SRDC Working Paper Series 03-07

Who Benefits From Unemployment Insurance in Canada: Regions, Industries, or Individual Firms?

The Earnings Supplement Project

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November 2003

SOCIAL RESEARCH AND DEMONSTRATION CORPORATION

This paper is part of the Social Research and Demonstration Corporation (SRDC) Earnings Supplement Project (ESP), sponsored by Human Resources Development Canada (HRDC). The research and analysis are based on data from Statistics Canada. The opinions expressed herein are the authors' and do not necessarily reflect those of SRDC, HRDC, or Statistics Canada.

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Abstract

The Canadian unemployment insurance (UI) program has led to a relatively stable pattern of cross-subsidization across industries and provinces over the years: some are always net beneficiaries of the program, others are always net contributors. Previous studies have shown that the major flow of funds is from the service industries toward the primary sector and construction, and from Ontario toward the provinces east of it. The present study corroborates those findings, but moves beyond aggregate analyses. It shows that cross-subsidization through UI occurs not only between industries but also within them, and that the behaviour and characteristics of individual firms may play a significant role in determining both between- and within-industry patterns in the flows of UI funds.

Using administrative data on all Canadian firms, workers, and UI benefit recipients over the 1986 to 1996 period, the study shows that firm-specific practices are twice as important as industry or geographic location in explaining whether a firm is a net beneficiary of, or net contributor to, the UI program. These findings highlight the importance of recognizing the role of the demand side of the labour market in analyses of the interactions between the UI program and the labour market.

Introduction

The Canadian unemployment insurance (UI) program has been a relatively significant aspect of the country's social security system, particularly in the aftermath of an important reform in 1971 that significantly increased coverage and benefits.[1] This reform in the structure of benefits was to have been accompanied by changes in the financial structure of the program that would introduce experience-rated premiums (i.e. premiums that vary according to the intensity of usage).[2] The economic analysis of the subsequent history of the program has been framed almost entirely in terms of the labour supply effects — the impact of earnings replacement rates and benefit entitlements on the aggregate unemployment rate, and the duration of individuals' unemployment spells and receipt of benefits. Corak (1994) offers a broad survey of this literature, one that has informed successive incremental restrictions in benefits during the 1970s and 1980s. Major changes in the program were introduced in the 1990s, in part by the growing realization that a very significant fraction of claimants have repeatedly relied on the program in a predictable way.[3] In a climate focused on deficit reduction, the 1996 reform that introduced the Employment Insurance (EI) program led to substantial reductions in the benefit rates and entitlements, but also to innovative reforms that introduced a measure of experience rating. Tellingly, these reforms were made to the supply side of the labour market: a clawback of benefits to higher income recipients became effective in 1997 with the rate depending on the individual's claim history. An "intensity rule" was also introduced in which benefit rates would be tied to the individual's past use of the program. The earnings replacement rate would decline by one percentage point for every 20 weeks of benefits collected during the past five years beginning in 2001 (to a maximum of five percentage points for those having collected 100 weeks of benefits or more). These innovations, however, were retracted in 2001, just before the total phase-in of the intensity rule.

In most industrialized countries, analyses of UI programs have also focused on the supply side of the labour market, in part reflecting the importance of search theory as a framework to guide both the development of data and empirical analysis. However, in the United States, the only country to have made extensive use of experience rating, an important body of literature placed the focus on the demand side of the labour market and relied on implicit contract theory to examine the incentives for firms to change their hiring and layoff decisions in response to changes in the premium rate-setting regime of UI.[4] In recent years, the exploration of newly available administrative data in a number of countries has led to a growing realization that a careful study of the interaction between employer and employee characteristics is needed to understand labour market outcomes fully. For instance, Abowd,

[1] See Lin (1998) for a legislative overview of the program.

[2] Kesselman (1983) describes the legislation and how the insurance aspects of the financial reforms were delayed and eventually dropped.

[3] See Corak (1993a,b), Gray & Sweetman (2001), and Lemieux & MacLeod (1995, 2000) for analyses of this issue.

[4] Search theory deals with unemployment associated with the process of matching job vacancies and unemployed workers. Implicit contract theory deals with unemployment that arises from firms and workers being engaged in a continuing employment relationship. See Atkinson & Micklewright (1991) for an extensive survey of the literature based on search theory and Hamermesh (1993, 1990) for an overview of the implicit contract literature, one that dates back at least to Feldstein (1976).

Kramarz, and Marglois (1999) show the importance of analyzing both the demand and supply sides of the market. Using large linked administrative data sets from France, the authors related wage determination, inter-industry wage differentials, firm-size wage effects, and human resource management to both firm and individual effects. Research in the United States, Canada, and Nordic countries, particularly in Denmark, has also underscored the need for a broader perspective on the relationship between the UI program and labour market transitions.[5]

In light of this literature, it may be that many of the consequences of the UI program attributable to individual behaviour reflect the demand side of the market. At the least, this literature stresses the fact that there is a need for greater awareness of the roles of both supply and demand to understand accurately the labour market consequences of the UI program. The objective of this paper is to bring a new perspective to bear on the operation of the UI program by relying on large administrative data sets that link information from firms, workers, and individual UI claimants. Following the framework in Anderson and Meyer (1993), and building on related work by Corak and Pyper (1995a), this study documents patterns in the flow of UI benefits and taxes (or UI contributions), and explains the nature of the resulting patterns of cross-subsidization, between industries as well as within industries. Analysis at the industry and firm levels examines what fraction of the variance in patterns of cross-subsidization are region-specific, industry-specific, and firm specific.

It should be noted that cross-subsidization between firms and industries will exist even in a perfectly experience-rated UI program. Certain firms or industries will suffer adverse shocks that necessitate benefit receipt while others will not: that is the nature of insurance. It is the persistence in the pattern of cross-subsidization through time — not its existence at any point in time — that suggests a deviation from insurance principles and illustrates both the incentives for firms to change their behaviour, and the results of such changes. While the analysis does not examine the consequences of the lack of experience rating in the structure of premiums, something that is not possible in the Canadian context given the universal nature of the program and the lack of variation in tax rates across firms, it documents the extent of the subsidies that may induce such changes, or perhaps represent their outcome.

We find that from 1986 to 1996 the Canadian UI program redistributed significant moneys between industries and provinces and that these transfers have been long-standing. The major flow of funds is from the service industries toward the primary sector and construction, and from Ontario toward the provinces east of it. Industries receive a net positive transfer through UI because of higher than average layoff rates, and lower than average wages (and hence contributions). This will come as no surprise to many observers. However, a less expected finding is that not only do the same industries receive a positive transfer year in, year out, but so do the same firms. In fact, the transfers imposed through UI are heavily concentrated at the firm level. Analysis of variance indicates that 60 per cent of explained variation in UI cross-subsidy patterns can be attributed to individual firm behaviour, practices, or characteristics, and these effects are twice as important as industrial sector or geographic location in explaining whether a firm is a net beneficiary of, or net contributor to, the UI program.

[5]See for instance Baldwin (1995) and Haltiwanger, Lane, Spletzer, Theeuwes, & Troske (1999).

Description and Overview of Data

The data used in this study are drawn from a series of administrative files associated with the Canadian tax system, the unemployment insurance (UI) program, and a longitudinal catalogue of enterprises developed by Statistics Canada.[6] Together, these files offer universal coverage of firms, workers, and UI benefit recipients, and allow the creation of firm-level information on the number of employees, the amount of contributions made to the UI program (by both the employers and employees), the number of UI claims made by the employees of the firm, the amount of UI benefits they collected, and the average duration of their claims. The basic unit of analysis is the "firm," which should be taken to mean all private or public sector enterprises that remit tax deductions on behalf of their employees to the tax agency.[7]

The analysis covers the 1986 to 1996 period, as 1986 is the first year in which data files containing yearly information on all UI claimants are available, and 1996 is the last year before a break occurred in the longitudinal consistency of the payroll data collected on firms. This 11-year period represents a complete business cycle: the aggregate unemployment rate was 9.6 per cent in 1986, the same rate experienced in 1996, after first falling to 7.5 per cent in 1989 and peaking at 11.4 per cent in 1993. The end year of the period of analysis also corresponds to the year of the Employment Insurance (EI) reform, which introduced substantial changes in the structure of the program that occurred in 1997. In covering the entire population of employers, employees, and UI claimants over an 11-year period, the data are much more comprehensive than that of Anderson and Meyer (1993) for the United States or Corak and Pyper (1995a,b) for Canada, two studies that are precursors to this paper.[8] Moreover, the data allow for an examination of the independent role of firms in determining the extent of cross-subsidization, which constitutes a unique contribution to this area of research.

Table 1 provides an overview of the UI program's operation between 1986 and 1996. The program was in deficit in the year 1986 and from 1989 to 1992, amounting to about $1.8 billion in both 1989 and 1990 and over $2.5 billion in 1991. It generated surpluses after 1992, recording a peak surplus of $8.2 billion in 1996. During this 11-year period, the program collected $17.2 billion in premiums on average per year (expressed in constant 1997 dollars), while paying out about $15.2 billion in benefits to 2.5 million claimants.[9]

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[6] Appendix A offers a detailed description of the source files and the procedures used to create the analytical files.

[7] Each reporting unit to Revenue Canada (as the Canada Customs and Revenue Agency was referred to during the period under study) is assigned a payroll deduction account, and this account number is the basis for aggregating to the firm level and linking across the various data sets.

[8] Anderson and Meyer (1993) offer an aggregate analysis of 22 states in the United States, covering about 55 per cent of UI-covered employment to establish the degree and persistence in cross-subsidies for major industries, at the two-digit Standard Industrial Classification (SIC) level. However, their more disaggregated analysis exploring the underlying causes of these patterns relies on eight states accounting for between 5 and 20 per cent of the states' covered workers. Their analysis at the firm level is based on just two states using only large employers and about 10 per cent of covered workers over a four- to six-year period. The structure of the data used by Corak and Pyper (1995a) is similar to that used in this present analysis, but more limited in nature. Their aggregate analysis covers the years 1986 to 1990, but because of underlying changes in the way in which industries were coded, the more detailed industry and longitudinal firm analysis is restricted to 1986 to 1988.

[9] These results are consistent with those reported in Lin (1998).

Table 1: Overview of the Canadian UI Program, 1986–1996

Years	Unemploy-ment Rate (%)	Number of Firms	Number of Jobs ('000)	Number of Claims ('000)	Total UI Benefits ($ millions)	Total UI Taxes ($ millions)	Account Balance ($ millions)	Proportion of Claims Due to Temporary Layoffs (%)
1986	9.6	839,832	19,211	2,612	14,239	13,720	-519	47
1987	8.8	871,068	20,284	2,449	13,153	14,351	1,198	46
1988	7.8	895,058	21,193	2,492	13,723	15,087	1,364	46
1989	7.5	915,217	21,746	2,578	14,762	13,016	-1,746	47
1990	8.1	925,314	21,308	2,767	17,011	15,188	-1,823	48
1991	10.3	915,244	20,165	2,780	19,111	16,572	-2,539	50
1992	11.2	915,008	19,271	2,913	20,289	19,868	-421	51
1993	11.4	918,720	18,976	2,614	17,309	19,879	2,570	52
1994	10.4	926,873	19,460	2,315	12,821	20,947	8,126	52
1995	9.4	932,169	19,656	2,430	13,194	20,812	7,618	50
1996	9.6	935,029	19,647	2,323	11,445	19,636	8,191	53
Average	9.5	–	–	–	15,187	17,189	2,002	49

Source: Authors' calculations based on Statistics Canada administrative data and the Labour Force Survey (LFS).

Note: All dollar figures are expressed in constant 1997 dollars.

Table 1 illustrates that the UI balance is quite sensitive to the business cycle. While the average annual balance over this period indicates a surplus of $2 billion, the yearly balances are quite different during the recovery and expansion of the early to mid-1990s than they were a decade earlier during the expansion following the 1981 to 1982 recession. Significant surpluses were recorded during the 1990s despite the average unemployment rate being higher than during the mid to late 1980s. As suggested by Lin (1998), these surpluses may be attributed to a number of factors. First, there was a rapid increase in tax revenue after 1991, due to the recovery of the economy and successive increases in premium rates.[10] Another contributing factor may be the declining amount of benefits, most likely associated with legislated reductions in benefit rates and eligibility.[11] A final notable feature of the data in Table 1 is the significant fraction of claims due to temporary job separations: on average, half of UI claimants were laid off temporarily, with a slight rise over the period.[12]

Table 2 presents information on UI account balances — total benefits less total taxes (or contributions) — by province and major industry. A positive value denotes that the industry is a net beneficiary of the UI program while a negative value indicates that it is a net contributor to the program. Figures in Table 2 are adjusted to reflect the fact that over this

[10] See Appendix B for the premium rate schedule over the 1986 to 2001 period.

[11] The benefit rate was reduced to 57 per cent from 60 per cent in 1993 and to 55 per cent (60 per cent for low-income claimants) in 1994. In addition, workers quitting without just cause were no longer eligible for benefits beginning in 1993.

[12] Our definition of a temporary separation may be more liberal than often used. Individuals are considered to have experienced a temporary separation if they are found to have employment income from the same firm in the tax year after the year of separation. In the extreme, this would classify an individual who experienced a separation of almost two years from the same firm as temporary if the separation occurred early in the year and the rehire late in the next year. See Appendix A for more details.

period, the UI account generated an average annual surplus of $2 billion. This $2 billion surplus is allocated to each industry (or province) in proportion to UI taxes paid.[13]

Over the 1986 to 1996 period, the Atlantic provinces, Quebec, and British Columbia were net beneficiaries of the UI program. Ontario was the largest net contributor, with an average net surcharge of $1.95 billion per year, while Quebec was the largest net beneficiary, with an average annual net transfer of almost $960 million. At the industry level, UI funds were transferred from the services and the public administration industries to the construction industry, the latter receiving an average net transfer of $1.58 billion annually and the former contributing $1.79 billion. The largest contributor was the service industry in Ontario, being surcharged $805 million per year, on average, while the construction industry in Quebec received the largest transfer, an average of $529 million annually.

As shown in Table 3, when these figures are divided by the number of jobs, Ontario still appears as the largest net contributor, with a net surcharge of $251 per job. Newfoundland and Prince Edward Island become the largest net beneficiaries, receiving net per job transfers of $1,782 and $1,371 respectively. At the industry level, the construction, forestry, and fishing industries are the largest net beneficiaries, with net per job transfers of $1,336, $2,005, and $4,735 respectively. Net transfers reach more than $6,800 annually per job in the fishing industries of Newfoundland and Prince Edward Island.

[13] The UI taxes paid by a particular industry (or province), denoted by T_i, are multiplied by the ratio of total UI benefits to total taxes, denoted by (B/T), for all industries (or all provinces). Entries in Table 2 thus represent the excess of benefits over taxes for each industry (or province) *that would prevail if the overall UI program were in balance*, and can be expressed as $B_i - T_i(B/T)$, where B_i represents UI benefits received by a particular industry (or province). Figures in Table 3, on a per job basis, are adjusted in the same manner. Data in tables 2 to 4 are similar to those presented in Corak & Pyper (1995a) but cover a longer time horizon.

Table 2: UI Balance Across Industries and Provinces, Annual Averages, 1986–1996 (Millions of 1997 Dollars)

	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Territories and Outside Canada	All Canada
Agriculture	7	15	12	18	66	27	6	13	2	53	0	219
Forestry	23	2	19	43	107	8	1	3	4	63	1	273
Fishing	20	14	26	33	9	3	1	0	0	6	0	113
Mining	3	0	-1	6	15	-20	-1	-4	-31	0	5	-29
Manufacturing	178	27	65	95	134	-519	-21	-10	-37	-8	0	-97
Construction	97	18	83	105	529	390	43	37	112	151	11	1,575
Transportation	16	3	-3	6	-95	-286	-33	-25	-47	-77	2	-539
Trade	63	15	37	35	123	-288	-21	-18	-61	-36	2	-151
Finance	3	0	-6	-1	-69	-269	-17	-13	-33	-51	0	-456
Service	92	13	19	48	16	-805	-57	-45	-115	-105	6	-933
Public administration	28	11	-37	-11	-137	-404	-41	-23	-122	-105	-16	-858
All industries	**597**	**130**	**261**	**417**	**959**	**-1,951**	**-115**	**-70**	**-261**	**19**	**13**	

Source: Authors' calculations based on Statistics Canada administrative data.

Table 3: Per Job UI Balance Across Industries and Provinces, Annual Averages, 1986–1996 (1997 Dollars)

	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Territories and Outside Canada	All Canada
Agriculture	2,863	2,206	1,029	2,068	1,218	239	396	532	78	1,237	2,735	710
Forestry	5,422	4,645	2,653	4,953	3,202	544	1,166	1,480	701	1,092	2,802	2,005
Fishing	6,849	6,828	5,329	6,503	5,210	1,547	3,233	1,131	-279	1,339	1,685	4,735
Mining	535	2,395	-31	957	463	-425	-272	-263	-289	9	2,272	-111
Manufacturing	3,979	2,596	897	1,357	160	-384	-235	-257	-199	-25	807	-33
Construction	3,963	2,688	2,173	2,776	2,094	989	1,226	1,007	733	888	3,132	1,336
Transportation	767	610	-81	196	-312	-605	-538	-512	-386	-413	386	-419
Trade	1,102	996	352	430	138	-208	-164	-171	-169	-77	368	-42
Finance	237	123	-229	-51	-252	-521	-421	-396	-328	-357	125	-391
Service	899	424	97	385	9	-282	-212	-199	-145	-101	726	-126
Public administration	455	763	-417	-124	-390	-766	-486	-368	-681	-692	-73	-519
All industries	**1,782**	**1,371**	**438**	**860**	**197**	**-251**	**-158**	**-116**	**-127**	**13**	**737**	

Source: Authors' calculations based on Statistics Canada administrative data.

Inter-industry Patterns of Cross-Subsidization

Previous studies have shown that, over time, some industries are persistently net beneficiaries of the unemployment insurance (UI) program while others are persistently net contributors. Cross-subsidization patterns observed over a period do not seem to be the result of a few particularly bad years requiring extensive readjustment and reliance on UI benefits. Rather, the way in which employment is structured within provinces or the way industries operate appears to determine the persistent patterns cross-subsidization embodied in the UI program. Corak and Pyper (1995a) as well as Karagiannis (1986) show that the long established and stable pattern of cross-subsidization in the Canadian UI program is little influenced by the business cycle and extends back at least to the years immediately following the introduction of the 1972 legislative changes.

An informative way of looking at net beneficiaries and net contributors to the UI program is by calculating the relative benefit to tax (RBT) ratios, defined as the industry UI benefits to taxes ratio (B_i/T_i) divided by the UI benefits to taxes ratio for all industries (B/T). An RBT ratio greater than one indicates that the industry is a net beneficiary of UI, and thus receives a subsidy, while a value less than one indicates a net contribution to the program or a surcharge. In other words, RBT ratio figures indicate the amount of UI benefits received for every dollar of UI contributions, and thus reflect patterns of cross-subsidization between industries.

RBT figures can be decomposed according to a method put forward by Anderson and Meyer (1993). This method allows for a better understanding of the underlying causes of the status of each industry with regard to the relationship between UI benefits and taxes. Equation (1) breaks the RBT ratio into four constituent components:

$$RBT_i = \frac{B_i / T_i}{B / T} = \frac{(n_i d_i b_i)/(t_i w_i)}{(ndb)/(tw)} = (\frac{n_i}{n})(\frac{d_i}{d})(\frac{b_i}{b})(\frac{tw}{t_i w_i}) \qquad (1)$$

where n_i represents the total number of UI claimants in industry i, d_i is the average duration (in weeks) of benefit receipt during a claim, b_i is the average weekly amount of benefit received, and $t_i w_i$ is the total contribution to UI paid by the employers and employees in the industry. Variables without subscripts represent the corresponding totals. An RBT greater than one can thus be attributed to an excessive number of claimants, a longer benefit duration, a higher benefit amount, and lower contributions to UI.

Since there is no experience rating in the Canadian UI system, premiums do not vary according to the intensity of usage of the program and thus $t_i=t$ for all industries (or t/t_i equals one). This implies that the value of the last term is governed by the relative earnings in the industry, (w/w_i). Industries paying relatively lower wages will make relatively lower contributions, resulting in this term being greater than one, and these industries being net beneficiaries or "subsidized." Likewise industries paying higher than average wages will make relatively more contributions and the last term in equation (1) will be less than one, these industries being net contributors or "surcharged."

Table 4 presents annual averages of RBT ratios by industry over the 1986 to 1996 period as well as their decomposition in their four components.[14] The relative number of claims is decomposed further into two elements: one for temporary separations (n_{ti}/n) and another for permanent separations (n_{pi}/n).

Table 4: UI RBT Ratios by Industries, Annual Averages (1986–1996)

Industries	RBT Ratios	Relative Number of Claims (n_i/n)					
		Due to Temporary Separation (n_{ti}/n)	Due to Permanent Separations (n_{pi}/n)	Relative Number of Claims (n_i/n)	Relative Duration of Benefit Receipt (d_i/d)	Relative Amount of Benefits (b_i/b)	Relative Amount of Taxes (tw/tw_i)
Fishing	14.76	2.002	2.053	4.055	1.302	1.273	2.195
Forestry	5.06	1.412	0.923	2.335	1.107	1.297	1.513
Construction	3.29	1.079	0.888	1.967	0.989	1.283	1.315
Agriculture	3.18	0.800	0.613	1.413	1.113	0.876	2.316
Manufacturing	0.95	0.791	0.552	1.342	0.895	1.063	0.748
Trade	0.92	0.289	0.497	0.785	1.074	0.855	1.281
Mining	0.90	0.679	0.471	1.150	0.896	1.335	0.652
Transportation	0.61	0.492	0.339	0.831	0.944	1.113	0.701
Service	0.8	0.384	0.376	0.760	1.002	0.864	1.219
Finance	0.56	0.254	0.339	0.593	1.107	0.992	0.859
Public administration	0.55	0.483	0.251	0.734	1.046	1.058	0.671

Source: Authors' calculations based on Statistics Canada administrative data.

These figures indicate that in forestry, fishing, and construction industries, all the factors (with one exception for the duration of benefits in the construction industry) contribute to these industries being, on average, net beneficiaries of the UI program from 1986 to 1996, with a higher than average number of claims as the major factor. On the other hand, the net subsidy in agriculture is mainly caused by lower contributions paid to the program due to relatively low wages. In all subsidized industries but the fishing industry, the claim rate due to temporary separations is greater than that due to permanent ones. Lower claim rates and/or higher contribution rates (due to relatively high wages) appear to be the leading causes of most surcharged industries being net contributors to the program. In the mining and manufacturing industries, higher than average wages offset higher than average claims and benefit rates, leading both industries to be net contributors. The trade and service industries are net beneficiaries, because a lower than average claim rate dominates and overrides the fact that wages are lower than average. In the case of the transportation, finance, and public administration industries, a lower claim rate and higher contributions rate work together to reduce RBT ratios.

An analysis at a more disaggregated industry level confirms that a higher than average incidence of layoffs, especially those leading to temporary job separations, and a lower than

[14]Complete figures on annual averages of RBT ratios by province and industry are provided in Appendix B.

average wage rate are the major — though not exclusive — reasons for persistent inter-industry subsidies. The pattern of annual average RBT ratios for all 228 industries defined at the three-digit Standard Industrial Classification (SIC) level shows that a minority of industries (100 out of 228) has an RBT ratio greater than one.[15]

Of these 100 subsidized industries, 84 have an RBT ratio between 1 and 3, and 16 have a ratio greater than 3. A large proportion of these industries (42 out of 100) tend to have both a higher than average layoff rate and a lower than average wage rate. A covariance analysis between the RBT ratio of all 228 industries and each component of this ratio confirms that the relative rate of layoffs and the relative UI contribution rates are the factors most strongly associated with RBT ratios, with covariances of 0.84 and 0.51 respectively. The covariance between RBT ratios and the relative duration of UI benefits is significantly different from zero but is very small (0.08), while the covariance between RBT ratios and the relative amount of UI benefit receipts is not significantly different from zero.

These results are consistent with theoretical predictions of firm behaviour under less than perfectly experience-rated UI programs, and resonate with the fact that firms have much more ability to influence wages and layoff decisions than the other two components in equation (1). As pointed out by Hamermesh (1993), a system that is not experience-rated, and thus where UI taxes are not tied to expected benefits from the program, offers a subsidy that provides incentives for firms to increase layoffs and/or reduce wages. In this sense, it is not surprising that relative layoff and wage rates are important influences, in an accounting sense, of the cross-subsidization status of industries. However, there remains considerable variation in these results even at the three-digit SIC level, suggesting that it is important to model firm-level effects directly rather than assume they are simply industry effects writ large.

[15]See Corak & Chen (2003) for figures at the three-digit SIC level, available at www.statcan.ca.

Longitudinal Analysis of Cross-Subsidization Patterns: Industry vs. Firm Effects

Cross-subsidization patterns between industries, measured by annual averages over a given period, provide limited information on the persistence of these patterns through time. To learn more about the extent to which the unemployment insurance (UI) program deviates from insurance principles, a more detailed longitudinal analysis is necessary.

As shown in Table 5, the longitudinal patterns of relative benefit to tax (RBT) ratios at the industrial level reveal that industries are concentrated at two extremes: industries are either never net beneficiaries of the UI program ("never subsidized") or always net beneficiaries of UI ("always subsidized") over the 11 years under study. The first set of columns of Table 5 summarizes the distribution of the three-digit level industries according to the number of years each of these 228 industries had an RBT ratio greater than one. Nearly 39 per cent of industries were never net beneficiaries of UI over the 11-year period. These "never-subsidized" industries account for 45 per cent of all jobs and 34 per cent of UI benefits, but contributed 61 per cent of total contributions. In contrast, more than 30 per cent of industries were net beneficiaries in every year during the 1986 to 1996 period, accounting for 32 per cent of all employment, 45 per cent of total UI benefits, and only 19 per cent of total UI taxes.

Table 5: Distribution of Industries and Firms by Number of Years With RBT Ratios Greater Than One, 1986–1996

Number of Years in Which RBT Ratio is Greater Than One	Distribution of Industries				Distribution of Firms			
	Proportion of All Industries	Proportion of All Jobs	Proportion of All UI Benefits	Proportion of All UI Taxes	Proportion of All Firms	Proportion of All Jobs	Proportion of All UI Benefits	Proportion of All UI Taxes
0	38.6	45.0	34.0	61.2	22.1	48.1	28.4	60.3
1	5.3	1.9	1.9	2.5	13.4	10.4	6.8	10.8
2	3.9	3.5	3.2	3.2	11.6	6.7	5.0	6.2
3	2.6	3.2	3.5	3.6	10.0	5.2	4.2	4.3
4	3.9	4.1	3.1	3.1	8.2	4.6	4.0	3.6
5	2.2	1.6	1.2	1.2	6.7	4.0	3.9	2.9
6	3.1	2.7	2.2	2.1	5.5	3.1	3.2	2.0
7	2.2	1.7	2.0	1.7	4.6	3.0	3.3	1.7
8	3.9	1.6	1.1	0.9	4.0	2.9	3.9	1.8
9	0.9	1.4	1.2	1.0	3.7	2.5	3.7	1.4
10	3.1	1.1	1.5	1.0	4.0	2.9	5.7	1.5
11	30.3	32.3	45.0	18.6	6.3	6.6	27.9	3.6
Total	100	100	100	100	100	100	100	100

Source: Authors' calculations based on Statistics Canada administrative data.

Note: Figures are based on all SIC three-digit level industries (228). Figures on firms are based on the 318,217 firms that were in operation for all 11 years from 1986 to 1996.

The next set of columns in Table 5 provides the same information as in the first set of columns, except at the firm level. There were about 2.2 million firms that operated in at least one of the 11 years under study, and almost 320,000 that operated during all 11 years. Since credible implicit contracts between employers and employees are most likely to have evolved among long-lived firms — which account for 71 per cent of all job-years that existed over this period — the analysis focuses on this group of firms.

The distribution of firms is considerably less concentrated than that of industries. At one extreme, less than one quarter (22 per cent) of the firms were never net beneficiaries of UI, while at the other extreme, a very small fraction of firms (6.25 per cent) were net beneficiaries every year during this 11-year period. These "always subsidized" firms accounted for only 6.6 per cent of all jobs, contributed only 3.6 per cent of total UI taxes, but received fully 28 per cent of all benefits. These firms represent less than one per cent of the 2.2 million firms that existed during this period and account for about one fifth of all UI benefits paid (figures not shown).

Table 6 provides information on selected characteristics of the always-subsidized and never-subsidized firms, in comparison with all types of firms, concentrating again on those firms operating in all 11 years. Figures in the first rows indicate that, when compared with the distribution of all jobs, a disproportionate share of jobs among always-subsidized firms are in medium-size firms (those with between 20 and 500 employees). Among never-subsidized firms, a disproportionate share of jobs are in large-size firms, with nearly 80 per cent of jobs in never-subsidized firms being in large enterprises compared with only 54 per cent of all jobs. Among never-subsidized firms, the distribution of claims according to the reason for job separation leading to claiming UI benefits is quite similar to that of all firms, regardless of their cross-subsidization status. However, among always-subsidized firms, UI claims that are associated with a temporary job separation represent a disproportionate share of claims. This result is in line with findings discussed above showing that a higher than average incidence of layoffs due to temporary job separations is a major contributing factor to persistent inter-industry subsidies. It also supports the results in Corak (1993a,b), Gray & Sweetman (2001), and Lemieux & MacLeod (1995, 2000), which suggest that the same workers repeatedly rely on UI benefits supported by employment with the same employers.

The third and fourth sets of rows of Table 6 deal with the distribution of firms across provinces and industries. Since firms across Canada (regardless of their cross-subsidization status) are mainly located in Quebec and Ontario, these two provinces consist of a significant portion of always-subsidized as well as never-subsidized firms, reflecting the absolute size of these provinces. However, the distribution between the two provinces within each category is quite different: while 38 per cent of always-subsidized firms are located in Quebec, and a further 15 per cent in Ontario, these percentages are reversed among the never-subsidized firms. In a similar fashion, the service industries capture the highest share of firms among all, always-subsidized, or never-subsidized firms. Among never-subsidized firms, a less than proportionate share is in service industries, and the reverse is true among always-subsidized firms. In addition, while firms in the trade industries come in second place for all firms and never-subsidized firms, among always-subsidized industries, second place goes to the construction industries. This suggests that significant cross-subsidization occurs within industries, a finding that is also illustrated in the following tables.

Table 6: Distribution of Firms by Cross-Subsidization Status and Selected Characteristics, Annual Averages, 1986–1996 (Percentages)

Characteristics	Always-Subsidized Firms	Never-Subsidized Firms	All Firms
Firm size		**(% of jobs)**	
Less than 19 employees	11.3	3.2	11.0
Between 20 and 99 employees	27.4	5.0	16.8
Between 100 and 499 employees	28.4	12.7	18.4
500 employees or more	32.9	79.7	53.8
Reason for layoff leading to a UI claim		**(% of claims)**	
Temporary job separation	71.5	43.2	47.8
Permanent job separation	21.1	40.4	37.0
Unknown reason for job separation	7.4	16.4	15.2
Province		**(% of firms)**	
Ontario	15.0	38.5	33.1
Quebec	37.8	14.7	23.5
British Columbia	–	–	13.2
Alberta	–	14.6	–
New Brunswick	9.7	–	–
Industry		**(% of firms)**	
Services	23.8	41.4	36.5
Trade	10.7	19.1	23.2
Construction	30.7	–	10.8
Finance	–	14.1	–

Source: Authors' calculations based on Statistics Canada administrative data.

Notes: Figures are based on the 318,217 firms that were in operation for all 11 years from 1986 to 1996. Figures by industry and province only indicate percentages for the three top categories.

More detail on the industrial distribution of always-subsidized and never-subsidized firms is presented in tables 7 and 8. These tables provide details on the 10 industries (defined at the three-digit SIC level) that account for the highest proportions of always-subsidized (Table 7) and never-subsidized firms (Table 8). The 10 industries listed in each table account for 57 per cent of all always-subsidized firms and for 47 per cent of all never-subsidized firms. A large percentage (30 per cent) of the always-subsidized firms belong to construction industries whereas the never-subsidized industries are not as concentrated in one particular industry even though a large fraction belong to the service industries. It is clear from these tables that cross-subsidization exists not only between industries but also within them. For instance, firms from three of the always-subsidized industries (with RBT ratios greater than one, indicating that these industries are net beneficiaries of UI as a whole) — agricultural, trade contracting, and truck transport industries — represent 30 per cent of all always-subsidized industries but are listed as well in the top 10 of never-subsidized industries.

Table 7: Distribution of Always-Subsidized Firms by Proportions of All Always-Subsidized Firms (Highest 10), 1986–1996

Three-Digit Level Industry	Industry	Proportion of All Always-Subsidized Firms	RBT Ratios (Calculated at the Three-Digit Level)
Trade contracting industries	Construction	19.7	3.10
Agricultural industries	Agriculture	7.0	4.21
Residential building and development	Construction	4.8	3.82
Logging industry	Forestry	4.1	5.10
Highway and heavy construction	Construction	3.9	3.94
Sports and recreation clubs service	Service	3.6	2.54
Food services	Service	3.5	1.39
Truck transport industries	Transportation	3.3	1.38
Hotels, motels, and tourist courts	Service	3.2	1.37
Fishing industries	Fishing	2.5	17.08

Source: Authors' calculations based on Statistics Canada administrative data.

Table 8: Distribution of Never-Subsidized Firms by Proportions of All Never-Subsidized Firms (Highest 10), 1986–1996

Three-Digit Level Industry	Industry	Proportion of All Never-Subsidized Firms	RBT Ratios (Calculated at the Three-Digit Level)
Office of physicians, surgeons, and dentists	Service	8.9	0.77
Religious organizations	Service	8.3	0.53
Agricultural industries	Agriculture	7.3	4.21
Investment intermediary industries	Finance	4.9	0.94
Real estate operator, insurance industries	Finance	4.5	0.96
Insurance and real estate agencies	Finance	3.1	0.56
Other retail store and non-store retail	Service	2.7	1.20
Trade contracting industries	Construction	2.7	3.10
Management consulting services	Service	2.1	1.01
Truck transport industries	Transportation	2.1	1.38

Source: Authors' calculations based on Statistics Canada administrative data.

The extent of cross-subsidization within industries is demonstrated even more clearly in Table 9, albeit at a more aggregated industrial classification. In both the mining and transportation industries, 49 per cent of firms are either never subsidized by UI or occasionally subsidized (between 1 to 3 years out of a total of 11 years), while a large percentage (34 per cent and 32 per cent respectively) are subsidized for at least 7 years. Even in public administration — the industries with the lowest RBT ratio — almost one third of firms are subsidized for seven years or more. This cross-subsidization within industries is sometimes more important than the cross-subsidization between industries. For instance, agriculture is a net beneficiary of UI, but as many as one third of firms in this industry never received a subsidy and a further one quarter received a subsidy for only 1, 2, or 3 years out of

the 11 under study. It is the minority of firms that lead UI benefits to be persistently greater than contributions for the industry as a whole. The same story holds, though perhaps not to the same degree, in other industries. In construction, 9 per cent of firms never receive a positive net transfer and a further 17 per cent receive one for just one to three years. In a similar fashion, a significant fraction of firms operating in industries that are net contributors to the UI program were subsidized for at least seven years over the 1986 to 1996 period. A substantial one quarter to one third of firms in the manufacturing, transportation, and public administration industries also fall into the former category.

Table 9: Distribution of Firms by Industry and Cross-Subsidization Status, 1986–1996

Industries	Never-Subsidized (%)	Subsidized One to Three Years (%)	Subsidized Four to Six Years (%)	Subsidized Seven to Ten Years (%)	Always-Subsidized (%)
Agriculture	32	26	15	18	9
Forestry	6	10	13	38	34
Fishing	8	6	11	46	29
Mining	23	26	16	22	12
Manufacturing	12	36	27	19	6
Construction	9	17	21	35	17
Transportation	21	28	19	22	10
Trade	17	42	24	13	3
Finance	44	39	12	4	1
Service	26	39	20	12	4
Public administration	22	28	19	22	9

Source: Authors' calculations based on Statistics Canada administrative data.

Note: Figures are based on the 318,217 firms that were in operation for all 11 years from 1986 to 1996.

These figures suggest that the behaviour and characteristics of individual firms may play a significant role in determining both between- and within-industry patterns in the flows of UI funds. Another way to look at this issue is to explore what fraction of the variance in RBT ratios is industry-specific, firm-specific, or due to other factors. Using the approach of Anderson and Meyer (1993), we estimate the following equation:

$$RBT_{jpt} = \alpha_t + \beta_p + \delta_i + \gamma_j + \varepsilon_{jpt} \qquad (2)$$

The dependent variable is the RBT ratio for firm j in province p in year t. It is assumed that the RBT ratio is a function of a number of fixed effects: α_t captures changes from year to year, β_p and δ_i are province and industry effects respectively, γ_j captures differences between firms, and ε_{jpt} serves as an error term. Province-fixed effects are included in the model because assessments of the nature of cross-subsidies through UI are often cast in regional terms.

Using a least squares procedure, we estimate a series of models by successively adding each group of fixed effects, with the change in the adjusted R-squared from the most restrictive to the least restrictive versions of the model providing a measure of the relative contribution of province, industry, firm, and other factors to the total variance in RBT ratios.[16] The results are presented in Table 10.

The first column indicates the contribution of year indicators to the variance of RBT ratios and shows very small year effects. As mentioned above, the impact of business cycle or any other year effect is likely removed by the fact that benefit to taxes ratios are standardized by the national benefit to taxes ratio. It can be seen from the next column that the provincial effect increases the adjusted R-squared by 10 percentage points showing substantial cross-subsidies between provinces. Adding the aggregated industry indicator further increases the adjusted R-squared another 10 percentage points, and an additional 3.6 percentage points when the more disaggregated industry categories are used. The most significant gain in adjusted R-squared, however, is found when firm indicators are introduced. As shown in the last column, adding firm indicators results in a large increase in the adjusted R-squared: an additional 35 percentage points to the explained variance, leaving approximately 41 per cent of total variance unexplained.

The effect of province and industry may be influenced by the order in which the blocks of fixed effects are introduced. This is assessed by reversing the order to include the aggregated and more disaggregated industry indicator first, followed by the province indicator. The magnitude of the inter-industry effect is about the same as before, but the between-industry effect has a larger impact, with a 13 percentage points increase in adjusted R-squared. The inclusion of the provincial effect only adds about 6.7 percentage points (figures not shown).

Variations in RBT ratio across firms are thus much greater than across industries and province. The model can explain 58.9 per cent of these variations. Of the explained variation in RBT ratios, 34.5 percentage points (59 per cent) can be attributed to firm-specific effects, between 6.7 and 10 percentage points (about 11 to 17 per cent) to province-specific factors, and the remaining 24 to 30 per cent to industry-specific factors.

The estimation is extended by examining each industry as well as each of the 10 provinces separately. The results are presented in the two next sets of rows of Table 10. Adding provincial fixed effects produces quite distinct results across industries. For example, provincial indicators increase the explained variation by as much as 24 percentage points in forestry industries, but only 2.5 percentage points in finance. The inter-industry variation (at the disaggregated three-digit SIC level) is generally minor except in manufacturing industries where it produces a gain of 17 percentage points in the adjusted R-squared. Firm effects are still dominant but the impacts are quite different across industries. Adding firm-specific effects results in an additional 42 percentage point gain in the explained variance for the agriculture, transportation, and trade industries, but 27 points for the fishing and finance industries. These results echo findings from Table 9.

[16] The adjusted R-squared is an indicator of the reliability of the relationship that is being estimated. In this analysis, the data cover firms located in the 10 provinces. Self-employed firms, those located in one of the territories, as well as those with an unknown industry are excluded from the sample. Note that the subscript for the dependent variable is *jpt*, because each firm may have more than one plant located in different provinces in a given year.

Table 10: Contributing Factors to Variance in RBT Ratios Across Industry and Across Provinces, 1986–1996

	Changes in R-Squared (in Percentage Points) Due to					
	Year Effect	Province-Specific Effect	Aggregated Industry-Specific Effect	Disaggregated Industry-Specific Effect	Firm-Specific Effect	Total R-Squared
All industries and provinces	0.05	10.22	10.44	3.64	34.53	58.88
By industry						
Agriculture	0.42	14.74	–	2.21	42.87	60.24
Forestry	0.49	24.08	–	0.09	34.44	59.10
Fishing	7.90	9.87	–	0.33	26.62	44.72
Mining	0.72	19.83	–	4.35	33.46	58.36
Manufacturing	0.04	10.39	–	16.66	31.79	58.88
Construction	0.80	15.32	–	0.45	31.28	47.85
Transportation	0.09	12.38	–	2.41	42.08	56.96
Trade	0.06	8.66	–	1.64	41.54	51.90
Finance	0.03	2.54	–	1.31	27.73	31.61
Service	0.10	6.68	–	7.84	36.78	51.40
Public administration	0.23	14.53	–	0.03	37.60	52.39
By province						
Newfoundland	0.46	–	7.71	13.74	41.97	63.88
Prince Edward Island	0.82	–	23.81	7.23	26.27	58.13
Nova Scotia	0.26	–	20.12	9.36	35.71	65.45
New Brunswick	0.82	–	33.73	5.59	29.45	69.59
Quebec	0.14	–	10.08	5.58	39.14	54.94
Ontario	0.52	–	7.91	3.94	26.18	38.55
Manitoba	0.24	–	11.93	4.13	27.03	43.33
Saskatchewan	0.39	–	12.10	4.21	29.03	45.73
Alberta	0.56	–	4.99	2.54	19.92	28.01
British Columbia	0.67	–	7.86	5.21	27.75	41.49

Source: Authors' calculations based on Statistics Canada administrative data.

Note: Figures are based on the 2,907,757 firms that were in operation for all 11 years from 1986 to 1996.

Similarly, the effects of industry differ across provinces. Adding an industry-specific indicator increases the adjusted R-squared by nearly 34 percentage points in New Brunswick, but less than 5 percentage points in Alberta. The within-industry variation is largest in the Atlantic provinces (especially in Newfoundland), and the least important in Alberta. Again, firm-specific effects result in significant increases in explained RBT ratios variation for most provinces. It is, however, noteworthy that industry-specific effects are more important than firm-specific effects in Prince Edward Island and New Brunswick, suggesting that heterogeneity among industries — rather than among firms — is a significant factor in determining cross-subsidization in these two provinces.

Conclusion

The Canadian unemployment insurance (UI) program — in spite of significant changes in eligibility rules and benefit entitlements and rates since the early 1970s — entails a relatively stable and long-lasting pattern of transfers across industries and provinces: some are never net beneficiaries of the program, others always are, especially when industries are examined at a relatively disaggregated level. This high UI cross-subsidization in Canada is often interpreted as the result of geographical location or an unavoidably large proportion of seasonal employment. However, our analysis suggests that these patterns are substantially due to firm-specific factors, and geography and industry are not as important in determining cross-subsidization once across-firm variations are considered. In other words, a considerable number of firms predictably and persistently receive subsidies through the UI program, year after year, regardless of their geographical and industrial conditions.

Using administrative data on all Canadian firms, workers, and UI recipients over the 1986 to 1996 period we find that higher than average incidences of layoffs, especially those leading to temporary job separations, and lower than average wage rates are the major reasons for persistent inter-industry subsidies. These two dimensions can be significantly influenced by the firm or reflect the implicit or explicit contract between employers and employees.

Cross-subsidies occur not only between industries but also within industries, and individual firm effects are very important in understanding the variations in cross-subsidization status across and within industries. Most firms that are net beneficiaries of UI for all 11 years belong to industries that are also net beneficiaries of UI for all 11 years. However, many firms that are net contributors to UI over the entire period also belong to industries that are net beneficiaries for the entire 11-year period. We find that firm-specific practices are twice as important as industry or geographic location in explaining whether a firm is a net beneficiary of, or net contributor to, the UI program. In addition, the impact of firm effects is very different across industries, accounting for over 40 per cent of the explained variation in the relative benefit to tax (RBT) ratio in some industries but less than 30 per cent in others. These findings demonstrate the importance of recognizing the role of the demand side of the labour market in analyses of the interactions between UI and the labour market, especially in policy-making. Implicit contract models might, in this sense, prove particularly valuable.

Appendix A

Our analysis is based on a number of administrative data sets. These include the Benefits and Overpayments (BNOP) unemployment insurance (UI) administrative datafile, tax information from T4 files, and data from the Longitudinal Employment Analysis Program (LEAP). The BNOP contains information on all UI claims initiated in a given year. Data from 1986 through 1996 is used to derive the total number of claims, the total amount of benefits paid, and the average duration of benefit receipt for the employees of each firm. Each BNOP record contains a payroll deduction account number associated with a particular firm. (Because the structure of payroll deduction account numbers changed in 1997, a longitudinally consistent labelling of firms beyond this year was not possible at the time of the research.) These account numbers are established and used by Revenue Canada (as the Canada Customs and Revenue Agency was referred to during the period under study) for tax remittance purposes. A firm may have several account numbers. These are all aggregated at the firm level using the information in LEAP, a longitudinally consistent catalogue of all firms operating in Canada. (See Statistics Canada, 1988, for a detailed description of this file.) A firm is defined according to the longitudinal business register identifier as used in LEAP. The categorization of a claim as being due to a temporary or a permanent separation is also done in the manner of Statistics Canada (1992). A temporary separation is said to have occurred if the individual had any employment earnings from the same firm in the year following the separation. This is determined by whether or not the firm issued a T4 indicating some earnings for that individual. If an individual initiates more than one UI claim in a given year, the firm information on each record in the BNOP is used to determine if the claims were supported with employment from the same firm, and the first claim is categorized directly as resulting from a temporary or permanent separation.

The T4 is also the source of information on the amount of UI contributions made. T4s are issued by firms to all paid employees, and used for tax purposes. They also have a payroll deduction account number and these are aggregated at the firm level using the LEAP in the same manner as that of the BNOP information. Total contributions by the employees of a firm are summed from the T4 file. Employers' contributions are derived by multiplying employees' contributions by 1.4, reflecting the legislated employer contribution rate. No adjustments are made for premium reductions to those firms participating in a premium reduction program, under which the employer's premium can be reduced when the employees are covered by a qualified short-term disability program. It is estimated that such adjustment would make very little difference.

UI contributions of self-employed fishers are not available in the T4 files. As such, this group is not included in the analysis. The number of T4s issued is used as an indication of the number of jobs in each firm or industry over the course of a given year. While there are a small number of cases in which employers issue more than one T4 per job to their paid employees, equating a T4 with a job does not entail too much of an error. (The exception to this is the fishing industry, dominated by self-employed individuals. It is not uncommon for these individuals to receive two or three T4Fs in a single calendar year.)

Appendix B

Table B.1: UI Program Rate Schedule, 1986–2001

Years	Contribution per Dollar of Insurable Earnings ($)		Maximum Annual Insurable Earnings ($)	Maximum Annual Contribution ($)
	Employer	Employee		
1986	3.29	2.35	25,740	1,452
1987	3.29	2.35	27,560	1,555
1988	3.29	2.35	29,380	1,657
1989	2.73	1.95	31,460	1,473
1990	3.15	2.25	33,280	1,797
1991	3.15 (3.92)	2.25 (2.80)	35,360	1,910 (2,377)
1992	4.20	3.00	36,920	2,659
1993	4.20	3.00	38,740	2,790
1994	4.30	3.07	40,560	2,990
1995	4.20	3.00	42,380	3,052
1996	4.13	2.95	39,000	2,762
1997	4.06	2.90	39,000	2,714
1998	3.78	2.70	39,000	2,527
1999	3.57	2.55	39,000	2,387
2000	3.36	2.40	39,000	2,246
2001	3.15	2.25	39,000	2,107

Note: Figures in parentheses became effective in the middle of year 1991.

Table B.2: RBT Ratios by Industries and Provinces, Annual Averages, 1986–1996

	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Northwest Territories	Yukon	Outside Canada	All Canada
Agriculture	10.86	10.01	4.87	8.63	4.69	1.73	2.16	2.99	1.22	4.74	3.37	8.67	0.20	3.18
Forestry	16.35	18.29	8.49	13.45	9.05	1.85	4.39	4.62	2.89	2.93	7.40	5.55	0.77	5.06
Fishing	25.54	27.42	21.35	22.15	17.99	3.31	16.09	7.67	0.69	4.68	6.40	4.34	0.61	14.76
Mining	1.35	7.32	1.02	1.79	1.36	0.68	0.78	0.76	0.74	0.98	1.38	3.58	1.50	0.90
Manufacturing	7.75	5.59	2.07	2.70	1.16	0.64	0.75	0.72	0.78	0.98	1.29	1.82	0.39	0.95
Construction	9.36	6.20	5.13	7.06	4.70	2.45	3.15	3.02	2.38	2.71	3.85	5.18	2.30	3.29
Transportation	1.8	1.75	0.93	1.19	0.72	0.46	0.54	0.52	0.59	0.60	1.47	1.02	0.29	0.61
Trade	3.28	3.09	1.65	1.82	1.24	0.65	0.71	0.69	0.71	0.88	1.27	1.47	2.52	0.92
Finance	1.32	1.17	0.74	0.94	0.73	0.42	0.48	0.51	0.59	0.60	1.13	1.09	0.37	0.56
Service	2.57	1.87	1.17	1.82	1.02	0.57	0.65	0.66	0.74	0.84	1.49	2.32	0.47	0.80
Public administration	1.49	1.85	0.63	0.90	0.64	0.37	0.55	0.65	0.45	0.44	0.89	1.04	0.28	0.55
All industries	**3.74**	**3.44**	**1.62**	**2.27**	**1.27**	**0.68**	**0.79**	**0.83**	**0.82**	**1.02**	**1.38**	**1.74**	**0.32**	

Source: Authors' calculations based on Statistics Canada administrative data.

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