

## **AIR TRAFFIC CONTROL INDUSTRIAL RELATIONS: GREAT BRITAIN AND THE UNITED STATES**

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### **ABSTRACT**

The authors compared air traffic control industrial relations systems output in Great Britain and the United States. The Dunlop model was utilized to identify the contextual determinants, identify which contexts produce the greatest similarity in rules, analyze implications of changes to the contexts, and analyze the practical, hypotheses-generating potential of the Dunlop model. The conclusion is that the union actors gauge behavior to predicted effects of contextual changes such that the hypotheses-generating aspect of Dunlop's model should be reconsidered.

Worldwide developments in technology, competition, industrial relocation, corporate alliances, privatization, and union membership have renewed academic interest in comparative industrial relations. The paradigm introduced in the seminal volume, *Industrial Relations Systems* [1] appears abandoned in this renewal, and current parlance favors employment systems over industrial relations systems. This preference stems from the belief that the term is more inclusive of nonunion employment. It is, however, ambiguously applied. Employment system is used synonymously at times and is differentiated at others from employment relations, employment practices, and employment rules.

Contemporary researchers observing changes in these items have created categories or clusters of similarities among workplaces and afterward employed them as explanations of differences, diversity, and commonalities within and among countries [2]. Differentiating the categories is difficult, inadequate attention to the interrelationships among the categories and the environment exists, and the typologies are not satisfactory for contemplating variations within a pattern among workplaces, industries, or countries. Generating testable hypotheses under these scenarios poses a considerable challenge. This has also been difficult with the Dunlop model, albeit due to the positive aspects of the model, most notably its dynamic nature, attention to interrelationships among the components of the system, and hence its explanatory and comparative value [3].

The model's utility for comparing unit industrial relations systems' output across countries to understand the contextual determinants [4] remains compelling. Globally, workers and managers are placed in close contact. Their heightened awareness of the terms and conditions of employment in similar sectors in different countries presents a challenge to all parties. Internationally entwined sector systems vary by public and private ownership. Economic unions of different countries struggle with the implications of chosen standards on individual countries and industries. Multinational corporations cope with the variation of employment practices in facilities across borders. Alliances desiring seamless global service face an array of work practices. Success in each instance entails comprehension of rule formation and reliable predictions of the effects of contextual changes.

This article is a case study using the industrial relations system model promoted by Dunlop to compare the output of the industrial relations systems in the service sector of air traffic control in the United States (public) and Great Britain (private). The purpose was to identify the contextual determinants of the work rules, identify which contexts yield the greatest similarity in rules, and present the unions' strategies based on their formulated assumptions of effects on system output from changed contextual variables.

An overview of the air traffic control industrial relations systems contexts, actors, and ideologies is first presented. This is followed by a comparison of system output, identification of the contextual determinants of output, contextual sources of the greatest similarity in output, the unions' assumptions, and concluding remarks.

## **INDUSTRIAL RELATIONS SYSTEM CONTEXTS**

### **Power Context**

#### *United Kingdom*

The United Kingdom industrial relations system from the late 1800s to the 1960s was characterized by immunities, i.e., exemptions from legal duties,

penalties, or liabilities. The parties preferred voluntarism in industrial relations, with minimum participation from the government and legal system.

Legislative inroads began in the 1960s. A framework of individual employment rights was created, covering unfair dismissal, unemployment compensation, equal pay, union membership and activities, industrial safety, maternity leave, and dismissal owing to race, sex, or marital status. Industrial tribunals were to settle employee complaints against employers regarding these new rights.

The Thatcher government produced collective legislation that removed trade union legal immunity, abolished legal protection for the closed shop, introduced secondary picketing restrictions, and required union repudiation of unofficial strikes. It also addressed internal union affairs. A union's right to discipline strikebreakers was removed, and ballots made mandatory for political funds, strikes, and elections.

Coinciding with this legislative period was a significant decline in union membership and coverage, concession bargaining, and decreased industrial action. Economic, technological, global, and legislative developments played roles in shaping the position and direction of government, unions, and employees. The dramatic decline in public sector employment and union membership is related to the government constraints placed on the autonomy of management through tight budgetary control, the introduction of an adversarial management style, and the privatization of formerly governmental functions through asset sales and contracting out. Legislatively, the private and public sectors were considered identical.

The Labour Party returned to power in 1996 and passed the Employment Relations Act 1999. This legislation made significant changes to collective labor law through the introduction of a procedure for mandatory union recognition, employee protection from dismissal for participation in industrial action, and provision for individual contracts within a unionized unit. The Labour government is less hostile toward unions than the Conservative government, but it has not enthusiastically supported collective bargaining [5].

### *United States*

Reliance on legislation in collective employment matters in the private sector became well-established through a series of laws enacted between 1926 and 1959. The growth of individual employment legislation began in the 1960s.

The federal government is the largest employer in the United States. Federal employees were not granted collective rights until the federal labor relations environment began to take shape in the 1960s and 1970s with the issuance of executive orders. Current federal labor relations are governed by the Federal Service Labor-Management Relations Statute (FSLMRS) passed in 1978 and administered by the Federal Labor Relations Authority (FLRA).

Federal sector labor regulations borrowed from the private sector in the provision of exclusive union recognition by majority election of bargaining unit employees and the duty of fair representation of all bargaining unit members irrespective of union membership. But these unions may not negotiate mandatory membership and face restrictions on dues collection. The effect has been a troublesome, free-rider problem for unions.

The central focus of public sector labor relations law is to ensure that federal sector collective bargaining is conducted consistent with the public interest in effective and efficient government. Unions representing federal employees must contend with a system of uniform civil service policies and procedures; a narrow scope of bargaining; no right to strike; enumeration of management rights that make clear the federal agencies' right to determine what work is done, by whom, and how; and no right to strike. Federal managers retain rights by law to manage that cannot be bargained away or taken away by third parties. The Congress and president determine some of the more important conditions of federal employment, such as pay and fringe benefits. These limitations detract from the degree to which unions of federal employees can influence the conditions of their employment.

Employer-employee relations in the federal sector have not been ideal. Calls by the executive in the 1990s for increased worker participation and improved communication stood in contrast with the reality of the administration's canceled and reduced pay increases and emphasis on reducing the size of the federal workforce. Pay was mandated to be competitive with the private sector but has not been. Recruitment and retention have been difficult. Private sector management techniques were introduced without corresponding improvements in opportunities for employees to be heard at the workplace.

### **MARKET AND TECHNOLOGICAL CONTEXTS**

Air traffic control systems are meant to assure the safe, efficient, reliable, and expeditious handling of aircraft operations in the air and at airports. Each of the various system facilities of tower, approach and departure, and en-route center is dedicated to a particular kind of airspace or aircraft movement. The international nature of air traffic control necessitates coordination and integration among nations. At the same time, each country makes different service demands on its air traffic control system in terms of type and volume of air traffic, geography, weather, system equipment and facilities, and national policies.

The International Civil Aviation Organization (ICAO) constructed the foundation for the current world air traffic control system in 1944. Radar was the technology on which air traffic automation was based. Jet aircraft and increasing demand for commercial air services outpaced the capabilities of the existing systems. In 1994, the ICAO inaugurated a study of the technical, operational, institutional, and economic concepts of alternative systems and concluded that

satellite technology offered the best way to achieve worldwide improvements in aviation communication, navigation, and surveillance. However, rather than the envisioned world approach, since then individual nations have been trying to find capacity solutions through competing technical alternatives.

In 2002, Britain opened the Swanwick Centre, believed to be the most technically advanced in the world [6]. It uses one of the largest computer systems in the United Kingdom. The National Air Traffic Services (NATS) introduced reduced vertical separation minimums throughout its upper airspace ahead of the rest of Europe. Heathrow Airport was equipped with a microwave landing system in 2004 [7].

The United States in 1994 aborted a modernization program begun in the 1980s, after sizable cost escalations. It has since adopted a gradual modernization approach to expand the effective capacity of its airways and runways. It has replaced old mainframe computers, installed color radar display screens, and nearly eliminated system crashes [8]. An improved automation tool is being installed in centers to guide airplanes on more efficient routes and the United States plans to phase in use of a global positioning system.

## **THE ACTORS: MANAGEMENT AND WORKERS**

### **Management**

The United Kingdom air traffic control system is responsible for aircraft flying in United Kingdom airspace and over the eastern part of the north Atlantic. The system is operated by the NATS, a wholly owned unit of the British Civil Aviation Authority (CAA) until 2001. The British government, in 1998, announced its proposal to establish a public-private partnership for NATS through the private sector sale of almost half of NATS. The government believed that this form of ownership would encourage investment and expansion and address public sector interests. After much debate and opposition, the partnership was established in the summer of 2001. The Airline Group, a consortium of airlines including British Airways, British Midlands, and Virgin Atlantic, now owns 46 percent of NATS, and the NATS staff holds 5 percent. The British government owns the remainder.

NATS provides air traffic control services, research and development, statistical data and information, aeronautical information, radar data to non-NATS airports, and controller and specialist training. The majority of its income is derived from the provision of en-route, terminal-area, and oceanic air traffic control services. These are supplied through the operation of the NATS control centers at West Drayton, Manchester, Prestwick, and, as of January 2002, the new Swanwick Centre. The remainder of its income derives from the provision of approach services and airport air traffic control (ATC) services provided by contract on an open-market basis.

The NATS business plan called for a two-center operation: the completed Swanwick Centre and the New Scottish Centre. The latter has been pushed back several years, in part because NATS experienced serious financial problems following the tragedy of Sept. 11. It has since received bailout money from the British government and banks, requested a rate increase to create sufficient operating revenues, and planned worker redundancies.

The air traffic control system of the United States is owned by the federal government and operated by the Federal Aviation Administration's Air Traffic Services (ATS). Owing to the geographic size of the United States, the ATS is a large organization responsible for numerous offices and facilities including 21 air route traffic control centers, 352 airport traffic control towers, 185 terminal radar approach control facilities, two radar approach control facilities, three combined center/radar approach control facilities, and the Air Traffic Control System Command. Users of the air traffic control system pay about 70 percent of the FAA budget; the remainder comes from the general fund of the federal government. The user revenues are derived through a passenger ticket tax, a cargo tax, and a fuel tax.

Despite an excellent safety record, the air traffic control system is often criticized for air traffic delays. The problems that have produced this situation are generally considered to result from the federal procurement process, a rigid personnel system, reliance on federal appropriations for funds, government micro-management, and a conflict of interest between the FAA's dual obligations of operations and safety [9].

The Air Traffic Management System Performance Improvement Act of 1995 mandated the FAA to be a more efficient organization. Reform was demanded in procurement, personnel, funding, and governance. The FAA is now exempt from the federal procurement system and has a new personnel system. A new fee system is yet to be produced. Much disagreement surrounds this issue, primarily because of the large general-aviation lobby in the United States and the non-hub commercial passenger carriers.

Flight and modernization delays have led some to conclude that privatization is the solution. They contend that funding the air traffic control system through borrowing in capital markets is preferable to funding via government appropriations.

### **Controllers**

A wide range of attributes is desirable candidates for controller positions [10]. Practical ways of measuring and identifying individuals who possess these attributes are a challenge in controller selection. In general, becoming a controller entails age, education, and citizenship requirements; qualifying scores on pre-employment tests; an interview; medical examination; suitability determination; and security investigation. Selected candidates receive a mix of classroom, simulator, and on-the-job training. Becoming a fully operational air traffic controller takes at least 18 months and up to four years.

Air traffic control is a continuous and often-demanding function that requires quick responses to changed flight plans, foul weather, emergency situations, and unscheduled traffic. The growth in air traffic has increased demands, even though controllers still work with outdated equipment and nonergonomic workspaces. Modernization of air traffic control will change the controllers' role in the system.

The British air traffic controllers are represented by Prospect, which was formed November 2001 by the merger of the Institution of Professionals, Manager, and Specialists (IPMS) and the Engineers' and Managers' Association (EMA). The new union represents members in the public and private sectors and has more than 105,000 members, each of whom is represented through a democratic structure. Prospect staff members assist in disciplinary and grievance actions and other employment problems. The union offers its members benefits and services including some types of legal assistance, career development services, professional indemnity policies, financial and insurance services, investment advice, and tax and retirement planning. The air traffic controllers are one of many specialist groups within Prospect. Prospect staff engages in contract negotiation for NATS-employed controllers. There are no constraints on negotiable subjects. A ballot is mandatory before industrial action.

The union was, and is, adamantly opposed to the public-private partnership, but supported the selection of the Airline Group as superior to its rivals in terms of investment, expertise, safety, national interest, and industrial relations [11]. It feared that under the CAA pension scheme (CAAPS) members' benefits would suffer in the new partnership. This was resolved, but important concerns remain. The union still maintains that a commercially driven company is unsuitable for running a safety service and will damage NATS' safety culture [11]. Computer breakdowns, staff shortages, a hold on the New Scottish Centre, and the financial bailout have not allayed these fears.

There are about 15,000 FAA controllers in the United States, Puerto Rico, and Guam represented by the National Air Traffic Controllers Association (NATCA). NATCA was founded in 1987 and certified by the Federal Labor Relations Authority (FLRA) as the exclusive bargaining representative for the FAA air traffic controllers. NATCA also represents more than 2,500 other members. It is responsible for ensuring fair representation on all matters relating to its members. Its members are represented through a democratic structure. Because the controllers are federal employees, NATCA is restricted in its representation role.

NATCA is firmly opposed to privatization of the air traffic control system. It maintains that air traffic control is rightly a government function and considers the experiences in Canada and the United Kingdom as confirmation of this position. NATCA favors the FAA approach to gradual, effective, and careful modernization and increased hiring.



## SYSTEM IDEOLOGY

The status of managers and workers is greatly dependent on the power context. Within the industrial relations systems of enterprises, industries, and sectors, the parties learn to view one another in particular ways. Attitudes and behaviors develop that become ingrained and habitual, whether they are positive or not. In air traffic control generally, uneasy relations exist between workers and management [10]. The International Federation of Air Traffic Controller Associations (IFATCA) has provided controllers the opportunity of comparing their circumstances since 1961. IFATCA is a world organization representing about 40,000 controllers from more than 100 countries. Its mission is to protect and safeguard the interests of the air traffic control profession. British controllers may also make comparisons with EUROCONTROL, the European organization for the Safety of Air Navigation, which has 30 member states. Its primary objective is the development of a seamless pan-European air traffic system. It employs eligible individuals from the member states as controllers.

Uneasy relations manifest themselves in outcomes and in everyday operations. When NATS was preparing to open Swanwick, the controllers rejected overtime hours to facilitate the training of colleagues. New pay incentives have been greeted with suspicion. The FAA reforms reduced the number of civil service rules, consolidated position descriptions, and created a new compensation system under which the air traffic controllers are covered by the air traffic specialized pay plan. The most recent contract contained several provisions for union consultation. Relations remain edgy, but steps toward cooperation are being taken.

## SYSTEM OUTPUT AND CONTEXTUAL SOURCES

Work-rule information was obtained from Prospect, NATCA, the FAA, and NATS. Comparisons of a sample of air traffic control industrial relations systems' rules are provided in Tables 1 through 9. The contextual determinants of a wide range of rules are identified on the following pages.

### Security

The balance of power between the parties of the air traffic control system is reflected by the arrangements for union recognition, negotiation, impasse, consultation, and grievance settlement. These arrangements owe much to the national legal systems that developed through the interaction of history, culture, politics, and economics. They are consistent with what the public—as consumers, workers, and management—regards as the appropriate balance of power at a point in time. This sentiment can appear contradictory since the public may simultaneously support greater power for one party and denounce too much power for the same party in a specific relationship and vice versa. Politicians respond to the prevailing sentiment and generally support complementary legislative agendas.



Table 1. Classification and Hours of Work

Available	Job share		Rotations and relief			Working hours		
	Job share	Eligibility	Breaks	Missed meal pay	Work day	Work week	Travel/training/discipline days	Meal time
United States	N/C	N/C	Every 2 hrs.	.50 hrly. for 5 hr.	8 hours	5 days	8 1/2 hrs/w 1/2 unpaid meal break	30 min.
United Kingdom	Yes	2 employees divide one job	Every 2 hrs.	OT or comp	8 hours	5 days	>8 hrs. paid as OT	60 min.

Table 2. Loss of License

United States	United Kingdom	Conditions	Exclusions	Benefit	Duration	Loss of license and other payments
		NC	NC	NC	NC	NC
		Medical	Self-inflicted or substance abuse	.5 basic annual salary s.t. no sick pay at full rate	Age 60, recovery, death, employment	Payment not in excess of basic annual salary

Table 3.

	Life insurance	Health insurance	Work-related injuries, illness, death
United States	Yes	G Yes	G program
United Kingdom	Yes	Employer Yes	G program plus equivalent to pension benefits

Table 4. Special Circumstances Leave

	Death in family	Personal religious	Care of family member	Election campaign	Acting as political agent	Bone-marrow or organ donation	Public duties	Sabbatical	Exams or study
United States	10 days LWOP or annual	G = yes operation permitting	G = 12 weeks unpaid may use annual leave	NC	NC	7 days paid	NC	NC	NC
United Kingdom	5 days pd	Sabbatical 6 to 12 months	5 days paid	1 month paid	6 weeks unpaid	NC	18 days	6 to 12 months unpaid	5-30 days

Table 5. Special Circumstances Leave

	Relocation from abroad	Adoption	Parental	Marriage	School holidays	Running for Parliamentary Office	Voluntary service	Special leave
United States	No	12 wks.	No	No	No	No	No	No
United Kingdom	5 days pd.	5 days pd.	13-17 wks unpaid	5 days pd.	Case by case, unpaid	1 month pd.	Case by case, pd.	Case by case, pd. or unpaid

Table 6. Special Circumstances Leave

Leave	Prenatal/infant care			Jury duty and court leave		
	Additional leave	Return to work	Court	Jury	Witness	Court
United States	9 additional months unpaid s.t. 30 day recall notice	same or comparable	Paid	Paid	Paid	Paid
United Kingdom	Unpaid up to 29 weeks provided return within 29 weeks of birth	same or comparable	Paid	Paid	Paid	Paid

Table 7. Annual Leave

	Years of service		Carryover of annual leave	Donations of annual leave
	< 3	15 and up		
United States	G = 13 days	G = 20 days	Use or lose policy unless employer precluded	Yes
	< 10	After 10	8 days	NC
United Kingdom	G = 20 days	Total = 28	Total + 33	

Table 8. Sick Leave

	Med. Cert. Req.		Add'l. sick days	Advance-ment	Unused sick days	Donations of sick leave
	No	Yes				
United States	Sick absence G = 12 wks unpaid 13 days pd.	Sick < 4 days	NC	30 days	Pd. 40% upon retirement	Yes
United Kingdom	6 months full pay	Sick > 7 days	6 months .50 pay and statutory sick pay	NC	NC	Yes
		Sick > 7 days	> 12 mos. Pay = med. retire + statutory sick pay			

Table 9. Paid Holidays

United States	New Year's Day	MLK Day	President's Day	Memorial Day	July 4th	Labor Day	Columbus Veterans' Day	Thanks-giving	Christmas
United Kingdom	G = 8 public banking holidays. Contract requires pay.								

### **Compensation**

Pay structure, rates, overtime, and special pay are especially subject to the influences of the service and labor contexts and the technology context. The controller function is highly valued. Starting yearly minimum pay is equal to average yearly income in both countries [12] and quickly outpaces it. The highest annual controller pay is 350 percent higher in Britain and 343 percent higher in the United States than the average annual income. The public values the provision of safe air traffic control even as it criticizes delays. The controller is rewarded for acquiring the requisite human capital through initial and recurrent training and experience. Controllers are compensated for coping with inadequate technology and for adapting to new technology. Their pay is related to the complexity of the service provided as well as the volume of traffic. Movement through the pay structures is associated with the length of service and skill development. Floors on overtime pay are legislatively dictated. Various forms of incentive pay to induce work effort consistent with organizational objectives have been introduced, with different levels of support.

### **Time Worked**

Arrangements for the number of hours worked, rotations, relief, and days worked are close to identical and are due primarily to the technology and service contexts, and influenced as well by regulation and custom. The concentration required for correct and accurate technology application and service provision dictates the reasonable amount of time allowed on the job in each category. Overtime is an issue in each. Controllers view overtime hours as a safety issue to be resolved by staffing-level solutions as opposed to generous reliance on overtime. Management views the costs in providing a labor-intensive service characterized by service peaks better as addressed through overtime hours of existing staff.

### **Time Not Worked**

The attitudes and traditions surrounding time off are more generous in Great Britain than in the United States and are reflected in national regulations and workplace arrangements. This is most pronounced in sick leave and special-circumstances leave. It is true for time available with pay, time available without pay, and reasons for time available. It is only in public holidays that United States controllers have an edge.

### **Substance-Abuse Testing**

The public's ideological skirmish on mandatory substance-abuse testing in transportation industries was legally decided in the 1980s in the United States in favor of controller testing and has been reinforced by subsequent court decisions.

Substance-abuse testing for controllers does not exist in Great Britain, which does not have workplace drug- or alcohol-testing legislation.

### **Protection Programs**

Health, disability, unemployment, and or on-the-job injury/disability schemes were governmentally established years ago in Great Britain. These programs became enriched through the years by sector-specific programs. NATS provides pensions, disability and injury, life, and health protection. United States law requires on-the-job illness and injury protection and unemployment insurance. The government, to compete in labor markets as an employer, provides its employees with pensions, disability, life, and health protection.

The controllers have achieved or are pressuring to achieve enhanced coverage reflecting the particular circumstances of the air traffic control technology and service, as well as the labor markets. Both countries require that controllers retire earlier than is typical or legal for most other workers. It is believed that in spite of innate individual differences, the alertness and quickness demanded of a controller are not apt to be present in acceptable levels in older controllers. Enhanced arrangements for medical retirement, early retirement, extended retirement, and disability are available in Britain and being lobbied for in the United States.

### **Performance Appraisal**

Performance appraisal in each system is linked to ideology, and the nature and technology of the service. Both systems provide procedures for administration and appeal.

### **Placement and Redundancies**

Internal appointments are the rule. The United States has legislated detailed notification requirements for reductions in force, closures, and reorganizations but requires nothing in the way of pay, although the employer offers limited severance pay. Great Britain lacks legislation and notification detail but provides more generous severance pay. Traditionally in the controller-manager relationship, management has consulted before acting.

## **ASSUMPTIONS**

The present arrangements of the air traffic control industrial relations systems are dynamic. Changes and anticipated changes in the contexts and adaptations to them are continual and promote further change. The unions respond before and after changes based on their assumptions of the consequent effects on system outcomes. The creation in 2001 of the British public-private partnership was



preceded by years of talk, study, and debate. IPMS actively lobbied and crafted positions against privatization because it was fearful of the effects on the safety of the air traffic control system, controller employment levels, controller wages, and controller pension benefits. It successfully demanded safeguards on pension rights prior to privatization. The union supported the Airline Group as the preferred bidder for NATS in light of the impending inevitability of the market context change. It continues working to heighten awareness of perceived negative repercussions from privatization, including the hold on the New Scottish Centre, redundancies, and safety. Similarly, the union lobbied to preserve and promote its position in the national legal system. Controllers expect the 19991 law coupled with privatization to substantially alter the ideology and arrangements that currently exist.

NATCA is an active lobbyist in Congress to influence legislative outcomes on federal benefits, compensation, collective bargaining, and employment legislation. When the FAA began contracting out certain types of air traffic control towers to the private sector in 1994, NATCA responded with a lawsuit. The legal and congressional fight has been ongoing over what types of facilities would be suited to such a program. NATCA is keenly aware that the road to greater privatization could be piecemeal. Such a change in the service market, especially depending on how it is crafted, is regarded as having the potential to fundamentally affect the balance of power, ideology, and outcomes of the air traffic control industrial relations system. It is believed that the power balance would be substantially altered by the change of coverage to private sector labor law.

NATCA envisions a struggle to maintain bargaining rights. Dividing the system among different companies is perceived as creating bargaining-unit issues. Controllers would gain the right to strike. A systemwide bargaining unit strike could invoke presidential emergency procedures, something more difficult to justify for single-facility strikes. Controllers anticipate that management by multiple entities would, apart from market pressures on wages and employment, create the specter of wage variation by facility, system ideological variation, and limited opportunity. This in turn could confound successful recruiting efforts. The union believes technological issues would result, as the traffic in certain markets might not support the expense of the most advanced equipment. This, too, is seen as ultimately affecting recruitment, wages, controller opportunities, and service safety.

### **CONCLUDING REMARKS**

The industrial relations system framework articulated by Dunlop was used to compare the air traffic control industrial relations systems in Great Britain (private) and the United States (public) to identify the contextual determinants of work rules, identify which contexts yielded the greatest similarity in rules, and

ascertain the unions' assumptions of effects on system output from changes in contextual variables.

The work arrangements of the two systems were found to be dependent on multiple contexts, although the extent of contextual influence and domination varied by work rule. The most similarity in work arrangements across the two systems occurred in those strongly influenced by the service market, labor market, and technology contexts. Work arrangements most dissimilar were due to national differences rooted primarily in the power context. The ideologies of the system were similar, due to the strong influence of the service market, labor market, and technology contexts. The unions were found to form assumptions consistent with the model structure. They developed activities based on the assumed effects on outcomes from the contextual changes.

The model proved a valuable analytical tool for the stated purposes and for permitting insight into the unions' ability to frame hypotheses of consequences to system output from contextual changes. The research task ahead is the generation of statistically testable hypotheses with predictive power. Ad hoc theories constructed from observations at a specific point in time are insufficient for enterprises and unions attempting to formulate strategic responses to change. We hope that a small contribution has been made toward understanding and encouraging the possibility of achieving hypotheses testing via statistical specification of the Dunlop model variables.

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