

The Effects of a Training Levy on Training Characteristics and Outcomes: The Case of Quebec

Les retombées d'une taxe de formation sur les caractéristiques et les résultats de la formation : le cas du Québec

Las repercusiones de un impuesto de formación sobre las características y los resultados de la formación: el caso de Quebec

Marie-Eve Gagnon et Michael Smith

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Résumé de l'article

Cet article vise à comparer les caractéristiques de la formation offerte dans les entreprises et leurs impacts sur les salaires des employés au Québec et dans les autres provinces canadiennes. Au Canada, comme dans de nombreux pays industrialisés, l'une des préoccupations majeures dans le dossier de la formation continue est le sous-investissement des entreprises. Le contexte institutionnel canadien de la formation en entreprise diffère d'une province à l'autre et le Québec se distingue, entre autres, par l'adoption d'une loi en 1995, appelée « loi 90 », exigeant de la part des entreprises assujetties d'investir annuellement dans le développement de la formation de leur main-d'oeuvre. Dans une perspective comparative, nous examinons les effets potentiels de cette mesure obligatoire de financement en formation. Nos analyses sont fondées sur un ensemble de micro-données longitudinales sur les milieux de travail canadiens et leurs employés. Des différences provinciales sont observées dans la formation structurée et en cours d'emploi, ainsi que sur l'impact de l'investissement sur les salaires. Au Québec, nous observons une incidence plus faible de la formation en cours d'emploi pour laquelle nous pensons que les dépenses sont plus difficilement justifiables dans le cadre de la loi. Les résultats indiquent également une tendance plus forte au Québec à recourir à des formateurs externes qu'ailleurs au Canada et ils mettent aussi en évidence des retombées plus élevées de la formation en cours d'emploi sur les salaires dans cette province, tandis que les effets engendrés par la formation structurée sont de tailles similaires à travers les provinces et les régions. Nous discutons des résultats en regard des différences provinciales et de leur environnement institutionnel, ainsi que des expériences internationales de politiques gouvernementales en matière de formation continue. Nous posons certaines hypothèses quant à l'impact plus élevé de la formation en cours d'emploi sur les salaires observé au Québec comparativement aux autres provinces.

The Effects of a Training Levy on Training Characteristics and Outcomes: The Case of Quebec

Marie-Eve Gagnon and Michael Smith

Much of the policy discussion on training is concerned with its undersupply. In 1995, inspired by the French example, Quebec introduced a levy on employers who underspend on training. In this paper we use a micro data set on Canadian workplaces to compare training characteristics and training effects on wages in Quebec with other parts of Canada. In Quebec, we find a much lower incidence of on-the-job training, a greater tendency to use outside trainers, and a larger effect of on-the-job training on wages. We speculate on ways in which these results may be explained by the training levy policy.

KEYWORDS: training, Quebec, training levy

Introduction

The main preoccupation of the literature on training is its under-supply (e.g., Reich, 2002: 118-119; Hearn and Rooney, 2008). Training may be under-supplied either because employers do not know its value or because they know its value only too well. Much of the now voluminous literature on high performance work systems is animated by the idea that employers fail to see the benefits of the systems' practices, one of which is extensive training provision. That implies a failure to train caused by ignorance.¹ The theoretical literature tends to take a different tack: employers fail to train if, in doing so, they would incur significant costs and at the same time run the risk that their expenditures may be wasted when trained employees are lured away by higher wage offers from other employers (Becker, 1975: 19-20). Those employers can afford to pay higher wages because they avoided training costs. In this case employers fail to spend on training because they know that the skills they provide are in demand elsewhere and the risk that they may lose their investment is substantial.

Marie-Eve Gagnon, Doctoral Student, Department of Sociology, McGill University, Montréal.

Michael Smith, James McGill Professor of Sociology and Department Chair, Department of Sociology, McGill University, Montréal (michael.smith@mcgill.ca).

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Over long historical periods countries have developed training institutions and cultures that differentially equip them to reduce the undersupply (cf. Thelen, 2004). But institutions and cultures are hard to change (Hollingsworth, 1997). How, then, might governments address the under-supply problem? Several countries have opted for a levy imposed on employers who fail to train, the revenue from which may be used to create a training fund. Between 1964 and 1982 the UK implemented a variant of a levy program, though the levy was only compulsory for part of that period (Stevens, 1999: 18). Australia experimented with something similar from 1989 to 1994 (Baker, 1994; O’Keefe and Dollery, 2006: 103). In 1995 Korea introduced a levy on employers to be redistributed as training grants (Lee, 2004: 236). The most interesting case, however, is France, which implemented a compulsory levy scheme in 1971 and has not since abandoned it (Greenhalgh, 2002: 231). Its policy requires employers who spend less than a specified percentage of their payroll on training to turn over the difference to the government, some of which has been funneled to employer and union-run training programs.²

Given the institutional obstacles to other methods for increasing the supply of training, on the one hand, and the feasibility of training levies on the other, it would be useful to have studies of their effects. The fact that both Australia and the UK introduced then abandoned a training levy is not encouraging. France, however, continues with its policy and we do have some evidence of its effects, largely involving comparisons with the UK (Greenhalgh, 1999, 2002; Hocquet, 1999). The UK comparison is interesting because its system is usually characterized as poorly performing and, notwithstanding its experiment with a levy, its workforce development policies have largely been directed at funding trainees. The research suggests that, as compared to the UK, in France, proportionally fewer employees get trained but their training episodes are longer, training is provided to a wider range of skills and competencies, and after controlling for unobserved trainee characteristics, the returns to training are higher. But the differences are not very large.

These results, moreover, may not be robust. Greenhalgh attempted to draw conclusions from studies that used a wide range of methodologies, sometimes producing inconsistent results within each country. Hocquet ran similar analyses on two data sets that had different sampling frames. The conclusions from this research are fragile because none of the studies used genuinely comparable data. There is much to be gained from a study of levy effects using more comparable data.

The Quebec Case: Possible Effects

Inspired by the French example, in 1995 the Quebec National Assembly adopted the *Loi favorisant le développement de la formation de la main-d’oeuvre* (L.Q. 1995, c. 43 [Law 90 or 1% Law]). It did so because there was strong evidence that Quebec employers provided much less training than did their Canadian

counterparts (Bélanger and Robitaille, 2008: 26). The passage of the law was followed by a substantial increase in employee participation in employee-supported training which was not matched in most other Canadian provinces (Peters, 2004: 14; only in New Brunswick was there also an increase of any significance).

The law required firm spending on training equal to at least 1% of payroll. Only firms above a specified payroll minimum have been subject to the law. That minimum started at a million dollars in 1996, was reduced to half a million in 1997, and then to a quarter of a million in the next year. In 2003, in response to employer complaints, it was returned to a million dollars (Bernier, 1998; Charest and Critoph, 2010; FNFMO, 2005; Morissette and Charest, 2010). The law is embedded within a fairly elaborate consultative structure, incorporating unions, employer groups, and community organizations. Quebec, then, provides another opportunity to explore the possible effects of the imposition of a training levy on employers. Those effects include both the character of training and the association between training and wages.

The Incidence and Character of Training

Training levies are designed to move the supply of training closer to a social optimum than it would be, were employers making unconstrained choices. Law 90, then, should have increased the quantity of employer-provided training. As we saw above, we know that the amount of employer-provided training did increase after passage of the law. After the imposition of the levy one would expect any difference between Quebec and other parts of Canada in the amount of employer-provided training to narrow or disappear.

Still, the introduction of a levy is likely to have confronted some Quebec employers with a problem: those who previously spent little on it would have had to learn how to provide training. For a large number, the solution seems to have been to hire an external trainer. In Quebec, as in France, the introduction of a levy “has, since its adoption, given rise to a veritable training industry” (Bernier, 1998: 42; Greenhalgh, 1999: 100). A second challenge was to ensure that the relevant government agency agreed with firm managers on what constituted a training expenditure. There is evidence that this has been an issue in previous implementations of training levies. In the UK firms became concerned with the documentability of their training expenditures (Ziderman, 1978: 46). Post-levy, Australian employers complained about record-keeping obligations (Noble, 1997: 11-12).

The implementation of the law in Quebec in effect specified a solution to this second challenge. “From the beginning, the 1% Law has defined admissible training under the law as any training that an SQDM accredited organization provides. Among these registered institutions we find private sector training

companies and professional orders, as well as traditional educators like school boards, their adult education centers, colleges and universities" (Bernier, 1998: 42).³ Some firms, then, might anyway have turned to external training providers because they had little or no experience of training in the past. Government rules that accredited outside trainers provided an additional incentive; doing so would preclude possible difficulties with government auditors.

Training and Wages

Training is designed to make employees more productive. It appears to do so (Dostie and Pelletier, 2007). More productive employees should have higher wages. There is abundant evidence that they do (e.g., Dolton, Makepeace and Treble, 1994; Blanchflower and Lynch, 1994; Parent, 2003), though how much of the associations reported in these studies indicates an effect of training on productivity is not entirely clear.

Being young, better educated, in a job that requires discretion and judgment (e.g., managers and professionals), and employed full-time all increase the likelihood of training (Green, 1993; Sutherland, 2004). Investments in training people with these characteristics yield higher returns. However, within these broad categories we know that there is substantial variation in intelligence, initiative, and effort. These traits are likely to increase the yield on training investments but also may be independently associated with higher wages. Part of the association between training and wages, then, may be caused by ability differences that cannot be directly observed in the available data sets.

Taking these issues into consideration, what should be the effect of a levy on the association between training and wages? There is no obvious answer to this question. A rationale for training levies is that training is under-supplied with respect to some broader social optimum but not with respect to the individual optimizing of firms. Insofar as that is the case, levy induced increments in training are likely to be provided to increasingly less promising trainees; this might cause progressively smaller effects on trainee productivity and wages. If, however, training were under-supplied because many employers failed to recognize its value, as argued in the high performance work organization literature, then the increment in the productivity of those now, but not previously trained, might not fall, and the effect on the wages of employees to whom incremental training was supplied would be as large as the effect on the wages of employees previously trained.

Effects of a levy on the kinds of training provided might also affect wages. If a levy encouraged expansion of forms of training that can be more readily documented, combined with the provision of training to the less talented, then the effect of documentable forms of training on productivity and wages would fall. If

there were some diversion of training investments from less to more documentable forms, one might expect a stronger relationship between training and wages among those receiving less documentable forms because the average quality of employees receiving wages is likely to be higher than it would otherwise be.

Hypotheses

The discussion above implies two hypotheses. First, the presence of a training levy in Quebec should have increased the use of training forms for which the expenditures can be clearly documented. Formal training involving a classroom should be easy to document, particularly when trainers are hired from outside. On-the-job training (OJT, alternately referred to as informal training in what follows), usually involving informal instruction by a co-worker or supervisor, is harder to document. One would expect a levy to increase the relative share of the first and reduce that of the second and, for both forms of training, to increase the proportion contracted from outside suppliers. Second, if training spending is diverted from OJT to formal training, given the tendency to direct training to the more able employees, and assuming some association between productivity and wages, one might expect OJT to be associated with higher wages in Quebec than in other parts of Canada.

Data and Methods

To estimate the effects of Law 90 one would prefer data on training and its outcomes before and after the law went into effect. We know of no such data. However, Statistics Canada's Workplace and Employee Survey (WES) makes possible an alternative research design. WES gathered data from a continuing panel of a random sample of workplaces, and two year panels of employees randomly selected within the sampled workplaces.⁴ Data collection began in 1999, three years after Law 90 came into effect. The sample contains approximately 5,500 workplaces and 25,000 employee responses per year. Data were drawn from interviews with both managers and employees. The theory on training investments, of course, deals with firms rather than workplaces. But many firms have more than one workplace, sometimes producing different goods or delivering different services. Other firms have workplaces in two or more jurisdictions, for example in Quebec, where there is a training levy, and Ontario where there is not. For most purposes workplaces are more appropriate than firms for examining training policy effects.

The WES is national, so training and its correlates can be compared across Canada. This provides a useful research design because, while differing in training policy, Quebec shares many characteristics with other Canadian jurisdictions.

Living standards are similar. Many of the same employers are present across the country. Business schools and employer associations provide pressure towards convergence in employment policies. Though Quebec has civil law and the rest of Canada common law, both systems operate with the same Supreme Court and there is some pressure to harmonize the codes and the decisions made under them. Most Canadian exporters depend heavily on the US export market and have to adapt to the tastes and preferences of US customers. These similarities increase the likelihood that differences in training characteristics and outcomes should be attributed to Law 90.

Quebec, however, differs from other parts of Canada in ways that complicate that inference. The proportion of over 45s in Quebec with less than a high school education exceeds that of most provinces to the west. Interposed between high school and university, Quebec's CEGEP system shortens both high school and university programs relative to other Canadian provinces. Quebec's share of immigrants is modest compared to Ontario and British Columbia.⁵ And a larger proportion of employees in Quebec is covered by collective agreements than in any other part of Canada, except Newfoundland. Training programs and outcomes are likely to be influenced by levels of education, the education delivery system, the presence or absence of unions, and, since they are likely to pose particular problems and opportunities, the proportion of immigrant employees. Later in the paper we consider the extent to which these factors may have confounding effects on the training-wage relationship.

We present results for Quebec, Ontario, B.C., and an aggregation of the Atlantic Provinces. Ontario, the other part of Canada's manufacturing heartland provides a natural comparator. B.C. shares with Ontario the absence of an equivalent of Law 90. Its inclusion increases the plausibility of inferences that assign cause to Law 90. The provinces in Atlantic Canada do not generate large enough workplace samples to sustain their separate analysis but Atlantic Canada is interesting because Quebec's labour productivity levels are somewhere between those of Ontario and Atlantic Canada. If the labour productivity level dominates the determination of distinct training practices we might expect Quebec's to be situated somewhere between those of Atlantic Canada and Ontario. We have omitted the Prairie Provinces (Alberta, Saskatchewan, Manitoba) because some of them pose problems of sample size, and there are very large economic differences among them.

In the analysis to follow we distinguish formal and informal training, where informal training is defined as on-the-job training. The two relevant questions in the survey are: "In the past twelve months, have you received any classroom training related to your job?" (specified as training with a pre-determined format and a pre-defined objective) and, "In the past twelve months have you received

any informal training related to your job (that is on-the-job training)?” Either form can be delivered by employees of the workplace or can be outsourced to external training providers. This may seem more obviously the case for classroom training than OJT. However, the outsourcing of human resources management functions, including both forms of training, has increased substantially (Stroh and Treehuboff, 2003; Richman and Trondsen, 2004). Outsourced OJT may take a number of forms. It may be provided by equipment or software vendors. Trainers may be hired to coach managers or other employees; that is, follow them around at work and advise them on how to do their jobs better. Firms may outsource regular OJT functions because they lack the technical expertise to provide the training. Here is one example.

Raytheon Professional Services (RPS) ... launched by Raytheon in the early 1990s, now is a \$100 million business. It does auto industry training in North America, Europe and Asia. RPS clients include its corporate parent, Nokia, Hewlett-Packard, John Deere, Ford and General Motors (GM). GM doesn't train Mr. Goodwrench. RPS does, coordinating GM's 191 training locations and 7,000 dealerships. RPS converted most classroom training for tech-based delivery to keep Mr. Goodwrench at the dealership working on cars instead of sitting in class at a training centre (Hall, 2004: 14; see also Brown and Fink, 2012).

OJT, then, is fairly widely outsourced.

We begin by examining the distribution of these training forms across relevant parts of Canada. Then we estimate cross-sectional and panel models of the association between training forms and the log of hourly wage rates, adding consecutive controls to see which factors most substantially modify the associations.⁶ We discuss the panel modelling strategy we use in the results section. To avoid repetition, we omit N's from the descriptive tables. For the employee responses (tables 1 and 4) the sample is quite large – a low of about 16,000 cases in Atlantic Canada to a high of almost 40,000 cases in Ontario. This is because they are calculated from averages over seven years. The N's for the employer responses (tables 2 and 3) vary between a low of about 2000 for Atlantic Canada and a high of almost 6000 in Ontario. The N's for the wage determination models (tables 5 and 6) are given in the tables.

Training in Quebec and Other Parts of Canada

The WES asked managers if their workplaces offered training, and employees if they had received it. Tables 1 to 3 summarize responses to these questions. About a third of employees reported formal training – a little higher in services than in goods-producing industries. Fewer reported OJT, particularly in Quebec. Quebec and Ontario are Canada's manufacturing heartland so, within

Quebec, comparisons with Ontario tend to dominate policy debate. The difference between Ontario and Quebec in the incidence of informal training – that is, OJT – is strikingly large – about 17 percentage points in aggregate and in both industrial subsectors (Turcotte, Léonard and Montmarquette, 2003: 23, report a similar result). On average, Quebec’s industry is less productive than Ontario’s. Productivity differences (and the technologies associated with them) might explain differences in the use of OJT and formal training. Atlantic Canada’s industries, however, are less productive than Quebec’s. While not as large as the difference with Ontario, the incidence of OJT in Atlantic Canada is also about 10 percentage points larger than in Quebec. Low productivity seems not to explain Quebec’s distinctly low use of OJT.

TABLE 1

Employee Proportion Reporting Formal and OJT Training: Annual Average, 1999-2005

	Formal			OJT		
	Total	Goods	Services	Total	Goods	Services
Atlantic Provinces	34.5	30.8	35.3	30.0	25.1	31.1
Quebec	34.4	28.4	36.5	18.1	15.7	18.9
Ontario	37.5	34.8	38.4	35.4	32.5	36.3
B.C.	32.3	25.4	33.8	33.1	28.8	34.1

Table 2 contains the employer responses to the training question, in aggregate, and for two of the most common forms of training. In contrast to employees, more employers report informal than formal training. This is not surprising. The question to employers asked whether or not they provided each kind of training. One might expect that many employers will provide OJT. Table 1 suggests that some of them only provide it to a small proportion of their employees. The differences by province and region between formal and on-the-job training

TABLE 2

Employer Proportion Reporting Formal and OJT Training: Annual Average, 1999-2006, All and Selected Kinds of Training

	Formal			OJT		
	All kinds	Tech.	Team	All kinds	Tech.	Team
Atlantic Provinces	30.7	11.9	9.0	43.1	18.2	10.5
Quebec	34.3	17.2	6.6	38.2	16.1	5.6
Ontario	34.3	15.5	9.5	50.4	23.2	11.7
B.C.	30.8	11.8	8.0	54.6	22.1	12.1

apparent in table 1 reappear in table 2. The incidence of OJT is, again, lower in Quebec, both in aggregate and for two of the higher incidence forms – training in technology use and in team work.

Tables 1 and 2, then, suggest that the one province that imposes a training levy – Quebec – provides the least OJT. One might be inclined to speculate on a causal connection. We know that, as compared to other parts of Canada, before Law 90, Quebec employers provided less training (Bélanger and Robitaille, 2008). We do not know the pre Law 90 shares of formal training and OJT. If, however, they were similar to other parts of Canada, it is possible that Law 90 caused a growth in formal training provided by accredited trainers while the provision of OJT remained about the same, or grew little or, perhaps, even declined.

Table 3 reanalyzes employer responses by workplace size. It suggests some caution but would not lead one to reject the possibility of a causal association. The table shows that the differences in the incidence of training between Quebec and the other provinces and region are most marked in the smaller workplaces – most clearly in those with less than 20 employees but, as compared to Ontario and B.C., at least, quite clearly in the 20 to 99 employee category too.

TABLE 3

Employer Proportion Reporting Formal and OJT Training: Annual Averages by Workplace Size, 1999-2006

	Atlantic Provinces		Quebec		Ontario		B.C.	
	Formal	OJT	Formal	OJT	Formal	OJT	Formal	OJT
1-19	25.9	38.4	27.0	30.2	28.3	44.8	25.8	50.0
20-99	64.4	75.9	66.2	75.1	61.4	77.5	62.3	85.6
100-499	78.6	90.5	91.9	90.1	86.7	93.2	80.4	92.0
500 +	95.5	94.8	95.0	92.8	97.2	95.6	90.9	92.3

That there is little difference in training incidences in the two largest size categories is not surprising. Large firm employers overwhelmingly report both sorts of training. There is not very much room for differences across jurisdictions. Substantially fewer employers in smaller workplaces report either kind of training, so there is more room for provincial differences. Would the smaller workplaces, however, be subject to Law 90? Between 1997 and 2004 there were varying payroll thresholds below which the law did not apply. Bear in mind that the law applies to firms, but our cases are workplaces. Many firms (including retail firms) have multiple workplaces; consequently a workplace with ten

employees may be subject to the law if it is part of a firm with, say, five similarly sized workplaces.

Even firms with a single workplace that falls into the smallest size category will often be subject to the levy. It does not take many lawyers (or management consultants) and associated staff to generate a payroll in excess of half a million dollars, the threshold that applied until 2003. A dozen lawyers and staff will usually generate a payroll that exceeds the larger, post 2003, million dollar threshold. At least some part of the large 16 to 17 percentage points difference between Quebec, on the one hand, and Ontario and B.C., on the other, is likely to be explained by a weaker incentive for workplaces subject to Law 90 to provide OJT. Moreover, the difference remains marked within the 20 to 99 employee category (8 and 9 percentage points respectively as compared to Ontario and B.C.) and few workplaces in that category are likely to have been exempt from the law. Finally, even within the two largest size categories, Quebec workplaces were about three percentage points less likely to provide informal training than their Ontario counterparts. Table 3, then, provides further evidence suggesting that Law 90 led to an expansion of formal training but not of OJT.

Table 4 shows that, while all provinces, as well as the Atlantic region, make use of external trainers, Quebec employees report much greater use of them for both formal training and OJT. As compared to the privileged comparator, Ontario, the percentage point differences are very large indeed: for formal training, 11 in the goods-producing sector and 16 in services; for informal training, 17 in the goods-producing sector and 12 in services. Conversely, Quebec employees receiving informal training are less likely than employees in the rest of Canada to report that it was provided by supervisors and colleagues. Spending on external trainers is readily documented. This result is again consistent with an effect of Law 90 on employer training choices.

TABLE 4a

Means of Training Provision (Formal Training): Annual Averages, 1999-2005

	Goods			Services		
	External trainer	Internal trainer	Supervisor	External trainer	Internal trainer	Supervisor
Atlantic Provinces	58.9	20.4	7.9	53.7	24.6	9.1
Quebec	67.4	19.7	7.2	64.2	21.6	6.1
Ontario	55.8	21.9	8.7	48.3	29.5	11.3
B.C.	60.7	18.5	9.8	57.0	23.1	8.8

TABLE 4b
Means of Training Provision (OJT Training): Annual Averages, 1999-2005

		Atlantic	Quebec	Ontario	B.C
Goods	Self-learning	8.6	6.3	8.7	11.0
	Supervisor	32.0	24.2	32.2	39.6
	Colleague	30.3	24.8	32.6	31.2
	Internal trainer	23.3	24.0	27.0	19.7
	External trainer	17.2	30.9	16.8	17.0
	Supplier	9.5	6.6	8.6	8.3
Services	Self-learning	10.5	10.4	11.7	11.3
	Supervisor	32.3	22.5	37.6	36.9
	Colleague	28.8	25.8	27.6	30.1
	Internal trainer	24.8	23.6	28.6	28.0
	External trainer	20.9	32.0	18.0	15.5
	Supplier	10.1	5.6	10.6	10.4

On balance, tables 1 to 4 suggest that Quebec employers choose training forms that facilitate the documentation of training expenses. As a result of this, tables 1 to 3 suggest, OJT may be underprovided; certainly, its incidence is much lower in Quebec than in other parts of Canada, most especially the parts of Canada with higher average productivity. Table 4 suggests that the Law also affects the choice of means of training provision. Quebec is much more likely than the comparator jurisdiction to use external trainers.

The Effect of Training on Wages

Training ought to be associated with higher wages. How much training increases wages is likely to be influenced by two things: i) the quality and suitability of the training provided and ii) the quality of the employees to whom the training is provided. Now, if in Quebec Law 90 has resulted in a growth in the proportion of formal training provided to OJT and if we assume that employers direct training towards employees most likely to profit from it (and the evidence that they do is strong) it is quite likely that the improvement in the performance – the increased productivity – of those receiving the scarcer OJT will exceed the effect of the more abundant formal training. We might, then, expect the wage effect of OJT in Quebec to be larger than the wage effect of formal training.

Most analyses of training and wages use cross-sectional data because that is all that is available. We can use the WES to reproduce the sorts of cross-sectional analyses found elsewhere and compare our results with them. The wage data

are attached to employees, for whom the WES maintained consecutive two year panels. This allows us to also apply dynamic models to the data.

In table 5 we present estimates from cross-sections pooled across the seven years from 1999 to 2005. Our analysis contains data from various parts of the business cycle – from the end of the information technology boom through the recession at the beginning of the decade into the subsequent recovery. As compared to studies using single year cross-sections our results are less tied to a particular economic conjuncture.

TABLE 5

Training Method and the Log Hourly Wage Rate with Consecutive Controls, Pooled OLS, 1999-2005

	Quebec	Ontario	B.C.	Atlantic	
1. Formal	0.1451*** (0.0111)	0.1592*** (0.0096)	0.1547*** (0.0125)	0.1846*** (0.012)	Education, experience, seniority, whether promoted
OJT	0.1026*** (0.014)	0.0462*** (0.0095)	0.0241* (0.0121)	0.0442*** (0.0127)	
Intercept	2.1115*** (0.0166)	2.0425*** (0.0168)	2.2286*** (0.0238)	1.8973*** (0.0215)	
R ²	0.3665	0.362	0.3297	0.4109	
2. Formal	0.1014*** (0.0104)	0.1240*** (0.0085)	0.1025*** (0.0112)	0.1449*** (0.0108)	Education, experience, seniority, whether promoted, contractual status, occupation, computer use
OJT	0.0699*** (0.013)	0.0246** (0.0087)	0.0038 (0.0113)	0.0260* (0.0115)	
Intercept	2.4186*** (0.0281)	2.3847*** (0.0246)	2.6090*** (0.0353)	2.1907*** (0.0352)	
R ²	0.4608	0.4707	0.4502	0.5066	
3. Formal	0.0871*** (0.0103)	0.1138*** (0.0085)	0.0915*** (0.0113)	0.1227*** (0.0106)	Education, experience, seniority, whether promoted, contractual status, occupation, computer use, union membership
OJT	0.0624*** (0.0129)	0.0179* (0.0087)	-0.0005 (0.0113)	0.0134 (0.0113)	
Intercept	2.4390*** (0.0294)	2.4095*** (0.0253)	2.6210*** (0.0366)	2.2718*** (0.0353)	
R ²	0.4727	0.4781	0.4603	0.5259	
4. Formal	0.0554*** -0.0122	0.0677*** -0.0086	0.0899*** -0.0131	0.1073*** -0.0125	Education, experience, seniority, whether promoted, contractual status, occupation, computer use, union membership, gender, workplace size, industry
OJT	0.0658*** -0.0145	0.0111 -0.0084	0.0036 -0.0127	-0.0049 -0.0125	
Intercept	2.6946*** -0.0339	2.6612*** -0.0275	2.8646*** -0.0417	2.5978*** -0.0386	
R ²	0.5496	0.5712	0.5158	0.6049	
N	30696	38493	19841	16123	

Robust standard errors in parentheses: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

The fundamental problem with cross-sectional methods is that it is usually not reasonable to assume that all relevant determinants have been controlled. Wages rise with education and most data sets allow the inclusion of education as a control. But attributes of employees, like initiative, effort, and intelligence, are not usually directly measured. These are also likely to both influence wages and attract training investments. An association between training and wages, then, may be partly explained by the (unmeasured) association between both wages and training, on the one hand, and unmeasured ability, on the other. Where panel data is available, fixed-effects models have been used to address this problem. They do so by modeling the effects of changes in independent variables on changes in dependent variables, including dummies for each wage earner in the sample, the effect of which is to control for different (and invariant) wage earner traits. Assuming that a person's intelligence and personality remain constant over the period covered by the panel, the introduction of these dummies means that their effect can be assumed to have been removed.

But we only have a two year panel and a two year panel adding dummies for every case considerably reduces the statistical power of tests of significance. Because of this, we use a random effects specification for our panel analysis. This procedure assumes that unobserved traits are randomly distributed across cases and controls for unmeasured individual characteristics by adding a common effect estimated from the entire sample. Panel analysis does not fully resolve the problems in establishing a causal sequence. Nonetheless, cross-sectional and dynamic models that generate similar results do provide stronger evidence for causation than cross-sectional analyses alone.

Table 5 presents training coefficients for cross-sectional models containing consecutively added controls. It allows us to see which controls reduce the effects of training most substantially. The effects of the two training forms of interest – formal training and OJT – are separately estimated within the same model. Model 1 contains measures of human capital and whether or not an employee had been promoted – an indicator of ability above and beyond human capital. To simplify the table, the effects of controls are not presented. All, in fact, have the expected effects. In model 1, formal training increases wages by similar amounts across jurisdictions – from more than 18% in the Atlantic region to slightly less than 15% in Quebec. The results for OJT are different. Its association with wages is not as strong, but is considerably stronger in Quebec than in the other jurisdictions – a 10% higher wage rate there as compared to under 5% elsewhere.

Model 2 adds a set of controls for job characteristics – contractual status (part-time versus full-time, casual versus permanent), occupation, whether the

employee uses a computer, and whether skill demands have increased in the recent past. Their effect is to reduce the sizes of the training premiums. Formal training now adds between about 14% to the wage rate in Atlantic Canada and about 10% in Quebec. The premium associated with OJT also falls, becoming insignificant in B.C. But Quebec's remains distinctly large: 7% as opposed to about 2% in Ontario and Atlantic Canada. These job characteristic controls are likely to remove some of the effects of unmeasured employee traits. Those displaying more intelligence, initiative, and effort are more likely to have been provided with computers or have had the skill demands of their jobs increased.

In models 3 and 4 we consecutively add union membership and gender. Each reduces the size of the training premium. Formal training remains significant across jurisdictions but its effect is smallest in Quebec – just over 5%. Ontario is closest with a premium of almost 7% while in B.C. and Atlantic Canada the premiums are much larger – 9% and almost 11% respectively. The most striking result, however, is for OJT. Its effect is insignificant everywhere, except Quebec, for which the premium remains rather robustly over 6%. The distinctive results with respect to OJT in Quebec that showed up in the previous section recur in the analysis of training and wages.

Table 6 presents our random effects estimates. The first model includes no explicit controls, only the adjustment for a randomly distributed effect of personal characteristics. The second model includes human capital. The premiums in models 1 and 2 of table 6 are considerably smaller than those of model 1 in table 5. After controls for human capital, formal training is associated with a wage increase of between slightly less than 5% in Atlantic Canada and slightly less than 4% in Ontario. Quebec's distinctness with respect to OJT is maintained. The pay of those receiving it grew by 3% there as opposed to slightly more than 1% in the other jurisdictions. Adding further controls in models 3, 4, and 5 reduces the size of the premium. Formal training, however, remains significant in all jurisdictions with the largest effect in Atlantic Canada (4%) and the smallest in Ontario and Quebec (between 2% and 3%).

The most striking results, again, are for OJT. There is no significant premium in Atlantic Canada and B.C., only a very small one – less than 1% – in Ontario, and one of more than 2% in Quebec. Quebec's distinctness with respect to OJT, then, is also apparent in a random effects model. That the estimated effect is much smaller from the panel models than from the pooled cross-sections is consistent with the assumption that some of the association between wages and training is generated by unmeasured employee attributes.

TABLE 6

Training Method and the Log Hourly Wage Rate Consecutive Controls, Random Effects: 1999-2005

	Quebec	Ontario	B.C.	Atlantic	
1. Formal	0.0565*** (0.0034)	0.0402*** (0.0031)	0.0559*** (0.0044)	0.0498*** (0.0046)	None
OJT	0.0383*** (0.0039)	0.0094** (0.003)	0.0096* (0.0041)	0.0171*** (0.0048)	
Intercept	2.8856*** (0.0038)	3.0485*** (0.0037)	3.0230*** (0.0046)	2.8075*** (0.0055)	
2. Formal	0.0460*** (0.0033)	0.0360*** (0.0029)	0.0475*** (0.0042)	0.0486*** (0.0044)	Education, experience, tenure, whether promoted
OJT	0.0301*** (0.0038)	0.0129*** (0.0028)	0.0162*** (0.0039)	0.0153*** (0.0046)	
Intercept	2.2344*** (0.0103)	2.2678*** (0.0114)	2.3612*** (0.00153)	2.0958*** (0.0168)	
3. Formal	0.0358*** (0.0032)	0.0318*** (0.0029)	0.0406*** (0.0041)	0.0455*** (0.0044)	Education, experience, tenure, whether promoted, contractual status, occupation, computer use
OJT	0.0222*** (0.0037)	0.0097*** (0.0028)	0.0106** (0.0039)	0.0114* (0.0045)	
Intercept	2.5479*** (0.0148)	2.6052*** (0.0142)	2.6937*** (0.0196)	2.3772*** (0.0221)	
4. Formal	0.0331*** (0.0032)	0.0288*** (0.0029)	0.0366*** (0.0041)	0.0426*** (0.0044)	Education, experience, seniority, whether promoted, contractual status, occupation, computer use, union membership
OJT	0.0215*** (0.0037)	0.0084** (0.0028)	0.0086* (0.0039)	0.0100* (0.0045)	
Intercept	2.5459*** (0.0151)	2.6057*** (0.0143)	2.6973*** (0.0198)	2.3957*** (0.0223)	
5. Formal	0.0281*** (0.0035)	0.0220*** (0.0033)	0.0324*** (0.0046)	0.0401*** (0.005)	Education, experience, seniority, whether promoted, contractual status, occupation, computer use, union membership, gender, workplace size, industry
OJT	0.0211*** (0.0041)	0.0065* (0.0031)	0.0073 (0.0043)	0.0096 (0.0053)	
Intercept	2.6943*** (0.0209)	2.7452*** (0.0208)	2.8533*** (0.0254)	2.6087*** (0.0288)	
Cases	30696	38493	19841	16123	
Employees	19246	23654	12324	9571	

Robust standard errors in parentheses: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Discussion and Conclusion

As compared to the rest of Canada, in Quebec, training is less likely to take the form of OJT, more likely to be provided by external trainers, and OJT generates a larger wage premium to those receiving it. This stronger association shows up in

both cross-sectional and dynamic specifications. Quebec training is distinct. The question is, why? Quebec differs from the rest of Canada in all sorts of ways. Only some of them, however, are likely to be relevant to training. Those include Law 90, the training challenge posed by poorly educated older employees, average productivity levels and the technology they reflect, the CEGEP system, more widespread collective bargaining, and a relatively modest inflow of immigrants.

It is difficult to see how any of these factors, other than Law 90, could explain our results. The education level of older workers is unlikely to be very important because training tends to be disproportionately directed at the young and the levels of education among young Quebecers match those elsewhere. The CEGEP system provides both general education and occupational preparation. Either is more likely to substitute for formal training than OJT. But it is OJT that Quebec provides in smaller amounts, not formal training. Collective bargaining sometimes subjects training access to seniority rules. But our more complete models estimate training effects after a control for unionization. One of the principal difficulties confronted by immigrants in Quebec and elsewhere is language. Lack of knowledge of the language of work reduces employment prospects and earnings (e.g., Girard, Smith and Renaud, 2008). We can reasonably assume that it reduces potential productivity. Workplaces have sometimes compensated for this through the provision of language skills (Hollenbeck, 1993). But, even were this a common practice (and it appears not to be), it would probably imply a lower incidence of formal training in Quebec than in the immigrant-magnet Canadian provinces, Ontario and British Columbia. That is not what our analysis shows.

Law 90 approximately reproduces policies for which there has been overseas experience. The clearest precedents are found in France, Australia, and the UK. The Australian and UK experiments appear not to have been judged a success. Each was fairly promptly abandoned, at least in a compulsory form. The French policy persists. As compared to the UK, there is some evidence that in France, training has been provided to a smaller proportion of employees, but over longer durations, covers a wider range of initial skills and competencies, and generates higher returns. The last three outcomes might be considered evidence of success. But the differences are not large and the methods used in the relevant studies (comparison of findings generated with different methodologies, analysis of data sets with different sampling frames) raise questions about the robustness of their results and conclusions.

The problematic character of the research on the French training levy increases the potential interest of the results presented here. They do not provide the comparison of training practices and effects before and after Law 90 that would be the gold standard for policy evaluation. They do, however, provide comparisons of training characteristics and outcomes within a single country using the same survey. This, we would argue, is not a trivial asset.

As in France, Quebec's training levy was followed by a significant expansion in the number of firms in the training-supply business. This explains table 4: Quebec employers were more likely to use external trainers to provide both formal training and OJT. How should we interpret this greater reliance on external trainers? Two possibilities occur to us. Law 90's premise is that training in Quebec was underprovided. If that were the case, the use of external trainers would make perfect sense. Many employers lacked experience in training provision, the Law provided an incentive to train more, and, to compensate for their inexperience, they bought expertise from outside. A second possibility is that many Quebec employers have regarded the Law as a nuisance. Confronted with a choice between spending on training or turning the money over to the government, they chose the method least likely to cause problems with government auditors; they hired external trainers from the list of accredited training providers.

Without the levy, one might have expected the choice between formal training and OJT to be substantially determined by technology. As we observed earlier, Quebec has more employment than Ontario in less productive manufacturing industries. B.C. is more heavily dependent on resource extraction than either Quebec or Ontario. There are, then, technological differences. But it is hard to see how they could explain the OJT incidence differences. Manufacturing and resource extraction provide modest proportions of employment in all provinces; in Quebec, OJT has been less used in both goods and service industries; it is not obvious what association to expect between productivity, the technology it rests on, and the use of OJT; and Atlantic Canada, Canada's least productive region, nonetheless uses more OJT than Quebec (though less than B.C. and Ontario). If it is true that OJT is harder to convincingly cost unless provided by external trainers, in the context of the constraints imposed by Law 90 it is not surprising that Quebec employers provide less of it. Insofar as this is the case, one might reasonably regard the less frequent use of OJT as a redirection of training forms away from those that would otherwise be chosen by employers.

The wage premium to OJT is higher in Quebec than in the other Canadian provinces. Technology seems unlikely to explain this difference; Atlantic Canada has particularly low rates of return to OJT. We think that the most plausible explanation for the higher premium in Quebec is that OJT has been underprovided. Law 90 displaces training investments away from it. Since, other things being equal, higher quality employees are more likely to receive training then, if fewer employees in Quebec are receiving OJT, their average quality is likely higher and the effect of their training on wages greater.

We cannot rule out other explanations for our results. However, added to the facts that the UK and Australia abandoned similar programs, possibly because

there was little evidence of useful outcomes of the program, and the evidence on the effects of the French policy is equivocal, we do think that our results ought to temper enthusiasm for this sort of program as a solution to the training "problem."

Notes

- 1 Pfeffer (1997: 169-176) cites "management beliefs" as an obstacle to the adoption of high performance work systems. Gollac and Volkoff (1996) suggest that managers excessively prize the short- over the long-term and, consequently, are unwilling to release employees from current work for training. Both of these accounts can be interpreted as examples of an underestimation of the value of training.
- 2 That national policy was preceded by a series of similar sectoral policies (see Greenhalgh, 1999). The percentage of payroll that employers have been required to pay has changed over time.
- 3 The SQDM is the Société québécoise de développement de la main-d'oeuvre, the government agency initially responsible for the application of Law 90. It was closed in 1998 and its responsibilities shifted to Emploi-Québec.
- 4 Exclusions are the northern territories and government employment. The latter is to be regretted more than the former. Not many people live in Canada's north. Previous research, however, suggests that governments provide their employees the best, or about the best, access to training.
- 5 Education and immigration data cited here were drawn from the Census.
- 6 On the measures see: <<http://www.statcan.gc.ca/pub/71-221-x/71-221-x2007000-eng.htm>>.

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SUMMARY

The Effects of a Training Levy on Training Characteristics and Outcomes: The Case of Quebec

In this article, we compare the characteristics of workplace-provided training and its effects on wages in Quebec with other Canadian provinces. It is widely argued that training tends to be under-provided by employers. The institutions of training provision vary across Canada. Quebec is most distinct. With Law 90, it attempted to address what was seen as a distinctly severe problem of under-supply; it required that firms invest a specified proportion of their sales in training or turn over the difference between what they spent and the specified proportion to the government. We use data from the Workplace and Employee Survey to explore the possible effects of this measure. There are differences between Quebec and the other provinces in the incidence of on-the-job and formal training, and in the relations between training and the wage rate. In Quebec, the incidence of on-the-job training is distinctly low and the use of external training providers distinctly high. We suggest that these outcomes are encouraged by Law 90, which encourages employers to use readily documentable forms of training. We also find that the association between on-the-job training and the wage rate is much stronger in

Quebec than in the comparator provinces. We argue that this is probably because, being less abundantly provided, on-the-job training is likely to be provided to employees who, on average, are more talented than their counterparts in the rest of Canada. We set our discussion of the possible effects of Law 90 in the context of a broader consideration of the relation between institutions and training choices and outcomes, including international comparison.

KEYWORDS: training, Quebec, training levy

RÉSUMÉ

Les retombées d'une taxe de formation sur les caractéristiques et les résultats de la formation : le cas du Québec

Cet article vise à comparer les caractéristiques de la formation offerte dans les entreprises et leurs impacts sur les salaires des employés au Québec et dans les autres provinces canadiennes. Au Canada, comme dans de nombreux pays industrialisés, l'une des préoccupations majeures dans le dossier de la formation continue est le sous-investissement des entreprises. Le contexte institutionnel canadien de la formation en entreprise diffère d'une province à l'autre et le Québec se distingue, entre autres, par l'adoption d'une loi en 1995, appelée « loi 90 », exigeant de la part des entreprises assujetties d'investir annuellement dans le développement de la formation de leur main-d'œuvre. Dans une perspective comparative, nous examinons les effets potentiels de cette mesure obligatoire de financement en formation. Nos analyses sont fondées sur un ensemble de micro-données longitudinales sur les milieux de travail canadiens et leurs employés. Des différences provinciales sont observées dans la formation structurée et en cours d'emploi, ainsi que sur l'impact de l'investissement sur les salaires. Au Québec, nous observons une incidence plus faible de la formation en cours d'emploi pour laquelle nous pensons que les dépenses sont plus difficilement justifiables dans le cadre de la loi. Les résultats indiquent également une tendance plus forte au Québec à recourir à des formateurs externes qu'ailleurs au Canada et ils mettent aussi en évidence des retombées plus élevées de la formation en cours d'emploi sur les salaires dans cette province, tandis que les effets engendrés par la formation structurée sont de tailles similaires à travers les provinces et les régions. Nous discutons des résultats en regard des différences provinciales et de leur environnement institutionnel, ainsi que des expériences internationales de politiques gouvernementales en matière de formation continue. Nous posons certaines hypothèses quant à l'impact plus élevé de la formation en cours d'emploi sur les salaires observé au Québec comparativement aux autres provinces.

MOTS-CLÉS : formation, Québec, taxe sur la formation

RESUMEN

Las repercusiones de un impuesto de formación sobre las características y los resultados de la formación: el caso de Quebec

Este artículo pretende comparar las características de la formación dispensada en las empresas y sus impactos sobre los salarios de empleados del Quebec y en las otras provincias canadienses. En Canadá, como en números países industrializados, una de las preocupaciones mayores en el folio de la formación continua es la sub-inversión de las empresas. El contexto institucional canadiense de la formación en empresa difiere de una provincia a otra y el Quebec se distingue, entre otros, por la adopción de una ley en 1995, llamada «ley 90», que exige a las empresas sujetas a dicha ley de invertir anualmente en el desarrollo de la formación de su respectiva mano de obra. En una perspectiva comparativa, se examina los efectos potenciales de esta medida obligatoria de financiamiento de la formación. Nuestros análisis son basados en un conjunto de micro-datos longitudinales sobre los lugares de trabajo canadienses y sus empleados. Se observan diferencias provinciales en la formación estructurada y en la formación durante el empleo, así como sobre el impacto de la inversión sobre los salarios. En Quebec, se observa una incidencia más débil de la formación durante el empleo por la cual nosotros pensamos que los gastos son más difícilmente justificables en el marco de la ley. Los resultados indican también una tendencia más fuerte en Quebec a recurrir a formadores externos comparativamente al resto de Canadá y ponen en evidencia los impactos más elevados de la formación durante el empleo sobre los salarios de esta provincia, mientras que los efectos engendrados por la formación estructurada son de talla similar a través las provincias y las regiones. Se discuten los resultados en relación con las diferencias provinciales y su entorno institucional, e igualmente con relación a las experiencias internacionales de políticas gubernamentales en materia de formación continua. Se plantean ciertas hipótesis en cuanto al impacto más elevado de la formación durante el empleo sobre los salarios, tal que observado en Quebec comparativamente a las otras provincias.

PALABRAS CLAVES: formación, Quebec, impuesto sobre la formación