Coeff-icient (5)	T-Ratio (6)
Sex	-0.211*	-12.29	-0.183*	-8.56	-0.133*	-6.76
Industry						
RES					0.738*	11.43
MANU					1.080*	20.94
CONST					0.862*	14.10
TR					1.280*	21.46
UC					1.530*	24.74
TRWH					0.136*	2.55
ED					1.760*	31.08
SERV					0.833*	16.52
LGOVT					1.470*	21.08
Occupation						
PROF			-0.166*	-3.50		
TEACH			1.126*	23.73		
HEALTH			0.956*	23.81		
ARTS			-0.280*	-3.54		
CS			-0.098*	-3.31		
SALE			-0.797*	-18.27		
RESF			0.052	0.83		
PROD			0.333*	11.21		
CONS			0.432*	10.80		
TRAN			0.193*	4.42		
MATO			0.382*	7.50		
Age						
A2534	0.263*	9.95	0.226*	8.23	0.177*	6.40
A3544	0.269*	8.81	0.201*	6.35	0.140*	4.39
A4554	0.184*	5.33	0.154*	4.30	0.063	1.74
A5564	0.675*	18.03	0.669*	17.23	0.528*	13.47
Education						
ELEM	-0.370*	-10.69	-0.038	-0.88	-0.005	-0.13
HIGHSCH	-0.481*	-17.79	-0.061	-1.68	-0.085*	-2.66
SOMPOST	-0.420*	-11.41	0.008	0.19	-0.064	-1.57
POSTSEC	-0.134*	-4.22	0.073*	1.93	0.196*	5.47
FT	0.349*	14.69	0.343*	13.46	0.292*	11.56
Job Tenure						
T5Y	0.251*	11.67	0.260	11.57	0.291	12.93
T1OY	0.573*	23.52	0.568	22.42	0.582	22.75
T11YUP	0.938*	34.79	0.898	31.83	0.878	30.83

Table 3 (continued)

Variable Name	Coeff-icient (1)	T-Ratio (2)	Coeff-icient (3)	T-Ratio (4)	Coeff-icient (5)	T-Ratio (6)
Province						
NFLD	0.371*	8.36	0.328*	7.07	0.338*	7.22
PEI	0.077	1.20	0.039	0.59	0.089	1.33
NS	0.141*	3.69	0.121*	3.03	0.144*	3.58
NB	0.174*	4.46	0.171*	4.19	0.167*	4.05
QUE	0.358*	11.93	0.366*	11.69	0.371*	11.72
ONT	0.124*	4.35	0.118*	3.97	0.106*	3.49
MAN	0.246*	6.73	0.224*	5.89	0.227*	5.93
SASK	0.284*	7.89	0.282*	7.53	0.303*	8.05
BC	0.422*	12.10	0.447*	12.33	0.453*	12.42
Marital Status						
MAR	0.141*	6.06	0.133*	5.52	0.145	5.95
OTHER	0.117*	3.08	0.135*	3.41	0.149	3.74
Constant	-1.060*	-23.91	-1.540*	-27.96	-2.210*	-31.74
Summary Statistics:						
Likelihood Ratio Test:		4768.650 (24 DF)	7405.680	(35 DF)	7821.85	(33 DF)
Maddala R-Square		0.156		0.232		0.243
Percent of Right Predictions:		68.90		73.00		73.60

* Significant at the .01 level.

VI Conclusions

The primary purpose of our study was to explore the key determinants of union status of a worker in Canada, and to evaluate the relative significance of occupation and industry employment in explaining the differences in degree of union membership by gender. Drawing heavily on recent U.S. research, we examined the demographic and related human capital characteristics of workers and their occupation and industry of employment as predictors of union status. Our estimation was based on a unique and larger data set than the samples used in previous economic studies of unionism in Canada.

Our empirical estimates suggest that both the individual worker characteristics and the labour market factors are important determinants of the union status of a worker. Our results also show that occupation and industry of employment are major factors in the differential in the proportion of union membership between men and women. Controlling for age, marital status, education, nature of employment (part-time or full-time), job tenure and province of residence, the industry and occupation of employment account for more than four-fifths of the differential in the male-female unionization rate. The results confirm the conclusions of U.S. studies that occupation and industry control variables are important predictors of union status and that "gender differences in membership ... can be attributed to factors other than gender per se" (Fiorito and Greer, 1986, 141). The findings suggest that since professionals, clerical, and sales and service workers are less likely to be unionized than other workers, trade unions face an uphill task in organizing the unorganized women.

The results of our research, however, should be interpreted with caution. We have only identified predictors of union status and not explanations of why workers unionize or do not unionize. Any generalizations about worker preferences for union representation based on union membership differences, because of individual worker characteristics and of occupation and industry of employment, would be hazardous and misleading. To understand why men and women in various demographic groups or in various industries and occupations are under-represented in unions, behavioural studies of voting intentions are required. Such studies are sadly lacking in Canada. There is also a need to go beyond occupation or industry of employment variables as predictors of unionization. To better understand the role of these factors, measures of job content, prestige, job satisfaction and job environment have to be developed. Similarly, we need to know about worker expectations of jobs and unions in order to evaluate worker preferences for union representation.

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[i] For the challenges facing the Canadian labour movement and the unions' responses, see Kumar and Ryan (1988) and Kumar and Slobodin (1987). For a "retrospect and prospect" view of unionism in Canada, see Kumar (1986).

[ii] Almost three-quarters of all women in 1987 were employed in three industry groups (Statistics Canada 1988b): community, business, and personal services (48 %); finance, insurance and real estate (8 %); and trade (18%). Women accounted for between 45 and 74 percent of the industry employment in the three groups. The three groups were responsible for almost all of the net growth in employment for the period 1981-87. Except for education, health and welfare services, where a majority of workers are union members, union density in all three industry groups ranged between 6 and 14 percent (Kumar, 1988).

[iii] It is important to distinguish between the union status of a worker and the predisposition of a worker to unionize. A worker acquires union status or becomes a union member by either (1) gaining employment in a job covered by a previously negotiated collective agreement, or (2) by participating in a successful union attempt to obtain certification to represent employees of a nonunion employer. Farber (1983a) has argued that "the union status of a

worker is determined as the result of separate decisions by workers and potential union employers. Workers decide whether they would prefer union or nonunion jobs based on utilities that these jobs yield to them. At the same time, union employers are deciding which, of the workers who want union jobs, to hire given that workers differ in their productive characteristics and that these characteristics are compensated differently in the union and nonunion sectors." Farber, therefore, draws a distinction between the union status of workers and the union status of jobs. Nonunion jobs become unionized through a deliberate choice by workers to seek union representation. Once jobs are unionized, their union status is maintained even if the workers who held those jobs initially leave the organization. Most collective agreements also provide that new workers in union jobs have to become **1.111** ion members following a short probationary period. Voos (1983) and Fiorito and Gallaghar (1986) have shown that although factors relating to union status overlap with those relating to union voting intentions or predisposition to unionize, there are marked differences in their impact. For example, most union status studies find that women are less likely to be union members than men, but in studies of voting intentions, no statistically significant difference in predisposition to unionize by gender has been found. Public attitudes towards unions also do not provide any evidence of a significant difference in worker perceptions by gender. See, for example, Kochan (1979) and Krahn and Lowe (1984).

[iv] Although, to the best of our knowledge, there has been no independent study in Canada of the determinants of union status by gender, a number of researchers have estimated probit union status equations, where sex is an explanatory variable, in calculating union-nonunion wage differentials. Sec for example Abbott and Stengos (1986), Kumar and Stengos (1984), Simpson (1985), Robinson and Tomes (1984), and Grant, Swidinsky and Vanderkamp (1987). For a descriptive study of women and unions in Canada see White (1980).

[v] See Chaison and Rose (1988) and Adams (1988) for a summary of differences in public policy, employer attitudes, public attitudes and values, and in union organizing efforts as explanations of diverging trends in union density in the United States and Canada. Whereas unions have experienced stagnation and decline in the United States, Canadian unions have shown a robust membership growth.

[vi] In both Manitoba and Ontario, pay equity legislation unions are held responsible for negotiating job evaluation systems and pay equity adjustments. Only when management and unions fail to reach an agreement will the government intervene to impose a settlement. (Kumar, Coates and Arrowsmith, 1988, 391).

[vii] It should be noted that with the Probit estimation, the dependent variable is not zero and one, but a continuous (unobservable) index I* that is determined by explanatory variables such that the larger the value of the index I*, the greater the probability of the worker being a union member. The estimating probit equation is written as:

$$I^* = \alpha + \beta X + u$$

Where α is intercept coefficient and u is the stochastic disturbance term (Gujrati, 1988, 491).

[viii] See Kumar (1988) and Statistics Canada (1985) for a description of the Survey.

[ix] The weighted estimates of unionization, that is the proportion of paid workers who were union members, in the main sample, were 41.5 percent and 31.9 percent for males and females respectively.

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