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Using longitudinal data from the Canadian Workplace and Employee Survey, this article estimates the union effect on a firm's ability to innovate new products. The results do not find a negative relationship between unions and product innovation. Surprisingly the presence of a union is found to have a small positive effect on a firm's ability to innovate new products. These results do not imply that unions are important determinants of product innovation; instead they are noteworthy because a negative effect is not observed. These findings contradict the popular assertion that unions generally detract from firm performance. The article then reviews the Canadian and U.S. empirical literature on the union effect on various measures of firm performance, such as labour costs, employment growth, sales and profitability. In keeping with the results of this paper it appears that the argument that unions detract from firm performance is not based on a conclusive body of empirical evidence.

KEYWORDS: trade unions, product innovation, Canadian national data

"Innovation is critical for firm success." This message has been championed by a number of sources concerned with business. Recently the management literature has included a number of studies that describe the importance of innovation for a firm's success, and even for its survival (for example see De Clercq, Menguc and Auh, 2009; Poskela and Martinsuo, 2009). The message is echoed by some of the most recognized business leaders. For example Jack Welch, CEO of General Electric remarked that "[a]n organization's ability to learn, and translate that learning into action rapidly, is the ultimate competitive business advantage" and Lew Platt, CEO of Hewlett-Packard similarly noted that "[s]uccessful companies of the 21st century will be those who do the best jobs at capturing, storing and leveraging what their employees know" (Busi, 2005). The management consulting industry has also noticed the interest in innovation and developed a sophisticated array of competencies aimed at promoting innovative capabilities among their clients. For example, Outlook, the on-line journal for Accenture Consulting is dominated by articles and studies on innovation initiatives (Accenture, 2010). If innovation truly is a fundamental component of firm success, then it is important to understand what prevents one firm from innovating while another has success in this endeavour.

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According to Statistics Canada approximately one in three workers in Canada belongs to a trade union. This, coupled with the spill-over effect unions have on non-unionized workplaces, makes unions an important part of the Canadian economy. Unions provide a number of services to workers. They give workers a collective voice and otherwise provide representation, negotiate higher wages and improved benefits, while also providing access to, and support during a third party grievance process in the event of a dispute with management. They can also be effective in promoting worker interests to local, provincial, and federal legislatures.

While unions can provide many benefits to Canadian workers and the communities in which they live, it is often argued that this comes with a cost. The argument against unions is based on the premise that they promote inefficiencies and are no longer affordable in today's highly competitive global marketplace. Indeed, the dismantling of trade tariffs and the deregulation of industries in accordance with the 1993 signing of NAFTA has put unions under greater scrutiny for their impact on Canada's ability to compete internationally. For example, the Canadian auto industry, which has one of the highest union density rates in the country, is in a critical state; some calling for a major restructuring of the Canadian Auto Workers Union's near monopoly control. This debate is best informed by Canadian empirical evidence illuminating what exactly unions do to key firm outcomes, such as innovation.

Following Freeman and Medoff's 1984 book, *What Do Unions Do?*, there has been a steady stream of studies examining the union effect on various measures of firm behaviour and performance. Some relationships have been studied more than others; for example the monopoly wage effect and the debated productivity effect are well documented (see Walsworth, 2010 for a review). Less is known about performance outcomes that are more difficult to quantify and thus measure, such as the ability to create or significantly improve a product. There are reasons to suspect that unions impede a firm's ability to create new or better products, mainly by interfering with management's ability to control the workplace. However there are also reasons to suspect that unions promote product innovation, mainly by negotiating greater job security and a wage premium. Additionally, higher wages and restrictions on outsourcing may encourage firms to compete based on innovation instead of competing based on low cost.

This article first reviews the limited empirical literature that examines the union effect on various forms of innovation. Next, the Canadian and U.S. empirical literature on unions and other key firm outcomes (such as productivity, labour costs, employment growth, sales and profitability) is reviewed to flush out union effects that may be relevant to understanding the impact unions have on innovation. Finally, the article uses Canadian private sector national data to examine the union effect on product innovation, a firm outcome which is widely researched in the management literature but has been less prominent in Industrial Relations scholarship. The data come from the 1999 to 2005 Canadian Workplace and Employee Survey (WES).

Unions and Innovation

Despite the potential role unions may have on product innovation, there is only one North American study that examines the direct relationship. From a cross-sectional sample of Canadian workplaces observed in 1999, Verma and Fang (2003) do not find a relationship between union measures and product innovation. This study is limited by the use of a single year of data, and even if a relationship was detected, causality would be difficult to determine. Alternatively a group of studies examines the effect of unions on innovation but uses a more general measure of innovation that also includes process innovation. From a U.S. sample Koeller (1996) finds that unionization is significantly lower in firms with high innovation output. Again using a U.S. sample, Audretsch and Schulenburg (1990) find that union density in a firm has a negative effect on innovation.

In the present article, product innovation is selected as the pertinent firm outcome because it is closest to a final measure of firm performance. It has a more direct and obvious impact on actual firm success. Conceptually there are a number of reasons to believe that unions may restrict product innovation. This argument can be found in the historical trend in collective bargaining of rules in North America that clearly define separate worker and management responsibilities. Canadian labour law and policy is based primarily on the U.S. Wagner model and is premised on the assumption that labour and management are adversaries (e.g., Sims, Blouin and Knopf, 1995). According to Godard (2009: 180):

> Canada has a strong normative tradition of employer hostility towards unions and of acrimonious union-management relations, a tradition that remains largely intact. There is also very little tradition of mutuality, as in the U.S., employer unilateralism on issues traditionally outside of collective bargaining is generally taken-for-granted, as reflected in management rights clauses and arbitral doctrine in the union sector. The result is a largely adversarial system, one in which unions continue to focus on collective bargaining and rely very little on employer 'goodwill'.

In a workplace environment that separates worker and management interests, innovation may be restricted for three reasons. First, with reduced worker/management collaboration, it is likely that information sharing between the parties is limited, making product innovation less probable. Secondly, workers, as well as managers, are more inclined to view their goals as distinct from each other, leaving workers with reduced incentive to innovate. For example, if a unionized worker is primarily concerned with wage maximization and considers firm profits or market share largely the concern of management, there may be limited desire/goodwill to innovate. Third, unions may pursue their goals by appropriating workplace control from management, thus interfering with unilateral management decisions regarding the design, speed and process of production. In this scenario it is easy to imagine a management team becoming frustrated with a union that slows or even prevents the implementation of a policy designed to elicit specific employee behaviours, such as a reorganization of the shop floor to encourage collaboration.

On the other hand, there are a number of reasons to suspect that unions promote product innovation. The strong preference of unions for seniority based pay, as

opposed to merit based pay, may encourage higher risk behaviours associated with innovation. In recognizing the separation between pay and productivity a worker is ensured of less financial consequence for pursuing innovative ideas that may detract from immediate job productivity. For example, a worker is more inclined to temporarily neglect immediate production requirements to experiment with alternative production materials or processes that could significantly alter the final product. Additionally, because union members are generally believed to enjoy a wage premium as high as 15 to 20 percent in the U.S. (Blackburn, 2008; Hirsch, 2004) and around 7 percent in Canada (Verma and Fang, 2002), greater firm specific loyalty may result and workers may be more inclined to make contributions towards innovation. Finally, the purported higher cost of union labour (see Swanson and Andrews, 2007; and Black and Lynch, 2001) and restrictions on outsourcing, via collective agreements, may encourage firms to compete based on product innovation, either by offering new products or better quality products instead of competing based on low cost.[1] Conceptually, a union imposed higher production cost makes a low cost product strategy less viable for unionized firms, and thus potentially promotes alternative product competition strategies that rely more on product innovation.[2]

Unions and (Other) Key Firm Outcomes: An Empirical Review

That unions detract from firm performance seems to be a sentiment beyond question. In a recent book about Canadian unions, Kumar and Schenk (2009: 17) observe what they call a 'dominant discourse' in the media that portrays unions in an overwhelm-ingly negative fashion: "[T]here are frequent references in the media that unions are a special interest group, are 'inflexible', are always demanding more, cause ineffi-ciency...." From an academic/research perspective it is interesting to consider whether or not unions have a negative impact on firm performance. Is there empirical evidence to support what has become a one sided debate against unions?

One of the most straight forward measures of a firm success is profits. In industries with union and non-union workplaces it would seem that the latter would have an advantage. Since unions are commonly associated with greater labour costs (Hirsch, 1992), inflexible workplace rules (Godard, 2009), a reduced ability to attract capital investment (Bronars, Deere and Tracy, 1994), and depressed sales levels (Voos and Mishel, 1986), it seems natural that non-union workplaces would report higher levels of profits. Alternatively it is possible that the purported advantages of unions, such as lower rates of employee turnover, greater job security, and higher employee morale may improve employee productivity so that heightened productivity in unionized workplaces negates the disadvantages commonly associated with unions.

Freeman and Medoff (1984), who describe the productivity benefits of unions (i.e. greater voice, among others), do not claim they exceed, or even match, the cost of unionization, a point repeated by Freeman in a subsequent publication (see Blanchflower and Freeman, 1992). In fact there seems to be a consensus among studies from the 1980s (for example see Clark, 1984; Hirsch and Connolly, 1987; Becker and

Olson, 1989) and the 1990s (see Mitchell and Stone, 1992; Byrne, Dezhbakhsh and King, 1996; Bronars, Deere and Tracy, 1994) that not only do union productivity gains fail to match added cost; the net productivity effect is negative. Recent U.S. studies, to some degree, repeat this finding. For example, Swanson and Andrews (2007) and Black and Lynch (2001) find a negative productivity effect whilst Doucouliagos and Laroche (2003) report a small but positive union effect. Only one study in Canada examines the union effect on productivity. Using a small sample of 100 firms, Grant and Harvey (1992) find no significant difference between management's perception of workplace productivity in unionized and non-unionized firms.

Studies examining the link between union presence and firm profitability in North America are ambiguous. Two older U.S. studies show unionized firms experience substantially lower profits (Becker and Olsen, 1992; Bronars, Deere and Tracy, 1994), whereas a more recent U.S. study finds that union presence is associated with greater profitability (Batt and Welbourne, 2002), albeit the sample was restricted to newly created firms. Canadian evidence is limited and dated. From a sample of manufacturing industries Maki and Lindsay (1986) reported no union effect on profits from 1970 to 1979, whereas Laporta and Jenkins (1996) found that union density has a negative effect on firm profitability after analyzing a sample of manufacturing industries from 1986.

Another key firm outcome that has been examined for a union effect is a firm's ability to grow in terms of the number of workers it employs. In theory, it is possible for unions to both increase and decrease employment growth. There are two arguments that suggest the possibility that unions could contribute to higher employment growth. First, unions present employees with 'voice' (Freeman and Medoff, 1984) that provides for a formal process to channel grievances to management without fear of retribution. This could increase productivity by reducing turnover, enhancing incentives to invest in training, improving communication flows and increasing employee morale. A second claim is that if unions and employers bargain over both wages and employment, instead of wages alone, then efficient outcomes are likely to lie on the demand curve (Hall and Lilien, 1979), and the effects of unions on employment outcomes will be ambiguous (Wooden and Hawke, 2000).

The link between unionization and employment growth is investigated in three studies in North America. Studying a sample of 1,798 California manufacturing firms from 1974 to 1980, Leonard (1992) found that employment in unionized settings grew about 3.9 percent per year slower than in non-unionized settings. There have been no U.S. follow-up empirical studies since Leonard's (1992) article. In Canada, Long (1993) analyzed a sample of 510 Canadian workplaces from the period of 1980 to 1985, and reported that union firms grew 3.7 percent more slowly per year within the manufacturing industries and 3.9 percent more slowly per year within the non-manufacturing industry. Also using Canadian data, Walsworth (2010) finds evidence of a diminished union employment effect in a sample covering 1999 to 2005. In fact Walsworth does not find any relationship between unions and employment growth when he employs the commonly used 'union status' measure, whereby even the

presence of a single union member triggers the firm to be coded as 'unionized'. He only finds a negative union effect for firms that have a majority of their workforce unionized. Even after applying this stricter measure of unions, Walsworth (2010: 154) reports a smaller effect of –2.2 percent per annum.

By way of review, the empirical evidence does suggest that overall unions have a negative impact on firm outcomes. However the evidence against unions is not without exceptions and, especially in the Canadian context, it is either absent or dated. For instance, the only relevant Canadian empirical study to be published in the last fourteen years finds a much diminished negative union impact (Walsworth, 2010). From an empirical standpoint, the effect of Canadian unions on firm performance is poorly documented in the Industrial Relations literature.

Data and Measurements

The data used in this analysis were collected from the same Canadian workplaces in 1999, and in every year up until, and including, 2005 as part of the Employer Survey of the Canadian Workplace and Employee Survey (WES). The advantages and disadvantages of the WES, and other surveys like it, are discussed by Godard (2001). Described in more detail in Zeytinoglu, Cooke, Harry and Chowhan (2008) and Cloutier, Renaud and Morin (2008), the Canadian WES aimed at shedding light on the relationships among competitiveness, innovation, technology use and human resource management.[3] Until 2004, data were collected in person but by 2005 computer assisted telephone interviews were used. The average response rate for the seven years of data collection is 74.8 percent. The initial 1999 sample was randomly selected from the Business Register maintained by the Business Register Division of Statistics Canada and is representative of all private sector workplaces with the exception of agriculture, forestry and fishing, and defence industries in the ten provinces of Canada. The sample was stratified for region, industry and size. The same workplaces were re-surveyed every year since 1999, with the most recent available data from 2005. Of the 6,271 workplaces surveyed in 1999, the first year of data collection, 4,250 remained in the sample in 2005. All workplaces with less than 20 employees were removed, further reducing the sample to 2,266 cases or 11,794 cases when the survey weights are applied, as they are in this research.

The Canadian WES is very similar to the British Workplace Industrial/Employee Relations Survey (WIRS/WERS) and the Australian Workplace Industrial Relations Survey (AWIRS). Like these data sets the Canadian WES collects information from the same workplaces at various time points, providing a more accurate assessment of innovation activity at different points in time (unlike retrospective cross sectional data that rely on participant memory and record keeping). Moreover, longitudinal data better identify and distinguish influences that are fixed (such as industry classification) and those that vary over time (such as workplace performance). It should be noted that like the WIRS/WERS and the AWIRS, the Canadian WES does not provide details on establishment heterogeneity (several workplaces in the sample may belong to the same firm). Also the workplaces in the final sample are surviving workplaces rather than representative

of all workplaces. By definition, the surviving workplaces do not include cases that have ceased to exist (potentially because of a union effect), and so the impact of union measures on innovation activity may be understated in the event of a negative relationship and overstated in the event of a positive relationship. To test the argument that workplaces with higher levels of unionization are more likely to disappear from the sample in 2005, levels of unionization in 1999 were examined in the 'non-surviving' workplaces to see if they differed significantly from the 'surviving' workplaces. They did not, so this concern is not considered to bias the subsequent results. Despite these limitations, a sample of private sector Canadian workplaces observed at several points in time offers a potentially valuable look at the union effect on product innovation.

In the present study innovation is modelled as a dependent variable and is measured as a propensity to innovate, calculated as a discrete variable ranging from 0 to 7. The minimum value of zero describes a workplace that has reported no product innovation activity (either improving an existing product or creating a new product) in any of the seven years of observation.[4] The maximum value of 7 describes a workplace that reported either improving an existing product or creating a new product in each of the seven years of observation. Table 1 presents the mean value for the input variables used to construct the dependent variable, herein referred to as the 'Propensity for Product Innovation Measure' (PPIM). In the first row of the last column, 47.5 percent of workplaces reported product innovation activity in 1999, either as an improvement (42.9 percent) or as a new product (31.5 percent); meaning that 26.9 percent of workplaces reported product innovation in both areas. The 'Product Innovation Dummy' values for all the years are summed into the PPIM and presented in the bottom row of the last column, reporting a value of 3.43, which is very close to the midpoint of the possible range of 0 to 7. Its distribution appears sufficiently close to normal; subsequent tests of skewness and kurtosis confirm this point.

TABLE 1
Propensity to Innovate Measure: Yearly Means

Data Year	Improved Product Innovation Dummy	New Product Innovation Dummy	Product Innovation Dummy
1999	.429	.315	.475
2000	.541	.464	.597
2001	.502	.414	.565
2002	.297	.300	.389
2003	.432	.358	.474
2004	.387	.300	.438
2005	.413	.393	.489
	Improved Product Innovation Measure	**New Product Innovation Measure**	**Propensity for Product Innovation Measure**
Total (0-7)	3.01 (2.01)	2.54 (2.04)	3.43 (2.03)

Source: Canadian WES, years 1999-2005. Data proportions are weighted. The unweighted n is 2,266. The standard deviations for all of the reported yearly means fall between 0.45 and 0.50. The standard deviations for the total measures are reported in parentheses.

Table 2 cross-classifies measures of 1999 workplace union density levels by the number of reported product innovations from 1999 to 2005.[5] The elements in this table sum horizontally to 100 percent. For comparison, the first row of data includes all workplaces regardless of union density level. Notice that in the first column of data, 8.1 percent of all workplaces report zero product innovations between 1999 and 2005, whereas the percentage of all workplaces increases steadily to 17.0 percent at 4 innovations and then declines steadily to 8.2 percent of all workplaces with the maximum value of innovations of 7. Looking at the data proportions for the workplaces segmented by five union density levels, there appears to be little relationship between unionization and product innovation. For example, 8.0 percent of workplaces with no union density reported zero innovations over the observation period, compared to 8.1 percent of all workplaces and 10.7 percent of workplaces with high union density (greater than 75 percent). Furthermore 50.2 percent of zero density workplaces reported 4 or more innovations compared to 47.0 percent of high union density workplaces (greater than 75 percent union density). These values are very similar and suggest no relationship between union density and propensity to innovate; however there is one exception. For workplaces with low union density (> 0% to < 25%) there is high incidence of low innovation activity: 80 percent of workplaces in this category report three or less innovations, compared to 51 percent of all workplaces. These relationships will be further tested in subsequent multivariate analyses.

TABLE 2

Proportional Propensity to Innovate by 1999 Workplace Union Density Level

				Number of Reported Product Innovations from 1999 to 2005					
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Nᵃ**
All Workplaces	8.1%	13.3%	13.2%	16.4%	17.0%	14.0%	9.9%	8.2%	2,266
Union Density									
Zero	8.0%	10.2%	13.2%	18.4%	18.7%	13.6%	10.0%	7.9%	1,227
> 0% to < 25%	2.8%	29.9%	28.1%	19.2%	4.1%	10.0%	5.9%	0%	59
25% to < 50%	10.0%	18.2%	11.8%	8.8%	11.2%	16.7%	12.8%	10.5%	114
50% to < 75%	4.7%	19.0%	19.8%	12.2%	17.7%	13.0%	8.0%	5.6%	277
> 75%	10.7%	21.9%	9.1%	11.3%	12.0%	14.5%	9.9%	10.5%	589

Source: Canadian WES, years 1999-2005. Data proportions are weighted.

ᵃ The unweighted N is reported.

A description and statistical summary of the explanatory variables are provided in Table 3. Note that the exclusion of all cases with missing observations resulted in an unweighted valid n of 1,824. In Table 3, the presence of unions in the Canadian private sector workplaces becomes clear: 27.9 percent of workplaces had at least a single union member in 1999 and approximately 84 percent of these workplaces

had a majority of their workers unionized.6 On average 20.5 percent of a workforce was covered by a union in 1999. These values reasonably coincide with Canadian aggregate union statistics and density rates.

TABLE 3
Explanatory Variables: Description and Summary Statistics

Variable Name	Description	Mean	SD
Union Density	Union members in 1999 as a percentage of total employment in 1999	20.5	35.2
Any Union Status	A dummy variable for workplaces where in 1999 any union members were present	.279	.448
Majority Union Status	A dummy variable for workplaces where in 1999 more than 50 percent of workers were unionized	.235	.424
Zero Density	A dummy variable for workplaces with no union density in 1999	.720	.448
> 0% to < 25% Union Density	A dummy variable for workplaces with low union density in 1999	.016	.128
25% to < 50% Union Density	A dummy variable for workplaces with moderately low union density in 1999	.027	.163
50% to < 75% Union Density	A dummy variable for workplaces with moderately high union density in 1999	.069	.253
> 75% Union Density	A dummy variable for workplaces with high union density in 1999	.165	.372
Employment Size	Number of employees at the workplace in 1999	80.3	101.6
HRM Autonomy	A dummy variable indicating human resource decisions are made at this workplace in 1999	.940	.236
Change in HRM Autonomy	A variable where 1 equals more human resource autonomy, 0 equals the same, -1 equals less autonomy between 1999 and 2005	-.041	.334
Workplace Age	The age of the workplace, measured in years in 1999	18.2	20.0
Sales 1	A dummy variable for workplaces where sales decreased in 1999 and in 2005	.020	.139
Sales 2	A dummy variable for workplaces where sales decreased in 1999 but was stable in 2005	.032	.177
Sales 3	A dummy variable for workplaces where sales decreased in 1999 but increased in 2005	.079	.270
Sales 4	A dummy variable for workplaces where sales were stable in 1999 but decreased in 2005	.049	.216
Sales 5	A dummy variable for workplaces where sales were stable in 1999 and in 2005	.137	.344
Sales 6	A dummy variable for workplaces where sales were stable in 1999 but increased in 2005	.130	.336
Sales 7	A dummy variable for workplaces where sales increased in 1999 but decreased in 2005	.139	.346
Sales 8	A dummy variable for workplaces where sales increased in 1999 but was stable in 2005	.117	.322
Sales 9	A dummy variable for workplaces where sales increased in 1999 and in 2005	.294	.455
Foreign Ownership	A dummy variable for workplaces that are majority owned by foreign interest in 1999	.116	.320
International Competition	A dummy variable for workplaces that faced product market competition from foreign companies in 1999	.495	.499

Source: Canadian WES, years 1999-2005. Data proportions are weighted. The unweighted valid n = 1,824. The industry classifications include: primary; tertiary; manufacturing; construction; transportation, warehousing, wholesale; utilities and information; retail and consumer service; finance, insurance, business services; real estate, rental operations; and education and health services.

According to the Canadian WES data presented in this article, the typical workplace has existed for almost 19 years (as measured in 1999), employs 80 workers, has an 11 percent chance of being majority owned by a non-Canadian interest, and has a 50 percent chance of facing international competition. It almost always (94 percent of the time) has autonomy to make its own HRM policy decisions, although this proportion has decreased slightly from 1999 to 2005. Whereas only 2 percent of workplaces reported a decreasing sales level in 1999 and 2005, closer to 13 percent reported an increasing sales level (as opposed to decreasing or stable) in one of the two observation points and 29.4 percent of workplaces reported an increasing sales level in 1999 and 2005. These findings are not surprising given the economic growth experienced in Canada in the observation period. Experimentation was undertaken with variables not reported in Table 3. Included here are industry classifications and occupational mix of the workforce. The former proved to have sufficient explanatory power to warrant inclusion in multivariate analysis, although the descriptive statistics are not reported in Table 3; whereas control variables for occupational mix did not demonstrate any significant explanatory power, and were omitted subsequently from the analysis.[7]

Results of the Union Effect on the Product Innovation

The OLS estimates of the propensity for product innovation are reported in Table 4. Specifications 1 through 5 all include the same group of control variables and re-port homogenous effects across specifications: larger and younger workplaces are slightly more likely to innovate, as are workplaces with autonomy over HRM poli-cies and, not surprisingly, workplaces that report increased levels of sales. Foreign ownership and exposure to international competition also increase a workplace's propensity to innovate. Notice the value for the Adjusted R2 in Specification 1 is .186 and increases little in Specifications 2 through 5 (up to .207 in the last speci-fication). This suggests that the union measures which are subsequently added as explanatory variables have relatively little predictive power, even though their coef-ficient estimates (for the most part) are significant at the .01 level. The relatively minor impact of the observed union effects is further discussed in the final section of the article.

In Specification 2, workplace union density is entered along with the common set of control variables. Surprisingly, 'Union Density' has a positive and significant effect (at the $p < .01$ level) on a workplace's propensity to innovate, as represented by the PPIM. Interpreted at the PPIM mean value of 3.43, a one unit increase in union density results in an increased PPIM value of 3.72 (3.43 + .294). Therefore the effect of union density on the PPIM (calculated at the mean) is 8.57 percent over the seven years of observation, or 1.22 percent a year.

In specification 3, along with the common set of controls, the 'Any Union Status' dummy variable identifying workplaces with even a single union member replaces the union density measure used in the previous specification. Here again the union measure has a positive and significant effect on the PPIM. The presence of any level

TABLE 4

Propensity to Innovate Equations (OLS): Union Status Effects

	(1)	(2)	(3)	(4)	(5)
Union Density		.294*** (.056)			
Any Union Status			.133*** (.043)		
Majority Union Status				.230*** (.045)	
> 0% to < 25% Union Density					-1.092** (.123)
25% to < 50% Union Density					.453*** (.109)
50% to < 75% Union Density					.284** (.071)
> 75% Union Density					.176*** (.053)
Employment Size	.002*** (.000)	.002*** (.000)	.002*** (.000)	.002*** (.000)	.002*** (.000)
HRM Autonomy	1.152* (.090)	1.182* (.090)	1.143* (.089)	1.172* (.090)	1.138* (.089)
Change in HRM Autonomy	.626*** (.059)	.624*** (.060)	.620*** (.060)	.622*** (.060)	.585*** (.060)
Workplace Age	-.015*** (.001)	-.015*** (.001)	-.015*** (.001)	-.015*** (.001)	-.015*** (.001)
Sales 3	.874*** (.128)	.851*** (.128)	.851*** (.128)	.863*** (.128)	.856*** (.127)
Sales 4	-.264* (.138)	-.263* (.139)	-.250* (.139)	-.257* (.139)	-.287* (.138)
Sales 8	.734** (.125)	.735** (.125)	.734** (.125)	.738** (.125)	.766** (.125)
Sales 9	1.114*** (.118)	1.116*** (.117)	1.115*** (.117)	1.117*** (.125)	1.105*** (.117)
Foreign Ownership	.473*** (.050)	472*** (.052)	.469*** (.052)	.480*** (.052)	.531*** (.053)
International Competition	.620*** (.035)	.624*** (.037)	.622*** (.037)	.629*** (.037)	.633*** (.037)
Industry controls	YES	YES	YES	YES	YES
Adjusted R2	.186	.200	.199	.200	.207
Model Fit (F)	100.2***	107.9***	107.1***	107.8***	101.7***
Unweighted N	1,824	1,824	1,824	1,824	1,824

Source: Canadian WES, years 1999-2005. Data proportions are weighted. *, **, *** denote significance at the 0.10 level, the 0.05 level, and the 0.01 level. The Constant term is included in each estimation. Standard errors are reported in parentheses under the coefficient estimates. Only the estimates for 'Sales' with significance are reported. 'Zero Density' and 'Sales 1' (workplaces where sales decreased in 1999 and in 2005) are reference group variables.

of unionization increases the PPIM score from the mean value of 3.43 to 3.56: a marginal effect of 3.88 percent over the observation period. In Specification 4 a stricter measure of union presence replaces the measure employed in the previous specification. The 'Majority Union Status' dummy variable, which identifies workplaces where a majority of the workers are unionized, also has a significant and positive effect on the PPIM, augmenting the mean value from 3.43 to 3.66: a marginal effect of 6.71 percent over the observation period. Considering the positive effect of union density reported in specification 2, it is not surprising that the stricter measure of unionization employed in Specification 4 is almost twice as powerful as the effect identified in Specification 2.[8]

In the final specification, union density levels are segmented into five groups. The dummy variable identifying workplaces with zero union density acts as the reference group for the remaining four union density level dummy variables. While the three higher union density levels are significant and positive, workplaces with more than zero union density but less than 25 percent, report a significant but negative effect on the PPIM. In other words, compared to workplaces with no union presence, a low level of union density restricts a workplace's capacity to innovate, whereas higher levels of union density (≥ 25%) promote innovation.

Discussion and Conclusion

Before proceeding to a discussion of the implications of the findings it is prudent to clarify three methodological issues. Ideally this study would examine the changes in product innovation associated with changes in union status or union density over the observation period. The Canadian WES is collected in seven consecutive years which unfortunately does not leave time for sufficient changes in union measures. For instance over the seven year period only 3.1 percent or 71 workplaces changed union status, and the average workplace union density level changed by less than 0.5 percent per year. The fixed nature of the union measures over the relatively short period of observation makes the data difficult to exploit as a panel. Secondly, to avoid collapsing the range of the dependent variable (where the PPIM ranges from 0 to 7) to something more manageable for multinomial logits (for example where *0 = no innovations*; *1 = one innovation*; *2 = two or more innovations*), OLS regressions are reported instead in Table 4. Supplementary analysis employing the more conventional multinomial logit equations yielded very similar results and is therefore not reported here; however it is available upon request from the author. Finally, the dependent variable (PPIM) is not an ideal proxy for product innovation. The measure relies on the subjective response of the interview participants (HR and IR managers) to assess whether or not an innovation was 'significant'. Readers should be cautioned that, especially in large organizations, HR/IR managers may not fully understand the market/sales/ profit impact of a product innovation. It is likely that this may bias the results to understate or overstate the frequency of innovations in a workplace. It has two further weaknesses that relate to innovation being measured as a dichotomous

variable in the raw data. First there is no distinction between workplaces that innovated once in a given year or several times in the same year. Secondly there is no allowance for the impact of an innovation. In an attempt to add an element of hierarchy within unions that innovate, the PPIM is the summed result of the yearly dichotomous innovation variables.

This article finds evidence that overall the presence of a union in a workplace does not interfere with product innovation. Although there is evidence that low levels of union density detract from innovation activity, on the whole union density measures have significant and positive estimates on product innovation. Alternative measures of unionization also report a positive effect on the propensity for product innovation. Workplaces with any union presence increased the propensity to innovate by 3.88 percent over the seven years of observation, and a workplace with a majority of their workforce unionized were 6.71 percent more likely to innovate over the same period.

The positive union effect reported in the present study is a departure from the existing literature; Hirsch and Link (1987) estimated a negative union effect (albeit on the perception of innovative capabilities, not innovation itself) and Verma and Fang (2003), using cross sectional data, did not detect any union effect.[9] As a caution it should be noted that these results do not necessarily imply that unions somehow increase a firm's competitive advantage via a greater ability to innovate. It could be that the purported increased marginal production cost caused by unions forces management to forgo other low cost (and potentially more profitable) product strategies. In this sense the positive union effect on the PPIM observed in this study could be the result of unions making other product strategies, less dependent on innovation, unviable. Potentially the opportunity costs of unrealized profits from a low cost product strategy are more important, in terms of competitive advantage, than the observed positive union effect on product innovation.

In light of the popular assertion that in general unions detract from firm performance, the findings of this study require further consideration. If unions unquestionably, or even on average, cause inefficiencies then the relationship between the various union measures and product innovation should be negative. The results reported in Table 4 do not show this expected negative relationship. In fact the statistical relationship is almost always positive. This should not be understood as a suggestion that unions promote innovation. For instance, the impact of the 3.88 marginal effect associated with union status is not clear. It is difficult to translate this into a measurement that clearly notes its impact on firm performance. From this study alone business leaders would be ill advised to encourage their labour force to unionize as a means of achieving superior product innovation. However the results are noteworthy because they do not identify a negative union effect on product innovation.

Some scholars, even those sympathetic to the cause of organized labour, may not be concerned about the 'negative press' unions receive. For them, the notion that

unions cause inefficiency may be a foregone conclusion and an acceptable cost for the advantages that accompany unions, such as workplace democracy, workplace voice, and working class representation among others. The debate regarding the benefits and consequences of organized labour in Canada is best approached with the understanding that the empirical evidence against unions is not conclusive, as this study suggests.

Notes

1 In this sense greater innovation does not necessarily signal greater profits, as the firm may have been better pursuing a low cost strategy if it were more feasible (i.e. in the absence of a union).

2 Similarly Walsworth and Verma (2007: 225) and Mitchell and Coles (2003) argue that firms who face low cost competition will react by intensifying their efforts to innovate so as to compete based on product quality and/or differentiation.

3 For data documentation on the Canadian WES refer to <http://www.statcan.ca/english/survey/business/workplace/workplace.htm>.

4 The Canadian WES asks respondents to reply with a 'YES', 'NO', or 'DON'T KNOW' to each of the following two questions: "[In the last year], has this workplace introduced an improved product or service? (An improved product or service is those whose performance has been significantly enhanced or upgraded.)" and "[In the last year], has this workplace introduced a new product or service? (A new product or service differs significantly in character or intended use from previously produced goods or services)." The complete Canadian WES data dictionary is available from <http://www.statcan.ca/english/freepub/71-221-XIE/intro.htm>.

5 The workplace union density measure used in this study identifies the proportion of unionized workers to total workers in a given workplace; not to be confused with the typical understanding of union density, which refers to the same measure but within a geographic or sectoral specification, for example Canada, or the private sector.

6 Experimentation was undertaken with a measure identifying workplaces that decertified (experienced a decline in union density to zero between 1999 and 2005); however, only 3 percent or 55 cases (unweighted) were identified. Not surprisingly this variable had no explanatory power in the subsequent analysis and was therefore removed.

7 The industry classifications include: primary; tertiary; manufacturing; construction; transportation, warehousing, wholesale; utilities and information; retail and consumer service; finance, insurance, business services; real estate, rental operations; and education and health services. The descriptive properties of the ten way industry classification are in-line with those presented by earlier studies using the Canadian WES, for example see Walsworth and Verma (2007).

8 As a further check on the positive and seemingly linear relationship between the various measures of unionization and the PPIM, a variable squaring 'Union Density' was created and run in a supplementary specification. It proved to be positive and significant with a stronger effect than union density (.354***, SD = .065).

9 A related stream of literature employs Research and Development (R&D) spending as a proxy for innovation, and examines the union effect (for example, see Menezes-Filho, Ulph and Van Reenen, 1998). While these studies are well equipped to take advantage of a measurable indication of innovation, R&D spending is not an exact measure of actual innovation. This concern is especially relevant when it is modelled as dependent on unionization which likely affects the transition of R&D spending into actual innovation.

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SUMMARY

What Do Unions Do to Innovation? An Empirical Examination of the Canadian Private Sector

This article uses Canadian national data to examine the union effect on product innovation, a firm outcome which is widely researched in the management literature but has been less prominent in Industrial Relations scholarship. Using a longitudinal sample from the employer survey of the Canadian Workplace and Employee Survey, the union effect on a firm's ability to create or improve a product is examined. According to the commonly held view that unions impede firm performance, the results should point to a negative relationship between unions and product innovation. Interestingly, a strong negative effect is not observed. In fact a small statistically significant positive union effect is reported. This result is considered to be robust. Across various specifications the presence of a union and the intensity of the presence (firm union density) have significant and positive effects on a firm's ability to innovate new products over a seven year period (1999-2005).

The results of this study do not imply that the presence of a union is an important determinant of product innovation. The results are noteworthy because they do not identify a negative relationship between unions and a measure of firm performance: product innovation. In this regard, the results give weight to the observation that there is very little empirical support for the popular argument that unions impede firm performance.

In Canada the demise of organized labour is often justified as a necessary adjustment to increasingly competitive markets. Indeed the signing of the 1993 NAFTA has put unions

under greater scrutiny for their impact on Canada's ability to compete internationally. That unions make firms less competitive is commonly accepted as a reasonable assessment. The results of this study and a review of the empirical literature on the union effect on other key firm outcomes such as productivity, labour costs, employment growth, sales and profitability, suggest that the popularly held negative assessment of unions is not based on a conclusive body of literature.

KEYWORDS: trade unions, product innovation, Canadian national data

RÉSUMÉ

Quel est l'effet de la présence syndicale sur les innovations en entreprise ? Une étude empirique du secteur privé canadien

Cet article utilise des données nationales canadiennes pour examiner l'effet des syndicats en matière d'innovation en matière de produits dans les entreprises, sujet abondamment traité dans la littérature managériale mais moins présent dans les travaux empiriques en relations industrielles. À partir d'un échantillon longitudinal de la composante « employeur » de l'Enquête sur le milieu de travail et les employés (EMTE) de Statistique Canada, l'effet de la présence syndicale sur la capacité de l'entreprise à créer de nouveaux produits ou à améliorer ses produits déjà existants est étudié. Selon un point de vue communément admis à l'effet que les syndicats agiraient plutôt comme un frein sur la performance de l'entreprise, les résultats de l'étude devraient indiquer une relation négative entre la présence syndicale et l'innovation en matière de produit. Or l'étude ne révèle aucun lien négatif fort. Au mieux seul un faible lien positif est observable d'un point de vue statistique. Et ce résultat est considéré comme robuste. En poussant les analyses selon diverses spécifications de la variable syndicale (mesurée selon la densité syndicale ou la présence syndicale), celle-ci est associée à des effets forts et positifs sur la capacité de l'entreprise à innover avec de nouveaux produits sur une période de sept ans (1999-2005).

Les résultats de l'étude n'impliquent pas que la présence d'un syndicat est un important déterminant en matière d'innovation de produit. Mais ils méritent d'être retenus parce qu'ils ne soutiennent pas l'existence d'une relation négative entre syndicats et performance de l'entreprise en matière d'innovation de produits. À cet égard les résultats donnent du poids à l'observation qu'il existe très peu de soutien empirique à l'argument populaire que les syndicats sont un frein à la performance des entreprises.

Au Canada l'opposition au syndicalisme est souvent justifiée comme un ajustement nécessaire des entreprises à des marchés de plus en plus compétitifs. À cet égard la signature de l'Accord de libre-échange nord-américain de 1993 (ALENA) a mis davantage de pression sur les syndicats dont on étudie de plus près l'impact sur la capacité du Canada à concurrencer sur le plan international. Affirmer que les syndicats rendent les entreprises moins concurrentielles est communément accepté comme une évaluation raisonnable. Les résultats de la présente étude et la revue de la littérature empirique sur l'effet des syndicats sur d'autres extrants clé de l'entreprise comme la productivité, les coûts du travail, la croissance de l'emploi, les ventes et la profitabilité, suggèrent que la perception populaire négative à l'égard des syndicats ne repose pas sur un corps de littérature concluant.

MOTS CLÉS : syndicats, innovation en matière de production, données nationales canadiennes

RESUMEN

¿Qué hacen los sindicatos por la innovación? Un análisis empírico del Sector privado canadiense

Este artículo usa datos nacionales canadienses para analizar el impacto sindical sobre la innovación del producto, un resultado empresarial que es ampliamente investigado en los estudios científicos de gestión pero que ha sido menos destacado en las investigaciones en relaciones industriales. Se utiliza una muestra longitudinal de empleadores proveniente de la Encuesta Canadiense del medio laboral y del empleado para examinar el efecto sindical en la capacidad de una empresa para crear o mejorar un producto. Según el punto de vista muy generalizado que los sindicatos impiden el rendimiento empresarial, los resultados deberían indicar una relación negativa entre sindicatos e innovación del producto. Sorprendentemente, no se observa un fuerte efecto negativo. En realidad, se observa un ligero efecto positivo estadísticamente significativo. Este resultado es considerado consistente. A través varias especificaciones, la presencia de un sindicato y la intensidad de su presencia (densidad sindical de la empresa) tienen efectos significativos y positivos en la capacidad de la empresa para innovar productos, y esto dentro de un periodo de siete anos (1999-2005).

Los resultados de este estudio no implican que la presencia de un sindicato sea un determinante importante de la innovación de productos. Los resultados son remarcables porque no identifican una relación negativa entre sindicatos y una medida de rendimiento empresarial: la innovación de productos. En este sentido, los resultados respaldan la observación que hay muy poca sustentación empírica al argumento popular que los sindicatos impiden el rendimiento empresarial.

En Canadá, la desaparición de la organización laboral es frecuentemente justificada como un ajustamiento necesario a la competitividad creciente de los mercados. Es más, la firma del TLCAN en 1993 puso los sindicatos bajo un mayor escrutinio en cuanto a su impacto sobre la capacidad de competición internacional de Canadá. Que los sindicatos hacen que las firmas sean menos competitivas es generalmente aceptado como una apreciación lógica. Los resultados de este estudio y una revisión de la literatura empírica sobre el impacto sindical sobre otros resultados claves de la empresa como la productividad, los costos laborales, el crecimiento del empleo, las ventas y las ganancias, sugieren que la apreciación popular ampliamente negativa de los sindicatos no está basada en un contenido concluyente de estudios científicos.

PALABRAS CLAVES: sindicatos, innovación de productos, datos nacionales Canadienses