Strike Activity Under Enterprise Bargaining: Economics or Politics?

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Abstract
Australia has moved rapidly from a centralised Award based wage determination system to decentralised enterprise bargaining. This move has been associated with a substantial drop in strike activity. The relationship between working days lost and a series of macroeconomic variables is tested for the period 1985 to 2003, incorporating dummy variables for the different pieces of industrial legislation and four major periods of political strike activity in that period. The economic variables proved mostly insignificant with only the CPI and business inventories having any association with changes in strike activity. Working days lost fell significantly with the introduction of enterprise bargaining. Both the Reform Act 1993 and the Workplace Relations Act 1996 were associated with below trend strike activity. Overall, these results indicate that institutional factors now influence strike volumes, rather than economic conditions.

1. Introduction
In just two decades, Australia has moved from a centralised, award based system of wage determination to one of enterprise level, productivity-based negotiations. For eighty years, industrial relations in terms of both wage determination and dispute resolution was controlled by the Conciliation and Arbitration Act 1904. In 1983 an incomes policy, The Accord, was introduced in agreement with the peak union body, the ACTU, offering wage restraint for a package of social wage benefits with the primary objective of controlling inflation. Although the ‘Accords’ formally lasted until the defeat of the Labor Government in 1996, the objectives of wage determination shifted from reducing inflation to improving productivity in 1987, and this remained the key objective throughout the Labor Government’s remaining period of office.

The shift from inflation to productivity as the basis of wage determination was accompanied by a gradual but persistent move towards decentralised enterprise level bargaining. By the time the Howard Coalition Government
was elected in March 1996, enterprise bargaining was the dominant form of wage determination in the unionised sector of the Australian labour force. The Coalition Government introduced a new piece of industrial legislation, The Workplace Relations Act 1996. This Act marked a significant change in the institutional framework for wage determination. It was no longer based on ‘more or less’ amicable consultation with the labour movement. Indeed, it can be argued that, with this Act, ‘labour flexibility’ replaced productivity as the underlying objective of industrial relations policy where flexibility increasingly meant the ability of management to negotiate workplace pay and conditions directly with employees and by-passing union representation. The major pieces of legislation during the 1987 to 2002 period are discussed in more detail below.

These institutional changes have been accompanied by a marked and sustained reduction in strike activity. Previous studies (Beggs and Chapman, 1987a, 1987b; and Morris and Wilson, 1994, 1999) have demonstrated that the Accord process resulted in substantial reductions in strike incidence and working days lost from industrial action. This paper examines the impact of enterprise bargaining, and particularly of the two main pieces of industrial legislation associated with it, the Commonwealth Reform Act of 1993 and the Workplace Relations Act of 1996 on more recent levels of industrial action.

Previous economic analyses which attempt to explain levels of industrial action have focused on macroeconomic conditions whereby strike levels are assumed to move in a pro-cyclical manner which affect both the profitability of the firm and the ability of workers to recover income lost during industrial action. However, under enterprise bargaining, workers are constrained by ‘no more claims’ clauses during the life of each agreement. Thus pay claims cannot be timed to take advantage of favourable economic conditions and must be left until the termination of agreements, which often last three years, with the right to strike period occurring only during the negotiation of the new agreement regardless of prevailing economic conditions. Thus, we need to test whether economic factors are still a major influence on strike activity or whether institutional conditions including legislative changes and changing power relationships between the Government, management and unions are now the predominant influence on the incidence and volume of strike activity.

Previous studies of our question have used regression analysis to derive short run relationships between strike measures and macroeconomic variables. However, recent developments in time series analysis have emphasised that this methodology may produce spurious results if the data series are non-stationary. In such cases, cointegration analysis is preferred (Patterson, 2000). While cointegration analysis is now extensively used in macroeconomic policy and financial analyses, this appears to be the first paper to use this process in analyses of industrial relations policy. This paper proceeds as follows. Firstly, the institutional and economic background for the current industrial relations situation is outlined. The factors used in previous studies of strike levels are then reviewed. From this, we develop a model which includes both economic variables and institutional ‘dummies’. After testing the economic variables for stationarity, a cointegration test is performed using the Johansen (1988) maximum likelihood method. The implications of the results are then discussed.
2. Institutional Background
Countries have widely different industrial relations systems which make significant differences to their ability to reduce industrial unrest (Diduch, 1998; and Stokke and Tornqvist, 2001). Diduch (1998, p.24) argues that long run reductions in disputes occur when trade unions are incorporated into managerial and government decision-making processes, particularly those which address problems such as high inflation, unemployment and adjustments to expanding international trade. In Australia, the Accord processes were introduced in 1983 specifically to facilitate the structural economic changes needed to combat such problems while maintaining an acceptable package of monetary and social incomes for workers, by including peak union bodies within national decision-making processes. This period has been demonstrated to have been associated with declining strike activity.

However, the 1990s have been a period of more decentralised industrial relations moving the country rapidly to an enterprise bargaining model incorporating no strikes during the term of the contract clauses as found in the U.S.A. and Canada as well as several Nordic countries. Enterprise bargaining in itself can thus influence the timing of industrial action. Disputes over pay and working conditions can only occur when a new agreement is being negotiated. Disputes over the interpretation of rights incorporated within an existing agreement should be dealt with by negotiation, mediation or special labour courts. Poorly framed agreements can result in disputes within the life of an agreement, although these may take forms other than cessation of production (Stokke and Thornqvist, 2001).

Australia has moved rapidly from a centralised industrial system based on industrial awards and the arbitration of disputes through the Australian Industrial Relations Commission (AIRC) to a decentralised enterprise bargaining process aimed at aligning wage increases with productivity improvements. The post incomes policy or enterprise bargaining era can be dated to the March 1987 National Wage Case decision which introduced the ‘two tier’ (flat increase plus bargained productivity increase) system. This approach was incorporated into the 1988 Industrial Relations Act operational from 1989 where the first tier came to represent the traditional income maintenance objective. The second tier involved a Structural Efficiency Principle facilitating negotiated wage increases based on productivity improvements arising from reforms of work practices, reduced staffing levels, multi-skilling and broad-banding or reductions in numbers of job classifications, worker participation, universal training, flexibility in working conditions and rationalisation of award coverage (Morris, 1999).

This Act was substantially amended in 1992 to strengthen the certified agreements provisions in response to a sustained campaign for increased enterprise bargaining by employer associations (Hodgkinson, 2003). These provisions were incorporated into the Commonwealth Industrial Relations Reform Act 1993 which came into effect in March 1994 and institutionalised the process of enterprise level bargaining for the negotiation and registration of workplace agreements, although maintaining an income safety net for workers with weak bargaining power. AIRC jurisdiction was separated into an ‘award stream’ (arbitration) to provide this safety net, and a ‘bargaining stream’ (conciliation) which was further sub-divided into a ‘union strand’
(certified agreements) and a ‘non-union strand’ (enterprise flexibility agreements). The Industrial Court was created to hear unresolved issues such as unfair dismissals (Short & Buchanan, 1995). These enterprise flexibility agreements were the first provisions made for industrial agreements under the ‘corporations power’ of the Australian constitution (DEWR, 2002a). It must be remembered that enterprise bargaining as incorporated in the 1988 and 1993 Acts was introduced under Labor Governments in consultation with the union movement as part of the ongoing Accord process. Such a process should have reduced politically based industrial action in response to such changes. However, the union movement was strongly opposed to the flexibility agreements, which they felt would be used to reduce wages and working conditions and become a vehicle to pursue de-unionisation agendas. Relationships between the union movement and the Keating Labor Government deteriorated from this time (Kelly, 1995).

The Howard Coalition Government was elected in March 1996 and enacted the Workplace Relations Act (WRA) in October 1996 to come into effect in early 1997. This Act was specifically aimed at increasing opportunities for employers to deal directly with employees, and so bypass unions, and to increase flexibility by tailoring agreements to specific individual enterprise conditions. It included Award simplification by cutting the safety net back to 20 allowable conditions, the introduction of non-union individual agreements (AWAs), and tighter conditions on approval of certified agreements and union activities (Mortimer, 1999). The WRA was strongly opposed by the union movement in the lead-up to its introduction. In late 1996, the Victorian State Government referred its powers regarding industrial relations to the Commonwealth such that all workers in that State were also covered by the federal legislation. The other States continued to provide their own industrial legislation covering enterprise and individual agreements (DEWR, 2002a). The WRA involved a reassertion of managerial prerogatives to control workplace conditions. The ensuing power shift and reduced influence of the union movement in determining the basis of wage negotiations would be expected to lead to increased strike activity. Nevertheless, the initial two years under the Workplace Relations Act showed little change in working days lost due to strike action (Peetz, 1999). However, by 1999, the then Workplace Relations Minister, Peter Reith, had increased pressure on employers to utilise the more ‘anti-union’ provisions of the Act with a corresponding increase in strike activity (Way, 1999).

The relationship between total number of disputes, working days lost (annualised data) and legislative change is shown in figure 1. The number of disputes declined steadily throughout the Accord period and this decline continued during the period of the Reform Act. The incidence of strikes was also low through the first period of the Workplace Relations Act but rose in 1999 with attempts to introduce further industrial relations reform. It has remained relatively high in recent years. Annualised working days lost remained high until early 1992, and then appears to have fallen and

1 The Howard Government is proposing to further cut this to 15 allowable conditions (Callus 2002).
2 Most of the days lost from the MUA waterfront dispute are not included in ABS data as workers were considered to have been laid off rather than locked out (Peetz, 1999, p.8).
remained consistently low with the introduction of enterprise bargaining. This graph also highlights four significant peaks associated with clusters of political strikes, discussed in more detail below. Quarterly data for working days lost, shown in figure 2, exhibited high volatility until March 1993, but on a declining trend. During the periods of the Reform Act and the Workplace Relations Act, this volatility dissipated and working days lost remained low. However, the statistical tests for structural breaks were not significant between these two periods.

The objective of this paper is to test whether there has been a significant change in working days lost as a result of the introduction of enterprise bargaining in Australia, and whether working days lost are different under each piece of legislation, taking into account the influence of economic factors and the clusters of political strikes. Prior to undertaking the statistical tests, a quick review of economic and industrial conditions during this period is provided.

An economic explanation of strike activity would predict strike indicators to move pro-cyclically with macroeconomic conditions (Ashenfelter and Johnson, 1968; and Diduch, 1998). Long term studies of industrial outcomes such as that in Healy (2002, p.82), show working days lost and number of disputes with a clear, if lagged, pro-cyclical pattern with the recessions of the mid 1970s and early 1980s prior to the long decline associated with the Accord. Macroeconomic indicators commonly employed by economists as indicators of business cycles when analysing industrial action include changes in Gross Domestic Product, price inflation, overtime, profits relative to workers compensation, unemployment or job vacancies and changes in inventories (Ashenfelter and Johnson, 1969; Beggs and Chapman, 1987a; Diduch 1998; and Morris and Wilson, 1994, 1999). Some models predict that unions will push for wage increases in times when real wages are low with subsequent high levels of disputes which will then fall after wage rises have been achieved (Ashenfelter and Johnson, 1968; Morris and Wilson, 1999). Unions may also be expected to push for real wage increases in times of high inflation (Diduch, 1998; and Morris and Wilson, 1999).

Table 1  Economic Indicators 1987 to 2003

<table>
<thead>
<tr>
<th>Year</th>
<th>Growth in Real GDP (per cent)</th>
<th>Change in CPI (per cent)</th>
<th>Change in Employment (per cent)</th>
<th>Change in Job Vacancies (per cent)</th>
<th>Change in Unemployment (per cent)</th>
<th>Change in Av. Weekly Earnings (per cent)</th>
<th>Change in Overtime per emply. (per cent)</th>
<th>Profits (GOS) as per cent of GNI</th>
<th>Change in Total Inventories $'000</th>
<th>Productivity (GDP per Labour input)</th>
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<td>1986/87</td>
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<td>9.4</td>
<td>1.68</td>
<td>6.84</td>
<td>6.60</td>
<td>5.73</td>
<td>8.17</td>
<td>28.76</td>
<td>-2076</td>
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<td>1987/88</td>
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<td>3.47</td>
<td>-7.10</td>
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<td>11.51</td>
<td>30.23</td>
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<td>72.5</td>
</tr>
<tr>
<td>1989/90</td>
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<td>8.0</td>
<td>2.47</td>
<td>5.87</td>
<td>6.29</td>
<td>6.30</td>
<td>-0.56</td>
<td>30.23</td>
<td>6135</td>
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</tr>
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<td>-0.10</td>
<td>5.3</td>
<td>-2.77</td>
<td>48.11</td>
<td>48.63</td>
<td>3.10</td>
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<td>-1090</td>
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<td>13.83</td>
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<td>2.07</td>
<td>2.55</td>
<td>14.85</td>
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<td>893</td>
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<td>2.77</td>
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<td>-8.27</td>
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<td>82.4</td>
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<td>4.23</td>
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<td>32.38</td>
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<td>-0.22</td>
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<td>2.99</td>
<td>5.19</td>
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<td>3.84</td>
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<td>3.21</td>
<td>1.74</td>
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<td>-49</td>
<td>91.3</td>
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<tr>
<td>1998/99</td>
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<td>1.2</td>
<td>2.21</td>
<td>-6.73</td>
<td>-7.21</td>
<td>2.53</td>
<td>-2.69</td>
<td>31.90</td>
<td>4677</td>
<td>95.2</td>
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<td>1999/00</td>
<td>4.00</td>
<td>2.4</td>
<td>2.93</td>
<td>-6.24</td>
<td>-6.54</td>
<td>3.87</td>
<td>-2.26</td>
<td>32.09</td>
<td>2961</td>
<td>98.9</td>
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<td>6.0</td>
<td>0.92</td>
<td>7.64</td>
<td>7.51</td>
<td>4.37</td>
<td>-5.14</td>
<td>31.52</td>
<td>1873</td>
<td>100.0</td>
</tr>
<tr>
<td>2001/02</td>
<td>3.94</td>
<td>2.9</td>
<td>1.86</td>
<td>-6.76</td>
<td>-6.85</td>
<td>3.67</td>
<td>5.42</td>
<td>31.90</td>
<td>-447</td>
<td>104.4</td>
</tr>
<tr>
<td>2002/03</td>
<td>3.56</td>
<td>2.7</td>
<td>1.97</td>
<td>10.38</td>
<td>-3.32</td>
<td>5.20*</td>
<td>4.88</td>
<td>31.89</td>
<td>1812</td>
<td>106.2</td>
</tr>
</tbody>
</table>

Sources: ABS Time Series data; Catalogue Nos. 5204.0: Australian System of National Accounts, 5206.0: National Income, Expenditure and Product; 6202.0: Labour Force, Australia, Preliminary, 6246.0: Wages and Salary Earners, Australia, 6302: Average Weekly Earnings, Australia, 6354.0: Job Vacancies, Australia, 6401.0: Consumer Price Index. All data seasonally adjusted where appropriate.

* Data for 2002/03 taken from ABS Cat. No. 6302.0.

Movements in these key economic indicators between 1985 and 2003 are shown in table 1. The recession between 1990 and 1992 is clearly shown. However, that has been followed by a period of sustained real growth except for a ‘dip’ in 2000/01. This growth has been accompanied by a steady rise in labour productivity and generally low inflation. Profits’ share of gross
national income remained stable at about 32 Per cent. Strong macroeconomic conditions can be expected to encourage higher wage demands by workers, which could be associated with higher levels of strike activity. However, higher profits mean firms are more likely to agree to wage demands to avoid strike costs. Firms’ capacity to bear strike costs are reflected in inventories or their ability to draw on stocks to meet client orders while production is stopped. As can be seen, total inventories fluctuated substantially over the 1987 to 2003 period.

Labour market conditions were generally strong during this period. Employment grew slowly at about two per cent per annum. However, particularly in the latter stages, both job vacancies and unemployment fell indicating a relatively strong demand for labour. This may have resulted in demands for higher wages and thus increased strike activity. Average weekly earnings rose steadily in this period, which may be associated with industrial militancy. Overtime earnings per employee were low in latter years. Earlier analyses of strikes assumed that striking workers could use overtime earnings to recoup income lost during the strike and this increased the incidence of industrial action. However, with enterprise bargaining, overtime provisions have increasingly been absorbed into pay rises and thus this factor is expected to have less influence on strike activity in recent years.

Macroeconomic conditions thus do not in themselves offer an easy predictor of strike activity. Strong economic growth should provoke increased wage demands and thus a greater propensity to strike. However, they also increase the cost of lost production to the firm while increasing profits and hence the capacity to pay higher wages, thus reducing the actual occurrence of strikes. Consequently, while most of these macro variables are interrelated, most studies include a range of these factors in an attempt to identify which specific factors are associated with the observed strike activity. This inter-relatedness of the variables commonly associated with industrial action suggests that cointegration analysis is the most appropriate method of analysing this question.

There were three specific industrial conditions which may also have influenced strike activity in this time period: the fall in union membership, the clustering of stoppages in the protected bargaining periods around the expiration and renegotiation of enterprise agreements and the reassertion of managerial prerogative after 1996. The latter two points suggest that working days lost should increase under the WRA or in association with the so-called union ‘pattern bargaining’ campaigns in 2000 and 2003. In Australia, union density or the percentage of the workforce belonging to unions peaked at 65 per cent in 1953 and was still over 50 per cent in 1980. However, since then it has declined steadily and consistently to just under 23 per cent by June 2003. This decline reflects world-wide labour market changes including a structural shift towards the more lightly unionised service sectors, increased casual and part-time employment and the emergence of more individualistic cultural values in the 1980s (Perry and Wilson, 2000). It is also argued that labour legislation and practices in Australia have also worked against union membership by encouraging ‘free
riding’ on union negotiated wage increases by non-members as well as Government support for the union bypass provisions of the Workplace Relations Act (Spooner, et al., 2001).

The decline in union density means that strike activity as traditionally measured as working days lost per 1,000 employees may be declining simply because less workers are involved in unions and hence are less able to strike. For example, workers covered by enterprise flexibility agreements do not have protected bargaining periods involving the legal right to strike. This does not mean that unionists are necessarily less militant. This factor can be covered by including union density as an explanatory variable as in Morris and Wilson (1999). Alternatively, where the objective is to examine how workers have reacted to legislative changes, outcome variables can be measured as number of strikes or working days lost per unionist (Beggs and Chapman, 1987a; Diduch, 1998; and Morris and Wilson, 1994).

Table 2  Industrial Indicators 1992 to 2002

<table>
<thead>
<tr>
<th>Year</th>
<th>Av. Annual Wage Inc. (Ent. Barg.)</th>
<th>Trade Union Membership</th>
<th>Union Density</th>
<th>Number of Agreements Made in year</th>
<th>Number of Employees Covered '000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992/93</td>
<td>3.9</td>
<td>2,508.8</td>
<td>39.6</td>
<td>906</td>
<td>865.3</td>
</tr>
<tr>
<td>1993/94</td>
<td>3.6</td>
<td>2,376.9</td>
<td>38.0</td>
<td>1,467</td>
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<td>1994/95</td>
<td>3.5</td>
<td>2,283.4</td>
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<td>1995/96</td>
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<td>2,251.8</td>
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<tr>
<td>1996/97</td>
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<td>2,194.3</td>
<td>31.1</td>
<td>3,914</td>
<td>565.8</td>
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<td>1997/98</td>
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<td>2,110.3</td>
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<td>1998/99</td>
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<td>2,037.5</td>
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<td>2000/01</td>
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<td>1,901.8</td>
<td>24.7</td>
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<td>3.8</td>
<td>1,902.7</td>
<td>24.5</td>
<td>6,521</td>
<td>775.9</td>
</tr>
</tbody>
</table>

Sources: DEWR, Workplace Agreements database, Trends in Federal Enterprise Bargaining, various issues; ABS. Cat. No. 6310.0: Employee Earnings, Benefits and Trade Union membership, various issues, ABS Cat. No. 6325.0, various issues.

Movements in industrial indicators are shown in table 2. The average annual wage increases emerging from enterprise bargaining can be compared with those shown for the whole labour force in table 1. Enterprise bargaining tended to result in higher wage outcomes until 1998/99 but lower outcomes between 1999 and 2001 when, as was discussed earlier, the labour flexibility aspects of the WRA were more strongly utilised. The number of enterprise agreements made and the number of workers covered by agreements rose steadily until 1998/99 but has since plateaued. There thus appears to be a correlation between increased use of enterprise bargaining and wage increases up to 1988/89, after which both the rise in the number of agreements, workers covered and wages weakens. These trends imply that the incidence and effectiveness of enterprise bargaining, which is most prevalent in unionised workplaces, has been affected by changes in power relationships under the Workplace Relations Act. It is less obvious whether these factors may have directly influenced strike activity.
An alternative approach argues that strike activity in Australia is a reflection of long term world-wide trends (Perry and Wilson, 2000). Globalisation can result in different countries experiencing similar inflation, unemployment and GDP growth rates which will result in similar strike patterns being observed. While statistically correlated, it is more difficult to sustain a causal argument that international macroeconomic conditions are not just interrelated but have similar causal connections with strike activity because of the complex differences in institutional arrangements in the industrial relations systems of different countries (Diduch, 1998). In this study, we are mainly interested in the changes associated with specific legislation. It is nevertheless true that international management practices, cultural values and technology are being adapted in Australia as national businesses internationalise and senior executives are recruited from overseas (Perry and Wilson, 2000). Such factors could lie behind the observed increase in ‘managerial policy’ disputes (Healy, 2002), if international managers are more prone to enforce managerial prerogatives and anti-union provisions of the WRA as the Australian industrial relations system moves to their more familiar enterprise bargaining regime.

4. The Model
The model used in this paper incorporates the general macroeconomic explanatory approach widely used in the economic literature of strike activity (Ashenfelter and Johnson, 1969; Beggs and Chapman, 1987a; Diduch, 1998; and Morris and Wilson, 1994, 1999). A less used alternative approach is to analyse the relationship between profits and strike activity at the firm level through its impact on the affected firm’s share price (McDonald and Bloch, 1999). Following Ashenfelter and Johnson (1968), this macroeconomic approach now normally incorporates institutional explanations based on trade union behaviour. In our model, wage negotiations are conducted by two parties, management and unions, which pursue conflicting aims within enterprise bargaining.

Unions attempt to achieve some pre-determined set of real wage increases and improved working conditions. Their acceptable monetary outcome, and hence the level of strike activity, will be higher:
(a) the higher are firm profits, or the general level of profits in the economy relative to the wages bill PROF (Ashenfelter and Johnson, 1968; Beggs and Chapman, 1987a; 1987b; and Morris and Wilson, 1994, 1999);
(b) the higher the general level of macroeconomic activity measured as real non-farm gross domestic product RNFGDP (Morris and Wilson, 1999) or lower the level of unemployment (Ashenfelter and Johnson, 1968; Beggs and Chapman, 1987b; and Diduch, 1998) or the higher the vacancy rate JVAC (Beggs and Chapman, 1987a; and Morris and Wilson, 1994);
(c) the higher the rate of inflation CPI to ensure an acceptable real wage increase (Ashenfelter and Johnson, 1968; Beggs and Chapman, 1987a, 1987b; Diduch, 1998; and Morris and Wilson, 1994, 1999);
(d) the higher the level of overtime OVER, or the prospect of making up lost earnings at the termination of the strike (Beggs and Chapman, 1987a; and Morris & Wilson, 1994);
(e) the lower the change in real average weekly earnings $\text{RWAGES}$ in order to restore the relative income position of workers (Ashenfelter and Johnson, 1968; and Morris and Wilson, 1999).

Firms attempt to maximise the current value of their future profit stream which they achieve by appropriating a higher proportion of the bargaining surplus (revenue minus fixed and intermediate costs, the wages bill and strike costs). The cost to the firm of resisting union demands and bearing associated strike costs activity will be higher (and hence the lower will be strike activity):

(a) the more buoyant their product market reflected in the ratio of current profits to the wages bill $\text{PROF}$ (Ashenfelter and Johnson, 1968; Beggs and Chapman, 1987a, 1987b; and Morris and Wilson, 1994, 1999) or the rate of growth of $\text{GNP/GDP}$ (Diduch, 1998);

(b) the lower are inventories $\text{PINV}$ or the risk of loosing customers during a strike (Ashenfelter and Johnson, 1968; Beggs and Chapman, 1987a, 1987b; and Morris and Wilson, 1994, 1999);

(c) the more effective is the union’s bargaining position in terms of the capacity of union leadership to utilise the strike weapon in bargaining ($\text{UDEN}$), reflecting the level of unionisation of the workforce or union density (Diduch, 1998; and Morris and Wilson, 1999).

Changes in industrial legislation will impact on the effectiveness of the union’s bargaining position. One of the objectives of the Workplace Relations Act (WRA) 1996 was to weaken the union’s negotiation position by encouraging direct negotiations with employees. Strike activity is not permitted when negotiating non-union agreements, although it is technically permitted for AWAs. Thus, management’s resistance to wage demands would be expected to rise after this Act was introduced. However, it could also have increased the militancy of union leadership as a response to its anti-union aspects. Thus, on both sides, politically motivated strike activity could be expected to have increased after the introduction of this legislative change. The impact of legislative changes and politically motivated clusters of strikes and lock-outs will be represented by dummy variables in this model. This approach is used in Ashenfelter and Johnson (1968); Beggs and Chapman (1987a, 1987b) and Morris and Wilson (1994, 1999).

The dependent variable, Strikes, is usually defined in terms of strike volume or Working Days Lost (WDL) per unionist (Un) or per employee (E). Strike frequency or number of strikes per unionist or per employee or Strike incidence measured as workers involved per unionist or employee have also been used. Measuring strike volume in terms of unionists means the results reflect the level of union militancy in different periods in Australian industrial history. Earlier studies showed that this measure of strike volume fell during the period of the Accord 1983-1987 (Beggs and Chapman, 1987a) and in the early period of enterprise bargaining up to 1992 (Morris and Wilson, 1994). Other Australian studies have measured working days lost per thousand employees (Beggs and Chapman, 1987b; and Morris and Wilson, 1999). Measuring working days lost per employee is open to ambiguous
interpretation as a fall could reflect either an improvement in employee job satisfaction and or a decrease in the opportunity to strike as union density or coverage of the workforce fell which may be offset by increased non-strike forms of industrial action. Nevertheless, in this study we have used this latter variable to make our results comparable with the more recent studies and to facilitate its use in international comparative studies.

Data
The sample period for this study is March quarter 1985 to September quarter 2003. The constructed database involves quarterly time series data derived from the following sources.

- **WDLE** Total Working Days Lost divided by Labour Force in thousands. Source: ABS Cat. No. 6321.0: Industrial Disputes, Australia, time series spread sheets, and ABS Cat. No. 6202.0: Labour Force Australia, time series spread sheets.

- **PROF** Profits as a ratio of the wages bill calculated as Gross Operating Surplus of private non-financial corporations (seasonally adjusted) divided by Compensation to non-farm employees (seasonally adjusted). Source: ABS Cat. No. 5206.0: National Income, Expenditure and Product, National Accounts time series spread sheets, tables 19 and 41.

- **RNFGDP** Real Non-Farm Gross Domestic product (seasonally adjusted) lagged one period. Source: ABS Cat. No. 5206.0: National Income, Expenditure and Product, National Accounts time series spread sheets, table 41.

- **JVAC** Job Vacancies per thousand employees. Source: ABS Cat. No 6354.0: Job Vacancies, Australia.

- **CPI** Annual Inflation Rate (proxy). Source: ABS Cat. No. 6401.0: Consumer Price Index (weighted average of eight capital cities).

- **OVER** Average Weekly Overtime Earnings per Employee. Source: ABS Cat. No. 6302.0: Average Weekly Earnings, calculated as difference between full time adult total earnings and full time adult ordinary time earnings.

- **RWAGES** Real Average Weekly Earnings (AWE) divided by CPI lagged one period. Source: ABS Cat. No. 6302.0, Average Weekly Earnings.

- **PINV** Book value of Private non-farm inventories (seasonally adjusted) as a percentage of non-farm GDP (seasonally adjusted) at current prices. Source: ABS Cat. No. 5206.0: National Income, Expenditure and Product, National Accounts time series spread sheets, table 41.
UDEN Union density measured as union membership divided by labour force. Source: ABS Cat. No. 6310.0: Employee Earnings, Benefits and Trade Union membership (extrapolated).

**Legislative Regime Variables**

As the purpose of this analysis is to measure the impact of industrial legislation change, a series of dummies are incorporated into the analysis.

Legislative Dummy (DL) one refers to the enterprise bargaining period March 1992 to present (September 2003) which is the period for which data on enterprise agreements is available.

Legislative Dummy (DL) two refers to the period of the Commonwealth Industrial Relations Reform Act 1993 operational from March 1994 to December 1996. This was a period of enterprise bargaining under Labor Governments.

Legislative Dummy (DL) three refers to the enterprise bargaining period of the Howard Liberal Government and the Workplace Relations Act 1996 operational from March 1997 to present (September 2003).

In addition, short periods when there were concentrations of politically motivated strikes can be identified, where strikes occurred for reasons other than the negotiation of wages and conditions. These are represented by the following dummies:

Dummy five covers the period 2nd quarter 1988 to 4th quarter 1989.\(^3\)

Dummy six covers the period 2nd quarter 1991 to 1st quarter 1992.\(^4\)

Dummy seven covers the period 1st quarter 1996 to 4th quarter 1997.\(^5\)

Dummy eight covers the period 1st quarter 2000 to 4th quarter 2000.\(^6\)

---

\(^3\) This was a period of abnormal strike activity involving a push to achieve real wage increases in 1988 following a period of declining real wages and loss of conditions 1982-83 to 1987-88 under the Accord (Norris, 1989). This period of high strike activity dated from the air traffic controllers rolling strikes from April 1988 to the end of the pilots dispute in December 1989 (Spooner, 1989, 1990).

\(^4\) This was a period of political strikes in response to the April 1991 National Wage Case which tied the 2.5 per cent wage increase earlier agreed under the Accord Mark IV to agreements tied to the structural efficiency principle. This condition would result in considerable delays to workers receiving the agreed rise and was subsequently rejected by the ACTU culminating in a 24 hour national strike in April 1991. A further general strike occurred in October 1991 in reaction to the NSW Industrial Relations Act (Jamieson, 1992).

\(^5\) This was a period of political strikes in reaction to the proposed industrial reforms by the newly elected Howard Liberal Government prior to the introduction of the 1996 Workplace Relations Act.

\(^6\) Such strikes included the BHP Pilbara dispute, the Finance Sector Union dispute with the Commonwealth Bank, the Joy Engineering lockout, the O’Connors meat works disputes and lockouts, lockouts at ACL, Yallourn Energy and Cadbury-Schweppes in Victoria, disputes in the Victoria construction industry, the Metal Workers Campaign 2000, etc. These actions were generally classified as caused by managerial policy and reflected a concerted campaign by conservative Federal and State Governments to enforce provisions of the WRA (Ellem, 2001).
Unit root tests using the Augmented Dickey-Fuller (ADF) were performed, with the results shown in Table 3. All variables were I(1) at the one per cent level of significance. As all variables were non-stationary and contained one unit root, the Johansen test for cointegration can be used. As the purpose of this study is to test for the significance of the economic and institutional dummy variables rather than forecasting, actual rather than log values of all variables is used.

The Akaike Information Criteria (AIC) and the Schwartz Bayesian Criteria (SBC) select the appropriate lag lengths. In all cases, they select similar lags for each variable. However, the number of lags selected differed among variables and in some cases relatively high numbers of lags were selected. To overcome this problem, the AIC and SBC criteria were applied to an unrestricted VAR model and the lag length chosen after testing a range of possibilities between one and eight, for the ones which minimised their values (Patterson 2000, p.541). In this study, this procedure selected lag lengths one and two.

Table 3  Augmented Dickey-Fuller Unit Root Tests

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>ADF t-statistic</th>
<th>AIC</th>
<th>SBC</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>WDLE(^7)</td>
<td>-0.1947</td>
<td>-1.5285(^*)</td>
<td>8.4</td>
<td>8.6</td>
<td>2.1401</td>
</tr>
<tr>
<td>CPI</td>
<td>-0.0549</td>
<td>-2.4709(^*)</td>
<td>2.2</td>
<td>2.4</td>
<td>2.1024</td>
</tr>
<tr>
<td>JVAC</td>
<td>-0.0612</td>
<td>-1.2997(^*)</td>
<td>7.3</td>
<td>7.4</td>
<td>1.9707</td>
</tr>
<tr>
<td>OVER</td>
<td>-0.1759</td>
<td>-2.6832(^*)</td>
<td>4.0</td>
<td>4.2</td>
<td>1.9755</td>
</tr>
<tr>
<td>PINV</td>
<td>-0.1376</td>
<td>-2.8406(^*)</td>
<td>2.3</td>
<td>2.4</td>
<td>2.0885</td>
</tr>
<tr>
<td>PROF</td>
<td>-0.1358</td>
<td>-3.9381(^*)</td>
<td>6.1</td>
<td>6.0</td>
<td>2.1581</td>
</tr>
<tr>
<td>RNFGDP</td>
<td>-0.0933</td>
<td>-1.4785(^*)</td>
<td>18.4</td>
<td>18.5</td>
<td>2.1446</td>
</tr>
<tr>
<td>RWAGES</td>
<td>-0.0210</td>
<td>-0.5778(^*)</td>
<td>5.9</td>
<td>6.0</td>
<td>1.9494</td>
</tr>
<tr>
<td>UDEN</td>
<td>-0.1255</td>
<td>-3.0828(^*)</td>
<td>-0.4</td>
<td>-0.1</td>
<td>1.7682</td>
</tr>
</tbody>
</table>

Notes: \(^*\) significantly different from 0 at the one per cent level.
The ADF t-statistic is determined with a constant but no trend for WDLE, JVAC, RWAGES, and with a constant and trend for CPI, OVER, PINV, PROF, RNFGDP, UDEN.
The Akaike Information Criteria and the Schwartz Bayesian Criteria are reported as AIC and SBC respectively. In all cases, both criteria suggest the same lag interval.

Cointegration Test

Johansen maximum likelihood VAR-based cointegration tests were conducted on the assumption that the series contained an intercept but no trend in the cointegrating vector. The test was performed including Dummy one representing enterprise bargaining and the four political dummies DUM five to DUM eight, for both one and two lag intervals. The trace statistic indicated two cointegrating equations, while the max-eiger statistic indicated one cointegrating equation for one lag. Using the two lag interval, both the trace and the max-eiger statistics indicated three cointegrating equations. These outcomes are shown in Table 4.

\(^7\) Unit root test for WDLE produced mixed results. ADF tests showed it to be non-stationary at I(1) due to the variance, particularly in the pre 1992 period. This series can be made stationary by introducing a trend or by using the Phillips-Perron test, which corrects for variance using the Bartlett kernel. For the purposes of this analysis, WDLE is taken as non-stationary due to the high level of variance in the data as shown in Figure 2.
Table 4  Model with Intercept in the Cointegrating Vector and Linear Trend in the Data.

<table>
<thead>
<tr>
<th>No. of CE</th>
<th>Eigenvalue</th>
<th>Trace Statistic</th>
<th>Max-Eiger Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero</td>
<td>0.7147</td>
<td>279.21**</td>
<td>91.55**</td>
</tr>
<tr>
<td>At most one</td>
<td>0.5404</td>
<td>187.66**</td>
<td>56.75 *</td>
</tr>
<tr>
<td>At most two</td>
<td>0.4658</td>
<td>130.92 *</td>
<td>45.77 *</td>
</tr>
<tr>
<td>At most three</td>
<td>0.3880</td>
<td>85.15</td>
<td>35.84</td>
</tr>
</tbody>
</table>

Trace statistic indicates two cointegrating equations at one per cent confidence level.
Max-eiger statistic indicates one cointegrating equation at one per cent level.

With two lag intervals:

<table>
<thead>
<tr>
<th>No. of CE</th>
<th>Eigenvalue</th>
<th>Trace Statistic</th>
<th>Max-Eiger Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero</td>
<td>0.7509</td>
<td>312.64**</td>
<td>100.07**</td>
</tr>
<tr>
<td>At most one</td>
<td>0.6392</td>
<td>212.57**</td>
<td>73.39 **</td>
</tr>
<tr>
<td>At most two</td>
<td>0.5222</td>
<td>139.18**</td>
<td>53.18</td>
</tr>
<tr>
<td>At most three</td>
<td>0.4076</td>
<td>86.00</td>
<td>37.69</td>
</tr>
</tbody>
</table>

Trace statistic indicates three cointegrating equations at the one per cent confidence level.
Max-eiger statistic indicates three cointegrating equations at one per cent level.

Notes: ** rejection of hypothesis at one per cent confidence level.
*rejection of hypothesis at five per cent confidence level.

5. Results
The estimation procedure is Johansen’s maximum likelihood vector autoregression (VAR) approach (Johansen, 1991, 1995). Vector Error Correction (VEC) equations were run using both one and two lag intervals. While the results were similar, the two lag model was significantly superior in terms of the R-squared values and returned a significant F value. Thus this equation is used for the rest of this analysis. As noted in the introduction, the purpose of this exercise is to investigate whether economic, legislative or political factors, in the form of strikes or lockouts, are the most relevant determinants of strike activity measured as working days lost per 1,000 employees (WDLE) in a period of enterprise bargaining.

Long Run Equations
The coefficients and statistical values for the economic variables from the long run equations are shown in table 5. As indicated above, three cointegrating equations were produced for the variables WDLE, CPI and JVAC.

Table 5  Long Run Coefficients: Economic Variables 1985 to 2003

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Explanatory Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>WDLE</td>
<td>OVER</td>
</tr>
<tr>
<td></td>
<td>2.003*</td>
</tr>
<tr>
<td></td>
<td>(3.834)</td>
</tr>
<tr>
<td>CPI</td>
<td>-0.648</td>
</tr>
<tr>
<td></td>
<td>(-1.173)</td>
</tr>
<tr>
<td>JVAC</td>
<td>-1.273</td>
</tr>
<tr>
<td></td>
<td>(-1.914)</td>
</tr>
</tbody>
</table>

Notes: Cointegrating vectors normalised on WDLE, CPI and JVAC respectively.
All tests of significance reported under the assumption of normality.
*significant at five per cent level.
The first cointegrating equation indicates that there is a long term relationship between working days lost and the explanatory economic variables: overtime (positive) and profits (negative). This suggests that days lost due to strikes increased when overtime rose and when profits share fell. Greater availability of overtime would make workers more willing to strike, knowing they could make up lost income through overtime at the end of the strike. Declining profits share would make managers more resistant to wages demands, thus resulting in strike activity. These results are thus sensible in terms of logical negotiating behaviour. However, as indicated above, the main focus of this study is on the short run analysis incorporating the legislative and political strike dummy variables. Short run error correction vector equations were run excluding those economic variables that were found to be insignificant in the above long run equations.

<table>
<thead>
<tr>
<th>Regressors</th>
<th>Model 1 (Enterprise Bargaining)</th>
<th>Model 2 (Reform Act 1993)</th>
<th>Model 3 (Workplace Relations Act)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>8.613</td>
<td>-5.329</td>
<td>8.297</td>
</tr>
<tr>
<td></td>
<td>(1.332)*</td>
<td>(-0.787)</td>
<td>(1.038)</td>
</tr>
<tr>
<td>Coin. Eq.1</td>
<td>-1.973</td>
<td>-1.366</td>
<td>-0.899</td>
</tr>
<tr>
<td></td>
<td>(-8.121)***</td>
<td>(-5.378)***</td>
<td>(-4.381)***</td>
</tr>
<tr>
<td>Coin. Eq.2</td>
<td>-1.233</td>
<td>-0.371</td>
<td>-0.571</td>
</tr>
<tr>
<td></td>
<td>(-2.254)**</td>
<td>(-0.648)</td>
<td>(-0.926)</td>
</tr>
<tr>
<td>Coin. Eq.3</td>
<td>-0.455</td>
<td>-0.278</td>
<td>0.081</td>
</tr>
<tr>
<td></td>
<td>(-2.663)***</td>
<td>(-1.462)*</td>
<td>(0.405)</td>
</tr>
<tr>
<td>WDLE t-2</td>
<td>0.481</td>
<td>0.358</td>
<td>0.182</td>
</tr>
<tr>
<td></td>
<td>(4.348)***</td>
<td>(2.717)***</td>
<td>(1.460)***</td>
</tr>
<tr>
<td>CPI t-2</td>
<td>5.262</td>
<td>4.566</td>
<td>1.676</td>
</tr>
<tr>
<td></td>
<td>(1.665)*</td>
<td>(1.191)*</td>
<td>(0.407)</td>
</tr>
<tr>
<td>JVAC t-2</td>
<td>0.187</td>
<td>0.201</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>(0.916)</td>
<td>(0.822)</td>
<td>(-0.017)</td>
</tr>
<tr>
<td>OVER t-2</td>
<td>-0.343</td>
<td>-1.267</td>
<td>-1.302</td>
</tr>
<tr>
<td></td>
<td>(-0.335)</td>
<td>(-1.056)</td>
<td>(-0.994)</td>
</tr>
<tr>
<td>PINV t-2</td>
<td>6.713</td>
<td>3.715</td>
<td>7.420</td>
</tr>
<tr>
<td></td>
<td>(2.744)***</td>
<td>(1.199)</td>
<td>(2.340)***</td>
</tr>
<tr>
<td>PROF t-2</td>
<td>-42.340</td>
<td>-216.775</td>
<td>-153.92</td>
</tr>
<tr>
<td></td>
<td>(-0.243)</td>
<td>(-1.072)</td>
<td>(-0.707)</td>
</tr>
<tr>
<td>Legislative Variable 1</td>
<td>-30.141</td>
<td>-12.759</td>
<td>-22.492</td>
</tr>
<tr>
<td>(Enterprise bargaining)</td>
<td>(-4.401)***</td>
<td>(-2.043)</td>
<td>(-3.482)***</td>
</tr>
<tr>
<td>Legislative Variable 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Reform Act 1993)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legislative Variable 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Workplace Relations Act)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political Dummy 5</td>
<td>18.615</td>
<td>5.206</td>
<td>10.841</td>
</tr>
<tr>
<td>(1988-89)</td>
<td>(2.869)***</td>
<td>(1.457)*</td>
<td></td>
</tr>
<tr>
<td>Political Dummy 6</td>
<td>7.210</td>
<td>7.889</td>
<td>3.701</td>
</tr>
<tr>
<td>(1991-1992)</td>
<td>(0.940)</td>
<td>(0.821)</td>
<td>(0.347)</td>
</tr>
<tr>
<td>Political Dummy 7</td>
<td>18.810</td>
<td>5.206</td>
<td>10.841</td>
</tr>
<tr>
<td>(1996-1997)</td>
<td>(3.202)***</td>
<td>(0.759)</td>
<td>(1.457) *</td>
</tr>
<tr>
<td>Political Dummy 8</td>
<td>18.564</td>
<td>7.889</td>
<td>3.701</td>
</tr>
<tr>
<td>(2000)</td>
<td>(2.227)**</td>
<td>(0.821)</td>
<td>(0.347)</td>
</tr>
<tr>
<td>Statistics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.785</td>
<td>0.663</td>
<td>0.620</td>
</tr>
<tr>
<td>Adj. R-squared</td>
<td>0.701</td>
<td>0.548</td>
<td>0.491</td>
</tr>
<tr>
<td>F statistic</td>
<td>9.332**</td>
<td>5.786**</td>
<td>4.807**</td>
</tr>
</tbody>
</table>

Notes: * Significant at ten per cent level, ** Significant at five per cent level, *** Significant at one per cent level.
to improve the model specifications. A retesting of the cointegration analysis on this basis confirmed that three cointegrating equations were still required in this shortened analysis.

**Enterprise Bargaining:**
The first VEC equation was run using Dummy one representing the enterprise bargaining period and the four nominated political dummies (Dummies five to eight). These results are shown in table 6. The only economic variables to show a significant relationship with WDLE in this equation were CPI, with a positive sign at ten per cent significance, and inventories (PINV), with a positive sign at one per cent significance level. This indicated that as inventories increased so did strike levels, consistent with the earlier hypothesis that managers are more resistant to workers’ demands and so are prepared to bear the costs of a strike if they have a stockpile of inventories from which to meet customer needs during that strike. Further rises in the CPI were associated with higher levels of WDLE, indicating that workers will attempt to regain real wages in times of inflation.

In this equation, the enterprise bargaining Dummy one was significant at the one per cent confidence level and indicated that WDLE had fallen by 30 per cent as a result of the introduction of enterprise bargaining. Of the political strike dummies, Dummy five covering 1988-89 and Dummy seven covering 1996-97 were significant (at the one per cent level). These both indicted that WDLE rose by 18 per cent due to political strikes related to the fall in real wages under the Accord and prior to the introduction of the Workplace Relations Act.

**Legislation – Reform Act 1993 and Workplace Relations Act 1996**
The impact of the two different legislative periods were tested separately using Dummy two to represent the Commonwealth Reform Act 1993 and Dummy three to represent the Workplace Relations Act 1996. Political dummies seven and eight were included in both equations.

Of the economic variables, inventories (PINV) was positive and significant (at one per cent level) in the WRA equation. This was the only significant economic factor affecting WDLE, although the lagged value of WDLE was also significant in both equations (at the one and ten per cent levels respectively).

Dummy two representing the Reform Act was negative and significant at the five per cent level, with a coefficient value of 13 per cent. This indicates that WDLE were lower than the trend level under this legislative regime. Dummy three representing the Workplace Relations Act was also negative and significant at the one per cent level, with a coefficient level of 22 per cent. For this equation, Dummy seven was positive and significant. Thus both pieces of enterprise bargaining legislation were associated with reduced working days lost, although the WRA has had a greater impact to date.
6. Conclusion
These results indicate that the main factor causing the decline in strike volumes in the recent period from 1992 onwards has been the introduction of enterprise bargaining. The conditions of enterprise agreements prevent workers taking advantage of cyclical improvements in economic conditions to pursue wage claims, as was the situation in Australia under the Award system. It is interesting to note that the decline in union density was insignificant in terms of WDLE. This probably reflects the situation where unionised sectors are now predominantly covered by enterprise agreements. This interpretation suggests that future analyses of strike activity need to include the characteristics of enterprise bargaining, and particularly the coverage and periodic occurrences of protected bargaining periods in major enterprise bargaining sectors as explanatory variables.

The superior performance of the WRA compared with the Reform Act needs careful analysis. Unions were unhappy with the Reform Act as it introduced a non-union stream of enterprise flexibility agreements, although by 1995, employers were generally satisfied with progress towards enterprise bargaining under this Act (Hodgkinson, 2003). As shown in figure 1, there was no apparent reduction in WDLE under the WRA until after the final period of political strikes (Dummy 8) in 2000. After this period, and possibly associated with a change of Minister for Industrial Relations, WDLE fell significantly despite a number of major coordinated industry-based enterprise bargaining campaigns under Campaign 2003. Thus the reduction in WDLE associated with this legislation may reflect changes in political resolve to enforce the anti-union aspects of the legislation, and the prevailing strategy of unions to pursue disputes through the Courts rather than the workplace (Hodgkinson, 2003). It does, however, support the earlier contention that the move to enterprise bargaining has been the main determinant of strike volumes in the past decade, rather than the particular conditions imbedded in the different legislation.

With the re-election of the Howard Coalition Government which will give it control of the Senate in 2005, further strengthening of the flexibility and anti-union components of the Workplace Relations Act can be expected. This may result in another cluster of political strikes, similar to those represented by Dummy 7. However, these results suggest that the trend towards lower levels of industrial dispute activity will be maintained.

References
Diduch, A.M. (1998), ‘Global Strike Patterns, Macroeconomic Variables, and Industrial Relations’, International Review of Comparative Public Policy, 10, 3-34.


