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**Pay Differences between the Government and Private Sectors:
Labour Force Survey and Census Estimates**

by

Morley Gunderson, Douglas Hyatt and Craig Riddell

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(Report to the Canadian Policy Research Network
Human Resources in Government Project)

By

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February, 2000

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Foreword

Governments in Canada have undergone a period of unprecedented change throughout the 1990s. External pressures and the need for fiscal restraint have led them to re-evaluate their services to the public and reduce the size of their workforces. This widespread restructuring has had tremendous human resource implications for governments, public sector unions, and for employees.

However, there has been little understanding of the nature and magnitude of the changes affecting government work and workers at the workplace level. To fill this information gap, CPRN initiated a large-scale project on Human Resource Issues in Government based on a research design that was jointly developed by Gordon Betcherman, Work Network Director at that time, and Anil Verma of the University of Toronto. The goal is to generate new applied knowledge that will help the federal and provincial governments and civil service unions redefine the strategies, policies, and procedures needed to transform the public service. The success of this transformation will depend on governments' ability to develop efficient and innovative workplaces and a healthy, motivated, and skilled workforce.

The research has been guided by an Advisory Committee that includes representatives of the sponsoring organizations as well as experts in the field, and I want to thank them for their advice and support. The sponsoring organizations include three federal agencies (Human Resources Development Canada, the Public Service Commission, and Treasury Board Secretariat), four provincial governments (Nova Scotia, Ontario, Manitoba, and Alberta) and the Public Service Alliance of Canada. A number of provincial government unions also participated in the research.

The research is designed to explore both macro and micro issues. The micro issues are addressed primarily through two large-scale surveys, one of managers responsible for units of between 5 and 100 people and the other of public service union representatives. Reports on these surveys will address technological change in the workplace, organizational change and human resource management innovation, work arrangements, and industrial relations issues. The surveys are complemented by four case studies which examine the way in which specific workplaces experienced the change of the past few years.

The macro studies describe how the environment shaping human resources in government is changing by providing a statistical profile of employment trends, an analysis of trends in labour-management relations, and this paper by Morley Gunderson, Doug Hyatt and Craig Riddell which examines pay differences between employees in the public and the private sectors. This detailed statistical analysis of trends in pay differences from 1971 to 1997 builds upon an earlier paper by Morley Gunderson that reviewed the literature on compensation issues. A list of all the publications and their release dates appears at the back of this paper.

Understanding how compensation in government compares to the private sector is a central policy issue at this time, as governments begin to focus on recruitment and retention of the key skills required to sustain an effective public service work force.

Gunderson, Hyatt and Riddell disentangle the effects of various factors that influence overall pay levels and present detailed results for the major occupational groups represented in government workforces, such as managers, professional/technical workers, clerical workers, and service workers. Findings are also reported separately for men and women. The results show that the answer to the question of whether there is a 'pay premium' associated with employment in government is far from a simple one. On one hand, some groups, such as senior managers and specialized occupational groups, such as information technology workers, are paid less than their private sector counterparts On the other hand, women in government, especially those employed in service jobs, such as food services, tend to be more highly paid than women in the private sector. It is clear that employment and pay equity policies, coupled with decades of collective bargaining, have narrowed the pay differentials between men and women and between the highest and lowest paid workers.

Compensation will be a major challenge in the years ahead, as governments address the issues of recruitment, retention, and being an 'employer of choice.' Because compensation cannot be the only tool used to attract and retain highly qualified workers in the public sector, government employers will also need to carefully consider human resource management practices that create an attractive and productive work environment

Judith Maxwell
President, CPRN Inc.

February 2000

Pay Differences Between the Government and Private Sectors: Labour Force Survey and Census Estimates

Morley Gunderson, Douglas Hyatt and Craig Riddell

Executive Summary

This report fills a gap in existing research on pay differences between government and private sector employees by analyzing in detail the current situation as well as historical trends. The report focuses on what economists refer to as a 'pay premium', which essentially refers to an average pay difference between employees in two sectors – government and the private sector – after taking into account a range of factors (other than industry) known to influence pay levels. By examining pay patterns within and between the government and private sectors, this report is intended to inform current discussions about responses to human resource management challenges within government, especially regarding workforce recruitment and retention.

The report provides estimates of government-private sector pay differences based on three large-scale micro data sources: (1) The 1997 Labour Force Survey, (2) the 1996 Census and (3) trends from the 1971, 1981 and 1991 Census public use files. While the Labour Force Survey and the Census are the most complete records of wage data by industry available in Canada, their relative strengths and weaknesses make neither data source entirely ideal for the task of addressing the complexities inherent in understanding the determinants of wage differences between industrial sectors. This report presents the most accurate estimates currently available, although readers should bear in mind the limitations of the data when interpreting the findings.

The 1997 Labour Force Survey (LFS) and the 1996 Census fill a gap in our knowledge by providing relatively current estimates of the public-private sector pay differences. They are complementary data sets in that the LFS has measures like collective agreement coverage, firm size, job tenure, hourly wages and a class-of-worker variable that designates whether the government is an employer. The census has measures of visible minority status, immigrant status, vocational training and language. However, the LFS and Census produce slightly different pay gap estimates, mainly because 1) the LFS results control for collective agreement coverage and 2) in the LFS, the government is identified as a separate employer, while in the Census, the public sector includes some private employers (for example, private schools and private hospitals).

Despite slight differences in the LFS and census estimates, they paint a fairly consistent current picture. The common thread of these results is that governments as employers tend to pay wage premiums whether they are in the public administration sector or in the broader public sector where private employers also exist. That is, government wages on average are estimated to be in the neighbourhood of 9 percent higher than in the private sector, with little difference across the three levels of government. If anything, this government pay 'premium' may be slightly lower at the federal level (8.5 percent) and slightly higher at the provincial level (10 percent), although there is

greater uncertainty about the federal premium (ranging from 7 percent in the LFS to 10 percent in the census). However, this overall pay gap masks considerable variation in the public-private pay gap when specific occupational groups are compared.

A combination of factors explains government-private sector pay differences. Notable in this regard are pay equity policies, which narrow the male-female pay differentials in government, and the tendency for governments to pay more than the private sector does for service jobs and less than the private sector wage rates for managers. In other words, the spread between the top and the bottom of the pay scale is less in government than in the private sector, likely a result of political, public and collective bargaining pressures.

In summary, while the evidence clearly shows that government employers pay a wage premium relative to private employers, that premium must be judged in light of the more egalitarian pay practices that seem to prevail in the public sector, especially with respect to women and less skilled workers where the premiums are usually largest. That may reflect political pressures as well as expectations that government should act as a "model employer," at least regarding compensation.

Summary of Labour Force Survey Results

- Across the different elements of the public sector, an overall government pay 'premium' of 7.6% prevails based on 1997 Labour Force Survey estimates, after accounting for the influence of other factors that could influence pay (including workers' characteristics such as age and education, occupation, and union membership). This reflects a stringent definition of the public sector requiring that the individual both be in a public sector industry designation and have a government as an employer, where the latter is defined here as being owned by the government, not just funded or controlled by the government.

- An estimated overall average 'premium' of 7.6% for government employees varies moderately within most subsectors of the public sector, from highs of 11.4% in provincial governments, 10.3% in local governments and 9.2% in transportation and communication, to around 7% in the federal government, education and religious and other organizations, to a low of less than 1% in the health sector.

- In the education and health sectors much of the government pay premium reflects the fact that government employers in these sectors tend to employ personnel in higher paying (and therefore more skilled) occupations.

- The government wage premium was typically about 50% higher (i.e., rising from 7.6% to 11% in the aggregate) when it also reflected the impact of collective bargaining (i.e., the impact of collective bargaining was not controlled for).

- The public sector wage premium is higher for females than for males in all elements of the public sector except for local governments where they are higher for males, and in provincial governments where they are very similar.

- Looking within each sector, occupational skill premiums are considerably smaller in the government sector (including the federal government) compared to the private sector. The pay premium for employees in the managerial/administrative/professional occupations compared to employees in service occupations is only 10% in the government sector compared to 41% in the private sector. Workers in clerical occupations earn 16% more than do workers in service occupations in the private sector, but they earn 9% less than do service workers in the government sector.

- Comparing across the two sectors, the public sector wage premium is very high for service occupations (especially in the three levels of government). Service workers include those in protective services, food and beverage preparation and other service occupations. The public sector wage premium for this group is a result of a large premium for women in service jobs in the government sector compared to the private sector, possibly reflecting the impact of pay equity in those low-status jobs.

- For clerical workers, the public sector pay premiums are modest, tending to be similar to the public sector pay premiums for all occupations, both for males and females.

- For managerial/administrative/ and professional employees the public sector wage premiums are slightly below the average of all occupations in federal and provincial government jobs, and substantially below average in local governments.

- Overall, the tendency to pay less than the private sector is most prominent for managers and especially male managers. This begs the question, however, as to whether the wage premium for male managers in the private sector compared to females and other occupations is justifiable if in fact that premium is a reflection of discrimination rather than of real differences in value. This issue poses a dilemma for governments as employers if they find they are unable to compete with the private sector for the kinds of skills it needs.

- There were large variations in the government wage premiums by gender and level of government, especially for professionals. More research is necessary to establish the reasons for this variation.

- Of particular note is the higher government pay for professionals, and especially male professionals, in the social sciences compared to the natural and physical sciences. The relatively higher pay for social scientists in government may reflect a much closer correspondence between their job requirements and their education than is found in the private sector, where such graduates are more likely to work in a wider range of non-social science jobs.

Summary of 1996 Census Results

- The analysis based on the 1996 census suggests that a government wage premium of about 10 percent exists at the federal level, and about 8.5 percent at the provincial and local levels. The public sector designation in the census uses the industry code designation,

making it less precise than the public sector definition available in the Labour Force Survey. Therefore, some employees will be categorized as being in the public sector even though they work for an organization that is privately owned. To the extent that this is the case, the average wage in those elements of the public sector that also contain some lower wage private sector workers will be biased downwards.

- A negative wage "premium" of 2.5 percent is found for the education sector compared to the whole of the private sector when Census data are used (the Census uses a broad definition of the public sector that includes private organizations not owned by governments). This premium is considerably smaller than the positive premium of 6.9 percent found using the LFS data (which is based on a narrower definition that requires government ownership). The difference between these two is mainly due to the private sector portion of the education sector in the census data, suggesting that private employers in the education sector pay considerably lower wages than do government employers. Again, this confirms the existence of a government pay premium even within a sector like education that has both private and government employers.

- Premiums of almost 12 percent are paid in the often-regulated sectors of transportation/communication and other utilities. Since there are numerous private employers in those sectors, this suggests that they may not be subject to the competitive pressures of conventional private sector employers who operate in a competitive and not regulated environment.

Summary of Historical Trends

The results from the 1971, 1981 and 1991 census give rise to the following conclusions subject to the data limitations discussed in the analysis:

- Overall, the historical census figures portray a picture of a moderate government pay premium that increased very slightly from 4.6 percent in 1971 to 5.5 percent in 1981, and more substantially to 8.5 percent by 1991. Although the more recent 1996 census figures are not directly comparable, they also suggest that the increasing trend continued into 1996, where the premium was about 9 percent.

- However, limitations of the historical census data make it difficult to determine the degree to which the changes would be influenced by other factors such as collective agreement coverage, firm size, narrowly-defined occupational distributions and increases in the technological intensity and overall skill requirements of government employment. Further, governments underwent a significant change in the composition of employment over this period. Very large numbers of lower-paying clerical positions were eliminated, while the share of employment in the higher-paying professional and managerial jobs increased. Government workforces have also aged more rapidly as a result of a 'hiring freeze' over much of this period. As a general rule, earnings rise with age, experience and tenure.

Questions for Further Research

Clearly there is room for further research in this important area. The above results raise a number of questions that merit further research:

- Why do low-wage clerical workers in the public sector get a small premium while other low-wage groups like service workers get a large public sector pay premium?

- Why do some levels of government appear to pay its male managers a small or even negative premium, while paying its male social scientists a large premium?

- Why are the public sector wage premiums so much larger in the education and especially health sector when there are no controls for differences in the occupational distribution, compared to other elements of the public sector where the results do not change much depending upon whether one controls for the occupational distribution?

- Why does the public sector pay premium appear to have increased since the 1970s, given the public sector restraint pressures that were going on over that period?

- To what extent do the public sector wage premiums reflect political pressures to be a "model employer" and not to emulate private sector compensation practices that could reflect such factors as discrimination and large wage disparities, and what are the consequences of this role?

- How would the analysis be affected by differences in non-wage aspects of compensation including pensions, fringe benefits, job security, bonuses and stock options?

Introduction

An earlier study[1] reviewed the existing literature and methodologies on pay differences between government and private sector employees, highlighting what we know and what we do not know in this area. It emphasized the need for more analysis of the current picture as well as historical trends. This report provides such evidence based on three large-scale micro data sources: (1) The 1997 Labour Force Survey, (3) the 1996 Census (based on special runs from the master file) and (3) trends from the 1971, 1981 and 1991 Census public use files.

For each of these components, the pros and cons of the data set are first described, as is the preparation of the data. The empirical results are then discussed, usually followed by a more detailed analysis of those results for different specifications or aggregations (e.g., with and without controlling for the impact of unions, for different occupations, for males and females). For each section, the results are also summarized, with an overall summary at the end of the report.

Analysis Based on the 1997 Labour Force Survey

The analysis in this section is based on the November 1997 Labour Force Survey (LFS). The pros and cons of the LFS for analyzing public-private sector wage differentials are first discussed, followed by an expanded discussion of the "class of worker" variable that designates whether the individual worked for a government employer. A descriptive picture is then portrayed of how workers who are employed by governments are distributed across various characteristics believed to influence their pay. The pure government wage premium that remains after controlling for a wide range of variables believed to influence pay is then presented for different sub-components of the public sector. This is followed by a discussion of the potential rationale for *not* controlling for differences in the occupational distribution and collective agreement coverage between the government and non-government sectors. The sensitivity of the results to such control variables is then presented for different levels of aggregation of government employment. This is followed by an analysis of the male-female wage differential and the occupational wage premium for different elements of the public sector. The public sector wage premium for separate occupation groups is then analyzed for the different elements of the public sector, separately for males and females.

Advantages and Disadvantages of the LFS for Analyzing Government –Nongovernment Pay

The LFS has a number of distinct advantages for the analysis of wage differentials between the public and private sectors:

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[1] Morley Gunderson. *Government Compensation: Issues and Options*, Human Resources in Government Series. Canadian Policy Research Networks. Discussion Paper W/03 (July 1998).

- It provides current information, being based on the Labour Force Survey, which is conducted on a monthly basis.

- The LFS is a "tried-and-true" survey, with a long history and with a well-established reputation within Statistics Canada and elsewhere.

- It has direct measure of hourly wages for the hourly paid. For persons paid by other time periods, an implied hourly wage figure can be calculated by dividing the pay by the usual hours worked in that pay period. This enables a measure of hourly wages to be used as the dependent variable, which therefore controls for differences in hours worked.

- Being based on a telephone interview with experienced interviewers, errors are less likely to be made compared to a survey sent to the respondent to fill in and return.

- The LFS has a wide range of conventional control variables to control for other factors that can influence wages. In addition to the usual demographic and human capital variables, it has measures of job tenure, coverage by a collective agreement, and firm size, that are not always available in conventional wage data sets.

- It has occupation codes at the more disaggregate 21 and 46 digit level, with the former also being capable of being aggregated to the 9 digit level.

- The LFS industry designations enable separating various components of the public sector: public administration (separating the federal, provincial, and local governments); broader public sector (to also include the separate sectors of education as well as health and welfare); and the broader public sector and regulated sectors (to also include the often regulated sectors of transportation, communication and utilities).

- Most importantly, and as detailed subsequently, the LFS has a "class of worker" variable that designates whether the employer is a government or privately owned enterprise. This can be important especially for many aspects of the broader public sector where both public and private employers can be involved.

    The Labour Force Survey also has a number of disadvantages for analyzing government – non- government pay differences:

- The wage and wage related data (e.g., job tenure, coverage by a collective agreement, and firm size) were only added to the LFS beginning January 1997, and hence cannot be used to capture changes over time. There is also the possibility that the newness of the measures could lead to the risk that the "kinks" have not been worked out, and the data have not been subject to considerable scrutiny through use.

- Being based on a monthly survey, measures like wages may be subject to some seasonal fluctuations, although different months can be aggregated.

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- Information is not available on some variables such as visible minority or Aboriginal person status or immigrant status, or for persons in the Yukon or Northwest Territories.

- The occupation designations are based on the 1980 Standard Occupation Coding which are slightly dated relative to the new 1991 SOC coding. Statistics Canada does plan to use the new 1991 SOC codes, and when this is done, the earlier files will also be recoded accordingly.

- The analysis is based on characteristics of the employees which need not correspond with the detailed job comparisons for specific occupations and levels that are conventionally used in the collective bargaining process.

Overall, we feel that the strengths vastly outweigh the weaknesses, and that the weaknesses do not fundamentally jeopardize conclusions that can be made on public-private sector wage differentials and their determinants. Furthermore, the LFS is an excellent complement to the Census data which we also use, and which tends to have strengths where the LFS is weak, and vice versa.

Government as Employer through the Class of Worker Distinction

The Labour Force Survey has the important feature that the class-of-worker variable denotes not only whether the worker is a paid employee or self-employed (as well as different categories of self-employment) but also whether the workers' employer is a government or a private sector organization. The respondent does not self-designate directly. Rather, the respondent simply indicates where they are employed. Statistics Canada then has an algorithm for designating the employer as either government owned or a privately owned enterprise.

The LFS class-of-worker distinction as used here is based on the narrow concept of "ownership" of the organization, while the National Accounts (NA) definition is based on the broader concept of "funding and control." This difference can be important for elements of the broader public sector like hospitals and universities where governments essentially fund the organization and perhaps control it through that funding. Under the LFS definition, about 60% of the hospital workers within the health and social service sector were classified as private because ownership was in the private sector. Under the NA definition, they are classified as public because funding and control are in the hands of the government. Similarly, employment in universities in the LFS was classified as in the private sector (because they are not owned by the government) but in the NA they were classified as in the public sector (because of funding and control). This means that the size of the public sector is smaller according to the LFS compared to the NA because the latter places organizations that are privately owned in the public sector if they are "funded and controlled" by the public sector. [2]

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[2] In January 1999, the LFS converted to the NA concept. Statistics Canada will revise their historical series back to 1976, with the estimated size of the public sector expected to increase by about 20% for that reason. The public use files, however, will not be revised, although the new ones will contain the more expansive definition of the public sector. Since these are not released through the Data Liberation Initiative until the full 12 months of data are available for the year, these data will not be available until early 2000.

The public sector designation as used here, therefore, reflects a narrow or "tight" concept of the public sector in that the individual not only is in a conventional public sector industry designation, but also is working for an employer that is owned by the government. Organizations that are funded and controlled by the government but not owned by the government are not included in the public sector designation of the LFS. Obviously this does not substantially affect the public sector industry designation of government or public administration (federal, provincial or local) since these are essentially government owned. However, it can affect the other elements of the broader public sector since they can have a mixture of government and private ownership.

The narrow LFS definition of the public sector does mean that some organizations in the broader public sectors of health, education and transportation/communication/ and utilities that are funded and controlled but not owned by the government are considered here as in the private sector. To the extent that there are public sector wage premiums or rents in these sectors, they will raise the "private" sector average wage and therefore reduce the government – nongovernment pay gap. The public-private wage gap as presented here may thereby be biased downwards and could be considered a conservative estimate of the gap for that reason.

The class-of-worker distinction as used here is in contrast to the Census analysis where the class of worker designation refers only to the distinction between paid employment and various categories of self-employment. A separate designation for government owned enterprises and private owned enterprises is not available. To the degree that the Census concept of the public sector also includes some private sector employers, and to the degree that "rents" emanate from the government as the employer, then the rents may be understated in the Census data since the public sector may include some private sector employers who pay according to competitive labour market conditions. Conversely, some of the conventional private sector groups may contain some persons who are employed in enterprises where the government is the employer, and who may pay wage premiums. In such circumstances, the Census data may tend to understate public sector pay premiums (mainly in the broader public sector), because both the public and private sectors contain mixtures of government and private employers. In essence, the pure premiums get diluted by this mixture.

Conventionally, the public sector is denoted only through the industry designation typically involving some combination of the following six industries: (1) federal administration, (2) provincial administration, (3) local administration, (4) education, (5) health and social services, and (6) transportation, communication and utilities. The first three correspond to the narrowest definition of the public sector -- government administration. The first five correspond to the definition of broad public sector, to also include education and health and social services. The full six correspond to the broad public and regulated sector to include the often-regulated transportation, communication and utilities industries.

For the narrowly defined public sector of public administration (federal, provincial, local) the class-of-worker distinction is not important since the government is the employer for virtually all employees (documented subsequently in Table 2). However, in the broader public sector the distinction is important because in the education sector the employer is a government for slightly

over 70 percent of the employees and a private organization for slightly under 30 percent of the employees. In the health and social service sector, the employer is a government for only 20 percent of the employees, and a private organization for 80 percent of the employees. In the often-regulated transportation, communication, utilities sector, the employer is a government for almost 30 percent of the employees and a private sector organization for slightly over 70 percent of the employees. In that vein, the ranking of the industries according to the extent to which the government is the employer is: government administration (100%); education (70%); and then a sharp drop to transportation, communication and utilities (30%); and health and social services (20%).

In our subsequent empirical work with the LFS we denote the pay premium as a government pay premium rather than simply a public sector pay premium since it is associated with the government as the employer. In discussing the workforces, however, we will retain the usual designation of public sector in reference to the different sectors, since government employment is usually confined to public administration at the federal, provincial or local levels.

Distribution of the Public and Private Sector Workforces

Before presenting the empirical results based on the wage equations, it is informative to provide some descriptive statistics. Table 1 indicates how each of the public and private sector workforces, respectively, are distributed across various groups that essentially are the independent variables used in the subsequent wage equations. The public and private distinction is based on the class-of-worker designation as to whether the employer was a government or a private sector organization.

While the overall paid workforce is 53 percent male and 47 percent female, the public sector is somewhat disproportionately female (53 percent) compared to 47 percent male, while the private sector is 46 percent female compared to 54 percent male.

The public sector is also disproportionately older as evidenced by the smaller portions in the younger age brackets and the larger portions in the older age brackets. The exception is for persons age 60 and over where the public sector proportions are slightly smaller, perhaps reflecting the earlier retirement programs of the public sector. Consistent with these age differences, the public sector is disproportionately "married" while the private sector is disproportionately "single" compared to the public sector.

The public sector is substantially more educated than is the private sector as evidenced by the larger proportions with a bachelor's degree and graduate degree in the public sector. The proportions working part-time are fairly similar, albeit slightly lower at 16 percent in the public sector compared to 19 percent in the private sector.

In addition to being older, workers in the public sector have considerably greater job security as evidenced by the substantially larger proportions with more than 10 years of tenure and especially with over 20 years of tenure. The proportion of employees with permanent jobs,

however, is slightly lower in the public sector compared to the private sector, largely because of the higher proportion of persons on contract work -- 8.6 percent in the public sector compared to 5.2 percent in the private sector.

Importantly, almost 80 percent of public sector workers are covered by a collective agreement, compared to slightly over 24 percent in the private sector. Alternatively stated, the overall collective agreement coverage of 34 percent of paid workers in Canada, is a weighted average of an almost 80 percent coverage rate in the 18 percent of the workforce that is in the public sector, and a much lower coverage rate of about 24 percent in the much larger private sector. When one considers that a number of employees are not eligible to be covered by a collective agreement (generally managerial employees), it is apparent that the vast majority of employees who could be covered by a collective agreement are covered in the public sector. Unionization and public sector employment go hand-in-hand in Canada.

Public sector workers are disproportionately employed in very large organizations of over 500 employees, while private sector workers are disproportionately employed in smaller establishments of fewer than 20 employees.

There is considerable variation in the extent to which the public and private sector workforces in Canada are distributed across the different provinces. For example, Newfoundland has 2.3 percent of the public sector workforce but only 1.4 percent of the private sector workforce. Alberta, in contrast, has 10.5 percent of the private sector workforce in Canada, but 9.2 percent of the public sector workforce. The three largest cities of Canada also have a disproportionate share of the countries' private sector workforce compared to its public sector workforce.

Notably, almost 60 percent of the public sector workforce in Canada are in managerial/ professional jobs, compared to 30 percent in the private sector. The distributions are fairly similar in the public and private sectors in clerical and service occupations, but they are much higher in sales and processing jobs in the private sector.

Distribution of Groups Across the Public and Private Sectors

The previous analysis portrayed how the public and private sector workforces were distributed across different groups (i.e., the distributions summed to 100 percent across the groups within each of the sectors). An alternative portrayal, provided in Table 2, is to indicate how the workforce in each of the groups is distributed across the public and private sectors (i.e., the distributions sum to 100 percent across the public and private sectors within each of the groups). This indicates the public sector workforce as a percentage of the total workforce of each province.

As indicated in Table 2, approximately 18 percent of the Canadian paid workforce is in public sector jobs where the government is the employer, with 82 percent being in private sector jobs where a private sector organization is the employer. That proportion, however, often differs considerably across different groups within the workforce. Comparing those proportions in each of the groups with the benchmark 18 - 82 split for the workforce as a whole highlights the extent to

which the proportion of each group's workforce that is in the public sector varies across the different groups.

The proportion in the public sector is slightly higher for females (20 percent) compared to males (16 percent). It is lower for younger workers, with only 6 percent of the younger workers under the age of 24 being in public sector jobs. Approximately, one-third of employees with a bachelor's or graduate degree is in the public sector, about twice the 18 percent of all employees who are in the public sector. Around 15 percent of part-time workers are in the public sector, compared to 18 percent of full-time workers.

The proportion of workers who are in the public sector rises substantially with tenure. Compared to the benchmark of 18 percent of the total workforce that is in the public sector, over one-third of the workforce with more than 20 years of tenure is in the public sector. Similarly, over 26 percent of workers on fixed-term contracts are in the public sector. Slightly over 40 percent of paid workers covered by a collective agreement are in the public sector, and 29 percent of workers in very large establishments of over 500 employees are in the public sector, even though that sector only constitutes 18 percent of the total paid workforce.

The proportion of the workforce in the public sector varies considerably by province, ranging from a high of 28 percent in Newfoundland, to a low of 16 percent in each of Alberta and Ontario. It is lower in each of the largest cities compared to the non-major cities.

The proportion of the workforce in the public sector varies dramatically by industry. Almost 30 percent of managerial and professional personnel are in the public sector, compared to the benchmark of 18 percent in the workforce as a whole. The proportions of the workforce that works in the public sector is very small in the primary and material handling occupations, and especially in processing and sales.

As discussed previously, virtually all workers in government administration have a government as their employer. Over 70 percent of employees in education have a government as their employer, but it drops to 29 percent in the regulated sector of transportation, communication and utilities and to 20 percent in the health and social service sector. The proportion drops to negligible amounts in the other industries, albeit 7 percent of the workforce in the finance/insurance/ and real estate sector have a government as their employer.

Overall, the picture that emerges is that the public sector workforce is disproportionately female (slightly), older, highly educated, long-tenured, engaged in contract work, covered by a collective agreement, employed in large establishments and in managerial and professional jobs.

Single Equation with Public Sector Industry Designations

Table 3 gives the results of estimating a single wage equation with different elements of the public sector designated by a series of public sector dummy variables given at the end of the table. All private sector industries are aggregated into the private sector omitted reference category.

Therefore, the coefficients on the public sector variables give the percent wage advantage (if positive) of being *both* in a public sector industry designation *and* having a government as an employer relative to having a private sector employer (irrespective of the industry designation), after controlling for the impact of other determinants of wages included in the analysis. Since the government wage premiums would only be considered reasonable if the effect of the control variables is considered reasonable, then the control variables are discussed first. As discussed subsequently, the results are similar whether the analysis is based on the aggregate 9 occupations or the more disaggregate 46 occupation groups; hence, the 9 occupation groups are used for ease of exposition.

The R-squared of 0.57 indicates that 57 percent of the variation in wages is explained by the variable used in the equation. This is quite high for cross-section studies where the individual is the unit of observations. In the following discussion, the statistical significance of the coefficients is seldom discussed since almost all are significant by conventional standards (i.e., t-values greater than 1.96).

The results for the control variables are reasonably in line with the theoretical expectations and the results of other studies. For example, males earn 17 percent more than females, even after controlling for the impact of a wide range of human capital variables and other factors believed to influence wages. Wages generally rise with age, even after controlling for tenure with the current employer.[3] For example, relative to persons in the 15-24 age bracket, wages are 15 percent higher for persons in the 25-29 bracket, peaking at around 27 percent higher for persons in the 45-49 and 50-54 brackets, and dropping off to 15 percent higher for persons in the 65-69 bracket.

Compared to the omitted reference category of single persons, wages are 7 percent higher for married persons, 2 percent higher for widowed persons and 5 percent higher for persons who are separated or divorced.

Higher wages are associated with each successive higher level of education. For example, relative to the omitted reference category of persons with elementary education or less, persons who graduate from high school earn 15 percent more, and persons who graduate from university earn 41 percent more. Hourly wages increase steadily with tenure with the current employer.

Persons who work full-time have hourly wages that are 8 percent higher than do persons who work part-time. Even after controlling for differences in human capital and other determinants of earnings, persons in non-standard jobs have lower earnings than persons in permanent jobs, although the differences are not that great. Specifically, relative to persons in permanent jobs, hourly wages are 5 percent lower in seasonal jobs, 2 percent lower in term contracts, and 2 percent lower in casual jobs.

After controlling for other determinants of wages, persons covered by a collective agreement earn 8 percent more than persons not covered, which is in the range of typical union

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[3] While age and tenure are obviously correlated, there is sufficient independent variation in our data to identify the separate effects of each.

impact measures in Canada. Wages rise consistently with establishment size, being 19 percent higher in establishments of 500 and more, compared to establishments of fewer than 20.

Wages vary considerably by region even after controlling for such factors as firm size and occupation and industry. Relative to the omitted reference category of British Columbia, wages are 9 percent lower in Ontario, 13 percent lower in Alberta, 16 percent lower in Quebec, around 20 percent lower in Manitoba and Saskatchewan, and around 30 percent lower in the Atlantic provinces. They are slightly higher in the major cities, but the magnitude is not large.

There is considerable variation in the occupational wage structure even after controlling for differences in human capital and other factors that influence wages. For example, relative to low-wage service jobs, wages are 37 percent higher in managerial and professional jobs and 33 percent higher in construction jobs. These differences, however, are muted by the fact that comparisons are being made here amongst persons in different occupations who have similar levels of education, experience etc.; obviously, the differences would be much greater if comparisons are made on a gross basis without controlling for the effect of these other determinants of wages.

The fact that the coefficients on the *control* variables are reasonably in line with theoretical expectations and the results of other studies adds credence to the results for the main variables of interest -- the public sector variables. As discussed previously, these variables involve a stringent definition of the public sector in that the individual must be in an industry designation that generally involves a public sector component, and their employer must be a government rather than a private sector enterprise.

The results indicate that workers in the different elements of the public sector and who have a government as an employer invariably earn more than workers in the private sector who have the same endowment of other wage determining characteristics. For the different levels of public administration, the pure government wage premium is 7 percent at the federal level, 11 percent at the provincial level and 10 percent at the local level. The premiums are smaller in the broader public sector, being 7 percent in the education sector and less than 1 percent (and statistically insignificant) in the health sector. In the regulated sector of transportation, communication and utilities, the premium is 9 percent, and it is 7 percent in other elements of the public sector.

Potential Rationale for Not Controlling for Occupation and Unionization

The conventional rationale for controlling for differences in the occupational status of the individual is that a person's occupation is an obvious determinant of their earnings; hence, it is important to control for such differences to isolate the pure public-private sector wage difference. As indicated previously when the distributions of the public and private sector workforces were discussed, the public sector is generally composed of persons in higher occupation levels; hence, some of the higher average pay in the public sector likely reflects those higher occupation levels. It is appropriate to control for such occupational differences if they are indicative of what is necessary to do the job. However, if some of the higher occupational status in the public sector were simply a mechanism whereby higher wages were paid, then it is not appropriate to control

for such occupational differences since they in fact are a source of the public sector rents. This is especially the case if underlying factors such as education are already controlled for. In such circumstances, it may be appropriate *not* to include any occupational categories in the wage equations. As indicated in Table 4, the 0 occupation controls corresponds to the situation where the occupation variable was omitted from the analysis so that there was no controlling for the effect on wages of differences in the occupational distribution between the public and private sectors.

This is analogous to the estimation of pure male-female wage differentials, when it is often argued that it is not appropriate to control for differences in the occupational distribution of males and females since the segregation of females into low paying jobs is often regarded as a source of discrimination, rather than a legitimate wage determining factor to be controlled for. As a practical matter, the male-female wage equations are often run with and without occupation controls, with the larger gap that exists without the controls sometimes being regarded as an upper bound on the pure male-female wage differential – a gap that includes the effect of occupational segregation as well as pure wage differentials within the same occupation.

It is likely more reasonable to regard differences in the occupational distribution of males and females as indicative of occupational segregation, than it is to regard the generally high occupational status of workers in the public sector as a mechanism for paying public sector wage premiums. The public sector is an industry that simply uses more professional, managerial and technical people and fewer low-wage service people, given the nature of the services provided. Nevertheless, persons in the public sector may be classified into higher level classifications as a way of paying higher wages,[4] thereby calling into question the desirability of *fully* controlling for differences in the occupational differences between the public and private sectors. While zero occupational controls may be an excessive way of accounting for this phenomenon, perhaps the use of the broader occupation groups as opposed to the finer levels may be a way of accounting for it.[5] Using a range of occupational controls can provide information on the extent to which is it potentially an issue.

A similar argument applies to the rationale for whether or not to control for differences in the degree of collective agreement coverage between the public and private sectors – a large difference as indicated previously. If unions are regarded as simply a source or mechanism for public sector wage premiums, then it is appropriate to not control for differences in the degree of unionization in estimating a pure-public private sector wage differential.

These arguments could apply to many of the control variables used in the analysis. If, for example, the higher levels of education of public sector workers was not an important ingredient for doing the job, but rather was simply a way of legitimising the payment of a public sector

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[4] It is also possible that the more elaborate bureaucratic career structures of the internal labour market of public organizations leads to more training and hence higher wages.
[5] This is one of the reasons for our use of the 9-occupation aggregate in our benchmark case. It also facilitates comparison with the occupation groups that are available in the census data. As well, the results are simpler to present than the more detailed occupation groups, and the results for our main variables of interest – the public sector variables – are not substantially affected by the occupation aggregation as discussed subsequently.

wage premium, then it would be appropriate not to control for differences in the education levels of workers in the public and private sector. The same could apply to the older age distribution of workers in the public sector, or their higher tenure.

Differences in the degree of collective agreement coverage and occupational distribution, however, are likely to be the more common mechanism whereby this phenomenon occurs, if it occurs at all. Hence, it is instructive to see how the pure public sector wage differential varies by the extent to which differences in the occupational distribution and the degree of collective agreement coverage are controlled for in the statistical analysis. This is done in Table 4.

Government Pay Premiums by Different Public Sector Aggregates, Occupation and Union Controls

Since the government wage premiums are the focus of this analysis, it is important to investigate the extent to which they are sensitive to the extent to which differences in the occupational distribution and the extent of coverage by a collective agreement are controlled for. Table 4 portrays the premiums for four different levels of aggregation for the occupation control variable: 46, 21, 9 and 0 occupation levels, as given respectively in columns 1 to 4. The top panel gives the conventional estimates, controlling for whether the person is covered by a collective agreement. The bottom panel gives the government wage premium when that control variable is omitted so that the public sector wage premium also captures the union wage premium. These results are presented for three different levels of aggregation of the public sector: (1) the *overall aggregate* of all components; (2) the three main aggregates of *public administration* (federal, provincial and local); the *quasi-public sector* (education, health and welfare); and the *regulated* sector (transportation, communication and utilities, and other elements of the public sector); (3) the *seven sub-aggregate* components as outlined above.

As a benchmark, the coefficients presented previously in Table 3 (based on the disaggregate 7 levels of the public sector, 9 occupation controls, and controlling for coverage by a collective agreement) are given in the third column, top panel, last segment of Table 4.

The top row indicates that the broadest definition of the public sector yields an overall public sector wage advantage of 7.6 to 9.5 percent depending upon the extent to which differences in the occupational distribution between the two sectors are controlled for. Even though this involves a broad definition of the public sector in that it includes the quasi-public sectors of education and health, as well as the regulated sectors, it does involve the stringent criteria that the employer is a government and not a private sector enterprise, as discussed previously. If the higher occupational status of persons in the public sector were a mechanism for paying higher wage premiums, the premium would be expected to increase as fewer occupation levels were controlled for (i.e., moving left to right). This generally does occur, although the difference is not large, going from 7.6% to 9.5% in the overall public sector. The change is likely small in part because it reflects the effect of occupational status *after* controlling for differences in education which is an important determinant of occupational status.

While the difference is not great in the aggregate, it differs substantially within the different sub-components of the public sector. As the comparison with our column 3 benchmark estimates indicates, there is not much difference in the public sector premiums at the federal or provincial level if the occupation variable is not controlled for or is controlled for through the use of 9 broad occupation aggregates (or the more disaggregate occupation groups). At the local level, the premium in fact goes down when there is no control for differences in the occupational distribution. In the education sector and especially the health sector, however, the difference is substantial, with a considerably higher wage premium paid when differences in the occupational distribution are not controlled for. Reasons for this large effect in the education and health sector merit further research. It may well be that government employees in the education and health sectors are in higher occupation levels (relative to their education and tenure) because such occupational qualifications are necessary to do the job – it need not be a mechanism for paying wage premiums. It is also important to emphasise that these comparisons of government employees in education and health are made with *all* private sector workers, not with just employees in the education and health sectors who do not have a government as their employer.

The comparison across the different sub-aggregates of the public sector also indicates that there is considerable variation in pure public-sector wage premiums across the different sectors. As indicated in the benchmark estimates of column 3, the aggregate public sector premium of 7.6% is a weighted average of premiums that range from less that 1% in health to over 11% in provincial government jobs. If the "outlier" of health is removed, however, then the range is much smaller, going from around 7 to 11%.

As the bottom panel indicates, not controlling for differences in the extent of coverage by a collective agreement does affect the results more substantially. Specifically, in the benchmark regressions with the 9 occupation controls, the overall aggregate public sector pay premium of 7.5% rises to 11% if differences in coverage by a collective agreement are not controlled for. In the federal public sector, the pure wage premium of 7% rises to 10% if differences in coverage by a collective agreement are not controlled for. This pattern of the wage premium being almost 50% higher if differences in collective agreement coverage are not controlled for prevails across most of the different components of the public sector and specifications. It highlights that a substantial portion of the wage gap between workers in the public and private sectors comes about because of the higher degree of unionization in the public sector and the fact that unions tend to increase wages.[6]

If unions are regarded as a mechanism whereby higher wages are paid to workers in the public sector, then the bottom panel is more indicative of the public-private sector wage gap. In contrast, if unions are regarded as an independent source of wage gains, then it is appropriate to control for differences in the degree of unionization between the public and private sectors, and the top panel gives the appropriate measure of the pure public sector wage premium, after controlling for the independent impact of unions. While the differences are large between the two panels, the fact remains that a public sector pay premium prevails even after controlling for the impact of the higher degree of unionization in the public sector.

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[6] Unions also have a variety of other effects, some of which may increase costs and some of which may reduce costs. They may improve working conditions, internal communications and even performance.

Gender and Occupational Wage Premiums in Government and Private Sectors

The previous analysis focused on government wage premiums for different levels of government and for different elements of the public sector. There is considerable interest, however, in how those premiums differ by such factors as occupation level and gender. For a variety of reasons governments are less likely to pay low wages at low levels in the occupational spectrum, or to pay the private sector wage to women since that private market norm may reflect discrimination (i.e., lower wages for the same productivity). Governments may be reluctant to pay women the private sector rate if they regard the private sector as underpaying women. At the higher end of the spectrum, political constraints may make it difficult for them to pay high salaries to higher level personnel, even if the failure to do so may lead to shortages of such personnel. Since they operate more under a political constraint than a profit maximizing constraint, they may find it easier to "live with" the shortages at the high end and the queues at the low end, rather than to pay competitive wages that are more common in the private sector. There may be a reluctance to emulate the growing wage polarization that is occurring in the private sector, and especially to match the top salaries in the private sector--salaries that have often been labelled as "obscenely" high, especially when bonuses and stock options are factored in (options that are not available in the public sector). In such circumstances, we would expect any government wage premium to be higher at the low end of the occupational distribution and for women, and smaller or even negative at the high end of the occupational distribution.

To examine this phenomenon, we contrast the occupational wage premiums, and the male-female wage differential in the private and public sectors. The small sample sizes of the Labour Force Survey (LFS) data preclude an extremely detailed analysis of this phenomenon by disaggregate occupation groups. For example, the government sector (federal, provincial and local public administration) has a sample size of 3,384, with 1,164 being in the federal government. Within the federal government, 23.9% of the sample is in clerical jobs, implying 278 observations, which is large enough for reasonably reliable estimates. However, only 1.8% of the federal sample is in reception work within the clerical group, and this implies only 21 observations, which is not large enough for reasonably reliable estimates.

As such, the coefficients are not reported for any of the sectors if the occupational group accounts for less then 1 percent of employment in the private sector. As well, figures for the government sector are not reported if they accounted for less then 1 percent of employment in that sector, and they are not reported for the federal sector if they account for less than 2 percent of employment in that sector. Furthermore, while the analysis can provide estimates of how the male-female wage differential differs between government and non-government employment, there are insufficient observations to disaggregate the occupational wage differentials separately for males and females. In essence, the sample sizes limit the extent to which disaggregations can be made by occupation, gender and level of government. In spite of these limitations, a fairly clear pattern emerges.

The more detailed analysis by occupation and gender will be limited to the private sector and the government sector (federal, provincial and local public administration). The broader public sectors of education and health as well as the often regulated sector of transportation,

communication and utilities are not included, in part because the government sector is the focus of the analysis, and in part because the education and health industries are extremely highly correlated with their occupational dimensions of, say, teachers and nursing or medical jobs.

Table 5 highlights how the male-female wage differential and the occupational wage premiums differ between the private sector and the government sector. The three broad occupation groups of service, clerical, and managerial/professional/administrative are utilized (with subsequent analysis indicating that these broad groups are representative of what also happens within these groups). The mean values indicate the proportion of workers in each of the private sector and the government sector who are in each of these broad occupation groups. In the government sector, for example (col. 2, panel 2), 22.4% of employees are in service jobs, 22% in clerical jobs and 45.4% in managerial/ professional/ administrative jobs, for a total of almost 90% being in these three main occupation groups. The remainder is in occupations not listed because they have so few observations, although these other occupation groups are included in the regression analysis.

The coefficients (as with the previous analysis) indicate the percentage wage gain (if positive) from being in that particular category relative to the omitted reference category. The coefficients are based on full wage regressions with all of the control variables as utilized previously in Table 3. The essential difference is that the wage regressions are now run separately for the private sector and for the government sector, so as to portray how the male-female wage gap and occupational pay differences differ between the private and government sectors. The results for those other variables are not reported here given the focus on the wage differences by occupation level and gender. The t-statistics are not reported since they are almost always significant at conventional levels.

The top panel is based on 9 occupation aggregates as used earlier in Table 3. After controlling for other determinants of wages, males earn 17.6 % more than females in the private sector, but only 13.8% more than females in the government sector, dropping to 9.3% more in the federal component of government within that government sector. A male-female wage gap still seems to prevail in the government sector even after controlling for the influence of other wage determining characteristics, but the gap is smaller in the government sector than in the private sector.

In the private sector, clerical workers receive 15.8% more than do service workers, and managerial, professional and administrative employees receive 40.6% more than do service workers, after controlling for the effect of the other variables included in the regression. In the government sector, however, clerical workers receive 9.4% less than do service workers, and managerial/professional/administrative employees receive only 10.3% more than do service workers. In essence, the occupational wage premium for managerial/professional/administrative jobs are clearly smaller in the government sector than in the private sector. As well, service jobs tend to be well paid relative to clerical jobs in the government sector compared to the private sector (or conversely clerical jobs tend to be poorly paid relative to service jobs in the government sector compared to the private sector). The picture in the federal government is fairly similar to that in the total government category.

In order to probe more deeply into the source of those occupational wage differences and to see if they are representative of sub-occupations within the broader aggregates, the analysis is repeated using the 21 more narrowly-defined occupation groups (third panel). At the 21 occupational group level, the service and clerical occupations are defined as in the previous 9 occupational group level; however, the managerial/administrative/professional category is broken down into seven sub-groups. The means and coefficients for the aggregate managerial/administrative/professional group as given in the previous panel for 9 occupational groups are repeated (in italics) for comparison purposes. Essentially, this enables a more disaggregate examination of the subgroups within the managerial/professional/administrative category. A fairly similar pattern prevails as existed in the aggregate data. Although not reported, the pattern of a much smaller male-female wage gap in the government sector prevails. A similar pattern for clerical workers also prevails; that is, clerical workers receive 16% more than do service workers in the private sector, but 9.2% less than do service workers in the government sector.[7] Similarly, the pattern of much higher wage premiums at higher occupation levels in the private sector compared to the government sector is evident in each of the subcomponents of the broad occupation grouping of managerial/professional/administrative jobs. Managers receive a premium of 44.9% relative to service workers in the private sector but only 12.4% in the government sector; professionals in the natural sciences receive a premium of 46.3% in the private sector but only 9.2% in the government sector; professionals in the social sciences receive a premium of 38.5% in the private sector but only 7.7% in the government sector. While the occupational wage premiums for the other occupation subgroups within the managerial/professional/ administrative groups are always higher in the private sector than in the government sector, strict comparisons here should not be made because of the small numbers in the government sector in these occupational categories (as indicated by the means). In essence, the pattern in the broad occupation groups of a substantially higher wage premium at the higher level being paid in the private sector relative to the government sector also prevails for more disaggregate occupations within those higher levels. As well, the pattern in the federal sector is fairly similar to that of the total government sector that also includes provincial and local governments.

An even more detailed analysis can be gleaned from using the narrowly defined 46 occupation groups (bottom panel), albeit here the problem of small sample sizes is obviously more relevant. Such an analysis essentially enables breaking down the clerical category into six subcomponents and the managerial/professional/administrative group into 16 subcomponents. The means and coefficients for their aggregate categories as reported in the second panel of the 9 occupational groupings is repeated, in italics, for comparison purposes.

As indicated in the top panel, the subcomponents of the clerical group pay higher wages relative to service workers in the private sector, and they pay lower wages than the service group in the government sector (and in the federal sector). This highlights that the aggregate picture of the clerical sector is representative of its subcomponents. Similarly, the bottom panel for the

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[7] Service workers include protective services, food and beverage preparation, lodging and accommodations and other service occupations. The actual tasks done by such workers may be different in the public and private sectors which could affect wages although the direction of any bias is not obvious.

subcomponents of the managerial/professional/administrative occupation groups are larger in the private sector than in the government sector, highlighting that the generalization of the private sector paying greater wage premiums to its high-level personnel applies to the subcomponents of the managerial/administrative/professional group.

Public Sector Wage Premiums by Occupation and Gender

The previous analysis of Table 5 reported the gender and occupational wage differences for the private sector compared to the government sector. This is informative since it tells us if the male-female wage differential and the skill premium are different in the government sector compared to the private sector.

A complementary perspective is provided in Table 6 which reports the wage premium for public sector workers compared to private sector workers, for select disaggregate occupation groups, for both sexes (top panel) and separately for males (middle panel) and for females (bottom panel). Two low-wage occupation groups are utilized (service workers and clerical workers) as is the higher-paid managerial/administrative/clerical group. These are at the level of aggregation of 9 occupations as reported earlier in Table 4. As indicated previously, these three groups constitute 90 percent of the workforce in the government sector (45% in managerial/administrative/professional, and about 22 % in each of service and clerical) with the "other category" making up the remaining 10 %. The more detailed occupation groups within these broad categories for clerical workers, and for managerial/ administrative/professional persons are listed previously in Table 5. For service workers, the subcategories include protective services, food and beverage preparation, lodging and accommodations, and other service occupations. The 10% of the government workforce in "other" occupations are in such jobs as sales, forestry, mining, processing, mechanics and repair, transport operators and material handling. The public sector wage premiums are calculated separately for each of the seven categories of the public sector as reported previously in Table 3 based on the aggregate figures for all occupations. For comparison purposes, those public sector premiums for all occupations are repeated in the top panel of column 1.

The results of Table 6, column 1, indicate that the public sector wage premium is higher for females than males in all elements of the public sector except for local governments where the public sector premium is 12.2% for males and only 5.9% for females (for provincial governments they are almost the same at 12.8% for males and 11.2% for females). For the federal government, the premium is 5.5% for males and 8.8% for females. In the health sector, the premium is 4.9% for females, and negative 14.2% for males.

Reasons for local governments (and to a lesser extent provincial governments) being an outlier in not paying a higher public sector wage premium to females compared to males are not obvious. It is possible that pay equity initiatives are not as strong at the local level, and that less formal compensation practices favour males. It is also possible that employers are more heterogeneous at the local level than at other levels, and hence they may respond more to local labour market conditions. More research would be needed to delineate the reasons for this

oddity, although the separate occupational analysis, discussed subsequently, provides some additional insights.

The separate results for the different occupation groups generally confirm the picture established previously based on the gender and occupation premiums presented in Table 5. Specifically, the public sector wage premiums are very high for service workers, and this tends to prevail across all seven elements of the public sector. They are especially high for employees in the three levels of government: 40 % premium at the federal level, 37% at the provincial level, and 34% at the local level. The separate results for males and females clearly illustrate that the high premiums for service workers are a result of high premiums for females (32% at the federal level, 30% at the provincial level and 18% at the local level). For males, the public sector wage premiums for service workers, at around 3%, are below the average for all occupations.

For clerical workers, the public sector wage premiums are modest, tending to be fairly similar to the average public sector premiums across all occupations. This is the case for both males and females.

For managerial/administrative and professional employees, the public sector wage premiums also tend to be modest and fairly close to the averages across all occupations. For all three levels of government, the public sector premiums are slightly below the average public sector premium in the federal and provincial jurisdictions, and substantially below the average public sector premium in local government.

For the "other" occupation groups (making up only about 10% of public employment), the public sector "premiums" are negative; that is, the public sector pays less than the private sector for otherwise similar workers. The difference is around 3-4% lower in the different levels of government, with all of that occurring because of the lower pay of males relative to their private sector counterparts. Females in these "other" occupations tend to get positive public sector wage premiums, with the magnitude being very large for females in the federal jurisdiction (31%). It is difficult to determine why this occurs because this "other" category is very heterogeneous consisting of very different occupations (e.g., sales, forestry, mining, processing, mechanics and repair, transport operators and material handling). As well, the small sample sizes do not permit a more detailed investigation. For example, as indicated previously in Table 5, 94% of the workforce was in service, clerical or managerial/administrative/technical jobs so that only 6% would be in the "other" category. Based on the federal sample of 1,164 persons, this implies only 70 persons in the federal jurisdiction in the "other" category.

Overall, the separate occupation results show that the public sector wage premium tends to be higher for females than males. It is highest for low-wage service workers, albeit only for females, not for males. It tends to be considerably lower, however, for low-wage clerical workers. The public sector premium tends to be lower for managerial/administrative/professional employees, although it is not much lower than the average across all occupations, except for local government employees.

This picture generally confirms the generalization that public sector premiums are higher at the low-wage level than the high wage level, and they are higher for females than males. Yet there are puzzles: why does the public sector not appear to pay its low-wage clerical workers a large premium as it seems to pay its low-wage service persons? What accounts for the large pay premium to females in the federal government in the "other" occupational groups?

One possible explanation is equal pay and pay equity policies, which are more prominent in the public sector than the private sector. They are a likely contributing factor to the higher public sector premium for women relative to men. They may also account for the larger public sector premium for women in service jobs compared to men in such jobs to the extent that the public sector is more prone to pay women in those jobs the same as men in those jobs (i.e., equal pay). This may not happen as much in the clerical jobs since those jobs tend to be extremely female-dominated, with male pay being drawn down to female pay more than vice versa. Similarly, with pay equity it may be more difficult to find male-dominated comparator groups of the same job evaluation "score" to compare with the female dominated clerical jobs, while such comparisons are easier to find for the service jobs.

While pay equity could be a contributing factor, more research on the direct impact of pay equity would be needed to sort out its precise contribution. It is also possible, as discussed previously, that the nature of work done by service workers and clerical workers is substantially different in the public and private sectors.

Probing the Managerial/Administrative/Professional Pattern

Table 7 provides an even more detailed analysis of the pattern of public sector wage premiums for subgroups within the more aggregate managerial/administrative/professional occupation group as presented earlier in Table 6. In essence, it takes the managerial/administrative/ professional subcategories that are most relevant to the government sector (that sector being the focus of our analysis) and breaks them into subgroups. The subgroups from the 21 occupational group level of disaggregation, with their sub-sub groups from the 49 occupational group level of disaggregation are:

- Managerial
  - Officials and administrators in government
  - Other managers and administrative
  - Management and administrative, related

- Natural and Physical Science Professionals in
  - Physical, life sciences
  - Math, statistics, systems analysts and related
  - Architects and engineers
  - Architectural and engineering related

- Social Science and Related Professionals

The other managerial/administrative/professional groups were not included here because they are occupations generally outside of core government, often in the broader public sector as with teaching and health related occupations. The results for all occupations and for the aggregate managerial/administrative/professional group are repeated from Table 6 onto Table 7 for comparison purposes.

As indicated in Table 7, when the managerial/administrative/professional group is broken down, there is considerable variation in the public sector pay premium for the three subgroups of managers, professionals in the natural sciences, and professionals in the social sciences. In the federal government, the public sector premium is very small (1.9%) for managers, and in fact is negative (-1.9%) for male managers, and positive (6.6%) for female managers. While positive for female managers, it is still less than the average premium of 8.8% paid to all females in all occupations in the federal government. In the federal government, the public sector pay premium is considerably larger for professionals in the natural and physical sciences (10.9%) and especially in the social sciences (16.7%), both of which are above the average premium across all occupations of 7% in the federal government. This high federal premium in the social sciences is exclusively the result of an extremely high premium for males in the social sciences (25.4%) with female social scientists receiving a more "normal" premium of 8.8%. These results suggest that the federal government pays considerably less than does the private sector for its managers, especially male managers, and pays considerably more for its scientists, notably its male social scientists. The lower pay of male managers results from a reluctance to pay high salaries for political reasons, but the considerable pay premium for male social scientists in the federal government relative to what they earn in the private sector is somewhat of a puzzle.

One plausible explanation is that professionals in the natural and physical sciences have numerous opportunities in the private sector and hence the government has a competitive norm against which to benchmark its own pay. It pays a "normal" premium of around 10 percent for such professionals. Professionals in the social sciences, however, have fewer private sector alternatives and hence their pay may be lower in the private sector compared to other professionals. Private sector employers will pay the lower competitive rate for such persons. But government employers may not follow such a competitive rate setting practice, but rather pay according to such factors as education qualifications. Professionals with a university degree are more likely to have similar pay in the public sector, whether the degree is an area where the private sector pays premiums (e.g., physical and natural sciences) or not (e.g., social sciences). In such circumstances, governments may not pay the lower competitive private sector rate for such professionals; hence, the large premium of around 17 percent for professionals in the social sciences. This is, however, only a plausible explanation, and it does not explain why this government premium is even larger for male social scientists (25%) compared to female social scientists (9%).

It is also possible, as discussed previously, that public-private differences in the detailed composition of this category may be part of this explanation. Governments are more likely to employ university graduates in social science disciplines such as economists, sociologists, statisticians, policy analysts and program managers. This is a clearer education - job fit, picked

up in the "social sciences" occupations category, than we would expect to find in the private sector, where graduates have a wider range of career paths (e.g. economists on Bay street, sociologists in marketing). More research is necessary, however, to try to uncover the explanation for this phenomenon of a large premium for male social scientists in the federal sector.

A similar pattern for male social scientists appears in provincial governments where they receive an even larger premium of 37.6%. For female social scientists the premium is essentially zero in provincial governments. For managers and professionals in the natural and physical sciences in the provincial governments, the premiums are more "normal" although they are low for female managers (4%).

For local governments, the premium for managers at 6% is somewhat below the average premium of 10% across all occupations in local government. In the professional groups, however, the "premiums" are negative and substantially so for females (-13.9% in the natural and physical sciences, and –18.2% in the social sciences). Again, this raises somewhat of a puzzle since there are no obvious reasons as to why females in the natural sciences and the social sciences in local governments should be paid so much less than their private sector counterparts when such lower wages are not prominent for other female occupations in local governments, or for such professional females in other elements of the public sector.

The unusual patterns that sometimes exist for the narrowly defined subgroups could simply reflect idiosyncrasies that may exist in the public sector since there are fewer competitive pressures to eliminate such idiosyncrasies. The public sector may be more willing to live with the queues or shortages that may be implied by such deviations from the competitive norm. More in-depth research would be necessary to uncover the reasons for such deviations when they exist.

As a generalization, the more disaggregated analysis within the managerial/ administrative/professional group suggests that the tendency to pay a lower public sector premium for higher level occupations is more prominent for managers, especially male managers. For example, the coefficients for male managers in each element of the public sector (with the exception of the health sector) were always less than the coefficients for all occupations. There were also many anomalies that do not have an obvious explanation such as the large public sector premium to male social scientists in the federal and provincial governments and the large negative "premiums" to female natural scientists and social scientists in local governments. The anomalies may simply reflect idiosyncratic compensation policies that are under less competitive pressure to dissipate in the public sector.

Summary of Labour Force Survey Results

- Overall, across the different elements of the public sector, a pure government pay premium of 7.6% prevails based on the 1997 Labour Force Survey data. This is based on a stringent definition of the public sector requiring that the individual *both* be in a public sector industry

designation *and* have a government as an employer, where the latter is defined here as being owned by the government, not just funded or controlled by the government.

- The overall average premium of 7.6% for government employees varies moderately within most subsectors of the public sector, from highs of 11.4% in provincial governments, 10.3% in local governments and 9.2% in transportation and communication, to around 7% in the federal government, education and religious and other organizations, to a low of less than 1% in the health sector.

- In most elements of the public sector, the premiums did not vary much if differences in the occupational distributions between the public and private sectors were *not* controlled for, with the notable exceptions of education and health where the government pay premiums rose substantially. That is, in the education and health sectors much of the government pay premium reflects the fact that government employers in these sectors tend to employ personnel in higher paying occupations.

- The government wage premium was typically about 50% higher (i.e., rising from 7.6% to 11% in the aggregate) when it also reflected the impact of collective bargaining (i.e., the impact of collective bargaining was not controlled for). Nevertheless, a moderate pure government wage premium of around 7.6% in the aggregate still prevailed even after controlling for the much higher degree of unionization for persons employed by governments.

- The male female wage gap is considerably smaller in the government sector (13.8%) than in the private sector (17.6%), with the federal male-female wage gap being 9.3%.

- Occupational skill premiums are considerably smaller in the government sector (including the federal government) compared to the private sector. The pay premium for employees in the managerial/administrative/professional occupations compared to employees in service occupations is only 10% in the government sector compared to 41% in the private sector. Workers in clerical occupations earn 16% more than do workers in service occupations in the private sector, but they earn 9% less than do service workers in the government sector.

- A more disaggregated analysis of the public sector wage premium by gender indicates that the public sector wage premium is higher for females than for males in all elements of the public sector except for local governments where they are higher for males, and in provincial governments where they are very similar.

- A more disaggregated analysis by occupation indicates that the public sector wage premium is very high for service occupations (especially in the three levels of government). This is a result of a large premium for women in service jobs in the government sector compared to the private sector.

- For clerical workers, the public sector pay premiums are modest, tending to be similar to the public sector pay premiums for all occupations, both for males and females.

- For managerial/administrative/ and professional employees the public sector wage premiums also tend to be modest and close to the average across all occupations, They are slightly below the average in federal and provincial government jobs, and substantially below average in local governments.

- More disaggregate analysis of the managerial/administrative/professional group indicates that there is considerable variation in the public sector pay premium within that category and across different levels of government. In the federal government, the premium for managers is very small (1.9%) and in fact is negative (-1.9%) for male managers. The federal pay premium is considerably higher for professionals at 10.9% in the natural and physical sciences and 16.7% in the social sciences, with the latter being exclusively a result of a large premium of 25.4% for males in the social sciences.

- For provincial governments, managers and professionals in the natural and physical sciences tend to receive a "normal" government pay premium; however, for male social scientists a large premium of 37.6% prevails.

- For local governments, managers receive a government pay premium that is below the average of the other occupations. Professional groups, however, are substantially underpaid in local governments relative to the private sector, especially females.

- Overall, the more disaggregate analysis reveals that the tendency to pay a lower public sector premium is most prominent for managers and especially male managers. There were large variations in the government wage premiums by gender and level of government, especially for professionals. More research is necessary to establish the reasons for this variation and whether it simply reflects idiosyncratic pay practices in the government sector.

Analysis Based on the 1996 Census

As a complement to the current analysis done on the 1997 Labour Force Survey, a similar analysis was conducted on the micro data file of the 1996 Census. To facilitate comparisons, the variables were coded in as similar a fashion as possible to those used in the LFS. Since the micro data tapes of the 1996 census were not yet publicly available, the runs had to be pre-specified and done internally by Statistics Canada[8]. Because of the cost of each run, only the basic regression was run, comparable to the wage equation of Table 3 based on the LFS.

A basic difference between the LFS and the Census (discussed subsequently) is that the public sector designation in the census is done solely through the industry code designation. There is no class of worker variable in the Census indicating whether the employer is a government or privately owned enterprise. Therefore, in some broader elements of the public sector, some employees will be categorized as being in the public sector even though they work for an organization that is privately owned. To the extent that there is otherwise a pure public sector wage

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[8] We are indebted to Michel Côté at Statistics Canada for handling this request.

premium, the average wage in those elements of the public sector that also contain some lower wage private sector workers will be biased downwards and the public-private pay gap will be correspondingly smaller. This obviously is a possibility only in the broader elements of the public sector, since government employment as given by the public administration industry designation will not be affected since the government is always the employer.

Pros and Cons of Census Data

The pros and cons of the micro data files of the Census are explicitly stated.
Advantages of the Census data for estimating public-private wage differentials are:

- The Census is a large data set with the public use files also providing a large number of observations.

- It is a "tried-and-true" survey, with a long history and well-established reputation within Statistics Canada and elsewhere.

- Being a census, it has an extensive set of control variables. In addition to the usual demographic and human capital variables, it has measures that often are not available on other data sets such as visible minority status, immigrant status, vocational training and language.

Disadvantages of the Census for our particular analysis include:

- The Census does not have a class-of-worker variable to distinguish government from private employers.

- The earnings measures are based on annual earnings since hourly or weekly wages are not available. It is also not possible to construct a measure of implied *hourly* earnings since a measure of usual hours worked per week was not available. All that can be constructed is implied *weekly* earnings, calculated as annual earnings from wages and salaries in 1995 divided by usual weeks worked in 1995.

- The census data can quickly become dated. For the 1996 Census, the earnings measures refer to the previous year, 1995. Public-use tapes of the micro data files are not released until considerably later, in this case 1999, so that there is a four-year lag in the data.

- The Census does not have information on potentially important control variables such as collective agreement coverage, union status, job experience or firm size. Nor does it have detailed occupation codes.

- The analysis is based on characteristics of the employees which need not correspond with the detailed job comparisons for specific occupations and levels that are conventionally used in the collective bargaining process.

Data Preparation

As discussed, the dependent variable is a measure of implied weekly earnings, so as to control for differences in weeks worked. Implied weekly earnings were calculated as annual earnings from wages and salaries in 1995, divided by the usual weeks worked in 1995. It was not possible to take the next step and construct a measure of implied hourly earnings because a measure of usual weekly hours worked in 1995 was not available, presumably because this would be difficult for a respondent to recall. A measure of the usual hours worked in the week prior to the enumeration week in 1996 was available, but using this to calculate an implied hourly wage would have been subject to considerable error given that weekly earnings refer to 1995 and weekly hours refer to 1996.

The data restrictions involved exclusions to ensure that the analysis is restricted to government and private sector employees who had conventional options to obtain labour market earnings. This involved restricting the analysis to persons who were 15-69 years old, paid employees, permanent residents, non-military personnel, and earned above $257 per week which approximates the weekly wage equivalent of the average minimum wage across Canada (detailed subsequently).

Persons under the age of 15 were excluded because they would normally be required to be in school as opposed to working at regular labour market work. Persons over the age of 69 were excluded because there would be few such persons in either the government or the private sector. Only paid employees were included so as to exclude the self-employed, given the unusual nature of their labour market earnings. The restriction to permanent residents excluded non-permanent residents who are more likely to have non-conventional earnings. Non-permanent residents are persons who hold a student or employment authorization or a Minister's permit, or who are refugee claimants. The restriction to permanent residents also facilitated comparisons across the different census years since the 1991 census was the first to include non-permanent residents. Military personnel were excluded to facilitate comparison with the LFS where they are excluded. As well, they are outside of the administrative or core definition of government. A small number of observations are also excluded if they were missing information on such factors as age, education, immigration status or marital status.

Restricting the analysis to persons who had weekly earnings above the implied minimum wage was done in part to exclude persons with unusually low paying jobs since such low pay could very well have been the result of reporting errors in the way the weekly earnings measure was calculated (i.e., annual earnings divided by usual weeks worked in 1995). This entailed the following calculation. Provincial minimum wages[9] were multiplied by their employment shares to

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[9] Since our purpose was to exclude persons with unusually low earnings we did not use the separate minimum wage in their specific province for each specific individual. Nor did we attempt to obtain the precise minimum wage (or the average of the minimum wages) that prevailed in the province throughout the year 1995 (the year of our annual earnings data). Rather, we used the minimum wages that were reported in a common source and that referred to minimum wages that were usually in existence in 1996 at the end of the year for the annual earnings data.

calculate an employment weighted minimum wage of $6.44 per hour (Appendix 1). Multiplying this by a 40-hour week would yield a weekly wage of $257.

The 14 Employment Equity Occupation Groups as given in the census codebooks are used for the occupational designation since these groups have a natural ranking in terms of the occupational hierarchy. They are reflective of the modern occupational designations associated with white collar and professional work in the information economy, and hence are also reflective of the sorts of jobs done in governments. They also designate levels within the broader occupation groups, such as senior managers and middle managers.

1996 Census Results

The R-squared of 0.35 in Table 8 indicates that 35 percent of the variation in wages is explained by the variables used in the equation. While this is reasonable for cross section studies where the individual is the unit of observation, it does remind us that there is a wide range of other factors not included in the analysis that also influence wages. Notably, the R-squared in the census equation is lower than the R-squared in the previous Labour Force Survey analysis. The Census has some variables not in the LFS (notably visible minority, Aboriginal, immigrant and language status) while the LFS also has variables not in the Census (notably tenure, collective agreement coverage, and firm size). The higher R-squared in the LFS suggests that these latter labour market variables are more important in explaining wage variation than are the personal characteristics variables that are available in the census but not in the LFS. As well, the LFS analysis is based on hourly wages while the Census analysis is based on weekly earnings. To the extent that there is more "noise" in the weekly earnings measure then this would also lead to a lower R-squared since the included variables would be able to explain less variation in a noisy measure that may be subject to more measurement error. In the discussion that follows, the t-statistics or levels of significance are generally not discussed (nor reported) since they are invariably significant.

The results for the control variables are reasonable and in line with theoretical expectations as well as the results of other studies, including the previous analysis based on the LFS. For example, males earn 22 percent more than do females even after controlling for the effect of other variables. Visible minorities earn 11 percent less than persons who are not visible minorities, Aboriginal persons earn 7 percent less than non-Aboriginal persons, and immigrants earn 4 percent less than do non-immigrants. Earnings rise consistently with age, peaking around the age of 50 and falling off slightly thereafter. The rise in earnings is slightly more pronounced (i.e., the coefficients are slightly higher) in the Census data than in the previous LFS analysis, likely reflecting the fact that the age variable is also capturing the effect of tenure in the Census data since it is not controlled for like it is in the LFS data.

Relative to never-married single persons, married persons earn the most with the earnings premium being slightly smaller for the other marital status groups. Earnings rise continuously with each higher level of education. One of the few unexpected relationships is the negative effect of having taken some vocational training, although the coefficient is extremely small,

indicating that persons who have taken some vocational training earn 3 percent less than those who have not taken such training. It could be that vocational training is a negative signal (the vocational versus academic stream) or it could be that it is taken in response to earnings losses (e.g., after a plant closing or mass layoff) or slow wage growth. As well, the variable is crudely defined (i.e., having taken some vocational training) and hence may not be reflective of the acquisition of valuable job-related training.

Relative to persons who speak only English, persons who speak only French earn 4 percent less, persons who are bilingual earn 2 percent more (and therefore 6 percent more than those who speak only French), and people who speak neither official language earn 18 percent less. Relative to people who speak neither English nor French, people who speak another language earn 5 percent less.

The only other unexpected relationship is that persons who normally work full-year (27 percent of the sample worked 49-52 weeks per year) have *weekly* earnings that are 8 percent less than do those who work part-year, after controlling for the impact of other factors that affect earnings. Since the earnings measure refers to weekly earnings, this may reflect a compensating wage premium for seasonal or other part-year work (e.g. high-paid male construction workers). It could also reflect the fact that some professionals (e.g. teachers) are paid on an 8-or 10-month basis. As well it may reflect reverse causality and the dominance of an income effect, if persons with high weekly earnings can afford to work for a shorter workyear.

Persons who work full-time (30 hours or more per week) not surprisingly have considerably higher weekly earnings than persons who work part-time. A regional pattern of earnings similar to that found in the LFS also prevails in the Census, with the provincial ordering (from high to low weekly earnings) being British Columbia, Ontario, Alberta, Quebec, the Yukon and Northwest Territories, Saskatchewan, Manitoba, Newfoundland, New Brunswick, Nova Scotia and Prince Edward Island. Weekly earnings are also slightly higher in major cities.

The occupational earnings pattern is as expected. For example, relative to the low-paying sales and service level I occupations, earnings are considerably higher for managers and professionals. Also, when the occupations have subcategories, earnings are higher at the higher level groups (e.g., for senior managers versus middle managers, or for professionals versus semi-professionals). These are pure occupational wage differences that remain even after controlling for other factors that influence wages, notably education. They would be much larger if these other factors were not controlled for – a professional worker for example would get the professional earnings premium plus the education premium.

The fact that the results for the control variables were generally in line with theoretical expectations and the results of other studies, including the previous LFS analysis, adds credence to the results for the main variables of interest – the public sector designations. The public sector results from Table 8 are repeated in Table 9 where they are also contrasted with the earlier LFS results.

Those results indicate that a pure public sector earnings premium exists for the three levels of government, but not for the broader public sectors of education and health. A premium also exists for the often-regulated sectors of transportation, communication and utilities. The premiums are fairly similar for the three levels of government, being 9.9 percent at the federal level, 8.7 percent at the provincial level and 8.5 percent at the local level. These are fairly close to the results that were found in the LFS data (Table 3) where the premiums were 7 percent at the federal level, 11.4 percent at the provincial level and 10.3 percent at the local level.

The noticeable difference is that with the Census data, the federal level paid the largest premium at 9.9 percent while with the LFS data it paid the lowest premium of the three levels of government, at 7 percent. Given the nature of the data sets it is not possible to disentangle the relative contribution of the different factors that could account for the differences. For example, the higher premium found at the federal level in the Census data could reflect the fact that collective agreement coverage cannot be controlled for in that data set and hence the high government wage premium may reflect the higher degree of collective agreement coverage. This is supported by the LFS results when the impact of unions was not controlled for (column 3, bottom panel of Table 4) and where the federal premium was 10.1 percent, almost identical to the 9.9 percent in the Census which does not allowing for the control of the union impact. However, when the impact of unions is not controlled for in the LFS data, the premiums in the provincial and local sectors increase to 15.1 percent and 12.9 percent respectively, which are substantially higher than the premiums of 8.7 percent and 8.5 percent respectively in the Census data. Thus, the anomaly is that in the Census data, the largest government wage premium is at the federal level, while in the LFS data the premium is smallest at the federal level. While this "twist" is unexplained, the fact remains that both data sets find a government wage premium, with that premium being fairly similar at the provincial and local levels in both data sets, but with conflicting evidence as to whether it is highest (census data) or lowest (LFS data) at the federal level.

Taking an average of the coefficients from the two data sets, which may be reasonable since they each have pros and cons, yields the following premiums: federal 8.5 percent (ranging from 7 to 10 percent), provincial 10 percent (ranging from 9 to 11 percent), and local 9.4 (ranging from 8.5 to 10.3 percent)[10]. Taking an average of these three levels of government, which is reasonable since they have roughly equal proportions of the workforce in these data sets, yields an overall government wage premium across the three levels of government of 9.3 percent[11].

Perhaps the safest generalization that can be made is that both data sets find a government wage premium in the neighbourhood of 9 percent with little difference across the three levels of government. If anything, it may be slightly lower at the federal level (8.5 percent) and slightly higher at the provincial level (10 percent) albeit there is somewhat more uncertainty about the federal premium.

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[10] These averages are presented later in Table 11 in the summary section.
[11] If the precise sample size weights are used the weighted average government wage advantage is 9.5 percent in the LFS and 9 percent in the Census.

Comparisons with the LFS and Census data for the broader elements of the public sector will almost invariably reflect the differences in the definitions of the public sector based on the fact that the LFS has the narrow definition based on where the government has to be the employer while the census is based only on the industry designation with both government and private sector employers. The effects of this are dramatic as illustrated by a comparison of the means (proportion of the labour force in each category). In the LFS, 6 percent of the labour force is in the education sector compared to 9.1 percent in the Census. While these differences could reflect other considerations (e.g., slight differences in the exclusion restrictions we imposed on the data) the vast proportion of the larger employment numbers in the Census invariably reflects some private, non-government owners in that sector. The differences are even more marked in the health sector, which accounts for only 2 percent of the labour force when the narrow definition of government ownership is used, but 10.6 percent of the labour force when the broader definition allowing both government and non-government ownership is used. Clearly, a large number of health care organizations are privately owned albeit they may be non-profit organizations. The differences are even more marked for the often-regulated sector of transportation/communication and utilities. When the narrow definition requiring government ownership is used as in the LFS data, only 2.3 percent of the workforce works in that sector. However, when the broader definition is used that also includes privately owned firms as in the census, 9.2 percent of the workforce is in that sector.

For the education sector a negative wage "premium" of 2.5 percent exists in the Census data based on the broader definition of the public sector to also include private organizations that are not owned by governments. This is considerably smaller than the positive premium of 6.9 percent that existed in the LFS data, which was based on the narrower definition that required government ownership (Table 11 later in the summary section contrasts these figures). Since the difference between these two is mainly due to additional private sector ownership in the lower-paying Census data, this suggests that the private employers in the education sector pay considerably lower wages than do government employers. Again, this confirms the existence of a government pay premium even within a sector like education that has both private and government employers.

The same is true in the health care sector where an even larger portion of the workforce works for private employers. In that sector, the difference between the public sector wage premium in the census data (negative 1 percent) and the LFS data (positive 1 percent) are not that great (contrasted later in Table 11). They do suggest, however, that private employers (who are more prominent in the Census data) pay lower wages than do their government counterparts in that sector.

In the often-regulated transportation/communication and utilities sectors, the premiums are fairly similar based on the LFS versus the census data. That is, the transportation/storage and communications/utilities sub-sectors in the census data are about of equal size and therefore the premium in the combined sector (to be comparable to the LFS) would be the average of the two components, or 11.7 percent. This is slightly higher than the 9.2 percent premium in the LFS based on the narrow definition involving government ownership. In this case, the inclusion of the private sector employers tends to raise the premium slightly, which is the opposite of what

occurred in the education and health sectors. A possible explanation is that these private employers are often regulated and therefore are not subject to the usual competitive pressures of conventional private employers. They may pay wage premiums out of any regulatory rents they receive.

Summary of 1996 Census Results

- Overall, the analysis based on the 1996 Census suggests that a government wage premium of about 10 percent exists at the federal level, and about 8.5 percent at each of the provincial and local levels.

- A negative "premium" of 2.5 percent exists in the education sector, and negative 1 percent in the health sector. These are negative because private employers within those elements of the public sector pay negative premiums, especially in the education sector, and these outweigh the positive premiums that are paid by *government* employers.

- Premiums of almost 12 percent are paid in the often-regulated sectors of transportation/communication and other utilities. Since there are numerous private employers in those sectors, this suggests that they may not be subject to the competitive pressures of conventional private sector employers who operate in a competitive and not regulated environment.

Summary of Combined 1996 Census and 1997 LFS Results

Table 10 provides a simple unweighted average of the LFS and Census result and repeats the separate results from the LFS and the Census. As indicated, the average figure may be a reasonable approximation because each data set has its strengths and weaknesses. The main differences are likely to reflect the fact that the LFS results control for collective agreement coverage, and in the LFS, the government is the employer while some private employers are in the public sector categories of the Census. The following generalizations emerge subject to the qualifications with respect to the data that were discussed throughout the text:

- Government wage premiums are likely in the neighbourhood of 9 percent with little difference across the three levels of government. If anything, the premium may be slightly lower at the federal level (8.5 percent) and slightly higher at the provincial level (10 percent) albeit there is somewhat more uncertainty about the federal premium (ranging from 7 percent in the LFS to 10 percent in the census).

- The public sector pay premiums are considerably lower in the broader public sectors of health (2.2 percent premium) and education (0.4 percent premium). However, when comparisons are restricted to government employers (LFS data) a "normal" government pay premium of 7 percent exists in the education sector, and a very small premium of 1 percent exists in the health sector. In essence, in the education sector the low average premium is

exclusively a result of the fact that private employers within that sector pay substantial negative premiums relative to employers in the public sector who employ labour with the same wage determining characteristics (i.e., the negative coefficient of 2.5 percent in the census where the education sector includes both government and private employers). The same pattern prevails in the health sector, albeit to a much smaller degree.

- In the regulated sector, premiums of slightly over 10 percent exist (slightly more in the Census data which include both government and private employers, and slightly less in the LFS data which is restricted only to government employers). The fact that there is little difference between the results depending upon whether the government is an employer suggests that private employers in those sectors are not subject to the same competitive forces as are private employers in the non-regulated sectors.

- The common thread of these results, however, is that governments as employers tend to pay wage premiums whether they are in the public administration sector or in the broader public sector where private employers also exist.

Historical 1971, 1981, and 1991 Census Analysis

To provide a picture of how public sector wages have changed over time, a similar analysis was conducted on the 1971, 1981 and 1991 census data. This is the only microdata set that allows comparisons to go back over such a period of time. The 1996 Census data could not be included in this comparison because, for reasons discussed subsequently, the 1971 industry codes had to be used and such codes are not available for the 1996 census. Furthermore because a common specification had to be used across the three census years, this necessitated a parsimonious specification as well as restricting the analysis to particular groups. The criteria used for that specification and for the data exclusions are outlined below.

Data Preparation

The dependent variable is a measure of annual earnings, converted to constant 1990 dollars. Differences in hours worked are controlled for by restricting the analysis to persons who worked between 35 and 44 hours per week and 49 to 52 weeks per year. As well, a dummy variable is included in the regression analysis to differentiate those who work 40-44 hours per week compared to 35-39 hours. It was not possible to construct a dependent variable of implied weekly earnings or hourly earnings by dividing annual earnings by usual hours worked since the hours worked per week were only in broad categories (e.g., 1-19, 20-29 hours) as were the categories of weeks worked per year (e.g., 1-13, 14-26, 27-39 hours).

The data restrictions for the historical analysis, as with the current 1996 analysis, involved exclusions to ensure that the analysis was restricted to persons who had conventional options to obtain labour market earnings. The historical analysis was restricted to the following persons: persons age 15-69; worked for pay or profit as wage and salary earners; major source of income was

wages and salaries; worked between 35 and 44 hours per week and 49 to 52 weeks per year. The rationale for these restrictions, and the procedures for implementing them, are as follows.

Persons under the age of 15 were excluded because legally they would normally be required to be in school as opposed to working full-time and full-year. Unpaid family members were excluded, and only persons working for pay or profit were included because the analysis is of labour market earnings. Persons in the military were included because they could not be separated out in the 1991 census. They could be separated out in the 1971 and 1981 census, but doing so would create problems of lack of comparability across the three census.

The self-employed were excluded and only persons who were wage and salary earners were included because of the focus on labour market earnings. For this reason, the analysis was also restricted to persons whose major source of income was wages and salaries. This variable was explicitly indicated in the 1971 but not the 1981 and 1991 census. For the latter two censuses it was constructed by first creating a variable giving the major source of income of the individual. Then the observations were excluded if the major source of the individual's income was not wages or salaries.

The analysis was restricted to persons who worked a "normal" workweek and workyear, defined respectively as 34 to 44 hours per week and 49 to 52 weeks per year, so that earnings differences are being compared across groups that are relatively homogeneous with respect to their working time. Given this focus on full-time, full-year persons whose major source of income is wages and salaries, the analysis was restricted to persons whose annual earnings would likely be above the minimum wage in 1990 dollars. This implies annual earnings of approximately $8500 or more in 1990 dollars. Occupations or industries designated as "other" were also excluded, given the uncertainty over that designation. The 1971 occupation and industry classes were used in the historical comparisons since they were common across the three census years. The excluded occupations were religion, other, or not stated. The excluded industries were unspecified, undefined or not determined.

The industry designations could not separate out the different levels of government within the broad industry designation of public administration. Furthermore, the broad industry sector of community, business and personal services is a mixture of private sector services (in the business and personal service categories) and public sector services in education, health and social services that fall into the community service component). The broad nature of the industry categories in the census files did not enable a separating out of these public sector components from the private sector ones within the broad category of community, business and personal services. As such, we are unable to separate out the different elements of the public sector (i.e., federal, provincial, local, education, and health) as done in the previous analysis. The only public sector designation we can specify in the historical census picture is the public administration or government sector, being an aggregate of the federal, provincial and local governments.

Results for 1971, 1981, 1991 Census

As indicated in Table 11, the results for the control variables seem reasonable and in line with theoretical expectations as well as the results of other empirical studies. This gives greater confidence to the results for the main variables of interest – the government sector industry designation.

For example, even after controlling for the effect of other wage determining factors, males earn about 30 percent more than females, with the gap dropping continuously over time, from 37 percent in 1971 to 27 percent by 1991. Immigrants earn about 5 percent less than non-immigrants.

Earnings profiles with respect to age exhibit the conventional pattern – rising with age, peaking in the late 40s, and falling slightly thereafter. Married persons earn more than persons who are separated, widowed and divorced, who in turn earn more than single persons. Earnings rise substantially with education, except for the small premium for post-bachelors education in 1971, which seems an anomalous result. Interestingly, the negative return to vocational training is a more recent phenomenon; in 1971 there was an 8 percent positive return. Perhaps this explains some of the decline in the numbers of young people enrolled in vocational training or pursuing vocational-type employment.

The earnings disadvantage associated with speaking only French declined slightly since 1971. A large earnings disadvantage associated with speaking neither of the official languages prevailed throughout the period. The regional pattern of earnings differentials generally persisted, although the magnitudes of differentials did change. The occupational wage pattern also persisted, with a general widening of the skill differential occurring as evidenced by the larger premium associated with being in most of the higher wage jobs relative to the low-wage omitted reference category of services.

As indicated, these results for the control variables seem reasonable and consistent with theoretical expectations as well as the results of other studies. Hence, they give credence to the main results of interest – the earnings differential between government and private sector employees. Because the only public sector industry designation is the aggregate of the federal, provincial and local governments (as discussed previously) we use that group as the omitted reference category so as to compare their earnings with each of the different private sector aggregate industry designations.

In addition to comparing earnings in the government sector with each of the private sector industries, regressions were also run with the private sector as the omitted reference category with a single government sector dummy variable. In that specification, so as to make the private sector as pure a private sector as possible, the transportation/communication/utilities sector was excluded from the private sector as was the community, business and personal service sector since that latter sector included education, health and social services. The coefficient on the single government variable in that specification is simply added to the table where the government omitted reference category is stated. Those coefficients for the single government dummy variable are shown in

parenthesis and italics in the government omitted reference category row to highlight that they are not from the same regression as the other coefficients on that table.

Of note, the results for that variable indicate that the government earnings premium increased over the period, from 4.6 percent in 1971 to 5.5 percent in 1981 to 8.5 percent in 1991. Although the more detailed specification of the 1996 census and the 1997 LFS are not directly comparable with the more parsimonious specification of the historical census analysis, the government premium of around 9 percent in the 1996 census and 1997 LFS would also be broadly consistent with the interpretation of an increasing government premium over the period and extending into the 1990s.

This is somewhat surprising given the public sector restraint pressures that were going on over the period. A variety of explanations for the increasing government wage premiums are possible, although more research would be necessary to try to disentangle the underlying causes. It is possible, that under the public sector restraint, those public sector employees with the largest premium stayed, and those with the smallest premium or rent left the public sector (as would be expected) for the private sector or alternatives like early retirement. This could be the case whether the restraint took the form of employment buyouts or even public sector wage restraint. It is also possible that equal pay and pay equity initiatives that increased over that period were stronger in the public sector than the private sector and they served to raise overall government wage premiums. Furthermore, the wage polarization that was occurring throughout the economy could have disproportionately affected the public sector since it tends to be an employer of higher-level personnel. It is also possible that the government premiums increased simply because the government sector was not subject to the same intense competitive pressures as was the private sector, where wages were often stagnant or even falling. These competitive pressures intensified in the 1980, especially from trade liberalization, global competition and industrial restructuring. As well, even though the analysis controls for changes in such factors as the occupational composition, age structures and education over the three census years, the broad categories necessitated by the data may not fully control for these composition effects. If the employment share of occupations with low public sector premiums decreased over the period (e.g. clerical workers) then the overall premium will increase simply because of these compositional effects.

The separate coefficients for the different industry variables relative to the omitted reference category of the government sector also highlight the growing public sector premium. That is, in most cases the coefficients on those industries are negative, indicating that employees in those industries tend to have lower earnings relative to government employees even after controlling for the impact of other wage determining variables (i.e., there is a government pay premium). Furthermore, in most cases, those negative coefficients became larger (i.e., the government pay premium became larger) over the time period.

For example, in 1971, workers in the government sector earned 5.5 percent more than did workers in the manufacturing sector with comparable wage determining characteristics. That premium remained about the same in 1981, but then rose to 8.1 percent by 1991. Those government wage premiums relative to manufacturing are very similar to the aggregate ones

relative to the total private sector (i.e., 4.6%, 5.5%, and 8.5 %) discussed previously, suggesting that the private sector comparisons are dominated by manufacturing.

Between 1971 and 1991, the government wage premium rose from 12.7 percent to 24.7 percent relative to farming, from negative 1.3 percent to positive 11.4 percent relative to construction, from 16.2 percent to 22.5 percent relative to trade, from 9.8 percent to 10.1 percent in finance, and from 15.6 percent to 17.7 percent relative to the service sector (albeit comparisons with the latter sector do not convey much since the service sector in this data set also includes the quasi public sectors of education, health and social services). Pay was very similar in the government sector relative to the often regulated sector of transportation/communication and utilities and that relationship did not change much over the time period (i.e., the coefficients were small and did not change much over the period). The notable exception to the pattern of a government wage premium that was increasing over time was when comparisons are made with primary industries. That sector paid a premium over the government sector throughout the period and that premium increased over time. Such a comparison may not have much meaning, however, given the small numbers in that sector and the fact that it is not one for which government sector pay comparisons are conventionally made. The same applies to comparisons with the farming and construction sectors.

Summary of Historical Picture

The results from the 1971, 1981 and 1991 census give rise to the following conclusions subject to the data limitations discussed in the analysis:

- Overall, the historical census figures portray a picture of a moderate government pay premium that increased very slightly from 4.6 percent in 1971 to 5.5 percent in 1981, and more substantially to 8.5 percent by 1991.

- Although the more recent 1996 Census figures are not directly comparable, they also suggest that the increasing trend continued into 1996, where the premium was about 9 percent.

- Limitations of the historical census data make it difficult to determine the degree to which the changes would be influenced by other factors such as collective agreement coverage, firm size, narrowly-defined occupational distributions and increases in the technological intensity of government employment.

Summary and Concluding Observations

Although more detailed summaries are provided at the end of each of the three sections, it is useful to bring them together in a self-contained "summary of the summaries."

- The 1997 Labour Force Survey and the special runs from the master file of the 1996 Census fill a gap in our knowledge by providing relatively *current* estimates of the public-private sector pay differences. They are complementary data sets in that the LFS has measures like collective agreement coverage, firm size, job tenure, hourly wages and a class-of-worker variable that designates whether the government is an employer. The Census has measures of visible minority status, immigrant status, vocational training and language. The 1971, 1981 and 1991 censuses also enable a portrayal of the time trend of pay differences between the government and private sector.

- Although, the LFS and Census results differ slightly (not surprisingly given the different nature of the data) they paint a fairly consistent current picture. Government wage premiums are likely to be in the neighbourhood of 9 percent with little difference across the three levels of government. If anything, the premium may be slightly lower at the federal level (8.5 percent) and slightly higher at the provincial level (10 percent) albeit there is somewhat more uncertainty about the federal premium (Table 11).

- Specifically, the federal pay premium is 7% in the LFS and 10% in the Census, although it is the same at 10% in the LFS when the impact of unions is not controlled for as is the case with the census data. This suggests that the pure federal pay premium is 7%, rising to 10% if the impact of unions is added in.

- The public sector pay premiums are considerably lower in the broader public sectors of health (2.2 percent premium) and education (0.4 percent premium) (Table 11). However, when comparisons are restricted to government employers (LFS data) a "normal" government pay premium of 7 percent exists in the education sector, and a very small premium of 1 percent exists in the health sector. In essence, in the education sector the low average premium is exclusively a result of the fact that private employers within that sector pay substantial negative premiums relative to employers in the private sector who employ labour with the same wage determining characteristics (i.e., the negative coefficient of 2.5 percent in the Census where the education sector includes both government and private employers). The same pattern prevails in the health sector, albeit to a much smaller degree.

- In the regulated sector, premiums of slightly over 10 percent exist (slightly more in the census data which include both government and private employers, and slightly less in the LFS data which is restricted only to government employers). The fact that there is little difference between the results depending upon whether the government is an employer suggests that private employers in those sectors are not subject to the same competitive forces as are private employers in the non-regulated sectors.

- The common thread of these results, however, is that governments as employers tend to pay wage premiums whether they are in the public administration sector (federal, provincial, local governments) or in the broader public sector where private employers also exist.

- In the LFS data, which allowed controlling for the effect of collective agreement coverage, the wage premium in the three levels of government was typically about 50% higher (i.e.,

rising from 7.6% to 11% in the aggregate) when it also reflected the impact of collective bargaining (i.e., the impact of collective bargaining was not controlled for). Nevertheless, a pure government wage premium of around 7.6% in the aggregate still prevailed even after controlling for the much higher degree of unionization for persons employed by governments.

- The male-female wage gap and occupational skill premiums are considerably smaller in the government sector than in the private sector, possibly a reflection of the impact of pay equity in those low-status jobs.

- The public sector wage premium is higher for females than for males in all elements of the public sector except for local governments where they are higher for males, and in provincial governments where they are very similar.

- The public sector wage premium is very high for service occupations (especially in the three levels of government). This is a result of a large premium for women in service jobs in the government sector compared to the private sector, possibly reflecting the impact of pay equity in those low-status jobs.

- For clerical workers, the public sector pay premiums are modest, tending to be similar to the public sector pay premiums for all occupations, both for males and females.

- For managerial/administrative/ and professional employees the public sector wage premiums are slightly below the average of all occupations in federal and provincial government jobs, and substantially below average in local governments.

- Within the managerial/administrative/professional group there is considerable variation in the public sector pay premium across subcomponents and across different levels of government. Overall, the more disaggregate analysis reveals that the public sector premiums were smallest for managers and especially male managers (where they were negative at the federal level). For the professional subgroups there were large variations in the government pay premiums by gender and level of government. Of particular note were the large government pay premiums paid to professionals, and especially male professionals, in the social sciences compared to the natural and physical sciences.

- Over time, the government pay premium has increased from 4.6 percent in 1971 to 5.5 percent in 1981, and more substantially to 8.5 percent by 1991. Although the more recent 1996 Census figures are not directly comparable, they also suggest that the increasing trend continued into 1996, where the premium was about 9 percent.

- While the evidence clearly shows that government employers pay a wage premium relative to private employers, that premium must be judged in light of the more egalitarian pay practices that seem to prevail in the public sector, especially with respect to women and less skilled workers where the premiums are usually largest. That may reflect political pressures as well as pressure to be a "model employer," at least regarding compensation.

- The results highlighted a number of questions that merit further research. Why are the public sector wage premiums so much larger in the education and especially health sector when there are no controls for differences in the occupational distribution, compared to other elements of the public sector where the results do not change much depending upon whether one controls for the occupational distribution? Why do low-wage clerical workers in the public sector get a small premium while other low-wage groups like service workers get a large public sector pay premium? Why do some levels of government appear to pay its male managers a small or even negative premium, while paying its male social scientists a large premium? Why does the public sector pay premium appear to have increased since the 1970s, given the public sector restraint pressures that were going on over that period? To what extent do the public sector wage premiums reflect political pressures to be a "model employer" and not to emulate private sector compensation practices that could reflect such factors as discrimination and large wage disparities, and what are the consequences of this role? How would the analysis be affected by differences in non-wage aspects of compensation including pensions, fringe benefits, job security bonuses and stock options? Clearly there is room for further research in this important area.

Table 1 - Distribution of the Public and Private Sector Workforces Across Various Groups, Labour Force Survey, November 1997

Group	Public	Private	Total
Total paid workforce	**100.0**	**100.0**	**100.0**
(Female)	53.3	45.9	47.2
Male	46.7	54.1	52.8
(Age 15-24)	5.2	18.0	15.7
Age 25-29	9.1	13.9	13.0
Age 30-34	12.1	14.9	14.4
Age 35-39	15.4	14.6	14.7
Age 40-44	18.7	13.4	14.3
Age 45-49	18.3	10.2	11.6
Age 50-54	13.4	7.8	8.8
Age 55-59	5.6	4.6	4.
Age 60-64	1.8	2.3	2.2
Age 65-69	0.4	0.5	0.5
(Never married, Single)	17.5	30.1	27.9
Married	73.2	62.3	64.2
Widowed	1.0	0.9	0.9
Separated/divorced	8.2	6.7	7.0
(Grade 0-8)	1.3	4.6	4.0
Some Secondary	6.1	14.7	13.2
Grade 11-13, graduate	15.0	22.2	21.0
Some post secondary	7.3	10.3	9.8
Post secondary diploma	34.5	33.4	33.6
Bachelors degree(s)	24.0	10.3	12.8
Graduate Degree	11.7	4.4	5.7
(Part-time)	16.2	19.4	18.8
Full-Time	83.2	80.6	81.2
(Tenure 1-5 months)	8.5	14.6	13.6
Tenure 6-11 months	3.6	10.8	9.5
Tenure 1-5 years	16.9	32.1	29.4
Tenure 6-10 years	22.6	1.8	18.7
Tenure 11-20 years	26.5	15.7	17.6
Tenure >20 years	22.0	9.0	11.3

…Table 1 continued	Public	Private	Total
Permanent Work	87.1	89.4	89.0
Seasonal Work	1.3	2.3	2.1
Contract work	8.6	5.2	5.8
Casual Work	3.1	3.2	3.1
(Not covered by collective agreement)	22.6	75.8	66.4
Covered by a collective agreement	77.4	24.2	33.6
(Establishment <20 employees)	18.8	38.0	34.5
Establishment 20-99 employees	35.8	30.9	31.8
Establishment 100-500 employees	24.8	19.8	20.7
Establishment> 500 employees	21.4	11.3	13.1
(British Columbia)	11.6	12.8	12.6
Alberta	9.2	10.5	10.3
Saskatchewan	44.4	2.8	3.1
Manitoba	5.1	3.6	3.8
Ontario	35.8	40.4	39.6
Quebec	24.5	23.5	23.6
New Brunswick	2.9	2.2	2.3
Nova Scotia	3.7	2.7	2.9
Prince Edward Island	0.6	0.4	0.4
Newfoundland	2.3	1.2	1.4
(Non major City)	73.0	63.6	65.3
Toronto	12.0	17.5	16.5
Montreal	10.3	11.9	11.6
Vancouver	4.7	7.0	6.6
Managerial/professional occupation	57.6	29.9	34.8
Clerical occupation	16.9	15.8	16.0
Sales occupation	0.8	10.1	8.5
(Service Occupations)	13.6	12.7	12.8
Primary occupation	0.8	2.2	1.9
Processing Occupation	2.5	16.5	14.0
Construction occupation	3.1	4.6	4.3
Transportation occupation	3.3	3.9	3.8
Material handling occupation	1.5	4.5	3.9
Agriculture Industry	0.0	1.2	1.0
Other primary Industries	0.4	2.4	2.1
Manufacturing Industry	0.2	21.9	18.1
Construction Industry	0.0	5.2	4.3
Wholesale trade Industry	0.0	5.8	4.8

…Table 1 concluded	Public	Private	Total
Retail Trade Industry	0.8	14.7	12.2
Personal service	1.3	11.2	9.5
Business service	0.3	10.2	8.4
Finance/Insurance/real estate Industry	2.3	6.7	5.9
federal administration	12.2	0.0	2.2
Provincial Administration	10.8	0.0	1.9
Local Administration	13.6	0.0	2.4
Education	33.7	3.0	8.4
Health	11.3	10.0	10.2
Transportation/communication/utilities	12.9	7.0	8.0
Religion and other public	0.0	0.7	0.6

Source: Statistics Canada, micro data file, Nov. 1997 Labour Force Survey. Titles in brackets denote reference category in subsequent regressions.

Table 2 – Distribution of Different Groups of the Paid Workforce Across the Public and Private Sectors, Labour Force Survey, November 1997

Group	Public	Private	Total
Total Paid workforce	**100.0**	**100.0**	**100.0**
(Female)	20.0	80.0	100.0
Male	15.7	84.3	100.0
(Age 15-24)	5.9	94.1	100.0
Age 25-29	12.4	87.6	100.0
Age 30-34	14.9	85.1	100.0
Age 35-39	18.6	81.4	100.0
Age 40-44	23.1	76.9	100.0
Age 45-49	28.0	72.0	100.0
Age 50-54	27.1	72.9	100.0
Age 55-59	20.6	79.4	100.0
Age 60-64	14.3	85.7	100.0
Age 65-69	15.3	84.7	100.0
(Never married, Single)	11.1	88.9	100.0
Married	20.2	79.8	100.0
Widowed	19.6	80.4	100.0
Separated/ divorced	21.0	79.0	100.0
(Grade 0-8)	5.9	94.1	100.0
Some Secondary	8.2	91.8	100.0
Grade 11-13, graduate	12.7	87.3	100.0
Some post secondary	13.2	86.8	100.0
Post secondary diploma	18.2	81.8	100.0
Bachelors degree(s)	33.4	66.6	100.0
Graduate Degree	36.4	63.6	100.0
(Part-time)	15.3	84.7	100.0
Full-Time	18.3	81.7	100.0
(Tenure 1-5 months)	11.1	88.9	100.0
Tenure 6-11 months	6.7	93.3	100.0
Tenure 1-5 years	10.2	89.8	100.0
Tenure 6-10 years	21.5	78.5	100.0
Tenure 11-20 years	26.7	73.4	100.0
Tenure >20 years	34.5	65.5	100.0

…Table 2 continued	Public	Private	Total
(Permanent work)	17.4	82.6	100.0
Seasonal Work	10.7	89.3	100.0
Contract work	26.4	73.6	100.0
Casual Work	17.3	82.7	100.0
(Not covered by collective agreement)	6.0	94.0	100.0
Covered by a collective agreement	40.8	59.2	100.0
(Establishment <20 employees)	9.3	90.7	100.0
Establishment 20-99 employees	20.0	80.0	100.0
Establishment 100-500 employees	21.3	78.7	100.0
Establishment> 500 employees	29.0	71.0	100.0
(British Columbia)	16.3	83.7	100.0
Alberta	16.0	84.0	100.0
Saskatchewan	25.7	74.3	100.0
Manitoba	23.4	76.6	100.0
Ontario	16.0	84.0	100.0
Quebec	18.3	81.7	100.0
New Brunswick	22.1	77.9	100.0
Nova Scotia	22.6	77.4	100.0
Prince Edward Island	25.1	74.9	100.0
Newfoundland	28.2	71.8	100.0
(Non major City)	19.8	80.2	100.0
Toronto	12.9	87.1	100.0
Montreal	15.8	84.2	100.0
Vancouver	12.7	87.3	100.0
Managerial/professional occupation	29.4	70.6	100.0
Clerical occupation	18.8	81.2	100.0
Sales occupation	1.7	98.3	100.0
(Service Occupations)	18.8	81.2	100.0
Primary occupation	7.3	92.7	100.0
Processing Occupation	3.1	96.9	100.0
Construction occupation	12.6	87.4	100.0
Transportation occupation	15.7	84.3	100.0
Material handling occupation	6.6	93.4	100.0
Agriculture Industry	0.0	100.0	100.0
Other primary Industries	3.6	96.5	100.0
Manufacturing Industry	0.2	99.8	100.0
Construction Industry	0.0	100.0	100.0

…Table 2 concluded	Public	Private	Total
Wholesale trade Industry	0.2	99.8	100.0
Retail Trade Industry	1.2	98.8	100.0
Personal service	2.6	97.4	100.0
Business service	0.7	99.3	100.0
Finance/Insurance/real estate Industry	7.0	93.0	100.0
federal administration	99.6	0.4	100.0
Provincial Administration	100.0	0.0	100.0
Local Administration	100.0	0.0	100.0
Education	70.7	29.3	100.0
Health	19.6	80.4	100.0
Transportation/communication/utilities	28.6	71.4	100.0
Religion and other public	0.0	100.0	100.0

Source: Statistic Canada, micro data file, Nov 1997 Labour Force Survey. Titles in brackets denote reference category in subsequent regressions.

Table 3 – Wage Equation, Labour Force Survey, November 1997

(Dependent Variable, log of Hourly Wage. T-statistics are not reported since invariably significant)

Variable	Mean	Coefficient
Constant		1.70
(Female)	.472	
Male	.528	0.170
(Age 15-24)	.157	
Age 25-29	.130	.147
Age 30-34	.144	.231
Age 35-39	.147	.265
Age 40-44	.143	.262
Age 45-49	.116	.267
Age 50-54	.088	.225
Age 55-59	.048	.209
Age 60-64	.005	.151
Age 65-69		
(Never married, Single)	.279	
Married	.642	.068
Widowed	.009	.022
Separated/ divorced	.070	.048
(Grade 0-8)	.040	
Some Secondary	.132	.065
Grade 11-13, graduate	.210	.148
Some post secondary	.098	.175
Post secondary diploma	.336	.228
Bachelors degree(s)	.128	.349
Graduate Degree	.057	.408
(Part-time)	.188	
Full-Time	.812	.079
(Tenure 1-5 months)	.136	
Tenure 6-11 months	.095	.040
Tenure 1-5 years	.294	.070
Tenure 6-10 years	.187	.165
Tenure 11-20 years	.176	.229

…Table 3 continued	Mean	Coefficient
Tenure >20 years	.113	.290
(Permanent work)	.890	
Seasonal Work	.021	-.045
Contract work	.058	-.022
Casual Work	.031	-.071
(Not covered by collective agreement)	.664	
Covered by a collective agreement	.366	.080
(Establishment <20 employees)	.345	
Establishment 20-99 employees	.318	.070
Establishment 100-500 employees	.207	.131
Establishment> 500 employees	.131	.190
(British Columbia)	.126	
Alberta	.102	-.130
Saskatchewan	.030	-.207
Manitoba	.038	-.222
Ontario	.396	-.088
Quebec	.237	-.163
New Brunswick	.024	-.267
Nova Scotia	.029	-.282
Prince Edward Island	.004	-.312
Newfoundland	.014	-.305
(Non major City)	.653	
Toronto	.165	.048
Montreal	.116	.027
Vancouver	.066	.006
(Service Occupations)	.128	
Managerial/professional occupation	.48	.366
Clerical occupation	.160	.123
Sales occupation	.084	.093
Primary occupation	.019	.194
Processing Occupation	.140	.149
Construction occupation	.043	.331
Transportation occupation	.038	.126
Material handling occupation	.039	.088
(Private Sector)	**.823**	
Federal administration	.022	.070

…Table 3 concluded	Mean	Coefficient
Local Administration	.024	.103
Provincial Administration	.019	.114
Education	.060	.069
Health	.020	.008
Transportation/communication/utilities	.023	.092
Religion and other public	.010	.068

Notes: Sample Size = 48, 385. R-squared = 0.57

Source: Regressions run on Statistics Canada, micro data file, Labour Force Survey, November 1997

Table 4 – Pure Government Wage Premiums for Different Aggregations of Public Sector and Occupations (With and Without Controlling for Impact of Unions) Labour Force Survey, November 1997

	46 Occupations (1)	21 Occupations (2)	9 Occupations (3)	0 Occupations (4)
Controlling for the Impact of Unions				
Overall public	7.6	7.9	7.6	9.5
3 sub-aggregates				
Public administration	9.0	8.7	9.5	8.6
Education & Health	5.8	7.0	5.2	10.9
Trans/comm/util/other	7.7	8.0	8.5	8.3
7 sub-aggregates				
Federal	6.0	5.4	7.0	7.3
Provincial	9.9	9.8	11.4	12.6
Local	10.9	10.7	10.3	6.9
Education	8.1	9.6	6.9	12.2
Health	2.4	2.5	0.8	7.6
Trans/comm/util	7.9	8.2	9.2	8.5
Religion and other public	7.4	7.4	6.8	7.9
Not Controlling for the Impact of Unions				
Overall public	11.2	11.5	11.0	12.6
3 sub-aggregates				
Public administration	12.8	12.5	12.6	11.3
Education & Health	9.4	10.6	9.5	14.7
Trans/comm/util/other	11.1	11.3	11.3	10.8
7 sub-aggregates				
Federal	10.0	9.3	10.1	9.9
Provincial	14.5	14.3	15.1	15.8
Local	14.1	13.8	12.9	9.1
Education	12.3	13.6	11.4	16.2
Health	5.1	5.1	4.3	10.6
Trans/comm/util	11.5	11.9	12.3	11.3
Religion and other public	10.1	10.1	9.0	9.6

Source: Each of the table entries represents the regression coefficients for the particular public sector variable from wage equations estimated from the micro data file of the November 1997 Labour Force Survey.

Table 5 – Gender & Occupational Wage Premiums, Government vs. Private Sector Labour Force Survey, November 1997

	Mean Share			Coefficient		
	Private	Government	Federal	Private	Government	Federal
	(1)	(2)	(3)	(4)	(5)	(6)
Sample Size	(38,765)	(3,384)	(1,164			
(Female)	.459	.440	.472			
Male	.541	.560	.528	.176	.138	.093
9 occupation grouping level						
(Service)	.127	.224	.151			
Clerical	.158	.220	.239	.158	-.094	-.128
Mgr/admin/prof	.299	.453	.550	.406	.103	.120
21 occupational group level						
(Service)	.127	.224	.151			
Clerical	.158	.220	.239	.160	-.092	-.129
Mgr/admin/prof	.299	.453	.550	.406	.103	.120
Managerial	.143	.283	.381	.449	.124	.107
Natural Science	.045	.088	.103	.463	.092	.147
Social Science	.016	.039	.038	.385	.077	.183
Religion	.004	.0004	0	-	-	-
Teaching	.019	.007	.005	.327	-	-
Medicine/health	.054	.016	.010	.374	.086	-
Art	.017	.020	.014	.272	.040	-
46 occupation grouping level						
(Service)	.127	.224	.151			
Clerical	.158	.220	.239	.160	-.092	-.128
Steno & typing	.026	.053	.034	.249	-.063	-.125
Bookeep/account	.055	.024	.020	.144	-.103	-.201
Office machine	.006	.011	.012	-	-.108	-
Material recording	.021	.006	.012	.095	-	-
Reception	.016	.014	.018	.139	-.045	-
Library	.033	.112	.143	.182	-.098	-.133
Mgr/admin/prof	.249	.453	.550	.406	.103	.120
Gov't officials	.0002	.091	.108	-	-	-
Other mgr/admin	.101	.074	.093	.458	.147	.130
Mgr & admin related	.042	.117	.098	.468	.098	.092
Physical life science	.006	.022	.038	-	-	-
Math/stats	.019	.035	.053	.519	.112	.127
Architect & engineer	.012	.022	.009	.537	.127	-
Arch & eng related	.008	.009	.003	-	-	-
Social Science	.016	.039	.038	.395	.078	.182
Religion	.004	.0004	0	-	-	-

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…Table 5 concluded						
46 occupation grouping level						
University	.101	.001	.0006	.319	-	-
Elementary	.006	.003	.0008	-	-	-
Other teaching	.004	.003	.004	-	-	-
Health diagnosis	.002	.002	.002	-	-	-
Nursing	.038	.012	.007	.355	.112	-
Medicine	.014	.002	0	.458	-	-
Arts & Recreation	.017	.020	0.14	.280	.044	.083

Note: - denotes coefficients not reported in any sector if occupation group accounts for less that 1% of employment in the private sector. Figures for the government sector were not reported if they accounted for less than 1% of employment and for the federal sector if they accounted for less than 2% of employment in that sector.

Table 6 – Public Sector Wage Premiums by Occupation and Gender Labour Force Survey, November 1997

	All Occupations	Service	Clerical	Managerial Professionals	Other
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Both Sexes					
Sample Size	(48,385)	(6,400)	(7,509)	(16,225)	(18,251)
Federal	.070	.396	.041	.067	-.042
Provincial	.114	.367	.098	.104	-.037
Local	.103	.335	.119	.003	-.025
Education	.069	.181	.082	.071	.061
Health	.008	.096	-.003	.022	-.124
Trans/comm/util	.092	.293	.082	.121	.077
Religion/other	.068	.138	.062	.070	.084
Males					
Sample Size	(25,130)	(2,676)	(4998)	(7,020)	(14,018)
Federal	.055	.029	.020	.057	-.084
Provincial	.128	.034	.139	.105	-.054
Local	.122	.021	.185	.030	-.036
Education	.049	.029	.078	.092	.015
Health	-.142	.060	-.036	-.166	-.141
Trans/comm/util	.076	.060	.055	.107	.059
Religion/other	.030	.048	.017	.051	.030
Females					
Sample Size	(23,255)	(3,724)	(6,093)	(9,205)	(4,233)
Federal	.088	.326	.048	.096	.313
Provincial	.112	.297	.086	.109	.013
Local	.059	.179	.102	-.039	.032
Education	.078	.175	.083	.061	.258
Health	.049	.113	.004	.051	-.056
Trans/comm/util	.149	.286	.115	.178	.254
Religion/other	.118	.034	.075	.115	.249

Source: Each of the table entries represents the regression coefficients for the particular public sector variable from wage equations estimated from the micro data file of the November 1997 Labour Force Survey.

Table 7 – Public Sector Wage, Premiums Within Managerial/ Professional Occupations, Labour Force Survey, November 1997

	All Occupations	Managerial/ Professional	Manager Only	Nat & Physical Science	Social Science
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Both Sexes					
Sample Size	(48,385)	(16,225)	(6,553)	(1,853)	(1064)
Federal	.070	.067	.019	.109	.167
Provincial	.114	.104	.088	.086	.183
Local	.103	.003	.061	-.025	-.156
Education	.069	.071	.066	.036	.006
Health	.008	.022	.155	-.018	.020
Trans/comm/util	.092	.121	.077	.164	.711
Religion/other	.068	.070	.119	.088	.156
Males					
Sample Size	(25,130)	(7,020)	(4998)	(1,462)	(304)
Federal	.055	.057	-.019	.088	.254
Provincial	.128	.105	.040	.077	.376
Local	.122	.030	..052	-.008	.013
Education	.049	.092	.049	-.064	.164
Health	-.142	-.116	.081	-.019	.024
Trans/comm/util	.076	.107	-.014	.166	.523
Religion/other	.030	.051	.034	.091	.216
Females					
Sample Size	(23,255)	(9, 205)	(3,185)	(391)	(760)
Federal	.088	.096	.066	.119	.088
Provincial	.112	.109	.124	.083	.008
Local	.059	-.039	.062	-.139	-.182
Education	.078	.061	.094	.058	-.019
Health	.049	.051	.176	n.a.	.019
Trans/comm/util	.149	.178	.192	.162	.789
Religion/other	.118	.115	.188	.111	.351

Source: Each of the table entries represents the regression coefficients for the particular public sector variable from wage equations estimated from the micro data file of the November 1997 Labour Force Survey.

Table 8 – (Log) Weekly Earnings Regressions, 1996 Census
(Dependent Variable, Log of Weekly Earnings. T-statistics are not reported since invariably significant)

Variable	Mean	Coefficient
(Female)	.428	
Male	.572	.222
(Non visible minority)	.907	
Visible minority	.093	-.109
(Non aboriginal person)	.985	
Aboriginal person	.015	-.073
(Non-Immigrant)	.809	
Immigrant	.191	-.038
(Age 15-24)	.076	
Age 25-29	.122	.103
Age 30-34	.157	.226
Age 35-39	.166	.304
Age 40-44	.156	.337
Age 45-49	.140	.363
Age 50-54	.096	.376
Age 55-59	.056	.354
Age 60-64	.026	.322
Age 65-69	.005	.274
(Never married, single)	.203	
Common law	.110	.056
Married	.592	.093
Separated	.028	.056
Widowed	.009	.043
Divorced	.057	.057
(No high school diploma)	.199	
High School graduate	.239	.052
Trade certificate or diploma	.131	.105
Other non-university certificate	.196	.146
University degree above bachelors	.029	.169
Bachelor's degree(s)	.137	.240
University degree above bachelors	.021	.289
Degree medicine/dentist/vet/optometry	.003	.605
Master's degree(s)	.037	.338
Doctorate Degree	.008	.458
(No vocational training)	.613	
Vocational training	.387	-.033
(English only)	.676	
French only	.109	-.039

Variable	Mean	Coefficient
…Table 8 continued		
English and French	.210	.021
Neither English nor French	.005	-.175
(no non-official languages known)	.810	
some non-official languages known	.190	-.045
(Part-time, <49 hours per year)	.266	
Full-time, 49-52 weeks per year	.734	-.084
(Part-time, 30 hours or more per week)	.079	
Full-time, 30 hours or more per week	.921	.231
(British Columbia)	.129	
Alberta	.096	-.050
Saskatchewan	.029	-.142
Manitoba	.036	-.144
Ontario	.397	-.032
Quebec	.242	-.121
New Brunswick	.003	-.190
Prince Edward Island	.004	-.233
Nova Scotia	.026	-.198
Newfoundland	.014	-.163
Yukon and Northwest Territories	.004	.127
(Non Major City)	.646	
Toronto	.167	.081
Montreal	.119	.040
Vancouver	.069	.032
(Sales and Service level I occupations)	.057	
Senior managers	.010	.694
Middle and other managers	.089	.384
Professionals	.177	.352
Semi-professionals and technicians	.064	.233
Supervisors	.017	.180
Foreman/women	.026	.337
Administrative and Senior clerical	.067	.159
Sales and Service Level II	.045	.083
Skilled crafts and trades	.083	.269
Clerical	.127	.078
Sales and Service Level III	.085	.195
Semi-skilled manual workers	.120	.135
Other manual workers	.037	.120
(Private sector)	.633	
Federal government services	.026	.099
Provincial Government services	.026	.087

…Table 8 concluded		
Variable	**Mean**	**Coefficient**
Local government services	.026	.085
Education services	.091	-.025
Health services	.106	-.007
Transportation and storage	.048	.077
Communication and other utilities	.044	.157
Intercept	5.651	
Sample size	1,546,690	
R-squared	.347	
Average log weekly earnings and weekly earnings	6.514	788.49

Source: Special run, statistics Canada, based on Master File of the 1996 Census.

Table 9 – Public Sector Wage Premiums, 1997 Labour Force Survey versus 1996 Census

Sector	Means (proportion of labour force)		Coefficients (x100)	
	LFS	Census	LFS	Census
	(1)	(2)	(3)	(4)
(Private Sector)	.833	.633		
Federal Government	.022	.026	7.0	9.9
Provincial Government	.019	.026	11.4	8.7
Local Government	.024	.026	10.3	8.5
Education	.060	.091	6.9	-2.5
Health	.020	.106	.080	-.07
Transportation and Storage	.023	.048	9.2	7.7
Communication and other utilities		.044		15.7

Source: Tables 3 (LFS) and 8 (Census).

Table 10 - Summary: Average Public Sector Wage Premiums, 1997 Labour Force Survey and 1996 Census

	Labour Forces Survey	**Census**	**Unweighted Average**
	(1)	**(2)**	**(3)**
Federal government	7.0	9.9	8.5
Provincial government	11.4	8.7	10.0
Local government	10.3	8.5	9.4
All government (unweighted average)	9.6	9.0	9.3
Education	6.9	2.5	2.2
Health	0.8	-.07	0.4
Transportation, communications, utilities	9.2	11.7	10.5[a]

Notes[a]: Calculated as the simple average of the 7.7% for transportation, and 15.7% for communications and utilities so as to facilitate comparisons with the LFS data where these groups were combined. The simple average was used because they each had similar proportions of the labour force (4.8 percent for transportation, and 4.4 percent for communications and utilities, as indicated in the means of Table 8).

Source: Calculated from Table 9. The unweighted average of column 3 is simple average of columns 1 and 2. The unweighted average of the 3 levels of government is the simple average of the federal, provincial and local figures, since they have similar proportions of the labour force.

Table 11 – Historical (Log) Annual Earnings Regressions Coefficients, 1971 1981 and 1991 Census

	1971	1981	1991
Intercept	9.613	9.759	9.636
(Female)			
Male	.369	.322	.270
(Non-Immigrant)			
Immigrant	-.054	-.048	-.057
(Age 15-24)			
Age 25-29	.143	.158	.189
Age 30-34	.230	.236	.301
Age 35-39	.276	.287	.358
Age 40-44	.292	.307	.391
Age 45-49	2.88	.320	.421
Age 50-54	.263	.316	.421
Age 55-59	.247	.292	.400
Age 60-64	.225	.267	.374
Age 65-69	.094	.158	.301
(Single)			
Married	.062	.078	.082
Separated, widowed, divorced	.022	.040	.053
(No high school diploma)			
High School graduate	.111	.101	.093
Some post secondary	.169	.197	.189
Bachelors degree	.390	.287	.305
Post Bachelors	.155	.336	.358
Post-graduate Degree	.445	.424	.443
(No vocational training)			
Vocational training	.081	-.048	-.031
(English only)			
French only	-.119	-.074	-.076
English and French	-.012	-.003	.007
Neither English nor French	-.241	-.225	-.250
(Hours 35-39 per week)			
Hours 40-44 per week	-.031	-.012	.004
(British Columbia)			
Prairies	-.109	-.082	-.065
Ontario	-.001	-.093	.021
Quebec	-.021	-.087	-.054
Atlantic Provinces	-.175	-.255	-.129
(Service Occupations)			
Manager	.314	.348	.331

…Table 11 concluded	1971	1981	1991
Science engineering and maths	.202	.260	.273
Social science	.232	.219	.194
Teaching	.296	.348	.341
Medicine and health	.229	.299	.281
Artistic, literary and recreation	.192	.140	.152
Clerical	.052	.078	.066
Sales	.159	.156	.149
Processing	.102	.154	.146
Fabricating and assembling	.075	.092	.105
Transport equipment operator	.040	.083	.703
Framing occupation	-.076	-.036	-.045
Primary occupation	-.069	.176	.172
Construction occupation	.123	-.144	.168
(Government)	(.046)	(0.54)	(.085)
Farming Industry	-.127	-.175	-.247
Construction Occupation	.013	-.038	-.144
Primary Industry	.054	.108	.119
Manufacturing	-.055	-.059	-.081
Transport/communication/utility	.016	.036	.008
Trade	-.162	-.177	-.225
Finance	-.098	-.057	-.101
Service(incl. Health & education	-.156	-.152	-.177
Sample size	24,531	68,789	59,029
R-squared	.53	.50	.45
Mean Dependent variable	10.71	10.30	10.31
Annual earnings, 1991 dollars	28,800	32,851	33,418

Source: Statistics Canada Individual Public Use Microdata File of 1971, 1981, and 1991 Census: The reference category for categorical variables is indicated in parenthesis. Statistical significance is not denoted, because the variables were almost always significant at conventional levels.

Appendix 1 – Calculations of Average Minimum Wage[a], Canada, 1995-96
(Weighted by Employment Shares)

Province	Minimum Wage ($)	Employment ('000)	Employment Share	Provincial Contribution[b]
	(1)	(2)	(3)	(4)
British Columbia	7.00	1,806	0.1320	0.9240
Alberta	5.00	1,413	0.1033	0.5165
Saskatchewan	5.60	461	0.0337	0.1887
Manitoba	5.40	526	0.0385	0.2079
Ontario	6.85	5,311	0.3883	2.6599
Quebec	6.70	3,213	0.2349	1.5738
New Brunswick	5.50	313	0.0229	0.1260
Prince Edward Island	5.15	60	0.0044	0.0277
Nova Scotia	5.35	385	0.0281	0.1503
Newfoundland	5.0	190	0.0139	0.0695
All Provinces	n.a.	13,678	1.0000	6.4393[a]

Notes:
[a] Calculated as the sum of the provincial minimum wage of column (1) times the provincial employment share of column (3).
[b] The contribution of each provinces to the employment weighted average minimum wage of 6.44 is the provinces minimum wage of columns (1) times its employment share of column (3).

Source: The minimum wage figures are from Statistics Canada, <u>Labour Force Update: A New Perspective on Wages</u>, No. 71-005-XPB (summer 1998) p.26. The minimum wage figures closest to the year 1995 are used.
The employment figures are from Statistics Canada, <u>The Labour Force: Annual Averages, 1976</u>. No. 71-220 XPB (February 1997). The employment figures are for the year 1996 since that corresponded to the year for most of the minimum wage figures.

Appendix 2 – Mean Values for Variables Used in 1971, 1981 AND 1991 Census Regressions

Variable	1971	1981	1991
(Female)	.317	.386	.443
Male	.683	.614	.557
(Non-Immigrant)	.786	.799	.809
Immigrant	.214	.201	.191
(Age 15-24)	.157	.158	.080
Age 25-29	.150	.168	.150
Age 30-34	.122	.155	.162
Age 35-39	.114	.123	.161
Age 40-44	.116	.099	.156
Age 45-49	.114	.092	.116
Age 50-54	.093	.086	.084
Age 55-59	.078	.071	.057
Age 60-64	.047	.042	.029
Age 65-69	.010	.006	.005
(Single)	.190	.025	.192
Married	.739	.711	.719
Separated, widowed, divorced	.072	.084	.089
(No high school diploma)	.573	.341	.223
High School graduate	.273	.233	.255
Some post secondary	.074	.304	.350
Bachelors degree	.041	.082	.118
Post Bachelors	.003	.014	.018
Post-graduate Degree	.036	.027	.036
(No vocational training)	.785	.689	.626
Vocational training	.215	.311	.374
(English only)	.712	.676	.673
French only	.083	.114	.114
English and French	.197	.205	.209
Neither English nor French	.00	.005	.004
(Hours 35-39 per week)	.319	.362	.354
Hours 40-44 per week	.681	.638	.646
(British Columbia)	.100	.106	.107
Prairies	.150	.161	.162
Ontario	.439	.405	.410
Quebec	.241	.259	.253
Atlantic Provinces	.070	.070	.069
(Service Occupations)	.102	.090	.097
Manager	.077	.110	.145

…Appendix 2 concluded	1971	1981	1991
Science engineering and maths	.056	.058	.071
Social science	.009	.017	.023
Teaching	.044	.049	.052
Medicine and health	.045	.046	.056
Artistic, literary and recreation	.008	.010	.012
Clerical	.258	.251	.233
Sales	.084	.086	.089
Processing	.056	.050	.030
Fabricating and assembling	.140	.135	.104
Transport equipment operator	.039	.033	.029
Farming occupation	.005	.005	.006
Primary occupation	.012	.009	.006
Construction occupation	.064	.051	.046
(Government)	.131	.118	.131
Farming Industry	.002	.003	.005
Construction Occupation	.039	.035	.035
Primary Industry	.028	.025	.021
Manufacturing	.267	.232	.170
Transport/communication/utility	.119	.105	.102
Trade	.133	.153	.147
Finance	.065	.078	.085
Service(incl. Health & education	.217	.250	.303
Mean Dependent variable	10.17	10.30	10.31
Annual earnings, 1991 dollars	28,800	32,851	33,419

Source: Statistics Canada. Individual Public Use Microdata File of the 1971, 1981 and 1991 Census

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