Worker Rights in Collective Bargaining

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Abstract

Collective bargaining agreements (CBAs) specify the contractual rights of unionized workers, but their full legal content has not yet been analyzed by economists. This paper develops novel natural language methods to analyze the empirical determinants and economic value of these rights using a new collection of 30,000 CBAs from Canada in the period 1986-2015. We parse legally binding rights (e.g., "workers shall receive...") and obligations (e.g., "the employer shall provide...") from contract text, and validate our measures through evaluation of clause pairs and comparison to firm surveys on HR practices. Using time-varying province-level variation in labor income tax rates, we find that higher taxes increase the share of worker-rights clauses while reducing pre-tax wages in unionized firms, consistent with a substitution effect away from taxed wages toward untaxed rights. Further, an exogenous increase in the value of outside options (from a leave-one-out instrument for labor demand) increases the share of worker rights clauses in CBAs. Combining the regression estimates, we infer that a one-standard-deviation increase in worker rights is valued at about 5.7% of wages.

1 Introduction

Labor economists have long been interested in the effects of collective bargaining agreements (CBAs) on wages and benefits (e.g. Farber et al., 2021; Martins, 2021; Card and Cardoso, 2022; Jäger et al., 2025). Yet CBAs are about much more than worker compensation, often extending across dozens of pages, with hundreds of legally binding plain-text clauses to go along with lists of positions and tables of wages. Is this text merely "cheap talk"? That is to say, are legal rights ancillary to wages and enumerated benefits, or do they have economic value to workers and firms? Drawing on legal theory and tools from unsupervised natural language processing, this paper measures and empirically studies the legal content of CBAs.

Our analysis of the full legal content of CBAs builds on early work in labor economics arguing for a broader role of CBAs beyond wages and employment (Freeman and Medoff, 1984; Farber, 1986). This additional text in CBAs governs a wide range of workplace rights and responsibilities. To motivate and interpret this legal content, we draw on the property-rights theory of the firm, which highlights how ownership and control are defined by the allocation of residual decision rights (Grossman and Hart, 1986; Hart and Moore, 1990). In particular, when workers have superior information about an activity, then it may be efficient to allocate decision rights to workers (Aghion and Tirole, 1997). From this perspective, worker rights clauses are not peripheral; they are legal instruments that reallocate authority within the firm. This reallocation can both increase worker welfare and enhance productive efficiency, making it essential to study empirically how economic conditions shape the prevalence and value of these rights.

To recover worker rights from contract text, we combine ideas from computational linguistics with canonical legal semantics of rights and duties (Hohfeld, 1913). Motivated by long-standing connections between formal grammar and legal theory (Lindahl, 1977), we take a structural, rather than purely data-driven, approach to measuring the legal content of contracts. Our method begins by constructing dependency trees for each sentence, parsing contractual clauses into linguistic primitives of subjects, verbs and objects. A sentence's verb structure, especially deontic modal verbs like "shall" or "may" (Von Wright, 1951; Kratzer, 1991), determines whether

a clause is a right, permission, obligation, or prohibition. The sentence's subject determines whether the clause applies to workers, unions, employers, or managers. For example, "employees shall receive..." indicates a worker right, while "the employer shall provide..." indicates a firm obligation. We then reduce the dimensionality of the remaining text of the clause (i.e. the sentence's object) by computing sentence vectors and grouping them into topics via a clustering algorithm. Our approach combines philosophical insights about the connection between formal linguistic features and normative legal claims (Kanger, 1971; Lindahl, 1977; Horty, 2001) with new algorithmic techniques to systematically measure the legal content of CBAs.

Our methodology offers a number of practical advantages. The large number of clauses with complex structures and contingencies makes coding each clause by hand very difficult. Further, the common statistical measures of text constructed from word counts, n-grams, or language embeddings do not work well in our setting because they miss small differences in language that would radically change the legal meaning of a clause. For example, replacing "may" with "must", or replacing "shall" with "shall not." Our structural approach to text analysis adapts innovations in dependency parsing to construct grammatically precise representations of natural language (Ash et al., 2020). These grammatical structures are particularly important for extracting legal guarantees (Solum, 2013; Solan, 2018), versus say political or media content (Gentzkow and Shapiro, 2010), or non-binding language in job postings (Atalay et al., 2020) or employee reviews (Sockin, 2022). In short, this structural approach to contracts is scalable, transparent, reproducible, and interpretable, and it could be adapted to many legal domains.[1]

We implement the approach in a new corpus of 30,000 collective bargaining agreements from Canada, 1986-2015. Ideally for our purposes, Canada has decentralized firm-level contract negotiation, a high-quality and comprehensive corpus of contract text, and a provincial structure of union regulation. While many (non-Anglo) countries have high union coverage and large corpora of collective bargaining agreements, these systems often feature a hierarchy of agreements negotiated at the firm (or even plant), sector, or national level, which makes identifying the binding contract provisions at a particular establishment challenging. Further, these civil-law countries tend to have much more extensive employment law (Botero et al., 2004), so the scope

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[1]In Section 4.6 below, we provide a longer discussion of the merits of the structural approach, including a comparison to potential LLM-based approaches.

of bargaining is potentially narrower. In the Anglophone common-law tradition (e.g. the U.S., U.K., and Canada), industrial relations have generally been conducted via binding legal contracts between individual employers and unions, against a backdrop of less restrictive employment law. All of these features make the firm-level collective bargaining agreements much more important as legal documents in decentralized collective bargaining contexts like Canada.

We apply our NLP pipeline to extract rights and duties for workers and firms, and then link them to metadata for empirical analysis. Descriptively, we see that a contract's legal content covers diverse topics and actions. Canadian labor contracts consist mainly of worker rights, worker obligations, and firm obligations. The standard non-wage benefits discussed in previous work (e.g. Freeman and Medoff, 1984; Budd, 2017; Corradini et al., 2025), such as vacations and pensions, are provided through worker-rights clauses entitling workers to these benefits. More generally, worker rights include a diverse set of legal entitlements defining benefits, workplace conditions, domains of control, and procedures for workplace governance. Such procedures structure decision-making around scheduling, dismissal, seniority, and dispute resolution, for starters. Some provisions (e.g. seniority) benefit one group of workers to the potential detriment of another group of workers.

Worker rights are legally enforceable claims, so they should matter a great deal to both firms and workers. Consistent with that, CBA rights are intensely bargained over by highly paid, well-trained lawyers and negotiators (McAlevey and Lawlor, 2023). As further substantiation of out measure of worker rights, we test whether it indeed captures what is important to workers through a series of quantitative validation exercises. We query a large language model to do pairwise comparisons of clause types as more or less beneficial to workers, and we find that worker rights are scored as the most pro-worker clause type. Further, we find that the share of worker rights in a union contract is correlated with pro-worker dimensions of the associated firm's human resource practices, as measured in the World Management Survey (Bloom et al., 2012). Other clause types are either uncorrelated or negatively correlated with pro-worker HR practices.

The next step is our empirical analysis of the determinants of the prevalence of worker rights in union contracts. To the extent that workers value these rights and they serve as untaxed compensation, we expect that the prevalence of worker rights clauses might respond to changes in tax rates on wage income. Hence, we

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empirically examine the effect of provincial effective labor income tax rates, which alter the relative price of wage and non-wage compensation. We identify these effects relying on the fixed schedule of contract expirations as well as a wide set of covariates, including other provincial labor laws, along with province-sector and sector-year fixed effects.

We find that tax increases lead to an increase in worker rights clauses. That is consistent with a substitution effect away from taxed compensation (income) and toward untaxed compensation (rights), similar to the finding in Gruber and Poterba (1994) that taxes increase health benefits relative to wages. The result holds in a staggered event-study design and is robust to a number of alternative specifications, including the addition of firm fixed effects, union fixed effects, and province-specific time trends. It also holds in an IV specification in which we isolate exogenous changes in *province* income tax through changes in *federal* tax rates and associated deductions/credits (Gruber and Saez, 2002; Akcigit et al., 2021).

A second factor determining contract terms is the relative bargaining power of employers and employees. To look at this, we analyze the effect of changes in the (un)employment rate in a local sector. We calculate a leave-one-out employment rate in a given sector as the average of log employment rates in other sectors to isolate labor demand shocks (Beaudry et al., 2012; Green et al., 2025). We find that exogenous increases in the local employment rate – reflecting stronger worker outside options and a tighter labor market – raise worker rights. That result is consistent with recent work by Lagos (2025) showing that improved union outside options during collective bargaining alters the text of Brazilian CBAs in a pro-worker direction, using both our measure and a supervised approach (discussed more below). As with the tax result, the effect of employment holds in a range of alternative specifications including event studies.

Overall, we find evidence consistent with worker rights behaving like non-wage compensation (Mas, 2025). To understand which clauses workers value, we run separate regressions for the effect of taxes and labor demand on different topics of worker rights. We find that for both taxes and employment, the largest effects are on scheduling and other rights around time use. Next, we distinguish between priced wage-like benefits – such as health coverage or bonuses – and unpriced control rights – such as scheduling flexibility and termination protection – which are typically hidden in contract text and overlooked in standard quantitative datasets. We find that policy

effects on control rights are at least as strong as those on priced benefits. Analyzing contract text is therefore essential to capture the full range of job attributes that matter to workers.

How much do workers value these rights? We find that income tax increases boost pre-tax wages, and more so for non-union than union workers. That effect is consistent with union contracts adjusting the mix of wages and rights in response to tax changes. Dividing the worker-rights response by the differential union wage response to taxes allows us to recover an elasticity of substitution between wages and worker rights (as measured in text), and thence to put a value of worker-rights language in monetary terms. Based on this calculation, we find that a one-standard-deviation increase in the contract share of worker rights clauses is equivalent in value to a 5.7% increase in worker wages.

These findings add to the longstanding literature on collective bargaining and unions (Freeman and Medoff 1984; Farber 1986; MacLeod 2011; Cazes et al. 2019). There has been a recent resurgence of interest from both policymakers and academics on the economic effects of unions and collective bargaining on wages and employment in a variety of countries and contexts, often using administrative data (Card and Cardoso, 2022; Jäger et al., 2025). While the union effect on productivity is ambiguous (Doucouliagos and Laroche 2003, 2009; DiNardo and Lee 2004; MacLeod 2011), in the U.S. and Canada, unions have historically been an important force in compressing the wage (and income) distribution (DiNardo et al., 1996; Card, 2001; Farber et al., 2021).[2]

We also add to the broad literature in labor economics on the non-wage aspects of employment. Those include on-the-job amenities (Lavetti, 2023), such as the ability to work from home (Bloom et al., 2015; Mas and Pallais, 2017, 2020; Cai and Wang, 2022). Yet detailed measures of non-wage employment conditions have largely come from surveys and cover only a relatively narrow set of dimensions (Dube et al., 2022;

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[2]Other related work includes the hysteresis in contract terms documented in Card (1986), suggesting that observed union contracts cannot be viewed as achieving the first best. There is also a large literature in labor and legal history, sociology, and political science concerned with the interaction of labor laws and labor contracts. Research that focuses on hand-coded features of union contracts includes Juravich et al. (2006) and Strunk and Grissom (2010). Stepan-Norris and Zeitlin (2003) argue that certain contract provisions, such as strong stewards, were a key distinctive demand of particularly politicized unions in the post-war period. McCammon (1990) and Pope (2004), among others, have argued that court interpretations of the Wagner Act have been decisive in weakening the strike provisions in contracts.

Maestas et al., 2023). Our contribution is to use the text of collective bargaining agreements to inductively measure a larger and more comprehensive set of worker rights backed by legal commitments. As we highlight in our discussion, the right to a benefit is conceptually distinct from the benefit itself, as failure to supply the benefit imposes legal costs for breach.

Methodologically, getting at the granular textual details of contracts is the core of this research. We build on work applying computational techniques from natural language processing to the text of written contracts (Sanga, 2014; Moszoro et al., 2016; Ganglmair and Wardlaw, 2017), which in turn is part of a growing area of empirical research using text data by economists and other social scientists (Roberts et al., 2013; Gentzkow et al., 2019; Ash and Hansen, 2023). In labor economics, recent work using topic models to analyze contract features includes Lagos (2025) and Corradini et al. (2025). Our innovation is to use concepts from formal legal linguistics, in combination with recent advances in natural language parsing and transformer-based semantic encoders, to evaluate the legal incidence of contractual language on different parties to the contract (see Ash et al., 2020). This approach allows us not only to recover legally meaningful linguistic patterns in a systematic and reproducible way, but also to connect them to economic models for theoretically grounded empirical analysis.

The rest of the paper is organized as follows. Section 2 provides an institutional background and outlines the data sources. Section 3 describes the text data and methods used to extract relevant clauses. Section 4 provides evidence validating our measure of worker rights. Section 5 outlines the econometric approach and reports the empirical results on how rights respond to tax and employment changes. Section 6 concludes.

2   Background

This section first provides an institutional background on collective bargaining and unions in Canada. Second, it outlines the data sources.

2.1 Collective Bargaining in Canada

Canadian collective bargaining has a number of attractive institutional features for our setting. As described above, like the U.S. and other Anglophone systems, Canada is a common-law country with decentralized bargaining at the firm level, with little scope for automatic contract extensions to non-union members (Jäger et al., 2025).[3] The difference between U.S. and Canadian labor market institutions has been the subject of considerable work in economics and industrial relations (Card and Freeman 1993, Card et al. 2004, Card et al. 2020). Eidlin (2018) provides a recent account of the historical origins and the political economy of the divergence between U.S. and Canadian labor union density.[4] While Canada has maintained a higher union density than the U.S. (about 30%, compared to about 10%), the process of collective bargaining is still somewhat similar between the two nations. Further, and perhaps most importantly, Canada has a comprehensive database of collective bargaining agreements available for use by researchers.

In Canada, collective bargaining is regulated at the "jurisdiction" level, where in most cases the relevant jurisdiction is the province. Labor law includes rules on the process of union recognition (card check vs. secret ballot election), for example, and restrictions on replacing striking workers. Many provinces also have "mandatory arbitration" where disputes between unions and employers are automatically referred to a labor tribunal, while other provinces allow alternative dispute resolution processes, e.g. mediation, before the case goes to an arbitrator.[5] Overall, this means that there is important variation in labor policies across provinces, so there will be important variation in the content of collective bargaining agreements across provinces even within the same sector or same national union. That is unlike many European contexts, where the national unions hold a large influence even over local bargaining matters, for example by setting agreements that cover entire sectors. In Canada contracts are negotiated at the firm level by local union representatives. Those local unions bargain around and in response to local provincial rules and policies.

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[3]Note that the Province of Quebec is a civil law jurisdiction. For this reason, we do not consider French language contracts.

[4]Kuhn (1998) reviews the empirical evidence on the productivity of unions in Canada. His evidence suggests that public sector unions in Canada reduce productivity, but there is little evidence of this for private section unions.

[5]Legree et al. (2017) provide a summary of provincial collective bargaining regimes and show that these have significant, if small, effects on unionization rates.

Collective bargaining agreements are legally binding contracts with meaningful sanctions for breach. However, there are some restrictions on what can be put in a contract. For example, there are basic rights in employment law and in the broader Charter of Rights and Freedoms that cannot be abrogated by a collective bargaining agreement. Further, there are unwritten "implied obligations", for example that employers are not to harass and workers are not to shirk. These also vary by jurisdiction.

A core issue in interpretation of the language of collective bargaining agreements is whether or not the employer has residual control rights, as is the case under Canadian common law (originating with British Master and Servant law), and consistent with the property-rights approach to the theory of the firm (Grossman and Hart, 1986). In an influential law review article written before he became a justice on the Canadian Supreme Court, Bora Laskin (1952) distinguished the collective bargaining regime from the common law regime. Collective bargaining agreements are treated more in line with civil law norms, where disputes rely upon the text of the agreement (Brown et al., 2019). This in turn implies that parties prefer more specific, and hence longer contracts (Doorey 2020). In particular, if a right has not been specifically provided, then workers cannot claim that right. Further, any limitations or contingencies on rights have to be explicitly contracted upon, suggesting that worker obligations should also increase with worker rights.

From the perspective of both workers and firms, a notable distinction in the set of granted provisions are those around priced and unpriced rights. That is, contracts could grant wage-like priced benefits, such as vacations and health benefits, or else provisions around control and governance, such as scheduling and grievance procedures. In Canada, as in other contexts, significant bargaining energies are invested in negotiating both types of rights.[6]

2.2 Data Sources

Our data source for Canadian contracts is Employment and Social Development Canada, from which we obtained more than 32K contracts in the English language for the years 1986 through 2015 (this is after removing about 10K French-language

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[6]A notable feature of the Canadian case is that, unlike the USA, workers in Canada are on government-provided healthcare plans. As Gruber and Poterba (1994) show for the U.S. case, workers can a great deal about health care benefits, and hence they are a central feature of US collective bargaining agreements. Since healthcare is not on the bargaining table in Canada, the collective bargaining agreements can focus on other issues, including the allocation of decision rights.

Table 1: Summary Statistics for Contracts Metadata

Variable	Obs	Mean	Std. Dev.	Min	Max
Private-Sector	32,402	0.480	0.500	0	1
Number of Employees	32,402	690.52	2886.66	0	170000
Year	32,402	2000.22	7.73	1986	2015
Duration (years)	32,402	2.600	1.170	0	20
Has COLA	32,402	0.282	0.450	0	1
Annual Wage Increase (%)	9,150	2.569	1.814	-7.561	19.836
Inflation	32,165	5.245	3.193	-5.930	29.986
Union Has Strike	32,402	0.033	0.178	0	1
Income Tax Rate (%)	24,910	22.390	1.448	16.11	25.62
Unemployment Rate (%)	29,200	5.086	3.545	1.08	49.92
Population (1000s)	29,471	5912.1	3753.8	96.9	11385
Employment (1000s)	29,471	213.51	168.8	0.2	696.7

Note: Summary Statistics (number of observations, mean, standard deviation, minimum, maximum) of contract characteristics and metadata matched to contracts. Data source: Employment and Social Development Canada.

contracts), along with metadata (company, year, etc) by contract.

Our data have 32,402 contracts, 7,572 companies (~4 contracts per company), 10 provinces and 3 territories, 906 cities, 11 sector/industry groupings, and 606 industry codes (NAICS codes).[7] Appendix Table A.1 reports summary tabulations for the provinces and sectors. Quebec has relatively few contracts in our sample because most of them are in French and thus excluded.

For each contract, we have the company, union, location, sector, public/private status, and number of employees. We have a set of related dates (signing, effective, and expiry), which allows us to compute contract duration, and match up to short-term changes in economic conditions.

Table 1 provides summary statistics on these variables. Appendix Figure A.1 provides histograms for a selection of the real-valued variables. About half of the firms are in the private sector. The number of employees is widely dispersed. Contract

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[7]Provinces exercise constitutional powers in their own right, the territories exercise delegated powers under the authority of the Parliament of Canada. Throughout the paper, provinces and territories are treated the same and referred to as provinces.

durations vary widely - from less than a year to as long as 20 years in exceptional cases -reflecting the absence of a legal limit on the length of CBAs. The average duration is around 3 years, with notable bunching at 12-month intervals. A good number of firms have COLA clauses, with meaningful variation in the gap between COLA and inflation.

Next, we have local labor market data from the Canadian Labor Force Survey. The data provides information on population, labor force, full-time employment, and part-time employment by province, sector, and year. We use these numbers to compute employment rates by province, sector, and year. In addition, we have data on the implicit personal income tax rate, by province and year, from the Center for the Study of Living Standards.[8] Summary statistics for these data are reported in Table 1.

From the Canadian Labor Force Survey, we also have access to a dataset of working-age residents in Canada aged 15 and above. We have information on their wages and union status alongside province and sector. Our sample contains more than 4 million workers surveyed between 1999 and 2006 (the start of financial crisis). We use the data to analyze the effects of taxes and employment on wages below.

3 Measuring Rights and Obligations in Contracts

This section describes our methods for measuring features of union contracts from the texts of the agreements. We begin by describing our framework for estimating rights and obligations, and then describe the details of how we process the contracts. The data pipeline is an updated version of Ash et al. (2020).

3.1 Rights, Obligations, and Modal Verbs

There is a growing body of evidence that workers value non-wage parts of the contract such as flexible scheduling and dignity at work (Chen et al., 2019; Corradini et al., 2025; Dube et al., 2022). Unionized workers are assured of receiving such rights by the text in collective bargaining agreements. Firms and unions expend significant time, money, and energy in contract drafting, including the expensive expert services of

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[8]Available at `http://www.csls.ca/reports/csls2011-17appendixtables.pdf`. This is the implicit personal income tax rate by province, computed from income tax revenues as a share of income. Union-worker earnings are 1.5 times that of non-union workers, and tend to locate in the middle income tax brackets.

labor lawyers to ensure that the text of these contracts are enforced (see Ashenfelter et al., 2013).

Our approach is to use contract text to measure the level of worker rights. There are a number of techniques that one could use to extract a "pro-worker" dimension from contracts (Gentzkow et al., 2019; Grimmer et al., 2022; Ash and Hansen, 2023). We take a structural approach to text: a linguistically informed parser-based method combining legal knowledge and grammatical structure to extract pro-worker clauses that provide worker rights. In Section 4.6 below, we discuss the advantages of our method over other available methods, including dictionary-based methods, supervised machine learning, and large language models.

Our approach draws from classic ideas in legal theory that map linguistic indicators to associated legal rights and duties (Hohfeld, 1913; Markovich, 2020). We focus on modal verbs, which play a pivotal role in legal language. Modal verbs express a necessity or possibility: "it <u>must</u> be that X" or "it <u>may</u> that X". Modal verbs can be either epistemic or deontic. Epistemic modal verbs have to do with what is entailed about the world (e.g. based on logical inference or evidence). In the terms of Kratzer (1991), modals have a "possible worlds" semantics, where words like "must" and "shall" imply compliance in all possible worlds, while words like "may" and "can" imply compliance in at least one possible world.

Deontic modal verbs (where deontic refers to "duty") express necessity or possibility in the domain of social freedoms to act. In a legal context, they indicate whether an action complies with the written law. Consider the modal verbs <u>can/may</u>: A firm <u>can</u> do X in two senses. *Epistemically*, there exists at least one possible world in which the firm actually does X. *Deontically*, the firm <u>may</u> do X if there is at least one possible world where it does X and it remains compliant with legal or social norms. Similarly, <u>must/will</u> can carry different meanings. Epistemically, a firm <u>must</u> do X if, in all possible worlds, it actually does X. Deontically, a firm <u>must</u> do X if failing to do so would constitute a legal or normative violation. Deontic verbs can also be conditional on specific events. A regulatory rule might state, "If event A occurs, firms <u>can</u> do X" (permissive) or "If event A occurs, firms <u>will</u> do X" (obligatory).

Deontic modal verbs play a crucial role in legal language because they express permissions, obligations, and prohibitions. In doing so, these verbs help translate legal theorist Wesley Hohfeld's conceptual framework, which classifies legal relations into categories such as "privilege," "right," and "duty" (Hohfeld, 1913; Lindahl, 1977;

Kramer, 2025). For Hohfeld, if actor A has a *privilege* to do X, then other actors cannot stop A from doing X. A *right* for A means that some action X must be performed for A. Symmetrically, a *duty* means that an actor must perform some action X. In the terminology that we use below, permissions correspond to privileges, rights to rights, and obligations and prohibitions to duties. In digital texts, such modal relationships can be extracted at scale using syntactic dependency parsing (e.g. Jurafsky and Martin, 2014).

3.2 Processing the Contracts

The contracts database arrived as scanned PDFs. The first step was to convert them to machine-readable text using OCR software. We excluded wage schedules, exhibits, appendices, and other miscellaneous materials. Next, we split the contracts into sections using a custom-built splitter based on the style of contract section headers. Within each section, we used a sentence tokenizer to split each section into a list of sentences. The resulting corpus consists of 980,909 contract sections (32.9 per contract) and 10.8 million sentences (11.06 per section).

Each contract sentence is parsed using a syntactic dependency parser called spaCy (`spacy.io`). This package uses the ClearNLP dependency schema and has proven accuracy and efficiency relative to other parsers.[9] The parser transforms sentences into parse trees, which represent the relations between words in a recursive hierarchical structure. The verb of a sentence is the root of the parse tree of a sentence, and arrows between words indicate which word depends on which, along with annotations indicating the type of dependency (e.g. subject, object, verb auxiliary, modifier). [10] SpaCY classifies dependencies statistically, and is already trained on a large annotated dataset of parse trees. Appendix Figure A.2 shows the dependency parse for two example sentences.

Like most natural language processing applications, our framework simplifies and abstracts from much of the syntactic and semantic richness of a collective bargaining agreement. Just the length of these contracts is quite informative. Figure 1 shows a tight and proportional relationship between contract length - measured as the log

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[9]See `http://www.mathcs.emory.edu/~choi/doc/clear-dependency-2012.pdf`. SpaCy has been updated to a more recent version since we processed our corpus. Using the more recent version does not substantially change the empirical results.

[10]For a complete list of the types of dependencies see `https://universaldependencies.org/u/dep/`

Figure 1: Contract Length is Proportional to Firm Size
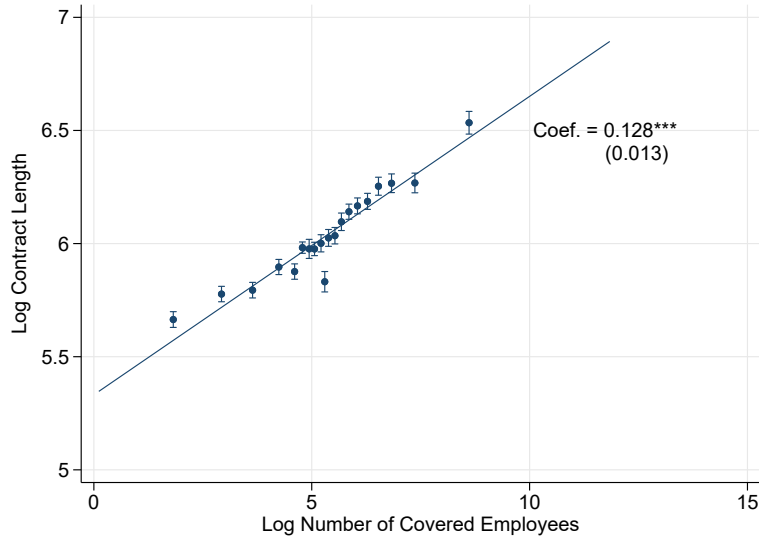
Note: Binscatter plot of the (log) number of clauses in the contract (Y axis) against the (log) number of covered employees (X axis). Data source: Employment and Social Development Canada.

number of clauses of a contract, where each clause is defined as a sentence containing a subject, verb, and object - and firm size, measured as the log number of employees covered by the CBA.[11] That provides some initial descriptive indication for a public-goods nature of contract clauses.

3.3 Clause Types

We build on the "Subject-Verb-Object" structure of each clause to identify types of clauses. First, for the subject, we identified four main personas in the contracts: worker, firm, manager, and union. The subject is assigned using a dictionary of synonyms to one of these four agent categories. Second, for verbs, we are most interested in deontic modal verb structures. The modal verb is distinguished as restrictive (*shall, will, must, should*) or permissive (*may, can*). Statements are tagged as negative ("shall not" rather than "shall"), and tagged as active ("shall hire") or

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[11]A foundational structure in linguistics is that most English sentences take the form "Subject-Verb-Object" (SVO). Subjects are the thing or person taking action or an attribute in the sentence, verbs are the action the subject is taking, and objects are what are being acted on by the verb. Therefore, in our framework each clause has 3 components: a subject, a verb, and an object.

passive ("shall be hired"). Appendix Table A.2 provides tabulations for the most frequent subjects, modals, and verbs encountered in our data set.

We identify a handful of special verbs that appear often in the contracts and delineate obligations and rights: Obligation Verbs (be required, be expected, be compelled, be obliged, be obligated, have to, ought to), Prohibition Verbs (be prohibited, be forbidden, be banned, be barred, be restricted, be proscribed), Permission Verbs (be allowed, be permitted, be authorized), and Rights Verbs (e.g. receive, gain, earn).[12] We define Action Verbs as all non-special active-tense words, including "be" by itself. Passive Verbs are all non-special passive-tense verbs.

Now, we use these grammatical features to assign statements to one of four types of contract statements (or "other"). The formal requirements, plus some examples, are included in Appendix Table A.3. An *Obligation* requires that the subject perform an action or set of actions (a Hohfeldian *duty*). A *Prohibition* requires that the subject not perform an action or set of actions (also a Hohfeldian *duty*). A *Permission* gives the subject liberty to do an action; others may not stop them from doing so (Hohfeld's *privilege*). A *Right* gives the subject an entitlement to beneficial actions by others (also called a *right* by Hohfeld).

The grammatical parse approach works well because it precisely identifies the critical structures in the sentence while allowing for flexibility in word order. For example, a dictionary approach for worker rights based on patterns like "employees shall receive" would miss variants like "employees shall always receive." In Ash et al. (2020), we use hand annotation of these phrases to show high precision of these assignments. Section 4.6 below provides a discussion of the advantages of this method relative to alternatives like dictionary matching, embeddings, and supervised learning.

We extract each statement type for each agent. Appendix Table A.4 shows the most frequent examples for the matrix of agents and statement types. Table 2 reports summary statistics on the overall frequencies. Clauses mostly concern workers (55.3%) and the firm (30.5%), rather than the union (11.7%) or managers (2.5%). In terms of statement types, a majority are obligations (54.4%), followed by rights

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[12]Receive, gain, and earn, are "active" rights verbs in the sense that "worker shall receive" is a right. We also have a long list of "passive" rights verbs, where for example "workers shall be entitled" is considered a right. These passive rights verbs include: entitled, given, offered, reimbursed, paid, granted, provided, compensated, guaranteed, hired, trained, supplied, protected, allowed, covered, informed, notified, selected, awarded. We experimented with a longer list of rights verbs and got similar results.

Table 2: Summary Statistics: What do Union Contracts Consist of?

Agent	Obligations		Rights		Permissions		Prohibitions		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%
Worker	666021	20.9	730327	22.9	266278	8.4	99795	3.1	1,762,421	**55.3**
Firm	788857	24.7	27382	0.9	108114	3.4	49099	1.5	973,452	**30.5**
Union	224119	7.0	68410	2.1	62912	2.0	17786	0.6	373,227	**11.7**
Manager	55518	1.7	7512	0.2	12537	0.4	3107	0.1	78,674	**2.5**
Total	1,734,515	**54.4**	833,631	**26.2**	449,841	**14.1**	169,787	**5.3**	3,187,774	100.0

Note: Counts and frequencies (%) of clause types in the contracts corpus, by agent (rows) and statement type (columns). Data source: Employment and Social Development Canada.

(26.2%), permissions (14.1%), and prohibitions (5.3%). The three most important agent×clause assignments are firm obligations (24.7%), worker rights (22.9%), and worker obligations (20.9%). Notably, there are very few firm rights (0.9%). [13]

Overall, then, union contracts mainly do three things: (1) impose obligations on workers, (2) impose obligations on firms, and (3) grant rights to workers. The first two items specify tasks, but they do not specify a clear beneficiary who could make a subsequent legal claim for delivery of the obligation. Worker rights are special because they explicitly guarantee key employment conditions – worker security, autonomy on the job, and the balance of time and pay – while clearly designating *workers* as the *legal beneficiaries* – who can pursue claims when those entitlements are not provided (Calabresi and Melamed, 1972). Without committing to providing worker rights as contracted entitlements, management may renege ex post. Hence, workers naturally care about this component of the contract. However, these protections have costs for the firm, so worker rights clauses are intensely bargained over by union and firm lawyers (McAlevey and Lawlor, 2023). Section 4 below provides extensive further discussion and validation of this text-based measure of worker rights.

To get an initial descriptive view on worker rights, we ask how they are distributed across firms, unions, and sectors. Appendix Figure A.5 shows that worker rights are spread relatively widely across firms. Their distribution is slightly more balanced across unions and markedly more uniform across sectors. Among the 30 largest private firms in our sample, the Great Atlantic And Pacific Company Canada (Limited) stands out for offering the most extensive worker rights, while the Canadian Film

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[13]Appendix Figure A.3 provides a descriptive look into the legal content of these union contracts over time. We plot for each year the average number of rights and obligations by contract, for workers and firms, respectively. We can see that firm obligations, worker rights, and worker obligations increase steadily until 2005. Since then, they are rather constant. The number of firm rights remains small throughout the period.

And Television Production Association (Performers) offers the fewest (Appendix Table A.5). For unions, the Professional Institute of the Public Service of Canada negotiates the most comprehensive worker rights, whereas the Canadian Merchant Service Guild negotiates the fewest (Appendix Table A.6). Across sectors, the wholesale and retail trade sector contains the highest concentration of worker rights clauses, while the construction sector contains the lowest (Appendix Table A.7). As shown in Figure A.4, when fixed effects for year, province, sector, union, and firms are added sequentially to explain variation in worker rights, we see that firm-level differences account for the largest share of explained variation, followed by union level-differences.

4   Validation of Worker Rights Clauses

The set of clauses that we call worker rights capture benefits, employment conditions, control rights, and procedural safeguards. The clauses are *legal entitlements* to those items, in the sense of Calabresi and Melamed (1972). Even when rights are not actively used, they still hold value. Many function like options: workers can choose to exercise them without requiring further approval from management. Often, however, workers are unaware of the rights available to them until those rights become the subject of a grievance or litigation.

In the text, worker rights clauses are tagged when a worker subject (e.g. "worker", "employee") is attached to a verb phrase describing the entitled benefit (see Table A.3). Those verb phrases include a non-negated verb structure with a rights verb (e.g., "employees will receive", "workers shall be paid") or a negated modal attached to an obligation verb (e.g. "workers may not be required", "employees should not be expected"). These phrase templates and rules were developed through application of legal knowledge to close reading of the clause texts, careful inspection of the associated syntactic parse outputs, and checking of the rule-based category assignments.

This section provides supporting material to help validate this procedure for identifying worker rights and our interpretation of rights as benefiting and protecting workers. We show a combination of qualitative and quantitative evidence for this interpretation. We also compare our measure to some alternative text-based measures proposed in the literature.

4.1 Qualitative Inspection of Topics Covered by Worker Rights

We first provide a qualitative validation of rights by illustration and inspection of the NLP pipeline outputs. A sample of 16 worker rights from the whole corpus are listed in Appendix Table A.8. As intended, these clauses reflect the assignment of various rights or benefits to workers. For example, limits on extended work hours (1, 3, 4, 5), requirements for timely payments (2), provisions around missing work or holidays (6, 7, 9, 11, 16), life insurance benefits (10), or seniority (13, 14). Some rights are very specific, such as employees being elected to political office being entitled to a leave of absence (15).

To move forward and provide a more comprehensive view beyond specific examples, we apply NLP tools to group the rights into topics. First, we take each sentence and vectorize them using a transformer-based sentence encoder (Reimers and Gurevych, 2019). These 768-dimensional vectors encode context-sensitive semantic information based on a pre-training task predicting logical relationships between sentences. The resulting sentence embeddings have a spatial representation, where the location in the vector space is semantically meaningful. That is, sentences that are semantically similar will tend to be spatially proximate in the space. And regions of high density in the space correspond to clusters of semantically related clauses. In line with that, we construct topics using k-means clustering applied to the sentence embeddings, with separate clusters constructed for each clause type – in particular, within the set of worker rights. These clusters can then be understood as prototypes representing the semantic distribution of rights.

Like popular topic model algorithms such as Latent Dirichlet Allocation (LDA) (Blei et al., 2003; Hansen et al., 2017), our clustering method learns topics inductively from the corpus texts, without labels. There are three main advantages of clustered embeddings over LDA for our context. First, the method is word-embedding-based, rather than bag-of-words-based, such that the meanings of words are interdependent, rather than independent. For example, our method registers that "employee" and "worker" are synonyms, whereas LDA treats those words as independent. Second, the method learns context-sensitive representations. For example, the word "lunch" can have a different meaning in clauses about worker lunch breaks, versus clauses about the lunch shift for restaurant workers. LDA does not make such a distinction. Third, our clustering method assigns each individual clause to a single topic, rather than a distribution across topics. That results in a simpler dataset, and makes more

sense for short documents (single sentences) rather than long documents.

Given that these topics are for descriptive purposes, we take a practical approach in tuning the clustering algorithm. After some experimentation, we settled on 30 topics.[14] These topics are listed and annotated in Table 3. Each row corresponds to a topic and we have five columns. The first column ("Narrow Topic Label") provides hand-annotated narrow topic labels. Skimming through the list, we see intuitive sets of benefits, as well as provisions describing workplace rules and requirements. Despite conditioning on worker rights only, there is still plenty of heterogeneity in the text such as the overlap between the work hours and overtime topics.

For further interpretability, we further manually aggregated the 30 "narrow" topics into seven "broad" topics: Family Issues, Health & Well-Being, Payments, Scheduling, Seniority, Vacations, and Work Termination. Appendix Table A.9 shows the match between narrow and broad topics and ranks the broad topics by frequency (see also Appendix Figure A.6). Interestingly, the largest share of worker rights are on scheduling. That allocation of rights makes sense in light of the point in Aghion and Tirole (1997) that contracts should allocate decision rights to workers when they have better information than employers. Workers are likely to be better-informed regarding their time constraints, so it makes sense that CBAs tend to give workers rights around the schedule.

Table 3 is sorted by the third column, "Sim to Wages." This score is motivated by a key conceptual distinction in the space of worker rights – of whether or not a right is a cash-like benefit that is more similar to (and potentially substitutable with) wages. These "priced" benefits can be distinguished from more rule-like provisions, the benefits of which are more subjective and may vary from one employee to another. To scale this dimension in our data, we score each narrow topic as indicating a priced benefit. We start with the codebook from U.S. Bureau of Labor Statistics' National Compensation Survey. That codebook provides a detailed list of employment benefits that impose a quantifiable cost to employers – that is, they are priced. We extract and parse this list of priced benefits, phrased as they would appear in contracts.[15] We

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[14]In the *k*-means algorithm, we selected 32 clusters. We dropped 2 outlier topics that were about a specific occupation (teachers), see Appendix Table A.9 and Appendix C for descriptive information about those.

[15]The full list is: incentive-based pay, a commission, a production bonus, a piece rate, a cost-of-living allowance, hazard pay, a uniform allowance, a tool allowance, free room and board, subsidized room and board, paid vacation leave, paid holiday leave, paid sick leave, paid personal leave, overtime pay, shift differential pay life insurance, health insurance, disability insurance, retirement benefits.

Table 3: Topics Describing Contracted Worker Rights

Narrow Topic Label	Broad Topic Label	Sim to Wages	Frequency	Topic Summary
Grievance & Discipline	Work Termination	0.1590	0.031	The clauses provide workers with rights related to disciplinary actions, grievance procedures, and representation, ensuring transparency, due process, and the ability to challenge or appeal employer decisions.
Job Security	Seniority	0.1677	0.03	The clauses provide workers with rights related to job security and stability, including provisions for notification and options in the event of workforce adjustments, opportunities for training or retraining, recall rights for seasonal or displaced employees, and protections for seniority and pay rate in cases of job changes or redundancies.
Notice Requirements	Work Termination	0.1750	0.027	The clauses provide workers with rights to receive advance notice regarding absences, layoffs, job vacancies, shutdowns, and meetings, ensuring they have adequate time to prepare for changes in their employment status or work conditions.
Recall	Work Termination	0.1768	0.032	The clauses provide rights related to job security and recall for workers who have been laid off, including options to accept vacant positions, refuse temporary recalls without penalty, and priority for rehiring in their former or equivalent positions if they become available.
Jury Duty	Others	0.1779	0.009	The clauses provide rights to workers for compensation or pay adjustments when they are required to serve on jury duty or appear in court as witnesses, ensuring they are not financially disadvantaged for fulfilling these civic duties.
Personnel Records	Others	0.1789	0.024	The clauses provide workers with the right to access, copy, and be informed about their personal and employment-related documents, including personnel files, job assignments, employment letters, disciplinary documents, and performance reviews.
Seniority & Promotion/Transfer	Seniority	0.1792	0.03	The clauses are granting workers rights related to job preference, promotion, and transfer based on seniority, qualifications, and experience.
Parental Leave	Family Issues	0.1838	0.027	The clauses provide rights related to maternity and parental leave, including paid and unpaid leave, allowances, and special considerations for employees who are pregnant or adopting a child.
Probation Period	Seniority	0.1838	0.015	The clauses provide rights related to the recognition and crediting of probationary periods for employees, including extensions, credit for previous service, and exemptions from additional probationary periods for certain transfers or promotions.
Bereavement Leave	Family Issues	0.1895	0.028	The clauses provide workers with bereavement leave, allowing them time off, often with pay, to grieve and attend funerals following the death of a close relative or family member.
Part-Time Employment	Scheduling	0.2014	0.023	The clauses are providing rights related to compensation, work hours, seniority, and benefits for part-time employees.
Work Hours	Scheduling	0.2045	0.058	The clauses provide workers with rights to guaranteed minimum pay for short-notice work, overtime compensation, pay for additional duties or hours beyond their regular schedule, and specific pay rates for work under certain conditions or times.
Reimbursements	Payments	0.2051	0.022	The clauses provide workers with rights to compensation and allowances for time spent and expenses incurred due to work-related travel, delays, and use of personal vehicles for work purposes.
Breaks	Scheduling	0.2065	0.013	The clauses are granting workers the right to paid rest and wash breaks during their work shifts.
Shift Premiums	Payments	0.2070	0.025	The clauses are providing workers with additional compensation for working under specific conditions, such as shift differentials, premium pay for weekends or consecutive shifts, and pay increases for assuming additional responsibilities or working in particular locations.

… continued on next page…

Table 3 (cont.): Topics Describing Contracted Worker Rights

Narrow Topic Label	Broad Topic Label	Sim to Wages	Frequency	Topic Summary
Termination	Work Termination	0.2076	0.026	The clauses are providing workers with rights to various forms of compensation upon termination of employment, including severance pay, payment for unused vacation, and other forms of separation payments.
Leaves of Absence	Scheduling	0.2100	0.039	The clauses provide workers with the right to take leaves of absence for union activities, public service, education, retraining, and other approved reasons, with varying conditions regarding pay and benefits.
Overtime	Scheduling	0.21094	0.026	The clauses provide workers with rights to receive enhanced compensation and specific benefits for working overtime, including higher pay rates for overtime hours, compensation for cancelled overtime, meal reimbursements, and shift change notifications.
Position Classification	Seniority	0.2115	0.036	The clauses are providing workers with rights to receive pay adjustments or increases when they take on duties in higher paying classifications, substitute in higher paying roles, transfer to new positions with higher salary scales, or are temporarily appointed to positions of a higher pay grade.
Workplace Safety	Health & Well-being	0.2118	0.054	The clauses provide workers with rights related to workplace safety, health protection, and compensation in case of job loss due to technological changes, as well as opportunities for union engagement and training on safety procedures.
Meals	Health & Well-being	0.2126	0.015	The clauses are granting workers rights related to receiving meal allowances, paid or unpaid meal breaks, and compensation related to meal times during or adjacent to their work shifts.
Workplace Injuries	Health & Well-being	0.2131	0.024	The clauses provide workers with rights to compensation and benefits in cases of injury, illness, or accidents occurring in the course of employment, including coverage for lost wages, protection against costs for damaged equipment, and provisions for receiving full or partial pay under specific conditions.
Scheduling	Scheduling	0.2146	0.03	The clauses provide workers with rights related to scheduling flexibility, compensation for working during non-standard hours or days off, and benefits during absences or layoffs.
Seniority-Based Benefits	Seniority	0.2194	0.039	The clauses provide workers with rights related to pro-rated benefits, eligibility for allowances based on employment duration, credit for service and seniority during leaves, cost-sharing for benefits, and qus based on continuous service, including adjustments in pay and long-term disability plans.
Sick Leave	Health & Well-being	0.2237	0.025	The clauses provide workers with rights related to receiving pay or benefits during periods of illness, injury, or medical leave, ensuring financial stability during times they are unable to work due to health reasons.
Holiday Pay	Vacations	0.2335	0.037	The clauses provide workers with rights to paid holidays, additional compensation for working on holidays, and adjustments to vacation schedules or pay in the event a holiday falls during their vacation period.
Holiday Work Pay	Vacations	0.2393	0.026	The clauses provide workers with enhanced compensation for working on holidays, weekends, or their scheduled days off, including provisions for part-time and temporary employees.
Vacations	Vacations	0.2405	0.045	The clauses are granting workers rights related to vacation qus, including the timing, duration, and pay during their vacation periods.
Seniority-Based Vacation	Vacations	0.2411	0.038	The clauses are granting workers vacation benefits and time off based on their length of service and seniority.
Payment Rules	Payments	0.2414	0.051	The clauses are giving workers rights related to the timing, frequency, and accuracy of their wage payments.

Note: List of topics describing worker rights clauses. "Narrow Topic Label" is a human-provided label based on the contained clauses and summary. "Broad Topic Label" is a human-provided label for the topical groups based on the contained clauses and summary. "Sim to Wages" is the sorting variable and scores the topics by their similarity to wages (see details in text). "Frequency" is the share of worker rights on that topic. "Topic Summary" is an LLM-generated summary of the topic based on a sample of associated clauses.

then construct simulated priced-benefit clauses as "Employees shall have ...", followed by each of these priced-benefit phrases. We compute sentence embedding vectors for each simulated priced-benefit clause, just as we do for the clauses in the contracts corpus. Finally, we compute "Sim to Wages" as the proximity of the average clause embedding to each topic cluster centroid. Topics that are closest to the list of priced-benefit clauses, shown at the bottom of Table 3 (e.g. payments, vacations, and sick leave), are the most similar to wages and tend to reflect the standard benefits that show up in accounting data. Topics that are furthest from the list, shown at the top of the table (e.g. grievance procedures, job security, and recall), are the least comparable with wages and tend to set rules and assign control rights. The high share of such restrictions is consistent with Rajan and Zingales's (1998) point that the allocation of decision rights *within* a firm can increase investment incentives, and hence firm performance.

The fourth column ("Frequency") gives the proportion of rights clauses associated to that topic. It indicates that rights clauses are relatively evenly distributed across topics, with the smallest topic ("Jury Duty") containing 1% of the rights clauses, and the largest topic ("Work Hours") comprising 6% of the rights clauses.

The fifth column gives an LLM-generated summary of the topic. That was produced by providing a random sample of clauses and prompting GPT-4 to summarize the associated rights being provided. We can see that the topics are intuitively related to on-the-job benefits, including holidays, sick leave, and payments, as well as rules around worker control and decision-making, such as scheduling, seniority, and termination. That provides some qualitative support of our measure of text-based measure capturing worker rights and the associated interpretation as comprising both wage-like benefits and and assignments of control rights.

Appendix C lists the rights clauses associated with each topic which were used to construct the LLM summaries. Even when they are about wage-like benefits, the clauses often reflect limits or conditions on the benefit. Still, because management reserve rights, these conditional clauses tend to expand worker rights rather than limiting them.

4.2 Validation with Pairwise Comparisons of Clauses

While the example worker rights clauses discussed above can be fairly interpreted as entitlements that benefit workers, it could be that such an interpretation would also fairly extend to many clauses from the other clause types. It is quite difficult to set an objective threshold for whether a given clause is pro-worker or not. That is a subjective determination that is difficult to calibrate, so human annotations of a sample of contract clauses as pro-worker or not might be of limited value.

A much easier annotation task is to take pairs of clauses and decide which of the two is more favorable to workers. For example, the clause "Employees who retire as well as current retirees and survivors will be provided with Life Insurance in the amount of $6,000", versus "If the parties mutually agree, the Company may hire temporary employees for short term periods not longer than 30 work days for non-routine work or special projects". The second clause (a firm permission) is not clearly favoring or disfavoring workers on its own. But a pairwise comparison is much easier: the second clause is clearly less beneficial to workers than the first clause (a worker right).

A downside of pairwise comparisons is that it requires more annotation data. Say we want to get a pro-worker score for 100 clauses for each of the 16 clause types (4 agents × 4 provisions). That adds up to 1600 annotations. In contrast, with pairwise comparisons we have 16×15=240 across-clause-type pairs; or 24,000 annotations to get 100 annotations for each type pair.

That is quite costly in terms of human annotation resources. Fortunately, pairwise comparisons in terms of pro-worker clauses is an easy enough task that the newest generation of human-aligned large language models (LLMs) are "smart enough" to reliably make such comparisons. We validate and implement that approach here.

We use OpenAI's GPT-4o model (`gpt-4o-2024-08-06`) with the system prompt, "You are a helpful legal assistant." The user prompt is, "Which of these sentences from a union collective bargaining agreement is more likely to be interpreted as an entitlement, benefit, or amenity for workers? Answer 'Definitely 1', 'Probably 1', 'Probably 2', 'Definitely 2', or 'Neither'. 1. [sentence 1]. 2. [sentence 2.]" For the input sentences, we input a randomly sampled pair from two different clause types.

First, we validated that this LLM method reproduces human annotations of the pairwise comparisons. For the example pair above, it picks the first clause on life insurance benefits. Consider the following more difficult pair: (1) "It is understood

Table 4: LLM Validation of Worker Rights as Favoring Workers

Clause Type	Clause Frequency (%)	Pro-Worker Frequency (%)
Worker Right	**22.9**	**79.7**
Worker Permission	8.4	67.3
Union Right	2.1	65.7
Firm Obligation	24.7	60.7
Manager Right	0.2	58.4
Worker Obligation	20.9	53.1
Manager Obligation	1.7	44.5
Union Permission	2.0	43.2
Worker Prohibition	3.1	41.6
Manager Prohibition	0.1	38.8
Firm Prohibition	1.5	36.5
Firm Permission	3.4	35.5
Manager Permission	0.4	34.3
Union Obligation	7.0	31.3
Union Prohibition	0.6	28.3
Firm Right	0.9	28.2

Note: Statistics from pairwise comparisons of clause types with GPT-4o, as described in the text. Rows indicate clause types. Second column gives the frequency of that clause in the corpus; third column gives the proportion of pairwise comparisons where that category's clause is annotated as more beneficial to workers than the paired clause from another category. Sorted by third column. Data source: Employment and Social Development Canada.

that upon thirty (30) calendar days written notice, either the supervisor or employee may terminate such an agreement."; (2) "The two members thus appointed shall confer jointly in an endeavour to select a third member who shall be the chair of the board." In that case, GPT-4o quite reasonably answers, "Neither". We compared the GPT-4o output to 300 human-labeled pairs, finding an agreement rate of 65.3%. More relevant to our purposes, the agreement rate is 83.3% when one of the clauses in a pair is a worker right.

We then implement this automated annotation procedure for a random sample of 24,000 across-clause-type pairs of clauses in the labor union contracts corpus. Based on this sample, we compute the predicted probability that each clause type is more pro-worker than all other clause types. Note that the clause-type distribution across the 24,000 pairs of clauses used in this exercise is uniform, as we randomly sample 100 clauses for each of the 16×15=240 clause-pair types irrespective of actual clause frequency. This design makes the precision of estimated pro-worker frequencies comparable across low- and high-frequency clauses, since it is no longer driven by unequal sample sizes.

The results of that exercise are shown in Table 4. According to the LLM pairwise

annotations, the clauses that we label as worker rights are substantially more pro-worker than the other categories. Specifically, they are more pro-worker 80% of the time, far higher than the second-ranked category of worker permissions (67%). The other common categories have even lower percentages: firm obligations and worker obligations are considered relatively pro-worker 61% and 53% of the time, respectively. Firm rights are classified as pro-worker just 28% of the time, making them the least likely to be pro-worker.

4.3 Validation Against Survey Data on Pro-Worker Practices

Next we validate our measure of worker rights by relating it to metadata. Specifically, we show that it is predictive of actual pro-worker human resources practices in firms. Our data source for these practices is the World Management Survey (Bloom et al., 2012). We were able to link the survey responses from 125 Canadian manufacturing firms to our labor contracts dataset.

Among many other things, this survey asks about human resource management practices. Following Bloom and Van Reenen (2010), we constructed a seven-point index for pro-worker HR practices as follows. Items that increase our index are "managers care about workers", "promotes good workers", and "employees are valued". Items that decrease the index are "focus on top talent", "incentives", and "fire poor performers". The summed index ranges from minus three to three. We then standardize the pro-worker HR index and compare it to our text-based measure of pro-worker rights and other clause types.

A coefficient plot of our worker right measure, regressed against the pro-worker index, is shown in Figure 2. We see that worker rights are an outlier among the clause types in being highly correlated with the index, with high statistical significance. In contrast, the other two frequent clause types (worker obligations and firm obligations), are negatively related to the index (see also Appendix Figure A.7). Overall, that is consistent with our interpretation of worker rights as measuring pro-worker entitlements and worker autonomy. The other contract clauses do not have such an interpretation.[16]

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[16]In Appendix Table A.10, we show that the workers' rights that are the least "wage like" – that is, ranking lowest on text similarity to priced benefits – are most predictive of the pro-worker HR index. That is, workplace rules and control rights are more indicative of pro-worker practices than more wage-like benefits.

Figure 2: Clause Types and Pro-Worker HR Practices
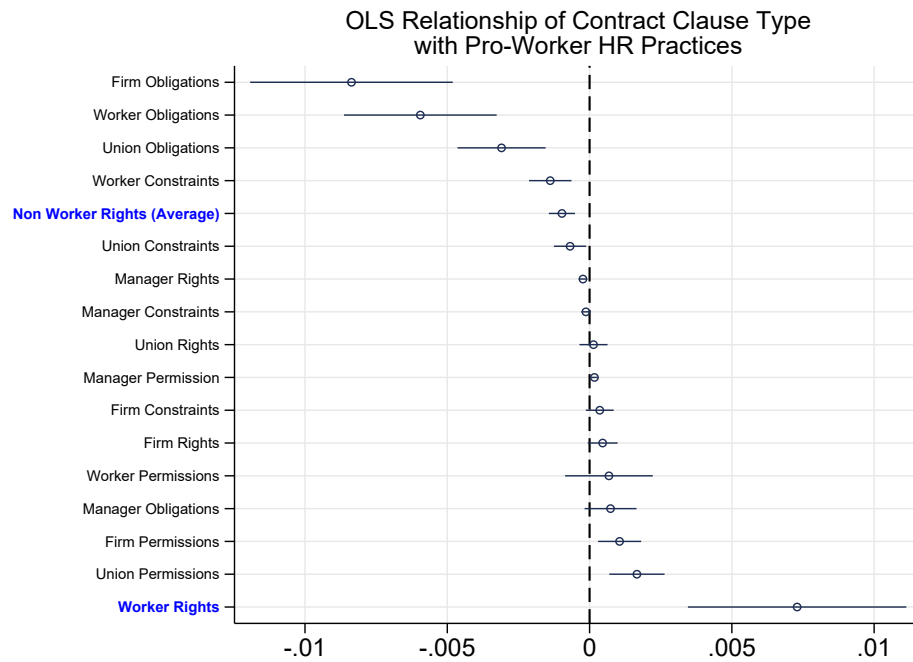
OLS Relationship of Contract Clause Type with Pro-Worker HR Practices

Note: Figure presents coefficients and 95% confidence intervals of regression of contract clause types on index for Pro-Worker HR Practices. Each coefficient is from a separate OLS regression. Outcome: Clause type share (number of clauses of type in question over the number of all clauses). Treatment: Standardized index of Pro-Worker HR Practices, defined as sum of approval rates to six statements about worker practices; it increases in "managers care about workers", "promotes good workers", and "employees are valued," and decreases in "focus on top talent", "incentives", and "fire poor performers". Controls: None. Inference: Heteroscedasticity-robust standard errors. Data sources: Employment and Social Development Canada, World Management Survey (Bloom et al., 2012).

4.4 Comparison with Alternative Supervised-Learning-Based Method

An alternative approach to measuring pro-worker content in labor union contracts is to identify text features that are associated with higher employment at a firm. That approach is motivated by the idea that higher employment, controlling for wages, reflects higher worker utility at the firm, as in recent models of monopsonistic labor markets with amenities (Bagger and Lentz, 2019; Lamadon et al., 2022; Volpe, 2024). Our approach is similar to Lagos (2025), who extracts contract features that predict firm-specific voluntary transitions. In a variant of this method designed to identify pro-women benefits, Corradini et al. (2025) predict higher female employment with contract text features, adjusting for gender wage premia.

We construct a "Text-Predicted Excess Employment" index as follows. We vectorize the contracts using LDA to produce topic shares $\vec{L}$. We run OLS to predict higher firm employment N based on the contract features $\vec{L}$, adjusting for wages. Because we don't observe firm-level wages, we impute the province-sector-year wage from the LFS. We also adjust for province-sector and sector-year fixed effects. Results are similar, but less precise, if we also include firm fixed effects.

We now have the contract-predicted employment $\hat{N}(\vec{L})$ from the fitted OLS regression. The regression model extracts contract topics that contribute to higher contract-covered employment, conditional on wages — that is, contract terms that allow the firm to have higher employment than competitors paying similar wages.

Appendix Figure A.8 provides the main comparison for this excess employment measure (text-predicted firm size). The excess-employment index is significantly positively correlated with our parser-based measure of worker rights. However, it is not correlated with the pro-worker HR practices index from Bloom and Van Reenen (2010). In other words, the parser-based measure appears to pick up the common worker-rights dimension reflected (with noise) in both proxies, which explains why it correlates with each despite their lack of correlation with one another. That gives some additional support for using our parser-based measure.

4.5 Case Study: Canadian Auto Workers

As a final descriptive validation, we focus on labor contracts between the Canadian Auto Workers (CAW, later Unifor) and DaimlerChrysler (Chrysler). These contracts

held particular importance under the "pattern bargaining" system of the Canadian auto sector, where Ford, General Motors, and Chrysler typically negotiated similar agreements, with one firm setting the standard. Chrysler is the only automaker that appears in every bargaining round in our data, so we concentrate on the CAW–Chrysler negotiations, even though another firm sometimes set the pattern (for instance, Ford in 2005).

Our analysis centers on the 2005 auto sector crisis—a period when post-WTO imports, a strong Canadian dollar, and rising oil prices exerted intense pressure on domestic manufacturers. Chrysler's bargaining leverage stemmed from its withdrawal of, and refusal to commit to, new Canadian investments, which left the CAW with limited scope for holding up production. After years of successfully defending and improving contract terms, the CAW was compelled in this round to accept significant concessions, not just in wages but also in highly valued workers' rights.
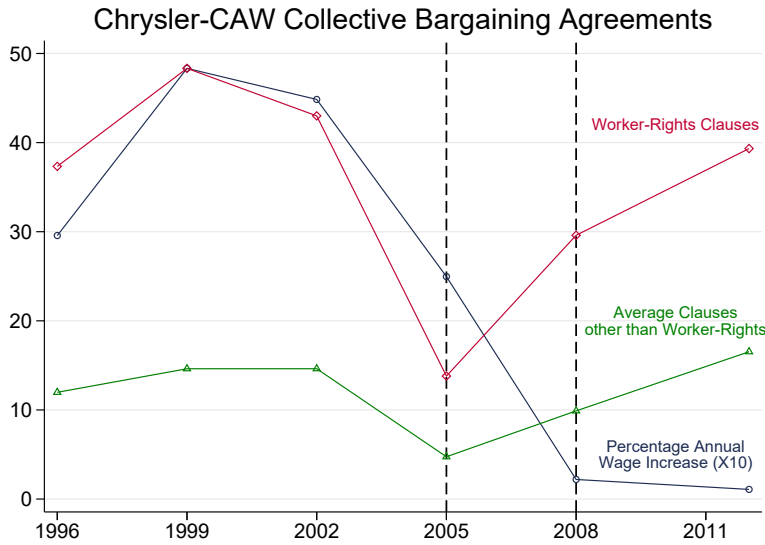
Reports at the time speak to the special turning point in these union negotiations. The New York Times reported that the contracts were "the most modest ever signed by the C.A.W." CAW President Buzz Hargrove described the negotiations as "totally unprecedented . . . there was 'no business as usual' in this round of bargaining." He wrote, "The companies started bargaining by demanding big concessions: like replacing wage increases with lump sums, abandoning COLA (even for pensioners), 10% co-pays on prescriptions, and giving up a week of paid time off per year." That is, there were pressures on both wages and rights.

We use this setting to undertake a more targeted validation of our NLP method. We expect that worker rights will decrease in the contract negotiated in 2005. Figure 3 shows a time series of these rights across Chrysler-CAW contracts (red diamonds series). As expected, rights drop precipitously in the 2005 contract. Similarly, contracted wage increases (in blue circles) also decrease in that round. In contrast, other contract features (the average of other clause types besides worker rights, in green triangles) do not change much.

The drop in rights seen in our data is reflected in labor's contemporaneous response to the cuts. Giving voice to labor activists, Coodin (2005) asks:

> Why, given the past breakthrough on outsourcing—which was a catalyst for other Canadian union members fighting job erosion—was such language not further strengthened? Why did the union continue to essentially give the companies the green light to push workers harder in the

Figure 3: Case Study: Pay and Rights During the 2005 Auto Sector Crisis

Chrysler-CAW Collective Bargaining Agreements

Worker-Rights Clauses

Average Clauses
other than Worker-Rights

Percentage Annual
Wage Increase (X10)

Note: Time series of features of the Chrysler-CAW contract, 1996 to 2012. The series includes counts of parsed worker rights (red), average of other clauses besides worker rights (green), and contracted wage increases (blue). The dashed vertical line in 2005 indicated the year of the auto sector crises, the dashed vertical line in 2008 indicates the year of the exchange-rate crisis.

> work place. . . Why, when the union had placed work-time on the agenda
> in every round of bargaining since its formation in 1985, did it set that
> goal aside?[17]

These discussions show the difficult position that CAW was in during these negotiations.

The divergence between wages and contract language in the 2008 bargain is also consistent the interpretation of worker rights as a set of entitlements that benefit workers at some cost to the firm. In May 2008, there was a historically high exchange rate between Canadian and U.S. dollars, making Canadian auto wages highly noncompetitive with U.S. worker wages. The relative cost of wages to amenities was high for the auto companies, which would manifest as demands for low wage increases and employer concessions on a variety of contractual rights (including no two-tier contracts and keeping a plant open) in response. We observe those trends directly in our time series: a further reduction in contracted wage increases (blue), yet a rebound

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[17]For a response arguing that the 2005 bargain won gains for unions, see Stanford (2005).

in rights (red).

Overall, this CAW case study provides additional grounding for our approach. Our parser-based measure of worker rights behaves like a valuable benefit that has to be traded off under significant bargaining pressure. Hence, we can use the prevalence of rights clauses as a well-grounded measure in our subsequent empirical analysis.

4.6   Discussion: Alternative Methods to Measure Worker Rights

Our structural parser-based approach to language is one of several methods that can, in principle, be employed to extract worker rights from contract texts, or to measure worker rights more generally (Gentzkow et al., 2019; Ash and Hansen, 2023). In the following, we discuss the benefits of the parser-based based approach relative to some potential alternatives.

A core assumption behind our approach is that small differences in complex language dependencies can significantly alter the legal content of a contract. For example, take these three clauses: "Workers must work from home", "Workers may work from home", "Workers may not work from home". They are all very close to each other in the standard language distance metrics, including those computed using state-of-the-art sentence embeddings (e.g. Reimers and Gurevych, 2019). Our grammar-based method identifies the critical verb modifiers in terms of modality (may vs. must) and negation (may vs. may not). Unlike a token-based or embedding-based approach, the structural grammar parse more faithfully captures the information in legal text that matters for judges, arbitrators, and lawyers.

To elaborate, take as a first alternative a dictionary approach, which would count rights-related terms in the contracts. For example, "health benefits" likely favors workers. A problem with this approach is that it is difficult to prepare a sufficiently complete list of pro-worker terms. And even with such terms, dictionaries miss important context. Some obvious examples include "new employees do not receive health benefits", or "only managers are entitled to health benefits". Our parser-based approach addresses the issue of context and negation from dictionaries, as it bring in the relationships between agents and actions through syntax.

Second, one could use supervised learning in which humans annotate a sample of clauses as pro-worker or granting rights, and then train a classifier to scale up to the whole dataset. A roadblock to this approach is that it is not possible to label

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most observed clauses as pro-worker or not. Even labor lawyers are hesitant to do that except for a few special types of clauses. Further, even if making those labels was possible in practice, statistical models would still require a very large dataset of annotations to learn that small linguistic changes can have large legal implications, especially for edge cases that may be rare in the existing corpus. Our approach addresses the issues with human annotations by focusing on specific syntactic features that have a structural legal meaning. It provides a generalizable rule to broadly label sentences without supervised learning.

Third, one could use supervised learning to scale text that is predictive of a meta-data variable indicating a pro-worker orientation. An example of this approach discussed above is Lagos (2025), who extracts contract text features that are predictive of a quits-based preference ranking of firms, conditional on wages. A downside of this approach is that one cannot fully control for the fact that quits are endogenously and jointly determined with the contract characteristics. This could introduce substantial confounding variation which may not reflect worker utility. Our parser approach, unlike the quits prediction approach, has no supervised outcome that could be correlated with omitted variables. The relevant predictors are strictly and manually regularized with legal knowledge. We view these two approaches as complements, however; for example, Lagos (2025) implements our approach in parallel with the supervised approach on Brazilian contracts, and he finds similar results: improvements in union bargaining power increase the rights of workers and decrease those of employers.

A fourth approach would be to use a large language model (LLM) to annotate clauses as being favorable to workers or not (Ash et al., 2025). LLMs are a powerful and promising approach. And as described above, we use both BERT-based and GPT-based models in different ways to support our analysis. But at present, those methods do not provide a substitute for a legally informed structural approach. For example, while a fine-tuned BERT could be used to get good test-set performance on the aforementioned supervised learning approaches, it would not address the problems of obtaining well-calibrated human annotations or the presence of unobserved confounders driving the predictions.

Aligned generative LLMs like GPT could improve on BERT by drawing on implicit legal expertise learned from their training corpus and during post-training alignment. But the current generation of LLMs are general-purpose tools that have only a basic understanding of Canadian labor law, or law more generally (e.g. Dahl et al., 2024).

Beyond human annotations used for model alignment, these model representations are not informed by real-world inputs or outputs, that is, factors outside the text. By contrast, our rule based parser explicitly embeds such legal knowledge through its rules, which are first order for contract interpretation and design. As Vafa et al. (2024) point out, LLMs do not have a structural model of the world – that is, they do not correctly infer the structure of deterministic systems (e.g. logic or navigation). Hence they can give misleading outputs for valid inputs.[18] Development of language models that integrate structured knowledge – for example through information retrieval, grammar-constrained decoding, or verifiable reasoning – is ongoing and promising. But for now our structural grammar-based approach, founded in a theory of how legal language creates duties and obligations, is likely to be preferred over pure LLM-based approaches.

The contrast between LLMs and our approach is an instance of a much larger, foundational, debate in linguistics. Should researchers focus on behavioral regularities in observed language use (Norvig, 2012), or instead on formal grammars describing the space of possible linguistic constructs (Chomsky, 1959)? Unlike LLM-based methods that do not have an internal "world model" of legal reasoning (Vafa et al., 2024), our measure is built around a structural model of contract writing. That makes our approach transparent, reproducible, and interpretable by humans.

Beyond these NLP alternatives, a more foundational question is: Why use text at all to measure worker rights? That is, why not measure wages and maybe some well-defined benefits like health insurance? A first answer is that the contract is a commitment: the legal right to a benefit is valuable above and beyond the benefit itself, as it is more difficult to revoke. Violations of contracted rights give unionized workers the right to grieve, to go to arbitration, and to strike, which simple retractions of non-contracted benefits do not. A second answer is that many things that workers care about are not wages or pecuniary benefits. Consistent with workers valuing such provisions, the contract terms clearly matter to the parties to an agreement. Firms and unions expend significant time, money, and energy in contract drafting, including the expensive expert services of labor lawyers (see Ashenfelter et al., 2013; McAlevey and Lawlor, 2023).

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[18]A simple clause example that "tricks'" recent versions of ChatGPT into identifying a worker right is: "School principals are cherished workers and are entitled to 6 weeks of vacation annually." The trick is that principals are managers, not workers. In our framework, this clause would properly be labeled as a management right, rather than a worker right.

5   Empirical Analysis

We are interested in measuring how observed contract terms in Canadian collective bargaining agreements respond to changes in local economic conditions. Section 5.1 outlines the empirical approach. Then we look at how provincial tax rates (Section 5.2), or changes in the local employment rate (Section 5.3), affect worker rights.[19]

5.1   Empirical Approach

The dataset is built at the level of the contract adopted in province p, sector s, firm i, and effective year t. For each contract, we have a set of outcomes represented by y_{psit}, which refer to worker rights and non-worker rights clause types. In the main specification, we look at the share of worker rights – that is, the number worker rights of a given type divided by the total number of statements in the contract. In robustness checks, we report other specifications for the outcome variable.

We focus on two treatment variables z_{pst}. First, we have a measure of the labor income tax rate that varies at the province by year level. This labor income tax rate, noted as $z_{pst}^{tax} = \log(\text{tax})$, is defined as the (log) province-by-year implicit personal income tax rate computed from income tax revenues as a share of income.

Second, we use local employment rate varying at the province by sector by year level. We calculate it as a leave-one-out employment rate, in which the employment rate in a given province, year, and sector is replaced by the average of the log employment rates in that province and year in all other sectors, noted as $z_{pst}^{emp} = \frac{\sum_{i \neq s, i \in S_{pt}} \log(\text{employment}_{pit}/\text{pop}_{pt})}{|S_{pt}|-1}|$, where S_{pt} is the set of sectors in a province-year. Due to substantial cross-sector mobility of workers in Canada (Chen and Fougère, 2010), this leave-one-out employment rate variable serves as proxy for the outside option of workers during the bargaining process (Beaudry et al., 2012; Green et al., 2025). For both tax and employment, we use a continuous measure for panel regressions, and a discretized version for event study regressions.

For each of our treatment variables, we use a linear model

$$y_{psit} = \rho z_{pst} + \alpha_{ps} + \alpha_{st} + X'_{psit}\beta + \epsilon_{psit}, \tag{1}$$

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[19]We also assessed the effects of local political control (local government controlled by the New Democratic Party, Canada's labor party), and local sectoral competition (more establishments in a sector in a province, motivated by Aidt and Sena (2005)) on worker rights, without finding conclusive results.

with the components described as follows. First, y_{psit} and z_{pst} are outcomes and explanatory variables of interest, respectively, with ρ giving the corresponding OLS coefficients. Second, α_{ps} refers to province-by-sector fixed effects, and α_{st} refers to year-by-sector fixed effects (we also present specifications with separate province, sector, and year fixed effects). Third, X_{psit} may include additional fixed effects (e.g., for union or company), or additional time-varying controls, for use in assessing robustness of $\hat{\rho}$. Finally, ϵ_{psit} is an error term. Standard errors are clustered by province-sector. In robustness checks, we show that the main results are robust to clustering by province.

Identification of this specification is threatened by omitted variables that are correlated with both z_{pst} and y_{psit}. We first note that because contract renegotiation is generally on a pre-specified timeline, the scope for endogenous timing of contract re-negotiation is limited. Moreover, our fixed effects take care of a wide range of potential confounders including province-by-sector specific differences in the bargaining process, or year-by-sector specific national policies. Nonetheless, our treatments could be correlated with other factors such as political environments that change at the province-by-year level that may also influence union negotiations. In robustness analyses, we present specifications that control for province-level New Democratic Party (NDP) government to account for the possibility that the presence of a left-leaning government might correlate with tax rates and employment rates and have independent effects on worker rights through other channels such as endogenous law changes. We also explicitly control for a range of pro-union and anti-union labor laws to mitigate concerns about endogenous treatment timing. Similarly, our proxy for outside options may be correlated with own-firm or same-sector labor demand. Thus, we explore specifications where we control for own province-sector-year employment rate in addition to the leave-one-out employment shock. We also show that there are no effects on the sample composition as indicated by firm entries and firm exists, and no effects on other contract features such as the presence of a COLA clause (Appendix Table A.11).

To assess the plausibility of the parallel trends assumption, we also estimate an event study model. We define an event as the largest labor tax (employment) increase in each province. Events are limited to the middle years in the sample to ensure a sufficiently large number of pre- and post event years.[20] To account for heterogeneous

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[20]Specifically, we define an event as the largest labor tax (employment) increase in a given province

treatment effects in the presence of staggered treatment timing (Sun and Abraham, 2021), we implement the event study estimator by Callaway and Sant'Anna (2021) using not-yet treated units as controls.[21] We test for parallel trends by looking for evidence of pre-trends, and by computing the joint significance of the pre-period coefficients.

To further account for potential confounders of tax changes, we implement an instrumental variable strategy inspired by Gruber and Saez (2002) and Akcigit et al. (2021). We isolate exogenous changes in the *province* income tax that arise due to changes in *federal* tax rates, driven by associated tax deductions and tax credits. The overall tax rate can be expressed as $z_{pt} = \log(\tau_{p,t}(\overline{y}_{p,t}) + \tau_{\text{federal},t}(\overline{y}_{p,t}))$, with $\tau_{p,t}(\overline{y}_{p,t})$ defining the province level tax rate in province p and year t that applies to the average income in that province and year, and $\tau_{\text{federal},t}(\overline{y}_{p,t}))$ defining the federal level tax rate in year t that applies to the average income in province p and year t. Using Kevin Milligan's Canadian Tax and Credit Simulator (CTaCS) (Milligan, 2019), we calculate our instrumented tax rate for which we lag income and province level tax rates by k years, with $k \in \{1, 3\}$, as follows:

$$z_{pt}^{\text{IV}} = \log(\tau_{p,t-k}(\overline{y}_{p,t-k}) + \tau_{\text{federal},t}(\overline{y}_{p,t-k}))$$

By lagging province level tax rates and income, our instrument does not identify from tax responses to province-level confounders and from endogenous income responses to taxes, respectively, but only from province tax changes due to changes in *federal* rates.

5.2   Effect of Labor Income Taxes on Worker Rights

This section reports how changes in personal income tax rates affects worker rights. Table 5 displays the OLS results from Equation 1, where Columns 1-3 have the share of worker rights as the outcome, and Columns 4-6 have the share of other parsed clauses (e.g. worker obligations, firm obligations, etc.). We respectively control for

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in the 1990s. For Prince Edward Island, we treat the year of the second largest labor tax increase as the event year, as there was a simultaneous corporate tax reform in the year of the largest labor tax increase.

[21]Two years are grouped together in bins to smooth the number of observations, as there are varying sample sizes in each year. The bins at the beginning (end) of the domain additionally include the years prior to (following) the domain's starting (ending) year (Schmidheiny and Siegloch, 2023).

Table 5: Labor Income Tax Rate and (Non-)Worker-Rights Clauses

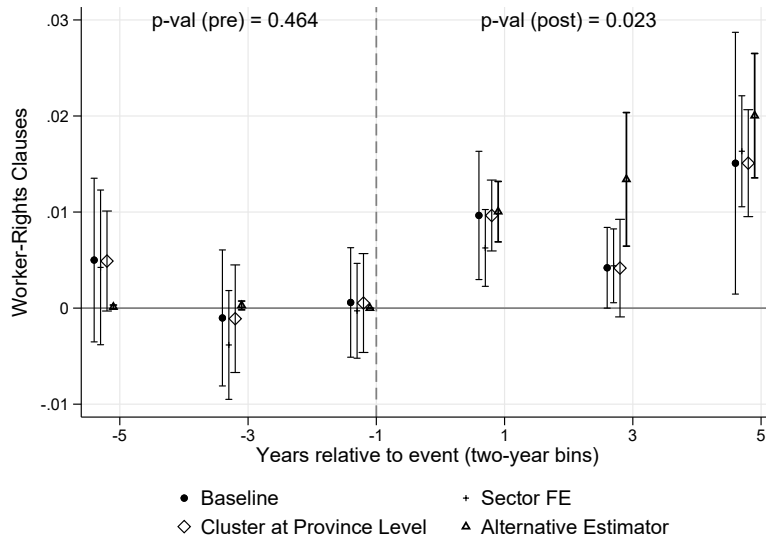|	Worker-Rights Clauses			Non-Worker-Rights Clauses (Average)		
	(1)	(2)	(3)	(4)	(5)	(6)
Log Income Tax Rate	0.055***	0.060***	0.052***	0.001	0.003	0.002
	(0.015)	(0.014)	(0.013)	(0.002)	(0.002)	(0.002)
R-Squared	0.10	0.15	0.19	0.13	0.20	0.24
Number of Observations	24,857	24,826	24,395	24,857	24,826	24,395
Province, Year, and Sector FEs	X			X		
Province-by-Sector and Year-by-Sector FEs		X	X		X	X
Contract Controls			X			X

Note: Coefficients and standard errors of effect of labor tax rate on worker rights clauses (Columns 1-3) or other parsed provisions (Columns 4-6), for different specifications as indicated in table footer. Outcome for Columns 1-3: Share of worker rights clauses, defined as number of worker rights clauses over the number of all clauses. Outcome for Columns 4-6: Share of other parsed clauses besides worker rights (e.g. firm obligations, worker obligations, etc) over the total number of all clauses. Treatment: Labor tax rate is defined as logarithmized implicit personal income tax rate. Inference: Standard errors clustered at the province-by-sector level. Single, double, and triple asterisks indicate statistical significance at the 10%, 5%,and 1% levels, respectively. Data sources: Employment and Social Development Canada, Center for the Study of Living Standards.

province, year, and sector fixed effects (col. 1 and 4), province-by-sector and year-by-sector fixed effects (col. 2 and 5), and additionally for contract controls (col. 3 and 6). Throughout all specifications, we find that higher income taxes increase worker rights clauses, while leaving non-worker rights clauses unaffected. This is consistent with a substitution away from the taxed income (wages) toward untaxed income (rights). The coefficient from col. 2 is our preferred estimate as contract controls may be endogenous. In terms of magnitudes, this preferred coefficient implies that a one percent increase in taxes leads to an increase in the share of contractual worker rights between 0.03 to 0.09 percentage points. Appendix Table A.12 show that this result is robust to a range of parametric specifications controlling, among others, for province-specific time trends, firm fixed effects, or a set of variables encoding pro- and anti-union state laws (such as laws banning professional strike-breakers, or mandating secret-ballot certification elections).[22]

The main result for worker rights also holds in non-parametric event-study specifications. Figure 4 displays the dynamic Callaway and Sant'Anna (2021) estimator of large, discrete labor tax rate increases. For pre-event periods, we find no trend in worker rights, supporting the identifying assumption of parallel trends (p-value of omnibus hypothesis tests of zero pre-event effects equals 0.464). After a tax increase,

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[22]The effects of labor tax and employment on worker rights also persists in subsamples of worker rights with and without numbers, implying that results are driven by increases in quantitative rights (such as the number of holidays) and qualitative rights (such as the right to work from home).

Figure 4: Event Study: Income Tax Increases and Worker Rights

Note: Figure presents coefficients for time indicators before and after labor tax rate increase on share of worker-rights clauses. Callaway and Sant'Anna (2021) estimator in the implementation of Rios-Avila et al. (2022), accounting for heterogeneous treatment effects and staggered treatment timing. Dynamic aggregation/event study effects, using doubly robust inverse probability weighting and event size weights. Outcome: Share of worker rights (number of worker rights over the number of all clauses). Controls: Not-yet-treated observations. Event is defined the largest labor tax increase in a given province in the 1990s, where labor tax rate is defined as logarithmized implicit personal income tax rate. Numbers on horizontal axis refer to years relative to event, binned to two years; i.e., -1 = two years prior to event. Inference: Standard errors clustered at the province-by-sector level; 90 percent confidence intervals displayed. The p-values of omnibus hypothesis tests of zero individual pre- and post-event baseline effects are 0.464 and 0.023, respectively. First estimator is baseline Callaway and Sant'Anna (2021) as described so far, second estimator is Callaway and Sant'Anna (2021) that adds sector fixed effects as control variables, third estimator is Callaway and Sant'Anna (2021) that clusters standard errors at the province level, fourth estimator implements alternative TWFE estimator by Gardner (2022). Data sources: Employment and Social Development Canada, Center for the Study of Living Standards.

we observe a significant increase in worker rights (p-value of omnibus hypothesis test of zero post-event effect equals 0.023). This result remains robust under the sensitivity framework of Rambachan and Roth (2023), which rules out substantial non-linear pre-trends, see Appendix Figure A.9.[23] Overall, the effect of tax increases on worker rights is consistent with a substitution effect between taxed and untaxed income.

As an additional robustness check, we present results from an instrumental variable approach in which we isolate exogenous changes in the *province* income tax that arise due to changes in *federal* tax rates. First, we analyse the first stage between

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[23]We also examine event studies of tax and employment decreases (not shown). Due to concerns about pretrends, we are cautious not to overinterpret these results (if at all, their effects move in the opposite direction of increases as expected; albeit at smaller magnitudes that suggest downward rigidity in worker rights).

Table 6: Effect of Instrumented Labor Tax on Worker Rights

	Lag = 1 years			Lag = 3 years		
	First Stage	Reduced Form	2SLS	First Stage	Reduced Form	2SLS
Outcome:	Log Tax Rate	Worker Rights	Worker Rights	Log Tax Rate	Worker Rights	Worker Rights
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged Log Tax Rate	0.335***	0.023**		0.212***	0.020*	
	(0.042)	(0.010)		(0.038)	(0.011)	
Instrumented Log Tax Rate			0.068***			0.092**
			(0.025)			(0.041)
Kleibergen-Paap rk Wald F-Statistic			65.08			31.67
R-Squared	0.92	0.15	0.003	0.92	0.15	0.002
Number of Observations	24,826	24,826	24,826	24,826	24,826	24,826
Province-by-Sector and Year-by-Sector FEs	X	X	X	X	X	X

Note: Figure presents the first stage, reduced form, and 2SLS coefficients of estimation of instrumented labor tax rate on worker rights. Outcome: Clause type, defined as the share of clauses of given type (number of clauses of type in question over the number of all clauses). Treatment for Columns 1,2,4 and 5: Lagged Log Labor tax rate in province p and year t, defined as the log of the sum of federal income tax rate of year t, calculated for the average income of province p and year t-k, and the province income tax rate of province p and year t-k, calculated for the average income of province p and year t-k, for k=1, and k=3. Treatment for Columns 4 and 6: Log Labor tax rate in province p and year t, instrumented as the log of the sum of federal income tax rate of year t, calculated for the average income of province p and year t-k, and the province income tax rate of province p and year t-k, calculated for the average income of province p and year t-k, for k=1, and k=3. Controls: Province-by-sector fixed effects and year-by-sector fixed effects. Inference: Standard errors clustered at the province-by-sector level. Single, double, and triple asterisks indicate statistical significance at the 10%, 5%,and 1% levels, respectively. Data sources: Employment and Social Development Canada, Center for the Study of Living Standards, Statistics Canada.

our baseline tax variable and the instrument based on lagged province tax rates and income levels. As shown in Appendix Figure A.10, we find a strong first stage with a Kleibergen-Paap F-Statistic of 65. Second, we document that the 2SLS estimates of the instrumented tax rates on worker rights clauses paint a similar picture to the corresponding OLS estimates, see Table 6. This implies that our main results are neither driven by endogenous income responses to taxes, nor by endogenous tax responses to province-level confounders.

5.3 Effects of Outside Options on Worker Rights

The second economic variable that we look at is the local sectoral employment rate at the time of contract negotiation. This leave-one-out employment rate can be seen as a positive shock to worker outside options, indicating a stronger labor market for workers (Green et al., 2025). Table 7 displays OLS results from Equation 1, which are otherwise comparable to Table 5. Throughout the specifications, a higher employment rate raises measured worker rights, while leaving non-worker rights unchanged.

Table 7: Effect of Employment Rate on (Non-)Worker-Rights Clauses

	Worker-Rights Clauses			Non-Worker-Rights Clauses (Average)		
	(1)	(2)	(3)	(4)	(5)	(6)
Log Employment Rate	0.048** (0.022)	0.053** (0.021)	0.048** (0.021)	0.002 (0.004)	0.001 (0.002)	0.001 (0.003)
R-Squared	0.10	0.15	0.19	0.13	0.20	0.24
Number of Observations	29,194	29,157	28,713	29,194	29,157	28,713
Province, Year, and Sector FEs	X			X		
Province-by-Sector and Year-by-Sector FEs		X	X		X	X
Contract Controls			X			X

Note: Coefficients and standard errors of effect of leave-one-out employment rate on worker rights clauses and other parsed provisions, for different specifications as indicated in table footer. Outcome for Columns 1-3: Share of worker rights clauses, defined as number of worker rights clauses over the number of all clauses. Outcome for Columns 4-6: Share of other parsed clauses besides worker rights (e.g. firm obligations, worker obligations, etc) over the total number of all clauses. Treatment: leave-one-out employment rate in a given sector, defined as the logarithmized average over the employment rates in other sectors. Inference: Standard errors clustered at the province-by-sector level. Single, double, and triple asterisks indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Data sources: Employment and Social Development Canada, Canadian Labor Force Survey.

Appendix Table A.13 show that the estimate for worker rights is robust to a range of alternative specifications including province-specific time trends, firm fixed effects, or a set of variables encoding pro- and anti-union state laws.

The effect also holds in more flexible event-study specifications analyzing discrete employment increases (Callaway and Sant'Anna, 2021), as displayed in Figure 5. There is no significant trend in worker rights for pre-event periods (p-value equals 0.973), and an increase in rights after the event (p-value equals 0.006). We can rule out substantial non-linear pre-trends in the sensitivity test of Rambachan and Roth (2023), see Appendix Figure A.11. The rise in worker rights following an employment increase is consistent with shifts in relative bargaining power between workers and employers.

5.4 Additional Results and Discussion

Interpreting the evidence. To summarize, we have two main empirical results. First, an increase in labor income taxes raises worker rights clauses. Second, an increase in the employment rate increases worker rights clauses. These effects are consistent with worker rights behaving like non-wage compensation. Both of these effects are predicted by the model provided in Appendix B.

In the model, CBAs are characterized as incomplete contracts strategically negotiated between firms and unions. Firms offer combinations of wages and rights under

Figure 5: Event Study: Employment Increases and Worker Rights
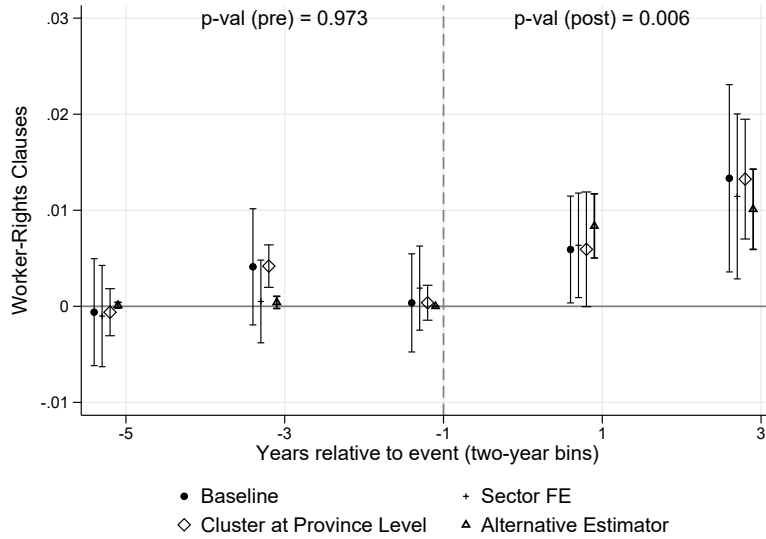
Note: Figure presents coefficients for time indicators before and after employment rate increase on share of worker-rights clauses. Callaway and Sant'Anna (2021) estimator in the implementation of Rios-Avila et al. (2022), accounting for heterogeneous treatment effects and staggered treatment timing. Dynamic aggregation/event study effects, using doubly robust inverse probability weighting and event size weights. Outcome: Share of worker rights (number of worker rights over the number of all clauses). Controls: Not-yet-treated observations. Event is defined the largest employment increase in a given province in the 1990s, where employment is defined as leave-one-out employment rate in a given sector (average log employment rate in other sectors in the same province-year; there were no such observations for the +5 window for employment rate increases). Numbers on horizontal axis refer to years relative to event, binned to two years; i.e., -1 = two years prior to event. Inference: Standard errors clustered at the province-by-sector level; 90 percent confidence intervals displayed. The p-values of omnibus hypothesis tests of zero individual pre- and post-event baseline effects are 0.973 and 0.006, respectively. First estimator is baseline Callaway and Sant'Anna (2021) as described so far, second estimator is Callaway and Sant'Anna (2021) that adds sector fixed effects as control variables, third estimator is Callaway and Sant'Anna (2021) that clusters standard errors at the province level, fourth estimator implements alternative TWFE estimator by Gardner (2022). Data sources: Employment and Social Development Canada, Canadian Labor Force Survey.

the threat of union strikes. Due to transaction costs involved in writing out contract terms, firms selectively include rights—such as vacation time or seniority rules—in the contract. These rights serve as untaxed compensation, benefiting workers, while imposing costs on firms. Firms contract rights up to the point where their marginal benefit equals marginal cost.

Consequently, the model makes two clear predictions. First, when labor income taxes increase, firms shift compensation towards untaxed rights, resulting in more worker rights clauses. Second, enhanced bargaining power from improved worker outside options similarly incentivizes firms to increase contracted rights. Those predictions align nicely with our empirical evidence.

Another prediction arising from the model is that when taxes go up, strikes should also become more frequent. We test this prediction by estimating Eq. (1) with strike intensity (worker days on strike during contract negotiation) as the outcome variable. Appendix Table A.14 shows that there is a positive and, in most specifications, significant effect of increased income taxes on strike intensity.

What types of rights do workers value most? To understand more precisely which worker rights are most valued, we analyze the effects of changes in labor income taxes and employment rates separately across specific categories of contract clauses. From the method described in Section 4.1, we have divided up the worker-rights clauses into seven broad categories of rights: Family Issues, Health & Well-Being, Payments, Scheduling, Seniority, Vacations, and Work Termination. We run the main regression specification for tax and employment effects, Eq. (1), with the outcome being the clause share of worker rights on that specific topic.

Figure 6 shows the estimates by worker-rights category, and we see notable heterogeneity across categories. For both taxes and employment, the largest effects are on rules related to Scheduling. There are more mixed results for the other topics. Tax increases also tend to boost Health & Well-being. Employment increases tend to boost rights around Seniority (that is also positive and significant for taxes).[24]

The most significant effects of taxes and employment are observed for worker rights related to scheduling and seniority - elements that reflect workers' desire for control over their time and the security of their employment. Moreover, a systematic ranking of worker rights by their substitutability with wages shows that higher income

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[24]For effects on the more granular topics (30 categories), see Appendix Figures A.12 and A.16.

Figure 6: Effect of Tax Rate and Employment Rate on Worker-Rights Clauses, by Category

A. Effect of Tax Rate

B. Effect of Employment Rate
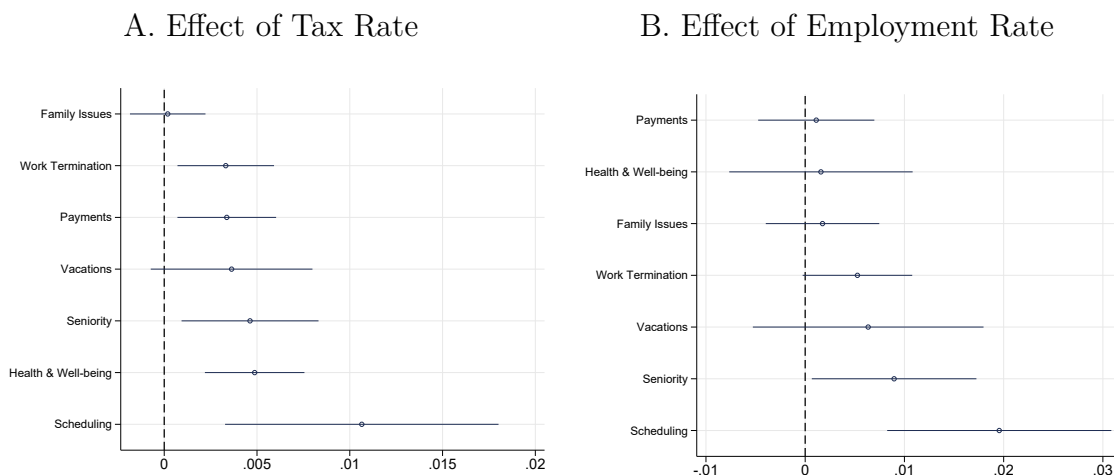
Note: These figures present coefficients and 95% confidence intervals of effect of labor tax rate (Panel A) and employment rate (Panel B) on worker-rights separately by different category, with the categories build using clustered sentence embeddings as described in Section 4.1. Each coefficient is from a separate OLS regression. Outcome: Share of worker rights clauses that belong to given topic group (number of worker rights clauses of topic group in question over the number of all clauses). Treatment (Panel A): Labor tax rate, defined as log implicit personal income tax rate. Treatment (Panel B): Leave-one-out employment rate in a given sector, defined as the average log employment over other sectors in the same province-year. Controls: Province-by-sector fixed effects and year-by-sector fixed effects. Inference: Standard errors clustered at the province-by-sector level. Data sources: Employment and Social Development Canada, Center for the Study of Living Standards, Canadian Labor Force Survey.

taxes lead to increases in the least wage-like clauses that are rules and control rights. These effects are at least as strong as those observed for more cash-like benefits (see Appendix Figure A.13).[25] The value of rights to the life of workers is self-evident, and the literature has produced related evidence for non-union workers (e.g. Mas and Pallais, 2017). However, as unpriced rights like control over scheduling and seniority are not typically captured in standard datasets or included in conventional measures such as health insurance or pensions, their importance is often overlooked. Our findings highlight the need for textual analysis of contracts to uncover the full range of job attributes that matter to workers.

How valuable are worker rights? We think of the labor contract as a combination of wages and rights, with workers and firms trading them off based on relative costs and the relative value to workers (see Appendix B). To explore this tradeoff, and to better understand the monetary value of worker rights, we now look at the effect of taxes on wages, using the worker-level micro-data from the Canadian Labor Force Survey as the data source.

We model the log hourly wage w_{pjt} for worker j in province p at time t as a function of union status u_{pjt}, the log tax rate z_{pjt}, and their interaction. We regress

$$w_{pjt} = \rho_1 z_{pjt} + \rho_2 u_{pjt} + \rho_3 u_{pjt} z_{pjt} + \alpha_{ps} + \alpha_{st} + X'_{pjt}\beta + \epsilon_{pjt}, \tag{2}$$

where the other terms are as above, but now at the worker level. The coefficients of interest are ρ_1, the effect of taxes on wages of non-union workers, ρ_2, the average difference in wages between union and non-union workers, and ρ_3, the interaction describing the relative effect of taxes on the wages of union workers.

Table 8 summarizes the main effects of the log tax rate on worker rights (in standard deviations) and log wages. In particular, Column 2 shows the estimates from Eq. (2). We see that (a) taxes are associated with increased pre-tax wages, consistent with partial pass-through to the firm; (b) union workers make more than non-union workers on average; and (c) a negative union interaction on union $\times$ taxes, meaning the effect is statistically smaller for union workers, relative to non-union

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[25]For employment, these subgroups are estimated less precisely, but we do not find a meaningful difference by wage substitutability either, see Appendix Figure A.17. Moreover, Appendix Table A.10 reports some additional evidence suggesting that the effect of tax rates on wage-like benefits is more precisely estimated than the tax rate effect on control rights.

Table 8: Valuing Worker Rights in Terms of Wages

	(1) Share Worker Rights (S.D.)	(2) Log Wages
Log Tax Rate	2.34***	0.23***
	(0.55)	(0.06)
Union		1.34***
		(0.50)
Log Tax Rate * Union		-0.36**
		(0.16)
R-Squared	0.15	0.31
Number of Obs	24,826	4,877,128
Province-by-Sector and Year-by-Sector FEs	X	X
Dataset:	Union Contracts	Labour Force Survey

Note: Coefficients and standard errors of effect of labor tax rate worker rights clauses in the contracts (Column 1), and on log wages in the LFS (Column 2), where the latter also includes dummies for union and the interaction of log tax rate and union. Labor tax rate is defined as logarithmized implicit personal income tax rate. Inference: Standard errors clustered at the province-by-sector level. Single, double, and triple asterisks indicate statistical significance at the 10%, 5%,and 1% levels, respectively. Data sources: Employment and Social Development Canada, Center for the Study of Living Standards, Canadian Labor Force Survey.

workers.[26]

This negative interaction result is consistent with unionized firms doing more substitution between wages and rights than non-unionized firms. Notably, the effect of taxes on pre-tax wages for non-union firms is wholly reversed for unionized firms, and actually goes negative. Unionized firms can bargain around untaxed rights in addition to wages. In response to a tax increase, then, there is more movement among unions on rights clauses rather than wages. One explanation of these results is that contract writing is costly, and unions can produce a more complete contract by spreading contracting costs across the whole membership, rather than having separate contracting costs for each individual worker. In public finance, this result is important because it shows that estimates of taxable income elasticity may be biased if rights are endogenous (e.g. Chetty, 2009; Chetty et al., 2011).

Our regression estimates for taxes mean that a 10% increase in the income tax rate is associated with the share of worker rights in contracts increasing by about 0.23 standard deviations. Meanwhile, a 10% tax increase is associated with union wages falling by 1.3 percent. Taken together, these estimates imply that a one-S.D. increase in the share of worker rights is worth about 5.7 percent of wages (assuming no change in worker utility).

This estimate is not strictly comparable to estimates of workers' value of amenities from the literature, as the responsiveness of worker rights to shocks in our data reflects firm costs of providing these rights as well as bargaining parameters such as the costliness of strikes (Mas, 2025). Still, it is interesting that it is in line with other reported magnitudes. For example, Mas and Pallais (2017) estimate that the option for remote work is worth about 8 percent of wages to workers. The estimates in Lagos (2025) suggest that CBA employment protection is worth 4 percent of wages. Dube et al. (2022) find that a one S.D. increase in "workplace dignity" is worth about 6 percent of wages, while Anelli and Koenig (2023) find that reducing workplace fatality risk by 1 in 100,000 is worth 9 percent of wages. Using data from job posts, Roussille and Scuderi (2023) find that a one S.D. increase in amenities is worth about 12 percent of wages. Our results situate the value of contracted worker rights among these other measures of workplace conditions.

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[26]See Appendix Figure A.14 for the coefficient plot. Appendix Figure A.15 shows that these results are robust to adding survey data from Gallup covering additional years to our main sample from the Canadian Labor Force Survey. Appendix Figure A.18 shows the effect of local employment rate on wages.

6   Conclusion

This paper applies natural language processing techniques to examine the legal content of labor union contracts. Our findings show that these contracts largely impose obligations on both workers and firms, while granting various rights to workers. The worker rights measure we introduce aligns with alternative metrics — including those from the World Management Survey — and corresponds with outputs of large language models. In our empirical analysis, we find that worker rights differ across firms and shift over time in response to economic conditions. These aspects of workplace autonomy are challenging to capture using traditional datasets, yet they likely contribute significantly to employee well-being, and behave as would be expected if they were non-pecuniary amenities. Further, the nature of contractual rights in a collective bargaining agreement, where they are backed by the legal system of courts and arbitration, makes them durable, potentially different from other amenities unilaterally chosen by an employer, which can be rescinded.

Future research could extend beyond worker rights clauses to analyze additional dimensions of union contracts. An intriguing observation, for instance, is the association between increased worker rights and heightened worker obligations. Drawing on Simon (1951), one interpretation is that when giving authority to an agent, one should also add limits to that authority. For example, while firms may provide workers autonomy over scheduling, such autonomy cannot be without limits. Our parser-based approach allows for a clear separation of worker rights from obligations, and can similarly clarify other dimensions, such as firm obligations. An important open question is whether the observed combinations of clauses represent efficient bargains or instead impose unnecessary costs on firms. Additionally, our analysis has only briefly touched upon the large number of exemptions, contingencies, and other conditional or qualifying statements within contracts. Future approaches might reveal richer information regarding how real-world contracts incorporate state-contingent terms. More generally, our approach provides a scalable framework for analyzing the legal content of contracts and regulatory texts beyond CBAs, offering new opportunities to study how formal legal language shapes economic and societal outcomes.

Finally, the findings in this paper are potentially important for contract theory. Recent work in contract theory provides good arguments for why simple (e.g. linear) contracts are robustly optimal (Carroll, 2019). But the real-world complexities of con-

tracts, such as collective bargaining agreements, remain beyond the grasp of current theoretical frameworks. As Jean Tirole emphasizes, "While there is no arguing that writing down detailed contracts is very costly, we have no good paradigm in which to apprehend such costs" (Tirole, 1999, pp. 773). Oliver Hart, meanwhile, notes that "[a]ctual contracts are poorly worded, ambiguous, and leave out important things" (Hart, 2017, pp. 1732). Our granular, comprehensive empirical analysis of the details of CBAs is in line with the observation that real-world contracts are complex, and that this complexity should be explored by economists. While reliably converting the modal semantics of "possible worlds" in legal language into probabilistic statements about state-contingent payoffs is some distance in the future, tools like formal grammar parsing provide scaffolding on which a new generation of structural contract models can be built.

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A Empirical Appendix

A.1 Appendix Material: Data Sources

Table A.1: Summary Tabulations for Contracts Metadata

Province	Freq.	Percent
Alberta	3,820	11.79
British Columbia	4,085	12.61
Manitoba	1,639	5.06
Multiprovince	2,005	6.19
New Brunswick	740	2.28
Newfoundland / Labrador	539	1.66
Northwest Territories	438	1.35
Nova Scotia	1,169	3.61
Nunavut	171	0.53
Ontario	15,719	48.51
Prince Edward Island	146	0.45
Quebec	558	1.72
Saskatchewan	1,177	3.63
Yukon Territory	196	0.6
Total	32,402	100

Sector	Freq.	Percent
Construction	1,626	5.02
Educational / Health	11,461	35.37
Entertainment	945	2.92
Finance / Real Estate	886	2.73
Information / Culture	1,295	4
Manufacturing	5,485	16.93
Primary industries	465	1.44
Public admin	3,882	11.98
Transportation	4,893	15.1
Utilities	560	1.73
Wholesale / Retail	904	2.79
Total	32,402	100

Note: Absolute and relative frequencies of contracts, by province/territory and sector. Data source: Employment and Social Development Canada.

Figure A.1: Summary Figures for Contracts Metadata
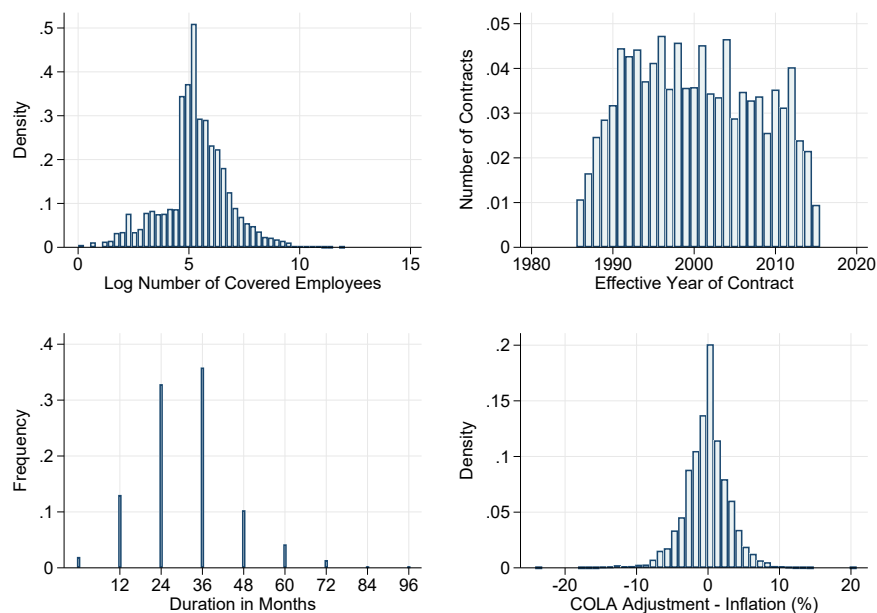
Note: Histograms of selected metadata of contracts: (i) Log number of employees covered by given contract; (ii) Effective year of contract; (iii) Duration of a given contract in months, (iv) Cost-Of-Living Adjustment Adjustments.Data source: Employment and Social Development Canada.

A.2 Appendix Material: Contract Parsing

Figure A.2: Syntactic Dependency Parse for Deontic Modal Verb Structures
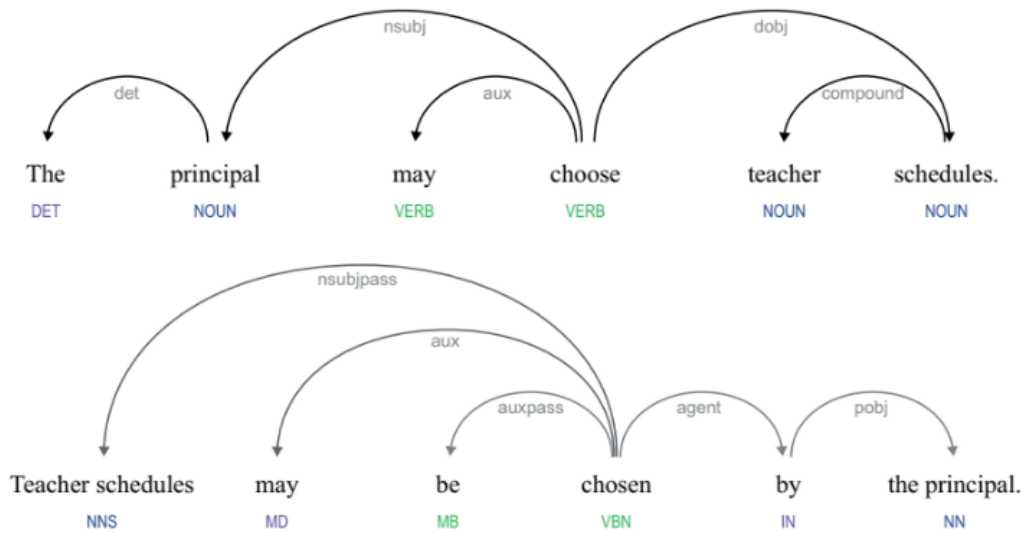
Note: Two examples of a parse tree. Each parse tree represents the relations between words in a recursive hierarchical structure. The edge labels indicate the relation between two words in a sentence.

Table A.2: Summary Tabulations: Subjects, Modals, and Verbs

Subject	Freq.
employee	32465
who	12633
it	7198
employer	6431
company	5666
which	5404
he	5101
party	4044
they	3997
there	3081
union	2735
that	2649
teacher	2598
member	2501
leave	2303
board	2247
grievance	2092
dans	1960
nurse	1809
hour	1690
hospital	1626
rate	1612
time	1596
period	1572
he/she	1485
she	1460
committee	1350
day	1346
work	1301
agreement	1299
provision	1278
seniority	1267
notice	1233
position	1224

Modal	Freq.
shall	57263
will	30974
may	13491
must	3465
should	1954
would	1788
can	1702
could	206
might	130
ought	79
need	27

Verb	Freq.
be	35265
have	6212
agree	5900
be_pay	5400
receive	4236
work	4035
be_require	3656
apply	3468
provide	3045
be_make	2955
be_entitle	2694
be_grant	2663
continue	2355
be_give	2301
pay	2237
be_consider	1945
include	1639
make	1570
become	1553
mean	1518
be_provide	1495
occur	1486
complete	1420
be_understand	1402
leave	1301
require	1293
take	1224
be_agree	1212
recognize	1202
be_deem	1188
meet	1142
give	1102
notify	1092
commence	1063

Note: List of most common subjects, modal verbs, and verbs in the extracted contract clauses, ordered by absolute frequency, respectively. Data source: Employment and Social Development Canada.

Table A.3: Contract Clause Typology

| Categorization Logic	Examples
Obligations	
Positive & Strict Modal & Active Verb	shall provide, shall include, shall notify, shall continue
Positive & Strict Modal & Obligation Verb	shall be required, shall be expected, shall be obliged
Positive & Non-Modal & Obligation Verb	is required, is expected
Prohibitions	
Negative & Any Modal & Active Verb	shall not exceed, shall not use, shall not discriminate
Negative & Permission Verb	shall not be allowed, is not permitted
Positive & Strict Modal & Constraint Verb	shall be prohibited, shall be restricted
Permissions	
Positive & Non-Modal & Permission Verb	is allowed, is permitted, is authorized
Positive & Permissive Modal & Active Verb	may be, may request, may use, may require, may apply
Negative & Any Modal & Constraint Verb	shall not be restricted, shall not be prohibited
Rights	
Positive & Active & Active Rights Verb	shall receive, shall earn
Positive & Passive & Passive Rights Verb	shall be paid, shall be allowed
Negative & Any Modal & Obligation Verb	may not be required

Note: Typology of clause types, word patterns, and corresponding examples.

Table A.4: Example Subject-Verb Tuples by Clause Type

subject	obligations	prohibitions	permissions	right	others
worker	employee is required (41789) employee shall be (21968) employees shall be (14350)	employee shall not lose (3578) employee shall not be (3517) employee will not be (2997)	employee may request (11120) employee may elect (9148) employee shall be allowed (7524)	employee shall be paid (61643) employee shall receive (57367) employee has (54772)	employee is (181457) employee works (42449) employees are (24868)
firm	company agrees (83488) employer agrees (76739) employer shall provide (19909)	board shall not be authorized (2397) company shall not be (1403) company will not be (1133)	employer may require (4992) employer may grant (4307) company may require (2705)	company has (9725) board shall have (7767) employer has (7506)	employer recognizes (13744) company recognizes (13531) company is (9089)
union	union agrees (46060) union shall notify (6113) member is required (3034)	union will not cause (967) union will not engage (590) representatives shall not suffer (316)	representative may be (3452) union may refer (1983) union may submit (1785)	union shall have (9463) union has (5231) member shall receive (4184)	union recognizes (15091) member is (12139) union is (10315)
manager	supervisor shall give (1278) management agrees (1272) manager shall give (1057)	supervisors shall not perform (343) supervisors will not perform (284) management will not take (139)	administrator may desire (566) director may grant (384) administrator may grant (377)	principal shall receive (973) administrator may have (808) principal shall be paid (516)	supervisor is (2126) management is fix (1375) management is vest (1334)
other	there shall be (73307) parties agree (70143) there will be (33167)	provisions shall apply (4494) leave shall not exceed (4242)	case may be (14213) which may arise (6131) which may be (6042)	who has (36467) leave shall be granted (15557) leave will be granted (10311)	who is (141114) there is (116098) it is understood (102328)

Note: Most frequent examples of subject-verb tuples by clause type.
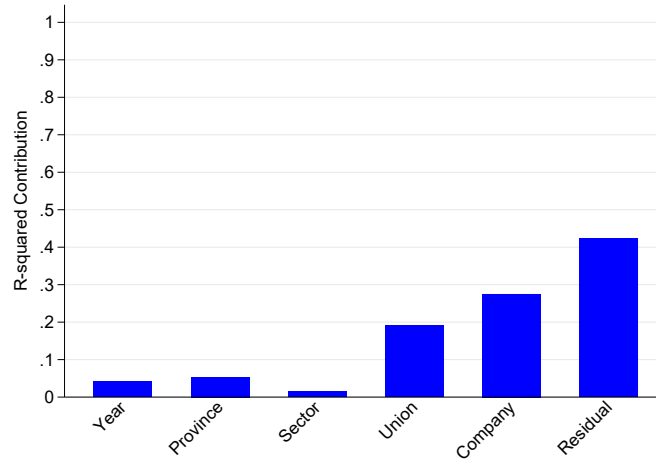
Figure A.3: Rights and Obligations Over Time, By Agent
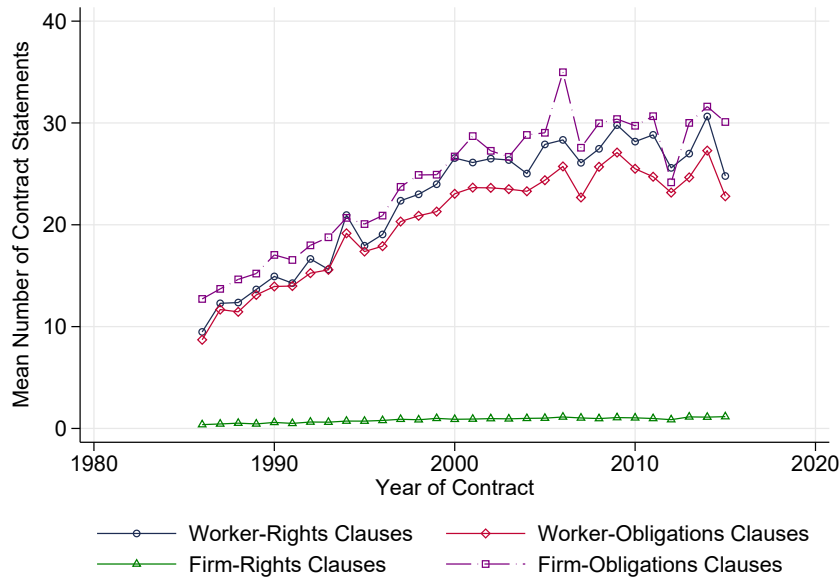
Note: Mean number of rights and obligations for workers and firms, respectively, over time. Data source: Employment and Social Development Canada.

A.3 Appendix Material: Exploring and Validating Worker-Rights Clauses

Figure A.4: Decomposition of Explained Variance in Worker Entitlements by Fixed Effects

Note: Figure displays the incremental R-squared contribution of sequentially added fixed effects explaining the share of worker entitlements in a contact. Fixed effects are introduced in the following order: year, province, sector, union, and company. The final bar ("Residual") captures unexplained variance. Data source: Employment and Social Development Canada.

Figure A.5: Distribution of Worker-Rights Clauses, by Firm, Union, and Sector

A. Worker Rights, by Firm
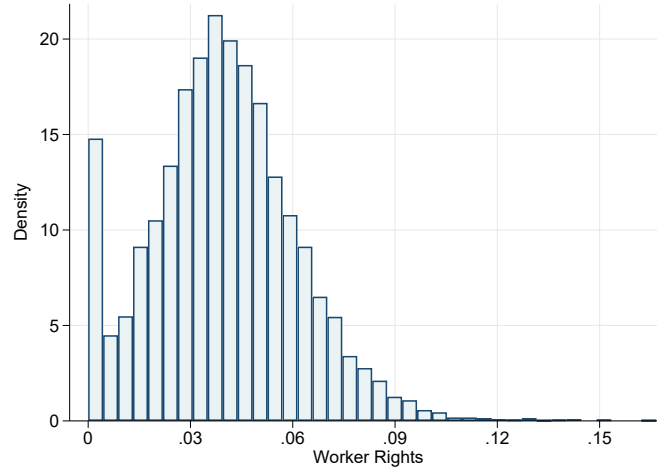
B. Worker Rights, by Union

C. Worker Rights, by Sector

Note: Histogram of share of worker rights, collapsed to level of firm (Panel A), union (Panel B), and sector (Panel C). Data source: Employment and Social Development Canada.

Table A.5: Share of Worker-Rights Clauses, By Firm

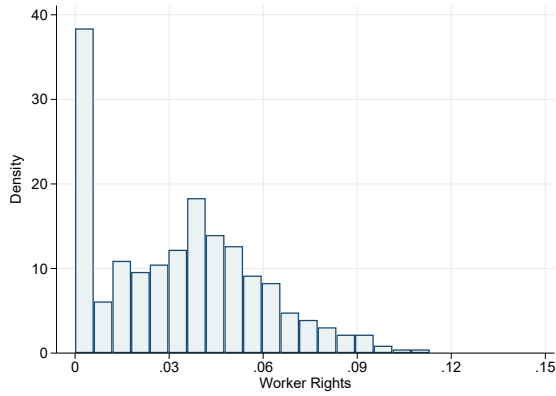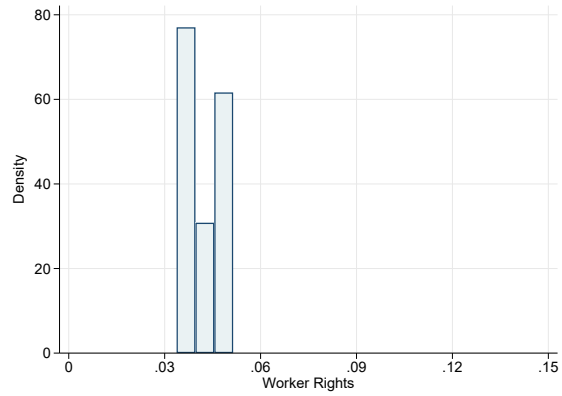| Firm	# of Employees	Share of worker rights
Great atlantic and pacific company canada, limited	8000	0.0707
Metro ontario ; food basics franchisees	6800	0.0696
British columbia telephone company	11095	0.0684
Bc tel	10658	0.0657
Metro	10000	0.0620
Forest industrial relations limited	10550	0.0610
Steinberg	9000	0.0514
Steinberg (miracle food mart and ultra mart food and drug stores)	10000	0.0498
Telus corp.	13700	0.0491
Miracle food mart of canada limited,div.great atlantic and pacific company	7770	0.0473
Metro ontario (retail)	9400	0.0468
New dominion stores, division of the great atlantic and pacific company of canada, limited	8500	0.0439
Corporation des concessionnaires d'automobiles de montreal	15570	0.0412
Association des constructeurs de routes et grands travaux du que.	9790	0.0411
Association de la construction du quebec	23700	0.0385
Overwaitea food group, save-on-foods bc and overwaitea foods	7920	0.0363
Stelco (hilton works)	7797	0.0361
L'association des entrepreneurs de services d'edifices quebec	7219.5	0.0300
Labourers employer bargaining agency	9333	0.0297
Electrical trade bargaining association agency of the electric contractors association	14500	0.0278
Carpenters employer bargaining agency	12700	0.0233
Mechanical contractors association ontario	11200	0.0210
Mechanical contractors association ontario	8000	0.0178
Electrical trade bargaining agency electrical contractors assn.	14000	0.0165
Ford motor company of canada, limited	9528	0.0164
Electrical trade bargaining agency of the electric contractors assn.	14250	0.0147
Institute of communications agencies and association of canadian advertisers	8510	0.0003
Canadian media production association	20000	0.0000
Institute of communications and cdn. assn. of advertisers	7755	0.0000
Canadian film and television production association (performers)	6870	0.0000

Note: Share of worker rights clauses by private firms. Largest 30 firms by employment; displayed in descending order of share of worker rights. Data source: Employment and Social Development Canada.

Table A.6: Share of Worker-Rights Clauses, By Union

Union	# of Contracts		Share of
	Private-Sector	Public-Sector	worker rights
Canadian Union of Public Employees	234	1850	0.0411
National Automobile, Aerospace, Transportation and General	836	189	0.0377
Workers Union of Canada (CAW Canada)			
Public Service Alliance of Canada	317	664	0.0703
Ontario Nurses' Association	29	650	0.0433
International Brotherhood of Teamsters	624	47	0.0472
Service Employees International Union	128	510	0.0327
Ontario Secondary School Teachers' Federation	7	592	0.0369
Teamsters Canada	491	30	0.0459
Communications, Energy and Paperworkers Union of Canada	454	42	0.0434
Ontario English Catholic Teachers' Association	0	450	0.0445
Ontario Public Service Employees Union	37	324	0.0351
Elementary Teachers' Federation of Ontario	0	334	0.0472
United Steelworkers of America	303	18	0.0355
Alberta Teachers' Association	1	320	0.0532
United Food and Commercial Workers International Union	278	24	0.0452
Alberta Union of Provincial Employees	44	238	0.0589
Christian Labour Association of Canada	231	30	0.0583
United Steel, Paper and Forestry, Rubber, Manufacturing,	210	24	0.0365
Energy, Allied Industrial and Service Workers Intl. Union			
United Food and Commercial Workers Canada	219	10	0.0487
International Association of Machinists and Aerospace	221	0	0.0353
Workers			
International Brotherhood of Electrical Workers	115	80	0.0434
International Union of Operating Engineers	128	63	0.0476
Canadian Merchant Service Guild	167	3	0.0154
British Columbia Government and Service Employees' Union	70	82	0.0426
Seafarers' International Union of Canada	132	0	0.0308
Professional Institute of the Public Service of Canada	8	115	0.0816
Amalgamated Transit Union	71	45	0.0409
Unifor	92	23	0.0393
Laborers' International Union of North America	96	18	0.0373
United Brotherhood of Carpenters and Joiners of America	90	11	0.0373

Note: Share of worker rights clauses by union. Unions ordered by number of contracts in the private and public sector; top 30 unions displayed. Data source: Employment and Social Development Canada.

Table A.7: Worker-Rights Clauses, By Sector

Sector	Share of worker rights
Construction	0.034
Educational, Health	0.041
Entertainment/Hospitality	0.038
Finance, real estate	0.048
Information and culture	0.041
Manufacturing	0.040
Primary industries	0.039
Public administration	0.048
Transportation	0.038
Utilities	0.046
Wholesale/Retail Trade	0.051

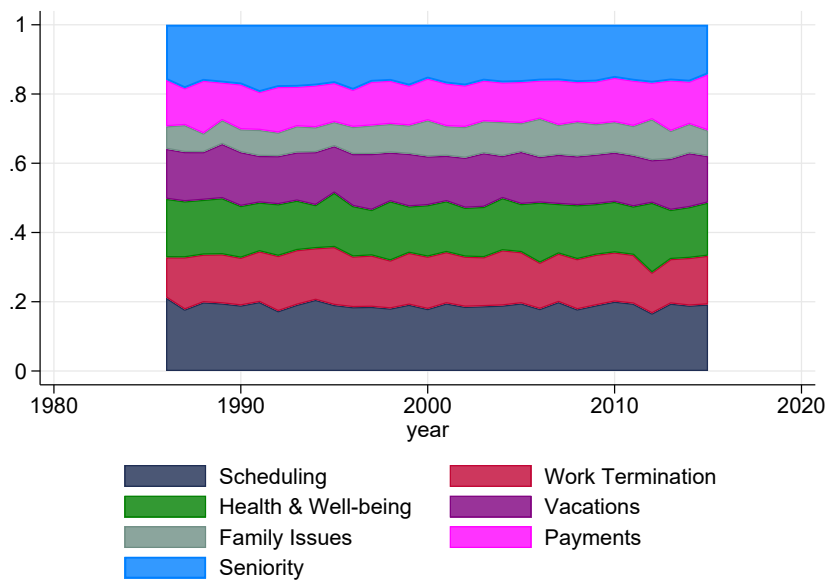**Note:** Share of worker rights clauses, by sector. Data source: Employment and Social Development Canada.

Table A.8: Example Worker-Rights Clauses

1. Employees should not be required to work more than two (2) hours after the end of their regular shift in such cases and shall be provided transportation by the Company, on request.

2. Such employees shall be paid not later than three (3) weeks after the date of application.

3. Where the Company schedules an employee to work in excess of seventy-seven (77) hours in one pay period, the employee will be paid for the excess hours at the applicable overtime rate.

4. However, an employee will receive one day of seniority if he or she works 5 or more hours on an overtime shift on Saturday or Sunday.

5. Standby Pay and Call-In Pay. An employee who is required by the Company to work overtime shall be paid at the rate of one and one-half times his applicable pro-rated hourly rate for time worked by him: (a) in excess of 8 hours in a work day

6. Where an employee is prevented by circumstances beyond his control from returning to work on time, he shall be paid for the holidays.

7. An employee who visits Occupational Health Services at the request of the Company following the completion of his shift will be paid in accordance with Section 16.01 and will be provided with transportation if necessary.

8. An employee in such instances will be paid at his/her regular rate upon returning to work.

9. If a general holiday falls on the regular pay day, employees shall be paid the last day worked before the general holiday.

10. Employees who retire as well as current retirees and survivors will be provided with Life Insurance in the amount of $6,000.

11. The employee shall be entitled to additional time off for any holidays occurring within such vacation period.

12. An employee terminated during his probationary period would be entitled to review under the grievance procedure up to and including Step 3.

13. An employee not in a labour pool shall only be entitled to make application for an equal or higher rated job or, for a job which is in a line having a higher rated job than exists in his current line of promotion except that: 1 .

14. However, where practicable, senior employees in each job shall be given the opportunity to perform any available work in that job, on their shift, within their Department.

15. Any employee elected at the Federal or Provincial level will be granted a leave of absence without pay and without benefits, to extend to one (1) term in office.

16. The employee shall be entitled to additional time off for any holidays occurring within such vacation period.

Note: Sample of 16 worker rights from corpus (any typos come from OCR errors). Data source: Employment and Social Development Canada.

Figure A.6: Worker-Rights Clauses Topics Over Time

Note: Shares of topic clusters of worker rights clauses, over time. Data source: Employment and Social Development Canada.

Figure A.7: Clause Types and Pro-Worker HR, Conditioning on Obligations
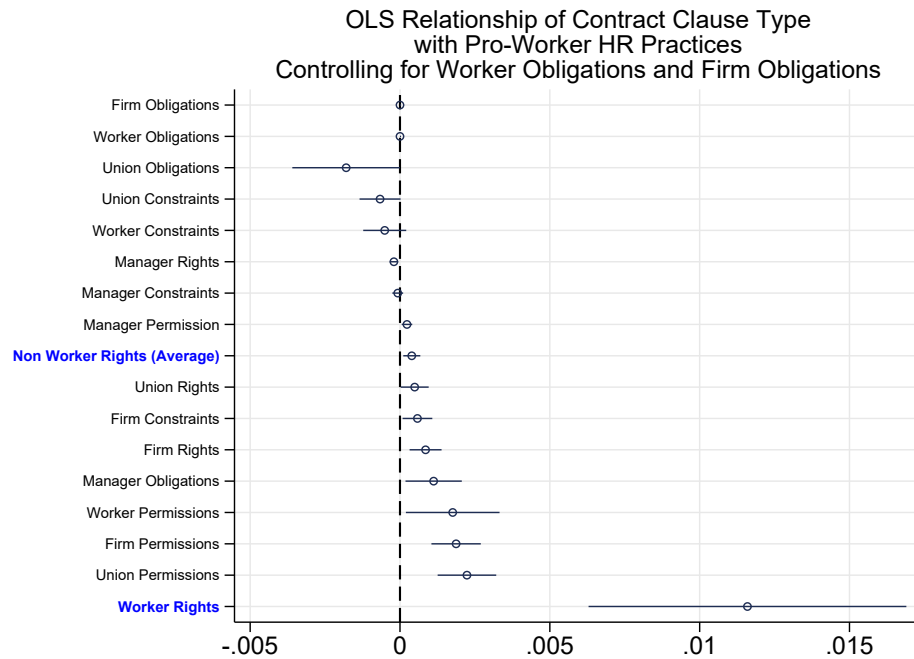
OLS Relationship of Contract Clause Type
with Pro-Worker HR Practices
Controlling for Worker Obligations and Firm Obligations

Note: Figure presents coefficients and 95% confidence intervals of regression of contract clause types on index for Pro-Worker HR Practices. Each coefficient is from a separate OLS regression. Outcome: Clause type share (number of clauses of type in question over the number of all clauses). Treatment: Standardized index of Pro-Worker HR Practices, defined as sum of approval rates to six statements about worker practices; it increases in "managers care about workers", "promotes good workers", and "employees are valued," and decreases in "focus on top talent", "incentives", and "fire poor performers". Controls: Firm obligations and worker obligations, defined as share of clauses of given type (number of clauses of type in question over the number of all clauses). Inference: Heteroscedasticity-robust standard errors. Data sources: Employment and Social Development Canada, World Management Survey (Bloom et al., 2012).

Table A.9: Match of Broad Topics and Narrow Topics

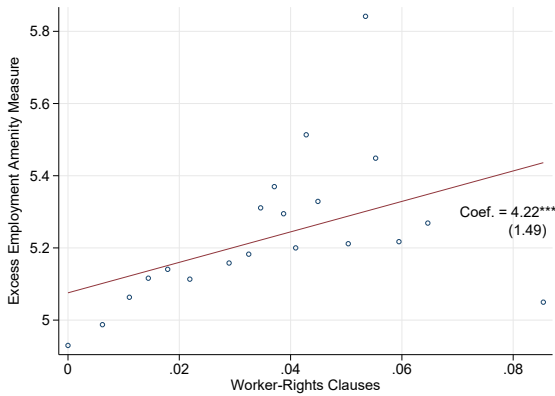| Broad Topic (Share)	Narrow Topic (Share)	Most Associated Words
Scheduling (0.189)	Work Hours (0.058)	hours, work, rate, shift, regular, minimum, worked, called, scheduled, half
	Leave of Absence (0.039)	leave, absence, granted, union, elected, loss, period, seniority, employer, year
	Scheduling (0.030)	day, work, days, required, rest, scheduled, hours, consecutive, week, shift
	Overtime (0.026)	overtime, hours, work, worked, rate, regular, shift, required, half, scheduled
	Part-Time Employment (0.023)	hours, seniority, credit, basis, status, changed, service, worked, work, regular
	Breaks (0.013)	rest, minute, 15, break, shift, period, minutes, hours, periods, half
Seniority (0.150)	Seniority-Based Benefits (0.039)	service, year, years, plan, benefits, retirement, salary, date, month, 00
	Position Classification (0.036)	rate, classification, higher, job, position, salary, transferred, new, assigned, lower
	Job Security (0.030)	position, job, temporary, given, vacancy, hired, nurse, opportunity, offered, months
	Seniority & Promotion/Transfer (0.030)	seniority, given, senior, preference, selected, job, ability, qualifications, positions, classification
	Probation Period (0.015)	probationary, period, agreement, rights, probation, privileges, completion, hired, completed, seniority
Vacations (0.146)	Vacations (0.045)	vacation, year, period, entitlement, annual, leave, employment, earned, following, service
	Seniority-Based Vacation (0.038)	vacation, years, service, year, weeks, continuous, completed, days, annual, percent
	Holiday Pay (0.037)	holiday, day, holidays, statutory, falls, vacation, general, following, work, regular
	Holiday Work Pay (0.026)	holiday, hours, rate, day, worked, holidays, regular, statutory, work, half
Health & Well-being (0.118)	Workplace safety (0.054)	union, agreement, required, provided, covered, granted, work, given, company, collective
	Sick Leave (0.025)	sick, leave, credits, days, illness, granted, absence, month, year, injury
	Workplace Injuries (0.024)	injury, compensation, injured, work, workers, disability, accident, medical, benefits, shift
	Meals (0.015)	meal, lunch, period, hours, hour, overtime, work, break, half, shift
Work Termination (0.116)	Recall (0.032)	laid, layoff, recall, given, lay, hired, new, opportunity, work, recalled
	Grievance & Discipline (0.031)	grievance, steward, union, discipline, discharge, discharged, notified, representative, suspended, procedure
	Notice Requirements (0.027)	notice, notified, given, days, layoff, change, advance, working, written, writing
	Termination (0.026)	severance, employment, service, notice, termination, laid, continuous, layoff, terminated, year
Payments (0.098)	Payment Rules (0.051)	rate, weekly, regular, day, hourly, agreement, hours, work, bi, half
	Shift Premiums (0.025)	shift, hour, premium, cents, hours, worked, 00, rate, regular, hourly
	Reimbursements (0.022)	travel, transportation, expenses, reimbursed, allowance, traveling, vehicle, employer, use, business
Family Issues (0.055)	Bereavement Leave (0.028)	death, law, bereavement, leave, funeral, days, granted, family, immediate, day
	Parental Leave (0.027)	leave, parental, child, maternity, weeks, pregnancy, granted, adoption, birth, pregnant
Others (0.128)	Teacher Compensation (0.066)	teacher, teachers, school, salary, occasional, teaching, board, year, experience, day,
	Teacher Leave (0.029)	teacher, leave, sick, school, year, granted, teachers, days, absence, board
	Personnel Records (0.024)	copy, file, given, written, provided, request, performance, review, personnel, appraisal
	Jury duty (0.009)	jury, witness, duty, court, subpoenaed, difference, required, day, received, serve

Note: Label, share (relative frequency), and 10 most associated words of topic clusters describing worker rights. Most associated words ordered by association strength. Data source: Employment and Social Development Canada.

Figure A.8: Worker-Rights Clauses, Pro-Worker HR Practices, and Text-Predicted Excess Employment
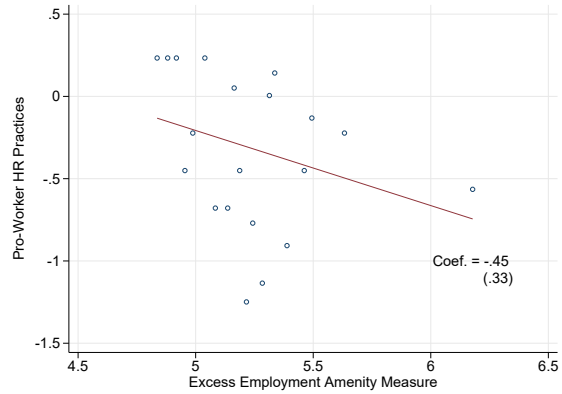
A. Pro-Worker HR Practices vs. Worker-Rights Clauses
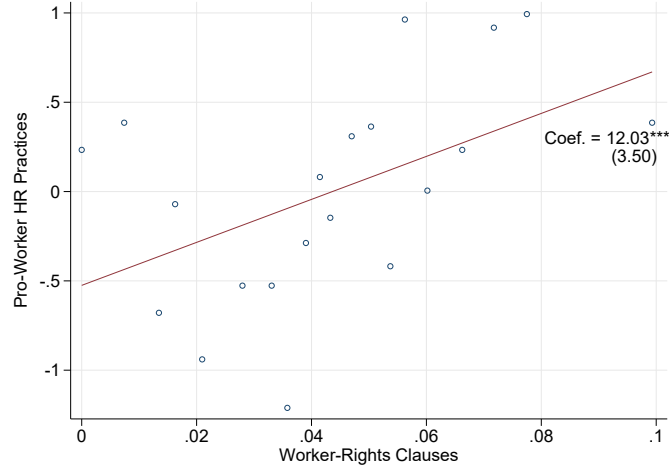
B. Text-Predicted Excess Employment vs. Worker-Rights Clauses C. Text-Predicted Excess Employment vs. Pro-Worker HR Practices

Note: Panel A: Binscatter plot of worker rights clauses (horizontal axis) and index for Pro-Worker HR Practices (vertical axis). Panel B: Binscatter plot of worker rights clauses (horizontal axis) and text-predicted excess employment index (vertical axis, defined in Section 4.4). Panel C: Binscatter plot of excess employment index (horizontal axis) and index for Pro-Worker HR Practices (vertical axis). Worker rights clauses is defined as share of worker rights clauses (number of worker rights clauses over the number of all clauses). Index of Pro-Worker HR Practices is defined as standardized sum of approval rates to six statements about worker practices; it increases in "managers care about workers", "promotes good workers", and "employees are valued," and decreases in "focus on top talent", "incentives", and "fire poor performers". "Excess employment amenity measure" or "text-predicted excess employment" refer to the text-predicted firm size, controlling for wages, as described in the text. Worker right measure significantly positively correlated with Pro-Worker HR Practices (Panel A). Excess employment is significantly positively correlated with worker rights measure (Panel B), but not correlated with the pro-worker HR practices (Panel C). Data sources: Employment and Social Development Canada, World Management Survey (Bloom et al., 2012).

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A.4 Appendix Material: Supporting Results

Table A.10: Worker Rights, Labor Tax, and HR Index

	Worker Rights (Distant Wage Substitutes)	Worker Rights (Close Wage Substitutes)	Worker Rights (Distant Wage Substitutes)	Log Income Tax Rate	Pro-Worker HR Index
	(1)	(2)	(3)	(4)	(5)
Log Income Tax Rate	1.354*	1.162***	1.280		
	(0.793)	(0.313)	(0.812)		
Worker Rights (Close Wage Substitutes)			0.063	0.0005***	0.144
			(0.060)	(0.0002)	(0.209)
Worker Rights (Distant Wage Substitutes)				0.0006	1.487***
				(0.0004)	(0.402)
R-Squared	0.24	0.19	0.24	0.91	0.13
Number of Observations	23,553	23,553	23,553	23,553	113
Province-Sector FEs	X	X	X	X	
Sector-Year FEs	X	X	X	X	

Note: Outcome variables indicated in column header. Worker rights variables standardized. Substitutability with wages of given topic calculated as the dot-product similarity between the centroid of the topic and the following 20 statements: "Employees shall have ..." incentive-based pay. a commission. a production bonus. a piece rate. a cost-of-living allowance. hazard pay. a uniform allowance. a tool allowance. free room and board. subsidized room and board. paid vacation leave. paid holiday leave. paid sick leave. paid personal leave. overtime pay. shift differential pay. life insurance. health insurance. disability insurance. retirement benefits. 16 topics most (least) close to these statements are grouped in categories of close (distant) substitutes of wages. Share of worker entitlements (number of worker rights clauses over number of all clauses). Standard errors clustered at the province-by-sector level, except for column 5. Single, double, and triple asterisks indicate statistical significance at the 10%, 5%,and 1% levels, respectively. Data sources: Employment and Social Development Canada, World Management Survey (Bloom et al., 2012).

Table A.11: Effect of Tax Rate and Employment Rate on Selected Outcomes

	Firm Entry	Firm Exit	Firm Size	COLA Clause
	(1)	(2)	(3)	(4)
Panel A:				
Log Income Tax Rate	0.253	-0.151	-0.391	0.003
	(0.191)	(0.165)	(0.478)	(0.182)
R-Squared	0.17	0.09	0.32	0.16
Number of Observations	22,864	22,864	24,826	24,826
Panel B:				
Log Employment Rate	0.261	-0.010	-1.040	-0.268
	(0.323)	(0.341)	(0.968)	(0.383)
R-Squared	0.17	0.24	0.32	0.15
Number of Observations	26,725	26,725	29,157	29,157
Province-Sector FEs	X	X	X	X
Sector-Year FEs	X	X	X	X

Note: Coefficients and standard errors of effect of log tax rate (Panel A) and leave-one-out average log employment rate (Panel B) on outcome indicated in the column header (firm entry, firm exit, and COLA clause are indicator variables, firm size is in logs). Sample of firm entries and firm exists excludes firms that only appear once in the dataset. Inference: Standard errors clustered at the province-by-sector level. Single, double, and triple asterisks indicate statistical significance at the 10%, 5%,and 1% levels, respectively. Data sources: Employment and Social Development Canada, Center for the Study of Living Standards, Canadian Labor Force Survey.

Table A.12: Robustness: Labor Income Tax Rate and Worker-Rights Clauses

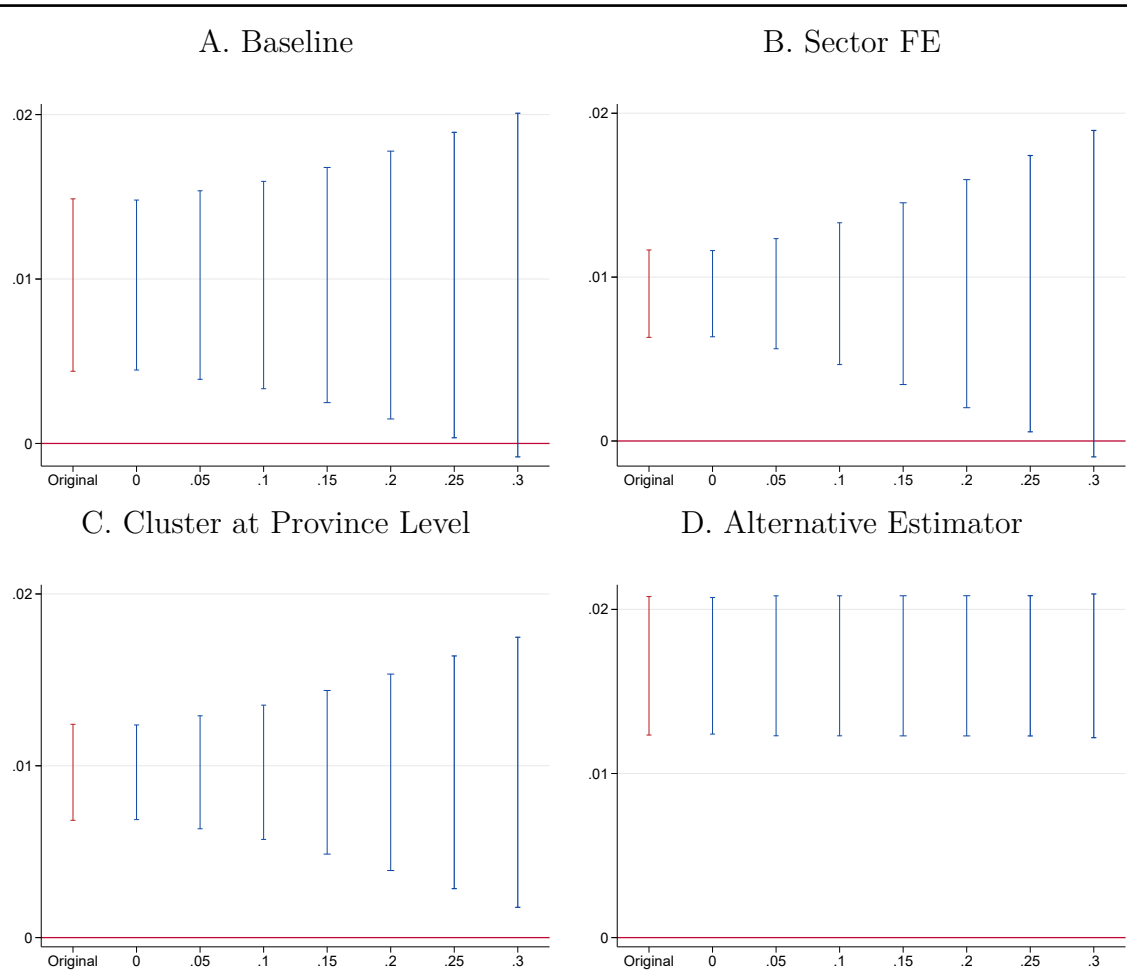|	Worker-Rights Clauses												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Log Income Tax Rate	0.060***	0.037***	0.041***	0.049***	0.060***	0.058***	0.060***	0.059***	0.060***	0.046***	0.035***	0.041***	1.778***
	(0.014)	(0.011)	(0.014)	(0.018)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.014)	(0.011)	(0.012)	(0.419)
R-Squared	0.15	0.16	0.55	0.34	0.15	0.15	0.15	0.15	0.15	0.30	0.47	0.16	0.18
Number of Observations	24,826	24,826	22,554	10,841	24,826	24,826	24,826	24,826	24,549	24,826	24,826	23,043	23,043
Province-Sector FEs	X	X	X	X	X	X	X	X	X	X	X	X	X
Sector-Year FEs	X	X	X	X	X	X	X	X	X	X	X	X	X
Province Trends			X										
Firm Fixed Effects				X									
Union Fixed Effects					X								
Cluster by Province						X							
Pro-Union Law Controls							X						
Anti-Union Law Controls								X					
NDP Party Control									X				
Employment Control										X			
Worker and Firm Obligation Control											X		
Share Parsed Clauses Control												X	
Drop Zero-Worker-Rights Clauses													X
Outcome: Number of Worker Rights (log)													X

Note: Coefficients and standard errors of effect of labor tax rate on worker rights clauses, for different specifications as indicated in table footer. Outcome: Share of worker rights clauses, defined as number of worker rights clauses over the number of all clauses. Treatment: Labor tax rate is defined as logarithmized implicit personal income tax rate. Controls: Pro-Union (Anti-Union) Law Controls includes set of separate indicator variables for whether a given law favorable (unfavorable) to unions is in place, see Table 3 in Legree et al. (2017) for list of laws. Inference: Standard errors clustered at the province-by-sector level, unless noted otherwise. Single, double, and triple asterisks indicate statistical significance at the 10%, 5%,and 1% levels, respectively. Data sources: Employment and Social Development Canada, Center for the Study of Living Standards.

Table A.13: Robustness: Effect of Employment Rate on Worker-Rights Clauses

	Worker-Rights Clauses												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Log Emp. Rate	0.053**	0.050***	0.040**	0.055**	0.053*	0.078***	0.056***	0.050**	0.049**	0.037**	0.035**	0.052***	1.820**
	(0.021)	(0.019)	(0.018)	(0.027)	(0.024)	(0.019)	(0.017)	(0.020)	(0.021)	(0.018)	(0.014)	(0.017)	(0.782)
R-Squared	0.15	0.16	0.56	0.36	0.15	0.15	0.15	0.15	0.15	0.31	0.47	0.16	0.18
Number of Observations	29,157	29,157	26,669	13,735	29,157	27,603	27,603	29,157	29,157	29,157	29,157	27,108	27,108
Province-Sector FEs	X	X	X	X	X	X	X	X	X	X	X	X	X
Sector-Year FEs	X	X	X	X	X	X	X	X	X	X	X	X	X
Province Trends			X										
Firm Fixed Effects				X									
Union Fixed Effects					X								
Cluster by Province						X							
Pro-Union Law Controls							X						
Anti-Union Law Controls								X					
NDP Party Control									X				
Employment Control										X			
Worker and Firm Obligation Control											X		
Share Parsed Clauses Control												X	
Drop Zero-Worker-Rights Clauses													X
Outcome: Number of Worker Rights (log)													X

Note: Coefficients and standard errors of effect of leave-one-out employment rate on worker rights clauses, for different specifications as indicated in table footer. Outcome: Share of worker rights clauses, defined as number of worker rights clauses over the number of all clauses. Treatment: leave-one-out employment rate in a given sector, defined as the logarithmized average over the employment rates in other sectors. Controls: Pro-Union (Anti-Union) Law Controls includes set of separate indicator variables for whether a given law favorable (unfavorable) to unions is in place, see Table 3 in Legree et al. (2017) for list of laws. Employment control controls for log employment rate (own sector). Inference: Standard errors clustered at the province-by-sector level, unless noted otherwise. Single, double, and triple asterisks indicate statistical significance at the 10%, 5%,and 1% levels, respectively. Data sources: Employment and Social Development Canada, Canadian Labor Force Survey.

Figure A.9: Effect of Tax Rate on Worker-Rights Clauses: Pre-Trend Sensitivity Analysis

A. Baseline

B. Sector FE

C. Cluster at Province Level

D. Alternative Estimator

Note: Figure presents sensitivity graphs for potential violation of parallel trends assumption, implementing the method by Rambachan and Roth (2023). Outcome: Share of worker rights (number of worker rights over the number of all clauses). Red bar represents the 90% confidence interval of average of post-reform event study coefficients of tax analysis as displayed in Figure 4 (Callaway and Sant'Anna, 2021). Blue bars represent corresponding confidence intervals when allowing for a non-linearity in the differential trend in the post-treatment periods that is about M times the maximum observed non-linearity in the pre-treatment period. $M = 0$ corresponds to allowing a linear differential trend. $M > 0$ allows for increasingly more varied nonlinear trends. Analogous to Figure 4, Panel A displays is baseline estimator (Callaway and Sant'Anna, 2021), Panel B adds sector fixed effects as control variables, Panel C clusters standard errors at the province level, Panel D implements alternative TWFE estimator by Gardner (2022). Data sources: Employment and Social Development Canada, Center for the Study of Living Standards.

Figure A.10: Income Tax IV: First Stage
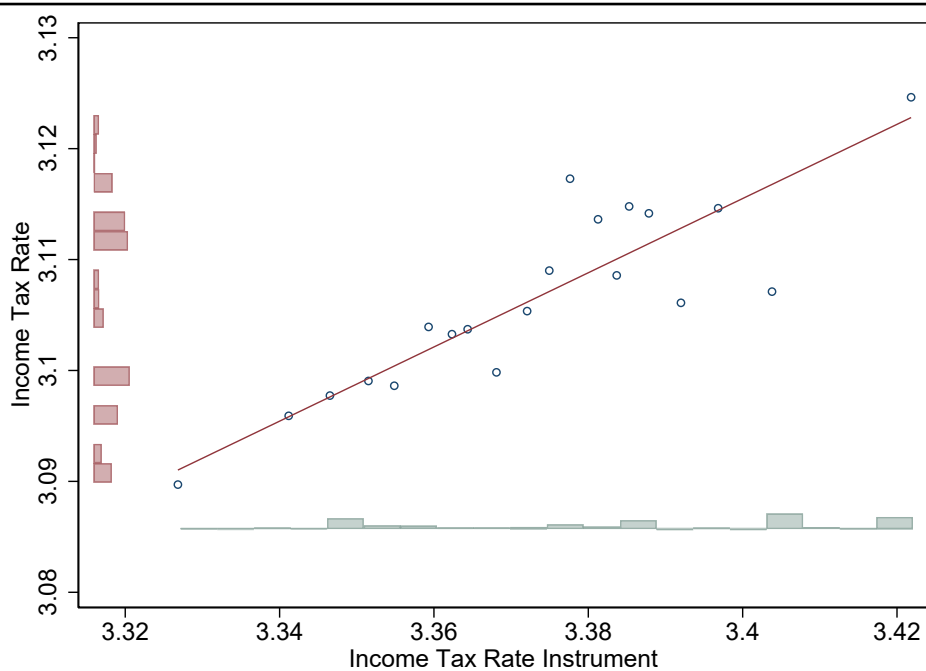
Note: Figure presents first stage binscatter of labour income tax rate (vertical axis) and predicted income tax rate based on lagged rates and exemptions (horizontal axis). Kleibergen-Paap First Stage F-Statistic = 65.08. Controls: Province-by-sector fixed effects and year-by-sector fixed effects. Data sources: Employment and Social Development Canada, Center for the Study of Living Standards, Statistics Canada.

Figure A.11: Effect of Employment Rate on Worker-Rights Clauses: Pre-Trend Sensitivity Analysis
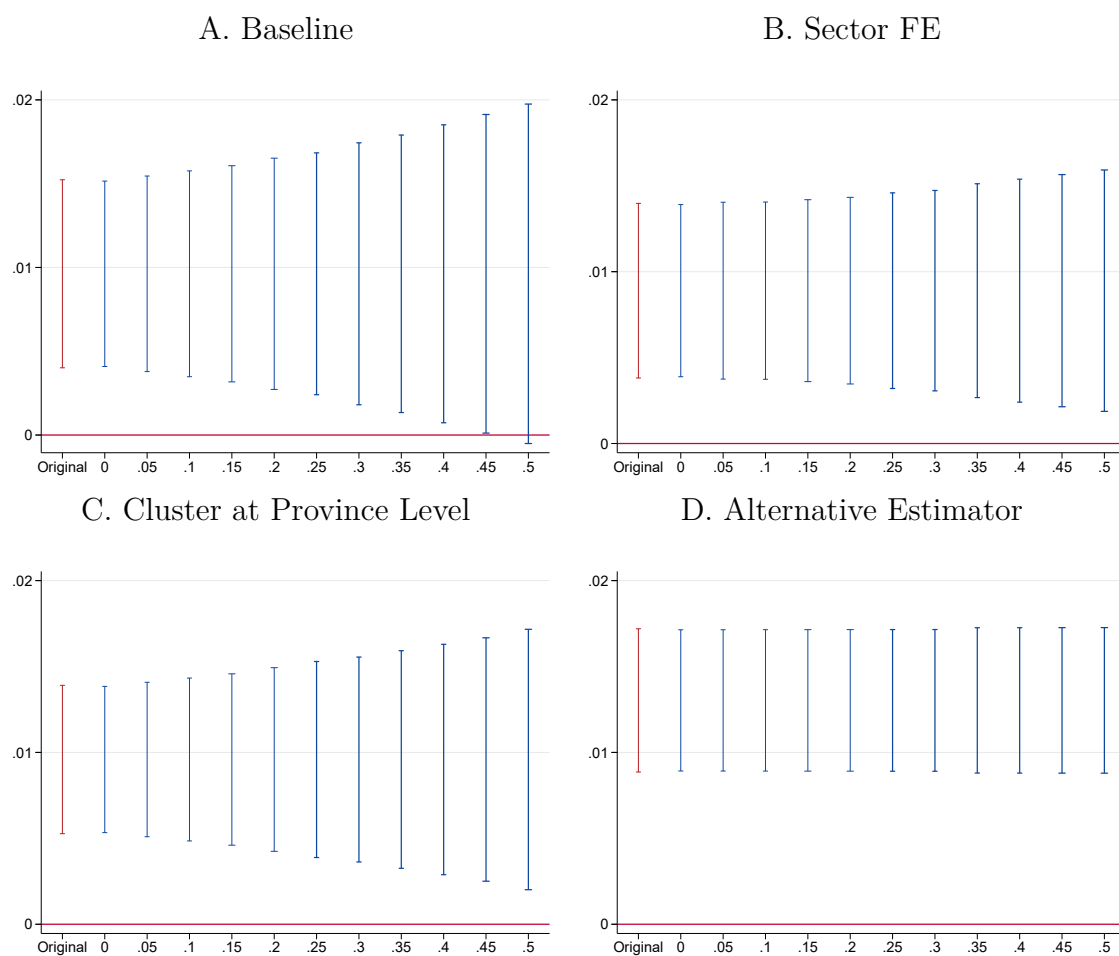

Note: Figure presents sensitivity graphs for potential violation of parallel trends assumption, implementing the method by Rambachan and Roth (2023). Outcome: Share of worker rights (number of worker rights over the number of all clauses). Red bar represents the 90% confidence interval of average of post-reform event study coefficients of leave-one-out employment analysis as displayed in Figure 5 (Callaway and Sant'Anna, 2021). Blue bars represent corresponding confidence intervals when allowing for a non-linearity in the differential trend in the post-treatment periods that is about M times the maximum observed non-linearity in the pre-treatment period. M = 0 corresponds to allowing a linear differential trend. M > 0 allows for increasingly more varied nonlinear trends. Analogous to Figure 5, Panel A displays is baseline estimator (Callaway and Sant'Anna, 2021), Panel B adds sector fixed effects as control variables, Panel C clusters standard errors at the province level, Panel D implements alternative TWFE estimator by Gardner (2022). Data sources: Employment and Social Development Canada, Center for the Study of Living Standards.

Figure A.12: Effect of Labor Income Tax Rates Worker-Rights Clauses by Topic – 30 Topics
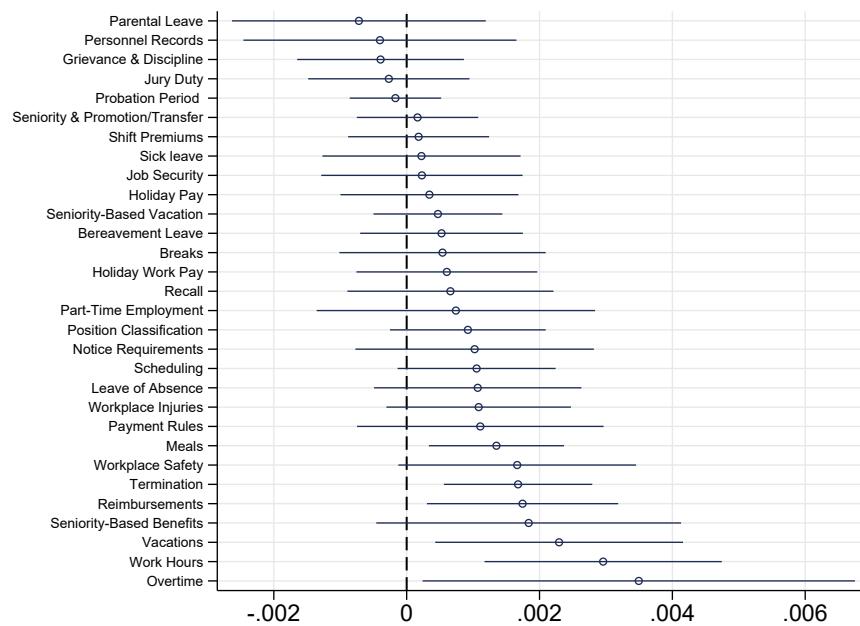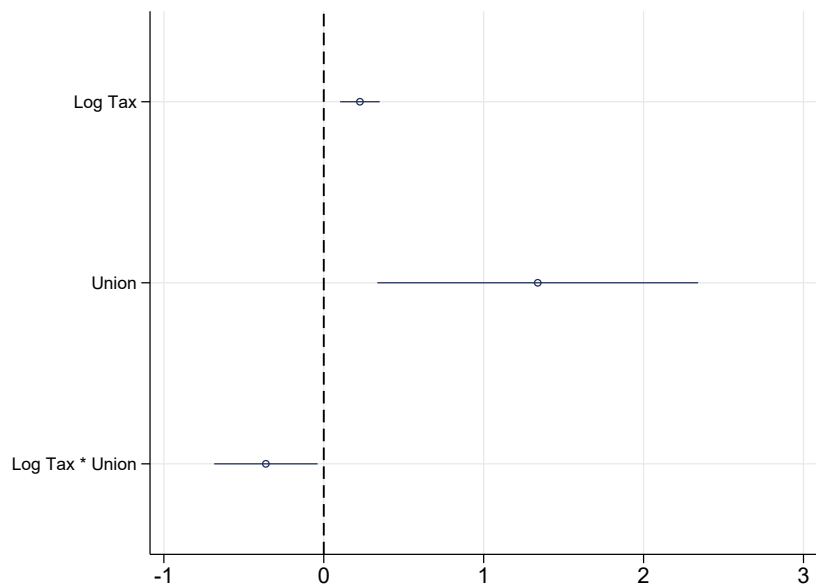

Note: Figure presents coefficients and 95% confidence intervals of effect of labor tax rate on worker right topics. Each coefficient is from a separate OLS regression. Outcome: Share of worker rights clauses that belong to given topic (number of worker rights clauses of topic in question over the number of all clauses). Treatment: Labor tax rate, defined as log of implicit personal income tax rate. Controls: Province-by-sector fixed effects and year-by-sector fixed effects. Inference: Standard errors clustered at the province-by-sector level. Data sources: Employment and Social Development Canada, Center for the Study of Living Standards.

Figure A.13: Effect of Tax Rates on Worker-Rights Clauses, by Substitutability with Wages
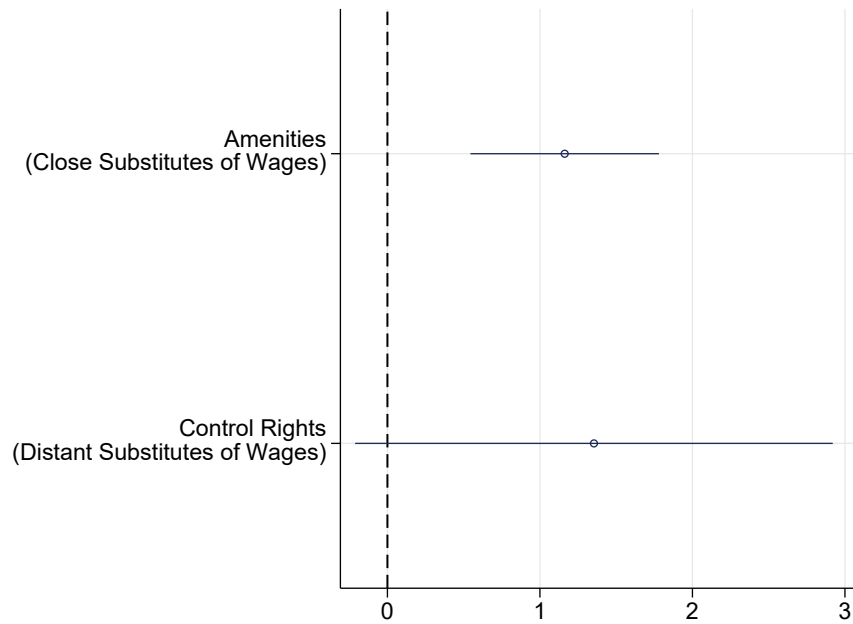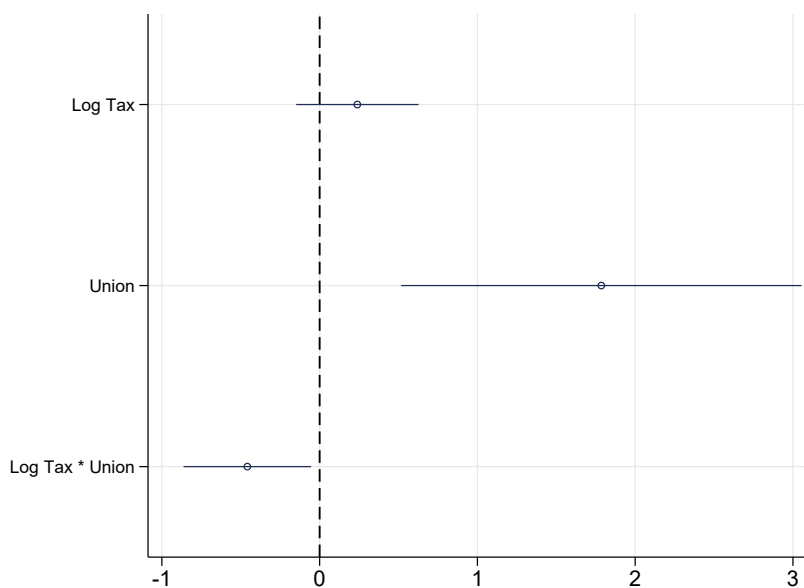

Note: Figure presents coefficients and 95% confidence intervals of effect of log labor tax rate on worker-right topical categories (by substitutability with wages). Substitutability with wages of given topic calculated as the dot-product similarity between the centroid of the topic and the following 20 statements: "Employees shall have ..." incentive-based pay. a commission. a production bonus. a piece rate. a cost-of-living allowance. hazard pay. a uniform allowance. a tool allowance. free room and board. subsidized room and board. paid vacation leave. paid holiday leave. paid sick leave. paid personal leave. overtime pay. shift differential pay. life insurance. health insurance. disability insurance. retirement benefits. 16 topics most (least) close to these statements are grouped in categories of close (distant) substitutes of wages. Each coefficient is from a separate OLS regression. Outcome: Worker right topic, defined as standardized mean of 16 applicable topics, each defined as share of worker rights clauses that belong to given topic (number of clauses of topic in question over the number of all clauses). Treatment: Labor tax rate, defined as log of implicit personal income tax rate. Controls: Province-by-sector fixed effects and year-by-sector fixed effects. Inference: Standard errors clustered at the province-by-sector level. Data sources: Employment and Social Development Canada, Center for the Study of Living Standards.

Figure A.14: Effect of Labor Income Tax Rates and Union Status on Wages

Note: Figure presents coefficients and 95% confidence intervals of effect of labor tax rate, union status, and the interaction of labor tax rate and union status on individual wages. All coefficient are from the same OLS regression. Outcome: Individual wages, defined as worker's logarithmized hourly wage (before taxes and other deductions, but including tips, commission and bonuses). Treatments: Labor tax rate, defined as logarithmized implicit personal income tax rate; union status, defined as indicator variable that equals one if worker is member of a union, and zero otherwise. Controls: Province-by-sector fixed effects, and year-by-sector fixed effects. Inference: Standard errors clustered at the province level. Sample: 1999-2006 (excludes years from the financial crisis 2007 onward). Data sources: Canadian Labor Force Survey, Center for the Study of Living Standards.

Figure A.15: Effect of Labor Income Tax Rates and Union Status on Wages, adding Gallup data
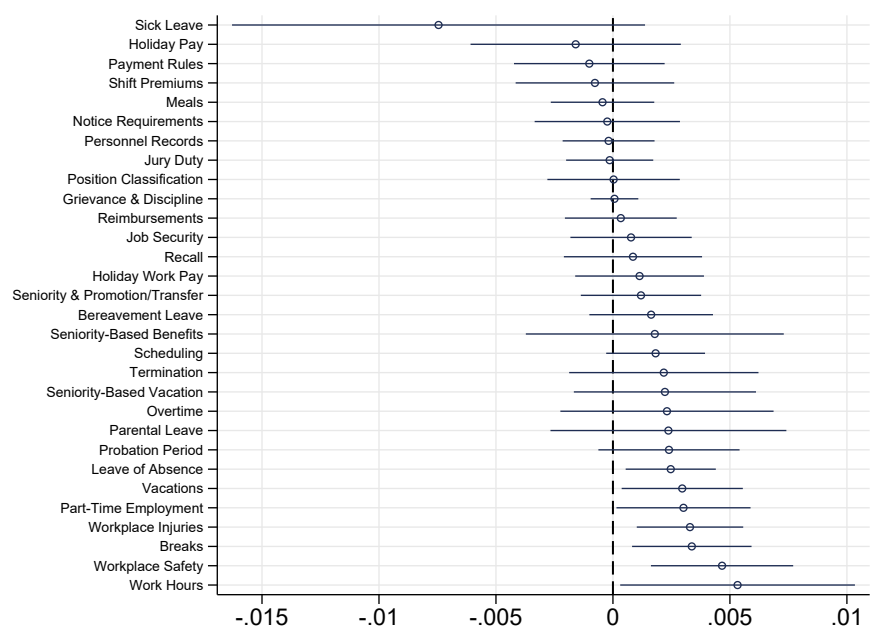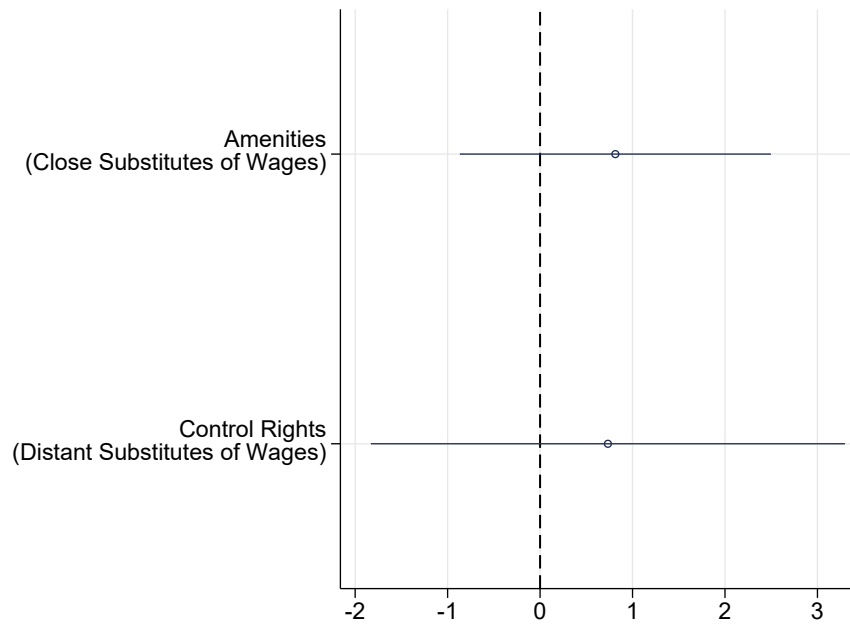

Note: Figure presents coefficients and 95% confidence intervals of effect of labor tax rate, union status, and the interaction of labor tax rate and union status on individual wages. All coefficient are from the same OLS regression. Sample: Merge of Gallup (1986-1996) and Canadian Labour Force Survey (1997-2006). Outcome: Individual wages, defined as worker's logarithmized hourly wage (before taxes and other deductions, but including tips, commission and bonuses). For Gallup, outcome is calculated from harmonized annual income levels (assuming 52 weeks per year and 36 working hours per week). Treatments: Labor tax rate, defined as logarithmized implicit personal income tax rate; union status, defined as indicator variable that equals one if worker is member of a union, and zero otherwise. Controls: Province fixed effects, and year fixed effects. Note that we do not have sector information for Gallup and therefore cannot interact province and year fixed effects with sector (not interacting these fixed effects allows to add data from the Canadian Labor Force Survey for 1997 and 1998 for which we also do not have sector information) . Inference: Standard errors clustered at the province level. Data sources: Canadian Labor Force Survey, Gallup, Center for the Study of Living Standards.

Figure A.16: Effect of Employment Rate on Worker-Rights Clauses by Topic

Note: Figure presents coefficients and 95% confidence intervals of effect of l leave-one-out average log employment rate on worker right topics. Each coefficient is from a separate OLS regression. Outcome: Worker right topic, defined as share of worker rights clauses that belong to given topic (number of clauses of topic in question over the number of all clauses). Treatment: Leave-one-out employment rate in a given sector, defined as the average log employment rates in other sectors in the same province and year. Controls: Province-by-sector fixed effects and year-by-sector fixed effects. Inference: Standard errors clustered at the province-by-sector level. Data sources: Employment and Social Development Canada, Canadian Labor Force Survey.

Figure A.17: Effect of Employment on Worker-Rights Clauses, by Substitutability with Wages

Note: Figure presents coefficients and 95% confidence intervals of effect of leave-one-out log average employment rate on worker-right topical categories (by substitutability with wages). Substitutability with wages of given topic calculated as the dot-product similarity between the centroid of the topic and the following 20 statements: "Employees shall have ..." incentive-based pay. a commission. a production bonus. a piece rate. a cost-of-living allowance. hazard pay. a uniform allowance. a tool allowance. free room and board. subsidized room and board. paid vacation leave. paid holiday leave. paid sick leave. paid personal leave. overtime pay. shift differential pay. life insurance. health insurance. disability insurance. retirement benefits. 16 topics most (least) close to these statements are grouped in categories of close (distant) substitutes of wages. Each coefficient is from a separate OLS regression. Outcome: Worker right topic, defined as standardized mean of 16 applicable topics, each defined as share of worker rights clauses that belong to given topic (number of clauses of topic in question over the number of all clauses). Treatment: Leave-one-out employment rate in a given sector, defined as the average log of employment rates in other sectors in the same province and year. Controls: Province-by-sector fixed effects and year-by-sector fixed effects. Inference: Standard errors clustered at the province-by-sector level. Data sources: Employment and Social Development Canada, Center for the Study of Living Standards.

Figure A.18: Effect of Employment Rates and Union Status on Wages
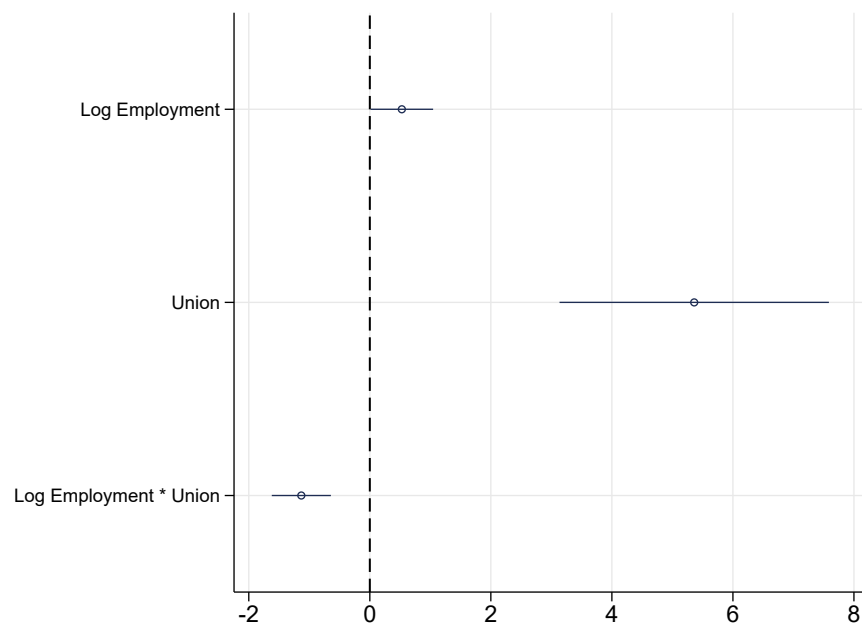
Note: Figure presents coefficients and 95% confidence intervals of effect of employment rate, union status on the interaction of employment rate and union status on individual wages. All coefficient are from the same OLS regression. Outcome: Individual wages, defined as worker's log hourly wage (before taxes and other deductions, but including tips, commission and bonuses). Treatments: Leave-one-out employment rate in a given sector, defined as the average of log employment rates in other sectors in the same province-year; union status, defined as indicator variable that equals one if worker is member of a union, and zero otherwise. Controls: Province-by-sector fixed effects and year-by-sector fixed effects. Sample: 1999-2006 (excludes years from the financial crisis 2007 onward). Inference: Standard errors clustered at the province level. Data source: Canadian Labor Force Survey.

Table A.14: Strike Intensity

	Effect on Strike Intensity				
A. Effect of Tax Rates					
	(1)	(2)	(3)	(4)	(5)
Log Income Tax Rate	0.524	1.076*	1.032*	0.896	1.445**
	(0.339)	(0.588)	(0.574)	(0.781)	(0.699)
R-Squared	0.07	0.08	0.17	0.33	0.14
Number of Observations	24,826	11,405	11,143	9,750	4,468
B. Effect of Employment Rates					
	(6)	(7)	(8)	(9)	(10)
Log Employment Rate	-0.501	0.476	0.239	0.120	2.374**
	(0.581)	(0.931)	(0.989)	(1.450)	(1.121)
R-Squared	0.06	0.07	0.16	0.34	0.12
Number of Observations	29,157	13,652	13,384	11,776	5,993
Sample	All	Private	Private	Private	Private
Province-Sector FEs	X	X	X	X	X
Sector-Year FEs	X	X	X	X	X
Contract Controls			X		
Firm FE				X	
Union FE					X

Note: Coefficients and standard errors of effect of labor tax rate (Panel A) or leave-one-out employment rate (Panel B) on strike intensity, for different specifications as indicated in table footer. Outcome: Strike intensity, defined as square root of number of working days lost to a strike during this contract negotiation. Treatment, Panel A: Labor tax rate is defined as log of implicit personal income tax rate. Treatment, Panel B: Leave-one-out employment rate in a given sector, defined as the average of log employment rates in other sectors in the same province and year. Inference: Standard errors clustered at the province-by-sector level. Single, double, and triple asterisks indicate statistical significance at the 10%, 5%,and 1% levels, respectively. Data sources: Employment and Social Development Canada, Center for the Study of Living Standards, Canadian Labor Force Survey.

B Model Appendix: Collective Bargaining Agreements as Endogenously Incomplete Contracts

This section considers a simple union-firm bargaining model. A contract consists of a wage and a collection of rights to certain amenities. The right to exercise an amenity may conflict with the control over time (e.g. vacations, paid time off, scheduling rules). Management will thus be reluctant to provide high levels of these amenities during the production process. Thus, in order for a worker to have the right to a particular amenity it must be contracted upon *ex ante.* Under the hypothesis that there are some costs associated with adding contract terms, as in Townsend (1979) and Dye (1985), it it is optimal to allocate more valuable amenities to the contract until the costs outweigh the benefits. That is similar to the framework in Mulligan and Shleifer (2005) in the context of regulatory text.

Bargaining is costly, while the number of potential clauses is unlimited. Hence, we can view a contract as a *capital good* with stock K_t in bargaining period t. For simplicity the contract is characterized by the number of clauses of type $t \in T$, where T is given by the clauses in Table .

In principle, there could be an unlimited number of amenities or worker rights, indexed by $i \geq 0$. It is assumed that workers can bargain for amenities $a^w(i) > a^f(i)$ above what the firm would offer. Amenities are normalized such that $a(i) = a^w(i) - a^f(i)$ is the increase in amenities above what the firm would choose in the absence of a contract. This value can come from two sources. First, there are non-production amenities such as paternity leave and vacation time. Second, there are production-related control rights – including the right to refuse some types of work, or the right to organize the pace and manner with which the work is done.

Both non-production amenities and control rights have the feature that the worker does not have to exercise the right. For example, workers that do not have children will not exercise the right for parental leave. Let $\lambda(i)$ be the fraction of workers who will exercise right or amenity i. The value of a contract right depends upon the intrinsic value of the right and the number of individuals who exercise the right. Let $\beta(i) = \lambda(i) a(i)$ be the value of amenity or right i to the union. Without loss of generality, amenities are indexed so that $\beta'(i) < 0$. It is also assumed that $\beta''(i) > 0$ and $\lim_{i \to \infty} \beta(i) = 0$. The cost of rights are normalized to have the same marginal cost c. Amenities are assumed to be workplace public goods, and so their costs do

not increase with firm size, as in Mulligan and Shleifer (2005).

Each amenity $a(i)$ is implemented via a fixed contract clause. It is assumed that clauses are nominally expensive and hence given T clauses, it is efficient to maximize the value of amenities delivered with T clauses. The total value of amenities with a contract of length T is:

$$A(T) = \int_0^T \beta(i)\,di, \tag{3}$$

and hence $A'(T) = \beta(T)$ and $A''(T) = \beta'(T) < 0$.

Workers have constant marginal product p and are paid a uniform wage w, taxed at a rate τ. Workers like rights to actions (including amenities) while employers dislike them with cost $cA(T)$. Union collective bargaining agreements are contracts over wages and ex-ante actions that workers are allowed to take, or amenities that firms must provide. The preferences of the union per worker over wages and amenities is given by a constant elasticity of substitution function:

$$V(T, w) = \left(A(T)^\rho + ((1-\tau)w)^\rho \right)^{1/\rho}, \tag{4}$$

where $\tau \in (0, 1)$ is the personal income tax rate. For this standard CES functional form the elasticity of substitution between amenities and net wages $(1-\tau)w$ is $\sigma = \frac{\rho}{1-\rho}$, where $\rho \in [0, 1]$.

The firm will make an offer to workers of a contract with T amenities, with value $A(T)$ and wage w, denoted by $K = \{T, w\}$. This offer faces a noisy outside option given by the union's strike threat. More precisely, if $V(K) < V^0 + \epsilon$ then workers will go on strike. If the support of ϵ is positive, this ensures that workers get at least V^0.

The timing is:

1. Firms choose the wage w and the number of amenities/rights T, producing a total value of amenities/rights $A(T)$.

2. If $V(K) < V^0 + \epsilon$, the firm strikes and workers get V^0, the outside option. If not, then the union accepts the contract that is then implemented. Production begins.

3. If the action is contracted $(i \leq T)$ then a fraction $\lambda(i)$ of workers choose to exercise the right or amenity $a(i)$. If the action is not contracted, the manager

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chooses the action $a^f(i)$.

4. Production is completed. Utility is realized and wages are paid to workers that are still employed.

Moving to the production function. Let $G(V(K) - V^0) = \Pr[V(K) - V^0(\tau) > \epsilon]$ be the probability that workers do *not* go on strike. It is assumed that when a strike occurs, profits are zero. Assuming constant returns to scale, the profit function of the firm offering contract $K = \{T, w\}$ is

$$\Pi(K) = (pN - wN - c \times A(T)) G\left(V(K) - V^0\right), \tag{5}$$

where N is the size or demand for the firm's product (which is not modeled), p is the product price, w the wage rate, and $c \times A(T)$ is the cost of providing amenities using T contract terms. The firm offers the union/workers efficient contract terms K that minimize costs for a given level of union utility.

To get convenient closed-form solutions, let $G' = g$ on its support $[0, 1/g]$. In that case we have we have $G(x) = gx$, for $0 \leq x < 1/g$ and $G(x) = 1$ for $x \geq 1/g$. This implies that if $V \geq V^0 + 1/g$ then there will be no strike. Thus, the probability of no strike is:

$$\Pr\left[V(K) - V^0 > \epsilon\right] = G\left(V(K) - V^0\right) = \min\left\{1, \max\left\{0, g\left(V(K) - V^0\right)\right\}\right\} \in [0, 1]. \tag{6}$$

Note that this expression shows that the probability of a strike may depend on the value of the contract and of the outside option. We use this to motivate an empirical comparison of strike intensity with taxes. Table A.14 shows evidence that an increase in the local tax rate increases strike intensity, as measured by number of worker days on strike. Hence, $g(V(K) - V^0)$ is decreasing. This can occur either due to more uncertainty (g is smaller) or fewer rents ($V(K)$) is smaller), or both. That supports our interpretation of the shocks.

Now we present our main proposition.

Proposition 1. *Suppose g is sufficiently small, so that there is a positive probability of a strike. At an efficient contract K, the wage as a function of contract terms is:*

$$w^*(1 - \tau) = A(T)\left(\frac{\hat{c}}{N}\right)^{1/(1-\rho)}, \tag{7}$$

where $\hat{c} = c(1 - \tau)$. Hence, an increase in the tax rate τ lowers the wage relative to amenities. Given the number of pro-worker clauses T^*, union utility is

$$V(T^*) = A(T^*) v\left(\frac{\hat{c}}{N}\right),$$ (8)

where

$$v\left(\frac{\hat{c}}{N}\right) = \left(1 + \left(\frac{\hat{c}}{N}\right)^{\rho/(1-\rho)}\right)^{1/\rho}.$$

If both wages and amenities are positive in equilibrium, then the equilibrium level of amenities is given by:

$$A(T^*) = \frac{1}{2}\left\{\frac{pN}{c\left(\left(\frac{\hat{c}}{N}\right)^{\rho/(1-\rho)} + 1\right)} + \frac{V^0}{v(\hat{c}/N)}\right\}$$ (9)

$$= \frac{1}{2}\left\{\frac{pN}{cv(\hat{c}/N)^\rho} + \frac{V^0}{v(\hat{c}/N)}\right\}.$$ (10)

The proof is provided in Appendix B.2.

From (10), we get the following corollary:

Corollary 2. *The number of amenities/rights T^* increases with an increase in the income tax τ, firm size N, firm productivity p, and the worker's outside option V^0.*

This result is consistent with our empirical findings. The model shows that the results follow from an efficiency-minded firm offering a contract to a union subject to a strike threat. One would obtain similar results from an efficient bargaining model, though the magnitudes of the effects will vary with the details.

B.1 Explaining Contract Categories

The previous analysis makes the basic point that if the contract provides unpriced amenities to workers then an increase in the income tax leads to an increase in contracted upon worker rights. This sections discusses the forces that lead to the addition of other clauses in the collective agreement. To simplify matters, clauses are divided into three groups, worker rights, denoted by T^W, firm rights, denoted by T^F, and all other clause, T^O.

The model in the previous section is technically equivalent to supposing that a worker must get an outside option u^0, that implicitly incorporates any cost of strikes. Thus, we may suppose that a worker's utility is given by:

$$U = V\left(T^W, (1 - \tau) w\right) = u^0. \tag{11}$$

From this, we can solve for the wage as $w\left(T^W, \tau, u^0\right)$. It is then assumed that the benefit of contracting to the firm is given by a twice differentiable, concave fixed benefit $\pi\left(\vec{T}\right)$, where the number of worker rights, firm rights and other clauses is given by $\vec{T} = \left\{T^W, T^F, T^O\right\} \geq \vec{0}$. It is assumed to satisfy:

$$\pi\left(\vec{0}\right) = 0, \tag{12}$$

$$\partial\pi/\partial T^i < 0, i = W, F, \tag{13}$$

$$\partial\pi/\partial T^O\left(0, 0, T^{*O}\right) = 0, \tag{14}$$

where $T^{*O} > 0$ is the optimal number of other clauses given that there is a union. The clauses given by T^O provide definitions and basic parameters for the collective agreement. Finally, we assume that clauses are complements:

$$\frac{\partial^2\pi}{\partial T^i\partial T^j}, i \neq j, i, j \in \{W, F, O\}. \tag{15}$$

This assumption can be viewed as a formal implementation of the Simon (1951) model. In that model he assumes that when the worker agrees to employment she give the right to the firm to direct her work. However, such a right cannot be unlimited. For example, the firm might ask the worker for extra hours of work. Thus, any right given to the firm is counter balanced by constraints. Conversely, if the firm gives the worker a right, it might be constrained. For example, the worker may have the right to seek medical attention during the hours of employment. However, to ensure that the visits are necessary, the firm might add the clause that the worker must provide a letter from the doctor. This is an example of where a work right (the right to seek medical treatment) is paired with the firm's right to verify the need for the appointment. This is effect is captured by condition (15).

Combining the benefits from contracting with the firms costs and revenues, firm

profits are given by:

$$\Pi\left(\vec{T}, \tau, u^0\right) = py\left(N\right) + \pi\left(\vec{T}\right) - N \times \cdot w\left(T^W, \tau, u^0\right), \tag{16}$$

where N is the number of workers at the firm. From which we have:

Proposition 3. *At an optimal contract characterized by:*

$$\vec{T}\left(\tau, u^0\right) = \arg\max_{\vec{T} \geq \vec{0}} \Pi\left(\vec{T}, \tau, u^0\right)$$

satisfies $\partial T^i/\partial\tau, \partial T^i/\partial u^0 \geq 0, i = W, F, O.$

Proof. From (11) and (16) it follows that $\partial^2\Pi/\partial\tau\partial T^W, \partial^2\Pi/\partial u^0\partial T^W \geq 0$, and with strict inequality when $T^W > 0$. The assumptions made on $\pi()$ ensure that $\partial^2\Pi/\partial T^i\partial T^j \geq 0$ for $i \neq j, i, j = W, F, O$. Finally, $\partial^2\Pi/\partial\tau\partial T^i = 0, i = F, O$. Hence the profit function satisfies the conditions of theorem 6 of Milgrom and Shannon (1994) that ensures the profit function is supermodular in contract clauses and has increasing differences in τ and u^0. Thus, the proposition follows immediately from theorem 5 of Milgrom and Shannon. $\qquad\square$

This proposition illustrates that the effect of both taxes and the outside option on the number of clauses in a contract is very general. It also implies that as the firm gets larger (N increases) the number of clauses in a contract increases. The relative importance of these effects can be captured by running the regressions in shares. This model predicts that the numbers of clauses T^O and T^F cannot increase without an increase in the number of worker rights. The extent to which these clause varies is an empirical question. When regressions are run in turns of shares, then this provides information on how the relative number of clauses varies with changes in the income tax and outside option.

B.2 Proof of Proposition (1)

Proof. It is assumed that a strike occurs with positive probability, hence $V\left(K|\tau\right) < V^0 + 1/g$. The first order condition for wages is given by:

$$\frac{\partial\Pi}{\partial w} = -gN\Delta V + MR \times g\frac{\partial V}{\partial w} = 0,$$

where $\Delta V = V(K|\tau) - V^0 > 0$. This inequality follows from the fact that product price is sufficiently high that profitable production is possible. The marginal revenue from production is given by $MR = (p \times N - w \times N - c \times A(T))$.

This implies:
$$\frac{\partial V}{\partial w} = \frac{N \times \Delta V}{MR}.$$

We get a similar formula for the level of amenities, T:

$$\frac{\partial \Pi}{\partial T} = -c \times A'(T) \times g \times \Delta V + MR \times g \frac{\partial V}{\partial T} = 0,$$

and thus:

$$\frac{\partial V}{\partial T} \frac{1}{cA'(T)} = \frac{\Delta V}{MR}.$$

From this we get:
$$\frac{cA'(T) \times \partial V/\partial w}{\partial V/\partial T} = N. \tag{17}$$

Next we compute the effects on union utility:

$$\frac{\partial V}{\partial w} = V^{(1-\rho)} \times \{(1-\tau)w\}^{\rho-1}(1-\tau),$$
$$\frac{\partial V}{\partial T} = V^{(1-\rho)} \times \{A(T)\}^{\rho-1} A'(T).$$

We can plug these back into (17). Notice that the $A'(T)$ drops out and we get (using the fact that $\rho < 1$):

$$\frac{cA'(T) \times V^{(1-\rho)} \times w^{\rho-1}(1-\tau)^{\rho}}{V^{(1-\rho)} \times \{A(T)\}^{\rho-1} A'(T)} = N,$$

or

$$\frac{w}{A(T)} = \frac{c^{1/(1-\rho)}(1-\tau)^{\rho/(1-\rho)}}{N^{1/(1-\rho)}}, \tag{18}$$

$$w(1-\tau) = A(T)\left(\frac{\hat{c}}{N}\right)^{1/(1-\rho)}, \tag{19}$$

where $\hat{c} = c(1-\tau)$, which gives us (7).

Putting this into union preferences gives us:

$$V^* (T) = \left(A(T)^\rho + \left\{ A(T) \left(\frac{\hat{c}}{N} \right)^{1/(1-\rho)} \right\}^\rho \right)^{1/\rho},$$

$$= A(T) \left(1 + \left(\frac{\hat{c}}{N} \right)^{\rho/(1-\rho)} \right)^{1/\rho},$$

$$= A(T) \, v(\hat{c}),$$

where

$$v(\hat{c}) = \left(1 + \left(\frac{N}{\hat{c}} \right)^{\rho/(1-\rho)} \right)^{1/\rho}.$$

To compute the optimal contract length we substitute (7) and (8) into the profit function:

$$\Pi(T) = \left(pN - \left(\left(\frac{\hat{c}}{N} \right)^{1/(1-\rho)} \times \frac{N}{(1-\tau)} + c \right) \times A(T) \right) \times G\left(V(T) - V^0 \right).$$

Given that a monotonic transformation does not change the optimization problem, we can divide by g (we have assumed that strikes occur with positive probability) to get:

$$\hat{\Pi}(T) = \left(pN - \left(\left(\frac{\hat{c}}{N} \right)^{1/(1-\rho)} \times \frac{N}{(1-\tau)} + c \right) \times A(T) \right) \times \left(V(T) - V^0 \right).$$

The first order condition is:

$$0 = \frac{d\Pi}{dT} = - \left(\left(\frac{\hat{c}}{N} \right)^{1/(1-\rho)} \times \frac{N}{(1-\tau)} + c \right) \times A'(T) \left(V(T) - V^0 \right) +$$

$$\left(pN - \left(\left(\frac{\hat{c}}{N} \right)^{1/(1-\rho)} \times \frac{N}{(1-\tau)} + c \right) \times A(T) \right) A'(T) \, v(\hat{c}).$$

The A' terms drop out. Let:

$$h\left(\tau, N\right) = \left(\left(\frac{\hat{c}}{N}\right)^{1/(1-\rho)} \times \frac{N}{(1-\tau)} + c\right)$$

$$= c\left(\left(\frac{\hat{c}}{N}\right)^{\rho/(1-\rho)} + 1\right).$$

Then we get

$$h\left(\tau, N\right)\left(A\left(T\right) v\left(\hat{c}\right) - V^0\right) = \left(pN - h\left(\tau, N\right) A\left(T\right)\right) v\left(\hat{c}\right)$$

$$2h\left(\tau, N\right) A\left(T\right) = pN + V^0 h\left(\tau, N\right) / v\left(\hat{c}\right).$$

Thus we have:

$$A\left(T^*\right) = \frac{1}{2}\left\{\frac{pN}{h\left(\tau, N\right)} + \frac{V^0}{v\left(\hat{c}\right)}\right\}$$

and we get the following expression for optimal contract length:

$$A\left(T^*\right) = \frac{1}{2}\left\{\frac{pN}{c\left(\left(\frac{\hat{c}}{N}\right)^{\rho/(1-\rho)} + 1\right)} + \frac{V^0}{v\left(\hat{c}/N\right)}\right\}$$

$$= \frac{1}{2}\left\{\frac{pN}{cv\left(\hat{c}/N\right)^\rho} + \frac{V^0}{v\left(\hat{c}/N\right)}\right\}.$$

Clearly, the right hand side is increasing in V^0, p and N, and decreasing in c and $(1-\tau)$. Since the left-hand side is monotonically increasing in T^*, we have the needed comparative statics. $\square$

C List of Worker Rights Clauses by Topic

This appendix provides ten example clauses for each of the topics extracted for worker rights clauses. The topics are listed in the order from Table 3. At the end, the two miscellaneous occupation-specific topics for teachers, which were dropped from the main analysis, are listed. For each topic, we recap the title, wage-similarity score, topic share, and GPT-4 summary. The 10 listed clauses are those used to construct that GPT-4 summary.

1. **Grievance & Discipline** 0.15900 0.031 The clauses provide workers with rights related to disciplinary actions, grievance procedures, and representation, ensuring transparency, due process, and the ability to challenge or appeal employer decisions.

   - 1. More severe disciplines will be purged from the employee's personnel file after twenty-four (24) months if the employee receives no additional disciplinary actions, of a similar nature, during that period.

   - 2. in such cases, employees shall be offered an irrevocable choice of either a formal or informal investigation.

   - 3. The claim by an employee, other than a probationary employee, that he has been suspended or discharged without just cause may be presented as a grievance within seven (7) calendar days after the employee has been notified of his suspension or discharge and such grievance will be processed in the following manner:

   - 4. An employee wishing to dispute any such entry shall be entitled to recourse through the grievance procedure.

   - 5. If the complaint affects the rate of pay of an employee, the Department Steward shall be informed.

   - 6. If the Employer representative is unable to meet the Steward during the Steward's normal working hours, the Steward shall be paid for all the time spent during the processing of the grievances with the Employer on the Employer's property or at any other place which is mutually agreed upon by both the Union and the Employer.

   - 7. If no written decision has been given to an employee at Step No. 1 within the time limits specified above, the grievance will be settled in favour of

the grievor provided that such settlement shall not prejudice any future such complaint or grievance, or the employee shall be entitled to submit the grievance to the next stage including arbitration.

- 8. The names of the Grievance Committee, Chairman and Stewards, or where absent a substitute, from time to time selected shall be given to the Home in writing and the Home shall not be required to recognize any steward until it has been notified in writing by the Union of the name of same.

- 9. The employee and the Union will be given a copy of any warning, reprimand, suspension or disciplinary layoff entered on any employee's personnel record, within two (2) working days of the alleged violation becoming known to the Company.

- 10. 5.1 A newly hired employee shall be informed in writing whether his or her position is within the bargaining unit, the name and address of the bargaining agent and the name and work location of the local Union steward which shall be provided as per Article 22.5.4 (Grievance Procedure).

2. **Job Security** 0.16773 0.03 The clauses provide workers with rights related to job security and stability, including provisions for notification and options in the event of workforce adjustments, opportunities for training or retraining, recall rights for seasonal or displaced employees, and protections for seniority and pay rate in cases of job changes or redundancies.

    - 1. If the position is affected by a workforce adjustment, the employee will be notified and provided with an opportunity to exercise her options under Article 34 unless otherwise agreed by the parties.

    - 2. Where a nurse receives training under this provision, she or he need not be considered for any further vacancies for a period of six (6) months from the date she or he is placed in the position.

    - 3. 36.7 Recall Subject to the establishment of labour requirements for the following season, seasonal employees will be offered seasonal employment for the subsequent work season by the employer.

    - 4. Such reinstatement or placement will be without loss of seniority and at not less than the same rate of pay to which the employee would be entitled

had she remained in her former position.

- 5. Any employee who is declared redundant to a work location shall be given the option of transferring to the first available position of equal classification or be demoted to the next lower classification.

- 6. The nurse shall be reinstated to her former position unless the position has been discontinued in which case she shall be given a comparable job.

- 7. An employee who is displaced by technological change or mechanization shall be given the opportunity to fill another vacancy if capable of doing so and according to seniority or be given a period of training sufficient to perfect or acquire the skills necessitated by the new methods of operation.

- 8. If an Employee has moved into an area to work on a project and his employment has been terminated, and such Employee does not remain in the area sixty (60) days after termination to qualify as a local resident, and such Employee is hired by the aforementioned Employer or a new Employer, such Employee shall be treated as a non-resident for all purposes and conditions of this Agreement.

- 9. b) Employees with recall-reinstatement rights will be offered the position in accordance with Article 79.02 c)

- 10. Such regularly assigned employees shall be protected by guarantee providing they take up their new assignment within the first cycle of operation of the run of their choice commencing from the date of selection.

3. **Recall** 0.17688 0.032 The clauses provide rights related to job security and recall for workers who have been laid off, including options to accept vacant positions, refuse temporary recalls without penalty, and priority for rehiring in their former or equivalent positions if they become available.

- 1. Employees who are laid off will be entitled to recall to classifications in their OGL for a period of three (3) years frorn the date of his/her layoff.

- 2. When an Employee has been given notice of lay-off, the Employee has the option of: a) Accepting a vacant position, if available, provided the Employee meets the minimum requirements to perform the position.

- 3. An employee who has been recalled to such temporary vacancy shall not be required to accept such recall and may instead remain on lay-off.

- 4. Whenever it becomes necessary to reduce the work force, the employee affected shall be given

- 5. Tradesmen not working at their trade and all other employees involved will receive the established shutdown rate.

- 6. An employee who has been recalled to such temporary vacancy shall not be required to accept such recall and may instead remain on layoff.

- 7. An employee recalled to work in a different classification from which she was laid off, or an employee who has displaced an employee in a lower or identical paying classification shall be entitled to return to the position she held prior to the layoff should it become vacant within six (6) months of the layoff, provided that the employee remains qualified and able to perform the duties of her former position.

- 8. No new employees shall be hired until all those laid off have been given an opportunity to return to work and have failed to do so, in accordance with the loss of seniority provision, or have been found unable to perform the work available.

- 9. An Owner/Operator who receives a notice of lay-off (a)

- 10. a full-time employee who has displaced a part-time employee shall be entitled to return to the position he held prior to the layoff should it become vacant within twenty-four (24) months of the layoff, provided that the employee remains qualified and able to perform the duties of his former position.

4. **Notice Requirements** 0.17505 0.027 The clauses provide workers with rights to receive advance notice regarding absences, layoffs, job vacancies, shutdowns, and meetings, ensuring they have adequate time to prepare for changes in their employment status or work conditions.

   - 1. Where possible, the Employer will be provided with two weeks notice of such absences.

   - 2. he/she shall be paid schedule wages for the time in excess of 10 days whatever the decision might be.

   - 3. Written notice of the proposed shutdown shall be given to the Union not later than two (2) weeks in advance of the shutdown date, in the event

an Employee is included in the shutdown, the employee will be paid his accumulated Vacation Pay, if any in the accrued amount to the end of the pay period immediately proceeding the shutdown.

- 4. Unlicensed personnel will receive a notice of seventy-two (72) hours prior to joining the ship unless exceptional circumstances arise.

- 5. Each employee who applies for a posted vacancy during the seven (7) day posting period will be notified in writing of the disposition of her application.

- 6. Employees in these categories will receive twenty-four (24) hours written notice of lay- off).

- 7. Where practical, the employee shall receive a minimum of one (1) day's notice of such a meeting and shall be informed of the reason for it.

- 8. Employees with ten (10) years continuous service, shall receive forty (40) working days notice.

- 9. Such employees for whom no employment is available will be given at least thirty (30) days notice of separation.

- 10. In the event of a permanent layoff as defined in the Employment Standards Act, all employees to be laid-off will be given at least eight (8) weeks notice of lay-off.

5. **Jury Duty** 0.17799 0.009 The clauses provide rights to workers for compensation or pay adjustments when they are required to serve on jury duty or appear in court as witnesses, ensuring they are not financially disadvantaged for fulfilling these civic duties.

- 1. No jury duty pay will be allowed for any day which the employee is entitled to vacation or general holiday pay.

- 2. Any regular full-time employee who is required to report for Jury Duty, Coroner's Inquest, or who is required to appear as a Crown Witness, on a day on which he would normally have worked, will be reimbursed by the Company for the difference between the pay received for Coroner's Inquest, Jury or Witness Duty and his regular straight time hourly rate of pay for his regularly scheduled hours of work necessarily lost.

- 3. An employee when called for jury duty or subpoenaed as a witness shall be paid full salary.

- 4. 17.01 An employee who is selected for service as a juror or subpoenaed as a witness will be compensated for loss of pay from his regularly

- 5. An employee who is summoned for jury duty and is required to lose time from his assignment as a result thereof, shall be paid for actual time lost with a maximum of one basic day's pay at the straight time rate of his position for each day lost, less the amount allowed him for jury duty for each such day excluding allowances paid by the court for meals, lodging or transportation, subject to the following requirements and limitations: (i)

- 6. 12.01 Each seniority employee who is summoned to and reports for jury duty, or as a court witness, as prescribed by applicable law (subject to the eligibility requirements in (a), (b), and (c)), shall be paid by the Company the difference between the employee's regular base rate, exclusive of premiums, for the number of hours up to eight (8), regardless of shift that he otherwise would have been scheduled to work: and the daily jury fee paid by the Court (not including travelling allowance or reimbursement of expenses).

- 7. The 14.14 Appearance in Court An employee summoned to appear or required to ~rve jury duty, or one who has been served with a subpoena to appear aS a witness, shall be paid the difference between what he would have earned for his scheduled hours at his paid rate and the court fee received.

- 8. Any employee will be compensated for time spent as a witness on behalf of the Company to a maximum of the basic work day or basic work week.

- 9. Any regular full-time employee who is required to perform Jury Duty, or who is subpoenaed to serve as a witness in a Court action or Coroner's Inquest, save and except actions involving the Company or Trade Unions, unless subpoenaed by the Crown, on a day on which he would normally have worked, will be reimbursed by the Company for the difference between the pay received for such duty and his regular straight time hourly rate of pay for his regularly scheduled hours of work.

- 10. No employee shall be entitled to receive such pay where the employee is summoned to give evidence in any civil litigation to which the City is not a Party, or where the employee is summoned to give evidence in a criminal case, or when the employee is the person charged in any court, unless such criminal case arises out of actions by the employee in the course of their employment.

6. **Personnel Records** 0.17894 0.024 The clauses provide workers with the right to access, copy, and be informed about their personal and employment-related documents, including personnel files, job assignments, employment letters, disciplinary documents, and performance reviews.

   - 1. The employee shall be entitled to make a copy of any information contained in their personnel file.

   - 2. ITie employee will be provided with a written confirmation of the information provided Ir&rr to ArtMe ll.lJ

   - 3. For call-outs, Employees will be informed of the specific job(s) to be performed when called by the Company.

   - 4. A Teacher shall be entitled upon request, to copies of materials contained in his/her personnel file.

   - 5. On written request the employee shall be provided with a copy of any such personal material.

   - 6. Employees shall receive a letter of employment which will include the Employee's: a) b) c)

   - 7. An employee shall be given a copy of any such document placed on the employee's file which might be the basis of disciplinary action.

   - 8. Immediate Supervisor" means that person from whom an Employee normally receives her work assignments.

   - 9. In the event that a written report is required by the employee, the employee will be given a copy of any written complaint while protecting the identity of the complainant.

   - 10. 26.01 Employee Performance Review When a formal review of an employee's performance is made, the employee concerned shall be given

an opportunity to discuss, sign and make written comments on the review form in question and the employee is to receive a signed copy to indicate that its contents have been read.

7. **Seniority & Promotion/Transfer** 0.17922 0.03 The clauses are granting workers rights related to job preference, promotion, and transfer based on seniority, qualifications, and experience.

   - 1. Such employees will be given preference in the hiring process.
   - 2. The most qualified employee, as determined by the Employer, shall be selected.
   - 3. In transfers from one job classification to another, senior employees shall receive first consideration.
   - 4. An employee who is bypassed in favour of an employee with less seniority to fill vacant job, shall be notified in wnting as to the reason@)
   - 5. When less than 1/4 of the department manpower is needed, senior employees from the above mentioned departments who request work, will be given the opportunity to work if they have the skill and ability to perform the job.
   - 6. The experience, not treated as classification seniority, the employee has received in the position he/
   - 7. In departments other than the Trucking Department, in the event of shift changes of more than two hours, senior employees within the classification and within the department shall be given shift preference.
   - 8. 11.03 Employees shall be selected for positions under Article .O1
   - 9. The employee, where appointed, will be given assistance and instruction in the higher rated job.
   - 10. Such employee will be given a seniority date on the full time employees' seniority list, which will reflect the amount of his full time seniority determined in accordance with the foregoing formula.

8. **Parental Leave** 0.18385 0.027 The clauses provide rights related to maternity and parental leave, including paid and unpaid leave, allowances, and special considerations for employees who are pregnant or adopting a child.

- 1. After completion of 6 months continuous employment, an employee who provides the Employer with proof that she has applied for and is in receipt of unemployment insurance benefits pursuant to Section 18, Unemployment Insurance Act, shall be paid a maternity leave allowance in accordance with the Supplementary Unemployment Benefit Plan.

- 2. An employee who adopts a child under the laws of the province or becomes the natural parent of a child is entitled to parental leave to a maximum of 37 continuous weeks in the event that: 9.6(g) (i)

- 3. a pregnant employee takes a Maternity Leave to which she is entitled pursuant to the Employment Standards Act, and Sec.

- 4. the CFO transitional allowance, for each week of the waiting period, less any other monies earned during this period; and (ii) for each week that the employee receives a maternity benefit under Employment Insurance or the Québec Parental Insurance Plan, she is eligible to receive the difference between ninety-three percent (93%) of her weekly rate of pay and, where applicable, the CFO transitional allowance, and the maternity benefit, less any other monies earned during this period which may result in a decrease in her maternity benefit to which she would have been eligible if no extra monies had been earned during this period.

- 5. On the occasion of the birth of his child, a male Nurse shall be granted, on request, special leave with pay to a maximum of one (1) day during the confinement of his spouse.

- 6. An Employee who has completed her probationary period shall, upon written request, be granted leave without pay for up to twelve (12) months as necessary for the purpose of adopting a child.

- 7. An employee who is pregnant and has completed six (6) months or more consecutive service shall be entitled to maternity leave without pay for a period not to exceed fifteen (15) weeks.

- 8. An employee who chooses not to take parental leave is entitled to a Day off with pay when their child is born or adopted, provided they were scheduled to work that day.

- 9. An employee who becomes pregnant shall, upon request, be granted maternity leave without pay for a period beginning before, on or after the

termination date of pregnancy and ending not later îhan twenty-seven (27) weeks after the termination date of pregnancy, subject to the Paternity Leave Without Pay clause 17.09.

- 10. Employees who are pregnant shall not be required to operate VDTs.

9. **Probation Period** 0.18385 0.015 The clauses provide rights related to the recognition and crediting of probationary periods for employees, including extensions, credit for previous service, and exemptions from additional probationary periods for certain transfers or promotions.

- 1. It is mutually agreed between the parties that the probationary period may be extended a further period not exceeding three (3) months and in such event the employee and the Union shall be notified in writing of such extension.

- 2. Following successful completion of the employee's probationary period, the employee shall be placed on the seniority list and will be credited with seniority at the date of hiring in the Caretaking and Maintenance Department (prorated for under twenty (20) hours per week) and the employee will be notified in writing of the employee's change of status.

- 3. a nurse who has been transferred to the Hospital and who has not completed her or his probationary period at the Hospital where she or he was formerly employed shall receive credit for her or his service during such probationary period, and shall complete the balance of the probationary period required by this agreement.

- 4. A nurse who transfers from casual part-time or full-time to regular part-time status shall not be required to serve a probationary period where such nurse has previously completed one since her or his date of last hire.

- 5. (b)A nurse who transfers from casual or regular part-time to full-time status shall not be required to serve a probationary period where such nurse has previously completed one since her or his date of last hire.

- 6. 12.01 Probationary Period Probationary periods are outlined in Appendices E, K, L and M. 12.02 Coverage Under the Collective Agreement During the Probationary Period During the probationary period provided

for in Clause 12.01, an employee is entitled to the advantages provided for in the present Collective Agreement, except as otherwise provided.

- 7. During the probationary period, employees shall be entitled to all rights and privileges of this Agreement, except with respect to discharge and annual vacation which may be taken during the probationary period with the approval of the Employer and which would result in an extension of the probationary period in time equal to that taken in annual vacation.

- 8. A nurse who transfers from casual or regular part-time to full-time status shall not be required to serve a probationary period where such nurse has previously completed one since her or his date of last hire.

- 9. Service Letter: At the termination of employment, employees who have completed their probationary period will be given a letter, upon request, showing his term of service and capacity in which employed.

- 10. A temporary full-time employee entering a full-time permanent position will not be required to serve a probationary period provided the employee held and worked in the identical full-time temporary position for at least twelve (12) months immediately prior to entering the full-time permanent position.

10. **Bereavement Leave** 0.18957 0.028 The clauses provide workers with bereavement leave, allowing them time off, often with pay, to grieve and attend funerals following the death of a close relative or family member.

   - 1. A part-time employee shall be granted bereavement leave in accordance with Article

   - 2. In the event the funeral is held on an employee's regular work day other than the three (3) days immediately following the day of death, the employee will be granted upon request, leave on that day to attend the funeral.

   - 3. An employee who has not completed three (3) consecutive months of continuous employment shall be granted bereavement leave without pay on any of the scheduled working days that occur during the three (3) days immediately following the day of the death of a close relative.

- 4. a full time employee will be granted one (1) days leave of absence with pay to attend the funeral.

- 5. Bereavement Leave Employees shall be granted up to five (5) working days for absence occasioned by the death of a relative.

- 6. An employee shall be granted up to five (5) regularly scheduled consecutive work days' leave without loss of salary or wages in the case of death or serious illness in the immediate family, defined as spouse, child, mother, father, brother, sister, mother-in-law, father-in-law, grandmother, grandfather, step-parent, step-child, grandchild, court appointed ward, court appointed guardian.

- 7. Teachers shall be granted compassionate leave with pay in the event of the death or serious illness of spouse, mother, father, brother, sister, son, daughter, step-parent, stepchild, parent-in-law, brother-in-law, sister-in-law, son-in-law, daughter-in-law, grandparent, grandchild, aunt, uncle, niece and nephew and a maximum of one day leave with pay will be granted to attend the funeral of the grandparent, grandchild, niece or nephew of the teacher's spouse.

- 8. 12.04 – Bereavement Leave Any employee who notifies the Hospital as soon as possible following a bereavement will be granted bereavement leave for three (3) consecutive working days off without loss of regular pay from regularly scheduled hours, in conjunction with the death of the spouse, child, parent, sister, brother, mother-in-law, father-in-law, grandparent, grandchild, brother-inlaw, sister-in-law or grandparent of spouse.

- 9. Employee would be paid bereavement leave for Wednesday and Thursday.

- 10. Upon the death of a nurse's mother-in-law, father-in-law, brother, sister, brother-in-law, legal guardian, grandparent, sister-in-law, grandchildren, son-in-law or daughter-in-law, a nurse shall be granted up to three (3) continuous calendar days without loss of pay.

11. **Part-Time Employment** 0.20145 0.023 The clauses are providing rights related to compensation, work hours, seniority, and benefits for part-time employees.

- 1. For 'the purposes of the rate progression scale, a 9 part-time employee will receive credit for a week of service " fi when he works his scheduled hours in any week.

- 2. Eligible part-time employees shall be compensated as follows:

- 3. Part-Time Employees who report to work for any shift will be guaranteed at least four (4) hours of work, or if no work is available, will be paid at least four (4) hours.

- 4. An employee who has elected to work part-time shall be entitled to a pro-rated gratuity based on the proportion of time the employee works relative to full-time employment.

- 5. In the event any full-time employee exercises his right under Section 21.04 and noves to another classification or moves to another department, said employee shall be given the 2,501-hour level for the first eight (8) weeks (300 hours), the 3,001-hour level for the next eight (8) weeks (300 hours) and the top rate thereafter in that classification.

- 6. 58.04 Part-time employees shall be paid at the hourly rate of pay for all work performed up to seven decimal five (7.5) hours in a day or thirty-seven decimal five (37.5) hours in a week.

- 7. The employee will be given credit in his seniority for his continuous service and will be entitled to the app licabl e part time rate of pay.

- 8. Regular part-time employees in a probationary period shall receive 12% in lieu of all benefits including annual vacations, general holidays and sick leave.

- 9. A part-time nurse who changes status to full-time will be given seniority credit on the basis of fourteen hundred (1400) paid hours of part-time service being equivalent to one (1) year of fulltime service and vice versa.

- 10. 4.2.1 Part-time employees shall be paid on the salary scale of the group to which they are assigned and progression shall occur at 1040 or 2080 (which ever is applicable

12. **Work Hours** 0.20458 0.058 The clauses provide workers with rights to guaranteed minimum pay for short-notice work, overtime compensation, pay for

additional duties or hours beyond their regular schedule, and specific pay rates for work under certain conditions or times.

- 1. In the event a part-time Employee is called in for extra work and no work is available, that Employee will be paid a minimum of three (3) hours.

- 2. Employees who normally work less than thirty-five (35) hours over five (5) days, shall be compensated at 1.5 times their hourly rate for the first two hours and double their hourly rate after that time for work performed on a sixth or seventh day.

- 3. The employee will be paid for each hour or part hour worked, rounded to the nearest fifteen (15) minutes to the Employer's advantage at the wage rates specified in the Appendix to this agreement.

- 4. If Tour Workers are asked to remain after their shift is scheduled to end, to put on felt, they shall be paid for the time worked plus three (3) hours.

- 5. Employees shall be paid two times' (2x) the Employee's regular hourly rate for time worked in excess of forty eight (48) hours in any work week.

- 6. Where a nurse attends a committee meeting outside of regularly scheduled hours, she or he will be paid for all hours spent in attendance at meetings at her or his regular straight time hourly rate.

- 7. In each instance the employee will be compensated at his single hourly rate not exceeding eight (8) hours for such travelling time in any twenty-four (24) hour period.

- 8. A shift employee wol1ting berwecn 1600 to 0800 llours and for all hours worked on a Sunday shall be paid as follows:

- 9. Therefore, the Non-Permanent employee would receive 5.5 hours of statutory pay.

- 10. If an employee is suspended for a day and his shift is more than eight (8) hours, the employee will be given the option of making up the hours in excess of eight (8) on another day in the week of suspension.

13. **Reimbursements** 0.20510 0.022 The clauses provide workers with rights to compensation and allowances for time spent and expenses incurred due to work-related travel, delays, and use of personal vehicles for work purposes.

- 1. When the transportation provided by the Employer for the conveyance of Employees is delayed by circumstances beyond the control of the Employees, the Employees shall be paid for all such time, up to a limit of two (2) hours at the Classification Basic Hourly Rate.

- 2. When an employee has been notified prior to leaving his place of residence not to report for work, the two (2) hours reporting time in paragraph (I) shall not apply, If on any project work cannot proceed due to shortage of mataid or other reason within the control of the Company, men living away f h m home will either be returned home (Le,) paid travel expense, travel time & subsistence allowance for travel day out and when requested to retum to job site shall be paid same when returning to work) or at the option of the Employer and with the consent of the employees will be paid three (3) hours and subsistence if applicable for the days that the work is delayed.

- 3. In such a case, employees who use their own vehicles will be paid thirty-five (35) cents per kilometer.

- 4. 3.06.1 Report Time Operators shall be paid the following report time for taking trolley coaches or motor buses out of the garage to operate in regular scheduled service and charter runs:

- 5. A n employee authorized by his Department Head to use his personal automobile in the performance of his duties shall be paid as follows:

- 6. An An Operator performing Tour or Multi-day Charter work requiring expense money will receive an advance from the Company for all reasonable expenses which will be incurred during such trip.

- 7. Employees on out-of-town assignments who require overnight accommodation shall receive in addition to the per diems in Article 12.2.1, first class, single accommodation, equivalent to AAA (American Automobile Association) or CAA (Canadian Automobile Association) standards.

- 8. Such Employee shall be reimbursed for a round trip between the Hospital and his home a t

- 9. Any employee covered by this Collective Agreement, authorized by the Director or designate to travel as part of the job, shall be paid a travelling allowance per kilometre ae approved from time to time by the Board.

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- 10. When the transportation provided by the Employer for the conveyance of employees is delayed by circumstances beyond the control of the employees, the employees shall be paid for all such time, up to a limit of two (2) hours at the applicable straight time rate.

14. **Breaks** 0.20653 0.013 The clauses are granting workers the right to paid rest and wash breaks during their work shifts.

  - 1. All employees shall be granted five (5) minutes wash time without loss of pay at the end of a regular work day.

  - 2. Employees will be entitled to a rest brcak of not more than fifteen (I 5) minutes during each half day worked.

  - 3. 24.10 Employees will be given one fifteen (15) rest period for the first four (4) hours scheduled to work, and worked.

  - 4. Each employee shall receive 2 work breaks of 15 minutes in each day's work

  - 5. The employee shall be entitled to a fifteen (15) minutes rest period in the morning and in the afternoon.

  - 6. An employee shall receive a 15 (fifteen1 minute rest period during eath half of a full eight (8) hour working day.

  - 7. Employees will be entitled to a fifteen (15) minute break in the first half of their a) shift and a fifteen (15) minute break in the second half of their shift without loss of pay.

  - 8. Part-time employees shall be entitled to a paid, rest period of fifteen (15) minutes for each three and three-quarters (3 and 3/4) hours of work during their shift at a time to be determined by the Employer.

  - 9. Any employee shall be entitled t o one (1) break of fifteen (1 5) minutes during both the first half and second half of any shift and where practical, during each t w o (2) hour period of overtime excepting during that period where a meal period is provided under Section 1 above.

  - 10. Part-time employees shall be entitled to a paid rest period of fifteen (15) minutes for each three and three-quarters (3 3/4) hours of work during their shift.

15. **Shift Premiums** 0.20708 0.025 The clauses are providing workers with additional compensation for working under specific conditions, such as shift differentials, premium pay for weekends or consecutive shifts, and pay increases for assuming additional responsibilities or working in particular locations.

- 1. Employees shall be paid a shift differential of 40 cents per hour for all hours worked between 7:

- 2. A Full Time nurse will receive premium pay as outlined in the contract for all hours worked on a second consecutive and subsequent consecutive weekend, save and except where: such weekend has been worked by the nurse to satisfy specific days off requested by such nurse; or

- 3. If the employee works three decimal seven five (3.75) hours or more he or she shall be paid the full premium for the day and his or her normal daily rate of pay.

- 4. Where, an employee's shift schedule is changed by the Company, the affected employee will be paid at the rate of time and one half for the first Shift.

- 5. Where incremental steps exist, the employee shall be paid an increase of at least sixty-five cents ($0.65) per hour or the next higher incremental step, whichever is greater.

- 6. Operations Administrative Clerk Office Clerk Operations Clerk Section A.2 - Leadhand Premium Employees who are assigned by the Company to perform the duties of leadhand shall receive a premium of twenty-five dollars ($25.00) per week for the weeks they perform the duties of leadhand.

- 7. Employees shall receive a shift premium of one dollar ($1.00) per hour for all hours worked on evening and night shifts, including overtime hours.

- 8. Employees shall be paid an additional twenty-one cents ($0.21) per hour, effective June 1, 2003, while working at the Family Leisure Centre or the Echo Dale Regional Park.

- 9. Hourly rated employees who work an afternoon shift shall be paid one dollar ($1.00) per hour over their regular rate of pay, if they start work prior to twelve noon, and one dollar and twenty-five cents ($1.25) per hour if they start work after twelve noon.

- 10. Aquatic Centre employees working such shifts shall be paid appropriate shift premiums.

16. **Termination** 0.20761 0.026 The clauses are providing workers with rights to various forms of compensation upon termination of employment, including severance pay, payment for unused vacation, and other forms of separation payments.

    - 1. On termination of employment, except for termination for just cause, a permanent employee who is entitled to an immediate annuity or an immediate annual allowance under the Public Service Superannuation Act, shall be paid severance pay equal to the product obtained by multiplying hidher weekly rate of pay on termination of employment by the number of completed years of continuous employment less any period in respect of which he/she was granted severance pay.

    - 2. less any period in respect of which the employee was granted severance pay under 46.01(a)(i).

    - 3. For example, an employee who terminates after accumulating five (5) weeks' service in the year would be entitled to 5/20ths of three days.

    - 4. Eligible Employees will be entitled to receive Separation Payment at their regular rate of pay according to the attached schedule.

    - 5. An employee whose employment is terminated for any reason shall be paid with his final pay an amount of money equivalent to any vacation which may have accrued to his benefit in accordance with Article 26.02.

    - 6. The employee may be given equivalent pay in lieu of written notice.

    - 7. Upon dismissal for any reason other than for gross misconduct or for self-provoked dismissal for the purpose of collecting severance pay, an employee shall receive cash severance pay in a lump sum equal to one week's pay for every 5 months continuous service or major fraction thereof up to a maximum of 52 wepks'ala?:

    - 8. When an employee dies or otherwise ceases to the employed, he or his estate shall be paid an amount equal to the product obtained by multiplying the number of days of earned but unused vacation with pay to his

credit by the daily rate of pay as calculated from the classification pre-
scribed in his certificate of appointment on the date of the termination of
his employment.

- 9. Established employees shall be paid Severance Pay in accordance with
  the Canada Labour Code.

- 10. Long-Term Maintenance employees who are assigned work on a major
  plant shutdown will be paid Short-Term Maintenance rates and overtime
  conditions during the period of the major shutdown.

17. **Leaves of Absence** 0.21003 0.039 The clauses provide workers with the right to
take leaves of absence for union activities, public service, education, retraining,
and other approved reasons, with varying conditions regarding pay and benefits.

- 1. If an employee is elected or appointed as an official delegate to at-
  tend conventions or business meetings in connection with the affairs of the
  Union, he shall, on giving the Co-operative at least seven (7) calendar days'
  notice, be granted such leave of absence without pay as may be necessary
  to enable him to attend such meetings or conventions.

- 2. Any employee who is elected to a full-time municipal, provincial or
  federal government office shall be granted a leave of absence in order to
  allow him to fulfill his elected duties.

- 3. An employee on such leave shall receive the pay and benefits provided
  in this Agreement.

- 4. 15.02 Education -Leave (a) If required by the Employer, an employee
  shall be entitled to leave of absence with pay and without loss of senior-
  ity and benefits to write examinations to upgrade his or her employment
  qualifications.

- 5. The public service leave described in Article 15.02(2) will be either with
  or without pay depending on the following circumstances: (a) where the
  Employee receives an honorarium for the public service that is equal to or
  greater than the Daily Rate of Pay, public service leave is granted without
  pay;

- 6. Apart from any on-the-job training offered by the Hospital, any em-
  ployee subject to layoff Who may require a leave of absence to undertake

retraining in accordance with the foregoing shall be granted an unpaid leave of absence which shall not exceed six (6) months.

- 7. Employees residing within these limits shall be entitled to a mutually agreed leave of absence at no cost to the Employer of five (5) or seven (7) days to be arranged between the employee and the Employer subject to the same qualifiers provided in the periodic or turn-around clauses.

- 8. The employee shall be notified when the leave is approved whether such allowances are to be continued in whole or in part.

- 9. An employee who is selected as a dele- Leave of absence may be granted for good reason.

- 10. An employee who is elected or selected for a full time position with the union or any body with which the union is affiliated, shall be granted leave of absence without loss of seniority for a period of one year.

18. **Overtime** 0.21094 0.026 The clauses provide workers with rights to receive enhanced compensation and specific benefits for working overtime, including higher pay rates for overtime hours, compensation for cancelled overtime, meal reimbursements, and shift change notifications.

- 1. An employee required to work authorized overtime in excess of their regularly scheduled hours on a paid holiday (but not including hours on a subsequent regularly scheduled shift), shall receive and two (2) times her regular straight time hourly rate for such additional authorized overtime.

- 2. If two or more overtime premiums are applicable to the same hours worked an employee shall receive only the highest overtime premium applicable to such hours, except calculation of overtime for the night shift will include the shift premium to which they are entitled.

- 3. An employee who is required to work more than two (2) hours of overtime immediately before or following hisher regularly scheduled hours of work, without notification of the requirement to work such overtime prior to the end of hisher previous regularly scheduled shift, shall be reimbursed for the cost of one (1) meal to a maximum of ten dollars ($10.00).

- 4. If an employeeis asked to work overtime, and agrees to, and the over-timeis cancelled within 1 1/2 hours before the end of their regular shift or

part way through the overtime period, the employee will receive 2 hours at time and one-half or hours worked on overtime, whichever is greater.

- 5. Unscheduled overtime shall be defined for the purposes of this section as being overtime for which,the Employee receives no notice thereof until the last regularly scheduled shift which the overtime follows.

- 6. An employee is entitled to overtime compensation under clause 14.02 and 14.03 for each completed fifteen (15) · minute period of overtime worked by the employee:

- 7. If it is necessary to change the employees' shift within a day, without having given them at least forty-eight (48) hours notice of the change, they shall be paid the appropriate overtime premium for all hours worked on the first shift so changed.

- 8. The lob Steward shall be offered the opportunity to share in the overtime on the site on which he/she is working.

- 9. Pursuant to Sub-clause 17.03(b) of the Master Agreement, Correctional Service Workers who are assigned to work other than in centres listed in Supplement I of the Master Agreement and who are authorized to work in excess of the normal weekly hours of work shall be compensated at one and one-half (1 1/2) times the Employee's regular salary for all overtime hours worked.

- 10. Notwithstanding the callout minimum, an employee who is at the work place prior to the commencement of the employee's regular shift and who is required to commence work prior to the commencement of the employee's regular shift, shall be paid in accordance with the overtime provisions for the actual time worked prior to the commencement of the employee's regular shift.

19. **Position Classification** 0.21151 0.036 The clauses are providing workers with rights to receive pay adjustments or increases when they take on duties in higher paying classifications, substitute in higher paying roles, transfer to new positions with higher salary scales, or are temporarily appointed to positions of a higher pay grade.

- 1. If an employee substitutes in a higher paying classification where the

salary placement in the salary range is less than the salary they would have received if substituting in a classification between their current classification and the substituting classification, then the salary placement will be equivalent to the higher rate.

- 2. not more than ten (lo$) cents below the job rate for the occupational classification for which they were hired and will be advanced to the job rate when they produce the normal quantity and quality and their performance is otherwise satisfactory, and in any event at the end of a period not to exceed six months from the date of hiring.

- 3. The employee will be paid at the new rate of pay that is closest but no less than his or her current rate of pay.

- 4. When an employee receives an increment in the lower rated position the employee's acting rate of pay will, if required, be adjusted accordingly.

- 5. An employee who transfers to a new position such that the minimum of the salary scale of the level of the new position is higher than that of the employee's previous position will be granted a promotional increase equal to the greater of five percent (5%) without exceeding the maximum of the applicable salary scale, or the amount necessary to bring the employee's salary to the minimum of the salary scale for the new position.

- 6. If the employee is receiving an out of line differential prior to the dates (b) specified in Section 1, the rate of pay of such employee shall be increased by the amount by which the rate for Job Class 1 has been increased, as provided in Section 1, and the following shall govern:

- 7. If the employee continues to act in the position for more than one (1) calendar year, they will no longer receive the compensation set out in (a) or (b) above, but will be placed on a step in the range of that classification.

- 8. Temporary Transfer Where an employee is assigned temporarily to perform the duties and assume the responsibilities of a higher paying position in the bargaining unit for a period in excess of one-half of a shift, he shall be paid the rate in the higher salary range immediately above his current rate from the commencement of the shift on which he was assigned the job.

- 9. Effective 2001 September 21, when an employee is temporarily appointed to carry out the duties incident to a position covered by this Agreement which is a higher pay grade than the position which the employee normally holds, the employee shall be paid for each full day the duties of the higher pay grade position are carried out at the minimum rate in the scale for such higher pay grade position except where the salary received in the employee's own position

- 10. If there is no such incremental rate the employee shall receive the next higher incremental rate.

20. **Workplace Safety** 0.21186 0.054 The clauses provide workers with rights related to workplace safety, health protection, and compensation in case of job loss due to technological changes, as well as opportunities for union engagement and training on safety procedures.

    - 1. It has been agreed that employees handling hazardous material shall be supplied by the Company with a l l necessary equipment (rubber clothing, goggles, etc.) to protect the employee's person.

    - 2. All temporary and part-time employees will be hired as Material Processors.

    - 3. (e) Employees whose services are terminated because of automation or technological change, shall receive a separation allowan~cein accordance with the scale outlined in Article 23 of the Agreement.

    - 4. The newly-hired employee shall be trained and instructed in the area in which assigned work, on aU safety and health procedures related to his job and his safety responsibility to himself and fellow workers, and wiU be introduced to the Union Safety and Health Committee member in his department.

    - 5. Once every second month, employees may be given the opportunity to meet and discuss Union matters in a room provided by the Employer on the Employer's premises.

    - 6. Employees shall be entitled to apply for enrolment in the Medical Services Plan.

- 7. The parties acknowledge that newly hired employees will be trained and instructed on health and safety matters relating to the job and their responsibility to themselves, their fellow employees and to the Employer.

- 8. In no event shall any employee be entitled to more than ten (10)

- 9. All employees shall be covered by The Workplace Health and Safety Compensation Aci.

- 10. (b) upon request, and with the approval of the Employer, the employee may be granted: (i)

21. **Meals** 0.21262 0.015 The clauses are granting workers rights related to receiving meal allowances, paid or unpaid meal breaks, and compensation related to meal times during or adjacent to their work shifts.

    - 1. An employee required to work overtime for a period in excess of two hours immediately following his or her regular hours of work shall be granted $8.00 as lunch money provided

    - 2. The time at which employees are granted unpaid meal periods shall be determined by the Department Head.

    - 3. 5.16 Employees who work one and one-half (1-1/2) or more hours overtime before their regular starting time or after their regular quitting time shall be paid a lunch allowance of nine dollars ($9.00) in cash.

    - 4. the employee shall be entitled to a meal at the small options facility at the Employer's expense.

    - 5. An employee working 3 hours or more after their regular shift shall be given a meal allowance and every 4 hours thereafter.

    - 6. Each employee shall be given a paid twenty (20) minute lunch break at the completion of the regular shift hour to consume such meal.

    - 7. Aday employee who, without prior notice given before the beginning of his shift, is required to work during the normal lunch hour will be provided with a lunch ticket.

    - 8. Employees are also entitled to one (1) unpaid meal break of one-half (1/2) hour on each regularly scheduled day of work.

- 9. If a full course meal cannot be suljplied, then the employees will receive one-half (l/2) hour's pay at the applicable overtime rate.

- 10. The employee upon reporting after the meal break shall receive a minimum of two (2) hours pay at the rate applicable.

22. **Workplace Injuries** 0.21316 0.024 The clauses provide workers with rights to compensation and benefits in cases of injury, illness, or accidents occurring in the course of employment, including coverage for lost wages, protection against costs for damaged equipment, and provisions for receiving full or partial pay under specific conditions.

   - 1. He shall be reimbursed for all lost time and benefits if reimbursement is part of the judgment.

   - 2. An employee prevented from performing their regular work with the Employer on account of an occupational accident that is recognized by the Worksafe BC as compensable within the meaning of the Act, shall receive from the Employer the net pay an employee would receive while at work.

   - 3. An employee who becomes sick or injured while on assignment away fiom home base will receive his normal basic home base salary until compensation liability has been established.

   - 4. Unless willful negligence is established, employees shall not be required to pay for lost, broken or otherwisedamaged equipment.

   - 5. An employee shall be granted Workers' Compensation leave with net pay in the event that the Workers' Compensation Board determines that the employee has established a claim (time loss benefits) and they are unable to perform their duties by reason of the compensable injury which occurred while employed by the Employer.

   - 6. An employee who is injured while at work and is sent home for the balance of the shift by his Supervisor shall be paid for the balance of the shift on which the injury occurred.

   - 7. If such employee is requlred to deal wlth matters arlslng out Of thls Agreement, up to but not lncludlng matters arlslng from any arbltration proceedlng, durlng a shlft for whlch he was scheduled to work, the employee

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wlll be compensated by the Employer to the extent of hls regular pay for such tlme.

- 8. A disabled employee may earn from employment, other than employment with The City or'any of its Associated Boards, Commissions, Authorities or Agencies, up to twenty percent (20%) of his annual full pay without any reduction in the employee's full pay but any monies earned by the employee from such employment in excess thereof shall be deducted from the employee's full pay.

- 9. the employee receives benefits from the As of the slxty-first (61et) day of a disability, the employee considered eligible for disability benefits under federal or provinclal law, wlth the exception of the Employment Insurance Act, must, at the board's written request along with the appropriate forms, make Ihe request and accept any obligations arising there from.

- 10. he would have received full base pay pursuant to the relevant article, but such payments will not reduce his/her general illness entitlement for that year.

23. **Scheduling** 0.21460 0.03 The clauses provide workers with rights related to scheduling flexibility, compensation for working during non-standard hours or days off, and benefits during absences or layoffs.

    - 1. shall be applied only to absences on the employee's regularly scheduled workdays and shall not be applied to any days for which the employee is receiving Weekly Indemnity benefits.

    - 2. If a Retail Store employee voluntarily elects to work on their regular day off in the week in which a closure is observed, the employee shall be paid at straight time for hours worked on that day

    - 3. Where possible, an employee will not be required to continue at work through his regular

    - 4. an employee is entitled to one (1) working day including the day of the funeral; e) I n the case of paragraphs a), b), c) and d)

    - 5. He will not be required to report for work until the end of the eight (8) hours rest period.

- 6. Where possible, employees will be given opportunities to select their work periods from among the established work schedules for their respective departments.

- 7. An employee who works a scheduled tour any period of which falls between midnight Saturday and midnight Sunday shall be paid Sunday Premium Pay.

- 8. These requirements will be considered to have been met for any week for which the Employee receives a Federal Unemployment Benefit.

- 9. On Vancouver Island, employees working outside their local area on the night shift shall not be required to work the day shift on the following day.

- 10. An eligible employee entitled to a partial automatic short week benefit with respect to certain hours of layoff not included in an Unemployment Insurance System week of unemployment, as provided in Section 3(a)(5) of Article 1, will receive an amount computed as provided in subsection 2(a) above, based on the number by which the hours for which the employee would regularly have been compensated exceeds his/her compensated or available hours, with respect to the days within the work week not included in such Unemployment Insurance System week of unemployment.

24. **Seniority-Based Benefits** 0.21947 0.039 The clauses provide workers with rights related to pro-rated benefits, eligibility for allowances based on employment duration, credit for service and seniority during leaves, cost-sharing for benefits, and entitlements based on continuous service, including adjustments in pay and long-term disability plans.

    - 1. Employees eligible to receive this allowance who are not actively employed for the full contract year shall receive a pro-rated amount of 1/12 of benefit amount, for each full month of active employment.

    - 2. Each eligible employee who has at least one year of continuous employment as of April 1, 2015, shall be entitled to receive, between July 1, 2016 and March 31 2017,

    - 3. For employees appointed prior to December 2, 1997, their anniversary date will be the date on which the employee received his last pay increment.

- 4. Where an employee dies and he would have been entitled to receive a Retirement Allowance, such allowance shall be paid: (a) (b) to his beneficiary; or, to his estate if there is no such beneficiary.

- 5. Each employee will be entitled to one-half (1/2)

- 6. Employees will receive service and seniority credit for all leaves granted under this Article.

- 7. Where an employee is covered for the foregoing benefits, sixty-five per cent (65%) of the costs of providing the benefits shall be borne by the Board and thirty-five per cent (35%) by the employee.

- 8. All Full-Time Employees covered by this Agreement shall be provided with a Long Term Disability Plan, 100% of the cost to be paid by the City.

- 9. Regular employees with six (6) or more years of continuous service as of July 1st are entitled to eighteen

- 10. (c) Anniversary date refers to the anniversary of the employee's first date of continuous employment and such date shall be designated as the date when an employee may be entitled to move across the pay level to the next increment subject to a satisfactory performance appraisal.

25. **Sick Leave** 0.22376 0.025 The clauses provide workers with rights related to receiving pay or benefits during periods of illness, injury, or medical leave, ensuring financial stability during times they are unable to work due to health reasons.

    - 1. 8.1 1 All time absent (up to thirty-one 1311 days) because of sickness or off-the-job accidents, and all time absent because of on-the-job accidents, shall be considered as time worked for the purposes of determining vacation pay to which full-time employees are entitled.

    - 2. Where the processing of an employee's claim for LTD benefits has been delayed beyond the 120 day elimination period and the employee is in no way responsible for the delay, the Board will continue to pay the employee out of hidher accumulated sick leave credits until the employee receives benefits from the LTD Plan.

    - 3. An Employee employed by the Thames Valley District School Board on 1998 June 30 shall be entitled to have credited to the Employee's account

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any sick days accumulated with a predecessor Board on or before 1998 June 30.

- 4. The employee shall be entitled on a biweekly basis, to utilize accrued sick credits in units of half days in order to supplement his or her rate of pay in the alternate position; but the combination of sick pay supplement and rate of pay in the alternate position shall not exceed the regular rate of pay in his or her former position.

- 5. Part-time employees shall be paid 100% of their regular salary (as per their full-time equivalent status) for up to eleven (11) days of absence due to illness.

- 6. An employee is entitled to sick leave with pay when he/she is unable to perform his /her duties because of illness or injury, provided that: (a)

- 7. Where, in respect of any period of compensatory leave, an employee is granted sick leave with pay on production of a medical certificate,

- 8. Employees who have been properly appointed to permanent positions in accordance with this Agreement shall be entitled to payment for absence from work due to sickness to the extent they have established sick leave credits under 11.1, hereof.

- 9. An employee shall earn sick leave credits at the rate of 8.

- 10. Where, in respect of any period of vacation leave, an employee is granted sick leave with pay, on production of a medical certificate, the sick leave granted shall be substituted for vacation leave.

26. **Holiday Pay** 0.23358 0.037 The clauses provide workers with rights to paid holidays, additional compensation for working on holidays, and adjustments to vacation schedules or pay in the event a holiday falls during their vacation period.

    - 1. All qualifying employees who have completed their probationary period will be entitled to the following paid holidays:

    - 2. Starting January 1" 2003, an employee required to work on the following public holidays and for which he is qualified for in accordance with clause 11.2 : New Year's Day Good Friday Victoria Day Christmas Day Canada

Day Labour Day Thanksgiving Day Boxing Day shall receive one and one-half (1 %) times

- 3. In addition to the provision contained in Article 10.2(a), an employee who works on a Statutory Holiday; shall be entitled to a day off with pay or straight time

- 4. An employee who qualifies for such Statutory Holiday on the day it occurs, and works on that day, will be paid for the Statutory Holiday at straight-time rates.

- 5. In addition, if an employee is eligible to receive pay under this clause for Christmas Day, he shall also be paid for Boxing Day and New Year's Day.

- 6. If such service occurs within a payroll period which includes a holiday, he shall receive holiday pay.

- 7. Where an employee receives three (3) or more weeks' vacation with pay and a statutory holiday occurs during the employee's paid vacation, an extra day's pay may be given in lieu of an extra day's vacation with pay if, in the opinion of the Employer, an extra day's vacation with pay will interfere with vacation schedules or hamper operations.

- 8. Ol All eligible employees shall be entitled to the benefits provided in this Article 18 in respect to the following Statutory Holidays: New Year's Day Good Friday Easter Monday Victoria Day Canada Day British Columbia Day Labour Day Thanksgiving Day -cey Christmas Day Boxing Day and any additional Statutory Holidays proclaimed or declared by the Government of Canada, the Province of British Columbia or the District of Saanich.

- 9. Friday Victoria Day Dominion Day Civic Holiday Each employee shall be entitled to one additional holiday with pay each year, such holiday to be scheduled by mutual agreement within a period of thirty (30) days before or after the employee's first and subsequent anniversary date of employment with the Hospital.

- 10. If a Holiday under Article 21:01, or a Presidential Day, falls during an employee's vacation period, the employee will not be required to use any vacation credit to cover the holiday.

27. **Holiday Work Pay** 0.23925 0.026 The clauses provide workers with enhanced compensation for working on holidays, weekends, or their scheduled days off, including provisions for part-time and temporary employees.

- 1. 10.03 Part-time employees shall receive payment for holidays proportionate to their actual time worked, calculated on the basis of the four (4) calendar weeks preceding the holiday.

- 2. An employee who performs work on a Sunday or second scheduled day off shall be paid at the rate of two (2) times their regular rate of pay, exclusive of premiums.

- 3. For the purpose of pay for work performed on General Holidays, hourly employees including spare board employees will be paid at one and one-half times the hourly rate.

- 4.) - Double time and one-half for time worked on any days on which any of the designated holidays is observed unless the holiday falls on one of the employee's regularly scheduled days off in which event the employee, in addition to holiday pay under Section (84), will be paid double time for time worked.

- 5. Employees who work on a continuous operations schedulewill receive 11.5straight time hours of pay for holidays, jury duty, and bereavement leave, provided that they meet thespecific criteriaforeachofthese provisions already contained within the Agreement.

- 6. In addition to (1) above, Temporary employees shall receive holiday pay, at their basic rate calculated on a pro-rata basis, based on the average number of hours worked per day in the previous thirty (30) calendar days, whether work is performed on the holiday or not;

- 7. If an employee works on any of the holidays listed in Article 32.06 they shall be paid at the rate of two and one-half (2½) times their regular straight time hourly rate for all hours worked on such holiday.

- 8. If an employee works on two (2) consecutive days off, the employee will be paid at the rate of double time (2) for all hours worked on the second consecutive day.

- 9. An employee who does not qualify for holiday pay under paragraph 21.02 for a paid holiday must be paid at least time and one half the employee's regular rate for each hour worked on a recognized holiday as set out in Article 21.01.

- 10. Each full-time employee shall be paid eight (8) hours pay for each such Holiday, following the first thirty (30) days of employment, which is calculated from the first day on payroll.

28. **Vacations** 0.24054 0.045 The clauses are granting workers rights related to vacation entitlements, including the timing, duration, and pay during their vacation periods.

    - 1. As far as possible, Regular Full-time Employees shall be granted their choice of vacation periods; however, the final allotment of vacation remains within the responsibility and authority of the Employer.

    - 2. Regular full time employees with less than one (1) year of employment shall receive vacation pay in accordance with the regulations established under the Canada Labour Standards Code as of July 1965 or any subsequent amendment thereto.

    - 3. Where military leave is approved an employee shall not be required to forfeit any of his vacation entitlements.

    - 4. Where military leave is approved an Employee shall not be required to forfeit any of his/her vacation entitlements.

    - 5. This amount multiplied by the number of days to which an employee is entitled will represent the total value of an employee's vacation pay.

    - 6. An employee is entitled to vacation leave to the extent of the employee's earned credits.

    - 7. All other employees who leave the service shall be entitled to vacation in accordance with the appropriate clauses in this Section.

    - 8. (d) Employees who are in their seventeenth (17th) anniversary year shall be granted five (5) weeks vacation with pay.

    - 9. The basic intent is to ensure that an employee receives his earned vacation where, because of a bonafide medical reason this may not have been possible.

- 10. An operating employee covered by paragraph 22.3 hereof will be entitled to vacation on the basis outlined therein if on his or her fourth or subsequent service anniversary date

29. **Seniority-Based Vacation** 0.24117 0.038 The clauses are granting workers vacation benefits and time off based on their length of service and seniority.

  - 1. After completing twenty-two (22) years continuous service with the Corporation, each employee shall be entitled to six (6) weeks of vacation, with vacation pay computed at twelve (12) percent of gross annual earnings.

  - 2. Where an employee leaves the Regular Service prior to the completion of six (6) months service as computed in accordance with Article 72.7, he or she is entitled to vacation pay at the rate of four percent (4%) of total earnings paid during the period of his or her employment.

  - 3. An employee who has completed twenty-five (25) years of service as of December 31 shall receive 217.5 work hours of vacation.

  - 4. A m@ar employee who has worked a minimum of fifteen hundred (1500) hours in a calendar year shall be entitled to maximum vacation pay benefits as spelled out under this article.

  - 5. After fifteen years' continuous service ~ four weeks with |0°/a of gross wages, As l'ar as possible, employees shall be granted their choice of vacation periods according to their seniority.

  - 6. Any employee completing nineteen (19) years of service shall receive six (6) weeks' vacation with pay of twelve percent (12%) of gross earnings.

  - 7. After one year of employment, an employee shall be granted two (2) weeks of vacation and the pay shall be based upon four and one-half percent (4½%) of his gross earnings during the applicable vacation year or eighty (80) hours at his regular pay, whichever is greater.

  - 8. (b) Employees who have completed twenty (20) years of employment by November 30th in any year shall receive five (5) weeks vacation with pay; however, if an employee has not completed his twentieth (20th) year of employment when taking his vacation, the pay for the fifth (5th) week shall be delayed until his twentieth (20th) anniversary date of employment.

- 9. During the fifth (5th) and sixth (6th) full vacation years of continuous service: the Employee earns three (3) weeks vacation fifteen (15) days.

- 10. Employees who have accumulated one hundred and twenty (120) days seniority will be granted two (2) floating holidays per year.

30. **Payment Rules** (0.24143, 0.051). The clauses are giving workers rights related to the timing, frequency, and accuracy of their wage payments.

   - 1. All personnel employed before the 31st of December 1979 will be paid at the maximum rate indicated in this Schedule for their classification subject to the provisions of note number two (2).

   - 2. an employee receives h i s pay cheque, t h e Company s h a l

   - 3. 18.03 Part-time employees shall be paid six (6))

   - 4. If, as and when an error occurs in an employee's pay cheque and the amount is equivalent to one (I) day's pay or more, he shall be entitled, on request, to a cheque being issued in favour of such employee as soon as possible and not later than the flrst (1st) Friday following the pay day on which the error was made for such shortage.

   - 5. All employees covered by this Agreement shall be paid on a definite bi-weekly basis, and dates will not be altered without consent of the Union.

   - 6. All regular Employees shall be paid twice each working month, on the fifteenth (15th) and last day of the month except where the fifteenth (15th) or last day of the month falls on a nonworking day, in which case pay day shall be the last applicable working day.

   - 7. the rate of wages to which the employee is entitled; (iii)

   - 8. 5.20.1 Accumulati~on of 'Time The employees will be entitled to bank a maximum of thirty (301 m i n u

   - 9. 30)calendar days In any dispute over a pay cheque or pay statement or any matter thereon the time limit shall be calculated from the date the employee received the pay cheque or pay statement.

   - 10. Employees will be paid every other Thursday.

Here are the two miscellaneous teacher topics, which were dropped from the analysis:

1. **Teacher Compensation** (0.15594, 0.066). The clauses are providing rights related to recognition of experience, compensation for additional duties, payment methods, seniority benefits, and allocated time for non-teaching activities.

   - 1. Exnerience Credit A Teacher on part-time assignment shall receive credit for teaching experience on the following basis: a) less than .5 assignment or less than one-half school year: one-half year credit.

   - 2. Sample Calculations Teacher is hired and he/she has 3.2 years experience.

   - 3. When a teacher provides noon supervision the teacher shall earn one day ofleave, without loss of salary; for every fifteen (15) hours of noon supervision to a maximum of three (3) days.

   - 4. If the position is not filled after the application of 32.06.1, any Teacher may be hired to fill the position.

   - 5. b) Teachers will receive payment by automatic deposit into the financial institution they set up with the Division, at the start of such payment.

   - 6. 13:02 Previous Experience a. Teachers shall receive full placement for past experience as recognized by the Department of Education to maximum.

   - 7. The teacher shall receive l i

   - 8. A teacher having seniority as determined by Article 13.01 who might be proposed for transfer because of a reduction of teaching time in the teacher's subject, will be given the opMrtunity over an incumbent with less seniority to teach in a subject or subjects that do not require a reduction of teaching time, provided the teacher with seniority has had teaching experience in such a subject or subjects.

   - 9. Teachers leaving the employment of the Board will be paid in full on or before the second Friday in July.

   - 10. Teachers in Grade 7 81 8 shall be granted a minimum of 240 minutes of release time from classroom instruction per 6 day cycle, or equivalent, for the purpose of preparation, planning and evaluation.

2. **Teacher Leave** (0.17779, 0.029). The clauses provide various types of leave (such as sick leave, maternity leave, compassionate leave, and leave for professional development or personal reasons) and ensure proportional benefits for part-time and occasional teachers, as well as specific rights related to the school calendar and adoption.

- 1. it occurs on a regular school day, a teacher shall be granted one (1) day leave with pay to attend to needs directly related to the adoption of a child.

- 2. Teachers employed on a fixed-term contract or on a part-time basis under contract shall be entitled to sick leave on a pro-rata basis.

- 3. A Teacher may be granted up to the lesser of two (2) meetings or two (2) days leave without loss of pay or Sick Leave or CumulativeSick Leave Credits for the purpose of participating on a committee of a professional association, exclusive of committees concerned with salary negotiations.

- 4. Part-time teachers shall be paid 100lll of their regular salary (as per their ful~tlme equivalent status) for up to eleven (11) days of absence due to nlness.

- 5. Effective September 1, 2014, a teacher is entitled to maternity leave for a period of fifteen (15) calendar weeks.

- 6. Any teacher may be granted, upon request and approval of the Board, a leave of absence without pay for the purpose of: (a) Improvement of qualifications, (b) travel, (c)

- 7. Each teacher in the Division shall be granted compassionate leave without loss of salary, to a maximum of one (1) day in the case of death of the teacher's sister-in-law, brother-in-law or grandparent-in-law.

- 8. The Occasional Teacher has not taught one (1) day in the previous school year unless such Occasional Teacher has been granted an extended leave in accordance with the provisions of Article 10.

- 9. The teacher shall be entitled to the same designated holidays, Christmas break, Easter or mid-winter break, and summer break, as observed by school boards of the province or territory in which he or she works.

- 10. If hired after the beginning of the fiscal year, a full--time teacher is entitled to the full allocation of sick leave credits as per sections 2 and B. 6.