Canadian International Labour Network

Labour Market Institutions and Outcomes: A Cross-National Study

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Card Check or Mandatory Representation Vote?

How the type of union recognition procedure affects union certification success.*

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Abstract

Cross-section time-series analysis of nine Canadian jurisdictions over nineteen years is used to identify the effect of mandatory votes/card check on certification success. The results indicate that mandatory votes reduce certification success rates by approximately 9 percentage points below what they would have been under card check. This result is robust across specifications and significant at above the 99 per cent confidence level.

Key Words: certification, union recognition, mandatory representation vote, card check, automatic certification

JEL Classification: J50, J58

1. Introduction

This paper provides empirical evidence on how two alternative union recognition procedures, mandatory votes and card check, affect certification success.[1] Mandatory votes require that a union receive majority support in a secret ballot in order to be recognized. In contrast, card check allows recognition based solely on membership evidence collected by the union and does not necessarily require a vote. In Canada unions are recognized on the basis of either card check or mandatory representation votes.[2] Canada is a federal state consisting of ten provinces and labour law is primarily the responsibility of the provinces. There is considerable variation over time and across jurisdictions in the use of these two forms of union recognition. I conduct an econometric analysis of cross-section time-series data for nine Canadian provinces over the period from 1978 to 1996 to identify how the type of union recognition procedure affects union certification success.[3] The empirical results show that mandatory votes reduce certification success rates by approximately 9 percentage points below what they would be under card check. This result is robust across specifications and significant at

[1]Other terms used for card check are 'card-based recognition' and 'automatic recognition'.

[2]An employer may also voluntarily recognize a union. Only a very small proportion of unions are voluntarily recognized.

[3]All of the results presented in this paper exclude Prince Edward Island and the federal sector. PEI has a population of approximately 100,000. Certification data are not readily available for this province. The federal sector is omitted because data are not available that properly measure the explanatory variables for this sector.

above the 99 percent confidence level. The evidence suggests the type of union recognition procedure has a substantial effect on certification success and therefore it is likely more difficult for unions to maintain or to expand membership under mandatory representation votes than under card check. This helps explain why the labour movements in North America and the U.K. have supported card check recognition procedures while business has preferred mandatory votes. The evidence also provides empirical support for the argument made by other researchers that differences in recognition procedures between the U.S. and Canada may provide a potential explanation for why Canada's unionization rate is higher than that of the U.S.

2. Motivation

Empirical evidence concerning the impact of different union recognition procedures is important for three reasons. First, it informs policymaking. Second, it contributes insight into the behaviour of unions and employers. Third, it provides evidence relevant to understanding the Canada-U.S. union density gap.

Information for policymakers

Reform of union recognition procedures has been an important policy issue in Canada, the U.S. and the U.K. Union recognition procedures in Canada have changed substantially over time. In 1976 all Canadian jurisdictions relied on card check. Since that time a number of jurisdictions have adopted mandatory votes and by 1997 almost sixty percent of the labour force was covered by this type of legislation. In the U.K. in June 2000 formal statutory recognition procedures (based on card

check) were introduced for the first time.[4] During the formulation of this legislation consideration was given to both card check and mandatory vote recognition procedures. In the U.S. in 1994, where union recognition procedures are based almost exclusively on mandatory votes, "The Commission on the Future of Worker-Management Relations" recommended changes to the existing mandatory vote procedure and encouraged firms to voluntarily recognize unions based on card check.[5]

Insight into union and employer behaviour

Second, the empirical results contribute to an understanding of union and management behaviour. In the 1999 round of collective bargaining in the North American auto industry, the unions (the United Automobile Workers and the Canadian Automobile Workers (CAW)) attempted to negotiate voluntary recognition of unions at the auto-makers' suppliers' plants if the union could demonstrate majority support based on signed membership cards. This was an attempt by the unions to circumvent existing mandatory vote procedures in effect in the U.S. private sector and in the province of Ontario and replace them with card check. Suppliers strongly resisted pressure to comply with this demand. The CAW's president, Buzz Hargrove, threatened to strike over the issue. In the U.K. in 1998 and 1999 during consultations surrounding the introduction of formal union recognition procedures labour supported card check while business preferred mandatory votes.

A piece of the Canada - U.S. union density gap puzzle

Third, a number of researchers (Weiler (1983), Meltz (1985), Gunderson and Meltz (1985),

[4]The Trade Union Recognition Order came into force on June 6, 2000. Details of the legislation can be found at http://www.dti.gov.uk/er.

[5]Commission on the Future of Worker-Management Relations. 1994, pp.42.

Rose and Chaison (1985,1990), Freeman (1985) and Chaison and Rose (1994)) have argued that union density is higher in Canada than in the U.S. because Canada has relied heavily on card check while the U.S. has used mandatory votes.[6] The evidence presented in this paper is relevant to this argument.[7]

3. Mandatory Representation Votes and the Canadian Industrial Relations Environment

This section describes the difference between mandatory representation votes and card check procedures in Canada. It also discusses two other features of the industrial relations legal environment in Canada that may affect certification success: *compulsory dues checkoff* and *first agreement arbitration.* Finally, it provides an overview of the Canadian industrial relations legal environment and a description of the variation in legislation over time and across provinces.

Mandatory Representation Votes and Card Check Certification Procedures

Mandatory representation votes and card check are two alternative legal procedures for

[6]Care needs to be taken when making this argument. In the mid-sixties U.S. and Canadian union densities were approximately equal at approximately 30 percent of the non-agricultural labour force. Since then Canadian union density has remained relatively stable while U.S. union density has fallen to less than 15 percent. As noted above, the use of mandatory votes in Canada has increased over time and therefore union recognition legislation in the two countries has converged. This might suggest that the union densities should converge as well. However over most of this period only a small portion of the Canadian labour force was covered by mandatory votes. In the mid 1990s three provinces introduced this legislation and coverage increased to almost sixty percent of the labour force. Because this legislation operates on certification success rates and therefore affects the flow of newly certified union members it will take time for changes in union recognition legislation to have an impact on the stock of union members and on union density.

[7]Johnson (2000) performs simulations based on these results and finds that by 1995, 17 to 26 percent of the Canada- U.S. union density gap can be attributed to mandatory votes.

obtaining bargaining rights in Canada. Both procedures involve four stages.[8] First, union organizers collect evidence of support in the form of signed union membership cards. Second, the union files an application for certification that includes the evidence of union support collected at the first stage. Third, a hearing is held before an adjudication body commonly called the Labour Relations Board (LRB). The hearing, involving all interested parties, determines the composition of the bargaining unit, considers any allegations of unfair labour practices and examines the membership evidence.

The first three stages are the same for either recognition procedure. The fourth stage is different. Under a system of mandatory representation votes, if there is a minimum level of support for the union (based on the membership evidence) then a secret ballot is conducted to determine if the union has enough support from the bargaining unit to be certified. Under a card check procedure it is not always necessary to hold a vote. If the membership evidence indicates sufficient support for the union it is certified immediately without a vote. Only if the membership evidence is above some minimum level of support but below the threshold required for automatic certification will a representation vote be held. In either process the application for certification is dismissed if membership evidence is below the minimum level of support.[9]

Compulsory Dues Checkoff and First Agreement Arbitration.

In order to identify the effect of different union recognition procedures on certification success it

[8]This description is a generalization of the certification process as it occurs across Canadian jurisdictions.The details of exact procedures differ across the jurisdictions but all procedures contain these elements.

[9] Support deemed sufficient for automatic certification is typically 50 to 55 percent. If a representation vote is held bargaining rights are granted if a majority of those voting (or of the bargaining unit, depending on the time period and jurisdiction) support the union. An application for certification is dismissed if less than 25 to 40 percent of the bargaining unit signed cards (depending on the time period and jurisdiction).

is important to control for other elements of the legislative environment that may also affect certification success. Two such elements are: *compulsory dues checkoff* and *first agreement arbitration*.[10]

Compulsory dues checkoff (also called the Rand Formula) requires that, at the union's request, a clause be included in a collective agreement that obligates the employer to deduct union dues directly from the wages of all employees in the bargaining unit *whether or not they are members of the union* and remit the funds to the union. Such clauses provide unions with financial security and an increased ability to represent their members effectively. Unions may be more likely to organize in such an environment and may also receive more employee support. On the other hand employers may increase their resistance to unionization if they perceive this type of clause increases union power and some employees may no longer support the union if they had hoped to be free riders. Though its expected effect on certification success is ambiguous this type of legislation is generally considered to support the union movement.

First agreement arbitration allows the first collective agreement between a bargaining agent and an employer to be settled by binding arbitration if a negotiated agreement cannot be reached. Such legislation ensures that if a union is granted bargaining rights it will be able to obtain a first collective agreement. Under such circumstances unions are more willing to organize workers and workers are

[10]Legislation that extends coverage to previously ineligible sectors of the economy also affects certification success. From 1978 to 1996 there have been two changes in coverage in Canada. In 1988 British Columbia passed legislation granting teachers collective bargaining rights. In that year teachers' associations were certified. Certifications associated with this change in coverage are eliminated from the data. From January 1, 1993 to November 10, 1995 Ontario extended coverage to a group of previously ineligible workers (some groups of professionals and domestic workers employed in private homes). When this legislation was revoked all units that had been certified under the earlier legislation were decertified. I have not controlled for this change in the analysis. Results based on a sample for the period from 1978 to 1992 do not differ qualitatively from those over the longer period.

more likely to support these efforts. However employers may intensify their resistance to the union during the organizing period since the strategy of resisting the union at the bargaining table will no longer be as effective. This type of legislation is considered to be supportive of the union movement however its impact on certification success is ambiguous.

Canada's Industrial Relations Legal Environment.

As mentioned the industrial relations legal environment in Canada is decentralized. The federal government has jurisdiction over its own public servants and also over a number of inter-provincial activities such as railways, trucking and shipping. The provincial governments have jurisdiction over all other activities within their geographical area in the remaining industries. While there are many similarities in labour legislation across the various jurisdictions there are also significant differences.

Mandatory representation votes, compulsory dues checkoff and first agreement arbitration have been introduced in various Canadian jurisdictions at different points in time. Table 1 shows when each of these types of labour legislation was in force for each jurisdiction in Canada over the period from 1976 to 1997. Table 2 gives the number of observations (province/year cells) corresponding to each of the eight possible legislative regimes (as defined by the presence of mandatory votes, compulsory dues checkoff and first agreement arbitration) for the sample of nine jurisdictions from 1978 to 1996. It is clear from examining both Table 1 and Table 2 that there is substantial variation in legislation across jurisdictions and over time. Prior to the introduction of mandatory representation votes in Nova Scotia in 1977 all Canadian jurisdictions employed card check for union recognition. Since this time mandatory votes have become more prevalent across Canada. B.C. introduced them in 1984 and

repealed this legislation in 1993. Alberta introduced mandatory vote legislation in 1988. In the mid-1990s Newfoundland (1994), Ontario (1995) and Manitoba (1997) introduced mandatory votes. Both compulsory dues checkoff and first agreement arbitration have been more common in the sample. Table 2 shows that over the sample period there are 42 province/year cells when mandatory vote legislation was in place, 79 province/year cells when first agreement arbitration was in place and 105 province/year cells when compulsory dues checkoff was in place. The variation in legislation across provinces and over time within provinces allows the impact of mandatory votes/card check on certification success to be estimated.

4. Background Information

There are two reasons mandatory votes may reduce certification success. The first, provided by Weiler (1983), recognizes that under mandatory votes there is greater opportunity for employers to discourage unionization. He argues that in a mandatory vote environment the delay between a petition for certification and the election provides the employer with the opportunity to influence the outcome of the election.[11] He also suggests that unfair labour practices are frequently used to discourage union support because the penalties for doing so are neither timely nor large.[12] In contrast under card check

[11] In the U.S. there is no time limit imposed by legislation between the petition for certification and the representation vote. The delay is usually two to three months. In Canada the time between petition and vote is legislated and varies across jurisdictions from 5 to 7 working days after the application is filed. There is some evidence for the U.S. that the length of time delay reduces certification success, for example, Roomkin and Juris (1978) and Cooke (1983).

[12] A number of studies link employer resistance and/or unfair labour practices to reduced certification success, for example, Dickens (1980), Seeber and Cooke (1983), Freeman (1985), Thomason (1992) and Riddell (1996). Bronfenbrenner and Jurvich (1998) provides information on various tactics that employers use to discourage unionization.

it is possible for the union to sign-up members without the employer's knowledge and to essentially present the employer with a fait accompli once the application is filed. There is another reason to suspect mandatory representation votes may reduce certification success. In the context of a union organizing drive peer pressure from fellow workers and from the union to sign union membership cards may make it difficult for an employee to express genuine feelings about the union. Therefore membership evidence used to determine recognition under a card check procedure may overstate employees' true support for a union and certification success is more likely than when there is a secret ballot.

Empirical evidence concerning the impact of mandatory votes is very limited. Weiler (1983), Meltz (1985) and Gunderson and Meltz (1985) use descriptive statistics drawn from U.S. NLRB and Canadian LRB Annual Reports to show that mandatory votes discourage unionization. Studies that use either pure time-series or pure cross-section data are not able to identify the impact of different union recognition procedures. It is not possible to use time-series analysis to identify the impact of specific union recognition procedures. There are three reasons for this: (1) changes in union recognition procedures are usually bundled together with other changes in labour legislation; (2) there is not enough variation within one jurisdiction in the use of a specific union recognition procedure - once introduced a procedure typically remains in force[13]; (3) the analysis of a single jurisdiction means there are no 'control' groups provided by other jurisdictions. A pure cross-section analysis can examine the effect

[13]If recognition procedures within a jurisdiction frequently change from one recognition procedure and back it might be possible to identify the impact of a specific procedure using time-series data alone. In reality once mandatory votes are introduced they usually remain in force. In Canada there is only one exception to this - British Columbia introduced mandatory votes in June, 1984 and repealed them in January, 1993.

of different union recognition procedures if there is enough variation in the use of different procedures across the sample. Martinello and Meng (1992) use cross-section micro data on Canadian workers in mining and manufacturing in an attempt to identify the effect of union recognition procedures on the probability a worker is covered by a union.[14] This research does not succeed in identifying the impact of mandatory representation votes because there is not enough variation in union recognition procedures across jurisdictions in the year they study (1986). Even if there were enough variation in a cross-section to estimate the relationship between mandatory votes and certification success in such an analysis it is not possible to distinguish between correlation and causation. Cross-section micro data cannot control for specific year effects or for slowly changing provincial trends over time.

This paper is the first in the literature to use cross-section time-series analysis to provide direct evidence of the impact of mandatory representation votes/card check on certification success. This methodology incorporates more information than either cross-section or time-series analysis. Both province fixed effects and province-specific time trends can be used in cross-section time-series analysis. Unobserved heterogeneity and legislative endogeneity may, to some extent, be addressed through the use of these variables. As a result cross-section time-series analysis is more likely to correctly identify the impact of different union recognition procedures on certification success.

5. Cross-Section Time-Series Econometric Approach

The decentralization of Canadian labour law permits the use of cross-section time-series

[14]This paper also considers legislation concerning replacement workers and compulsory dues checkoff.

analysis to test for the effect of mandatory representation votes/card check on certification success. The annual data cover nine Canadian jurisdictions from 1978 to 1996.[15] The panel consists of observations where union recognition procedures differ across provinces and where union recognition procedures change over time within a province (as discussed earlier and described in Tables 1 and 2). All of this variation is used in the econometric analysis.

In cross-section time-series a number of possible error relationships may exist. There can be heteroscedasticity across provinces, correlation between provinces, common autocorrelation across provinces and/or province-specific autocorrelation. Specifications are first estimated using Ordinary Least Squares (OLS). Diagnostic tests are conducted to check for the presence of the error structures described above. Feasible Generalized Least Squares (FGLS) is employed when the diagnostic statistics reveal the presence of any of these error relationships.[16]

Specification

I estimate the following reduced form equation:

$$certification\ success_{i,t} = \alpha X_{i,t} + \varepsilon_{i,t} \qquad \textbf{(1)}$$

Subscript i refers to the jurisdiction, subscript t refers to the time period. The specification recognizes that certification success depends on a number explanatory variables (X) that capture the

[15]The time period is determined by data availability. Please see the Data Appendix for more detail.

[16]See Greene (1983) and LIMDEP 7.0 for good explanations of the diagnostic tests. These statistics are described in Table 3 where they are presented with the estimation results.

legal, economic, organizational, and structural components of the environment and an error term (å). This reduced form could be derived from a number of different structural models.[17]

Dependent Variables[18]

Two dependent variables are used as measures of certification success. The certification success rate (*certrate*) is defined as the percent of certifications disposed that are granted in the period. Certifications disposed refers to certification applications that are processed over the period.[19] Certification applications that are disposed are either granted, withdrawn or dismissed. The certification success rate provides an intuitively appealing definition of certification success but it suffers from endogeneity because the denominator is likely influenced by the union recognition procedure in force. To illustrate, suppose legislation is passed that is favourable to the union movement. It is likely that attempts will be made to organize units that were previously considered too costly or difficult to

[17]Ashenfelter and Pencavel (1969) describe a very general structural model that has provided the theoretical basis for a number of empirical studies of unionization (Ashenfelter and Pencavel (1969), Kumar and Dow (1986), Riddell (1993) and Martinello (1996)). In this model unionization is the result of the interaction of demand for and supply of union services. The demand for union services is the result of cost-benefit analysis by workers. The supply of union services is the result of cost-benefit analysis by union organizers. Many factors can influence these actors' perceptions of costs and benefits including: employer tactics (themselves influenced by a similar cost-benefit analysis); legislation; and overall economic conditions. Structural changes in the overall economy may not shift the individual supply or demand curves but can affect the aggregate outcome due to the changes in the composition of the economy. Other structural models that could be described by this reduced form include Dunlop's (1958) classic industrial relations framework used by Seeber and Cooke (1983) and partial adjustment models such as those used by Lawler and Hundley (1983) and Ellwood and Fine (1988) in their empirical analyses of certification success.

[18]For specific information concerning the sources of the data and descriptive statistics for all the variables used in the paper please see the Data Appendix.

[19]Certification applications disposed is approximately equal to the certification applications filed in the period. Note that the data on the number of certifications granted and the number of certifications disposed refer to the number of bargaining units not to the number of employees that are in the bargaining unit.

organize. The number of certification applications will increase. However the marginal applications are for units that likely have a lower propensity to certify and ceteris paribus their success rate is likely to be lower. In this case the coefficient on the legislation variable is biased toward zero and the results from specifications using *certrate* as a dependent variable would underestimate the effect of the explanatory variables on certification success.[20] While it is reasonable to suppose that endogeneity biases these results towards zero from a theoretical perspective it is possible for the bias to go in the other direction.[21]

Specifications are also estimated using another definition of certification success. The win rate (*winrate*) is defined as the percent of *all business establishments* in a province that are granted certification within the period. The number of business establishments in a jurisdiction is not influenced by the type of union recognition procedure in effect (see footnote 21). Empirical results using this dependent variable provide information on how mandatory vote/card check legislation affects the percentage of firms in a province that become newly unionized.

Explanatory Variables

[20]Another form of endogeneity also exists in this analysis. Rose and Chaison (1996) present empirical evidence that union density affects legislation. If legislation affects certification success and certification success affects union density and union density affects the degree of political success and political success affects legislation then the relationship is endogenous. This type of reverse causation is not likely to be important since the stock of union members affects political success and certification success is a flow that in any one period has a negligible effect on the stock.

[21]The results from regressions that use ln(certifications granted), ln(number of business establishments) and ln(certification applications processed) as the dependent variable indicate that the presence of mandatory vote legislation has a significant negative effect on both certifications granted and applications processed. The magnitude of the effect on certifications granted is much larger than on certifications processed. As expected mandatory vote legislation has no significant effect on the number of business establishments in a province.

The explanatory variables used in this study are similar to those used in other studies of union growth and certification success. The variables attempt to capture the effects of legislation, business conditions, organizational environment and structural factors. In addition specifications are estimated that include province fixed effects and province-specific time trends that attempt to address unobserved heterogeneity and legislative endogeneity.

The legislation variables are the three discussed earlier; mandatory representation votes (*mandvote*); compulsory dues checkoff (*checkoff*); and first agreement arbitration (*firstarb*). Each of these variables is assigned the value one in periods and jurisdictions when such legislation is in effect and zero when it is not.

Business conditions are described by the unemployment rate (*uerate*) and the provincial inflation rate (*pdot*). While there is general agreement that cyclical conditions should be taken into account results of earlier studies do not present a consistent picture of how these cyclical variables affect certification success or union density. A priori it is not possible to sign the coefficients on the cyclical variables.

The organizational environment is captured by provincial union density (*density*). It is hypothesized that as union density increases certification success increases because unions become an accepted part of the employment relationship and because unions have the financial resources to expand. However as union density increases fewer workers remain to be organized and it is likely that at some point the unorganized workers who remain are those that are the most difficult and costly to organize. At this point union density becomes negatively related to certification success. Specifications are estimated with density included linearly and /or quadratically.

Finally structural factors may affect certification success. Traditionally the easiest workers to organize are full-time males in the manufacturing sector. The more difficult workers to organize are part-time women in the service sector. Three variables are included to capture structural factors: the percent of those employed that are part-time (*partime*); the percent of those employed that are female (*female*); and an industry mix variable (*mix*). The industry mix variable for each province in a particular year is created by multiplying the employment share of each industry in that year by the national union density of that industry in 1976 and then summing over all the industries and multiplying by 100. This indicates what union density would have been in province, i, in year, t, given the current employment mix in the province and assuming that 1976 national unionization rates prevail. A priori the coefficients on the percent part-time and the percent female are expected to be negative while the coefficient on the industry mix variable is expected to be positive.

Fixed Effects and Time Trends

Cross-section time-series analysis allows the use of province fixed effects and province-specific time trends.[22] The availability of these variables provides the opportunity to address the issues of unobserved heterogeneity and legislative endogeneity.

In order to identify the impact of mandatory vote legislation on certification success the empirical analysis must take into account that different provinces in Canada likely have very different

[22]Year dummies can also be used in cross-section time-series analysis. In the description that follows only province dummies and province-specific time trends are discussed. Specifications were estimated that included year effects. These effects were never significant either individually or as a group when the cyclical variables were included in the analysis. In the interest of efficiency the year effects were dropped from the analysis.

attitudes towards unions.[23] Provinces where public opinion is not supportive of the union movement may have low certification success rates and also enact mandatory vote legislation. If attitudes towards unions are not taken into account it will not be clear from the analysis whether mandatory vote legislation is in fact negatively related to certification success or if this relationship is spurious - reflecting only the general lack of public support for unions in provinces that enact this legislation. Data are not available that allow the measurement of social attitudes across provinces yet if this unobserved heterogeneity is not taken into account the coefficient on the mandatory vote dummy variable is likely to be biased. What can be done about this? Cross-section time-series allows province fixed effects to be included in the analysis. The inclusion of provincial dummies controls for unobserved province-specific characteristics that are constant over time such as public opinion towards unions.

It may also be the case that there are unobserved province-specific characteristics, such as social attitudes towards unions, that change over time. Provinces where mandatory votes are introduced may be those where there is declining public support for unions. In this case a reduction in certification success rates may be due to changing public opinion towards unions and not to the introduction of mandatory vote legislation. Data are not available that permit the consistent measurement of changes in public opinion toward unions over time and across provinces.[24] Cross-

[23]For example, Saskatchewan was the first jurisdiction in Canada to elect a socialist government and the first jurisdiction in the world to introduce public health care. It has a long history of support for the labour movement and this is confirmed by the very high average certification success rates in Saskatchewan (83 percent) relative to the average of the whole sample (69 percent). Saskatchewan does not have mandatory representation votes.

[24]Information that would allow variables that measure or instrument public opinion toward unions to be included in a cross-section time-series analysis is not available in Canada. Opinion polls concerning public attitudes towards unions are available on a national basis but not provincially. The pragmatic ideology of the major political parties in Canada makes it difficult, if not impossible, to create a meaningful instrument based on public support for

section time-series analysis allow this form of unobserved heterogeneity to be addressed through the use of province-specific time trends. Linear and quadratic province-specific time trends are used to capture unobserved province-specific factors that change smoothly over time.

The inclusion of province fixed effects and/or province-specific time trends, allowed by cross-section time-series analysis, means that the coefficient on the mandatory vote dummy variable is associated with a discrete change in the level of certification success that occurs once mandatory vote legislation is introduced. Unobserved provincial differences, such as social attitudes towards unions, that are constant over time or change smoothly over time are controlled for by province fixed effects and province-specific time trends. This means that, while there is no guarantee, we can have some level of assurance that the difficult problem of legislative endogeneity has been addressed.[25]

6. Results

Certification Success Rate Results

Table 3 presents estimation results from two specifications where the certification success rate is the dependent variable. Specification #1 includes legislation variables (*mandvote, firstarb,*

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different political parties that would capture changes in public opinion towards unions over time and across jurisdictions in Canada. Martinello (1996, 1999) is able to use political variables in his time-series analyses of single jurisdictions. Even in this case the measurement of political factors is not straightforward.

[25] In order to provide some additional assurance that this is the case Granger/Sims causality tests were used to test directly for the exogeneity of mandatory vote legislation. These results show that mandatory vote legislation is exogenous in these specifications. A detailed description of the Granger/Sims causality tests and results can be found in Appendix One.

Endogeneity may be more widespread. The percent part-time, percent female, density and industry mix variables may also be endogenous. If specifications are estimated (using either the certification success rate or the certification success proportion as the dependent variable) that either omit or lag these variables the coefficient on the mandatory vote dummy variable is negative and significant at greater than the 99 percent level in all specifications.

checkoff) , environment variables (*mix, female, partime, density, uerate, pdot*), and province dummies as explanatory variables. Specification #2 adds province-specific time trends.[26] Diagnostic tests on the error structures of both specifications show that heteroscedasticity exists across provinces; correlation exists among the provinces at a point in time; and there is province-specific first-order autocorrelation. FGLS corrects for these problems and provides more efficient estimates than OLS. The FGLS estimates are presented in columns 1 and 2 of Table 3.

Results on the legislation variables are similar across specifications. In both specifications the coefficient on the mandatory vote dummy is negative and significant at more than the 99% confidence level. The evidence suggests that mandatory representation vote legislation reduces certification success rates by approximately 9 percentage points below what they would have been under card check. Since the mean value of the certification success rate for the sample is 69 percent this represents a reduction of 13 percent in the certification success rate when mandatory vote legislation is in force. The coefficients on first agreement arbitration and compulsory dues checkoff are never significantly different from zero. Since these legislative variables are likely to be positively correlated with political support for unionization but are ambiguously related to certification success these results provide further confirmation that the negative significant coefficient on the mandatory vote dummy

[26] The results on the mandatory vote coefficient are not very sensitive to the inclusion of covariates The coefficient on the mandatory vote dummy variable is negative and significant at the 90 percent level in a regression that includes only the legislation variables. When province fixed effects are added to this regression the mandatory vote coefficient is negative and significant at greater than the 99 percent level. Other specifications were estimated. These specifications included (national) year dummies, quadratic province-specific time trends and various forms of the environment variables (the quadratic unemployment rate, the proportionate rate of change in the unemployment rate, the rate of change in inflation, and quadratic union density). In any specification that included the legislation variables and the province dummies the coefficient on the mandatory vote dummy variable was negative and significant at at least the 90 percent level. The negative effect of mandatory votes on certification success is robust across many specifications.

variable is not just reflecting legislative endogeneity.

Results on the environment variables are mixed. The coefficients on the cyclical variables are similar in both specifications: the unemployment rate is always negative and significant; the inflation rate is never significantly different from zero. Higher unemployment rates appear to reduce certification success. Coefficients that describe structural factors vary across the specifications. The industry mix coefficient is positive and significant in Specification #1. It may be that this coefficient is not significant in Specification #2 because the province-specific time trends introduced in this specification capture most of the variation in this variable. The sign on the industry mix coefficient confirms prior expectations. The coefficients on percent female, percent part-time, and provincial union density are usually not significantly different from zero.

Win Rate Results.

The same specifications are estimated using the win rate as the dependent variable. These results are presented in columns 3 and 4 of Table 3. Diagnostic tests indicate that FGLS can improve the efficiency of Specification #3 by correcting for heteroscedasticity across provinces; correlation between provinces; and province-specific first-order autocorrelation. Diagnostic tests indicate that FGLS can improve the efficiency of Specification #4 by correcting for heteroscedasticity across provinces and correlation between provinces.

When the percentage of newly certified firms rather than the certification success rate is used as the dependent variable, the coefficient on the mandatory vote dummy continues to be negative and significant at more than the 99% level in all specifications. The coefficient on the first agreement arbitration dummy variable is never significantly different from zero. The coefficient on compulsory dues

checkoff is negative and significant in the FGLS result for Specification #4. Coefficients on cyclical variables perform similarly in both specifications. The coefficient on the unemployment rate is always negative and significant. The coefficient on the inflation rate is always positive and significant. The structural variables present fairly consistent results. The percent female coefficient is always significant and negative as expected. Percent part-time and union density coefficients are never significantly different from zero. The coefficient on industry mix is negative and significant in Specification #3 otherwise it is not significantly different from zero.

The results from the win rate specifications confirm that a significant, negative relationship exists between mandatory representation votes and certification success.

7. Conclusions

The results presented in this paper show that mandatory vote legislation reduces certification success rates approximately 9 percentage points below what they would be under card check. This result is robust across different specifications and significant at more than the 99% confidence level. The cross-section time-series approach used to obtain these results is preferred to either a pure time-series or a pure cross-section approach. First, it incorporates more variation. Second, it allows the inclusion of province dummy variables and province-specific time trends that address the problem of unobserved heterogeneity and may provide a remedy for legislative endogeneity. This means that we can have some confidence that the impact of mandatory votes on certification success has been

correctly identified.

These results are relevant to policymakers who should be aware that the type of recognition procedure affects certification success and will influence the ability of unions to maintain and expand their membership. The evidence helps us to understand why the labour movements in North America and the U.K. have supported card check recognition procedures while business has preferred mandatory votes. The results also suggest that differences in recognition procedures between the U.S. and Canada may provide a potential explanation for why Canada's unionization rate is higher than that of the U.S.

Table 1*

Mandatory Representation Votes, Compulsory Dues Checkoff and First Agreement Arbitration in Canada 1976-1997**			
Jurisdiction	**Mandatory Vote**	**Checkoff**	**First Agreement**
Federal		84:7	78:4
Newfoundland	94:2	85:6	85:6
PEI			not yet proclaimed***
Nova Scotia	77:5		
New Brunswick			
Quebec		77:12	77:12
Ontario	95:11	80:6	86:5
Manitoba	97:2	72:11	82:2
Saskatchewan		72:5	94:6
Alberta	88:11		
British Columbia	84:6 to 93:1	77:9	73:11

*Sources for Table 1 are found on the following page.

**The numbers in the cells of the table indicate the year:month the legislation is introduced. In almost all jurisdictions the legislation remains in force until the end of 1996. The one exception is mandatory vote legislation in B.C. that was repealed in January, 1993.

***Legislation to introduce First Agreement Arbitration was passed in PEI on May 19, 1994. It comes into force on proclamation. It is not yet in force.

Sources for Table 1:

Labour Legislation in Canada, 1949-50. Ottawa: Department of Supply and Services,

Labour Legislation of the Past Decade: A Review of Developments in Canadian Labour Legislation for the 1951-1960 period. Ottawa: Dept. Of Supply and Services, 1961.

Department of Labour, Legislation Research Branch, Recent Legislation and Administrative Developments. Ottawa: Department of Supply and Services, 1961, 1962, 1963, 1964, 1965, 1966.

Labour Canada, Legislative Research Branch, Developments in the Enactment and Administration of Labour Law in Canada. Ottawa: Ministry of Supply and Services, 1966-67, 1967-68, 1968-69, 1969-70, 1970-71.

Labour Canada, Legislative Review. Ottawa: Department of Supply and Services, volumes 1 through 22, covering the period from 1973 to 1989-90.

HRDC, Highlights of Major Developments in Labour Legislation. This covers the period from 1990 to 1998 and is available from the HRDC website: http://labour-travail.hrdc-drhc.gc.ca/policy

Table 2

Variation in Legislative Environments of Nine Canadian Jurisdictions from 1978 to 1996			
Legislative Environment			Number of Observations
Mandvote	Firstarb	Checkoff	
no	no	no	38
yes	no	no	28
no	yes	no	0
no	no	yes	26
yes	yes	no	0
no	yes	yes	65
yes	no	yes	0
yes	yes	yes	14
		Total	171

Table 3: Results				
Dependent Variable	**Certification Success Rate (certrate)**		**Win Rate (winrate)**	
Specification	**#1**	**#2**	**#3**	**#4**
mandvote	-9.08 (.959)**	-8.88 (1.07)**	-.052 (.019)**	-.140 (.018)**
checkoff	-.55 (2.33)	-2.42 (2.35)	-.014 (.024)	-.064 (.030)
firstarb	-.28 (1.44)	-3.23 (1.69)	.028 (.015)	-.006 (.019)
mix	2.71 (0.79)**	1.05 (.837)	-.018 (.009)*	-.015 (.011)
female	-.28 (0.27)	-.09 (.042)	-.023 (.004)**	-.020 (.006)**
partime	1.18 (0.38) *	.56 (0.51)	.009 (.005)	.007 (.006)
density	0.26 (0.20)	0.08 (0.23)	.004 (.002)	-.002 (.003)
uerate	-1.21 (0.14)**	-1.22 (0.22)**	-.016 (.003)**	-.018 (.003)**
pdot	.06 (0.10)	.07 (0.12)	.006 (.002)**	.006 (.002)**
bc	3.44 (2.85)	7.67 (4.50)	.124 (.061)*	.409 (.064)**
alta	-3.89 (2.98)	-5.46 (5.79)	-.064 (.043)	-.196 (.067)**
sask	25.52 (5.86)**	8.71 (8.60)	-.122 (.073)	-.058 (.113)
man	12.42 (3.33)**	5.31 (5.83)	-.103 (.041)*	-.070 (.062)
ont	-.03 (2.62)	-5.98 (4.87)	.047 (.032)	.035 (.044)
que	11.42 (2.67)**	12.37 (4.43)**	.271 (.068)*	.647 (.057)**
ns	19.99 (1.65)**	16.56 (3.00)**	.164 (.035)**	.168 (.041)**
nfld	7.05 (3.78)	5.06 (7.50)	.205 (.048)**	.218 (.063)**
bctime		-.23 (0.28)		-.012 (.004)**
altime		-.56 (0.34)		.011 (.004)*
satime		.61 (0.33)		.002 (.004)
matime		.45 (0.33)		.004 (.003)
ontime		.35 (0.27)		.004 (.003)

qutime		-.25 (0.26)		-.022(.004)**
nbtime		-.28 (0.33)		-.0009 (.003)
nstime		-.45 (0.28)		.005 (.004)
nftime		.36 (0.39)		.009 (.005)*
constant	-18.73 (28.70)	42.70 (31.33)	1.56 (.339)**	1.60 (.441)**
Diagnostic Statistics (1)				
Wald (2)	136.05**	131.21**	256.57**	149.66**
Likelihood Ratio (3)	74.21**	76.68**	61.27**	52.26**
Autocorrelation Statistic (4)	.1104	.1873	2.81	.3394
Autocorrelation Statistic (5)	6.59* 5.74*	6.92*	12.82** 11.91** 10.39** 5.72*	

The numbers in brackets are standard errors.
**significant at at least the 99 per cent level
* significant at at least the 95 per cent level

(1) The FGLS specification was chosen based on a significance of at least 95%.
(2) The null hypothesis for the Wald Statistic is that of homoscedastic errors cross provinces.
(3) The null hypothesis for the Likelihood Ratio Statistic is that there is no correlation between the error terms of the provinces at a point in time.
(4) The null hypothesis for this autocorrelation statistic is that there is common first-order autocorrelation across provinces.
(5) The null hypothesis for this autocorrelation statistic is that there is province specific first-order autocorrelation. There are nine test statistics - only those that are significant at at least the 95 percent level are reported.

Data Appendix

The data are annual and cover the period from 1978 to 1996. The data set begins in 1978 because data on the number of business enterprises by province are only available from 1978. Nine Canadian provinces are represented in the data. Prince Edward Island is omitted because no certification data are readily available for this province. (P.E.I. is a very small province with a total population of approximately 100,000.) The federal jurisdiction is omitted because data on the explanatory variables for this sector are not available. Descriptive statistics for all of the variables used in the study are presented in Table A1.

Dependent Variables

The certification success rate (*certrate*) is defined as the percentage of disposed certification applications that are granted. The data on certifications granted and certifications disposed come from Martinello (1996a). This publication provides information on all jurisdictions except Prince Edward Island. Data are available from as early as 1951, for some jurisdictions, to 1993 or 1994. Professor Martinello kindly provided updated figures until 1996. The data are compiled from the Annual Reports of the private sector Labour Relations Boards (LRBs) of the various jurisdictions and include information on certifications in the public and private sector as well as the construction industry. Note that the data used for this paper do not allow us to distinguish between certifications granted to unions organizing new bargaining units and those granted to unions organizing existing bargaining units through raids or displacements. Such information is available only on a very limited basis in the Annual Reports.

Special Notes on British Columbia and Alberta[27]

In 1988 legislation was passed in British Columbia that extended bargaining rights to teachers. The teachers responded by certifying the professional association that had functioned as their union. This change in coverage accounted for 75 certifications granted and disposed in 1988. Since this paper is not addressing the impact of changes in coverage on certification success the 1988 numbers for certifications filed, granted and disposed in B.C. in 1988 have been reduced by 75 to eliminate the impact on certification success of this legislative change.

Data for certifications disposed and certifications granted in 1986 and 1987 are not available in Alberta due to computer problems at the Labour Relations Board. These numbers are created using the same procedure as Martinello (1996a). Since the average ratio of certifications filed to certifications disposed is approximately one, certifications disposed is set equal to certifications filed for these two years. Certifications granted is obtained by multiplying certifications filed in 1986 and 1987 by the average of the ratio of certifications granted to certifications filed in 1989 and 1990. This later period is used because a judicial ruling in 1984 that was later overturned meant that certification behaviour over the earlier period (1984, 1985) was highly unusual. Unfortunately it is not possible to adjust the data to eliminate the effect of the ruling. 1988 is not used because the computer problems meant that the data in 1988 only covers four months of the year.

The win rate (*winrate*) is defined as the percentage of firms where certifications are granted. The data on number of firms are provided by the Business and Labour market Analysis Division, Statistics Canada from its Longitudinal Employment Analysis Program (LEAP).[28] The LEAP system is

[27] All of the detailed information concerning British Columbia and Alberta comes from Martinello (1996a).

[28] I would like to thank John Baldwin and Bob Gibson at Statistics Canada for kindly providing this data.

a longitudinal micro-database on businesses in the Canadian economy constructed through a record linkage of administrative data from Revenue Canada and Employment and Immigration Canada and Statistics Canada survey data. Only businesses that have paid employees in Canada are considered. The term business includes all businesses or organizations which during a reference year have remitted social security and tax deductions on behalf of these employees to Revenue Canada. Establishment data are only available from 1978. Almost all the LRB Annual Reports cover a 12 month period. However occasionally a LRB Report covers as short a period as 4 months or as long a period as 15 months. This is not an issue in the construction of the certification success rate variable since both the numerator and denominator of this variable are defined for the same period of time. For the win rate variable it is necessary to annualize certifications granted using the information on the length of time (in months) the Annual Report covers. This information is available in Martinello (1996a).

Legislation Variables

Mandatory representation votes (*mandvote*), compulsory dues checkoff (*checkoff*) and first agreement arbitration (*firstarb*) are captured using dummy variables. In each case the variable is equal to zero if the legislation is not in force in the period. It is equal to one when it is in force. It is equal to the fraction of the year that it is in force in the year it is introduced (months in force/12).

The data for this variable are compiled from the sources listed in Table 1. Where possible the data are cross-checked against information available in other studies (e.g. Martinello (1996a).)

Economic Environment

The unemployment rate (*uerate*) for each province is the relevant series from the Labour Force Survey, Annual Averages database on CANSIM. (Series numbers: D987851, D987569, D987287, D987005, D986723, D986441, D986159, D985877, D985313).

The inflation rate for each province (*pdot*) is calculated from the CPI- All Items for its largest city (1986=100). Again the source of this information is the CANSIM database (Series numbers: P818800, P818600, P818200, P817800, P817000, P816400, P816600, P816000)

Employment and Industry Mix

The industry mix variable (*mix*) is described in the paper. The base weights for the measure are the national unionization rates for each industry in 1976. The Corporation and Labour Unions Returns Act (CALURA) provides unionization rates for eleven industry groups in 1976. The 'employment rate' for each industry, in each year, for each province is calculated using data on employment that correspond to each of eleven industry groups of the unionization data and data on total employment in the province. The industry groups are; agriculture; forestry; fishing and trapping; mines, quarries and oil wells; manufacturing; construction; transportation, communication and other utilities; trade; finance; service industries; and public administration. These data, as well as the data necessary to construct the percent of employment that is part-time (*partime*) and the percent of employment that is female (*female)* are from the Labour Force Survey, Annual Averages and were accessed through the CANSIM database. (Series numbers: (total employment) D987714, D987342, D987150, D986868, D986586, D986304, D986022, D985740, D985176; (employment by industry) D987751-D987765, D987469-D987583, D987469-D987483, D987187-D987201, D986905-D986919, D986624-

D986637, D986341- D986355, D986059-D986073, D985777-D985791, D985213-D985227; (female employment) D987732, D987450, D987168, D986886, D986604, D986322, D986040, D985758, D985194; (part-time employment) D987797, D987515, D987233, D986951, D986669, D986387, D986105, D985823, D985259.)

Union Saturation

The union density concept used in the empirical analysis is defined as:

$$\text{density} = \frac{\text{union members}}{\text{paid labour force}} \times 100$$

The series on union membership comes from the Corporation and Labour Unions Return Act (CALURA)**.** This was discontinued in 1992. Statistics Canada continued to collect comparable data until 1995. The data from the period from 1993 to 1995 are available from Statistics Canada, Unionization in Canada: A Retrospective. (Catalogue No. 75001-SP) Supplement, Summer 1999. The 1996 union density data for each province is constructed by fitting a linear trend to the existing union density series for each province. The CALURA series itself is not entirely consistent because of a revision in 1983. It also does not cover all union members because only unions with 100 or more members were required to report. I have defined potential union members as the "paid labour force". The paid labour force is equal to the total labour force minus those who are self-employed. Again the data are from the LFS. Annual Averages on the CANSIM database.(Series numbers: (labour force) D987677, D987395, D987113, D986831, D986549, D986267, D985985, D985703, D985139; (self-employment) D987769, D987487, D987205, D986923, D986641, D986359, D986077, D985795, D985231)

Table A1: Descriptive Statistics (1978-1996)					
Variable	Observations	Mean	Std. Dev.	Min	Max
certrate	171	69.04	10.84	39.53	97.65
winrate	171	.25	.15	.05	.79
mandvote	171	.23	.42	0	1
checkoff	171	.61	.49	0	1
firstarb	171	.45	.49	0	1
mix	171	28.74	2.38	22.34	33.20
female	171	42.37	2.75	34.26	46.21
partime	171	16.90	3.04	8.57	23.29
density	171	31.01	4.84	21.20	43.92
uerate	171	10.51	3.71	3.80	20.80
pdot	171	5.02	3.19	-1.46	13.26

Appendix One: Causality Tests

The empirical analysis presented in the body of the paper suggests that mandatory representation votes have a significant negative effect on certification success. This result could be spurious due to the endogeneity of legislation. If public opinion has turned against unions it may be that the introduction of mandatory vote legislation really has no effect on certification success but rather the decrease in certification success reflects declining public support of unions. It is possible to test for the exogeneity of mandatory vote legislation directly using a Granger/Sims approach. The basic idea behind this test is that if mandatory vote legislation is exogenous and has a negative effect on the level of certification success this effect should only be observed in periods after the legislation is introduced. In order to perform this test dummies are created that capture the timing of the introduction of mandatory vote legislation:

D03 : equals 1 three years before mandatory votes are introduced and zero in all other years.
D02: equals 1 two years before mandatory votes are introduced and zero in all other years.
D01: equals 1 one year before mandatory votes are introduced and zero in all other years.
D00: equals 1 in the year mandatory votes are introduced and zero in all other years.
D10: equals 1 in the first year after mandatory votes are introduced and zero in all other years.
D20: equals 1 in the second year after mandatory votes are introduced and zero in all other years
D30: equals 1 in the third year after mandatory votes are introduced and zero in all other years.

A number of specifications are estimated that incorporate these dummies. These results are shown in Tables A2 and A3. All specifications are estimated using OLS. In all these specifications there is no indication of declining levels of certification success in the periods prior to the introduction of mandatory vote legislation. The coefficients on the leading dummies (D03, D02 and D01) are typically not significant and if significant are positive in sign.

Table A2: Causality Tests- dependent variable is the certification success rate						
Variable	#1	#2	#3	#4	#5	#6
D03	7.49(3.2)*	4.67 (3.18)	4.77(3.12)	7.96(3.14)*	5.55 (3.24)	5.72(3.21)
D02	4.99 (3.26)	1.63 (3.23)	1.76(3.17)	5.36 (3.21)	2.30 (3.36)	2.65(3.33)
D01	1.91 (3.22)	-.92 (3.16)	-.62(3.11)	2.87 (3.18)	.02 (3.29)	.51 (3.27)
D00	-.42 (3.25)	no	5.08(3.33)	.511 (3.27)	no	3.49(3.42)
D10	.78 (3.15)	no	6.57(3.27)*	2.76 (3.18)	no	5.80(3.36)
D20	-.11 (3.18)	no	5.57(3.29)	2.07 (3.24)	no	4.97 (3.39)
D30	-1.49(3.58)	no	3.41(3.58)	1.44 (3.50)	no	3.80 (3.57)
mandvote	no	-7.05(1.99)**	-10.5(2.41)**	no	-4.34(2.57)	-7.24(2.92)*
firstarb	.14 (2.30)	.57 (2.22)	-.15(2.18)	-2.14 (2.83)	-2.78(2.82)	-2.64(2.79)
checkoff	-.47 (3.21)	-.68 (3.10)	-1.51(3.06)	1.20 (4.12)	-1.00(4.16)	-.75(4.12)
structural variables	yes	yes	yes	yes	yes	yes
cyclical variables	yes	yes	yes	yes	yes	yes
province dummies	yes	yes	yes	yes	yes	yes
province time trends	no	no	no	yes	yes	yes

Standard errors are in parentheses.

* Significant at at least the 95 percent level.

**Significant at at least the 99 percent level.

Table A3: Causality Tests - dependent variable is the winrate.						
Variable	#1	#2	#3	#4	#5	#6
D03	.08 (.04)*	.07 (.04)	.07 (.04)	.08 (.03)*	.03(.03)	.03(.03)
D02	.10 (.04)*	.08 (.04)	.08 (.04)*	.09(.04)**	.04(.04)	.04(.04)
D01	.02 (.04)	.003(.04)	.004(.04)	.006(.04)	-.04(.03)	-.04(.03)
D00	-.02(.04)	no	.004(.04)	-.03(.04)	no	.03(.04)
D10	-.06 (.04)	no	-.03(.04)	-.05(.04)	no	.01(.04)
D20	-.06 (.04)	no	-.03(.04)	-.05(.04)	no	.006(.04)
D30	-.07 (.04)	no	-.05 (.05)	-.05(.04)	no	-.007(.04)
mandvote	no	-.07(.03)*	-.05 (.03)	no	-.14(.03)**	-.15(.03)**
firstarb	.05 (.03)	.05 (.03)	.05 (.03)	.03(.03)	.01 (.03)	.02(.03)
checkoff	-.004(.04)	-.01 (.04)	-.009(.04)	-.002(.05)	-.04 (.04)	-.04(.04)
structural variables	yes	yes	yes	yes	yes	yes
cyclical variables	yes	yes	yes	yes	yes	yes
province dummies	yes	yes	yes	yes	yes	yes
province time trends	no	no	no	yes	yes	yes

Standard errors are in parentheses.

* Significant at at least the 95 percent level.

**Significant at at least the 99 percent level.

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