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Economic Vulnerability and Ethnicity in Canada's Metropolitan Workforce:

***An Exploratory Analysis of Census
Classifications***

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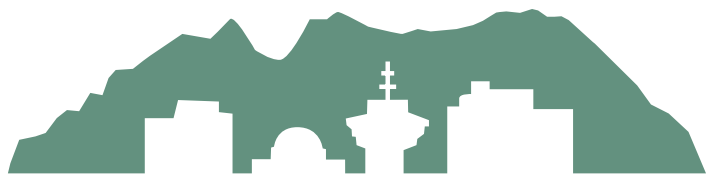
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ECONOMIC VULNERABILITY AND ETHNICITY IN CANADA'S METROPOLITAN WORKFORCE: AN EXPLORATORY ANALYSIS OF CENSUS CLASSIFICATIONS¹

Fernando Mata

Citizenship and Multiculturalism Branch

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ABSTRACT

Using selected 2006 Census classifications from Statistics Canada's special interest profile tables, this exploratory paper aims to identify economically vulnerable ethnic groups residing in Canada's major metropolitan areas. Economic vulnerability was approximated by eleven selected indicators related to their labour market activity attributes, employment patterns as well as income- and poverty-related profiles. A sample of 1,659 male and female ethnic classifications representing approximately 100 ethnic origins of "core" workforce (aged 25-54) members who resided in 15 major CMAs were examined. Ethnic group classifications were studied using Latent Class Analysis (LCA) and Principal Component Analysis (PCA). Component scores related to classifications were also predicted by selected demographic, generational, linguistic, residential, and educational attributes. The most typical ethnic classifications corresponding to vulnerable groups were found among individuals reporting Non-European (Somali, Afghan, Bangladeshi, Pakistani, Colombian, and Korean) as well as Aboriginal (North American Indian) ethnic origins. In terms of the prediction of the dimensions of economic vulnerability using regression analysis, the stronger predictors found were those attributes pertaining to first generation composition, linguistic, and human capital-related group characteristics.

INTRODUCTION

In developing their theory of economic vulnerability, Chaykowsky and Slotsve (2007) state that a sizeable number of workforce members in Canada's labour markets have jobs characterized by low pay and few benefits, few prospects for advancement, and considerable risk in terms of employment security. There are two essential employment patterns associated with economic vulnerability: (a) the extent and depth of low pay and (b) the strong presence of forms of non-standard employment. The economically vulnerable segment of the labour force is said to be sizeable—about a third of all individuals who do paid work over the course of a year and about 11 percent of those who are employed on a full-time basis throughout the year. Based on a review of broader indicators drawn from SLID panels, the vulnerable labour force “appears to be not declining in size as the proportion of jobs paying under \$10 per hour (in 2001 dollars) remained the same between 1986 and 2004” (HRSDC 2005, 2).

Several factors seem to intersect and give rise to economic vulnerability (HRSDC 2005). Part-time and self-employed workers experience, on average, a greater incidence of low earnings. A large segment of non-standard workers, including part-time and self-employed workers, have a number of the characteristics that, taken together, are often associated with labour market vulnerability. Higher vulnerability levels are more prevalent among women, especially those who did not graduate from high school compared to those with university degrees. Workers whose employment status is non-standard (in particular, part-time and self-employed) and less stable (e.g., part-year and part-time, or full-year and part-time) also have higher degrees of economic vulnerability.

Some ethnic groups are over-represented in the vulnerable segment of Canada's labour force (Driedger 1989; Reitz and Banerjee 2007). Ethnic groups made up of visible minorities and recently arrived immigrants are frequently found in sectors of urban economies such as Toronto in low-paying jobs, menial occupations, and poor working conditions (Ornstein 2000). These individuals have limited economic opportunities and are restricted in their choices in the labour market. While some enter the labour force and stay in white collar or professional jobs, others tend to take the jobs most accessible to them, i.e., unskilled or skilled blue collar jobs. Over time, this process leads to the stratification of the labour force by "entrance status" and the concentration of workers in particular occupations, branches of industry, and earning brackets. Leaving the "entrance" status behind is problematic for ethnic group members with limited human capital (Bratsberg and Terrell 2002; Friedberg 2000; Zeng and Xie 2004).

Given the prevailing patterns of ethnic residential choices, it is also expected that the more economic vulnerable ethnic groups reside in the major metropolitan areas of the country. In 2006, about 68% of Canada's population lived in communities located within the nation's 33 census metropolitan areas. International migration continues to be the major population driver of large urban centres. In 2006, already 63% of all immigrants lived in Toronto, Montréal, or Vancouver compared to 52% in 1981. The number of visible minorities in major urban centres is also rising. Projections suggest that visible minorities could represent 50% of the population of Toronto and Vancouver by 2016.

In addition to the topic census tables, Statistics Canada has now released special interest tables that provide summary information on the ethnic composition of labour force members according to selected demographic, cultural,

and socio-economic characteristics. The ethnic sub-population classifications contained in these tables may be valuable in providing important clues about the presence of vulnerable ethnic groups in the major metropolitan labour markets of the country. Using these classifications as group proxies, the purpose of the current study is fourfold: (1) to pinpoint economically vulnerable individuals of core working ages present in the workforce of Canada's 15 major metropolitan areas; (2) to identify typical vulnerable groups among male and female workers; (3) to map the position of ethnic groups in the major dimensions of vulnerability; and (4) to examine the role that residential, generational, immigrant, and linguistic characteristics play in predicting economic vulnerability.

The study is essentially exploratory in nature¹ and proceeds in four major phases of analysis. The first phase covers basic descriptive and correlational statistics of male and female samples of classifications. The second and third phases comprises the application of Principal Components Analysis (PCA) and Latent Class Analysis (LCA) where various models were fitted to the data. In the last phase, regression analysis aimed at predicting dimension scores of vulnerability were predicted by socio-demographic, residential, and ethnic membership attributes of classifications.

1 It is conducted in preparation of the arrival of a public use individual microdata from the 2006 Census.

DATA, VARIABLES, AND ANALYTIC APPROACH

Data

The data is drawn from Statistics Canada's 2006 special interest profile table Cat. 95-564-XCB2006007 by Census Metropolitan Areas (CMA) and gender (20% Sample Data). This table was released to the public in Beyond 20/20 format on December 9, 2008. Beyond 20/20 is the standard software used by Statistics Canada and presents data through a multilevel classification array format where census counts are easily manipulated by standard statistical packages.

A multifactorial selection approach was adopted to choose the number of ethnic census classifications or ECCs required for the analysis.² From an initial selection of 3,000 possible classifications (100 ethnic origins X 15 Metropolitan Areas X 2 genders), a minimal number of 200 population members represented by each classification seemed appropriate to avoid the analytical complications presented by potential data outliers. This criterion brought the final sample to a total of 824 male and 835 female classifications (1,569 in total). The selected ECCs represented a population of approximately 12.3 million individuals (6.4 million males and 5.8 million females) comprising 100 ethnic origins of individuals in "core" working ages (aged 25-54) and residing in the 14 major metropolitan areas of the country in 2006 (see table A-1 in the Annex).

In each ECC, both single and multiple ethnic origins as well as non-permanent residents were counted, and thus, these sub-populations could not be

² Treating the table as it followed a data setup similar to a 3-Way Analysis of Variance design (three categorical variable layers containing cells of continuous variables), the original Beyond 20/20 table was decomposed into smaller classifications forming a "quasi" individual dataset. These smaller classifications or ECCs were the units of observations in the dataset.

isolated for analytical purposes.³ With the exception of the Inuit classification, all other ethnic origin identifications were included in the analysis to ensure a broad spectrum of reporting.⁴ In terms of broad families of origins, about 43.8% of all ECCs sampled were of individuals reporting European Origins followed by Non-European (38.4%), British (7.2%), French (3.4%), and Aboriginal (4.0%). Also included were Canadian (1.8%) and those reporting regional origins such as American and Newfoundlander (1.8% and 1.9%, respectively). Following the 2006 census definition, ethnic origin refers here to the ethnic or cultural origins of the respondent's ancestors. An ancestor referred to someone from whom a person was descended and was usually more distant than a grandparent.

The CMAs selected for the analysis included a broader representation, not only of MTV (Montréal, Toronto, and Vancouver) and the larger CMAs but also some ECCs from cities in the Prairies (Saskatchewan) and Atlantic Provinces (Newfoundland and Labrador and New Brunswick). The CMA frequency was the following: Calgary (156), Edmonton (140), Halifax (72), Hamilton (138), Moncton (25), Montréal (182), Ottawa-Gatineau (172), Québec (58), Regina (60), Saskatoon (62), St. John's (28), Toronto (198), Vancouver (176), Victoria (81), and Winnipeg (111).

In the special interest table, there were already pre-calculated population estimates (rates and medians). These estimates were not subject here to any statistical transformation to preserve their original metric. In order to study the distinct ethnic categories in the Beyond 20/20 table, many classifications needed to be collapsed together so as to calculate the various percentages,

³ The ECCs with the highest numbers of non-permanent residents were: Mexican (18.7%), Korean (16.2%), Nigerian (12.7%), Japanese (12.4%), Arab n.i.e. (10%), Australian (8.6%), Albanian (7.5%), African, n.i.e. (7.4%), Turk (7.0%) and Colombian (6.2%)

⁴ This ethnic classification had only 2 categories and less than 2,000 total population represented.

medians, and rates that were subsequently used in the multivariate analysis of data.

Variable Selection and Analytical Approach

The phenomenon of economic vulnerability is a difficult construct to measure directly. One of the more frequent approximations to it is to combine selected group indicators and study them jointly (Statistics Canada 2004; Saunders 2005; Vallee 2005; Statistics Canada 2001). This is the approach followed here. The chosen indicators were expressed in relative terms (i.e., as percent) or median values (i.e. incomes and wages) for each ECC. There was an explicit attempt to cover a broad range of economic indicators that covered domains related to labour market access, economic performance, employment status, income profiles, and poverty risks.

In total, eleven indicators of economic vulnerability were chosen:

prate	The labour force participation rate of the ECC
erate	The employment rate of the ECC
urate	The unemployment rate of the ECC
manocc	The percentage of labour force members of the ECC working in manual occupations such as trades transport, equipment-related, primary industries, processing, manufacturing, and utilities
epart	The percentage of the ECC who worked part-time with some employment income
selfemp	The percentage of the ECC who were self-employed with employment income
mincfull	The median income of workers of the ECC who worked full-time and full year, constant \$2005
mwages	The median income of wage/salary earners of the ECC, constant \$2005
pernoinc	The percentage of individuals of the ECC who did not work or had no employment income in 2005
govtrans	The percentage of the total income of the ECC in 2005 due to government transfer payments
pretax	The percentage of individuals of the ECC who lived in economic families falling under the Low Income Cut-off (LICO) established by Statistics Canada

The labour force participation rate for a particular ECC group was defined as the percentage of the total population in that particular group who was in the labour force. The employment rate for a particular group was defined as the number of persons in that group employed in the week prior to Census Day (May 16, 2006) expressed as a percentage of the total population. Similarly, the unemployment rate was defined as the number of persons in that group unemployed in the week prior to Census Day, expressed as a percentage of the labour force. The percentage with part-time employment indicator referred to the persons who worked part-time (less than 30 hours per week) divided by total employment. The government transfer income indicator was computed as the percentage of total average income for persons age 15 and over made up by government income. The poverty indicator measured the incidence of low-income as the proportion of individuals in economic families or unattached individuals who fell below the low-income cut-off. The threshold values used by Statistics Canada for the determination of the incidence of low-income economic families and low-income unattached individuals generally varies by four urban size categories and one rural (five categories in all) and for families, by family size (seven categories).

Three considerations seemed relevant in the analysis of economic vulnerability indicators: (a) the basic aim at identifying and classifying sets of observations (ECCs); (b) the need to undertake a separate analysis of male and female samples as the vulnerability process was assumed to substantively differ by gender; and (c) the need to reduce the data to manageable dimensions. Given that several factor analytic techniques are especially suitable to accomplish all these analytical purposes together, two specific methods were used in the analysis: Principal Components Analysis (PCA) and Latent Class Analysis (LCA). These techniques allow for the recognition of non-random patterns or structures in the existing set of variables, generally without imposing any pre-

determined model of relationship between these variables. Class membership probabilities and component scores derived from these analyses were used in the different phases of the data exploration.

DATA ANALYSIS

Descriptive Statistics

To begin the empirical exploration of the ECC male and female samples and obtain a first glance at data patterns. Classifications were sorted by their average value for labour force participation rates in 2006. To more conveniently summarize this information, Table 1 provides information on the top five and bottom five ECCs for each sample. Among the male ECCs, those corresponding to European groups such as Belgian, Austrian, Slovenian, Serbian, and Macedonian ranked at top levels of labour force participation (above 93%), while Somalian, Albanian, Colombian, Iraqi, and Korean ranked at bottom levels (below 84%). A higher average percentage of ECCs corresponding to these latter workers displayed high unemployment rates and average percentages of workers engaged in manual type of occupations. Among female ECCs examined, Filipino and Barbadian ECCs displayed the highest participation rates (87.1 and 86.9 respectively), higher than those of their European counterparts. Average participation rates below 56% were found among female ECCs corresponding to Iraqi, Bangladeshi, Pakistani, Somali, and Afghan groups.

As expected part-time employment was prevalent among female ECCs compared to males, while average self-employment was the converse. Taking all indicators into account, male ECCs such as Somali or Korean and female ECCs corresponding to the Bangladeshi, Pakistani, Somali, and Afghan groups appeared as the typical underperformers in Canada's metropolitan labour

markets. These groups were also more likely to display higher average percentages of individuals in economic families living under the before-tax LICO (at least one in five). With respect to female ECCs, those corresponding to Bangladeshi, Pakistani, Somali, and Afghan women displayed even higher average percentages of individuals belonging to economic families living under the before-tax LICO than the male ECCs, accompanied by very low values on the average total income and wage income indicators.

These initial patterns of relationships were reflected in the correlation matrices of indicators calculated for male and female ECCs, presented in Table 2. A close inspection of these matrices reveals a cluster of either moderate and/or strong associations between participation rates, employment rates, total incomes of full-time full-year workers, and wages/salaries of the working populations ($r = .34$ or higher). These indicators, as a cluster, show strong negative associations with ECCs' unemployment rates, percentage of workers reporting no employment income, dependency of total income on government transfers, and the number of economic family members living under the LICO cutoffs ($r = -.40$ or higher). The average percentage of workers concentrated in manual occupations displays positive correlations with total income dependency on government transfers ($r = .19$ for males and $r = .40$ females). Similarly, the average percentage of part-time workers is found to be positively associated with the low income cut-off indicator ($r = .32$ for males and $r = .27$ for females). The self-employment indicator is shown to be positively associated with the percentage of no employment income indicator among male ECCs ($r = .39$) but was found to be negligible among female ECCs ($r = -0.01$). Although negative in direction, the correlations between the total income and wage income indicators with the LICO indicators were not as strong as might have been predicted ($r = -.04$ or higher).

TABLE 1: AVERAGE VALUES OF ECONOMIC VULNERABILITY INDICATORS BY TOP AND BOTTOM FIVE LABOUR FORCE PARTICIPATION RATES: MALE AND FEMALE ECC SAMPLES

MALE ECC											
SAMPLE											
(N=824)	PRATE	ERATE	URATE	MANOCC	EPART	SELEMP	MINCFULL	MWAGES	PERNOINC	GOVTRANS	BLICO
Top Five											
Belgian	94.4	90.8	3.5	26.8	25.6	11.3	\$49,787	\$45,216	10.8	2.2	0.7
Austrian	94.3	90.5	4.1	23.6	24.6	14.0	\$52,509	\$48,319	14.1	1.4	0.6
Slovenian	93.6	90.6	3.0	23.6	17.4	10.8	\$41,224	\$29,819	12.3	1.0	0.0
Serbian	93.4	90.0	3.7	30.3	28.1	11.8	\$47,247	\$42,272	14.9	1.9	1.2
Macedonian	93.4	90.2	4.6	30.5	14.4	11.3	\$25,678	\$23,051	13.7	1.7	1.4
Bottom Five											
Somali	83.1	71.4	14.3	39.1	28.7	7.3	\$14,176	\$12,130	37.3	14.9	21.8
Albanian	82.6	72.4	13.0	51.2	20.5	7.7	\$16,376	\$14,860	29.2	9.2	7.1
Colombian	81.8	72.5	12.8	21.2	29.8	8.0	\$30,647	\$19,245	30.5	11.5	9.9
Iraqi	80.2	72.9	9.0	31.2	41.7	14.9	\$30,750	\$22,225	34.6	12.4	5.0
Korean	76.9	72.2	6.4	11.7	41.6	23.2	\$30,072	\$18,764	39.2	3.5	29.3
Average	85.1	80.4	5.7	17.3	35.9	9.5	\$37,366	\$30,361	20.3	7.0	6.5
FEMALE ECC											
SAMPLE											
(N=835)	PRATE	ERATE	URATE	MANOCC	EPART	SELEMP	MINCFULL	MWAGES	PERNOINC	GOVTRANS	BLICO
Top Five											
Filipino	87.1	84.1	3.7	8.5	49.8	4.2	\$31,140	\$25,396	13.7	8.5	8.0
Barbadian	86.9	81.8	6.1	2.0	43.1	4.5	\$25,200	\$26,656	15.4	9.5	2.6
Latvian	86.9	81.4	6.6	1.4	15.1	10.7	\$14,860	\$11,617	18.8	5.4	0.0
Acadian	86.9	82.5	5.0	2.7	37.5	7.2	\$36,271	\$30,789	15.9	6.3	1.4
Belgian	86.8	84.6	2.4	3.9	38.8	8.4	\$39,706	\$32,991	15.0	6.0	0.8
Bottom Five											
Iraqi	55.3	50.4	9.2	14.7	31.9	4.1	\$17,944	\$10,590	45.5	29.3	5.6
Bangladeshi	55.3	46.5	17.0	15.3	47.7	2.9	\$13,334	\$7,745	45.4	34.7	37.2
Pakistani	54.9	46.9	14.9	11.3	69.9	4.9	\$33,004	\$16,272	45.3	27.8	32.0
Somali	50.1	40.4	20.6	9.5	28.8	3.2	\$12,628	\$5,547	51.7	58.4	53.2
Afghan	48.4	42.7	10.3	13.0	39.9	3.5	\$13,400	\$8,662	44.9	42.4	29.4
Average	79.8	75.0	6.3	6.0	42.0	6.9	\$32,392	\$24,743	22.8	10.6	7.5

Indicators:

prate	The labour force participation rate of the ECC
erate	The employment rate of the ECC
urate	The unemployment rate of the ECC
manocc	The percentage of labour force members of the ECC working in manual occupations such as trades, transport, equipment-related, primary industries, processing, manufacturing and utilities
epart	The percentage of the ECC who worked part-time with employment income
selfemp	The percentage of the ECC who were self-employed with some employment income
mincfull	The median income of workers of the ECC who worked full-time and full-year, constant \$2005
mwages	The median income of wage/salary earners of the ECC, constant \$2005
pernoinc	The percentage of individuals of the ECC who did not work or had no employment income in 2005
govtrans	The percentage of the total income of the ECC due to government transfer payments in 2005
pretax	The percentage of individuals of the ECC who lived in economic families falling under the LICO

TABLE 2: CORRELATION MATRICES OF ECONOMIC VULNERABILITY INDICATORS OF MALE AND FEMALE ECC SAMPLES

MALE ECC											
SAMPLE	PRATE	ERATE	URATE	MANOCC	EPART	SELFEMP	MINCFULL	MWAGES	PERNOINC	GOVTRANS	BLICO
prate	1.00										
erate	0.90	1.00									
urate	-0.47	-0.80	1.00								
manocc	0.09	0.07	-0.02	1.00							
epart	-0.19	-0.22	0.15	0.01	1.00						
selfemp	0.02	0.08	-0.14	-0.23	0.14	1.00					
mincfull	0.34	0.36	-0.28	-0.10	0.31	0.18	1.00				
mwages	0.38	0.40	-0.31	-0.04	0.25	0.12	0.93	1.00			
pernoinc	-0.66	-0.69	0.49	-0.07	0.19	0.39	-0.25	-0.33	1.00		
govtrans	-0.59	-0.70	0.64	0.19	0.14	-0.19	-0.41	-0.43	0.56	1.00	
blico	-0.33	-0.41	0.38	0.02	0.32	0.12	-0.05	-0.07	0.43	0.38	1.00
mean	85.1	80.4	5.7	17.3	35.9	9.5	\$37,366	\$30,361	20.3	7.0	6.5
s. dev.	9.2	10.5	4.3	15.2	19.4	5.0	\$18,151	\$16,465	9.3	7.3	11.8
FEMALE ECC											
SAMPLE	PRATE	ERATE	URATE	MANOCC	EPART	SELFEMP	MINCFULL	MWAGES	PERNOINC	GOVTRANS	BLICO
prate	1.00										
erate	0.96	1.00									
urate	-0.54	-0.73	1.00								
manocc	-0.28	-0.31	0.31	1.00							
epart	-0.01	0.00	-0.02	-0.02	1.00						
selfemp	0.17	0.21	-0.24	-0.22	0.08	1.00					
mincfull	0.37	0.38	-0.27	-0.23	0.56	0.21	1.00				
mwages	0.44	0.46	-0.33	-0.23	0.52	0.19	0.93	1.00			
pernoinc	-0.88	-0.90	0.64	0.26	-0.03	-0.01	-0.32	-0.42	1.00		
govtrans	-0.75	-0.78	0.63	0.40	-0.04	-0.36	-0.43	-0.48	0.71	1.00	
blico	-0.48	-0.52	0.46	0.21	0.27	-0.07	0.04	-0.04	0.53	0.54	1.00
mean	79.8	75.0	6.3	6.0	42.0	6.9	\$32,392	\$24,743	22.8	10.6	7.5
s.dev.	4.8	6.6	3.8	12.2	15.7	5.0	\$18,835	\$17,738	7.6	3.1	10.8

Indicators:

prate	The labour force participation rate of the ECC
erate	The employment rate of the ECC
urate	The unemployment rate of the ECC
manocc	The percentage of labour force members of the ECC working in manual occupations such as trades, transport, equipment-related, primary industries, processing, manufacturing and utilities
epart	The percentage of the ECC who worked part-time with employment income
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mincfull	The median income of workers of the ECC who worked full-time and full-year, constant \$2005
mwages	The median income of wage/salary earners of the ECC, constant \$2005
pernoinc	The percentage of individuals of the ECC who did not work or had no employment income in 2005
govtrans	The percentage of the total income of the ECC due to government transfer payments in 2005
pretax	The percentage of individuals of the ECC who lived in economic families falling under the LICO

Latent Class Analysis

To initiate the factor analytical part of the study and to pinpoint typical clustering patterns of ECCs with similar profiles in economic vulnerability indicators, Latent Class Analysis was undertaken. The main assumption in LCA is that there are underlying categorical latent variables, which explain the associations between a set of observed variables (Hagenaars and McCutcheon 2002). Using the information contained in the eleven vulnerability indicators (standardized), LCA assigned each ECC a specific probability that it belonged to a certain class. Based on the highest probability of class membership, each ECC was assigned to a certain class. In order to find the best LCA model fit, the difference between the observed and expected frequencies was minimized using an iterative expectation-maximization (EM) algorithm, and the optimal number of classes was based on a combination of statistics, which included the Bayesian information criterion (BIC), entropy, and the Lo-Mendell-Rubin or LMR test (Lo, Mendell and Rubin 2001). In total, eight latent class models were estimated for males and female ECCs. Each model, which specified a certain number of latent classes, was assessed in terms of five goodness of fit statistics: the log likelihood ratio, Akaike and Bayes' information criteria (AIC and BIC), entropy statistics, and the LMR test. The latter statistic of model fit compares the estimated model with a model with less than one class than the estimated model. A low p-value of the ratio test indicates that the model with one class less is rejected in favour of the estimated model.

Goodness of fit statistics for the latent class models are presented in Table 3. Reduction in the size of the goodness of fit measures of the male models fitted (two classes and three classes) experienced monotonic declines that slowed down with the fitting of a three class model. The V LMR ratio test of

this last model was undistinguishable from a simpler one with only two classes ($p < .25$), suggesting an optimal solution containing two classes. For the female models, a model containing only four classes was found to be the optimal one (LMR test=831.1, $p < .06$). For all models, entropy statistics were excellent, exceeding the mark of .90 or above.

Table 4 presents the ECCs distributions by broad ethnics by the optimal latent class models solutions. In the optimal latent class model for males, the first class was the high vulnerability one (101 classifications or 12.3% of the all male ECCs). More than half of the classifications (58.4%) corresponded to Non-European groups and 4% to Aboriginal ones. In the second class (low vulnerability), European groups had a higher representation of categories compared to Non-European ones (42.3% to 37.6%). The optimal latent class model for females produced a finer breakdown of classifications. Here, two high vulnerability classes were clearly identified: high1 and high2 classes. High1 class (102 cases or 12.2% of female ECCs) contained classifications displaying traits of both high global and income vulnerability while high2 class classifications (67 of 8% of female ECCs) had higher global vulnerability levels compared to income ones. Again, Non-European and Aboriginal groups were over-represented in these classes compared to European ones. The third class (642 or 76.9% of cases) was that of Medium-Low vulnerability and had a larger representation of British, French, and European-related ECCs. The fourth female ECC class (24 cases or 2.9% of cases) identified was a very peculiar one, comprising Non-European ECCs that displayed lower levels of vulnerability.

TABLE 3: LCA RESULTS: GOODNESS OF FIT TESTS AND CLASSIFICATION RESULTS

	LOG	AIC	BIC ADJUSTED	ENTROPY	LMR TEST	SIG
Males						
Two classes	-1733.2	3480.2	3491.1	.997	11512.2	.00
Three Classes	-1651.8	3325.5	3398.9	.963	154.9	.25
Females						
Two classes	-1661.1	3336.1	3346.6	.999	1348.3	.00
Three Classes	-1543.2	3106.4	3121.9	.972	224.5	.00
Four classes	-1468.5	2963.1	3024.6	.976	142.2	.01
Five classes	-1429.9	2881.9	2906.8	.973	83.1	.06

TABLE 4: OPTIMAL SOLUTIONS OF LATENT CLASS MODELS: DISTRIBUTION BY BROAD ETHNIC ORIGINS OF ECCs

ECC GROUP	MALES			FEMALES				
	HIGH CLASS	LOW CLASS	TOTAL	HIGH1	HIGH2	MEDIUM-LOW	LOW	TOTAL
Canadian	1.0%	0.7%	0.7%	2.0%	0.0%	0.5%	0.0%	0.6%
British	1.0%	10.0%	8.9%	0.0%	0.0%	11.4%	0.0%	8.7%
French	0.0%	4.4%	3.9%	2.0%	0.0%	4.8%	0.0%	4.0%
Aboriginal	4.0%	2.9%	3.0%	7.8%	4.5%	2.8%	0.0%	3.5%
European	35.6%	42.3%	41.5%	37.3%	1.5%	47.8%	0.0%	41.4%
Non-European	58.4%	37.6%	40.2%	50.0%	94.0%	30.4%	100.0%	39.9%
Other	0.0%	2.1%	1.8%	1.0%	0.0%	2.3%	0.0%	1.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
N	101	723	824	102	67	642	24	835
Percentage	12.3%	87.7%	100.0%	12.2%	8.0%	76.9%	2.9%	100.0%

Principal Components Analysis

Principal Components Analysis (PCA) was applied to the male and female ECC correlation matrices. PCA reduces data to a number of variables that progressively explain the total variation in the data (Jolliffe 1986; Skrondal and Rabe-Hesketh 2004). The objective of PCA is to take the original variables and find combinations of these to produce indices or new variables. These new variables, named principal components, are uncorrelated in order of their importance in explaining the total variation in the data. The number of components is typically chosen to be equal to the number of eigenvalues that are larger than one (Kaiser-Guttman criterion). Due to the mathematical property of “orthogonality” (at right angles) present in the principal components, ECCs may be located on principal component space based on the prior knowledge of their average component scores.

The best results of PCA are obtained when the original variables are highly correlated, either positively or negatively. If this is the case, original variables can be adequately represented by two major principal components. The varimax rotated component loadings, which are obtained by maximizing column differences in the component matrix for these major components, are presented in Table 5.

The first principal component of the male ECCs (which accounted for 44.7% of the variance) represented a wide range of negative labour market outcomes, which ranged from high unemployment to high poverty risks. The variables that loaded highly and positively with this component were *urate* (.68), *pernoinc* (.81), *govtrans* (.73), and *blico* (.46). Strong negative loadings of this component were found for *prate* (-.83), *erate* (-.94), *mincfull* (-.49), and *mwages* (-.54). This dimension represents, thus, a global dimension of vulnerability. A similar and even stronger first component was found

in the female ECC sample (accounting for more than half of the variance or 53.2%). The indicators that displayed the highest positive and negative loadings here were pernoinc (.91), prate (-.92), and erate (-.97). The manual occupations indicator seem also to have a moderate loading (.32), with the first overall component of vulnerability among female ECCs. The weakest indicator of the first component in both male and female ECCs was the part-time one (.18 for males and .14 for females).

The second principal component (which accounted for a further 20.5% of the total variance in the male sample and 19.8% in the female one) contrasted income vulnerability to other manifestations of vulnerability. Indicators that loaded negatively with this component were mincfull and mwages (-.72 and -.64 among males and -.96 and -.90 among females). The part-time indicator also displayed moderate associations with this second component (.42 among males and .62 female ECCs).

TABLE 5: PCA RESULTS: ROTATED COMPONENT LOADINGS AND SIGNIFICANCE TESTS

VARIMAX ROTATED LOADINGS	MALES		FEMALES		CFA T RATIOS FOR LOADINGS OF GLOBAL VULNERABILITY COMPONENT	
	GLOBAL VULNERABILITY COMPONENT	INCOME VULNERABILITY COMPONENT	GLOBAL VULNERABILITY COMPONENT	INCOME VULNERABILITY COMPONENT	MALES	FEMALES
VULNERABILITY INDICATORS						
prate	-0.83	-0.06	-0.92	-0.19	-23.7	-35.2
erate	-0.94	-0.02	-0.97	-0.20	-11.4	-10.2
urate	0.68	-0.07	0.67	0.16	Reference	Reference
manocc	-0.04	-0.21	0.32	0.17	3.3	11.5
epart	0.18	0.42	0.14	0.62	-3.3	-7.5
selfemp	0.09	0.51	-0.13	-0.20	-2.8	-8.3
mincfull	-0.49	-0.72	-0.20	-0.96	-11.3	-11.4
mwages	-0.54	-0.64	-0.30	-0.90	-9.9	-7.7
pernoinc	0.81	0.27	0.91	0.15	17.0	21.7
govtrans	0.73	0.18	0.79	0.28	20.3	24.0
blico	0.46	0.22	0.62	0.18	12.2	16.1
eigenvalues	4.92	2.25	5.86	2.18		
% Variance explained	44.7%	20.5%	53.2%	19.8%		

To verify the presence of these two major components in the data structure, a confirmatory component analysis was undertaken revealing that all factor loadings for male and female models were significant at the .01 level. Significant critical ratios (t ratios) for the first component results are also presented in the same table.

Based on the information contained in the average component scores,⁵ it was possible to approximate geometrical position of ECCs in 2-dimensional Euclidean space. Scatterplots of Chart 1 and 2 present the positions of the male and female ECCs. This space is divided into four quadrants (I=++, II=-+, III=-- and IV=+-). Of particular interest are groups placed in the first quadrant and fourth quadrants as these scored the highest average scores in the major principal components extracted from the correlation matrices.

The male ECC scatterplot of Chart 1 clearly shows a major cluster of classifications displaying the highest scores in the global vulnerability dimensions (inside circle). The rightmost cluster comprises ECCs of Somalian, Afghani, Colombian, Iraqi, Korean, Bangladeshi, Thai, Albanian, and Arab classifications. These displayed the highest average component scores in the vulnerability dimension and were quite distinct from the remaining classifications (above 93% of all male classifications). It is also evident here that the Arab ECCs displayed characteristics of higher income vulnerability compared to the others. These classifications clearly reflect a cluster of economically vulnerable ethnic sub-populations. In the female scatterplot of Chart 2, the ECC corresponding to Somali women constituted an outlier cluster by itself (above 99% of all female classifications). A second female cluster was also visible in the

⁵ A component score is a numerical value that indicates a unit's relative spacing or standing on a latent dimension tapping some attributes. They are normally scales distributed with a mean of 0 and variance 1.

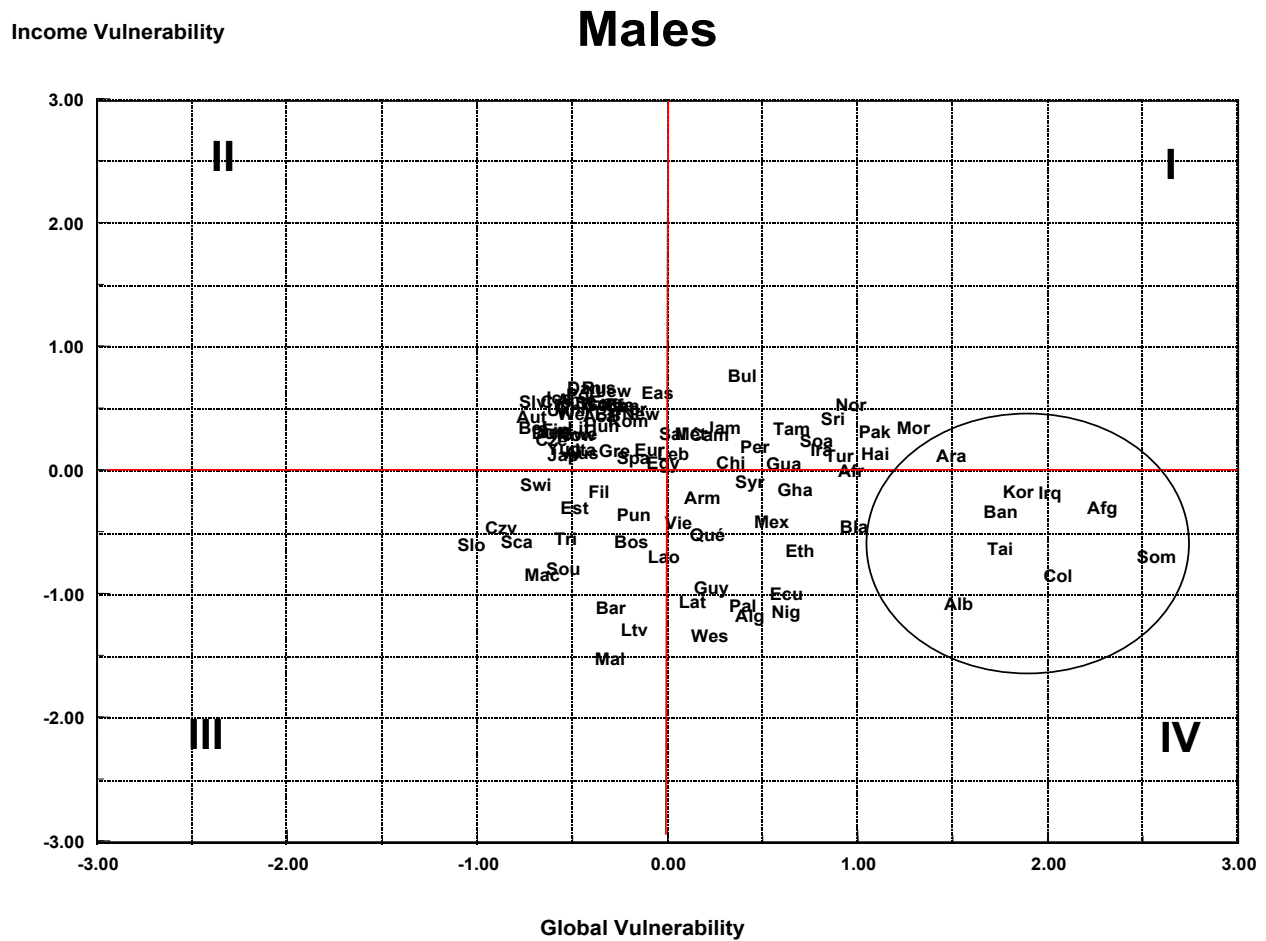
scatterplot, made-up of Pakistani, Bangladeshi, Afghani, Korean, Arab, Thai, and North American Indian classifications of women. All these classifications obtained average scores that ranked above 99% of the female cases. Here, the Pakistani and North American Indian women ECCs clearly displayed attributes of both global and income vulnerability.

Average component scores for each of the 15 CMAs were also calculated. In the overall vulnerability dimension, male classifications pertaining to residents in Montréal and Toronto were found to be significantly higher than the average score of 0. For male ECCs, this score was +1.09 or higher than 84% of all male cases. The corresponding score for females was +.96 for female ECCs or higher than 73% of all female ECCs. ECCs of Toronto residents were more prone to display high scores on the second component measuring income vulnerability. The corresponding component scores were +.51 and +.59 for male and female ECCs respectively (above 69% and 72% of the cases in their respective samples). These findings suggest that these two metropolitan centres may hold the most economically vulnerable populations of the country.

Although the distribution of ECCs corresponding to the most vulnerable groups varied across cities and genders, there were some ethnic group classifications that ranked within the top five highest levels of global vulnerability (see Table 6). Among both male and female classifications, Somali, Afghan and Korean ECCs ranked among the highest scores in all 15 CMAs considered. Other classifications that ranked at high levels were Colombian and Iraqi among male ECCs as well as Pakistani and Bangladeshi among females. Somali classifications scored the highest and second-highest averages in Toronto and Ottawa-Gatineau. Afghani ECCs were found among the most vulnerable in cities such as Montréal, Toronto, Edmonton, and Vancouver. The high city-wide scores of Colombian classifications were explained by their highest averages

(males and females ECCs) in Quebec city. Korean ECCs were found ranking at top levels in cities such as Edmonton, Vancouver, and Victoria. The generic Arab n.i.e. (not identified elsewhere) was one of the most frequently found among the cities examined and topped the rankings in the city of Halifax. Finally, as expected, ECCs containing Aboriginal members identified as North American Indians displayed the highest vulnerability scores in places such as Regina and Saskatoon but also showed their presence in the city of Moncton.

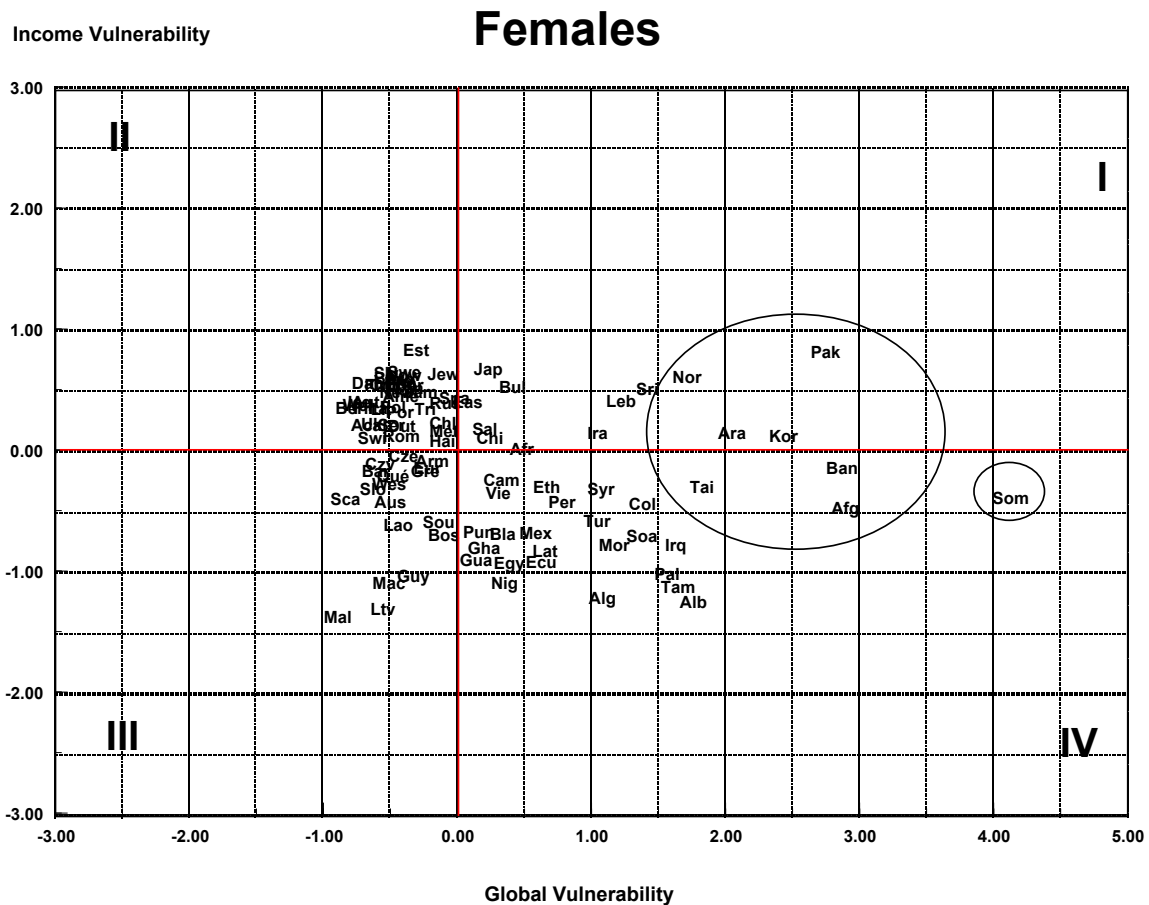
CHART 1: MALE ECCs POSITIONS IN PRINCIPAL COMPONENT SPACE



Component Scores: .00=Average, +.50=equal or above 69% of cases, +1.00=equal or above 84% of cases, +1.50= equal or above 93% of cases, +2.00=equal or above 97% of cases, +2.50=equal or above 99% of cases.

Symbols; Acadian (Aca), Afghan (Afg), African (Afr), Albanian (Alb), Algerian (Alg), American (Ame), Arab(Ara), Armenian (Arm), Australian (Aus), Austrian (Aut), Bangladeshi (Ban), Barbadian (Bar), Belgian (Bel), Black (Bla), Bosnian (Bos), British Isles (Bri), Bulgarian (Bul), Cambodian (Cam), Canadian (Can), Chilean (Chl), Chinese (Chi), Colombian (Col), Croatian (Cro), Czech (Cze), Czechoslovakian (Czv), Danish (Dan), Dutch (Du), East Indian (Eas), Ecuadorian (Ecu), Egyptian (Egy), English (Eng), Estonian (Est), Ethiopian (Ethi), European (Eur), Filipino (Fil), Finnish (Fin), French (Fre), German (Ger), Ghanaian (Gha), Greek (Gre), Guatemalan (Gua), Guyanese (Guy), Haitian (Hai), Hungarian (Hun), Icelandic (Ice), Iranian (Ira), Iraqi (Irq), Irish (Iri), Italian (Ita), Jamaican (Jam), Japanese (Jap), Jewish (Jew), Korean (Kor), Laotian (Lao), Latin American (Lat), Latvian (Ltv), Lebanese (Leb), Lithuanian (Lit), Macedonian (Mac), Maltese (Mal), Mexican (Mex), Moroccan (Mor), Métis (Met), Newfoundlander (New), Nigerian (Nig), North American Indian (Nor), Norwegian (Now), Pakistani (Pak), Palestinian (Pal), Peruvian (Per), Polish (Pol), Portuguese (Por), Punjabi (Pun), Québécois (Que), Romanian (Rom), Russian (Rus), Salvadorean (Sal), Scandinavian (Sca), Scottish (Sco), Serbian (Ser), Slovak (Slo), Slovenian (Slv), Somali (Som), South African (Sou), South Asian (Soa), Spanish (Spa), Sri Lankan (Sri), Swedish (Swe), Swiss (Swi), Syrian (Syr), Taiwanese (Tai), Tamil Tam), Trinidadian/Tobagonian (Tri), Turk (Tur), Ukrainian (Ukr), Vietnamese (Vie), Welsh (Wel), West Indian (Wes), Yugoslavian (Yug).

CHART 2: FEMALE ECCs POSITIONS IN PRINCIPAL COMPONENT SPACE



Component Scores: .00=Average, +.50=equal or above 69% of cases, +1.00=equal or above 84% of cases, +1.50= equal or above 93% of cases, +2.00=equal or above 97% of cases, +2.50=equal or above 99% of cases.

Symbols: Acadian (Aca), Afghan (Afg), African (Afr), Albanian (Alb), Algerian (Alg), American (Ame), Arab (Ara), Armenian (Arm), Australian (Aus), Austrian (Aut), Bangladeshi (Ban), Barbadian (Bar), Belgian (Bel), Black (Bla), Bosnian (Bos), British Isles (Bri), Bulgarian (Bul), Cambodian (Cam), Canadian (Can), Chilean (Chl), Chinese (Chi), Colombian (Col), Croatian (Cro), Czech (Cze), Czechoslovakian (Czv), Danish (Dan), Dutch (Du), East Indian (Eas), Ecuadorian (Ecu), Egyptian (Egy), English (Eng), Estonian (Est), Ethiopian (Ethi), European (Eur), Filipino (Fil), Finnish (Fin), French (Fre), German (Ger), Ghanaian (Gha), Greek (Gre), Guatemalan (Gua), Guyanese (Guy), Haitian (Hai), Hungarian (Hun), Icelandic (Ice), Iranian (Ira), Iraqi (Irq), Irish (Iri), Italian (Ita), Jamaican (Jam), Japanese (Jap), Jewish (Jew), Korean (Kor), Laotian (Lao), Latin American (Lat), Latvian (Ltv), Lebanese (Leb), Lithuanian (Lit), Macedonian (Mac), Maltese (Mal), Mexican (Mex), Moroccan (Mor), Métis (Met), Newfoundlander (New), Nigerian (Nig), North American Indian (Nor), Norwegian (Now), Pakistani (Pak), Palestinian (Pal), Peruvian (Per), Polish (Pol), Portuguese (Por), Punjabi (Pun), Québécois (Que), Romanian (Rom), Russian (Rus), Salvadorean (Sal), Scandinavian (Sca), Scottish (Sco), Serbian (Ser), Slovak (Slo), Slovenian (Slv), Somali (Som), South African (Sou), South Asian (Soa), Spanish (Spa), Sri Lankan (Sri), Swedish (Swe), Swiss (Swi), Syrian (Syr), Taiwanese (Tai), Tamil (Tam), Trinidadian/Tobagonian (Tri), Turk (Tur), Ukrainian (Ukr), Vietnamese (Vie), Welsh (Wel), West Indian (Wes), Yugoslavian (Yug).

TABLE 6: HIGHEST GLOBAL VULNERABILITY SCORES* BY CMA OF RESIDENCE AND GENDER

HALIFAX MALES		HALIFAX FEMALES		MONCTON MALES		MONCTON FEMALES	
Arab, n.i.e.	1.46	Arab, n.i.e.	2.47	British n.i.e.	1.56		
		Egyptian	1.94	NA Indian	1.41		
MONTRÉAL MALES		MONTRÉAL FEMALES		QUÉBEC MALES		QUÉBEC FEMALES	
Bangladeshi	4.79	Bangladeshi	5.15	Colombian	7.59	Colombian	2.24
Afghan	4.30	Pakistani	4.75	African, n.i.e.	3.21	Moroccan	1.35
Pakistani	4.11	Afghan	4.40	Moroccan	2.15		
Somali	3.55	Sri Lankan	3.82				
Arab, n.i.e.	3.51	South Asian, n.i.e.	3.62				
OTTAWA-GATINEAU MALES		OTTAWA-GATINEAU FEMALES		TORONTO MALES		TORONTO FEMALES	
Afghan	4.55	Afghan	4.2	Somali	3.46	Somali	4.82
Somali	3.33	Somali	3.97	Afghan	3.03	Afghan	4.14
Iraqi	3.05	Arab, n.i.e.	2.99	Korean	1.74	Pakistani	3.26
Arab, n.i.e.	2.08	Iraqi	2.71	Iraqi	1.74	Bangladeshi	2.79
Black	1.91	Palestinian	2.28	Bangladeshi	1.63	Korean	2.30
HAMILTON MALES		HAMILTON FEMALES		WINNIPEG MALES		WINNIPEG FEMALES	
Iraqi	2.35	Pakistani	3.17	Korean	2.82	Korean	2.81
Arab, n.i.e.	2.32	Korean	2.86	NA Indian	2.39	NA Indian	1.63
Pakistani	1.88	Arab, n.i.e.	2.45	Arab, n.i.e.	2.37		
NA Indian	1.25	Albanian	2.00				
Korean	1.24	Afghan	1.91				
REGINA MALES		REGINA FEMALES		SASKATOON MALES		SASKATOON FEMALES	
NA Indian	2.64	NA Indian	2.26	NA Indian	3.00	NA Indian	2.72
Chinese	1.06						
MALES CALGARY		FEMALES CALGARY		EDMONTON MALES		EDMONTON FEMALES	
Iraqi	1.85	Pakistani	3.42	Korean	1.94	Somali	4.93
Albanian	1.64	Korean	2.41	Afghan	1.81	Korean	2.18
Korean	1.30	Lebanese	2.09	Somali	1.51	Afghan	2.11
		Iraqi	1.21	South Asian, n.i.e.	1.40	Lebanese	1.72
		Arab, n.i.e.	1.16			Arab, n.i.e.	1.37
VANCOUVER MALES		VANCOUVER FEMALES		VICTORIA MALES		VICTORIA FEMALES	
Taiwanese	3.52	Korean	3.25	Korean	1.22	Korean	2.18
Korean	2.92	Taiwanese	2.91				
Afghan	1.89	Somali	2.78				
Iranian	1.37	Afghan	2.62				
North American Indian	1.26	Pakistani	1.95				
ALL 15 CMAs MALES				ALL 15 CMAs FEMALES			
Somali	2.57			Somali	4.12		
Afghan	2.28			Afghan	2.89		
Colombian	2.05			Bangladeshi	2.86		
Iraqi	2.01			Pakistani	2.76		
Korean	1.84			Korean	2.43		

*- Average Component Scores for top five ECCs scoring 1.00 or higher (above 84% of all cases)

Regression Analysis

The final phase of the data exploration involved investigating the effects of different generational composition,⁶ human capital, residential, and ethnic traits on the principal component scores of the global and income vulnerability dimensions. Using multivariate regressions, component scores were regressed on three types of covariates of economic vulnerability measured by the following indicators:

Socio-demographic:

- the percent of ECC members who were first generation individuals
- the percent of ECC members who were second generation individuals
- the percentage of ECC that knew neither of the official languages (English or French)
- the percentage of ECC members who were recent immigrants to Canada (5 years or less)
- the percentage of ECC members who had a university degree equivalent to a bachelor degree or higher
- the percentage of ECC members who were non-permanent residents

Residential:

- 14 residential dummy variables representing ECCs with residences in Calgary, Edmonton, Halifax, Hamilton, Moncton, Montréal, Ottawa-Gatineau, Québec, Regina, Saskatoon, St. John's, Vancouver, Victoria, and Winnipeg. Toronto residence was left out as the reference category.

⁶ Generation status indicates for the number of generations a person and his or her family have been in Canada and is derived from place of birth of respondent, place of birth of father, and place of birth of mother. First generation persons are those born outside Canada. Second generation persons are persons born inside Canada with at least one parent born outside Canada. Third generation includes persons born inside Canada with both parents born inside Canada.

Ethnic memberships:

- 6 broad ethnic origin dummy variables representing memberships in Canadian, French, Aboriginal, European, Non-European, and Other broad groups. Membership in British ethnic groups was left out as the comparison category.

Based on previous research undertaken in the subject area, it was anticipated that (a) first generation compositional characteristics and lack of official languages in the ECCs would be positively associated with higher global and income vulnerability scores; (b) higher amounts of human capital (i.e., higher percentage of individuals who had university education) would be negatively associated with the same scores; (c) the place of residence would have various effects on the probabilities of higher or lower component scores; and (d) memberships in ethnic classifications associated with Non-European ethnic and Aboriginal groups would be associated with a higher likelihood of occupying a vulnerable status in the metropolitan labour force.

Regression results of the prediction of component scores are presented in Table 7. In terms of the prediction of the component scores of global vulnerability for both male and female ECCs, positive and statistically significant coefficients were found for the percent lack of official language skills, percent recent immigrants, percent university degrees, and percent non-permanent residents. ECCs corresponding to residents in Montréal displayed significant higher average vulnerability scores compared to the reference category ($b = .94$ for males and $.83$ for females). Following the line of the previous sections' findings, net from other factors, membership in Aboriginal and Non-European categories were significantly associated with higher global vulnerability scores

(b's of .57 and .41 for the male and female Aboriginal ECCs, b's of .44 and .43 for the male and female Non-European ECCs.

The prediction results for the income vulnerability scores showed a different pattern of relationships than those for the global vulnerability scores. None of the socio-demographic predictors were found to be statistically significant in the regression equations. The regression coefficients representing residence in the Atlantic cities (Halifax, Moncton, and St. John's) and Winnipeg were found to be substantively higher than the reference category and also displayed statistical significance. In the case of the female prediction, membership not only in the Aboriginal and Non-European categories but also the Canadian one were found to be statistically significant ($b=99$).

TABLE 7: PREDICTION OF THE GLOBAL AND INCOME VULNERABILITY COMPONENT SCORES BY SELECTED COVARIATES

PREDICTORS	GLOBAL VULNERABILITY SCORE				INCOME VULNERABILITY SCORE			
	MALES		FEMALES		MALES		FEMALES	
	Co-EFFICIENT	PROB.	Co-EFFICIENT	PROB.	Co-EFFICIENT	PROB.	Co-EFFICIENT	PROB.
SOCIO-DEMOGRAPHIC								
% first generation	0.02	ns	0.04	ns	0.01	ns	0.01	ns
% second generation	0.00	ns	0.00	ns	0.01	ns	0.00	ns
% with no official language	0.08	**	0.07	**	-0.01	ns	-0.02	ns
% recent immigrants	0.03	*	0.02	*	-0.01	ns	0.02	ns
% with university education	-0.01	**	-0.01	**	0.00	ns	0.00	ns
% non-permanent residents	0.02	**	0.03	**	0.01	ns	0.01	ns
RESIDENTIAL								
Calgary	-0.51	**	-0.41	**	0.24	ns	0.39	**
Edmonton	-0.21	*	-0.24	*	0.32	*	0.61	**
Halifax	0.17	ns	-0.03	ns	1.03	**	1.02	**
Hamilton	-0.15	ns	-0.16	ns	-0.53	**	-0.75	**
Moncton	0.55	*	-0.26	ns	1.04	**	1.25	**
Montréal	0.94	**	0.83	**	0.20	**	0.28	*
Ottawa	0.30	**	0.03	ns	0.28	*	0.44	**
Quebec	0.44	**	0.08	ns	.11	**	.64	**
Regina	-0.25	ns	-0.63	**	0.89	**	0.91	**
St John's	0.61	**	0.15	ns	1.41	**	1.16	**
Vancouver	-0.07	ns	-0.03	ns	0.14	ns	0.18	ns
Victoria	0.09	ns	-0.02	ns	-0.69	**	-0.54	**
Winnipeg	-0.10	ns	-0.04	ns	0.89	**	0.54	**
BROAD ETHNIC ORIGINS								
Canadian	-0.19	ns	-0.22	ns	0.19	ns	0.99	*
French	-0.04	ns	-0.11	ns	0.14	ns	0.26	ns
Aboriginal	0.57	**	0.41	**	0.42	**	0.86	**
European	-0.11	ns	-0.11	ns	0.14	ns	0.28	*
Non-European	0.44	**	0.43	**	0.48	**	0.51	**
Other	-0.03	ns	0.02	ns	-0.12	ns	0.05	ns
CONSTANT	0.10	**	-0.81	**	-0.87	**	-1.55	**
ADJUSTED R ²	0.52		0.57		0.15		0.17	

Symbols: ns=non-significant coefficient, *significant coefficient at the .05 level, **significant coefficient at the .01 level

CONCLUSIONS

The main policy concern about the economically vulnerable segment of the Canadian labour force is that it appears to be not only quite substantial but also a long-term phenomenon. Vulnerable workers are typically characterized as having the least ability to influence the terms and conditions of their employment, while many remain, in practice, outside the reach of existing policy frameworks.

Notwithstanding the pitfalls of working with densely aggregated data such as the B2020 special interest table, which can lead to making assertions in danger of falling into ecological fallacy (error of reasoning committed by coming to conclusions about individuals based on data about aggregates), this exploratory multivariate analysis using 2006 Census data has revealed some interesting associational patterns in the attributes of census classifications pertaining to ethnic groups. These patterns allowed us to track their approximate positions in the major domains of economic vulnerability.

Overall, economic vulnerability levels were found to be substantially higher than average for classifications representing members of particular ethnic groups. Aboriginal (North American Indian) classifications topped the vulnerability ranks in cities such as Winnipeg, Regina, Saskatoon, and Moncton. In the other cities, classifications pertaining to visible minorities who were recent immigrants to Canada, those who had entered Canada as refugee class members, and/or those who had come from Arab/Muslim countries were frequently found at high vulnerability levels. The case of the Somali group is atypical as their members appear to be challenged on many economic fronts. It was consistently the most vulnerable of the ECC groups, ranking at top vulnerability levels in major gateway cities such as Montréal, Toronto, and Ottawa-

Gatineau. Racial/religious discrimination, little formal education, and difficulties in escaping from dependency on social assistance programs have been reported as factors accentuating the vulnerable status of this group (Kuscow 2006). For groups such as Bangladeshi and Pakistani, the concentration in low-skilled, low-paid jobs (particularly among female workers) has been singled out as a major factor impeding the improvement of their economic conditions (Naidoo 2003). The Afghan group has only a recent history in Canada and appears to struggle in Canadian labour markets. Colombian and Korean groups have members who often are highly educated but may have limited job market access due to foreign accreditation issues and other language difficulties (Kwak 2004).

This analysis also raises concerns about working-age women (who displayed higher vulnerability scores compared to men) and residents of both sexes in some metropolitan areas (e.g. Montreal and Toronto) of Somali, Pakistani, Bangladeshi, Iraqi, Afghan, Korean, and Aboriginal ethnic backgrounds. Workers such as these are likely to be poor and display a variety of social exclusionary outcomes such as human and social capital deficits, inadequate housing, restricted economic opportunities, some degree of social isolation, and the lack of capacity to generate new skills and sustained asset building (PRI 2005). They may often live in communities that are not conducive to a change in their socio-economic attributes. It is also suspected that, in determining these groups' vulnerability status, a variety of socio-economic, health and demographic correlates may be interacting with life events, occupational transitions, and household-related factors that together work to keep their disadvantaged position stable over time.

Systematic study of economic vulnerability patterns of ethnic groups illustrates the type of stratification process taking place in a variety of urban

contexts. It also helps in understanding how some members of the workforce of different ethnic backgrounds are adjusting to socio-economic conditions in local labour markets. The profiles of the most economically vulnerable ethnic groups in Canada need to be studied in order to get more insight into the factors that drive poor labour market and economic outcomes in metropolitan labour markets, and in turn, to better inform, design and carry out appropriate intervention programs. Studying these profiles over time and monitoring progress with respect to relevant indicators of economic integration requires collecting adequate survey and census data on their socio-economic status and developing appropriate methodologies for its measurement. The major challenge in this type of analysis relates to finding a way to derive vulnerability indicators that not only group individuals or communities that are vulnerable or not at any given point in time but also indicate how they can move beyond their current conditions.

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APPENDIX

TABLE A1: SAMPLE OF ETHNIC CENSUS CLASSIFICATIONS (PART 1)

ETHNICITY	ECCs	N			ETHNICITY	ECCs	N		
		TOTAL	FEMALES	MALES			TOTAL	FEMALES	MALES
Total	1,659	12,259.8	6,396.6						
Canadian		0.0							
Canadian	30	2,034.8	1,046.7	988.1					
British									
British, n.i.e.	28	112.6	59.5	53.1					
English	30	1,299.2	670.8	628.4					
Irish	30	929.1	498.5	430.6					
Scottish	30	976.3	509.0	467.4					
Welsh	28	100.8	53.7	47.1					
French									
Acadian	18	20.5	10.6	9.9					
French	30	1,089.2	560.3	528.9					
Québécois	8	43.5	20.7	22.8					
Aboriginal									
Métis	29	72.9	39.3	33.5					
NA Indian	30	181.5	100.8	80.7					
European									
Albanian	8	7.6	3.6	4.0					
Australian	11	7.2	3.3	3.9					
Austrian	24	49.5	25.5	23.9					
Belgian	26	35.9	18.6	17.3					
Bosnian	14	6.7	3.6	3.1					
Bulgarian	10	10.8	5.5	5.3					
Croatian	18	33.2	17.0	16.2					
Czech	22	25.2	13.0	12.2					
Czechoslovakian	15	7.5	4.0	3.6					
Danish	24	42.1	22.4	19.7					
Dutch	29	177.0	91.8	85.2					
Estonian	13	4.5	2.2	2.3					
European, n.i.e.	14	10.2	4.5	5.7					
					Non-European				
					Afghan	14	16.7	8.4	8.3
					African, n.i.e.	20	50.2	25.1	25.0
					Algerian	7	13.4	5.9	7.5
					Arab, n.i.e.	18	33.3	14.8	18.5
					Armenian	10	17.9	9.0	8.9
					Bangladeshi	7	10.8	4.9	5.8
					Barbadian	9	9.3	5.1	4.2
					Black	15	16.9	9.7	7.1
					Cambodian	11	8.1	4.4	3.7
					Chilean	13	12.9	6.6	6.3
					Chinese	28		317.6	276.1
					Colombian	14	15.0	8.2	6.8
					East Indian	24		200.4	191.8
					Ecuadorian	4	5.9	3.2	2.7
					Egyptian	15	20.4	9.8	10.6
					Ethiopian	14	11.1	5.6	5.6
					Filipino	22		117.1	74.6
					Ghanaian	8	8.7	4.6	4.0
					Guatemalan	7	5.3	2.7	2.7
					Guyanese	11	22.7	12.6	10.1
					Haitian	7	39.6	22.3	17.3
					Iranian	17	55.7	27.0	28.7
					Iraqi	12	9.7	4.5	5.1
					Jamaican	16	79.8	45.2	34.6
					Japanese	18	32.9	20.0	12.9
					Korean	18	59.7	33.3	26.3
					Laotian	10	6.2	3.1	3.1
					Latin, Central or South				
					American, n.i.e.	9	7.1	3.8	3.2
					Lebanese	17	53.1	25.2	28.0
					Mexican	16	18.6	10.5	8.2

TABLE A1: SAMPLE OF ETHNIC CENSUS CLASSIFICATIONS (PART 2)

ETHNICITY	ECCs	N TOTAL	N FEMALES	N MALES	ETHNICITY	ECCs	N TOTAL	N FEMALES	N MALES
<u>European</u>					<u>Non European</u>				
Finnish	20	22.6	12.1	10.5	Moroccan	8	19.9	9.1	10.9
German	30	626.1	326.5	299.6	Nigerian	8	6.3	2.9	3.4
Greek	22	82.1	40.8	41.3	Pakistani	15	48.3	23.3	25.1
Hungarian	24	75.4	39.5	35.9	Palestinian	11	7.5	3.4	4.1
Icelandic	17	20.2	10.4	9.9	Peruvian	7	9.5	5.2	4.3
Italian	27	428.2	214.4	213.8	Punjabi	13	20.0	9.8	10.2
Jewish	20	105.7	54.0	51.8	Salvadorean	16	19.4	9.5	9.8
Latvian	13	6.6	3.2	3.3	Somali	9	10.6	6.1	4.5
Lithuanian	15	12.7	6.7	6.0	South African	10	7.0	3.5	3.5
Macedonian	4	11.5	5.8	5.7	South Asian, n.i.e.	12	23.9	11.8	12.0
Maltese	6	8.5	4.2	4.2	Sri Lankan	8	45.8	22.3	23.5
Norwegian	25	88.7	47.7	41.0	Syrian	9	9.8	5.0	4.8
Polish	26	267.9	141.5	126.4	Taiwanese	6	7.0	4.0	3.0
Portuguese	22	139.3	70.9	68.4	Tamil	6	14.8	7.2	7.5
Romanian	25	68.3	35.7	32.6	Trinidadian/Tobagonian	16	21.4	11.9	9.5
Russian	25	144.2	76.9	67.3	Vietnamese	22	76.2	39.9	36.4
Scand, n.i.e.	13	7.4	3.4	4.0	West Indian	14	22.2	13.0	9.3
Serbian	16	24.8	12.4	12.4	<u>Other</u>				
Slovak	16	15.2	7.9	7.2	American	27	71.0	37.6	33.4
Slovenian	14	9.3	4.9	4.5	Newfoundlander	4	2.5	1.2	1.3
Spanish	24	119.3	66.2	53.1					
Swedish	24	70.4	38.8	31.6					
Swiss	25	26.1	13.3	12.9					
Turk	14	17.1	8.0	9.1					
Ukrainian	25	305.2	159.4	145.8					
Yugoslav, n.i.e.	16	15.5	8.0	7.5					

TABLE A2: AVERAGE VALUES OF ECONOMIC VULNERABILITY COVARIATES BY ECCs (PART 1)

ETHNICITY	% FIRST GEN-ERATION		% No KNOWLEDGE OF OFFICIAL LANGUAGES		% IMMI-GRANTS 5 YEARS OR LESS		% UNIVERSITY EDUCATION ABOVE BACHELOR CANADA		% POST SECONDARY DEGREES OUTSIDE CANADA	
	%	%	%	%	%	%	%	%	%	%
All ECCS	43.4	1.2	2.2	34.5	23.9	Non-European				
Canadian										
Canadian	2.1	0.0	0.3	22.3	2.2	Afghan	98.5	12.2	0.5	19.2
British						African, n.i.e.	72.1	0.3	2.1	27.6
British n.i.e.	12.4	0.0	2.4	36.5	6.1	Algerian	93.0	0.1	0.2	57.2
English	8.1	0.0	1.3	29.8	5.3	Arab, n.i.e.	89.3	2.4	1.5	45.2
Irish	5.4	0.0	0.9	30.1	4.0	Armenian	69.6	0.4	6.5	44.0
Scottish	5.5	0.0	1.0	31.5	3.9	Bangladeshi	98.9	1.6	0.2	53.1
Welsh	10.5	0.0	1.9	35.2	6.0	Barbadian	47.8	0.0	3.9	26.3
French						Black	50.2	1.1	2.8	17.2
Acadian	2.6	0.0	0.5	36.6	2.9	Cambodian	98.0	9.2	7.2	9.7
French	5.0	0.0	0.6	27.6	4.0	Chilean	82.7	1.7	11.0	24.7
Québécois	1.6	0.0	0.0	30.7	3.6	Chinese	79.3	6.1	2.2	48.5
Aboriginal						Colombian	93.1	9.6	1.0	49.3
Métis	0.9	0.0	0.1	17.7	1.5	East Indian	82.0	2.0	3.0	46.4
NA Indian	2.2	0.0	0.3	17.1	2.3	Ecuadorian	78.7	3.5	7.5	24.2
European						Egyptian	79.0	0.4	4.3	70.8
Albanian	92.4	4.4	0.7	35.2	73.5	Ethiopian	97.4	0.8	0.4	18.1
Australian	41.9	0.0	4.0	41.5	34.4	Filipino	88.9	0.1	1.4	36.4
Austrian	12.1	0.1	2.2	38.5	7.1	Ghanaian	90.4	0.7	1.4	25.2
Belgian	11.1	0.0	1.6	35.7	7.8	Guatemalan	92.9	3.1	3.1	10.8
Bosnian	92.9	3.6	0.9	23.2	61.6	Guyanese	62.1	0.0	4.7	25.2
Bulgarian	85.7	0.5	0.4	64.8	72.2	Haitian	71.5	0.2	5.8	27.2
Croatian	43.6	0.4	4.7	33.0	20.9	Iranian	94.5	1.1	1.3	53.6
Czech	29.3	0.1	2.6	38.6	17.2	Iraqi	94.7	3.5	2.0	37.6
Czechoslovak	11.5	0.0	2.0	29.4	6.3	Jamaican	65.1	0.0	3.6	19.7
Danish	12.4	0.0	2.4	33.0	8.2	Japanese	46.0	0.9	1.2	46.7
Dutch	12.9	0.0	2.2	29.7	8.1	Korean	92.7	6.5	2.6	58.2
Estonian	10.2	0.1	0.5	43.8	7.0	Laotian	95.6	4.0	10.4	8.7
Europe n.i.e.	24.3	0.3	1.7	40.3	15.2	Latin Am, n.i.e.	89.5	2.6	3.2	22.0
						Lebanese	63.2	0.9	2.3	34.2
						Mexican	82.6	4.1	1.3	43.1

TABLE A2: AVERAGE VALUES OF ECONOMIC VULNERABILITY COVARIATES BY ECCS (PART 2)

ETHNICITY	% GEN-ERATION	% FIRST GEN-ERATION	% NO KNOWLEDGE OF OFFICIAL LANGUAGES	% IMMI-GRANTS 5 YEARS OR LESS	% UNIVERSITY EDUCATION ABOVE BACHELOR	% POST SECONDARY DEGREES OUTSIDE CANADA	ETHNICITY	% GEN-ERATION	% FIRST GEN-ERATION	% NO KNOWLEDGE OF OFFICIAL LANGUAGES	% IMMI-GRANTS 5 YEARS OR LESS	% UNIVERSITY EDUCATION ABOVE BACHELOR	% POST SECONDARY DEGREES OUTSIDE CANADA
Non-European													
Finnish	11.9	0.1	2.1	35.9	8.1	86.8	Moroccan	86.8	0.1	2.5	48.2	48.0	
German	10.7	0.0	1.4	30.7	7.2	89.2	Nigerian	89.2	0.1	0.1	54.0	57.5	
Greek	26.3	0.4	3.4	33.5	10.0	89.7	Pakistani	89.7	3.5	2.6	47.7	64.7	
Hungarian	19.7	0.2	2.2	32.3	12.5	87.0	Palestinian	87.0	1.1	1.2	51.7	49.4	
Icelandic	3.4	0.0	0.4	34.4	3.7	91.6	Peruvian	91.6	2.3	1.9	33.6	54.6	
Italian	17.8	0.1	3.6	29.2	8.1	90.0	Punjabi	90.0	5.4	2.4	26.9	57.5	
Jewish	32.6	0.1	2.7	54.7	22.5	96.5	Salvadorean	96.5	2.5	1.7	10.7	30.7	
Latvian	19.0	0.0	3.0	50.1	12.1	98.6	Somali	98.6	3.6	0.1	12.8	31.1	
Lithuanian	21.2	0.0	1.5	45.8	17.0	67.7	South African	67.7	0.1	4.0	45.7	39.7	
Macedonian	44.1	0.3	6.2	28.9	21.1	91.1	South Asian, n.i.e.	91.1	3.0	2.0	41.1	59.9	
Maltese	18.1	0.0	3.6	26.5	5.0	96.3	Sri Lankan	96.3	4.0	1.3	23.4	45.7	
Norwegian	7.9	0.0	1.4	34.1	5.3	67.7	Syrian	67.7	0.7	2.8	48.5	39.8	
Polish	24.9	0.2	1.3	34.9	15.5	90.8	Taiwanese	90.8	7.4	2.1	59.2	50.3	
Portuguese	53.4	1.5	7.1	19.6	13.0	99.5	Tamil	99.5	3.3	0.1	28.4	50.5	
Romanian	45.3	0.5	0.6	46.3	35.4	49.7	Trinidadian/ Tobagonian	49.7	0.0	3.6	30.1	10.7	
Russian	29.0	0.3	1.2	42.9	24.9	84.7	Turk	84.7	3.0	2.9	40.3	51.7	
Scandinavian n.i.e.	10.0	0.0	1.3	29.6	7.3	94.6	Vietnamese	94.6	7.4	4.1	20.9	19.1	
Serbian	78.4	1.3	1.8	42.2	50.0	58.3	West Indian	58.3	0.1	4.6	21.2	10.0	
Slovak	33.9	0.4	1.8	42.8	22.0	Other	Other	Other	Other	Other	Other	Other	
Slovenian	22.9	0.0	3.8	40.0	11.0	21.2	American	21.2	0.0	2.4	37.1	12.2	
Spanish	66.1	1.0	2.8	36.1	38.7	1.3	Newfoundlander	1.3	0.0	0.0	33.0	3.8	
Swedish	10.5	0.0	1.1	35.3	8.1								
Swiss	20.5	0.0	1.8	41.1	13.7								
Ukrainian	11.3	0.2	0.5	34.9	11.0								
Yugoslav, n.i.e.	37.7	0.2	4.2	26.9	21.7								

