

# The Determinants of Union Membership:

Evidence from two Australian Surveys

by

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of The Australian National University

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*In memory of my Grandfathers:*

### Bill Mills (1899-1987)

### Frank Grimes (1909-1990)



## Declaration

This thesis was written while I was studying at the Economics Department, Research School of Social Sciences at The Australian National University. The opinions expressed are my own original work, unless otherwise acknowledged in the text or Acknowledgments.



**Paul Grimes**

March 1994



## Acknowledgments

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I am solely responsible for any errors or shortcomings.



## Abstract

This thesis is an econometric investigation of what determines an individual's probability of union membership.

Following Olson (1965) it is argued that unions are fundamentally collective organisations that seek to advance collective goals. Therefore, it is stressed that union membership needs to be understood as a collective action problem in which individuals have an incentive to free ride the collective benefits of unionism.

The empirical analysis commences with the estimation of a simple reduced form model of union membership. Similar models of Australian union membership have been estimated by Crockett and Hall (1987), Miller and Rummery (1989), Deery and DeCieri (1991), and Christie (1992). Chapter 3 surveys the findings of the previous studies and presents new evidence from the *Class Structure of Australia* and *Issues in Multicultural Australia* surveys. In particular, the first Australian estimates of the impact of workplace size on the individual's probability of union membership are reported.

However, in the following chapters we show that the standard model masks important relationships that are revealed by more disaggregated models. Indeed, a major contribution of this thesis is the development of more detailed, "multiple-hurdle" models of union membership.

In Chapter 4 we modify the simple model by specifying a two-stage model of unionised employment and union membership. Here union membership is modelled as a decision which is conditional on the individual being employed in a unionised workplace. One of the principal findings of this chapter is that once the availability of union membership is controlled, there is no significant difference in the propensities of private and public sector workers to join unions.

Another issue explored in Chapter 4 is the appropriate interpretation of the relationship between wages and union membership. Some researchers argue that there is a wage premium associated with union membership, and that this wage premium should be treated as a determinant of the individual's probability of

membership. However, we argue that, under normal circumstances, an individual cannot expect a wage gain simply by joining the relevant union. Indeed, our estimates indicate that there is no wage advantage associated with union membership in unionised establishments. However, we do find a significant wage premium associated with employment in a unionised establishment.

There is some controversy in the literature about the impact compulsory union membership arrangements have on the overall level of union membership in Australia. In Chapter 5 we specify a two-stage model of compulsory and voluntary union membership. Using the estimates from a model of voluntary union membership, we find that closed shop arrangements have a substantial impact on the overall level of union membership. In particular, we estimate as many as 65 percent of compulsory union members would not join a union if membership was not a condition of their employment.

Finally, in Chapter 6 we investigate the reasons why a smaller proportion of women join unions than men. We find that the male-female membership differential is largely the product of two factors: (i) that women are less likely than men to be employed in unionised establishments; and (ii) that women have a substantially lower rate of closed shop employment than men. We find little evidence to support the proposition that women have a weaker desire for union membership than men.



# Contents

|                                                                       |           |
|-----------------------------------------------------------------------|-----------|
| Declaration . . . . .                                                 | iii       |
| Acknowledgments . . . . .                                             | v         |
| Abstract . . . . .                                                    | vii       |
| Contents . . . . .                                                    | ix        |
| List of Tables . . . . .                                              | xiii      |
| List of Figures . . . . .                                             | xv        |
| <br>                                                                  |           |
| <b>1 Introduction . . . . .</b>                                       | <b>1</b>  |
| <br>                                                                  |           |
| <b>2 The Theory of Union Membership . . . . .</b>                     | <b>15</b> |
| 2.1 Introduction . . . . .                                            | 15        |
| 2.2 The Economic Analysis of Trade Unions . . . . .                   | 15        |
| Trade Union Objectives . . . . .                                      | 17        |
| Unions as Rent Seeking Coalitions . . . . .                           | 18        |
| 2.3 The Union Membership Decision . . . . .                           | 26        |
| Union Membership and the Logic of Collective Action . . . . .         | 26        |
| The Collective Benefits of Unionism . . . . .                         | 27        |
| The Free Rider Incentive: A Simple Model . . . . .                    | 29        |
| Union Membership as a Prisoner's Dilemma . . . . .                    | 31        |
| 2.4 Compulsory Union Membership . . . . .                             | 35        |
| 2.5 Voluntary Union Membership . . . . .                              | 37        |
| The Social Custom Model . . . . .                                     | 37        |
| Job Protection and Union Membership . . . . .                         | 43        |
| An Insurance Model of Union membership . . . . .                      | 44        |
| Workers' Compensation . . . . .                                       | 47        |
| Information . . . . .                                                 | 48        |
| The Fringe Benefits of Union Membership . . . . .                     | 49        |
| 2.6 Union Organisation and Eligibility for Union Membership . . . . . | 50        |
| 2.7 Union Membership and Unionised Employment . . . . .               | 53        |
| 2.8 Conclusion . . . . .                                              | 56        |
| <br>                                                                  |           |
| <b>3 The Determinants of Union Membership: . . . . .</b>              | <b>59</b> |
| <b>A Preliminary Analysis and Empirical Survey</b>                    |           |
| 3.1 Introduction . . . . .                                            | 59        |
| 3.2 Modelling Trade Union Membership . . . . .                        | 60        |
| The Membership Decision . . . . .                                     | 60        |

|                                                                                      |            |
|--------------------------------------------------------------------------------------|------------|
| A Reduced Form Model of Union Membership . . . . .                                   | 63         |
| Union Membership and Wages . . . . .                                                 | 68         |
| 3.3 Data . . . . .                                                                   | 71         |
| The Issues in Multicultural Australia Survey . . . . .                               | 72         |
| The Class Structure of Australia Survey . . . . .                                    | 74         |
| 3.4 Model Specification and Estimation . . . . .                                     | 74         |
| A Structural Model of Union Membership . . . . .                                     | 76         |
| 3.5 The Determinants of Union Membership . . . . .                                   | 79         |
| Workplace Size . . . . .                                                             | 80         |
| Industry of Employment . . . . .                                                     | 87         |
| Public Sector Employment . . . . .                                                   | 91         |
| Occupation . . . . .                                                                 | 93         |
| Job Tenure . . . . .                                                                 | 101        |
| Hours Worked . . . . .                                                               | 104        |
| Age/Experience . . . . .                                                             | 106        |
| Education . . . . .                                                                  | 109        |
| Location and State of Residence . . . . .                                            | 110        |
| Other Personal Characteristics . . . . .                                             | 113        |
| 3.6 Conclusion . . . . .                                                             | 119        |
| Appendix 3 . . . . .                                                                 | 122        |
| <b>4 Trade Union Coverage, Union Membership and the Union Wage Premium . .</b>       | <b>127</b> |
| 4.1 Introduction . . . . .                                                           | 127        |
| 4.2 Union Density and the Extent of Unionised Employment . . . . .                   | 131        |
| 4.3 The Union Impact on Wages . . . . .                                              | 140        |
| 4.4 A Model of Unionised Employment, Union Membership and Wages . . . . .            | 144        |
| Estimation of the Reduced Form Model of Union Membership . . . . .                   | 153        |
| 4.5 Estimation Results . . . . .                                                     | 155        |
| 4.6 Union Coverage and the Union Wage Differential . . . . .                         | 166        |
| Modelling Wages and Union Coverage . . . . .                                         | 167        |
| Estimation of the Union Impact on Wages . . . . .                                    | 171        |
| 4.7 Conclusion . . . . .                                                             | 178        |
| Appendix 4 . . . . .                                                                 | 183        |
| <b>5 Voluntary and Compulsory Union Membership . . . . .</b>                         | <b>185</b> |
| 5.1 Introduction . . . . .                                                           | 185        |
| 5.2 The Extent of Compulsory Unionism . . . . .                                      | 187        |
| Compulsory Membership Arrangements . . . . .                                         | 187        |
| Measuring the Extent of Compulsory Unionism . . . . .                                | 190        |
| 5.3 Econometric Modelling Issues . . . . .                                           | 196        |
| A Simple Model of Compulsory Membership . . . . .                                    | 199        |
| Open Shop Union Membership . . . . .                                                 | 202        |
| 5.4 Empirical Analysis . . . . .                                                     | 204        |
| 5.5 Conscripts and Volunteers . . . . .                                              | 219        |
| 5.6 The Impact of the Closed Shop . . . . .                                          | 223        |
| The Demise of the Closed Shop and the Decline in Trade Union<br>Membership . . . . . | 227        |

5.7 Conclusion . . . . . 228

6 Explaining the Male-Female Membership Differential . . . . . 231

6.1 Introduction . . . . . 231

6.2 Explanations for the Male-Female Membership Differential . . . . . 233

6.3 Male and Female Membership: Some Sample Statistics . . . . . 235

6.4 Estimating the Membership Differential . . . . . 240

    No Slope Interactions . . . . . 240

    Full Slope Interactions: Full IMA Sample . . . . . 243

    Full Slope Interactions: Open Shop Sub-Sample . . . . . 249

6.5 Decomposition Analysis . . . . . 254

6.6 Trade Union Availability and the Male-Female Membership Differential . . . 260

6.7 Male-Female Differences in Attitudes to Trade Unionism . . . . . 261

6.8 Conclusion . . . . . 263

7 Conclusion . . . . . 265

    The Main Findings . . . . . 267

    Practical Relevance and Suggestions for Future Research . . . . . 275

Bibliography . . . . . 277



## List of Tables

|            |                                                                             |     |
|------------|-----------------------------------------------------------------------------|-----|
| Table 3.1  | Summary of Major Australian Cross-Section Studies . . . . .                 | 77  |
|            | of Union Membership                                                         |     |
| Table 3.2  | Union Density Rates by Establishment Size . . . . .                         | 81  |
| Table 3.3  | Union Membership and Workplace Size: Estimated Coefficients and . . . .     | 85  |
|            | Marginal Effects                                                            |     |
| Table 3.4  | Industry of Employment: Estimated Coefficients . . . . .                    | 90  |
| Table 3.5  | Union Membership and Sector of Employment: Estimated Coefficients . .       | 93  |
| Table 3.6  | Occupation and Supervisory Status: Estimated Coefficients - . . . . .       | 97  |
|            | IMA Survey                                                                  |     |
| Table 3.7  | Occupation and Supervisory Status: Estimated Coefficients - . . . . .       | 98  |
|            | CSA Equation                                                                |     |
| Table 3.8  | Predicted probabilities of Union Membership by Occupation, Sector . . .     | 100 |
|            | and Selected Industries and Workplace Sizes (%)                             |     |
| Table 3.9  | Job Tenure, Education, Experience and Hours Worked: . . . . .               | 103 |
|            | Estimated Coefficients                                                      |     |
| Table 3.10 | State of Residence: Estimated Coefficients . . . . .                        | 112 |
| Table 3.11 | Selected Personal Characteristics: Estimated Coefficients . . . . .         | 115 |
| Table 3.12 | Political Affiliation and Attitudes to Unions: Estimated Coefficients . . . | 118 |
| Table A3.1 | Probit Model of Union Membership: . . . . .                                 | 122 |
|            | Issues in Multicultural Australia Survey                                    |     |
| Table A3.2 | Probit models of Union Membership: . . . . .                                | 124 |
|            | Class Structure of Australia Survey                                         |     |
| Table 4.1  | Measures of Trade Union Coverage: Selected Categories . . . . .             | 134 |
| Table 4.2  | Membership Take-Up Rates: Selected Categories (Employees in . . . . .       | 136 |
|            | Unionised Establishments Eligible for Membership Only)                      |     |
| Table 4.3  | Bivariate Probit Model of Unionised Employment . . . . .                    | 156 |
|            | and Union Membership                                                        |     |
| Table 4.4  | Independent Probit Models of Union Membership . . . . .                     | 162 |
| Table 4.5  | Union Wage Differentials: Zero Slope Interactions . . . . .                 | 173 |
| Table 4.6  | Estimated Union Status Coefficients: OLS . . . . .                          | 176 |
| Table 4.7  | Average Union Membership Differential: Estimates from a Model . . . .       | 177 |
|            | with Two Selection Criteria                                                 |     |
| Table 5.1  | Union Membership and Closed Shop Employment Densities . . . . .             | 194 |
|            | for Selected Categories                                                     |     |
| Table 5.2  | Union Membership and Open Shop Employment: Probit Estimates . . . .         | 206 |
| Table 5.3  | Likelihood Ratio Tests of Joint Significance - Open Shop . . . . .          | 208 |
|            | Employment Probit                                                           |     |
| Table 5.4  | Independent Probit Models of Union Membership . . . . .                     | 214 |

|            |                                                                                              |     |
|------------|----------------------------------------------------------------------------------------------|-----|
| Table 5.5  | Willingness to Join a Union: Probit Estimates . . . . .                                      | 222 |
| Table 5.6  | Predicted and Actual Average Probabilities of Union Membership . . . . .                     | 227 |
|            |                                                                                              |     |
| Table 6.1A | Sample Statistics: IMA Survey . . . . .                                                      | 237 |
| Table 6.1B | Sample Statistics: CSA Survey . . . . .                                                      | 238 |
| Table 6.2  | Probit Estimates of the Effect of Being Female on the Probability<br>of Membership . . . . . | 242 |
| Table 6.3  | Probit Estimates of Union Membership: Full IMA Sample . . . . .                              | 246 |
| Table 6.4  | Probit Estimates of Probability of Union Membership: . . . . .<br>Open Shop Sample           | 250 |
| Table 6.5  | Likelihood Ratio Tests - Variables Interacted with FEMALE . . . . .                          | 252 |
| Table 6.6  | Decomposition of the Male-Female Membership Differential . . . . .                           | 259 |
| Table 6.7  | Estimated FEMALE Coefficients: CSA Data . . . . .                                            | 261 |

## List of Figures

|            |                                                                                                             |     |
|------------|-------------------------------------------------------------------------------------------------------------|-----|
| Figure 1.1 | Australian Union Density (1976-1992) . . . . .                                                              | 2   |
| Figure 1.2 | The Standard Model of Union Membership . . . . .                                                            | 7   |
| Figure 1.3 | Two Stage Model of Unionised Employment and Union Membership . . .                                          | 9   |
| Figure 1.4 | Two Stage Model of Closed Shop Employment and Union Membership .                                            | 12  |
|            |                                                                                                             |     |
| Figure 3.1 | A Structural Model of Union Membership . . . . .                                                            | 76  |
| Figure 3.2 | Years with Current Employer and Estimated Probability of Membership<br>for a Stylised Worker: IMA Estimates | 104 |
| Figure 3.3 | Hours of Work and Estimated Probability of Membership . . . . .                                             | 105 |
|            | for a Stylised Worker: CSA Estimates                                                                        |     |
| Figure 3.4 | Experience and Estimated Probability of Membership . . . . .                                                | 108 |
|            | for a Stylised Worker: CSA Estimates                                                                        |     |
|            |                                                                                                             |     |
| Figure 4.1 | CSA Union Membership and Coverage Questions: An Overview . . . . .                                          | 132 |
|            |                                                                                                             |     |
| Figure 5.1 | Two Stage Model of Unionised Employment and Union Membership . .                                            | 197 |
| Figure 5.2 | Three Stage Model of Unionised Employment and Compulsory . . . . .                                          | 198 |
|            | and Voluntary Union Membership                                                                              |     |
| Figure 5.3 | Two Stage Model of Closed Shop Employment and Voluntary . . . . .                                           | 199 |
|            | Union Membership                                                                                            |     |
| Figure 5.4 | Tenure and Estimated Probability of Membership: . . . . .                                                   | 219 |
|            | Open Shop and Full Sample Estimates                                                                         |     |
| Figure 5.5 | IMA Union Membership Questions: An Overview . . . . .                                                       | 220 |
|            |                                                                                                             |     |
| Figure 6.1 | Attitudes to Trade Unions: Males and Females . . . . .                                                      | 262 |
|            |                                                                                                             |     |
| Figure 7.1 | Workplace Size and Estimated Probabilities of Membership for a . . . . .                                    | 268 |
|            | Stylised Worker: IMA Estimates                                                                              |     |
| Figure 7.2 | Sector of Employment and Estimated Probabilities of Membership . . . .                                      | 269 |
|            | for a Stylised Worker: IMA and CSA Estimates                                                                |     |
| Figure 7.3 | Political Affiliation and Estimated Probabilities of Membership . . . . .                                   | 271 |
|            | for a Stylised Worker: IMA and CSA Estimates                                                                |     |
| Figure 7.4 | Sex and Estimated Probabilities of Membership . . . . .                                                     | 274 |
|            | for a Stylised Worker: IMA and CSA Estimates                                                                |     |

## Introduction

For over a century trade unions have had a profound impact on Australia's political and economic development. Trade Unions formed the oldest of Australia's political parties, the Australian Labor Party. Through the Labor Party, they have provided the nation with some of its most influential leaders. Unions have also helped shape the unique institutions of Australia's regulated labour market. Today, more than 2.5 million Australian workers belong to a trade union (ABS, 1993), and the Labor Party has been in power federally for more than a decade. Yet it is widely believed that union influence has peaked and that unions face a future of inevitable decline.

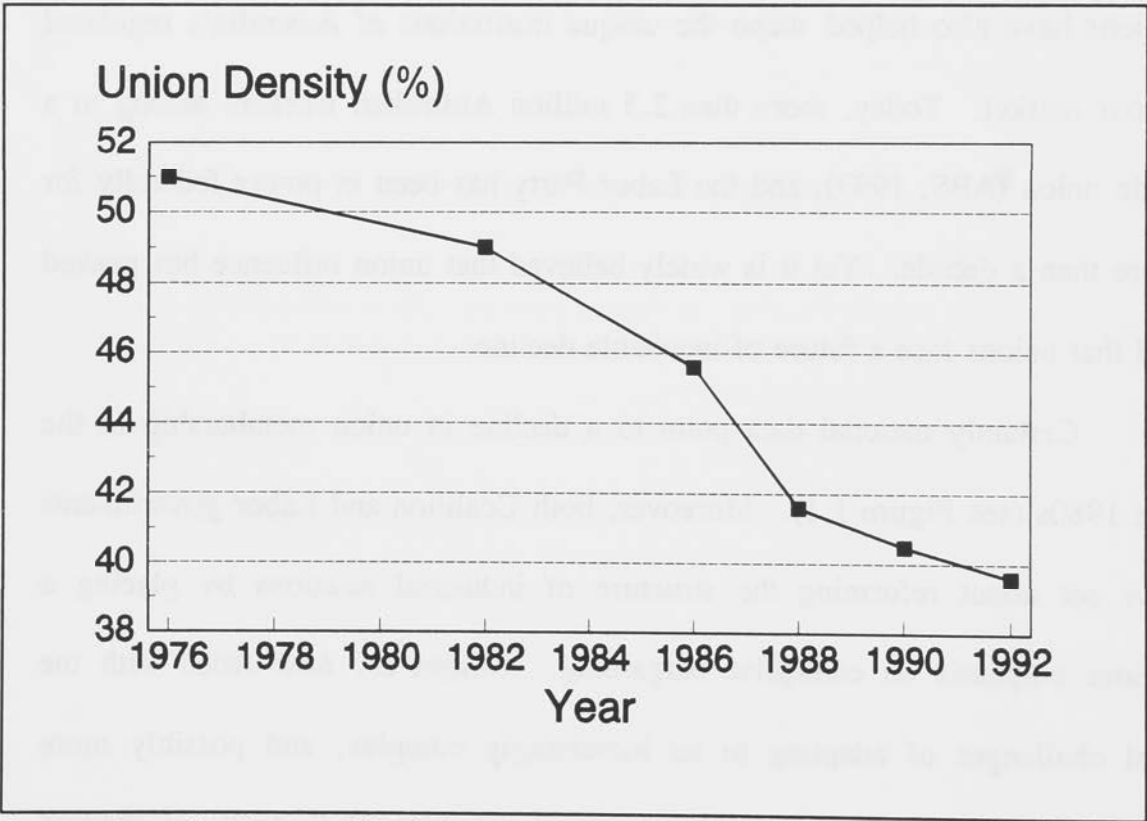
Certainly national data point to a decline in union membership in the late 1980s (see Figure 1.1). Moreover, both Coalition and Labor governments have set about reforming the structure of industrial relations by placing a greater emphasis on enterprise bargaining. Unions are now faced with the dual challenges of adapting to an increasingly complex, and possibly more hostile industrial environment, and of remaining relevant to needs of modern workers. In this climate, a study of trade union membership has not only academic appeal, but is also very topical.

While there are a host of important issues that might be tackled, not



least of which are the reasons for the decline in union membership<sup>1</sup>, this thesis has a very specific focus. The central aim is to use econometric methods to investigate what factors determine whether an individual becomes a union member. For instance, is a worker's probability of membership related to his or her sex? Is it related to occupation? Is it related to political affiliation?

FIGURE 1.1  
Australian Union Density (1976-1992)



Source: Australian Bureau of Statistics, *Trade Union Members Australia*, various issues.

<sup>1</sup>The models developed in the thesis could be applied to investigate the sources of the decline in trade union membership using individual data (see, for example, Farber (1990)). However, to the best of our knowledge, suitable Australian data sources for such an exercise are not readily available (the unit record data collected by the Australian Bureau of Statistics is a possible exception but is only available at considerable expense).

In order to answer these questions a source of individual data including union status is required. Although such data sets are comparatively rare in Australia, in this thesis data from two Australian surveys are used. Neither of these data sources have previously been used to model the determinants of union membership. Furthermore, both surveys contain information not available from other Australian data sources.

The first survey is the *Class Structure of Australia* (CSA) survey which was conducted in 1986. The CSA survey includes data on whether an individual is employed in a unionised or non-unionised location. This is a crucial piece of information because workers in unionised locations clearly are expected to be far more likely to become union members than those in non-unionised establishments.

The second data source is the Office of Multicultural Affairs' 1988 survey *Issues in Multicultural Australia* (IMA). The IMA survey is a unique source of information on compulsory union membership.

### *The Theory of Union Membership*

Why do workers join unions? Chapter 2 surveys the theories proposed by economists and other social scientists.

Much of the literature on the determinants of union membership relates to the United States. In the United States, institutional arrangements allow union membership to be modelled in a relatively straight-forward fashion. It is typically assumed that the labour market consists of two sectors - a unionised

sector and a non-unionised sector - and that the structures of compensation in the two sectors differ. Utility maximising workers choose their preferred sector of employment based on the utilities expected in each sector (Farber, 1986). Since a majority of workers are employed in non Right-To-Work states (where membership is compulsory for workers in unionised establishments), the decision to seek employment in the union sector is tantamount to choosing to join a union. The major innovation in recent years has been the recognition that it is costly for American unions to organise new jobs and that, as a result, there is likely to be an excess demand for unionised employment, and therefore a queue for union membership. Consequently, it is assumed that a worker only becomes a union member if: (i) he or she desires a union job; and (ii) if he or she is chosen from the queue by a unionised employer.

Explaining why workers join unions when union membership is not compulsory is more problematic. Since unions are engaged in supplying services which are collectively enjoyed by members and non-members, there is an incentive for workers to free-ride and not join their union. Because approximately 50 percent of Australian unionists are voluntary members, a large part of Chapter 3 is devoted to outlining theories of open shop unionism. Much of the literature surveyed is the product of recent research by British economists who have sought to explain trade union membership in the wake of the Thatcher government's abolition of the closed shop.

Following Olson (1965) it is recognised that, within a rational choice framework, unions must supply private incentive goods in order to attract members. Thus, unions provide excludable private services such as insurance

benefits, cheap holidays, retail discounts and the like. While such fringe benefits no doubt help attract and retain some members, they fail to provide a complete explanation for the existence of trade unions. After all, private firms could offer the same benefits without incurring the cost overheads associated with the other services provided by trade unions.

The social custom model offers a more complete explanation of open shop trade unionism. This model relies on the observation that human societies establish certain norms of behaviour (or social customs). Individuals who disobey a social custom suffer a loss of reputation in their community. Potentially, we might think of union membership as a workplace social custom.

If union membership is established as a social custom in the workplace, then individuals who value their reputations with their workmates have an incentive to join the union. In effect, the excludable private good provided by the union is a good reputation with one's fellow workers. However, the most unsatisfactory aspect of the social custom model is that the process leading to the formation of the workplace social custom is only vaguely developed.

An important goal of the trade union is to protect its members against unfair dismissal or other arbitrary managerial decisions. The insurance model of voluntary union membership is based on the idea that the job protection services of trade unions are private goods. In this way, the desire for job protection can provide sufficient incentive for an individual to join a union.

*Empirical Survey*

It is somewhat surprising, in a country as heavily unionised as Australia, that the first econometric study of individual union status was not published until 1987 (Crockett and Hall, 1987). However, thanks largely to the efforts of researchers connected with the Western Australian Labor Market Research Centre there is now a small but growing literature investigating the determinants of union membership in Australia.<sup>2</sup> This literature is surveyed in Chapter 3.

All of the previous Australian studies estimate dichotomous choice models using probit, logit or linear probability (OLS) techniques.<sup>3</sup> The models are usually interpreted within a rational choice framework; that is, it is assumed that a worker joins a union if he or she expects that membership will yield greater utility than non-membership. This approach is sufficiently common for us to label it as the "standard approach" to modelling individual union status (see Figure 1.2).

Since the IMA and CSA data have not previously been used to model union membership, Chapter 3 offers an ideal opportunity to survey the results from the earlier studies in the light of new estimates available from these data sources. Moreover, the chapter is a convenient vehicle for presenting the

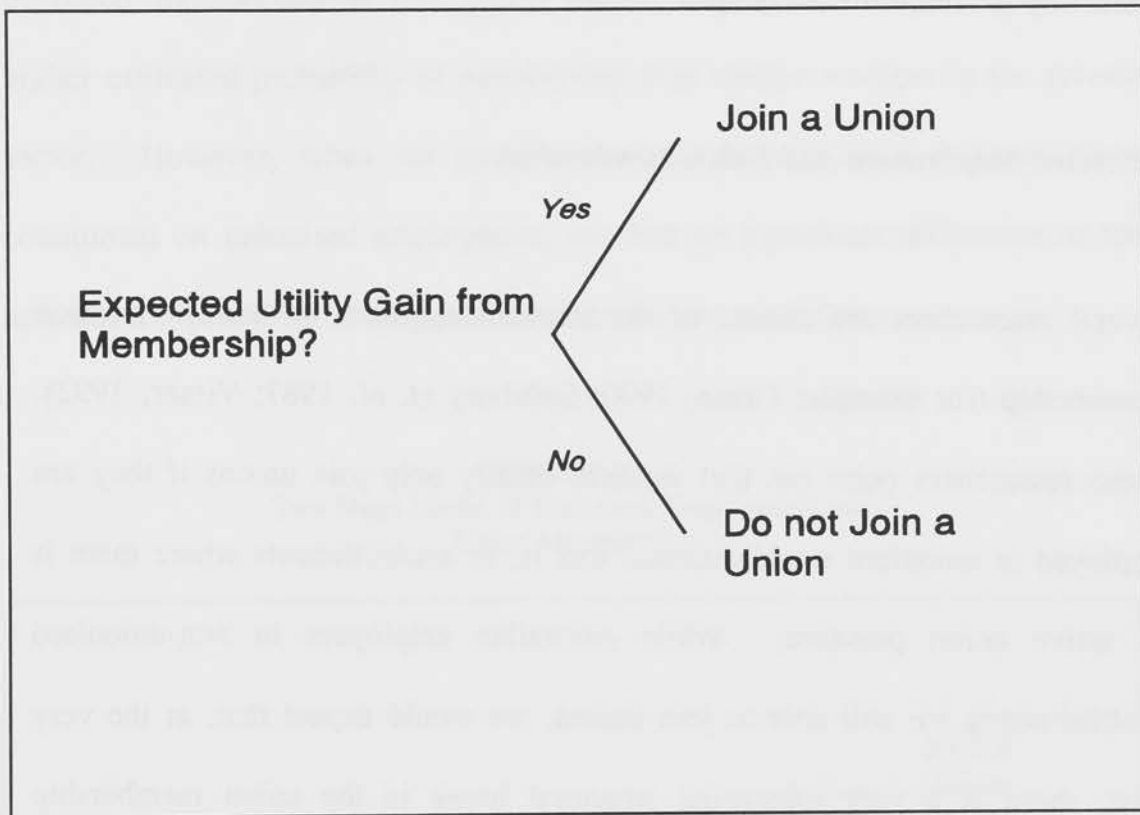
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<sup>2</sup>Four of the five major Australian studies of individual union status have been by researchers associated with Western Australian institutions.

<sup>3</sup>More complicated "structural" models of union membership and wage determination are developed in two of the studies (Miller and Rummery 1989; Christie 1992). Nevertheless, these papers also report estimates for a reduced form model of union membership.

estimates from the standard model of union membership. These estimates can then be used as a basis for comparing the estimates from the alternative specifications developed in the later chapters.

FIGURE 1.2  
The Standard Model of Union Membership



Even though the Australian determinants of union membership literature is relatively small, there are now sufficient studies, using a variety of data sources, for common patterns to be identified. For example, several job-related characteristics such as occupation, tenure in current job and sector of employment are routinely found to have a statistically significant impact on an individual's estimated probability of union membership. Conversely, many

personal characteristics such as sex, marital status, country of birth and migrant status are found either to be consistently insignificant, or to produce a mixture of significant and insignificant results depending on the data source used. However, personal attitudes towards trade unionism and political affiliation are found to have a significant impact on the worker's predicted probability of union membership.

### *Unionised Employment and Union Membership*

Several researchers are critical of the standard approach to modelling union membership (for example: Green, 1990; Spilsbury *et. al.* 1987; Visser, 1992). These researchers point out that workers usually only join unions if they are employed in unionised establishments; that is, in establishments where there is an active union presence. While Australian employees in non-unionised establishments are still able to join unions, we would expect that, at the very least, there is a very substantial structural break in the union membership model for workers employed in unionised and non-unionised locations. It makes sense, then, to model union membership as a decision made conditional on a worker having first secured employment in a unionised location.

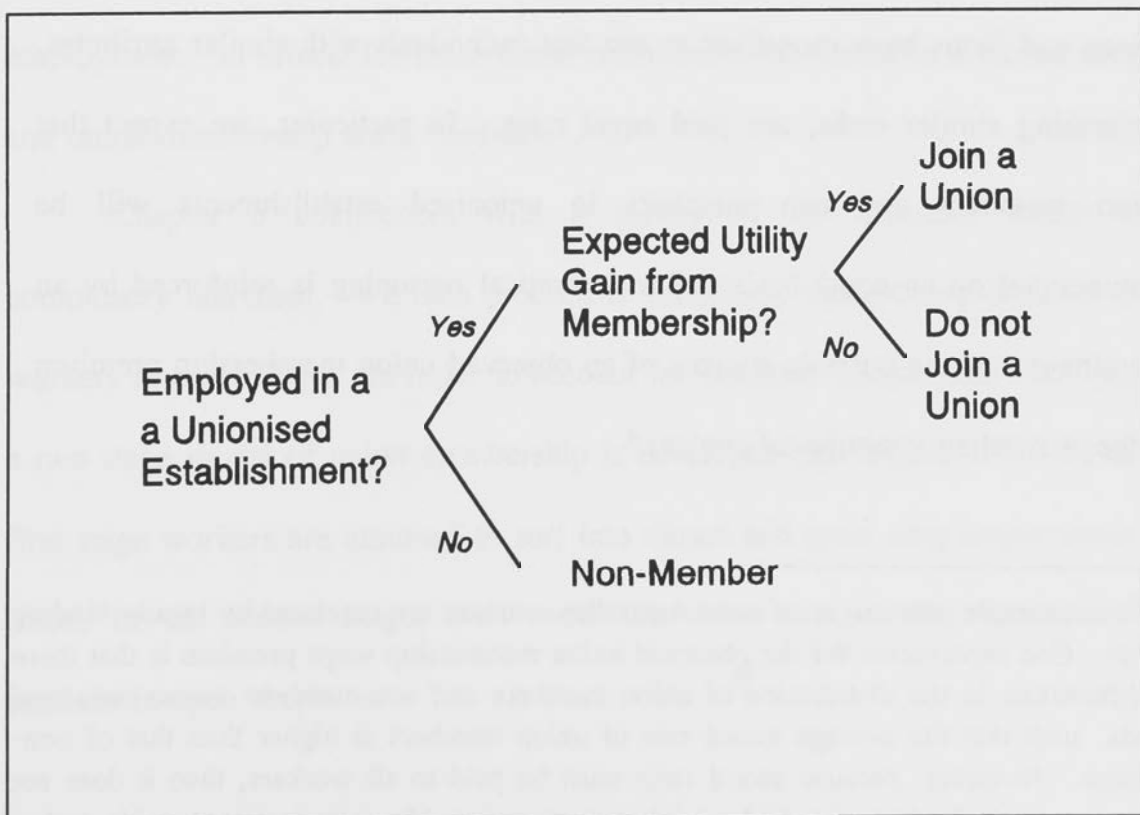
In Chapter 4 union membership is modelled as a decision taken by unionised employees. A two stage model is developed in order to account for potential sample selection bias arising from the non-random assignment of workers to unionised employment. In essence, the model views union membership as being determined by a sequential process (see Figure 1.3).



First, workers are assumed to choose between unionised and non-unionised employment. Then those individuals who secure unionised employment are confronted with the decision to either join the union or not join the union.

Modelling union membership in this way produces some interesting results. For example, one of the most robust findings from the standard model of union membership is that public sector employees have a significantly higher estimated probability of membership than similar workers in the private sector. However, when we model union membership as a decision taken conditional on unionised employment, we find no significant difference in the unionisation probabilities of private and public sector workers.

FIGURE 1.3  
Two Stage Model of Unionised Employment and  
Union Membership





*Unionised Employment, Union Membership and the Union Wage Premium*

Several Australian studies reveal a statistically significant wage premium associated with union membership (Miller and Mulvey, 1993). Consequently, it is argued by some researchers that an individual can expect a wage gain by becoming a union member (Miller and Rummery, 1989; Christie, 1992). The individual's expected wage gain from union membership is therefore treated as an important determinant of his or her probability of membership.

However, we assert that the act of joining a union does not, in normal circumstances, yield higher wages for the individual. Therefore, we argue that the conventional union membership premium should not be treated as a determinant of union membership. The crux of our argument is that both unions and firms have incentives to see that individuals with similar attributes, performing similar tasks, are paid equal rates. In particular, we expect that union members and non members in unionised establishments will be remunerated on an equal basis. Our theoretical reasoning is reinforced by an examination of the possible sources of an observed union membership premium in the Australian institutional context.<sup>4</sup>

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<sup>4</sup>For example, the wages of most Australian workers are regulated by legally binding awards. One explanation for the observed union membership wage premium is that there are differences in the distribution of union members and non-members across industrial awards, such that the average award rate of union members is higher than that of non-members. However, because award rates must be paid to all workers, then it does not follow that an individual, simply by joining a union, would expect to improve his or her wage. After all, the individual is already covered by a particular award and joining a union does not change that fact.

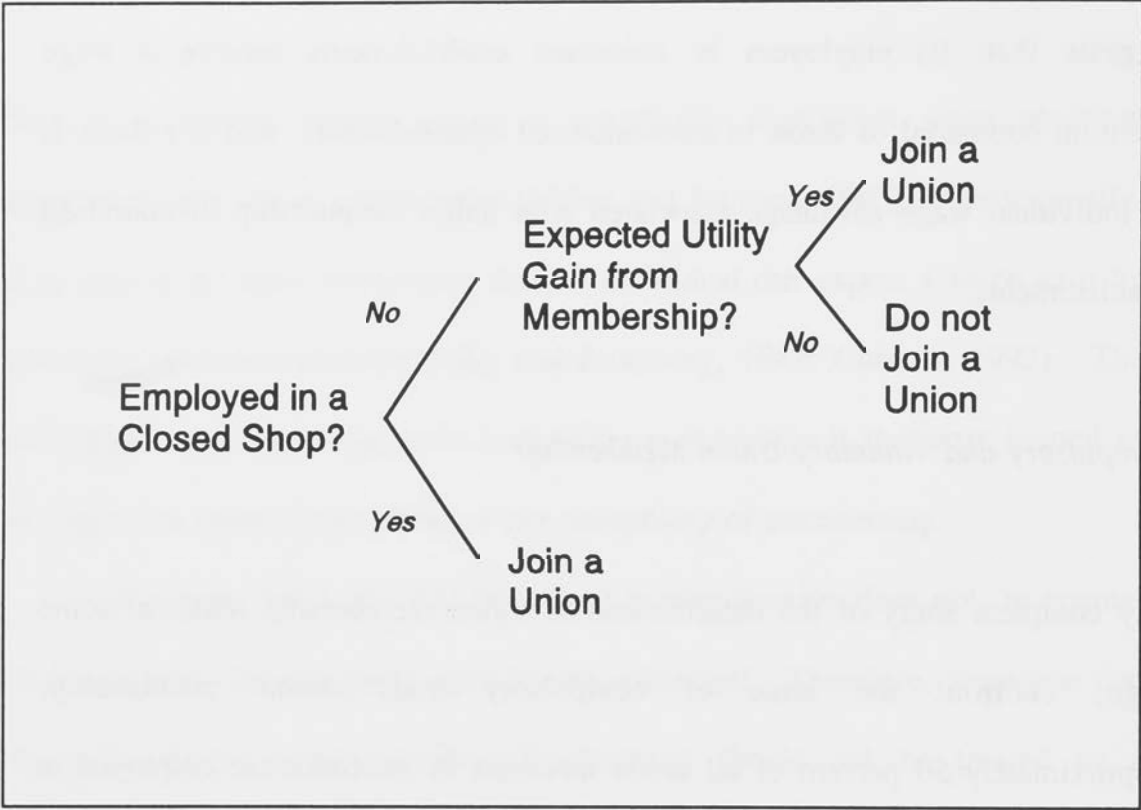
However, whether our argument is correct is ultimately an empirical question. To this end, in Chapter 4 we present empirical evidence which suggests that: (i) employees in unionised establishments receive a wage premium compared to those in non-unionised establishments, and (ii) there is no individual wage advantage associated with union membership in unionised establishments.

### *Compulsory and Voluntary Union Membership*

Any complete study of the determinants of union membership must, at some stage, confront the issue of compulsory trade union membership. Approximately 50 percent of all union members in Australia are employed in closed shops where union membership is a compulsory condition of continued employment. In effect, for these union members employment in a closed shop and union membership are a "tied sale".

Chapter 5 commences with a survey of the different forms of compulsory unionism. We then proceed to model the membership decision of workers in open shops. In order to account for potential sample selection bias, a two stage model of union membership is developed (see Figure 1.4). In the first stage workers are assumed to sort into closed and open shop employment. Then, in the second stage, we model the union membership decision of workers in open shops.

FIGURE 1.4  
Two Stage Model of Closed Shop Employment  
and Union Membership



The small amount of research that has been conducted into the impact of compulsory membership in Australia has produced mixed results. On the one hand, Crockett and Hall (1987) suggest that most compulsory members would still join a union even if membership were voluntary. This finding is also implicitly supported by Miller and Rummery (1989: p.209). On the other hand, according to Rawson (1978), approximately two-thirds of closed shop employees are unwilling union members.

Estimating how many compulsory members would still join a union if there were no closed shops is a hazardous exercise. However, one counterfactual is that closed shop employees would join unions in the same

way as open shop employees now do. That is, we might use the estimates from a model of open shop union membership to predict how many compulsory members would still join unions in the absence of closed shops. In line with the statistics presented by Rawson, we estimate that as few as 36 percent of closed shop employees would voluntarily join a union if membership were not a condition of their employment.

### *The Male-Female Membership Differential*

One of the most prominent features of Australian unionism is the substantial difference between the male and female rates of union membership. While the gap has narrowed over the last 30 years, males have an average rate of union membership almost 25 percent higher than female workers (Curtin, 1993). The aim of Chapter 6 is to determine the source(s) of this membership gap.

Broadly speaking, the explanations for the male-female membership differential can be grouped in two categories. In the first category are the explanations which rely on men and women having different desires for union representation. For example, it is sometimes suggested that women are less likely to become union members because unions do not place sufficient emphasis on addressing the special needs of female workers. Similarly, it has been suggested that unions are adversarial, male dominated institutions which women are reluctant to embrace.

The second set of explanations argue that sex *per se* is not important and that the differential is simply the product of the differing employment

## *Chapter 1*

patterns of men and women. For example, it is often said that women are less likely to become union members because of their weaker attachment to the labour force than men. That is, because women, on average, have less labour market experience and expect to be in their jobs for shorter periods than men, it is thought that women have a lower stake in investing in trade union membership.

While data inadequacies prevent a definitive conclusion, we find scant evidence to support the proposition that there is a significant difference in the desire for union membership by men and women. In other words, the lower membership rate of women is largely the product of female employment being concentrated in those jobs where all workers - both men and women - are less likely to be union members.

## 2

# The Theory of Union Membership

### 2.1 Introduction

Why do Australian workers join unions? This chapter suggests some answers by surveying the explanations proposed by economists and, to a lesser extent, by sociologists and political scientists. Inevitably, much of the literature surveyed contemplates union membership in institutional settings which are quite different to Australia's. For the most part these institutional differences are unimportant, but sometimes they are critical. Therefore, although we provide a broad survey of the literature, we also aim to show how the literature might be applied to explain union membership in Australia.

A complete understanding of union membership requires a knowledge of the "technology" of trade unionism. Accordingly, this chapter consists of two parts. In the first part we review the economic approach to analysing trade unionism. The second part examines the individual's decision to join a union.

### 2.2 The Economic Analysis of Trade Unions

In their *History of Trade Unionism* Sidney and Beatrice Webb (1902: p.1) defined a trade union as "a continuous association of wage earners for the

purpose of maintaining or improving the conditions of their working lives". Their definition was necessarily broad because when they commenced their study of trade unions they had expected to find "an economic thread for a treatise", but in the course of their research they found a "spider's web" instead (p.xxvi). Students of trade unionism have been grappling with the difficulties of untangling the spider's web ever since.<sup>1</sup>

For economists the task has proven to be particularly challenging. Writing in 1975, George Johnson noted that "the problem of modelling trade union behaviour has proven to be virtually intractable" (1975: p.24). Since then, a good deal of research on the economics of trade unions has been undertaken and important progress has been made, but many issues remain unresolved.<sup>2</sup> Chief among these are the related questions of what is the objective function of the trade union?; and how is that objective function determined?

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<sup>1</sup>A contemporary view of the web of trade union structures and activities in Australia is provided by Deery (1989: p.74):

"Generalisations about the behaviour and activities of Australian unions can be a somewhat difficult and hazardous exercise in a country which boasts over 300 organisations representing more than 3 million members. Australian unions have a variety of objectives, interests and activities. They differ in size, structure, and organisational strength and nature and coverage of membership. They often hold conflicting political ideologies, pursue varying industrial tactics and serve different interests and roles. To attribute a single set of goals and objectives to them is to assume a unity of purpose which is simply not present."

<sup>2</sup>Surveys of this research include Creedy and McDonald (1992), Pencavel (1991), Ulph and Ulph (1990), Farber (1986), and Oswald (1985).



### *Trade Union Objectives*

The modelling of trade union objectives is beset with a host of principal-agent and social choice problems (Pencavel, 1991). For example, in his famous critique of attempts to model the trade union as maximising a well-defined objective function, Arthur Ross (1946) pointed out that the preferences of the union's leaders and officials (the union's "management") should be considered separately from those of its members. Thus, trade union behaviour might fruitfully be modelled in a principal-agent framework in which the union's management is viewed as an agent delivering services to the membership (Rosa, 1984; Martin, 1984; Faith and Reid, 1987).

Ross also observed that most trade unions have democratic structures, and that internal political processes constrain the actions of union leaders who wish to maintain the support of their members. In this context, a public choice approach to modelling trade union behaviour may provide useful insights (Burton, 1984; Booth, 1984).

Economists commonly make two implicit assumptions when specifying the objective function of the union.<sup>3</sup> First, potential social choice complications are avoided by assuming that union members are identical, or that members' utilities can be aggregated in a simple utilitarian framework. Second, the union's management is assumed to be a perfect agent such that the union's objective function solely reflects the preferences of the members

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<sup>3</sup>Oswald (1985) and Pencavel (1991) provide detailed surveys of the various trade union objective functions proposed in the literature.



(Farber, 1986).

The assumption that union members are homogeneous has been relaxed by several authors including Farber (1978) and Booth (1984). Other researchers, following Berkowitz (1954), view the objective function of the union as solely reflecting the preferences of its management. In this context, possible maximands for the union include the size of the membership, the total revenue from union fees, or trade union profits (union revenues less costs) (Farber, 1986).

### *Unions as Rent Seeking Coalitions*

While the question of what constitutes the relevant objective function of the trade union is disputed,<sup>4</sup> there is greater consensus among economists that unions are best viewed as organisations which seek to create or capture rents in an industry (Farber, 1986). While the literature largely focuses on the use of monopoly power by unions to extract rents from firms, increased attention has been paid in recent years to the ways in which unions may create rents by improving workplaces and enhancing productivity.

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<sup>4</sup>In his recent book, Pencavel (1991: p.54) states that economists' knowledge of trade union objectives is meagre and warns that "economists have good reason to adopt a very modest posture when discussing the structural operation of unionized labor markets in that at least one crucial component of our modelling of such markets is not at all well understood".

*Monopoly Power and Union-Firm Bargaining*

Over the last decade or so there has been a great increase in research by economists into the nature of union-firm bargaining (Pencavel, 1991). The models are based on the idea that firms extract rents in product markets, and that unions aim to capture part of these rents for their members. The ability of unions to expropriate the rents, however, depends on their bargaining power (their "monopoly power") relative to that of firms.

Much of the literature has focussed on the determination of wage and employment levels when a single firm bargains with a single union (Farber, 1986).<sup>5</sup> The bargaining process is modelled by defining the payoffs to the union and firm.

The firm is assumed to maximise profits,  $\Pi(w,n)$ , where  $w$  is the wage, and  $n$  is the number of workers employed by the firm. Usually, product market conditions are taken to be exogenous (that is, the price at which the firm sells its output is assumed to be independent of the outcome of the bargaining process).<sup>6</sup>

As we have seen, the specification of the union's objective function is

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<sup>5</sup>While wages and employment are variables of central importance, in practice unions and firms bargain over a myriad of employment issues (Pencavel, 1991). The basic bargaining framework outlined here can be extended to include such things as hours of work (Earle and Pencavel, 1990), innovation (Dowrick and Spencer, 1991), investment (Hoel, 1990), and effort (Bulkley, 1992). Similarly, the models can be extended to allow for industry-wide or multiple union bargaining (Ulph and Ulph, 1990) and centralised bargaining (Calmfors and Driffil, 1988).

<sup>6</sup>Dowrick (1989) relaxes this assumption, and investigates the interaction between the bargaining process, profits and product prices in an oligopolistic product market setting.

more controversial, so it is represented here in a generic form as  $U(w,n)$ . Typically, an asymmetric cooperative Nash model is used to determine the solution to the bargaining process. Thus, the level of wages and employment which emerge are those which maximise the product of the weighted net payoffs to the union and the firm. That is,

$$\max N = U(w,n)^\gamma \Pi(w,n)^\gamma \quad (2.1)$$

where  $\gamma$  is a parameter that represents the bargaining power of the union relative to that of the firm. This parameter reflects the parties' relative rates of time preference (which captures their eagerness to settle a dispute), and their relative degrees of risk aversion (which captures the degree to which the parties would be prepared to accept a certain payoff in one period relative to an uncertain future payoff) (Ulph and Ulph, 1990).<sup>7</sup> In addition, the model can be augmented by specifying the payoffs to the firm and the union in the event that they are unable to reach agreement (Svejnar, 1986).<sup>8,9</sup>

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<sup>7</sup>In addition, Svejnar (1986) suggests that  $\gamma$  is a function of variables such as the institutional structure of bargaining, the rate of inflation and the unemployment rate. McDonald and Suen (1991) argue that the quality of the union leadership and the union members' perception of the "justness" of their claims are also relevant determinants of trade union power.

<sup>8</sup>The specification of the "threat-points" depends on the nature of the bargaining process (Binmore *et al.* 1986). If a strike is involved, they depend on the funds available to union members and the stream of income available to the firm for the duration of the strike. If negotiations are to break down completely, they depend on the income available to union members in alternative employment (or in unemployment if there are insufficient jobs), while for firms they depend on the income derived from using non-union labour.

The magnitude of the payoff to the union depends on two things: the monopoly power of the union (which determines what proportion of the available rents it succeeds in extracting), and the size of the rents that are available to be bargained over in the first place. In turn, the size of the available rents depends on product market conditions. Under perfect competition, for instance, there are no rents to be shared in union-firm bargaining<sup>10</sup> while in an oligopolistic market setting, Dowrick (1989) confirms that the higher the available rents, the greater the scope for unions to raise wages above competitive levels.

### *Political Power*

Unions are influential actors in the political marketplace. This is especially true in Australia where there has always been a close association between trade unions and the oldest of the major political parties - the Australian Labor Party (ALP). Many unions are formally affiliated with the ALP and pay subscription fees based on the size of their membership. This arrangement has

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<sup>9</sup>There are two general models of union-firm bargaining which may be analysed using the above framework; namely, the right-to-manage and efficient bargain models. In the right-to-manage model, the union and the firm bargain solely over the wage. Once the wage is agreed, the firm unilaterally determines the level of employment (which, for the profit-maximising firm, will be on its labour demand curve). In general, it can be shown that the solution derived from the right-to-manage model is not Pareto optimal and that there are potential efficiency gains to be made if the union and the firm bargain over both the wage and the level of employment as they do in the efficient bargain model (McDonald and Solow, 1981).

<sup>10</sup>However, the union may still be able to extract benefits for its members if bargaining takes place on an industry rather than company level.

seen unions exert strong control over the internal affairs of the party (Rawson, 1978; Deery, 1989).

The political activism of trade unions is interpreted by many economists as being an extension of their rent-seeking activities. Such researchers cite union campaigns for tariffs (increasing the rents available to be extracted from domestic firms) and minimum wage legislation as supporting this view (Faith and Reid, 1987). Similarly, union campaigns in favour of the right to strike and against legislation outlawing secondary boycotts may be interpreted as attempts by unions to secure a legislative environment which enhances their bargaining power.

The ability of unions to successfully achieve their political objectives depends on their political power. This, in turn, depends on several factors including the number and distribution of pro-union voters (Faith and Reid, 1987).

### *Collective Voice*

The collective voice model of unionism is most clearly articulated by Freeman and Medoff in *What Do Unions Do?* (1984). Their model builds on Albert Hirschman's (1970) insight that individuals communicate their preferences in two ways: by entry and exit decisions, or by using some direct form of communication or "voice".

In the labour market, entry and exit are analogous to workers quitting unsatisfactory jobs and taking-up new jobs that better match their preferences.

In a world of perfectly mobile labour - where workers can quit their jobs and immediately find alternative employment - the entry and exit mechanism is an efficient way of conveying worker preferences to firms. But, in reality it can be costly for workers to exercise the exit option. This is particularly true for older, more experienced workers with greater investments in firm-specific human capital.

Discontented workers facing high exit costs may consider voicing their grievances instead of quitting. However, according to Freeman and Medoff, individuals acting alone face (possibly severe) disincentives to revealing their preferences in this way. For instance, an individual who raises grievances directly with management may be fearful of becoming known as a "trouble maker", of being victimised, or possibly even of being dismissed. However, unions provide an alternative mechanism for transmitting worker grievances to firms: union members can raise concerns through their union safe in the knowledge that they will not be victimised.

In a competitive labour market without trade unions, Freeman and Medoff argue that firms tailor their employment conditions to suit the preferences of marginal workers (that is, those workers who are most likely to quit if dissatisfied). These marginal workers tend to be younger and have lower investments in firm specific human capital.

While not explicitly stating the precise form of the union's objective function, Freeman and Medoff stress the political dimension of trade unionism. Consequently, they view the union as placing more weight on the preferences of inframarginal members. In effect, then, the union provides a mechanism for

aggregating workers' preferences and acts as a "collective voice" for its members.<sup>11</sup>

The collective voice function of trade unions has benefits for both firms and workers. Because the union provides workers with a viable means of airing grievances, discontented workers exercise the exit option less frequently and are thus saved the costs of searching for more suitable employment. Similarly, firms gain when workers are more prepared to use a voice process to reveal their preferences. In particular, unionised firms gain from greater employment stability because turn-over costs are reduced and, with a lower probability that employees will quit, they have greater incentive to invest in their workers. Conversely, in the absence of unions, firms are penalised by the shirking (or perhaps even active sabotage) of discontented workers who face high exit costs and who feel unable to voice their grievances fully.

### *The Australian Context*

Much of the literature reviewed here has union activity at the enterprise level as its main focus. Consequently, trade union gains in the form of higher compensation and better working conditions are viewed as being obtained and

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<sup>11</sup>By acting as a single bargaining agent for its members, the union may also enhance enterprise efficiency other than through the collective voice channel. For instance, trade unions enable firms to realise potential economies of scale in the negotiation of employment contracts: instead of incurring the costs of bargaining with many individual workers, the firm negotiates a single contract with the union (Faith and Reid, 1987; Hundley, 1989). Furthermore, union officials and management can build up a relationship which may engender a more cooperative and informed bargaining environment.



distributed at the firm level. For example, most bargaining models are concerned with the bargaining process between a single union and a single firm in a decentralised bargaining environment free from legislative constraints. Similarly, the collective voice model of unionism implicitly assumes that unions are active at the firm level.

The Australian labour market, however, is characterised by a high degree of centralised control over wages and many other facets of employment, although this is diminishing.<sup>12</sup> This restricts the applicability of such models within an Australian context, particularly over the time period for which the data used in the thesis relate (1986 - 1988).<sup>13,14</sup> Nevertheless, such models do shed some light on how union power might be exercised to secure benefits for union members, particularly in regard to those facets of employment not directly regulated through awards.

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<sup>12</sup>Australia is now steadily moving to a less centralised industrial relations system (Hancock and Rawson, 1993). Nevertheless, enterprise bargaining has yet to be implemented in most of the labour market. Furthermore, that bargaining which has taken place has been heavily scrutinised by industrial tribunals.

<sup>13</sup>Over this period unions were able to secure adjustments in wages and conditions in accordance with the centrally determined Principles of Wage Fixation. However, these adjustments were only granted on the proviso that unions entered a "no extra claims" commitment - that is, if they agreed not to seek further adjustments over and above those prescribed by the Principles.

<sup>14</sup>Because so many employment conditions are determined through awards, the collective voice role of Australian unions is weakened. Some commentators have also noted that the occupational basis of many unions as may weaken the collective voice mechanism. Because union membership tends to be more spread out, union activity at the workplace level is reduced and the productivity enhancing effects of collective voice is constrained.



### 2.3 The Union Membership Decision

#### *Union Membership and the Logic of Collective Action*

It used to be widely thought that common interests were sufficient to sustain collective action (Moe, 1980). The conventional wisdom was that the prospect of gains to be made through collective action would be sufficient to ensure that individuals participated in collective endeavours. In this way, union membership could be explained in straight-forward terms: individuals become union members if they belong to a group of workers for whom collective action yields net benefits.

However, Mancur Olson (1965) in *The Logic of Collective Action* challenged the conventional wisdom by arguing that the core services provided by collective associations such as trade unions are public goods which are consumed by members and non-members alike. Since non-members are not excluded from the fruits of the collective action, there is an incentive for individuals to free-ride while others fund the costs of the collective action. Of course, if all potential members choose to free-ride, the collective endeavour will fail. Therefore, Olson argued, the promise of collective gains is not sufficient *by itself* to ensure that individuals participate in collective endeavours such as trade unionism.

*The Collective Benefits of Unionism*

Perhaps the most basic goal of the trade union is to secure better conditions of employment for workers - unions seek higher wages, better fringe benefits, and improved working conditions.<sup>15</sup> While unions may wish to promote the interests of their members ahead of non-members, in practice many of the conditions they negotiate flow to non-members. In effect, these benefits of unionism are public or collective goods.

Why do many of the benefits of union activity flow equally to non-members? The answer provided by Olson is that the exclusion of non-members is often not feasible. Consider, for example, the physical conditions of employment in a given establishment. These conditions are public goods for the workers in the plant (Flanagan, 1983; Freeman and Medoff, 1984). If a union succeeds in securing improvements in conditions, non-members can only be excluded by dividing the plant in two. Obviously, exclusion of this sort is rarely, if ever, feasible.

Legal constraints are a further impediment to the exclusion of non-members from union gains. For example, in the United States, where bargaining occurs at the firm or plant level, unions are required by law to represent fairly all workers in the bargaining unit (Pencavel, 1971). Similarly,

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<sup>15</sup>The fringe benefits targeted by unions include such things as long service and annual leave, superannuation, meal allowances and other work allowances (clothing, travel, car etc.).

The working conditions are the physical conditions of work. The safety of the workplace, meal and rest breaks, staff facilities such as lunch rooms, and the amenity of the environment in which work takes place.

Australia's award system guarantees that non-unionists enjoy many of the benefits of union activity (awards are legally binding documents covering all workers within their scope irrespective of union membership status)<sup>16</sup>. Thus, even the employment of non-unionists in establishments with no union members can be - and indeed often is - regulated by union-negotiated awards.

Furthermore, non-unionists cannot be excluded from the benefits of union pressure to induce governments to make policy changes or enact legislation favourable to their members. For instance, legislated occupational health and safety standards apply to all workers, not just union members. Similarly, union-negotiated increases in family allowances, health benefits and other aspects of the "social wage" also accrue to non-members.

Finally, even if exclusion were feasible, unions and firms have incentives to ensure that conditions of employment and levels of remuneration are determined equally for members and non-members. For example, unions have an incentive to see that non-members are remunerated on an equal footing with members, otherwise non-unionists might undercut the union rate (Booth and Chatterji, 1993; Hancock and Rawson, 1993) and secure employment ahead of unionists. In order to avoid harming the employment prospects of their members, unions therefore have an incentive to seek common standards for workers.

Conversely, it can be argued that firms have an efficiency incentive to ensure that union-negotiated wages and benefits are also paid to non-members.

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<sup>16</sup>Plowman (1992) and Strauss (1988) provide useful surveys of the institutional structure of industrial relations in Australia.

This line of reasoning is most likely to be valid in teamwork settings where cooperation is important. In such settings, worker unity is maintained by firms paying workers performing similar tasks equal rates (Lazear, 1989).

***The Free Rider Incentive: A Simple Model***

Consider a union which only supplies collective goods with a total value  $C$ , and which charges a fixed membership fee,  $F$ . We assume that workers derive different levels of utility,  $S_i$ , from consuming the collective goods:

$$S_i = \alpha_i C, \quad \alpha_i \geq 0 \quad (2.2)$$

Similarly, we allow the loss in utility,  $Q_i$ , from paying fees to vary for different workers:

$$Q_i = \beta_i F, \quad \beta_i < 0 \quad (2.3)$$

For generality, we might allow  $C$  to be negative or positive; that is, we might admit the possibility that for some workers the collective services of unionism are a net "bad". However, for simplicity we will assume that the service provided by the union is always a net "good" (ie.  $C > 0$ ).

We might suppose that if a worker joins the union there is an increase in the value of the collective goods provided,  $\Delta_i C$ . For example, an increase

in membership may enhance the bargaining power of the union, and hence increase the union's ability to extract rents from firms (Naylor and Cripps, 1991). Or an increase in membership may raise the political power of the union and its ability to obtain concessions from governments. Finally, we might expect that the effectiveness of the union as a medium for enhancing workplace productivity improves as its membership increases.

A rational choice framework is typically used to model the individual's decision to join a union (for examples see: Booth, 1986; Lee, 1978; and Christie, 1992). In formal terms, it is assumed that a worker,  $i$ , has a utility function  $V_i$ . Each worker is able to evaluate the payoffs from joining the union,  $V_i^U$ , and from not joining the union,  $V_i^N$ . Workers who expect a net utility gain from membership (ie.  $V_i^U - V_i^N > 0$ ) join the union.

Assuming that the worker's utility function is additively separable, the expected payoffs to joining and not joining can be written as

$$\begin{aligned} V_i^U &= \alpha_i(C + \Delta_i C) + \beta_i F \\ V_i^N &= \alpha_i C \end{aligned} \tag{2.4}$$

Thus, the expected gain from union membership is

$$V_i^U - V_i^N = \alpha_i(\Delta_i C) + \beta_i F \tag{2.5}$$

Clearly, the size of the marginal increase in the value of the collective

goods provided,  $\Delta_i C$ , is a crucial factor in the individual's decision to join the union. While there may be exceptions<sup>17</sup>, we would usually expect that an extra member has, at best, a marginal impact on the union's monopoly power or its capacity to improve productivity through its collective voice function (thus,  $\Delta_i C \approx 0$ ). Consequently, the worker chooses to free ride as she expects a net utility loss from membership:

$$V_i^U - V_i^N \approx \beta_i F < 0 \quad (2.6)$$

In summary, when the union only supplies collective goods, each worker has an incentive to free-ride and let other workers fund the services provided by the union.

### ***Union Membership as a Prisoner's Dilemma***

Consider a group of workers for whom union action yields a net utility gain for each member of the group when all members of the group join the union (that is,  $\alpha_i C^{\text{All Join}} > \beta_i F^{\text{All Join}}$ , for all  $i$ ). Now if all of the workers choose to free ride, union services will not be provided, and each worker will be worse

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<sup>17</sup>Here is an exception: Consider a worker employed in a non-unionised plant where the employer is not fully complying with award conditions. If the worker joins the union, she may call on the union to see that award conditions are enforced. Even if no other workers join the union it may still be in her interest to become a union member. (However, even this example need not solve the free rider problem if our worker is aware that state and federal arbitration inspectorates will respond to workers' complaints and act to ensure that there is compliance with the award).

off than if they had all chosen to join. In this context, union membership can be viewed as a multiple person Prisoner's Dilemma: collectively, it is best if all members of the group become union members, but the dominant *individual* strategy is to free-ride.<sup>18</sup>

The sort of Prisoner's Dilemma envisaged here (and by Olson in *The Logic of Collective Action*) is akin to a static, one shot game. In this setting the problem of collective action is at its most serious because, from the individual's perspective, the strategy to free-ride dominates all other strategies (Rasmusen, 1989). However, trade unions are engaged in ongoing collective action - workers are faced with a recurring union membership decision - and, consequently, the problem of ongoing collective action can be viewed as an open-ended, indefinitely repeated Prisoner's Dilemma (Hardin, 1982; Elster, 1989).

In the indefinitely repeated Prisoner's Dilemma free-riding (or defection) is not the dominant strategy (Rasmusen, 1989). The idea is that in a repeated Prisoner's Dilemma there is scope for strategic interaction between individuals. So long as individuals do not discount future benefits too highly, they have a stake in the collective action continuing in the future. Therefore, cooperation can be maintained by the threat that if one individual does not cooperate, others may also choose not to cooperate. In this way if someone chooses not to cooperate, they run the risk of jeopardising the collective

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<sup>18</sup>Actually, the optimal result may arise when only a subset of the group are union members: with decreasing marginal returns to participation in the union, it may be that beyond a certain threshold the marginal cost of union membership is greater than the marginal benefit.



endeavour and, in the process, penalising themselves as well as others.

In a group of conditional cooperators (for example, a group of workers in which each worker is a union member only as long as all others are also union members), the cost-benefit calculus underlying the individual's membership decision is transformed. If it is shared knowledge that all members are conditional cooperators, a worker knows that by choosing to free-ride, the union will quickly unravel as others retaliate and also choose to free-ride. In this context, union membership can be explained by a rational choice model provided that: (i) the value of the collective good provided in the future is sufficient to cover the costs of union membership; and (ii) the individual's rate of time discounting of future union benefits is not too high.

The ability to monitor the actions of others is a crucial ingredient in maintaining conditional cooperation. This, Michael Taylor (1982: p.53) argues, is more likely to be true in smaller rather than larger organisations:

Unfortunately, [voluntary cooperation] is less likely to occur in large groups than in small ones, since a conditional cooperator must be able to monitor the behaviour of others in the group so as to reassure himself that they are doing their parts and not taking advantage of him. Clearly, as the size of the group increases, this mutual monitoring becomes increasingly difficult and the "tacit contract" of conditional cooperation becomes increasingly fragile.<sup>19</sup>

If small groups are better able to sustain conditional cooperation, then one way to overcome the problem of collective action may be to organise large groups as federations of smaller groups (Olson, 1965; Bendor and Mookerjee,

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<sup>19</sup>Cited after Bendor and Mookerjee (1987: p.131).



1987). Thus, a union wishing to ameliorate the problem of collective action might organise branches at the firm or workplace level.<sup>20</sup> If workers are aware that workplace level action is crucial in order to secure the main collective benefits of unionism, they have a stake in seeing that their branch of the union is supported. As long as the branch is not too large, workers will be able to monitor their workmates' participation in the union, and the union may be sustained through conditional cooperation.

On the other hand, unions which conduct much of their activity at an industry or some other aggregate level, face potentially severe collective action problems. As the importance of workplace activity is reduced, so too is the stake workers have in seeing that the union is supported at their workplace.<sup>21</sup> Furthermore, while workers in one plant may be able to monitor the actions of their workmates, they will be less able to monitor workers in other plants and firms. Under such conditions, the potential for the union to be sustained by conditional cooperation is greatly undermined.

While the game-theoretic analysis of the repeated Prisoner's Dilemma provides a useful framework for describing the problem of collective action, researchers have largely avoided explaining the individual's decision to join a union in these terms. One possible reason may be that a cooperative

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<sup>20</sup>The role of head office would be limited to providing technical assistance to the branches, and to pursuing objectives which cannot be achieved through workplace bargaining.

<sup>21</sup>Similar reasoning analysis underpins Kenyon and Lewis' (1992) explanation for part of the decline in Australian union membership over the Accord years. The increased centralisation of wage fixation, they argue, diminished the role of shop floor union structures and, consequently, increased the scope for free-riding.

equilibrium requires individuals to behave in a psychologically implausible manner (Elster, 1989). For example, a cooperative equilibrium requires that  $m$  individuals cooperate in a certain period if and only if exactly  $m-1$  other individuals cooperated in the previous period (Taylor, 1987). While such behaviour may be plausible in small groups, it is unlikely that individuals base their union membership decision on such precise reasoning.

If conditional cooperation is an unsatisfactory explanation for union membership, why do workers join unions? Broadly speaking, there are two explanations (Olson, 1965). First, union membership can be made compulsory. Indeed, around 50 percent of all Australian union members are employed in closed shops where union membership is a compulsory requirement for continued employment (Zappala, 1992; Rawson, 1990).

The second explanation is that unions provide private incentive goods in order to attract and retain members. These goods include fringe benefits (such as discounted insurance policies, medical benefits, cheap holidays and the like), protection for union members against unfair dismissal, and workers' compensation assistance. The last two goods underpin the insurance model of union membership. While a further private good - reputation - underpins the social custom model of union membership.

## **2.4 Compulsory Union Membership**

Compulsory unionism in Australia is grounded in a diverse and complicated web of institutional arrangements. While a host of different closed shop

arrangements can be identified, they may broadly be categorised as either pre-entry or post-entry closed shops (Wright, 1981; Weeks, 1987; Zappala, 1992).

As implied by its name, the pre-entry closed shop is a workplace where union membership must be acquired before a prospective employee can seek employment on the site. Perhaps the most conspicuous evidence of the pre-entry closed shop in Australia is provided by the "no-ticket - no start" signs which are displayed prominently outside many large building sites.

While the pre-entry closed shop is perhaps the best known form of compulsory unionism, it is by far the least common. A 1981 study by Wright (which remains the most recent source of data on the different forms of compulsory unionism), showed that only 3.3 percent of all compulsory union members were employed in pre-entry closed shops. The remaining 96.7 percent of compulsory union members were employed in post-entry closed shops of one sort or another (Wright 1981: p.134).

When membership is compulsory, union membership and job choice are joint decisions: a worker choosing to work in a closed shop also chooses to become a union member. Yet there is a subtle difference in the sequencing of these decisions depending on whether the worker is employed in a pre-entry or post-entry closed shop.

In the pre-entry closed shop the worker makes the union membership decision prior to applying for work. In effect, union membership is a permit which enables one to seek employment in the pre-entry closed shop.

In post-entry closed shops, workers are not required to become union members until after they have been offered employment. Thus, we expect that

workers will join the union if the costs of union membership are less than the costs incurred by refusing the job and looking for alternative employment.

Only the broadest features of compulsory unionism have been sketched here. In Chapter 5 the institutional underpinnings of compulsory union membership are discussed in greater detail, and the union membership decision made by workers open shops is modelled separately. We then seek to answer two major questions: (i) does compulsory unionism increase the proportion of workers who become union members?; and (ii) how are traditional models of union membership affected by the failure to account for the presence of compulsory unionism?

We turn now to models of union membership in open shops where union membership is voluntary.

## **2.5 Voluntary Union Membership**

### ***The Social Custom Model***

The game-theoretic analysis of the repeated prisoner's dilemma shows that collective action based on conditional cooperation is fragile - one defector is sufficient to unravel the entire cooperative endeavour. However, models which incorporate social, as distinct from strategic, interactions between individuals may offer a more robust solution to the free-rider problem in large groups (Elster, 1989).

Sociologists have long recognised that communities establish certain

customs or norms of behaviour, and that the individual who disobeys a social custom suffers a loss of reputation within the community. People who value their reputation in the community, can therefore be made to adhere to a social custom even when it is against their individual pecuniary interests to do so (Akerlof, 1980)<sup>22</sup>. If a community adopts cooperation as a social custom, reputational considerations alone may be sufficient to maintain collective action.

Booth (1985) suggests that union membership may be established as a social custom for a group of workers. For members of the group, trade union membership confers a private benefit - a good reputation with one's workmates. Workers may therefore be motivated to join the union solely by the reputational benefits of membership.

It should be noted that a social custom need not be supported by all members of a community; that is, the non-pecuniary benefits of a good reputation may not be large enough to prevent some individuals from free-riding. Nevertheless, we expect that the greater the adherence to the social custom, the greater the reputation one derives from obeying a social custom<sup>23</sup> (Akerlof, 1980).

In establishments where union membership is a social custom, the cost-benefit calculus underpinning the worker's membership decision is altered by

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<sup>22</sup>Akerlof (1980: p.749) defines a social custom as "an act whose utility to the agent performing it depends on the belief or actions of other members of the community"

<sup>23</sup>Intuitively, the loss of reputation for an individual who fails to support a social custom with, say, 99 percent support will be greater than for an individual who breaks a social custom with, say, 75 percent support.

the inclusion of reputational considerations. For example, if  $\mu$  represents the union density rate in the establishment - that is, the level of adherence to the social custom - the utility derived from having a good reputation may be written as:

$$R_i = R_i(\mu); \quad R_1 > 0, \quad R_2 < 0, \quad R(0) = 0 \quad (2.7)$$

In the absence of any other private incentives, a worker joins the union if the utility gained from a good reputation is greater than that lost from paying union fees (ie. if  $R_i(\mu) > -\beta_i F$ )<sup>24</sup>.

One of the key results of the game-theoretic analysis of the repeated prisoner's dilemma is that multiple equilibria are possible. While a social custom of cooperation may provide a more robust foundation for explaining ongoing cooperation in large groups, the potential for multiple equilibria still exists.

Booth (1985) demonstrates this point clearly in her model of union membership. Assuming all workers in the group are identical, Booth shows that by including reputation an equilibrium level of union density which is less than 100 percent but greater than 0 percent is possible. However, this

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<sup>24</sup>It is not necessary that the social custom be established in the workplace to provide a reputational incentive for union membership. Several writers approaching union membership from a sociological perspective have emphasised the importance of family and social background in shaping a worker's attitude towards trade unionism (see, for example, van de Vall, 1970). Therefore, an individual from such a background may still have a reputational incentive to join a union even though the social custom may not have been established in his or her workplace.

intermediate equilibrium is unstable - a slight disturbance will see union density climbing to 100 percent or unravelling to 0 percent. Both of these alternative equilibria are stable. The intuition underlying Booth's model is straight-forward: identical workers who value their reputations either all join or none join.

In a series of recent papers (Naylor, 1990; Naylor and Cripps, 1991; Naylor and Raum, 1993), Robin Naylor and his collaborators have developed the social custom model further. Allowing workers to value their reputations differently, they show that a stable, intermediate equilibrium is possible. However, there are other equilibria.

First, as with Booth's model, zero union membership is one equilibrium. This is the situation where the social custom is not established and the incentive to free-ride dominates. Moreover, it is a stable equilibrium - a small exogenous increase in union density does not provide sufficient reputational incentives to sustain a positive level of union membership.

The second equilibrium is at an intermediate level of union density. This is the density rate that is just sufficient for the social custom to be established, and to provide workers who place a high value on their reputations with an incentive to join the union. However, this equilibrium is unstable. A small exogenous decrease in union membership is enough to weaken the reputational incentive sufficiently for marginal members to resign. As union density decreases, the reputational value of membership is further eroded and still more members resign. This process continues until union density ultimately falls to zero.



Alternatively, a small exogenous increase in union density from the unstable equilibrium strengthens the reputational value of union membership and some marginal non-members join the union. As union density increases, the reputational value of union membership strengthens, and still more workers join. This process continues until a third equilibrium is reached.

The third equilibrium is a stable equilibrium. Depending on the distribution of preferences, it may be established at 100 percent as in Booth's model. However, if some workers place relatively low weight on their reputations, they may continue to free-ride even at high levels of union density. Consequently, the third equilibrium may be at some point below 100 percent.

The model can be modified by allowing workers to have differing beliefs about the social custom (Akerlof, 1980; Naylor, 1990). For example, we might categorise workers in two groups. The first group consists of those who believe in union membership (for example, those who have an ideological affinity with the aims of trade unionism). The second group consists of those who do not believe in trade unionism. Clearly, a greater proportion of the first group are expected to become union members. However, the reputational incentives may be strong enough to induce even some of the non-believers to become union members.

The social custom model of union membership has two important policy implications for trade unions (Naylor and Cripps, 1991). First, the model implies that a "critical mass" of union density must be established before union membership can be sustained. In order to be certain of successfully organising



a non-unionised establishment, a union must devote sufficient resources so that it recruits sufficient members to ensure a stable non-zero equilibrium. A recruitment campaign that fails to generate this critical mass will ultimately prove futile.<sup>25</sup>

The second policy implication relates to trends in aggregate union density. Naylor and Cripps suggest that because union density can fall quickly below its critical mass, and is subsequently difficult to re-establish, movements in aggregate union membership may be downwardly flexible, but "upwardly sticky". If this is correct, then Australian unions face a very serious challenge indeed in reversing the recent decline in union membership.

While the social custom models reviewed here shed new light on the nature of union membership, they leave several important questions unanswered. Most importantly, they fail to explain precisely how the social custom of union membership is established in the first place, or under what circumstances its emergence is more likely.<sup>26</sup>

Intuitively, we might think, however, that when the gains from unionism are greater, workers have a stronger incentive to see that unionism succeeds, and that somehow this translates into a greater likelihood of the social custom of union membership being established. If this intuition is

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<sup>25</sup>Schelling (1978) discusses the importance of critical mass in several other social contexts. One of his examples is the "dying seminar" syndrome which occurs when participation in an academic seminar falls below some critical threshold and participants no longer feel that their attendance at the seminar is worthwhile.

<sup>26</sup>There is a developing literature which attempts to explain the emergence of social customs or conventions in game-theoretic terms (see, for example, Sudgen, 1989). However, it appears that no attempts have been made to apply this literature to the specific issue of trade unionism.

correct, we have an explanation for how the promise of greater returns to union action for certain groups of workers can produce higher levels of union density among these groups. The traditional explanation is that workers are more likely to become union members if they belong to a group for which union action produces greater gains. But how this occurs in the face of an incentive to free-ride is usually not discussed. However, if the prospect of greater gains provides additional impetus for a social custom of union membership to emerge, then there is an explicit link between individual union status and the size of the potential collective gains from unionism.

### ***Job Protection and Union Membership***

One of the fundamental aims of the trade union is to protect workers against unfair or arbitrary actions by employers. Unions help workers resolve grievances by supplying the services of trade union officials who are skilled in dispute resolution, and who are backed by the authority of the union.

Of course, unions are able to exclude non-members from the job protection and grievance resolution services they provide. Indeed, by supplying job protection services as private goods, unions have a way of overcoming the free rider problem.

There are two pieces of evidence which suggest that job protection is an important element in the union membership decision for many workers. First, unions emphasise their ability to protect individual members as a key "selling point" of membership. Second, union members, surveyed across several

countries, consistently report that job protection was a key consideration in their decision to join a union (for a survey of this literature see Moe, 1980).

Of the various matters in which unions may safeguard the interests of their members, protection from dismissal is often considered to be among the most significant. While the desire for job protection is widely cited as an important element in the demand for union membership, the only attempt to formalise this proposition has been that of Blanchflower *et. al.* (1989). The following section sketches a similar insurance model of union membership.

### *An Insurance Model of Union Membership*

As before, assume that a worker (who expects to remain employed in her current job), is able to evaluate the payoffs from joining the union,  $V_i^U$ , and from not joining the union,  $V_i^N$ . Now, assume that the worker faces a probability,  $\delta$ , of being dismissed.

If dismissed, she has some probability,  $\tau$ , of finding an alternative job with the payoff,  $V_i^A$ . Otherwise, she receives unemployment benefits with the payoff,  $V_i^S$ .<sup>27</sup> Thus, if she is dismissed, her expected payoff,  $V_i^D$ , is

$$V_i^D = \tau V_i^A + (1-\tau)V_i^S \quad (2.8)$$

We assume that the probability of dismissal is lower for a union

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<sup>27</sup>The payoffs are ranked as follows:  $V_i^N > V_i^A > V_i^S$ .

member than a non-member (ie.  $\delta^U < \delta^N$ ). Therefore, her expected payoff when she does not join the union,  $V_i^{NJ}$ , is now

$$\begin{aligned} V_i^{NJ} &= (1-\delta^N) + \delta^N V_i^D \\ &= V_i^N - \delta^N(V_i^N - V_i^D) \end{aligned} \quad (2.9)$$

However, if she joins the union her expected payoff is

$$V_i^J = (1-\delta^U)V_i^U + \delta^U V_i^D \quad (2.10)$$

For simplicity, we shall assume that the union is able to completely insure its members against dismissal (ie.  $\delta^U=0$ ). The worker's expected utility gain from union membership is now

$$\begin{aligned} V_i^J - V_i^{NJ} &= V_i^U - V_i^N + \delta^N(V_i^N - V_i^D) \\ &= \beta_i F + \delta^N(V_i^N - V_i^D) \end{aligned} \quad (2.11)$$

Thus, the worker will join the union if she expects that the loss in utility from paying union fees,  $\beta_i F$ , will be less than the expected utility gain arising from the certainty of not being dismissed.

The simple model outlined here formalises the basic intuition underlying the membership decision when unions insure their members against dismissal. For instance, the model implies that an increase in the probability

of dismissal for non-members relative to members increases the rate of union membership, and also shows that the rate of union membership is related to the expected costs of dismissal.

One implication of the insurance model is that unionisation rates for similar workers will be higher in regions with higher levels of unemployment (Blanchflower *et. al.* 1989). In these regions, dismissed workers have a lower probability of finding alternative employment.<sup>28</sup> As the expected costs of dismissal for these workers are higher, they have a greater incentive join a union in order to insure against job loss. In a similar fashion, the model also implies that aggregate union density increases in recessions as the level of unemployment rises (Naylor and Cripps, 1991).<sup>29</sup>

The simple model presented here could be extended in a number of ways. First, we might allow the probability of dismissal for union members to depend on the strength of the union (Blanchflower *et. al.* 1989).<sup>30,31</sup> A second extension would be to relax the implicit assumption that all workers are equally risk averse - naturally we would expect that more risk averse workers

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<sup>28</sup>That is,  $\tau$  is assumed to be a function of the regional rate of unemployment.

<sup>29</sup>In recent years, many Australian states have improved access to state industrial tribunals for non-union members seeking action against unfair dismissal. By weakening the insurance function of trade unions, these reforms may explain part of the recent decline in union membership.

<sup>30</sup>A stronger union is expected to be able to better protect its members. Since union strength depends partly on the level of union density, the insurance model, like the social custom model, implies a positive relationship between union density and probability that an individual joins the union.

<sup>31</sup>Since union members may not be able to fully observe the union's efforts to protect their job, the model could also be extended to incorporate moral hazard considerations.

would be more likely to insure against dismissal.

A more complicated extension would be to consider different forms of dismissal. For instance, we might assume that unions are able to provide complete protection against unfair dismissal (via the relevant industrial tribunal if necessary) but only provide partial protection for workers facing legal dismissal for misconduct or shirking.<sup>32</sup>

### ***Workers' Compensation***

Unions have traditionally campaigned hard for safer working conditions and better, more effective workers' rehabilitation and compensation schemes. Most of the benefits of this activity are collectively enjoyed by union members and non-members alike.<sup>33</sup> However, unions offer excludable, private benefits in this area as well. In particular, unions act for injured members to see that they receive their full entitlements at law. In some cases, this may even entail the provision of considerable legal assistance to members pursuing compensation through the courts.

Union membership, therefore, has another insurance dimension: workers may purchase membership in order to be more certain of receiving proper compensation if they are injured at work. This implies that union

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<sup>32</sup>If workers can be insured against dismissal from shirking or misconduct, there is adverse selection dimension to union membership as poor quality workers have a greater incentive to join the union than high quality workers.

<sup>33</sup>Unions have successfully lobbied for health and safety standards to be regulated through legislation which then applies to all workers - members and non-members. Similarly, all jurisdictions have workers' compensation and rehabilitation legislation.

membership is expected to be more prevalent in occupations in which there is a greater risk of injury.

### ***Information***

So far, we have assumed that workers are perfectly informed about the costs and benefits of union membership. But what if they lack sufficient information to accurately assess the net benefits of membership? Crouch (1980) argues that a lack of information about the benefits of union membership is pervasive and that workers rely on shorthand formulae or general perceptions about unionism when deciding to join a union.

One rule of thumb is the degree of support for unionism in the community or, more importantly, the workplace. For instance, a worker unsure of the precise benefits of unionism may view a high rate of union membership in her workplace as evidence that other workers find union membership worthwhile.<sup>34</sup>

In his study of public interest groups, Rothenberg (1990) also stresses the importance of information in the individual's membership decision. He argues (p.244) that people join interest groups for relatively vague reasons, then learn about the organisation before making a considered judgement about the value of membership:

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<sup>34</sup>Similarly, economists have long recognised the importance of demonstration effects in consumption behaviour (for a survey, see Frank (1985)).



"First-time contributors are only likely to have very rough evaluations about how much they value the group's magazine or the political information furnished to members, the types of interactions offered, the association's specific positions on a variety of issues, or the additional monetary or non-pecuniary costs of membership besides annual dues."

A crucial element in the initial decision to join is contact with the interest group. This line of reasoning is equally valid in the context of trade union membership.

Unions advertise their services mainly through literature distributed at workplaces, through the workplace visits of union organisers, and via the word of mouth recommendations of union members. Workers who do not come into contact with union officials are less likely to be informed of the benefits of membership and, consequently, are less likely to become union members. Moreover, it is clear that workers in the extreme, but not uncommon, situation of being unaware that there is a union that they are eligible to join will not become union members.

### ***The Fringe Benefits of Union Membership***

Given the potentially severe collective action problems facing unions, it is not surprising that unions supply a diverse range of fringe benefits for members. However, the fringe benefits provided by Australian unions have not been the



subject of much academic research.<sup>35</sup> An exception is the chapter by Deery (1989). A recent survey conducted by the ACTU also provides further information about the fringe benefits unions supply (ACTU, 1991).

In the past, many unions acted as friendly societies providing a range of insurance benefits for their members (Beatrice and Sidney Webb, 1902). With the advent of universal social security benefits, this function of trade unions has gradually become less important. Nevertheless, the ACTU survey shows that the legacy of the early days of unionism persists. For example, some of the most common fringe benefits provided by unions are accident insurance, medical benefits, and death benefits. In addition, most unions provide legal assistance schemes as well as discounted general insurance policies. Other common fringe benefits provided by unions include financial and taxation advice, and cheap holidays (often at facilities owned by unions).

## 2.6 Union Organisation and Eligibility for Union Membership

Broadly speaking, Australian unions can be categorised in three groups. First, and most numerous, are the occupational or trades based unions. These unions represent workers in specific, narrowly defined occupations. Employment in the occupation (and hence the membership of the union) may be concentrated in a particular industry (as is the case for the Australian Nurses Federation) or

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<sup>35</sup>There is also an apparent dearth of literature on this aspect of trade unionism in other countries. A notable exception is Alison Booth's (1989) survey of the fringe benefits supplied by British unions.

dispersed across several industries (as for Australian Services Union).

The second group of unions are industry unions. These unions, such as the Shop, Distributive and Allied Employees Association (SDA) and the Transport Workers Union, recruit workers across a range of occupations in a single industry. In the case of the SDA, for example, the membership is drawn from warehouse workers, shop assistants and clerks in the retail sales industry.

Finally, there are general unions which organise workers across a range of occupations and industries. Prominent examples of such unions are the Australian Workers Union and the Federated Miscellaneous Workers Union.<sup>36</sup>

The activities of trade unions in Australia are regulated by the federal Industrial Relations Act (1988), and similar legislation in each of the states. In all jurisdictions unions must be registered with the appropriate industrial tribunal (the Australian Industrial Relations Commission in the federal jurisdiction). In the federal jurisdiction, registration requires that unions submit proposed rules including a clause defining the categories of workers eligible for membership in the union. A union which already has coverage of workers that another union wishes to recruit may object to the scope of the proposed membership clause. Normally the Commission will not approve a

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<sup>36</sup>The recent movement towards amalgamated "mega-unions" will inevitably lead to a blurring of the distinction between the various forms of union organisation with occupational unionism, in particular, becoming less common.

union's application to enrol workers already covered by another union.<sup>37</sup>

Many unions are therefore granted an effective monopoly over the provision of union services to particular groups of workers. Consequently, workers dissatisfied with the performance of their union cannot form rival unions; instead they can only air their grievances within the internal forums of their union.<sup>38</sup>

Because there is a diverse range of unions in Australia, each holding a monopoly over the recruitment of specific categories of workers, there are often several unions present in a single workplace.<sup>39</sup> Some of these unions may be more active in representing the interests of their members than others. Thus, it is conceivable that similar workers in the same workplace receive quite different levels of service from their respective unions. Moreover, it is entirely possible that some workers are ineligible to join any of the unions actively present in their workplace. Although possibly employed in highly organised establishments, these unrepresented workers may not have a strong

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<sup>37</sup>Most states have similar registration requirements. However, since the Employee Relations Act 1992 was enacted in March 1993, there has been no requirement that a union seeking recognition in Victoria must not seek to represent workers who might "conveniently belong" to another recognised association.

<sup>38</sup>There are some, albeit quite rare, instances where individual workers do face a choice between membership of rival unions. Somewhat more numerous (but still relatively uncommon) are the situations where a group of workers in a particular workplace has some choice in determining the union to represent them. However, having made a decision on representation, the group is effectively "locked-in" and would find it difficult to move to a rival union.

<sup>39</sup>Callus *et. al.* (1991: p.49) report that on average there are 1.9 unions present in unionised workplaces with 5 or more employees. The number of unions present is, however, strongly related to the size of the establishment. For example, there is an average of 6.3 unions present in unionised workplaces with more than 500 employees.

desire to join unions which, after all, are not actively delivering a service to their workplace.

In Australia there is no central database showing precisely how many workers are eligible for membership in one of the nation's 200 odd unions. The Australian Bureau of Statistics does, however, collect statistics on award coverage. The data used in the empirical analysis in the later chapters are from surveys conducted in 1986 and 1988. During this period, the ABS reports that the extent of award coverage was 85 percent (ABS, 1990).<sup>40</sup> Presumably, most (if not all) of these workers are eligible to join a union. That is not to say, however, that all of the remaining 15 percent are not eligible for membership. For instance, some of these uncovered workers are managers who, although not covered by an award, may still be eligible for union membership.

In summary, there is currently no way of knowing precisely what proportion of wage and salary earners are eligible for union membership. However, award coverage statistics suggest that, during the period from 1986 to 1988, the figure was in the region of 85 to 90 percent of all employees.

## **2.7 Union Membership and Unionised Employment**

Underpinning our discussion of union membership has been the assumption that, **within a given establishment or firm**, union negotiated improvements in

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<sup>40</sup>The latest survey shows that some 80 percent of wage and salary earners are covered by an award (ABS, 1992).

wages and conditions usually flow to all workers, both members and non-members. That is, viewed at the plant level, union negotiated improvements in wages and conditions are public goods. However, notwithstanding the constraints imposed by the award system, we have **not assumed** that remuneration and conditions of employment are determined equally for similar workers in different establishments or firms. In particular, we have not assumed that remuneration levels and conditions of employment are equal for similar workers in unionised and non-unionised firms.

While it is generally believed that the award system ensures greater uniformity in conditions across firms, there is still scope for unions to extract additional benefits for workers in unionised firms or plants. First, unions may secure higher wages and better conditions than the minimum standards set by awards. These over-award payments may be the result of unions exercising monopoly power at the firm level or, alternatively, they may arise from the productivity enhancing (collective voice) activities of the union.

Similarly, unions may secure gains for workers in unionised firms in areas outside the ambit of awards. Again, these gains may be monopoly gains or gains arising from higher rates of productivity.

Finally, while awards are legally binding, some firms may not fully comply with their provisions.<sup>41</sup> Non-compliance with award standards may be a conscious decision taken by the firm, or it may simply be the result of

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<sup>41</sup>The introduction of occupational superannuation in awards is evidence of this. Non-compliance with the superannuation provisions was so widespread, especially among small business, that the Australian government was eventually forced to enact separate superannuation legislation.

ignorance about the award or recent variations to the award. However, unions monitor and ensure compliance with award conditions and this alone may be sufficient for wages and conditions to vary between unionised and non-unionised establishments.

If wages and other conditions differ between unionised and non-unionised locations, might not workers take these differences into consideration when deciding where to work? In the United States, where wages and other conditions can differ markedly between unionised and non-unionised establishments, union membership has traditionally been modelled as a job-choice decision (Farber, 1986). For instance, it is a well established fact that unionised workers in the United States enjoy a sizeable wage premium compared to similar workers in non-unionised employment (Lewis, 1986). Thus, it is commonly assumed that the difference between the wage a worker expects to earn in unionised employment and the wage she expects to earn in non-unionised employment will be an important element in her decision to take a unionised job (Farber, 1986). Because of the prevalence of compulsory unionism in unionised establishments, union membership and the decision to seek a unionised job are treated as joint decisions.<sup>42</sup>

By modelling union membership as a job choice decision, the free-rider problem is circumvented. While union gains in the form of higher wages and better conditions may be public goods from the perspective of workers already

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<sup>42</sup>This assumes that all workers who want a unionised job are able to get one. Abowd and Farber (1982) suggest that because of the difficulties American unions face in unionising jobs, some workers who want union jobs will be unable to secure them. Therefore, there is a queue for union jobs and a worker only becomes a union member if she is selected from the queue.

employed in unionised establishments, they are excludable in the sense that workers must become union members in order to be employed in the unionised establishment.

There are two main reasons why this sort of model is less appropriate for the analysis of union membership in Australia than it might be in the United States. First, around 50 percent of Australian union members are employed in open shops. For these workers their continued employment is not dependent on union membership. Second, workers in non-unionised employment are not prevented from becoming union members and having a union represent them, even if no other workers in the plant become union members. In contrast, American workers in non-union plants must enter a complex election process before a union has the right simply to commence negotiations of their behalf.

In the Australian environment it is more appropriate to treat the union membership decision for workers employed in open shops as being separate from the decision to join a union. In this way, the collective gains of unionism do not factor in the worker's union membership decision.

## **2.8 Conclusion**

If we were to identify the central theme of this chapter, it would be that unions are fundamentally collective organisations which seek to advance collective goals. Any theory of union membership must recognise this fact by explaining why individuals join unions when they have an incentive to free-ride the



services supplied by unions. However, the previous econometric studies of Australian union membership pay scant attention to this fundamental point. Indeed, a review of these studies reveals no mention of the free-rider problem.<sup>43</sup> No doubt this is due, in large part, to the considerable influence of American studies of the determinants of union membership. The central focus of most of these studies, however, is on the problem of modelling the choice between unionised and non-unionised employment, with union membership treated as a characteristic which goes with a unionised job.

Although the previous econometric studies of Australian union membership do not seek to explain union membership as a collective action problem, there is a considerable body of literature on this issue. Our survey of the literature reveals four major explanations for why workers join unions. They are:

1. *Compulsion.* The simplest way to overcome the free-rider incentive is to make membership compulsory. Thus, workers in closed shops are

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<sup>43</sup>In contrast, unionists have long been aware of the incentive for workers to free-ride the benefits of union membership. Their sentiments are clearly reflected in the words of the "Non-unionist's psalm":

*The dues paying member is my shepherd,  
I shall not want,  
He provideth me with rest days and vacations,  
So that I may lie down in green pastures.  
Beside the still waters.  
He restoreth my back pay,  
He guideth my welfare without cost to me,  
I stray in the paths of the non-righteous,  
For my money's sake.  
Yea, though I alibi and pay no dues,  
From generation to generation,  
I fear no evil for he protects.*

*The working conditions which he provides,  
They comfort me.  
He anointeth my head with oil of Worker's  
Compensation,  
Sick pay, annual leave and long service leave,  
And the forty-hour week,  
And my cup runneth over with in-gratitude.  
Surely his goodness and loving kindness ,  
Shall follow me all the days of my life,  
Without cost to me,  
I shall dwell in his house forever,  
And allow him to pay the bills.*

(From *The Shop Assistant*, September 1965, with the added dedication "*Disrespectfully dedicated to all those who take advantage of our labours whilst remaining outside our ranks*". A slightly different version is quoted by McKenna and Easson (1990)).



required, as a condition of employment, to become union members.

2. *Social Custom.* If union membership is a workplace social custom, individuals may still choose to become union members even when they have a pecuniary incentive to free-ride. This is because when union membership is a social custom, membership confers the benefits of a good reputation with one's fellow workmates.
3. *Insurance.* While unions are largely engaged in supplying collective goods, workers may choose to join a union in order to secure the private insurance benefits of membership. These include insurance against unfair dismissal, assistance with workers' compensation claims, and protection against arbitrary managerial decisions.
4. *Union Fringe Benefits.* Finally, workers may desire union membership in order to receive the fringe benefits supplied by trade unions.

These four explanations are not necessarily mutually exclusive. For instance, there is no apparent reason why voluntary trade unionism might not be explained partly by the insurance model and partly by the social custom model. Indeed, a complete theory of union membership might encompass all four explanations.

Ideally, the purpose of the following empirical chapters would be to establish the contribution, and validity, of each of these explanations of union membership. However, as we shall see, data constraints limit our capacity to satisfactorily determine these questions. Nevertheless, the theory outlined here provides a reference point for specifying the empirical models and for interpreting their results.

## The Determinants of Union Membership: A Preliminary Analysis and Empirical Survey

### 3.1 Introduction

The econometric analysis of the determinants of the individual union status of Australian workers is still in its infancy; indeed, the first such study of union membership was not published until 1987 (Crockett and Hall, 1987). Since then further contributions have been made by Miller and Rummery (1989), Christie and Miller (1989), Deery and DeCieri (1991), and Christie (1992). While comparatively few in number, the pioneering studies have analysed the impact of a wide range of variables on the probability of union membership, and have laid a solid foundation for further research.<sup>1</sup>

This chapter maps the contours of what is already known about the determinants of union membership in Australia. However, it is not intended to be a passive survey: throughout the chapter, the findings of the previous studies are reviewed in the light of new estimates obtained using data from the Issues in Multicultural Australia, and the Class Structure of Australia surveys.

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<sup>1</sup>In addition to the individual level studies of union membership, time series studies of union membership have been undertaken by Sharpe (1971), Kenyon and Lewis (1992), and Borland and Ouliaris (1991). More recently, firm-level data from the Australian Workplace Industrial Relations Survey have been used to analyse workplace union density (Wooden and Balchin, 1993).

As noted earlier, the central aim of this thesis is to build upon and extend the previous Australian research into the determinants of union membership. To this end, Chapters 4 and 5 develop more detailed models of union membership using data which are uniquely available from the IMA and CSA surveys. Nevertheless, the parsimonious approach adopted in the previous studies, and in this preliminary chapter, provides a useful reference point for relating the findings of the later chapters.

### 3.2 Modelling Trade Union Membership

#### *The Membership Decision.*

Let us consider a union that is engaged in supplying union services to the workers in a given occupation and establishment.<sup>2</sup> As we have already seen, the services supplied by unions include both collective benefits (ie. improvements in working conditions) and private benefits (ie. protection for members against unfair dismissal or arbitrary managerial actions).

The union's leadership decides the services to be provided, and the intensity with which these services are to be delivered to each workplace. For example, the leadership decides which establishments are to be visited by union organisers and other officials, and the duration and frequency of these workplace visits. Of course, the union is constrained in the services that it can

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<sup>2</sup>Because of the occupational basis of many Australian trade unions, the services supplied to workers in different occupations within the same establishment are distinguished here.

provide. In particular, financial constraints limit the union's capacity to deliver services to workplaces where total organising costs exceed total membership revenue (Berkowitz, 1954). Similarly, the union's capacity to supply higher wages, better fringe benefits and the like is constrained by industrial legislation, the union's bargaining power, and the rents available to be extracted from firms.

Trade union membership is typically modelled as a utility maximising decision. It is assumed that an individual  $i$  is able to evaluate the utilities expected to be derived from membership,  $V_i^u$ , and non-membership,  $V_i^n$ . An individual is assumed to join the union if he or she expects a net utility gain from membership (ie. if  $V_i^u - V_i^n > 0$ ).

The utility derived from union membership is a function of the private and collective benefits of membership, the costs of membership and, in workplaces where union membership is a social custom, the reputational benefits of membership. For convenience, we assume that the utility expected to be derived from union membership can be written as an additively separable function of these costs and benefits:

$$V_i^u = CB_i\alpha_1 + PB_i\alpha_2 + R_i\alpha_3 + F_i\alpha_4 \quad (3.1)$$

where  $CB_i$  and  $PB_i$  are vectors which record the collective and private benefits of unionism,  $R_i$  is an index which measures the individual's workplace reputation, and  $F_i$  is a vector which captures the costs of membership.

Clearly, a non-member receives none of the private benefits of

membership ( $PB_i=0$ ), and does not pay union fees ( $F_i=0$ ). If we normalise the reputation measure such that for a non-union member  $R_i=0^3$ , the expected utility from non-membership is

$$V_i^n = CB_i\alpha_1 \quad (3.2)$$

Note that we assume that the weights placed on the costs and benefits of membership (ie. the alphas) are constant for different individuals. However, utility functions are likely to vary across individuals, and we allow for this by adding an index,  $T_i$ , which is a measure of individual tastes for union membership. Therefore, the expected net utility gain from union membership is written as

$$U_i^* = V_i^u - V_i^n = PB_i\alpha_2 + R_i\alpha_3 + F_i\alpha_4 + T_i \quad (3.3)$$

where  $U_i^*$  is an unobserved index which measures the expected utility gain (or loss) from union membership. If  $U_i^* > 0$ , the individual joins the union ( $U_i=1$ ); otherwise the individual does not join ( $U_i=0$ ).

Typically, the data sources that are used to model union membership do not contain direct information about the costs and benefits of membership. For example, information on union membership fees, the fringe benefits of

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<sup>3</sup>More generally, we might set  $R_i=0$  for all non-members and for union members employed in locations where union membership is not a social custom.

membership, contact with union officials *et cetera* is usually lacking in the data used. Instead, the available data include personal attributes (such as marital status and sex), and human capital, workplace and occupational characteristics. The specification of an econometric model of union membership must therefore be developed with these data constraints in mind.

### ***A Reduced Form Model of Union Membership.***

The central problem facing researchers wishing to model union membership using large individual data sets is that direct information on the private benefits and costs of membership (ie. the elements of the vectors  $PB_i$  and  $F_i$ ) are lacking in the available sources of data. However, theory suggests that the collective and private goods supplied by trade unions to workers in occupation  $j$  and establishment  $k$  depend on the net costs of organising the workplace, the union's bargaining power, and the rents available to be extracted from the firm. In turn, these factors are assumed to be a function of workplace and firm characteristics, as well as occupational characteristics. They also depend on the extent of union membership in the workplace.

To keep matters relatively simple, let us assume that the private benefits supplied by the union, and the information provided to workers about

these benefits, can be summarised by a single unobserved index,  $PB_{ijk}^*$ .<sup>4</sup> This index is modelled as a function of workplace, firm and occupational characteristics

$$PB_{ijk}^* = \gamma_0 + D_{ik}\gamma_1 + G_{ij}\gamma_2 + \mu_{jk}\gamma_3 + v_{1i} \quad (3.4)$$

where  $D_{ik}$  is a vector of characteristics of the firm and the workplace in which the individual is employed,  $G_{ij}$  is a vector of occupational characteristics and  $v_{1i}$  is a randomly distributed error term which captures the unobserved determinants of the scale and scope of the private benefits supplied by the union. The extent of union membership in the workplace,  $\mu_{jk}$ , is given by

$$\mu_{jk} = \frac{\sum_{i=1}^{n_{jk}} U_i}{n_{jk}} \quad (3.5)$$

where  $n_{jk}$  is the total number of workers in occupation  $j$  at the workplace  $k$ .

As seen in the previous chapter, the social custom model of trade union membership postulates that, in workplaces where union membership is a social

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<sup>4</sup>Clearly, the problem of modelling the myriad services provided by unions is finessed here. It would not be difficult to develop a richer specification in which the individual elements of the basket of private benefits are modelled separately. However, such an approach would entail a great deal of cumbersome notation, and would not add much to our understanding of the fundamental issues involved in specifying the union membership equation in the absence of detailed data on these private benefits.

custom, a worker derives a reputational benefit from membership of a trade union. The reputation derived from membership is modelled as a function of the overall support for the social custom and as a function of the individual's personal attributes (particularly his or her attitudes towards trade unionism):

$$R_i^* = \varphi_0 + M_i \varphi_1 + \mu_{jk} \varphi_2 + v_{2i} \quad (3.6)$$

where  $M_i$  is a vector of personal attributes, and  $v_{2i}$  is a random error term which captures the unobserved determinants of the reputational benefits of membership.

In order to receive the private benefits of membership, a worker must pay union fees. The method and frequency of the payments, as well as their quantum, should be seen as relevant components of the worker's perceived costs of membership.<sup>5</sup> Once again, researchers rarely have available data on union fees, or on the method of payment of those fees. However, we assume that the costs of membership can be represented by a single unobserved index,  $F_{ijk}^*$ , which is a function of workplace and firm characteristics (which are assumed to capture the method of payment)<sup>6</sup>, and which is also a function of occupational characteristics (which are assumed to capture the average costs of

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<sup>5</sup>For example, a worker who has a preference for income smoothing will favour regular payroll deductions over annual or semi-annual payments.

<sup>6</sup>For example, automatic payroll deductions of union fees may be the result of a union exercising its bargaining power to induce a firm to provide these arrangements. Alternatively, a firm wishing to facilitate trade union membership may be happy to provide payroll deductions without any threat of union action.



organising the workers covered by the union):

$$F_{ijk}^* = \phi_0 + D_{ik}\phi_1 + G_{ij}\phi_2 + v_{3i} \quad (3.7)$$

where  $v_{3i}$  is a random error term which captures the unobserved determinants of the fees to be paid and the method of payment of those fees.

Finally, the individual's taste for the services provided by the union is assumed to be a function of personal and human capital characteristics and is modelled as

$$T_i^* = \lambda_0 + H_i\lambda_1 + M_i\lambda_2 + v_{4i} \quad (3.8)$$

where  $T_i^*$  is an unobserved index and  $v_{4i}$  is a randomly distributed error term.

Substituting for (3.4)-(3.8) in (3.3) we obtain a reduced form membership equation:

$$U_{ijk}^* = \beta_0 + D_{ik}\beta_1 + G_{ij}\beta_2 + H_i\beta_3 + M_i\beta_4 + e_{ijk} \quad (3.9)$$

Simplifying the notation, the reduced form model of union membership

equation is

$$\begin{aligned} U_{ijk}^* &= X_{ijk}\beta + \epsilon_{ijk} \\ U_i &= I(U_{ijk}^*) \end{aligned} \tag{3.10}$$

where  $X_{ijk}$  is a vector of explanatory variables ( $X_{ijk} = [D_{ik}:G_{ij}:H_i:M_i]$ ),  $\beta$  is a vector of parameters to be estimated, and  $I(\cdot)$  is an indicator function.<sup>7</sup> The error term,  $\epsilon_{ijk}$ , captures the unobserved determinants of the worker's perception of the costs and benefits of membership.

The method used to estimate the model depends on the assumed properties of the error term. If  $\epsilon$  is assumed to be normally distributed, then probit estimation is used and the probability that the worker  $i$  is a union

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<sup>7</sup>That is,  $I(U_i^*)=1$  if  $U_i^*>0$ , and  $I(U_i^*)=0$  if  $U_i^*<0$ .

member is<sup>8</sup>

$$\begin{aligned} \text{Prob}(U_i=1) &= \text{Prob}(U_i^* > 0) \\ &= \text{Prob}(\epsilon_i > -X_i\beta) \\ &= \Phi(X_i\beta) \end{aligned} \tag{3.11}$$

where  $\Phi(\cdot)$  is the normal distribution function.

### *Union Membership and Wages*

In the previous chapter we argued that, seen from the perspective of workers at the plant level, any wage gains that unions secure are collective goods which are received by both members and non-members. However, the studies of Australian union membership by Miller and Rummery (1989), Miller and Christie (1989), and Christie (1992) reveal a wage premium associated with union membership. Consequently, they assume that by joining a union a worker may obtain an increase in his or her wages. Such a wage increase

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<sup>8</sup>Probit estimation accounts for the fact that the dependent variable takes only two values:  $U=1$  "worker is a union member"; or  $U=0$  "worker is not a union member". Also, in the probit model, the predicted probabilities of union membership are constrained to lie between zero and one. Alternative estimation methods include the linear probability model and the logit model. The linear probability model involves OLS estimation of the union membership equation. This model has a number of shortcomings including the fact that the estimated probabilities are not constrained to be in the zero-one interval (for a discussion, see Greene (1990)).

If the cumulative distribution function of  $\epsilon$  is assumed to be the logistic distribution function, then the logit model is used instead. Because the normal and logistic distributions are very similar (except in the tails), it generally does not matter much whether a logit or probit model is used (Amemiya, 1981).

would, of course, be a major inducement for a worker to join a union. Therefore the individual's expected wage gain from membership is included as a determinant of the probability of union membership.

The model estimated in these studies has the same structure as the model proposed by Lee (1978) which has been widely employed in studies of union membership in North America and elsewhere. In Chapter 4 we will argue that it is more appropriate, in the Australian context, for this model to be used to explain the individual's choice of employment between unionised or non-unionised establishments rather than to model the individual's union membership decision. Nevertheless, given the prominence of the model in the literature, we shall briefly sketch its structure.

First, it is assumed that union members and non-members have different wage structures. The wage equations applying to union members and non-members are written as

$$\ln W_i^u = \tilde{Z}_i \delta^u + \eta_i^u \quad \text{Members} \quad (3.12a)$$

$$\ln W_i^n = \tilde{Z}_i \delta^n + \eta_i^n \quad \text{Non-members} \quad (3.12b)$$

where  $\tilde{Z}_i$  is a vector of human capital and other wage-determining characteristics and  $\eta_i^u$  and  $\eta_i^n$  are normally distributed random error terms. The parameter vectors ( $\delta^u$  and  $\delta^n$ ) are assumed to be constant across individuals.

Next, it is assumed that the worker's expected utility gain from membership is a function of industry and individual characteristics,  $\tilde{X}_i$ , and the

difference between the log hourly wage received if the worker is a union member,  $\ln W_i^u$ , and that received if the worker is not a union member,  $\ln W_i^n$ :

$$U_i^* = \beta_0 + \tilde{X}_i \beta_1 + (\ln W_i^u - \ln W_i^n) \beta_2 + e_i \quad (3.13)$$

where  $e_i$  is a normally distributed random error term which captures the unobserved determinants of union membership (ie.  $e_i \sim N(0, \sigma_1^2)$ ).

Now substituting (3.12a) and (3.12b) in (3.12) yields a reduced form membership equation:

$$U_i^* = \tilde{\beta}_0 + \tilde{X}_i \tilde{\beta}_1 + \tilde{Z}_i (\delta^u - \delta^n) \tilde{\beta}_2 + \tilde{e}_i \quad (3.14)$$

where  $\tilde{e}_i = e_i + \eta_i^u - \eta_i^n$ .

Assuming joint normality of the error terms, the reduced form equation can be used to compute the inverse Mill's ratio terms needed to account for potential sample selection bias in the wage equations (Lee, 1978).

Although the wage gain the individual expects from union membership is not observed, it can be estimated using the selectivity-corrected wage equation estimates. Substituting the difference in the predicted wages  $(\ln \hat{W}_i^u - \ln \hat{W}_i^n)$  allows estimation of a "structural" membership equation defined by (3.13).

Thus far, we have argued, on purely theoretical grounds, that a union membership premium is unlikely to be a widespread phenomenon at the plant

level. In Chapter 4 we shall present empirical evidence to support this proposition (in particular, we show that there is no significant relationship between union membership and wages among workers employed in unionised establishments). Consequently, we do not believe that it is appropriate to treat the union membership wage premium as a determinant of the individual's probability of union membership. Therefore, in this chapter, we do not estimate a simultaneous equations model of wages and union membership. Furthermore, when we review the findings of the previous studies that estimate such models, we focus primarily on the reduced form estimates presented in those studies.

### 3.3 Data

The data used in this thesis come from two sources. The first source is the Office of Multicultural Affairs' 1988 survey, *Issues in Multicultural Australia*; the second is the *Class Structure of Australia Survey* conducted by the University of Queensland in 1986.<sup>9</sup> Neither of these data sets have previously been used to model the determinants of union membership.

The reason for choosing these particular data sets is that they contain important information which is not available in the data sets that have previously been used to model Australian union membership. For instance, the IMA survey includes questions on compulsory union membership. In

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<sup>9</sup>These data are available from the Social Science Data Archives, The Australian National University. (IMA: SSDA study numbers 534-537; CSA: SSDA study number 493).

Chapter 5, we use this information to model separately the determinants of voluntary and compulsory union membership. Similarly, the CSA survey is a unique source of data on union presence. This allows us (in Chapter 4) to model union membership as a decision made by workers in unionised workplaces.

### *The Issues in Multicultural Australia Survey*

The Issues in Multicultural Australia Survey consists of four samples: *The General Sample* - a sample of the general Australian population aged 15 and over (35 percent); *The NESB Sample* - a sample of non-English speaking migrants; *The Second Generation Sample* - a sample of second generation Australians of non-English speaking backgrounds (18 percent); and *The New Arrivals Sample* - a sample of migrants who arrived in Australia after July 1981 from non-English speaking countries. In total 4502 individuals are surveyed.<sup>10</sup>

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<sup>10</sup>Note that, in effect, the pooled IMA data constitute an exogenously stratified random sample. (In this case the stratification is by migrant status and non-English speaking background).

Because migrant status and non-English speaking background are exogenous determinants of union membership, no adjustments need to be made to account for the oversampling of migrants (and individuals with non-English speaking backgrounds) in probit estimation (for a discussion of this point see Heckman and McCurdy, 1986: p.1928). However, sample statistics derived from the pooled IMA data, such as the sample means, will be biased estimators of the population means.

Later in this chapter we shall see that migrant status and non-English speaking background are entered in the membership equation as a series of dummy variables. The parameters of all the other variables (such as job tenure, political affiliation and workplace size) are constrained to be equal across workers, irrespective of their migrant status or English speaking background. However, if the parameters of the other variables were actually to differ for migrants and non-migrants, (or workers

The IMA survey has a wide geographical coverage - only the Northern Territory, isolated small urban centres, and sparsely populated rural areas are excluded.

In this thesis the data are restricted to currently employed wage and salary earners for whom valid data are available for all key variables of interest. The purged data set consists of 2088 cases.<sup>11</sup>

The membership rate in the sample used here is 45.9 percent. This is almost four percentage points higher than the union density rate in August 1988 as reported by the Australian Bureau of Statistics (ABS, 1989). One possible explanation for the difference is that the ABS survey excludes workers who are trade union members by virtue of holding a second job. This distinction is not made in the IMA survey.<sup>12</sup>

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with English and non-English speaking backgrounds), then the probit estimates would be biased.

It must be stressed that this bias would not be the product of the oversampling of migrants, but rather would be the product of a misspecified equation (that is, the bias would still be present even if a fully representative random sample of the population were used instead of the stratified random sample). Nevertheless, the presence of a large proportion of migrants in the sample may, in practice, bias the estimates further than if the misspecified equation were to be estimated using a sample with a smaller, more representative proportion of migrants.

<sup>11</sup>At first glance, it would seem that an unusually large number of observations have been lost. However, the number of currently employed wage and salary earners in the pooled IMA sample is only 2149. That is, less than 3 percent of observations are discarded because of lack of valid data on the key variables of interest.

<sup>12</sup>A further explanation may be that the mean rate of union membership is biased because migrants are oversampled. However, the union density rate for the general sample, which is a sample of the general Australian population, is 45.5 percent - still higher than that reported by the ABS.



### *The Class Structure of Australia Survey*

The Class Structure of Australia Survey, conducted during the second half of 1986, is a survey of 1195 Australians aged 18 years and over. The survey is restricted to males in full-time paid employment (working at least 30 hours per week), and females working at least 15 hours per week in regular part-time or full-time employment.

Once again, the self-employed, and respondents for whom data is missing for key variables of interest, are excluded from the analysis. This leaves a data set consisting of 1009 observations.

The union density rate in the sample used here is 52 percent, higher than the national union density rate of 46 percent reported by the Australian Bureau of Statistics for August 1986 (ABS, 1989). Undoubtedly, part of the difference can be explained by the exclusion from the CSA survey of casual and part-time males, and also of females who do not regularly work at least 15 hours per week.<sup>13</sup>

### **3.4 Model Specification and Estimation**

Using the data from the IMA and CSA surveys, we estimate two reduced form probit models of the determinants of union membership. Subject to data

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<sup>13</sup>The ABS reports that in August 1986, only 21 percent of casual employees were union members while 50.8 percent of permanent employees were union members. It is interesting to note that the figure for permanent employees is almost identical to the union density rate in our sample from the CSA survey.

availability, the estimated models include as many as possible of the independent variables used in the previous Australian studies (these studies are summarised in Table 3.1). The intention is for the equations to be interpreted as general models which nest, as far as possible, the more specific specifications of the earlier studies. Because the estimated equations contain a large number of variables, the probit results are reported in more readily digestible portions throughout the next section. Nevertheless, the estimated equations are presented in full in Tables A3.1 and A3.2 in the appendix to this chapter.

The IMA and CSA surveys, while being comparatively rich sources of data for modelling the determinants of union membership, lack variables that theory would suggest are important in a model of union membership. For example, both surveys do not record the union density rate in the respondent's place of work; they both lack data on the intensity of union activity in the respondent's workplace; and neither survey records the price of union membership. Consequently, many of the variables included in the estimated equations are best interpreted as proxies for unobserved variables which would capture the costs and benefits of membership more directly.

Whenever different data sources are involved, it is almost inevitable that there will be variables available in one source which are not available from the other, and that similar variables will be coded in different ways. Indeed, this is the case with the IMA and CSA data sets and it should be noted, therefore, that the estimated equations are not identical. For example, the size of the respondent's place of work is recorded in the IMA survey but

not the CSA survey. On the other hand, the CSA survey contains rich attitudinal data which are not available from the IMA survey. Furthermore, while occupation is coded in the IMA survey according to the Australian Standard Classification of Occupations, in the CSA survey the earlier Classification of Occupations scheme is used instead.

*A Structural Model of Union Membership*

In Chapters 4 and 5 we shall argue that the single index model of union membership defined by (3.11) should be interpreted as a reduced form approximation to a more complicated (multiple index) structural model of union membership (such as that depicted in Figure 3.1).

FIGURE 3.1  
A Structural Model of Union Membership

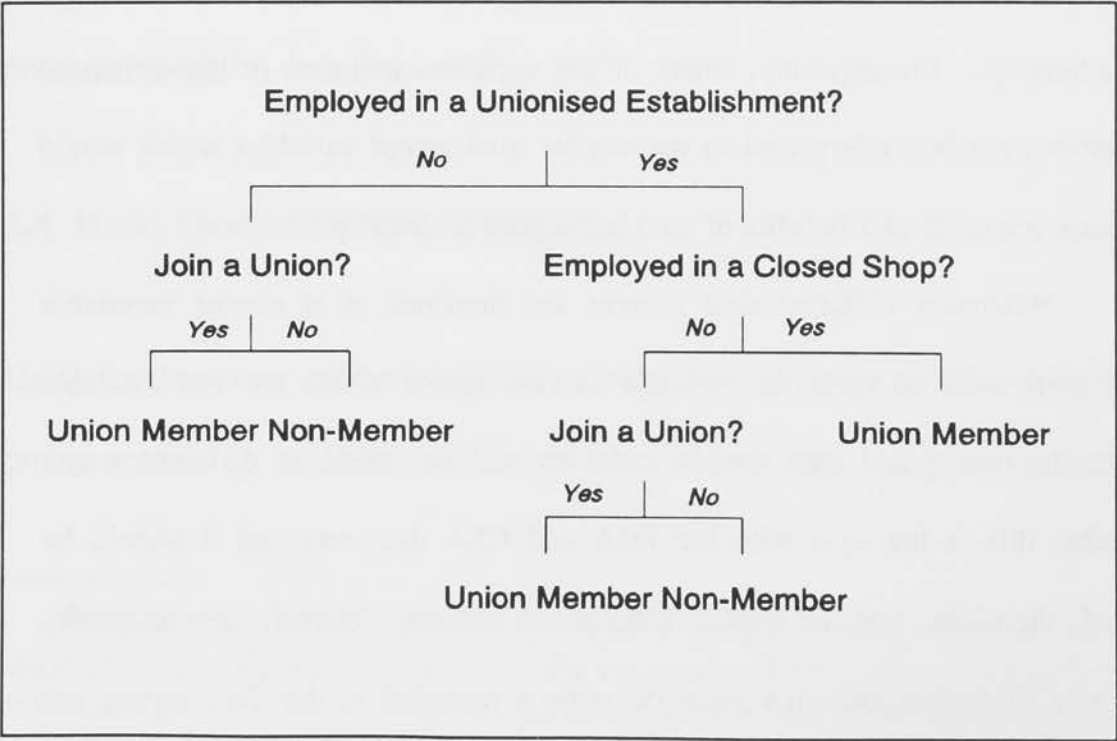


TABLE 3.1  
Summary of Major Australian Cross-Section Studies  
of Union Membership

| Study                                         | Sample                                                            | Independent Variables                                                                                                                                                                |
|-----------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Crockett and Hall (1987)                      | Survey of WAIT graduates from late 1970s, 887 males and females   | Gender, marital status, number of children, birthplace, full-time work experience, unemployment duration, industry, sector of employment, earnings, job satisfaction, job tastes     |
| Christie and Miller (1989)<br>Christie (1992) | National Social Science Survey, 1984, 1316 males and females      | Gender, marital status, education, location, experience, industry, occupation, expected wage gain, attitudes towards unions                                                          |
| Miller and Rummery (1989)                     | Australian Longitudinal Survey (ALS), 1985, 1904 males aged 19-25 | Education, qualifications, location, industry, occupation, full-time status, general labour market experience, expected wage gain, job satisfaction                                  |
| Deery and DeCieri (1991)                      | 1987 Australian Election Survey, 862 males and females            | Gender, marital status, dependents present, education, age, location, white-collar, full-time status, sector of employment, social status, spouse in union, attitudes towards unions |

Source: Miller and Mulvey (1993)

Such a model of union membership would recognise that employment in a unionised location - that is, a location where there is an active union presence - is a crucial determinant of union membership. Indeed, it can be argued that union membership is best modelled as a decision made conditional on an individual being employed in a location where there is a union present.<sup>14</sup>

A fully specified structural model of union membership would also acknowledge that many unionised establishments are closed shops in which membership is a compulsory condition of employment. An individual employed in a closed shop must either join the union or seek alternative employment.<sup>15</sup> However, for an individual employed in an open shop the membership decision is a voluntary one insofar as his or her continued employment is not dependent on union membership status.

In short, the union membership equations estimated in this chapter, along with those estimated in the previous Australian studies, should be viewed as reduced form approximations to a structural model of union membership similar to that sketched above. This makes interpretation of the estimated

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<sup>14</sup>It should be acknowledged, however, that some individuals employed in non-unionised locations may still join unions. For example, individuals with a strong ideological interest in trade unionism may still join regardless of whether or not there is a union present in their workplace. Similarly, some workers may become union members in order to protect themselves against unfair dismissal, or to have their award conditions enforced, even though there is no union present at their place of work. While, as far as we are aware, there are no Australian data on the extent of union membership in non-unionised locations, it is our belief that the overwhelming majority of union members are, in fact, employed in unionised locations.

<sup>15</sup>Some closed shop agreements allow "conscientious objectors" to be exempted from membership. These arrangements are discussed in Chapter 5.

coefficients a somewhat hazardous undertaking. Indeed, it implies that, at best, only tentative conclusions may be drawn about the estimates. (For example, a satisfactory test of the social custom and insurance models of union membership requires a model that controls for the supply of union services and that also accounts for compulsory membership).

While recognising that our estimates, and those of the previous studies, are derived from reduced form models of union membership, we shall nevertheless attempt, in the following section, to provide some interpretation of the major findings. However, it is not our intention to treat the estimates as providing definitive tests of the various theories of union membership.<sup>16</sup>

### **3.5 The Determinants of Union Membership**

A brief inspection of Table 3.1 reveals that the previous Australian studies of individual union membership status have investigated the influence of a wide range of personal and employment-related characteristics on the probability of union membership. In this section, the results from the previous studies are reviewed while, at the same time, new evidence from the IMA and CSA surveys is presented and weaved into the analysis.

It must be stressed that the estimates presented in this section are from probit models that control for all of the available determinants of membership,

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<sup>16</sup>In a similar vein, Booth (1986: p.45) comments that the (single index) model estimated in her paper does not explain the choice of whether or not to be a union member but, in essence, summarises the data.

not just the particular variable of interest. As noted previously, the estimated equations are presented in full in the appendix to this chapter (see page 122).

### **Workplace Size**

Until recently, Australian data on trade union membership and workplace size were not readily available. However, since 1990 the Australian Bureau of Statistics has published union density rates for several establishment size categories. The data show that, on average, larger workplaces have higher rates of union membership than smaller workplaces (ABS, 1990). Looking at Table 3.2 we see that a similar pattern is evident in data from the Australian Workplace Industrial Relations Survey (AWIRS).<sup>17</sup>

There are several reasons why workplace size might be a determinant of an individual's probability of union membership. First, to the extent that there is a wider gulf between workers and management in large workplaces, there is expected to be a greater demand for the advocacy or voice services of trade unions by workers in large establishments.

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<sup>17</sup>The AWIRS is a national survey of workplaces with 5 or more employees. However, detailed data on union activity are only available for workplaces with 20 or more employees. The AWIRS data are described in detail by Callus *et. al.* (1991).



TABLE 3.2  
Union Density Rates by Establishment Size

| Establishment Size (number of employees) | Union Density (%) |                   |
|------------------------------------------|-------------------|-------------------|
|                                          | ABS (August 1990) | AWIRS (1989-1990) |
| 1-4 employees                            | 16.4              | -                 |
| 5-9 employees                            |                   | 20                |
| 10-19 employees                          |                   |                   |
| 20-49 employees                          | 46.0              | 47                |
| 50-99 employees                          | 58.2              | 56                |
| 100-199 employees                        |                   | 66                |
| 200-499 employees                        |                   | 71                |
| 500 or more employees                    |                   | 72                |

A second reason might be that workplace size is a proxy for union activity. In particular, economies of scale may allow unions to be active in larger rather than smaller establishments.<sup>18</sup> As we saw in Chapter 2, theory

<sup>18</sup>Data from the Australian Workplace Industrial Relations Survey (AWIRS), for instance, show that union delegates (shop stewards) are present in 93 percent of all workplaces with 500 or more employees but are present in only 39 percent of workplaces with 20-49 employees (Callus *et. al.*: p.271). Another measure of union activity is the frequency workplace visits by full-time union officials. The AWIRS data show that 77 percent of workplaces with 500 or more employees are visited by union officials at least once every 3 months, while 50% of workplaces with 20-49 employees are visited irregularly or not at all (Callus *et. al.*: p.291).

Economies of scale are one explanation for the greater intensity of union activity in larger workplaces. Because financial constraints limit the capacity of unions to organise those workplaces for which organising costs exceed membership revenue, unions are expected to concentrate their resources in large establishments which have lower average organising costs.

Another explanation is that firms have greater incentives to encourage unionism in larger establishments. The exit-voice model of unionism, for instance, postulates that unions enhance workplace productivity by providing a structure for identifying and resolving workers' grievances. To the extent that smaller workplaces allow closer personal contact between workers and management there is less scope for union voice to raise productivity. However, in larger, more impersonal establishments union voice may have a greater role to play in boosting workplace



suggests that an individual is more likely to become a union member when there is greater union activity in his or her workplace. For instance, when unions are more active in the workplace, workers have greater information about the benefits of membership and, consequently, are expected to be more likely to become union members. Moreover, both the collective and private benefits of membership are expected to be greater in establishments with more intensive union activity.<sup>19</sup>

Another reason why workplace size might be a determinant of the probability of union membership is that it is a proxy for workplace union

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efficiency. Hence, it can be argued that there is greater incentive for management to facilitate union involvement in larger workplaces.

Employers can encourage union membership in several ways: by establishing closed-shop agreements with unions; by allowing union meetings in company time; by facilitating workplace visits by union officials; or by allowing payroll deductions of union fees. Another way employers can lower the costs of unionism is by allowing union delegates to undertake union business during work time.

The AWIRS data show that in large workplaces employers are more likely to allow delegates time off for union business. For instance, in 82 percent of workplaces with 500 or more employees delegates are allowed time off for union business, while 59 percent of establishments with 20-49 workers allow delegates to be paid for time spent on union business (Callus *et. al.*: p.281). Moreover, 24 percent of all workplaces with more than 500 workers have union delegates employed full-time on union business, compared with only 5 percent of all workplaces with 20 or more employees (Callus *et. al.*: p.273).

<sup>19</sup>In an instrumental model of union membership, it is the prospect of greater private benefits which provides the individual with a greater incentive to become a union member. However, as discussed in Chapter 2, greater collective benefits (that is, benefits enjoyed by all workers in the plant irrespective of union status) may provide additional impetus for the emergence and maintenance of a social custom of union membership.

density.<sup>20</sup> Recall that in the social custom model, the reputation derived from obeying the social custom is an increasing function of the overall adherence to the social custom. Thus, the higher the union density rate in the workplace, the greater the reputational benefits of membership and the more likely a given individual is to join the union.

We now have several explanations for why the probability of union membership might be a function of workplace size, but what is the empirical evidence?

Unfortunately, data limitations mean that none of the previous Australian studies of the determinants of union membership include workplace size as an explanatory variable.<sup>21</sup> However, using British data, Booth (1986) finds that a worker employed in large plant (with more than 500 workers) has a significantly higher probability of union membership than a similar worker

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<sup>20</sup>It is, of course, quite likely that workplace union density and union activity are endogenous. However, our aim is not to explain workplace union density, but rather to model individual union status. For our purposes, then, it is sufficient to know that unions are more active in large workplaces and that large workplaces have higher union density rates.

<sup>21</sup>Christie (1992) reports a positive relationship between the probability of union membership and firm size (measured by the number of full-time workers employed Australia-wide). Despite her concern that firm size is a less appropriate proxy for organising economies than workplace size (workplace size was not available in her data), it may be that there are distinct organising economies associated with both firm size and workplace size. For instance, it may be less costly for a union to organise a small branch of a large firm (payroll deductions may have already been negotiated with head office, for example), than to organise the sole branch of a small firm. However, we lack suitable data on firm size to include in our membership equation.

employed in a very small plant (with less than 25 employees).<sup>22</sup>

A strength of the IMA survey is that it is one of the few Australian sources of individual data which records both union membership and workplace size. The size of the establishment in which an individual is employed is tabulated in one of five categories (these categories range from "just myself" to "500+"). Therefore, in the membership equation estimated using the IMA data, workplace size is entered as a series of dummy variables, with establishments employing more than 500 workers being the omitted category.

Table 3.3 reports the estimated coefficients on the workplace size variables from the reduced form probit model of union membership.<sup>23</sup> The coefficients indicate the change in the predicted probability of membership for an individual in each of the workplace size categories relative to an individual in the omitted workplace size category (500+ workers). An indication of the

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<sup>22</sup>Using AWIRS data, Wooden and Balchin (1993) include both establishment size and firm size in a model of workplace union density. While firm size is positively related to workplace union density, establishment size is found to be an insignificant determinant of union density. Wooden and Balchin describe this result as perplexing and suggest the greater occupational diversity of large workplaces as one reason for the result. There are other possible explanations.

First, workplaces with fewer than 20 employees are not included in their data. However, the aggregate data suggest that the establishment size-union density effect is strongest in small establishments (see Table 3.2). That is, workplace organising economies might largely be exhausted once an establishment size threshold of around 20 employees is reached.

Second, workplaces with no union members are excluded from the analysis. However, as these are more likely to be small rather than large workplaces, the workplace size effect may be biased downward by the exclusion of these establishments.

<sup>23</sup>One of the peculiar features of the CSA survey is that workplace size is only recorded for respondents who are self-employed. Thus, workplace size is not included in the CSA membership equation.

magnitude of the estimated coefficients is gained by calculating the marginal effect of a one-unit change in the variable of interest on the probability of union membership with all independent variables set at their mean values. Thus, we see that the estimated probability of membership for an individual who is the sole employee in an establishment is approximately 34.5 percentage points lower than that of a similar individual employed in a workplace with more than 500 employees.

TABLE 3.3  
Union Membership and Workplace Size: Estimated Coefficients  
and Marginal Effects

| Workplace Size Category                    | Estimated Coefficient | Standard Error       | Marginal Effect on Probability of Membership (%) <sup>§</sup> |
|--------------------------------------------|-----------------------|----------------------|---------------------------------------------------------------|
| Employee works alone                       | -1.12 <sup>***</sup>  | 0.31                 | -34.5                                                         |
| 2-20 employees                             | -0.62 <sup>***</sup>  | 0.10                 | -22.2                                                         |
| 21-50 employees                            | -0.26 <sup>**</sup>   | 0.11                 | -10.0                                                         |
| 51-100 employees                           | -0.12                 | 0.12                 | -4.6                                                          |
| 101-500 employees                          | 0.06                  | 0.11                 | 2.5                                                           |
| More than 500 employees                    | -                     | -                    | -                                                             |
| LR Test of Joint Significance ( $\chi^2$ ) |                       | 80.04 <sup>***</sup> |                                                               |

Notes:

\*significant at 10% (two-tailed *t*-test for coefficients)

\*\*significant at 5% (two-tailed *t*-test for coefficients)

\*\*\*significant at 1% (two-tailed *t*-test for coefficients)

<sup>§</sup>Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.

It is interesting to note that while workers in smaller establishments have a significantly lower probability of union membership, the workplace size effect diminishes rapidly. Indeed, a worker employed in an establishment with 51-100 workers does not have a significantly lower predicted probability of membership than a worker with similar attributes employed in an establishment with more than 500 employees.

The estimated workplace size coefficients are consistent with the proposition that there are economies of scale associated with larger establishments and that, as a consequence, unions are more likely to organise larger workplaces, and to offer workers in these workplaces a more extensive range of union services. Ultimately, this translates into a higher probability of union membership for workers in larger establishments. However, it would seem that any organising economies are largely exhausted once a workplace size threshold of about 50 employees is reached.

The social custom model offers a possible explanation for the observed drop-off in the magnitudes of the estimated workplace size coefficients. To start, recall that a critical mass of union members is required to sustain a non-zero equilibrium level of union density. Now, it can be argued that unions will be more inclined to devote the organising resources necessary to reach the critical mass when the potential number of members to be gained is greater. However, we might expect the social bonds between workers in larger, more impersonal workplaces to be weaker than in smaller workplaces. Consequently, workers in large establishments may place less weight on their workplace reputations than workers in smaller establishments.

Thus, it can be argued that there are countervailing forces operating. On the one hand, unions are more likely to organise larger plants because they offer the prospect of more members to be gained. But, on the other hand, larger workplaces offer a less fertile environment for union membership to be sustained by social custom because the bonds between workers in larger plants are weaker.<sup>24</sup>

### ***Industry of Employment***

Industry variables are routinely included in models of individual union status. They are usually interpreted as proxying several factors affecting the monopoly gains to be made by unions. In particular, they are assumed to proxy variables affecting union power, and the rents available to be captured from firms.<sup>25</sup>

If unions are more successful in extracting rents in a certain industry, does this mean that an individual employed in the industry will have a higher probability of union membership than one employed in an industry where unions are less successful? Many researchers assume that the answer is Yes, arguing that when unions capture greater rents, the benefits of union

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<sup>24</sup>In the context of this scenario, the IMA estimates suggest that the organising effect dominates initially, but that once an establishment size of around 50 employees is reached the organising effect is offset by a diminution of the social bonds between workers. It should be noted, however, that estimates to be presented in Chapter 5 suggest that, in open shops, the economies of scale/organising effect only dominates until a workplace size of about 20 employees is reached.

<sup>25</sup>For example, different industries have different concentration and capital-labour ratios, and face different product market conditions. These variables are expected to influence both the costs and benefits of unionisation (see, for example, Hirsch and Berger, 1984).



membership are greater and that, consequently, there is a greater incentive for workers to join a union. In Chapter 2, however, we argued that the way in which the rents are distributed is of crucial importance. If, for instance, the rents are distributed as private goods, then the greater monopoly union gains give workers an added incentive to join the union. On the other hand, if the rents are distributed as collective goods, individuals have an incentive to free-ride, and the nexus between the magnitude of the monopoly gains and the probability of union membership is more tenuous.<sup>26</sup>

An alternative reason for including industry dummies is that they capture variations in the intensity of union activity across industries. Assuming that trade union activity is a function of organising costs, unions are expected to be less active in those industries which are more costly to organise.<sup>27</sup> Thus, workers in industries characterised by small, widely dispersed workplaces with high rates of labour turn-over are expected to be less likely to become union members because there is less union activity in

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<sup>26</sup>Recall, however, that it can be argued that the prospect of greater gains from collective action provides additional impetus for a social custom of union membership to become established and sustained among a group of workers.

<sup>27</sup>Hirsch and Addison (1986: p.31) argue, in the context of unionism in the United States, that greater above-competitive rents may not only be associated with higher potential benefits of unionisation (through higher wages, for example), but may also be associated with higher unionisation costs as firms will resist union organising activity more vigorously when there is more at stake. Thus, the existence of greater rents in a given industry may not necessarily translate into a higher rate of unionisation in that industry.

While Australian firms may not be able to resist unionisation in the same way as American firms, it may nevertheless still be true that firms which feel they have more to lose from union activity will be prepared to increase the costs of unionisation (for example, by not providing a facility for payroll deductions of union fees, or by limiting union access to the workplace strictly to the letter of award requirements).

these industries than in other industries.

Several of the earlier Australian studies have established a statistically significant link between industry of employment and probability of union membership (Christie, 1992; Miller and Rummery, 1989; and Crockett and Hall, 1987). However, we find only tentative support for the proposition that the probability of union membership depends on industry of employment (see Table 3.4).

Of all the industry variables included in our estimated equations only the transport industry coefficient is significant in both.<sup>28</sup> The wholesale and retail industry coefficient is significant only in the CSA equation, while the finance and business services coefficient is significant in the IMA equation but not the CSA equation. In the IMA equation a worker in the communications industry has a significantly higher estimated probability of membership. (However, none of the respondents to the CSA survey are employed in the communications industry so a communications coefficient is not estimated).

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<sup>28</sup>It should be noted that, in this section, any comparisons between the IMA and CSA estimates focus on the significance of the coefficients rather than their signs or magnitudes. This is because the estimated equations have different specifications and the coefficients are not directly comparable. For example, because workplace size is not controlled in the CSA equation, differences in the workplace size may be a source of differences in the coefficients if industry of employment is correlated with workplace size.



TABLE 3.4  
Industry of Employment: Estimated Coefficients

|                                            | <i>Issues in Multicultural Australia</i> |      |                                  | <i>Class Structure of Australia</i> |       |                                  |
|--------------------------------------------|------------------------------------------|------|----------------------------------|-------------------------------------|-------|----------------------------------|
|                                            | $\hat{\beta}$                            | s.e  | Marginal Effect (%) <sup>§</sup> | $\hat{\beta}$                       | s.e.  | Marginal Effect (%) <sup>§</sup> |
| <i>Industry of Employment:</i>             |                                          |      |                                  |                                     |       |                                  |
| Agriculture                                | -0.37                                    | 0.28 | -13.9                            | } 0.09                              | 0.31  | 3.7                              |
| Mining                                     | -0.35                                    | 0.38 | -13.3                            |                                     |       |                                  |
| Manufacturing                              | 0.03                                     | 0.12 | 1.2                              | -0.01                               | 0.19  | -0.3                             |
| Electricity, gas and water                 | 0.20                                     | 0.27 | 8.1                              | 0.19                                | 0.46  | 7.3                              |
| Construction                               | 0.28*                                    | 0.17 | 11.0                             | -0.05                               | 0.32  | -2.1                             |
| Wholesale and retail trade                 | -0.12                                    | 0.14 | -4.8                             | -0.48**                             | -0.22 | -18.6                            |
| Transport and storage                      | 0.44***                                  | 0.17 | 17.4                             | 0.52**                              | 0.22  | 19.4                             |
| Communication                              | 0.52**                                   | 0.23 | 20.3                             | -                                   | -     | -                                |
| Finance, property and business services    | 0.30**                                   | 0.14 | 12.0                             | -0.09                               | 0.18  | -3.5                             |
| Public administration                      | -                                        | -    | -                                | -                                   | -     | -                                |
| Community services                         | -                                        | -    | -                                | -                                   | -     | -                                |
| Recreation and personal services           | -0.05                                    | 0.16 | -2.0                             | -0.25                               | 0.25  | -9.8                             |
| LR test of joint significance ( $\chi^2$ ) | 28.62***                                 |      |                                  | 15.06**                             |       |                                  |

*Notes:*

\*significant at 10% (two-tailed *t*-test for coefficients)

\*\*significant at 5% (two-tailed *t*-test for coefficients)

\*\*\*significant at 1% (two-tailed *t*-test for coefficients)

<sup>§</sup>Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.

While only a small number of industry coefficients are statistically significant at the 5 percent level or better, this should not be seen as evidence that the influences they are assumed to proxy are not significant determinants of union membership. Indeed, this point serves to highlight a shortcoming of

the previous studies of union membership which, it should be noted, is also shared by this thesis. In particular, theory suggests that a range of firm and industrial characteristics will be related to union membership. However, typically the only proxies for these variables available in the data are industry dummies. Moreover, the industry dummies are conventionally entered in the membership equation at such a high degree of aggregation that they are very imprecise instruments for the influences they are thought to proxy.<sup>29</sup>

### ***Public Sector Employment***

A key feature of unionism (not only in Australia but in virtually all OECD countries)<sup>30</sup> is that public sector employees have a higher rate of union membership than otherwise similar workers in the private sector (Visser, 1991). In the case of Australia, the Australian Bureau of Statistics reports that 67 percent of Australian workers in the public sector are union members while only 29 percent of private sector workers are union members (ABS, 1993).

The influence of public sector employment on the probability of union membership has previously been investigated by Crockett and Hall (1987) and Deery and DeCieri (1991). Both studies find a highly significant and positive

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<sup>29</sup>The industry dummies in our membership equations (and in the previous Australian studies) are constructed at the 1 digit or major classification level. More disaggregated dummy variables could be constructed (at the two or, possibly, 3 digit level). However, many of the industry categories would then have too few cases for the coefficients to be determined with a reasonable degree of accuracy.

<sup>30</sup>In Sweden and Denmark union density rates in the private and public sectors are approximately equal (Visser, 1991). However, by international standards both of these countries have very high overall rates of union membership.

relationship. Deery and DeCieri, for example, report that public sector employees have a probability of union membership of approximately 40 percentage points higher than private sector employees with similar attributes.

We also find that public sector employment is a highly significant determinant of an individual's probability of union membership (see Table 3.5). Both the IMA and CSA estimates suggest that a public sector employee has an estimated probability of union membership in the region of 30 percentage points higher than a similar private sector employee.

Why are public sector employees more likely to become union members? Lower organising costs may be one explanation. For instance, because a very high proportion of public sector employees are directly employed by state or federal governments, unions representing large number of employees need only negotiate with a single employer. (This is also true of other large public sector bodies such as Telecom and Australia Post). Furthermore, unions wield considerable political power and many governments (particularly Labor governments)<sup>31</sup> have responded to union pressure to lower the costs of unionisation. Automatic payroll deduction of union fees, for instance, is a standard practice in the public sector.

On the demand side, we might speculate that the public sector provides a more fertile environment for the social custom of union membership to

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<sup>31</sup>A recent series of events in South Australia is an interesting illustration of this point. Prior to the election of the Liberal government in November 1993, the South Australian government provided automatic deductions of union fees and also provided a monthly list of non-members to public sector unions. However, despite the vocal opposition of the union movement, the new government has announced that these arrangements are to be withdrawn.

emerge. For example, it may be that public sector employees are inclined to view collective organisations such as trade unions more favourably than their private sector counterparts. Similarly, the large, more impersonal nature of the public sector may stimulate greater demand for the advocacy or "voice" services provided by trade unions.

TABLE 3.5  
Union Membership and Sector of Employment: Estimated Coefficients

| <i>Sector of Employment Category</i> | Estimated Coefficient | Standard Error | Marginal Effect on Probability of Membership (%) <sup>§</sup> |
|--------------------------------------|-----------------------|----------------|---------------------------------------------------------------|
| <i>IMA Survey</i>                    |                       |                |                                                               |
| Employed in public sector            | 0.74***               | 0.10           | 28.0                                                          |
| Employed in private sector           | -                     | -              | -                                                             |
| <i>CSA Survey</i>                    |                       |                |                                                               |
| Employed in public sector            | 0.97***               | 0.13           | 32.3                                                          |
| Employed in private sector           | -                     | -              | -                                                             |

*Notes:*

\*significant at 10% (two-tailed *t*-test for coefficients)

\*\*significant at 5% (two-tailed *t*-test for coefficients)

\*\*\*significant at 1% (two-tailed *t*-test for coefficients)

<sup>§</sup>Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.

### *Occupation*

Occupation is routinely found to be a statistically significant determinant of an individual's probability of union membership. Miller and Rummery (1989), for example, estimate that a young male sales worker with average

characteristics has a probability of union membership of 40 percent, while a manual worker with similar attributes has a probability of membership of 60 percent. Christie (1992) also reports that occupation is a significant determinant of union membership. Similarly, although they lack detailed occupational data, Deery and DeCieri (1991) find that white-collar workers have a probability of union membership of approximately 10 percentage points lower than blue-collar workers. They also find (in most of their regressions) that supervisors are less likely to be union members (although the relationship is not statistically significant).

Why is there a strong link between occupation and probability of union membership? One explanation is that the demand for union membership varies across different occupations. Senior managers, to take an obvious example, are unlikely to demand the services provided by trade unions. Similarly, workers in occupations with greater employment security and fewer job hazards are expected to place less value on the job protection services of trade unions. Finally, those occupations involving greater teamwork, and hence stronger social bonds between workers, should provide a more fertile environment for unionism to be sustained by a workplace social custom.

On the supply side, variations in union activity may explain why workers in certain occupations have higher or lower probabilities of union membership. Assuming, once again, that union activity is a function of organising costs, unions are expected to less intensively organise those occupations which are most costly to organise. For example, a union recruiting workers in an occupation characterised by dispersed employment

faces higher organising costs than one which recruits workers from a more concentrated employment base. If unions organising a high cost occupation are less able, *ceteris paribus*, to actively organise and deliver union services to the workplaces in which workers in the occupation are employed, workers in the occupation will be less likely to become union members.<sup>32</sup>

Earlier we asserted that there are potential economies of scale for unions organising large workplaces. Implicitly, the discussion assumed a single union engaged in organising a given workplace. However, while there are some notable exceptions, most Australian unions draw their membership from specific occupations rather than organising workers across a range of occupations within a particular industry or firm. This means that several unions are often present at the one establishment. Furthermore, even in very large establishments some occupations may only be represented in small numbers. Clearly, the union responsible for organising these workers will not reap significant organising economies.<sup>33</sup>

Both our estimated equations include occupational dummy variables. However, it should be noted that different coding schemes are used. For the

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<sup>32</sup>Perhaps an example will help illustrate this point: One group of workers who have a low rate of union membership are hairdressers. It may or may not be true that hairdressers have a lower desire for membership than other workers. However, it is true that the very high costs of organising the small, widely dispersed workplaces in which most hairdressers are employed present a formidable barrier to the widespread unionisation of hairdressers.

<sup>33</sup>Clerical workers are an example. It is not uncommon for only a handful of clerks to be employed in a large establishment (a large manufacturing plant, for example). Although employed in a large workplace, the clerks' union (now called the Australian Services Union) does not reap the benefits of the organising economies that would normally be associated with a large plant.

IMA equation, the Australian Standard Classification of Occupations is used. The occupation dummies in the CSA equation, on the other hand, are constructed from the Classification of Occupations categories.

Looking at Tables 3.6 and 3.7 we see that, as expected, managers and administrators have a significantly lower probability of membership than labourers (the omitted category in the IMA equation), or tradespersons, process workers and labourers (the omitted category in the CSA equation). The marginal effect estimates indicate that the probability of union membership for a manager or administrator is approximately 35 percentage points lower than that of a labourer with similar attributes.

It should be noted that the CSA equation includes two managerial variables. The first is the managerial category in the Classification of Occupations. However, one of the weaknesses of the Classification of Occupations is that many workers who would normally be thought of as holding managerial positions are actually coded in different occupational categories. Since the CSA survey also contains separate data on managerial status an additional managerial variable is included in the estimated equation.



TABLE 3.6  
Occupation and Supervisory Status: Estimated Coefficients -  
IMA Survey

|                                                                     | Estimated<br>Coefficient | Standard<br>Error    | Marginal Effect on<br>Probability of<br>Membership (%) <sup>§</sup> |
|---------------------------------------------------------------------|--------------------------|----------------------|---------------------------------------------------------------------|
| <i>Current occupation:</i>                                          |                          |                      |                                                                     |
| Manager, administrator                                              | -1.13 <sup>***</sup>     | 0.17                 | -34.7                                                               |
| Professional                                                        | -0.67 <sup>***</sup>     | 0.13                 | -23.7                                                               |
| Para-professional                                                   | -0.53 <sup>***</sup>     | 0.14                 | -19.4                                                               |
| Tradesperson                                                        | -0.35 <sup>***</sup>     | 0.11                 | -13.3                                                               |
| Clerk                                                               | -0.70 <sup>***</sup>     | 0.12                 | -24.6                                                               |
| Salesperson, personal service worker                                | -0.33 <sup>**</sup>      | 0.13                 | -12.7                                                               |
| Plant and machine operator                                          | -0.05                    | 0.12                 | -1.9                                                                |
| Labourer                                                            | -                        | -                    | -                                                                   |
| <i>Supervisory status:</i>                                          |                          |                      |                                                                     |
| Supervisor                                                          | -0.05                    | 0.07                 | -2.1                                                                |
| Non-Supervisor                                                      | -                        | -                    | -                                                                   |
| LR test of joint significance of<br>occupation dummies ( $\chi^2$ ) |                          | 70.36 <sup>***</sup> |                                                                     |

*Notes:*

\*significant at 10% (two-tailed *t*-test for coefficients)

\*\*significant at 5% (two-tailed *t*-test for coefficients)

\*\*\*significant at 1% (two-tailed *t*-test for coefficients)

<sup>§</sup>Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.



TABLE 3.7  
Occupation and Supervisory Status: Estimated Coefficients -  
CSA Equation

|                                                                                           | Estimated<br>Coefficient | Standard<br>Error    | Marginal Effect<br>on Probability of<br>Membership (%) <sup>§</sup> |
|-------------------------------------------------------------------------------------------|--------------------------|----------------------|---------------------------------------------------------------------|
| <i>Current occupation (CCO classification):</i>                                           |                          |                      |                                                                     |
| Manager, administrator                                                                    | -0.86 <sup>***</sup>     | 0.24                 | -31.4                                                               |
| Professional                                                                              | -0.23 <sup>*</sup>       | 0.18                 | -9.2                                                                |
| Clerk                                                                                     | -0.40 <sup>***</sup>     | 0.18                 | -15.8                                                               |
| Salesperson                                                                               | -0.04                    | 0.23                 | -1.7                                                                |
| Service, sport and recreation worker                                                      | -0.08                    | 0.23                 | -3.1                                                                |
| Transport, communications worker                                                          | -0.11                    | 0.28                 | -4.5                                                                |
| Tradesperson, process worker, labourer                                                    | -                        | -                    | -                                                                   |
| Other occupations (agricultural worker,<br>mine worker, members of the armed<br>services) | -2.15 <sup>***</sup>     | 0.53                 | -51.0                                                               |
| <i>Managerial, supervisory status:</i>                                                    |                          |                      |                                                                     |
| Manager                                                                                   | -0.30 <sup>**</sup>      | 0.18                 | -12.1                                                               |
| Supervisor                                                                                | 0.01                     | 0.11                 | 0.5                                                                 |
| Non-supervisor                                                                            | -                        | -                    | -                                                                   |
| LR test of joint significance of occupation<br>dummies ( $\chi^2$ )                       |                          | 54.30 <sup>***</sup> |                                                                     |

*Notes:*

<sup>\*</sup>significant at 10% (two-tailed *t*-test for coefficients)

<sup>\*\*</sup>significant at 5% (two-tailed *t*-test for coefficients)

<sup>\*\*\*</sup>significant at 1% (two-tailed *t*-test for coefficients)

<sup>§</sup>Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.

In order to gain a clearer impression of the magnitudes of the estimated coefficients it is helpful to look at Table 3.8. In this table we consider the predicted probability of membership for a "stylised individual" using the IMA estimates.<sup>34</sup> The stylised individual is an individual whose attributes are the means of all the independent variables in the membership equation except for occupation and one other variable of interest. For example, the first column of Table 3.8 gives the predicted probabilities of membership by occupation for a stylised individual in the manufacturing industry.<sup>35</sup> Thus, we see that the stylised manager in the manufacturing industry has an estimated probability of membership of 19.4 percent, while the stylised labourer has an estimated probability of membership of 60.5 percent.

The second column of Table 3.8 gives the predicted probabilities of membership for a stylised individual across occupations in the transport and storage industry. The next two columns compare predicted probabilities for the private and public sectors. Finally, in the last two columns, the predicted probabilities of membership for the smallest and largest workplace size categories are given.

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<sup>34</sup>Because the probit equation is non-linear, the marginal effect of a change in an independent variable depends on what point in the distribution the calculation is made. Any effect will be larger in the middle of the distribution, and smaller in the tails. Greene (1990) suggests, therefore, that to get an overall impression of the magnitude of an estimated coefficient it is prudent to calculate the marginal effects at different points in the distribution. Table 3.8 allows us to make such comparisons.

<sup>35</sup>This individual has attributes that are the same as the means of all the independent variables except for occupation and industry.

TABLE 3.8  
**Predicted Probabilities of Union Membership by Occupation, Sector  
 and Selected Industries and Workplace Sizes (%)**

|                                      | <i>Industry of Employment</i> |                       | <i>Sector of Employment</i> |        | <i>Workplace Size<br/>(No. of Employees)</i> |               |
|--------------------------------------|-------------------------------|-----------------------|-----------------------------|--------|----------------------------------------------|---------------|
|                                      | Manufacturing                 | Transport and Storage | Private                     | Public | 1 worker                                     | More than 500 |
| <b><i>Occupation:</i></b>            |                               |                       |                             |        |                                              |               |
| Manager, administrator               | 19.4                          | 32.6                  | 15.3                        | 38.8   | 4.8                                          | 29.5          |
| Professional                         | 34.4                          | 50.3                  | 28.6                        | 56.9   | 11.5                                         | 46.9          |
| Para-professional                    | 39.6                          | 55.9                  | 33.5                        | 62.3   | 14.5                                         | 52.4          |
| Tradesperson                         | 46.7                          | 62.8                  | 40.3                        | 68.9   | 18.9                                         | 59.5          |
| Clerk                                | 33.3                          | 49.1                  | 27.6                        | 55.7   | 10.9                                         | 45.7          |
| Salesperson, personal service worker | 47.3                          | 63.4                  | 40.9                        | 69.5   | 19.3                                         | 60.1          |
| Plant and machine operator           | 58.6                          | 73.5                  | 52.2                        | 78.6   | 28.1                                         | 70.6          |
| Labourer                             | 60.5                          | 75.1                  | 54.1                        | 80.0   | 29.8                                         | 72.2          |

***Note:***

Predicted probabilities are for a stylised individual who has attributes which are the means of the remaining independent variables.

## ***Job Tenure***

One of the implications of the insurance model of unionism is that a worker facing higher dismissal costs is more likely to demand union membership for the protection it provides. The argument goes like this: since workers with longer tenure in their current job have greater investments in job-specific human capital - and thus face higher dismissal costs - workers with longer tenure are more likely to become union members.

Once again, however, a similar prediction may be assembled from the social custom model of union membership. For example, to the extent that workers with longer tenure have developed greater social bonds with their workmates, and are therefore expected to place greater weight on their workplace reputation, the social custom model predicts a positive relationship between tenure and probability of union membership.

To date, the only Australian evidence of the relationship between job tenure and probability of union membership is provided by Miller and Rummery (1989). In their reduced form membership equation, Miller and Rummery report that duration of employment has a strong impact on the probability of union membership. For example, they estimate that a young male with average attributes who has spent one year in his current job has probability of membership of 41 percent, and that after 5 years the probability rises to 57 percent (Miller and Rummery: p.201)<sup>36</sup>.

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<sup>36</sup>Coincidentally, the average job tenure of respondents in the IMA survey is slightly greater than 5 years (5.02 years, to be exact).

We also find, in both our estimated equations, that job tenure is a significant determinant of a worker's probability of union membership (see Table 3.9).<sup>37</sup> Job tenure is included as a quadratic in order to allow flexibility in the functional form of the relationship between tenure and probability of union membership. In particular, it is likely that the impact of an extra year's tenure on the probability of union membership diminishes the longer an individual has been employed in his or her current job. For example, in the context of the insurance model of union membership, it may be argued that the tenure variable captures two effects. On the one hand, increased tenure is associated with greater firm-specific skills and, therefore, higher expected costs of dismissal. On the other hand, it may be that workers with greater seniority feel more secure against dismissal (or other unfair managerial actions). With increasing job tenure, it may be that the job security effect eventually comes to dominate the accumulated firm-specific human capital effect.<sup>38</sup>

Figure 3.2 (which uses the IMA estimates) shows that a stylised worker who has just commenced employment has an estimated probability of union membership of 32 percent. After 5 years in the job, the probability rises to 48 percent. The probability of union membership peaks at around 76 percent after 23 years spent in the current job.

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<sup>37</sup>In the CSA survey, job tenure is measured as years spent in present job; in the IMA survey it is measured as years worked for present employer.

<sup>38</sup>A similar argument may be constructed in the context of the social custom model. In particular, the marginal effect of an extra year's job tenure on the weight an individual places on his or her reputation may decline with increasing job tenure.

TABLE 3.9  
**Job Tenure, Education, Experience and Hours Worked: Estimated Coefficients**

|                                     | Issues in Multicultural Australia |                |                                                               | Class Structure of Australia |                |                                                               |
|-------------------------------------|-----------------------------------|----------------|---------------------------------------------------------------|------------------------------|----------------|---------------------------------------------------------------|
|                                     | Estimated Coefficient             | Standard Error | Marginal Effect on Probability of Membership (%) <sup>§</sup> | Estimated Coefficient        | Standard Error | Marginal Effect on Probability of Membership (%) <sup>§</sup> |
| <i>Job Tenure:</i>                  |                                   |                |                                                               |                              |                |                                                               |
| Years in current job                | 0.093 <sup>****</sup>             | 0.013          | } 3.6                                                         | 0.091 <sup>****</sup>        | 0.017          | } 3.5                                                         |
| (Years in current job) <sup>2</sup> | -0.002 <sup>****</sup>            | 0.000          |                                                               | -0.002 <sup>****</sup>       | 0.001          |                                                               |
| <i>Education:</i>                   |                                   |                |                                                               |                              |                |                                                               |
| Years of education                  | -0.012                            | 0.015          | -0.5                                                          | 0.014                        | 0.026          | 0.6                                                           |
| <i>Potential Experience:</i>        |                                   |                |                                                               |                              |                |                                                               |
| Experience                          | 0.006                             | 0.011          | } 0.2                                                         | 0.041 <sup>****</sup>        | 0.014          | } 1.6                                                         |
| (Experience) <sup>2</sup>           | 0.000                             | 0.000          |                                                               | -0.001 <sup>****</sup>       | 0.000          |                                                               |
| <i>Hours of Work:</i>               |                                   |                |                                                               |                              |                |                                                               |
| Hours of work                       | 0.019 <sup>**</sup>               | 0.008          | } 0.7                                                         | 0.044 <sup>****</sup>        | 0.021          | } 1.7                                                         |
| (Hours) <sup>2</sup>                | -0.000 <sup>**</sup>              | 0.000          |                                                               | -0.001 <sup>****</sup>       | 0.000          |                                                               |

*Notes:*

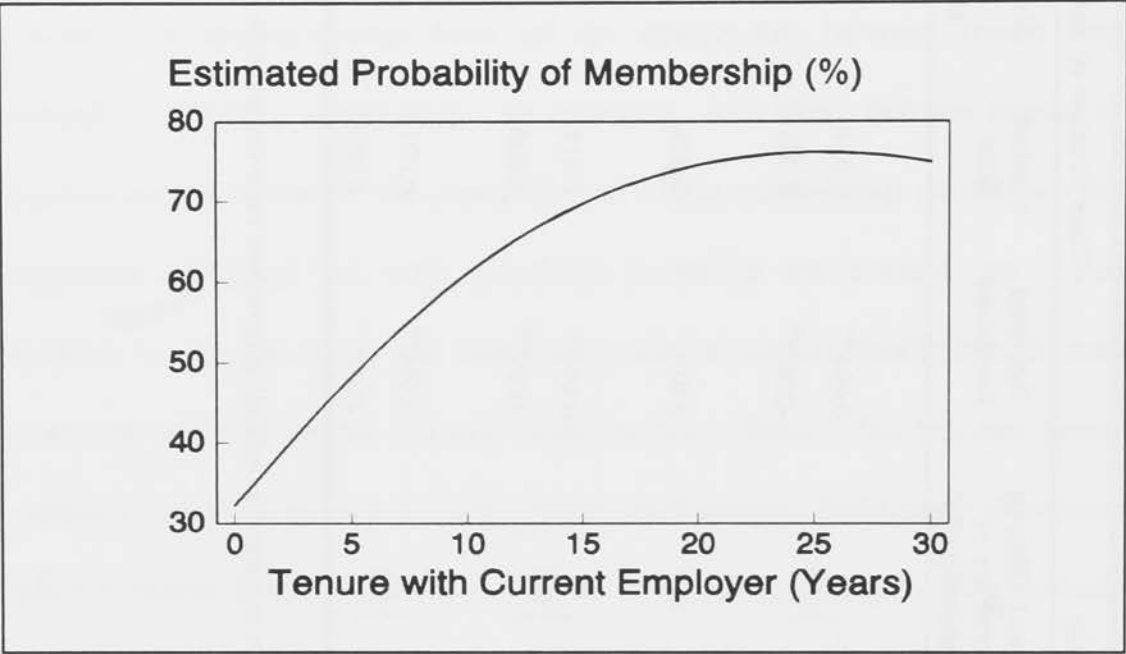
<sup>§</sup>Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values. Values of 0.000 or -0.000 reflect absolute values rounded to less than  $\pm 0.001$ .

\*significant at 10% (two-tailed *t*-test)

\*\*significant at 5% (two-tailed *t*-test)

\*\*\*significant at 1% (two-tailed *t*-test)

FIGURE 3.2  
Tenure with Current Employer and Estimated Probability of Membership for a  
Stylised Worker: IMA Estimates



*Hours Worked*

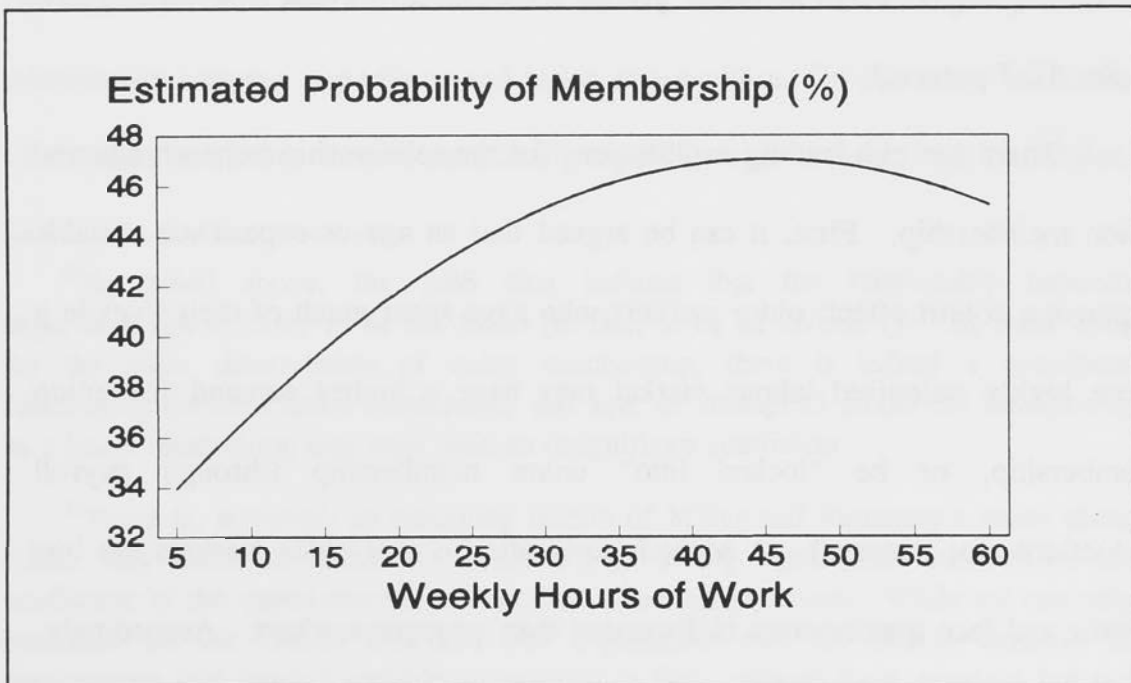
It is widely believed that a full-time worker is more likely to be union members because he or she has a greater attachment to his or her job than a part-time or casual employee. Certainly all the major theories of union membership - including the social custom and insurance models - predict a positive relationship between hours worked and union membership.

Miller and Rummery (1989) find that young full-time males have a probability of union membership of the order of 14 percentage points higher than part-time males. Similarly, Deery and DeCieri (1991) find that part-time

workers have a probability of union membership of approximately 10 percentage points lower than full-time workers.

Hours worked per week is included in quadratic form in our estimated equations. In both equations it is found to be a significant determinant of union membership (see Table 3.9). Figure 3.3 (which is drawn using the estimation results from the IMA equation) shows that a stylised worker<sup>39</sup> employed for 5 hours per week has an predicted probability of membership of 37 percent. However, a stylised worker, identical in all other respects, but working 40 hours per week, has an estimated probability of membership of 49 percent.

FIGURE 3.3  
Hours of Work and Estimated Probability of Membership for a  
Stylised Worker: CSA Estimates



<sup>39</sup>The stylised worker has attributes that are the means of all the independent variables except hours worked per week.



### *Age/Experience*

One of the most striking features of Australian unionism is the much lower rate of union membership among younger workers. For example, employees in the 15-19 years age group have a membership rate of 23 percent, half the rate of those aged 55-59 years (which is 46 percent) (ABS, 1993). The strongest evidence that age (or, alternatively, years of labour market experience) has an independent impact on an individual's probability of union membership is provided by Christie (1992). She finds that the probability of union membership increases each year for about 35 years of potential labour market experience before declining. (Incidentally, the drop-off in union membership rates for workers in their 60s is clearly evident in ABS statistics: workers in the 65 years and over group, for instance, have a membership rate of just 12.7 percent).

There are two leading explanations for the relationship between age and union membership. First, it can be argued that an age or experience variable captures a cohort effect: older workers who have spent much of their lives in a more highly unionised labour market may have a higher demand for union membership, or be "locked into" union membership (through payroll deductions, for instance). A second explanation is that older workers are less mobile and face greater costs if dismissed than younger workers. Accordingly, older workers are more inclined to insure themselves against dismissal by joining a union.

Notwithstanding these possible theoretical explanations, there is still

some doubt as to whether age has an independent effect on the probability of union membership. Deery and DeCieri (1991), for instance, find that the relationship is statistically insignificant. This may be due, however, to a misspecified equation as a quadratic term is not included in their estimated equation.<sup>40</sup> Similarly, Miller and Rummery (1989) fail to find a significant relationship between labour market experience and the probability of union membership in their reduced form membership equation. However, Miller and Rummery suggest that this finding might be explained by the fact that their sample consists only of young male workers aged between 19 and 25 years.<sup>41</sup>

Both of our probit equations include potential experience (defined, in the conventional manner, as age minus years of education minus five) as an independent variable. Interestingly, our estimation results are also ambiguous. On the one hand, the IMA estimates do not show a statistically significant relationship between experience and union membership. On the other hand, the CSA probit estimates show a statistically significant relationship. In particular,

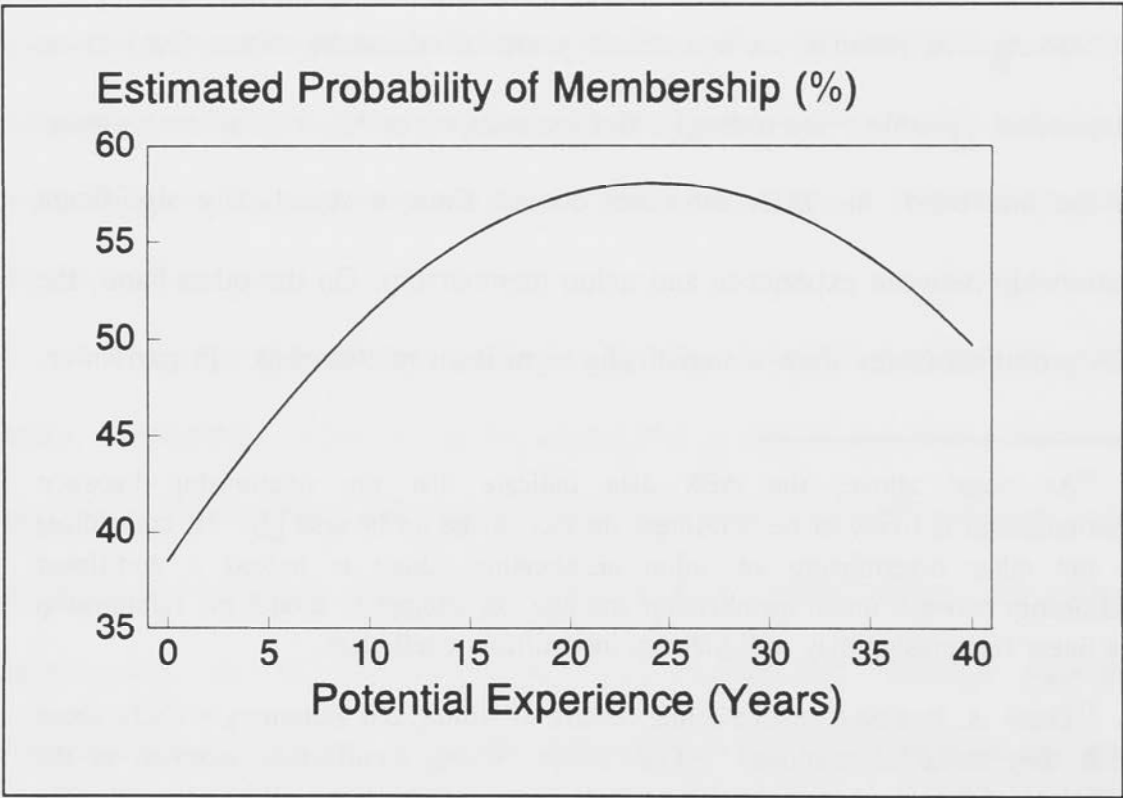
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<sup>40</sup>As noted above, the ABS data indicate that the relationship between experience/age is likely to be non-linear (in fact, to be an inverse U). If, controlling for the other determinants of union membership, there is indeed a non-linear relationship between union membership and age, an attempt to model the relationship as a linear relationship may well yield an insignificant coefficient.

<sup>41</sup>There is, however, an intriguing feature of Miller and Rummery's study about which they make no comment. That is, the strong significance attached to the coefficient of the experience variable in their structural equations. While we can only speculate on the reason for this, one explanation may be that a duration of employment (job tenure) variable is included in their reduced form equation but not their structural equations. The duration of employment variable more accurately measure a worker's mobility and the investment a worker has made in job specific skills. Since experience and job tenure are correlated, when the duration of employment variable is excluded the experience variable will, in part, capture the mobility effect. With the duration of employment variable included, the experience variable will now be a stronger measure of a cohort effect.

the estimates indicate that at the mean of all independent variables, an extra year of labour market experience increases a worker's probability of membership by 1.6 percentage points. Furthermore, the estimates indicate that the relationship is non-linear with the estimated probability of membership for a stylised worker peaking after approximately 25 years of potential labour market experience (see Figure 3.4).

FIGURE 3.4  
Experience and Estimated Probability of Membership for a  
Stylised Worker: CSA Estimates



## ***Education***

Education variables are routinely included in models of union membership. However, the relationship between education and union membership is not well understood. Some researchers, such as Deery and DeCieri (1991), find that there is no significant relationship between the two. Similarly, in our equations neither of the estimated education coefficients are statistically significant (See Table 3.9).<sup>42</sup> On the other hand, Miller and Rummery (1989) report that young workers with post-secondary qualifications have a higher probability of union membership. Occupying the middle ground is Christie (1992) who finds that only workers with diploma level qualifications have a significantly higher probability of union membership.

Similarly contradictory results have been found using U.S. data. Hundley (1988) provides an explanation for this by noting: (i) that jobs with lower educational requirements are more likely to be unionised; and (ii) among jobs with similar educational requirements, unionised jobs are likely held by more educated workers. Underpinning Hundley's explanation is a queuing model of union membership: union wage premiums generate an excess demand for unionised employment, and unionised employers (who must pay higher wages) choose the best educated workers from the queue. However, in the following chapters, education is found to be a statistically insignificant determinant of an individual's probability of unionised employment and closed

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<sup>42</sup>Because education and occupation are correlated, it may be that the education coefficient is insignificant because the effect is being captured, in part, by the occupation variables.

shop employment, as well as an insignificant determinant of union membership.

### *Location and State of Residence*

Miller and Rummery (1989) report that young male workers living in locations outside the major capital cities have an estimated probability of union membership of approximately 8 percentage points higher than those resident in the major urban locations. Some limited support for this finding is provided by Christie (1992) who finds that workers living in rural communities of less than 1000 people are more likely to be union members (albeit with a marginal level of statistical significance). In neither study is a substantial theoretical explanation advanced to explain why the size of the location in which a worker lives should matter.<sup>43</sup> *A priori*, theory does not provide a simple answer. On the one hand, it might be thought that it is more costly for unions to provide services to workers in small rural locations. On its own, this suggests that rural workers should be less likely to be union members than city workers who, it is expected, will receive a wider, more frequent union service. On the other hand, there may be variations in the demand for union membership between metropolitan and non-metropolitan workers. For example, to the extent that workers in non-metropolitan areas face more limited job opportunities, they face higher costs of dismissal than similar workers in

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<sup>43</sup>Early in their paper, Miller and Rummery (p.191) suggest that attitudes towards unions will vary across regions, but they give no explanation for, nor give any evidence of this.

metropolitan areas. Therefore, non-metropolitan workers are expected to have a greater desire for union membership in order to be insured against job loss.

In addition to size of residential area, Christie also includes state of residence as an explanatory variable. However, Christie reports that only Tasmanian workers have a significantly different probability of union membership to workers in other states.

One reason why state of residence might be included is that it captures differences in state industrial relations legislation. Indeed, in Chapter 5 we show that there is some evidence that an individual's probability of closed shop employment varies across states. We argue that this may be due to differences in the treatment of union preference and compulsory unionism across state jurisdictions.

Size of location of residence variables are included in the IMA probit, but are found to be insignificant (see Table A3.1 in the appendix to this chapter). In addition, state of residence variables are included in both our equations (see Table 3.10). We find that workers in Western Australia have a lower estimated probability of membership (albeit with only marginal significance in the CSA equation). As discussed further in Chapter 5, this result may be due to preference to unionists clauses being disallowed under Western Australian industrial law.

TABLE 3.10  
State of Residence: Estimated Coefficients

|                                                                          | <i>Issues in Multicultural Australia</i> |                |                                                               | <i>Class Structure of Australia</i> |                |                                                               |
|--------------------------------------------------------------------------|------------------------------------------|----------------|---------------------------------------------------------------|-------------------------------------|----------------|---------------------------------------------------------------|
|                                                                          | Estimated Coefficient                    | Standard Error | Marginal Effect on Probability of Membership (%) <sup>§</sup> | Estimated Coefficient               | Standard Error | Marginal Effect on Probability of Membership (%) <sup>§</sup> |
| <i>State of residence:</i>                                               |                                          |                |                                                               |                                     |                |                                                               |
| New South Wales                                                          | -                                        | -              | -                                                             | -                                   | -              | -                                                             |
| Victoria                                                                 | 0.03                                     | 0.08           | 1.3                                                           | -0.12                               | 0.12           | -4.9                                                          |
| Queensland                                                               | -0.02                                    | 0.11           | -0.7                                                          | -0.23                               | 0.15           | -9.1                                                          |
| South Australia                                                          | 0.16                                     | 0.12           | 6.6                                                           | 0.05                                | 0.17           | 2.2                                                           |
| Western Australia                                                        | -0.27**                                  | 0.12           | -10.6                                                         | -0.39*                              | 0.17           | -15.5                                                         |
| Tasmania                                                                 | 0.56**                                   | 0.26           | 21.8                                                          | -0.18                               | 0.30           | -7.3                                                          |
| Australian Capital Territory                                             | -0.39*                                   | 0.21           | -14.8                                                         | -0.63*                              | 0.33           | -23.9                                                         |
| LR test of joint significance of state of residence dummies ( $\chi^2$ ) |                                          | 18.80***       |                                                               |                                     | 10.54          |                                                               |

*Notes:*

<sup>§</sup>Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.

\*significant at 10 % (two-tailed *t*-test)

\*\*significant at 5 % (two-tailed *t*-test)

\*\*\*significant at 1 % (two-tailed *t*-test)



***Other Personal Characteristics***

In addition to variables measuring an individual's education or experience, a wide variety of other personal characteristic variables have been included in the previous Australian studies of union membership. These include sex, country of birth, marital status, and variables measuring political affiliation and a worker's attitudes towards unionism. Some of these variables have been included in only one study, while those that are included in more than one study often yield mixed evidence of their significance. Sex is one example of the latter.

For instance, ABS statistics show that women are, on average, about 25 percent less likely to become union members than men (45 percent of male workers are union members while only 34.6 percent of female workers are union members (ABS, 1991)). However, Deery and DeCieri (1991) find that, controlling for the other determinants of union membership, being female has an insignificant impact on the estimated probability of union membership. Christie (1992), on the other hand, finds that women are significantly less likely to be union members than men with similar characteristics by an average of about 11 percentage points.

Our estimated equations also yield ambiguous results. In the IMA probit, being female is estimated to reduce a worker's probability of union membership by approximately 6 percentage points (although it should be noted that the female coefficient is only significant at the 10 percent level). In the CSA equation, however, the female dummy has a positive but insignificant



estimated coefficient. In Chapter 6 we explore the origins of the male-female membership differential in greater detail. In brief, we find that the differential is largely due to the different employment patterns of men and women, rather than to a lower desire by women for union membership.

The impact of a worker's country of birth has previously only been investigated by Crockett and Hall (1987). They find some evidence that women born in Asia are less likely to become union members. However, little weight can be placed on this finding given the very small number of Asian women in the sample used by Crockett and Hall.<sup>44</sup>

The IMA survey is an ideal data source for investigating the relationships between ethnic origin, migrant status and probability of union membership. Accordingly, in the estimated membership equation we include the following variables: (i) a dummy variable for workers from non-English speaking backgrounds; (ii) dummy variables for migrants who arrived in Australia before 18 years of age and after 18 years of age; and (iii) separate dummy variables for migrants' region of origin. None of the estimated coefficients are statistically significant (see Table A3.1). Migrant status variables are also included in the CSA equation, but again they are found to be statistically insignificant.

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<sup>44</sup>There are a total of 11 females born in Asia in Crockett and Hall's sample. Only 3 of these women are union members.

TABLE 3.11  
Selected Personal Characteristics: Estimated Coefficients

|                                                                       | Issues in Multicultural Australia |         |                                  | Class Structure of Australia |      |                                  |
|-----------------------------------------------------------------------|-----------------------------------|---------|----------------------------------|------------------------------|------|----------------------------------|
|                                                                       | $\hat{\beta}$                     | s.e.    | Marginal Effect (%) <sup>§</sup> | $\hat{\beta}$                | s.e. | Marginal Effect (%) <sup>§</sup> |
| <b>Sex:</b>                                                           |                                   |         |                                  |                              |      |                                  |
| Female                                                                | -0.12                             | 0.08    | -4.8                             | 0.02                         | 0.12 | 1.0                              |
| <b>Marital status:</b>                                                |                                   |         |                                  |                              |      |                                  |
| Married                                                               | 0.00                              | 0.09    | 0.1                              | -0.18                        | 0.14 | -7.1                             |
| Separated, divorced, widowed                                          | 0.29*                             | 0.15    | 11.5                             | -0.39***                     | 0.20 | -15.3                            |
| Never married                                                         | -                                 | -       | -                                |                              |      |                                  |
| <b>Migrant status:</b>                                                |                                   |         |                                  |                              |      |                                  |
| Migrated to Aust. 18 years or younger                                 | -0.27                             | 0.38    | -10.5                            | -0.12                        | 0.15 | -4.7                             |
| Migrated to Aust. after 18 years of age                               | -0.18                             | 0.36    | -6.9                             | -0.13                        | 0.14 | -5.3                             |
| Non-English speaking background (NESB)                                | 0.13                              | 0.23    | 5.1                              | -                            | -    | -                                |
| (Migrated to Aust. 18 years or younger)*(NESB)                        | -0.24                             | 0.31    | -9.4                             | -                            | -    | -                                |
| (Migrated to Aust. after 18 years)*(NESB)                             | 0.15                              | 0.26    | 5.8                              | -                            | -    | -                                |
| LR test of joint significance of marital status dummies ( $\chi^2$ )  |                                   | 12.94** |                                  |                              | 4.39 |                                  |
| LR test of joint significance of migrant status dummies ( $\chi^2$ )  |                                   | 4.69*   |                                  |                              | 1.52 |                                  |
| LR test of joint significance of region of birth dummies ( $\chi^2$ ) |                                   | 11.79   |                                  |                              | -    |                                  |

Notes:

<sup>§</sup>Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.

\*significant at 10% (two-tailed *t*-test)

\*\*significant at 5% (two-tailed *t*-test)

\*\*\*significant at 1% (two-tailed *t*-test)

Christie (1992) considers the impact of marital status on union membership and finds that it is insignificant. Similarly, Deery and DeCieri (1991) find that only blue collar workers who are married with a dependent spouse and children have a significantly higher probability of union membership. We obtain contradictory results. In the CSA equation workers who are married or who are separated, divorced or widowed have a lower estimated probability of union membership than single workers. However, in the IMA equation widowed, divorced or separated workers have a higher estimated probability of membership than single or married workers.

Deery and DeCieri (1991) investigate the relationship between union membership and a range of variables which measure a worker's socioeconomic status and political attitudes. Several of these variables, (including class status, attitude towards wealth distribution, sociopolitical background, and spouse in union), are found to have a marginally significant or an insignificant impact on a worker's probability of union membership. However, there is some evidence (particularly for white collar workers) that individuals identifying themselves as being left-wing are significantly more likely to become union members.

One of the strongest findings to emerge from the previous studies of Australian union membership is that workers who have anti-union attitudes are significantly less likely to become union members. Christie and Miller (1989), and Deery and DeCieri (1991) both devise indexes which measure an individual's attitude towards unions and find that workers with anti-union attitudes have a significantly lower estimated probability of union membership

than those with positive attitudes towards unionism.<sup>45</sup>

The CSA survey is also a rich source of attitudinal data, and we also have constructed an index of union sentiment.<sup>46</sup> However, as there are only 834 respondents for whom valid attitudinal data are available, the estimated equation reported in Table A3.2 is re-estimated for the smaller sample, but with the index of union sentiment included as an additional explanatory variable. Confirming the previous research, we find that workers with very strong anti-union attitudes have a significantly lower estimated probability of union membership (see Table 3.12). At one extreme, a stylised worker with the strongest possible anti-union score has an estimated probability of membership of 18 percent. While at the other extreme, a stylised worker who has the strongest possible pro-union score has an estimated probability of union membership of 72 percent.

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<sup>45</sup>The indexes are based on very similar questions in two different surveys. Deery and DeCieri seem to have constructed their index unaware of the previous research by Christie and Miller.

<sup>46</sup>The index of union attitudes is derived from a worker's response to one question and four statements.

The first question is: "Imagine that workers in a major industry are out on strike over working conditions and wages. Which of the following outcomes would you like to see occur?". The four possible responses range from "The workers win their most important demands" (scored as 1) to "The workers go back to work without winning any of their demands" (scored as 4).

Responses to the statements "The trade unions in this country have too much power" and "Workers often go on strike for no good reason" are coded from "strongly agree" (scored as 4) to "strongly disagree" (scored as 1).

Finally, the responses to the statements "On many occasions strikes are the only effective means for achieving workers' objectives" and "Trade unions are necessary to protect the workers" are coded from "strongly agree" (scored as 1) to "strongly disagree" (scored as 4).

TABLE 3.12  
Political Affiliation and Attitudes to Unions: Estimated Coefficients

| Issues in Multicultural Australia                                                    |               |         | Class Structure of Australia                                        |               |          |                                                                        |               |      |                                                                     |
|--------------------------------------------------------------------------------------|---------------|---------|---------------------------------------------------------------------|---------------|----------|------------------------------------------------------------------------|---------------|------|---------------------------------------------------------------------|
|                                                                                      |               |         | (I)                                                                 |               |          | (II)                                                                   |               |      |                                                                     |
|                                                                                      | $\hat{\beta}$ | s.e.    | Marginal Effect on<br>Probability of<br>Membership (%) <sup>§</sup> | $\hat{\beta}$ | s.e.     | Marginal Effect<br>on<br>Probability of<br>Membership (%) <sup>§</sup> | $\hat{\beta}$ | s.e. | Marginal Effect on<br>Probability of<br>Membership (%) <sup>§</sup> |
| <i>Political affiliation:</i>                                                        |               |         |                                                                     |               |          |                                                                        |               |      |                                                                     |
| Labor voter                                                                          | 0.20***       | 0.07    | 7.8                                                                 | 0.36***       | 0.11     | 13.9                                                                   | 0.33***       | 0.12 | 12.7                                                                |
| Coalition voter                                                                      | -0.02         | 0.09    | -0.9                                                                | -0.42***      | 0.12     | -16.4                                                                  | -0.30**       | 0.14 | -11.8                                                               |
| No political<br>affiliation or minor<br>party voter                                  | -             | -       | -                                                                   | -             | -        | -                                                                      | -             | -    | -                                                                   |
| <i>Attitude to unions:</i>                                                           |               |         |                                                                     |               |          |                                                                        |               |      |                                                                     |
| Anti-union attitude                                                                  | -             | -       | -                                                                   | -             | -        | -                                                                      | -0.09***      | 0.02 | -3.6                                                                |
| LR test of joint<br>significance of<br>political affiliation<br>dummies ( $\chi^2$ ) |               | 10.9*** |                                                                     |               | 35.08*** |                                                                        |               | -    |                                                                     |

Notes:  
<sup>§</sup>Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.  
\*significant at 10 % (two-tailed *t*-test)  
\*\*significant at 5 % (two-tailed *t*-test)  
\*\*\*significant at 1 % (two-tailed *t*-test)

Both of our membership equations include two political affiliation variables. The first is for workers who identify themselves as Labor voters, the second is for Coalition voters. In both equations Labor voters are found to have a significantly higher estimated probability of union membership than Coalition voters, or workers with no political affiliation or who vote for a minor party (the omitted political affiliation category). However, the marginal effects of the political affiliation variables are strongest for the CSA estimates. The estimates indicate that being a Labor voter increases a worker's probability of membership by about 13 percentage points, and that being a Coalition (conservative) voter reduces the probability of membership by a similar amount. Since it is expected that political affiliation is correlated with union attitudes it is not surprising that the inclusion of the attitude index reduces the magnitude of the political affiliation coefficients (see column III of Table 3.12).

### **3.6 Conclusion**

In this chapter, we derive and estimate a simple, single index model of union membership. Similar models have been estimated in the previous Australian studies of union membership by Crockett and Hall (1987), Miller and Rummery (1989), Deery and DeCieri (1991), and Christie (1992). Indeed, the model is so pervasive in the literature that it can safely be characterised as the "standard model" of union membership. We argue, however, that this model is best thought of as a reduced form approximation to a more complicated

structural model of union membership.

In the following chapters, we shall see that data limitations prevent the estimation of a fully specified structural model of membership. Nevertheless, we shall attempt to extend and improve upon the standard model in two ways. In Chapter 4, union membership is modelled as a decision made by an individual conditional on the individual being employed in a unionised location. In Chapter 5, we account for compulsory membership by modelling the union membership decision of workers in open shops where union membership is not a condition of employment.





## APPENDIX 3

TABLE A3.1  
**Probit Model of Union Membership:**  
**Issues in Multicultural Australia Survey<sup>†</sup>**

|                                         | Estimated<br>Coefficient | s.e.  | Marginal<br>Effect <sup>§</sup> |
|-----------------------------------------|--------------------------|-------|---------------------------------|
| Experience                              | 0.006                    | 0.011 | } -0.002                        |
| (Experience) <sup>2</sup>               | 0.000                    | 0.000 |                                 |
| Education (years)                       | -0.012                   | 0.015 | -0.005                          |
| Tenure in current job                   | 0.093 <sup>***</sup>     | 0.013 | } 0.036                         |
| (Tenure) <sup>2</sup>                   | -0.002 <sup>***</sup>    | 0.000 |                                 |
| Hours of work                           | 0.019 <sup>**</sup>      | 0.008 | } 0.007                         |
| (Hours) <sup>2</sup>                    | 0.000 <sup>**</sup>      | 0.000 |                                 |
| <b>Current occupation:</b>              |                          |       |                                 |
| Manager, administrator                  | -1.13 <sup>***</sup>     | 0.17  | -0.35                           |
| Professional                            | -0.67 <sup>***</sup>     | 0.13  | -0.24                           |
| Para-professional                       | -0.53 <sup>***</sup>     | 0.14  | -0.19                           |
| Tradesperson                            | -0.35 <sup>***</sup>     | 0.11  | -0.13                           |
| Clerk                                   | -0.70 <sup>***</sup>     | 0.12  | -0.25                           |
| Salesperson                             | -0.33 <sup>**</sup>      | 0.13  | -0.13                           |
| Plant and machine operator              | -0.05                    | 0.12  | -0.02                           |
| <b>Supervisory status:</b>              |                          |       |                                 |
| Supervisor                              | -0.05                    | 0.07  | -0.02                           |
| <b>Sector of employment:</b>            |                          |       |                                 |
| Public sector                           | 0.74 <sup>***</sup>      | 0.10  | 0.28                            |
| <b>Workplace size:</b>                  |                          |       |                                 |
| Employee works alone                    | -1.12 <sup>***</sup>     | 0.31  | -0.35                           |
| 2-20 employees                          | -0.62 <sup>***</sup>     | 0.10  | -0.22                           |
| 21-50 employees                         | -0.26 <sup>**</sup>      | 0.11  | -0.10                           |
| 51-100 employees                        | -0.12                    | 0.12  | -0.05                           |
| 101-500 employees                       | 0.06                     | 0.11  | 0.03                            |
| Workplace size not known                | -0.37 <sup>*</sup>       | 0.21  | -0.14                           |
| <b>Industry of employment:</b>          |                          |       |                                 |
| Agriculture                             | -0.37                    | 0.28  | -0.14                           |
| Mining                                  | -0.35                    | 0.38  | -0.13                           |
| Manufacturing                           | 0.03                     | 0.12  | 0.12                            |
| Electricity, gas and water              | 0.20                     | 0.27  | 0.08                            |
| Construction                            | 0.28 <sup>*</sup>        | 0.17  | 0.11                            |
| Wholesale and retail trade              | -0.12                    | 0.14  | -0.05                           |
| Transport and storage                   | 0.44 <sup>***</sup>      | 0.17  | 0.17                            |
| Communication                           | 0.52 <sup>**</sup>       | 0.23  | 0.20                            |
| Finance, property and business services | 0.30 <sup>**</sup>       | 0.14  | 0.12                            |
| Recreational and personal services      | -0.05                    | 0.16  | -0.02                           |
| <b>Importance of job security:</b>      |                          |       |                                 |
| Job security important in a job         | 0.12 <sup>*</sup>        | 0.07  | 0.05                            |
| <b>Political affiliation:</b>           |                          |       |                                 |
| Labor voter                             | 0.20 <sup>***</sup>      | 0.07  | 0.08                            |
| Coalition voter                         | -0.02                    | 0.09  | -0.01                           |

**Location of residence:**

|                      |      |      |      |
|----------------------|------|------|------|
| Other urban location | 0.14 | 0.11 | 0.05 |
| Rural location       | 0.12 | 0.11 | 0.05 |

**State of residence:**

|                              |         |      |       |
|------------------------------|---------|------|-------|
| Victoria                     | 0.03    | 0.08 | 0.01  |
| Queensland                   | -0.02   | 0.11 | -0.01 |
| South Australia              | 0.16    | 0.12 | 0.07  |
| Western Australia            | -0.27** | 0.12 | -0.11 |
| Tasmania                     | 0.56**  | 0.26 | 0.22  |
| Australian Capital Territory | -0.39*  | 0.21 | -0.15 |

**Migrant status:**

|                                                   |       |      |       |
|---------------------------------------------------|-------|------|-------|
| Non-English speaking background (NESB)            | 0.13  | 0.23 | 0.05  |
| Migrated to Aust. 18 years or younger             | -0.27 | 0.38 | -0.10 |
| Migrated to Aust. after 18 years of age           | -0.18 | 0.36 | -0.07 |
| (Migrated to Aust. 18 Years or younger) *(NESB)   | -0.24 | 0.31 | -0.09 |
| (Migrated to Aust. after 18 years of age) *(NESB) | 0.15  | 0.26 | 0.06  |

**Sex:**

|        |       |      |       |
|--------|-------|------|-------|
| Female | -0.12 | 0.08 | -0.05 |
|--------|-------|------|-------|

**Marital status:**

|                              |       |      |      |
|------------------------------|-------|------|------|
| Married, defacto             | 0.00  | 0.09 | 0.00 |
| Widowed, divorced, separated | 0.29* | 0.15 | 0.11 |

**Region of birth:**

|                                      |       |      |       |
|--------------------------------------|-------|------|-------|
| Southern Europe                      | 0.39  | 0.38 | 0.15  |
| Other Europe                         | 0.13  | 0.38 | 0.05  |
| East Asia                            | -0.15 | 0.40 | -0.06 |
| South East Asia                      | 0.22  | 0.37 | 0.09  |
| South Asia                           | 0.10  | 0.38 | 0.04  |
| Latin America and the Carribean      | 0.49  | 0.43 | 0.19  |
| Africa                               | 0.40  | 0.42 | 0.16  |
| Oceania (excluding N.Z.)             | 0.26  | 0.41 | 0.10  |
| Principal English-speaking countries | 0.06  | 0.39 | 0.02  |
| <b>Constant</b>                      | -0.39 | 0.33 | -     |

|                                                 |           |
|-------------------------------------------------|-----------|
| Number of cases                                 | 2088      |
| Log-likelihood                                  | -1103.94  |
| 2(lnL-lnL <sub>0</sub> ) ( $\chi^2$ )           | 673.16*** |
| Pseudo R <sup>2</sup> (1-lnL/lnL <sub>0</sub> ) | 0.23      |

**Notes:**

Values of 0.000 or -0.000 reflect absolute values rounded to less than  $\pm 0.001$

\*significant at 10% (two-tailed *t*-test for coefficients)

\*\*significant at 5% (two-tailed *t*-test for coefficients)

\*\*\*significant at 1% (two-tailed *t*-test for coefficients)

‡Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.

†Base categories for dummy variables: Occupation - Labourer; Sector - Private sector; Establishment size - 500 or more employees; Industry - Public administration and defence, and community services industries; Political affiliation - no party affiliation or minor party affiliation; Location of residence - major urban centre (100,000+ residents); State of residence - New South Wales; Migrant status - Australian born, English-speaking background; Marital status - Never married; Region of birth - Australia.

TABLE A3.2  
 Probit Models of Union Membership:  
 Class Structure of Australia Survey<sup>†</sup>

|                                                                                    | I                     |       |                              | II                    |       |
|------------------------------------------------------------------------------------|-----------------------|-------|------------------------------|-----------------------|-------|
|                                                                                    | Estimated Coefficient | s.e.  | Marginal Effect <sup>‡</sup> | Estimated Coefficient | s.e.  |
| Experience                                                                         | 0.041 <sup>***</sup>  | 0.014 | } 0.016                      | 0.051 <sup>***</sup>  | 0.016 |
| (Experience) <sup>2</sup>                                                          | -0.001 <sup>***</sup> | 0.000 |                              | -0.001 <sup>***</sup> | 0.000 |
| Education (years)                                                                  | 0.014                 | 0.026 | 0.006                        | 0.006                 | 0.029 |
| Tenure in current job                                                              | 0.091 <sup>***</sup>  | 0.017 | } 0.035                      | 0.105 <sup>***</sup>  | 0.019 |
| (Tenure) <sup>2</sup>                                                              | -0.002 <sup>***</sup> | 0.001 |                              | -0.002 <sup>***</sup> | 0.001 |
| Hours of work                                                                      | 0.044 <sup>**</sup>   | 0.021 | } 0.017                      | 0.014                 | 0.024 |
| (Hours) <sup>2</sup>                                                               | -0.001 <sup>**</sup>  | 0.000 |                              | 0.000                 | 0.000 |
| <i>Current occupation:</i>                                                         |                       |       |                              |                       |       |
| Professional                                                                       | -0.22                 | 0.18  | -0.09                        | -0.13                 | 0.20  |
| Manager, administrator                                                             | -0.85 <sup>***</sup>  | 0.24  | -0.31                        | -0.74 <sup>***</sup>  | 0.26  |
| Clerk                                                                              | -0.39 <sup>**</sup>   | 0.18  | -0.16                        | -0.26                 | 0.20  |
| Salesperson                                                                        | -0.04                 | 0.23  | -0.01                        | 0.11                  | 0.27  |
| Transport, communications worker                                                   | -0.10                 | 0.28  | -0.04                        | 0.08                  | 0.31  |
| Service, sport and recreation worker                                               | -0.07                 | 0.23  | -0.03                        | 0.21                  | 0.25  |
| Other occupations (agricultural worker, mine worker, member of the armed services) | -2.14 <sup>***</sup>  | 0.53  | -0.51                        | -1.45 <sup>**</sup>   | 0.61  |
| <i>Managerial status:</i>                                                          |                       |       |                              |                       |       |
| Manager                                                                            | -0.30 <sup>*</sup>    | 0.18  | -0.12                        | -0.18                 | 0.19  |
| Supervisor                                                                         | 0.01                  | 0.11  | 0.00                         | 0.13                  | 0.12  |
| <i>Sector of employment:</i>                                                       |                       |       |                              |                       |       |
| Public sector                                                                      | 0.97 <sup>***</sup>   | 0.13  | 0.32                         | 0.98 <sup>***</sup>   | 0.15  |
| <i>Industry of employment:</i>                                                     |                       |       |                              |                       |       |
| Agriculture, mining                                                                | 0.09                  | 0.31  | 0.04                         | 0.05                  | 0.32  |
| Manufacturing                                                                      | -0.01                 | 0.19  | -0.00                        | -0.06                 | 0.21  |
| Electricity, gas and water                                                         | 0.19                  | 0.46  | 0.07                         | 0.05                  | 0.49  |
| Construction                                                                       | -0.05                 | 0.32  | -0.02                        | -0.01                 | 0.37  |
| Wholesale and retail trade                                                         | -0.48 <sup>**</sup>   | 0.22  | -0.19                        | -0.49 <sup>**</sup>   | 0.25  |
| Transport and storage                                                              | 0.52 <sup>**</sup>    | 0.22  | 0.19                         | 0.47 <sup>*</sup>     | 0.25  |
| Finance, property and business services                                            | -0.09                 | 0.18  | -0.04                        | -0.04                 | 0.20  |
| Recreational and personal services                                                 | -0.25                 | 0.25  | -0.10                        | -0.37                 | 0.28  |
| <i>State of residence:</i>                                                         |                       |       |                              |                       |       |
| Victoria                                                                           | -0.12                 | 0.12  | -0.05                        | -0.12                 | 0.14  |
| Queensland                                                                         | -0.23                 | 0.15  | -0.09                        | -0.24                 | 0.16  |
| South Australia                                                                    | 0.05                  | 0.17  | 0.02                         | 0.11                  | 0.18  |
| Western Australia                                                                  | -0.39 <sup>**</sup>   | 0.17  | -0.15                        | -0.44 <sup>**</sup>   | 0.20  |
| Tasmania                                                                           | -0.18                 | 0.30  | -0.07                        | -0.14                 | 0.30  |
| Australian Capital Territory                                                       | -0.63 <sup>*</sup>    | 0.33  | -0.24                        | -0.62 <sup>*</sup>    | 0.36  |
| <i>Migrant status:</i>                                                             |                       |       |                              |                       |       |
| Migrated to Aust. ≤ 18 years                                                       | -0.12                 | 0.15  | -0.05                        | -0.15                 | 0.18  |
| Migrated to Aust. > 18 years                                                       | -0.13                 | 0.14  | -0.05                        | 0.03                  | 0.16  |
| <i>Personal characteristics:</i>                                                   |                       |       |                              |                       |       |
| Female                                                                             | 0.02                  | 0.12  | 0.01                         | -0.05                 | 0.13  |

|                                                 |                       |      |       |                       |      |
|-------------------------------------------------|-----------------------|------|-------|-----------------------|------|
| Married                                         | -0.18                 | 0.14 | -0.07 | -0.14                 | 0.15 |
| Separated, divorced, widowed                    | -0.39 <sup>**</sup>   | 0.20 | -0.15 | -0.47 <sup>**</sup>   | 0.23 |
| No. of children                                 | 0.03                  | 0.05 | 0.01  | 0.00                  | 0.05 |
| <b>Political affiliation:</b>                   |                       |      |       |                       |      |
| Labor                                           | 0.36 <sup>***</sup>   | 0.11 | 0.14  | 0.33 <sup>***</sup>   | 0.12 |
| Coalition                                       | -0.42 <sup>***</sup>  | 0.12 | -0.17 | -0.30 <sup>**</sup>   | 0.14 |
| <b>Attitude to unions:</b>                      |                       |      |       |                       |      |
| Anti-union attitude                             | -                     | -    | -     | -0.09 <sup>***</sup>  | 0.02 |
| Constant                                        | -1.50 <sup>**</sup>   | 0.62 | -     | 0.13                  | 0.78 |
| Number of cases                                 | 1001                  |      |       | 834                   |      |
| Log-likelihood                                  | -510.39               |      |       | -409.23               |      |
| 2(lnL-lnL <sub>0</sub> ) ( $\chi^2$ )           | 365.54 <sup>***</sup> |      |       | 336.64 <sup>***</sup> |      |
| Pseudo R <sup>2</sup> (1-lnL/lnL <sub>0</sub> ) | 0.26                  |      |       | 0.29                  |      |

**Notes:**

Values of 0.000 or -0.000 reflect absolute values rounded to less than  $\pm 0.001$

\*significant at 10 % (two-tailed *t*-test for coefficients)

\*\*significant at 5 % (two-tailed *t*-test for coefficients)

\*\*\*significant at 1 % (two-tailed *t*-test for coefficients)

<sup>§</sup>Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.

<sup>†</sup>Base categories for dummy variables: Occupation - Tradesperson, process worker, labourer; Managerial status - non-manager, non-supervisor; Sector - Private sector; Industry - Public administration and defence, and community services industries; Political affiliation - no party affiliation or minor party affiliation; State of residence - New South Wales; Migrant status - Australian born; Marital status - Never married.



## 4

# Trade Union Coverage, Union Membership and the Union Wage Premium

### 4.1 Introduction

Several scholars (ie. Bain and Elsheikh, 1976; Spilsbury *et. al.* 1987; Payne, 1989; Green, 1990; Visser, 1992) argue that when modelling union membership one needs to consider separately the individual's "propensity to unionise" from his or her "opportunity to unionise", where the opportunity to unionise means that there is a union present at the individual's place of work. The logic of the argument is self-evident: In some workplaces unions are actively engaged in providing a service to workers - union officials visit the workplace; there are workplace union delegates (shop stewards); workers are informed of the existence of the union, and are aware of the functions that it performs. In other workplaces, however, there is no active union presence - union officials do not visit the workplace; there are no union delegates; and workers may not even be aware that there is a union which they are eligible to join. Clearly, a worker is much more likely to join a union if he or she is employed in a workplace with an active union presence rather than in one without an active union presence.

In this chapter, we model union membership as a decision made by an individual conditional on the individual being employed in a location where

there is a union present. However, such a model of union membership must contend with the possibility of sample selection bias arising from the non-random assignment of workers to unionised and non-unionised establishments.<sup>1</sup> Accordingly, we propose a two-stage model of unionised employment and union membership which allows us to address the issue of potential sample-selection bias.

In the first stage, it is envisaged that utility-maximising workers choose between two sectors of employment: the unionised sector (which is comprised of workplaces which have an active union presence), and the non-unionised sector (which is comprised of establishments without an active union presence). We assume that workers may observe differences in the structures of compensation in the two sectors, or they may observe differences in working conditions in the two sectors or both.

Workers who have secured employment in a unionised establishment are then assumed to be faced with the decision to join or not to join a union. That is, the decision to join a union is made conditional on the individual being engaged in unionised employment.

Another issue addressed in this chapter is the question of what constitutes the most appropriate way to model union membership and wages. In Chapters 2 and 3 we argued that individuals with similar attributes and who

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<sup>1</sup>Formally, sample selection bias arises if the unobserved variables which influence the probability of unionised employment are correlated with the unobserved determinants of union membership. For example, consider individuals with unmeasured attributes which indicate that the individuals are relatively more risk averse than other workers. Sample selection bias may arise if individuals with these unmeasured attributes are more likely to choose unionised employment, and are also more likely to choose to join a union.

perform similar tasks will, within a given plant, be remunerated on an equal basis irrespective of their union membership status. That is, we reject the proposition (which has gained some currency in the Australian literature) that a worker joining a union in a unionised establishment can, under normal circumstances, expect a wage gain just because he or she has become a union member.

If this argument is correct, conventional membership-based estimates of the union wage premium will be biased downward, a point now explained. In the conventional approach, the union wage premium is measured by the coefficient of a union membership dummy in a standard wage regression. Alternatively, it is measured by estimating separate wage equations for members and non-members, and then by calculating the difference in the average predicted wages using the estimated parameters from the two wage equations. However, if unions increase the wages of all workers in unionised establishments, an estimate of the average union wage premium that is based on the union membership status of workers will be biased downward. This is because those non-union members employed in unionised workplaces receive the same wages as members and, therefore, also receive a wage premium.

In this chapter, we find that there is a wage premium associated with unionised employment, and that this premium is approximately twice as large as a conventionally measured union membership wage premium. In addition, we find that there is no significant difference in the wages received by



members and non-members in unionised employment.<sup>2</sup>

Following Abowd and Farber (1982), we recognise that if there is a limited supply of unionised jobs, the existence of a wage premium raises the potential for there being an excess demand for unionised employment. The excess demand is manifested as a queue for unionised employment, and an individual only secures a unionised job if she is selected by a unionised employer from the queue. We assume that a single latent variable may be specified to model the joint outcome of these two decisions.

Green (1990) has developed (for the U.K.) a model of union availability and membership which is similar to our model of unionised employment and union membership. However, our model is differentiated in two key respects. First, Green models union availability as a latent branch formation process. However, we believe that it is inappropriate to model this process using individual data. Rather we treat the stock of unionised jobs as being exogenously determined, and we focus instead on the process by which workers are allocated to these jobs.

The second difference is that Green allows the structure of wages to differ for members and non-members in unionised employment, but does not consider differences in wages between the unionised and non-unionised sectors. In contrast, we allow the wage structures to differ between the two sectors. However, within the unionised sector, we assume that the wage structures are identical in the sense that the wage received by a worker in a unionised

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<sup>2</sup>It must be stressed, however, that a detailed investigation of the union impact on wages is beyond the scope of this thesis. Rather we focus on the specific question of whether or not union members in unionised establishments receive a wage premium.

establishment is assumed to be independent of his or her membership of a trade union.

## **4.2 Union Density and the Extent of Unionised Employment**

Before elaborating our model of unionised employment and union membership, it is helpful to analyse some sample statistics using data from the Class Structure of Australia Survey and compare these statistics with those obtained from the Australian Industrial Relations Workplace Survey.

### *The Class Structure of Australia Survey*

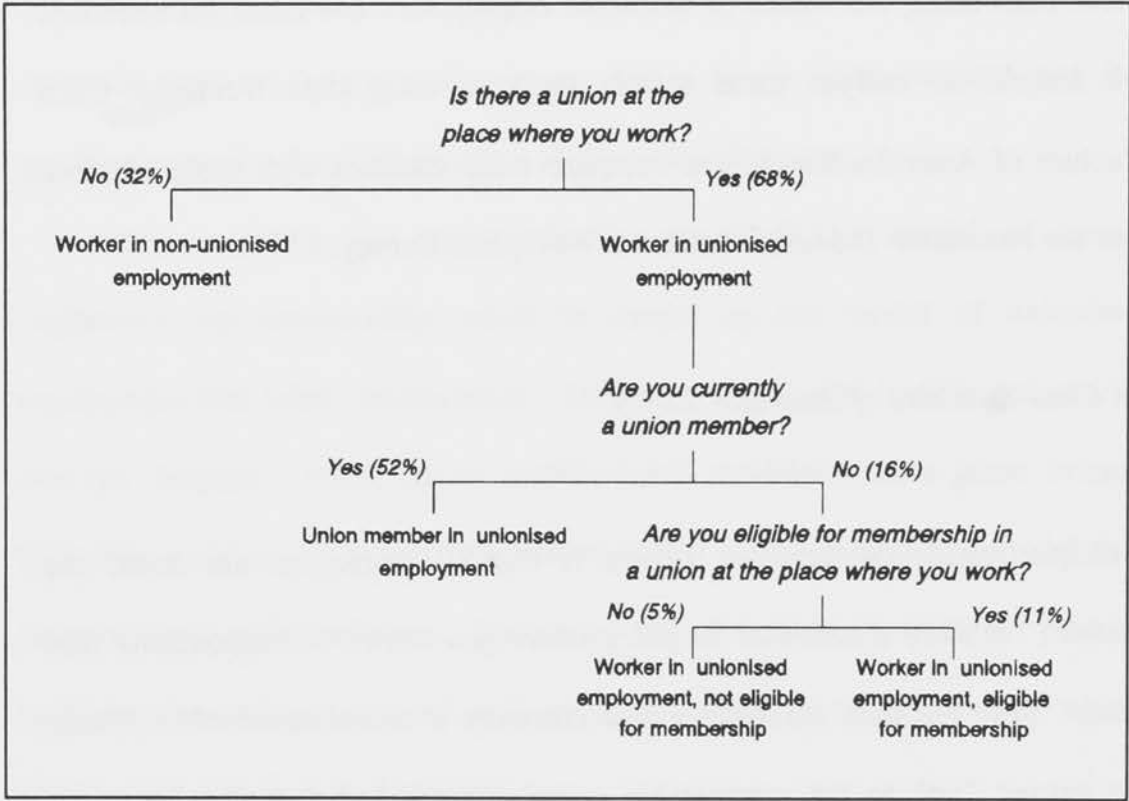
A unique feature of the CSA survey is that all employees are asked the question: *"Is there a union at the place where you work?"*. Respondents who answer "yes" are then asked *"Are you currently a union member?"*. Those who answer "no" to the membership question are asked a further question: *"Are you eligible for membership in a union at the place where you work?"*.

These questions allow workers' union coverage to be classified in several ways (see Figure 4.1). At the broadest level, workers can be classified according to whether or not they are employed in establishments with a union presence. In this chapter, individuals who are employed in such establishments are said to be engaged in unionised employment.

A narrower measure is one based on eligibility for union membership. Eligible unionised workers are those who are employed in unionised

establishments, and who are eligible for membership of one of the trade unions present. Finally, in the conventional way, workers can be categorised according to their union membership status.

FIGURE 4.1  
CSA Union Membership and Coverage Questions: An Overview



Corresponding to these categories, are three measures of union density. The first is the union membership density; that is, the proportion of all workers who are union members. This is the conventional measure of unionisation and it is also the narrowest. A broader measure is the unionised employment density; that is, the proportion of all workers who are employed in establishments where unions are actively present. Finally, we can measure

unionisation as the proportion of workers who are employed in unionised establishments and who are eligible for membership in one of the unions present at their place of work. Rather inelegantly, we call this the eligible unionised employment density.

Table 4.1 reports the three different measures of union density for the full CSA sample, selected occupations and industries, and the private and public sectors. Perhaps the most striking finding is that only 68 percent of all respondents are employed in unionised locations.<sup>3</sup>

A central argument of this chapter is that union membership determination is a two-stage process. Seen this way, the union membership density rate is the product of: (i) the proportion of all workers in unionised employment who are eligible for union membership; and (ii) the union membership take-up rate by eligible unionised employees.

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<sup>3</sup>It should be recalled, however, that the CSA survey covers only a sub-sample of the general workforce; namely, males regularly employed for 30 hours or more per week, and females working at least 15 hours per week in regular employment. Consequently, the sample means should be treated as biased estimates of the population means. In the particular, it is our expectation that the mean rate of unionised employment is biased upward because workers who are not in regular employment, or who work short part-time hours are expected to be less likely to be in unionised employment than regularly employed part-time and full-time employees.

TABLE 4.1  
Measures of Trade Union Coverage: Selected Categories

|                                                 | Unionised<br>Employment Density<br>(%) | Eligible Unionised<br>Employment<br>Density (%) | Union<br>Membership<br>Density (%) |
|-------------------------------------------------|----------------------------------------|-------------------------------------------------|------------------------------------|
| <i>Full Sample:</i>                             | 68.1                                   | 62.8                                            | 52.0                               |
| <i>Sector:</i>                                  |                                        |                                                 |                                    |
| Private Sector                                  | 52.9                                   | 44.5                                            | 35.3                               |
| Public Sector                                   | 87.5                                   | 86.2                                            | 73.0                               |
| <i>Industry:</i>                                |                                        |                                                 |                                    |
| Manufacturing                                   | 67.3                                   | 52.8                                            | 44.0                               |
| Electricity, gas and water                      | 84.2                                   | 84.2                                            | 84.2                               |
| Construction                                    | 60.0                                   | 52.0                                            | 48.0                               |
| Wholesale and retail trade                      | 44.1                                   | 34.2                                            | 22.5                               |
| Transport and storage                           | 84.4                                   | 83.3                                            | 75.6                               |
| Finance, property and<br>business services      | 44.2                                   | 40.7                                            | 36.3                               |
| Community services                              | 82.6                                   | 81.2                                            | 67.1                               |
| Recreational and personal<br>services           | 50.9                                   | 43.6                                            | 30.9                               |
| <i>Occupation:</i>                              |                                        |                                                 |                                    |
| Managers and<br>administrators                  | 60.7                                   | 40.4                                            | 23.6                               |
| Professionals                                   | 75.7                                   | 70.7                                            | 59.5                               |
| Clerks                                          | 65.1                                   | 60.6                                            | 46.3                               |
| Salespersons                                    | 50.0                                   | 42.4                                            | 36.4                               |
| Service, sport and<br>recreation workers        | 67.7                                   | 64.5                                            | 51.6                               |
| Transport and<br>communications workers         | 80.4                                   | 80.4                                            | 74.5                               |
| Tradespersons, process<br>workers and labourers | 69.4                                   | 67.8                                            | 60.3                               |

If union membership is available, workers tend to join unions in large numbers. (Table 4.2 shows that the average take-up rate of union membership among eligible unionised workers is more than 80 percent). This observation is consistent with the social custom model of union membership. Recall that one of the predictions of the social custom model is that an equilibrium union density rate is only maintained if a very substantial proportion of individuals in a workplace adhere to the social custom of union membership. If union membership falls below a critical threshold level, the workplace union density falls to zero. Thus, the social custom model predicts that workplace union density will either be zero or above some relatively high threshold rate.

However, Table 4.2 also reveals that membership take-up rates vary considerably across different industries. For example, the average take-up rate exceeds 90 percent in the construction, transport and storage, and electricity, gas and water industries.<sup>4</sup> On the other hand, the recreational and personal services, and wholesale and retail trade industries both have average take-up rates below 75 percent.

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<sup>4</sup>Because of the small number of respondents in some of the industry categories, it should be borne in mind that these statistics are not precise estimates.

TABLE 4.2  
**Membership Take-Up Rates: Selected Categories**  
**(Employees in Unionised Establishments**  
**Eligible for Membership Only)**

|                                              | Membership Take-Up Rate<br>(%) |
|----------------------------------------------|--------------------------------|
| <i>Full Sample:</i>                          | 82.6                           |
| <i>Sector:</i>                               |                                |
| Private Sector                               | 79.3                           |
| Public Sector                                | 84.7                           |
| <i>Industry:</i>                             |                                |
| Manufacturing                                | 83.3                           |
| Electricity, gas and water                   | 100.0                          |
| Construction                                 | 92.3                           |
| Wholesale and retail trade                   | 65.8                           |
| Transport and storage                        | 90.7                           |
| Finance, property and business services      | 89.1                           |
| Community services                           | 82.5                           |
| Recreational and personal services           | 70.8                           |
| <i>Occupation:</i>                           |                                |
| Managers and administrators                  | 58.3                           |
| Professionals                                | 84.1                           |
| Clerks                                       | 76.4                           |
| Salespersons                                 | 85.7                           |
| Service, sport and recreation workers        | 80.0                           |
| Transport and communications workers         | 92.7                           |
| Tradespersons, process workers and labourers | 88.9                           |

The statistics reported in Tables 4.1 and 4.2 provide new insights into the determinants of union density rates for different groups of workers. As an example, consider managers and administrators. Managers and administrators have the lowest union membership rate of any occupation. Looking at Table 4.1 we see that this very low membership rate can be partly explained by the fact that many managers, even when they are employed in unionised locations, are not eligible to become members of one of the unions present at their place of work. Nevertheless, as expected, even those managers who are employed in unionised establishments, and who are eligible for membership, are less likely to become union members than other workers: for example, 83 percent of all eligible unionised employees become union members, but only 58 percent of eligible unionised managers take-up union membership. One of the most striking features of Australian unionism is the much higher incidence of union membership in the public sector. Until now, it has not been clear to what extent the difference is due to a higher level of unionised employment in the public sector, or due to a higher take-up rate of membership by public sector employees. The CSA survey reveals that almost all of the differential is attributable to the higher incidence of unionised employment in the public sector.<sup>5</sup> Indeed, private sector workers who are employed in unionised

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<sup>5</sup>If  $V^p$  and  $V^s$  are the proportions of workers who are employed in unionised establishments in the private and public sectors, and  $\alpha^p$  and  $\alpha^s$  are the membership take-up rates for these groups, then the membership differential between public and private sectors can be written as  $(V^s\alpha^s - V^p\alpha^p)$ . This differential can be decomposed as follows:

$$(V^s\alpha^s - V^p\alpha^p) \equiv (V^s\alpha^s - V^p\alpha^s) + (V^p\alpha^s - V^p\alpha^p)$$

The first term on the right hand side of this expression measures the part of the differential which can be attributed to the higher rate of eligible unionised employment in the public sector. The second term measures the part of the differential which is due to the higher take-up rate of union membership in the public sector. Using the statistics



establishments, and who are eligible for membership, have a membership rate which is only slightly lower than their public sector counterparts.

### *The AWIRS Survey*

The only other major source of data on unionised employment in Australia is the Australian Workplace Industrial Relations Survey (AWIRS). Significantly, the picture which emerges from the AWIRS confirms many of the features of the CSA data, although differences between the two surveys prevent exact comparisons being made.

One such difference is the definition of what constitutes a unionised establishment. In the AWIRS, a unionised workplace is defined as an establishment with at least one employee who is a union member. However, using the CSA data, a unionised establishment is defined according to an individual's assessment of whether there is a union present in his or her workplace.

Despite differences in the scope of the surveys<sup>6</sup>, and in the definitions used, both the CSA and the AWIRS data paint very similar pictures of the patterns of unionised employment. For example, using the AWIRS data, Callus *et. al.* (1991) report that 77 percent of all workers in establishments of

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reported in Tables 4.1 and 4.2, it can be calculated that of the overall differential of 37.7 percentage points, 35.3 percentage points are due to the higher rate of eligible unionised employment in the public sector, and 2.4 percentage points are due to the higher take-up rate of union membership by public sector workers.

<sup>6</sup>Recall that the AWIRS is a survey of workplaces with at least 5 employees.

more than 5 employees are employed in unionised establishments. This is somewhat higher than the 68 percent of respondents to the CSA survey who report that there is a union present at their place of work, but nevertheless the two statistics are of similar orders of magnitude.

The AWIRS data also confirm that the take-up rate of union membership among workers in unionised establishments is very high. Callus *et. al.* (1991) calculate that the average membership take-up rate in unionised workplaces with more than 20 employees is 71 percent. This is remarkably close to the average take-up rate for all unionised employees of 74.5 percent in the CSA survey.<sup>7,8</sup>

The AWIRS data also show that in 57 percent of all Australian workplaces with at least 5 employees, there are no union members. However, the non-unionised workplaces are heavily concentrated among very small establishments - only 73 percent of establishments with 20-49 employees are unionised, while 97 percent of establishments with 200-499 employees are unionised. Therefore, the lower rate of unionised employment reported by the respondents to the CSA survey might be explained, in part, by the fact that very small establishments are included in the CSA survey, but are excluded from the AWIRS.

Finally, according to the AWIRS data, only 1 percent of public sector workplaces with more than 5 employees are not unionised, and 100 percent of

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<sup>7</sup>Note that this is the take-up rate among **all** unionised employees, not just those eligible for membership.

<sup>8</sup>It might be added that it is almost the same as union membership rate reported by Drago *et. al.* (1992: p.190) for a sample of Business Council of Australia workplaces.

public sector establishments of more than 20 employees are unionised. Although the rate of unionised employment reported by public sector respondents to the CSA survey (87.5 percent) is very high it is still somewhat lower than this.

### 4.3 The Union Impact on Wages

In recent years, there have been several studies of the impact of unions on individual wages in Australia.<sup>9</sup> The union wage effect is typically estimated by the coefficient of a union membership dummy variable in a conventional semi-logarithmic wage equation. In some cases, separate wage equations are estimated for members and non-members. The estimates are then used to calculate the average wage gain associated with union membership. While the estimates vary considerably, the existing studies point to an average union membership differential somewhere in the order of 5 to 10 percent (for a comprehensive survey of the previous studies, see Miller and Mulvey, 1993).

Given the widespread regulation of wages through the award system<sup>10</sup>,

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<sup>9</sup>The major studies include Mulvey (1986), Miller and Rummery (1989), Christie (1992), and Kornfeld (1993).

<sup>10</sup>As discussed in Chapter 2, in Australia the basic wages and conditions of 80 percent of employees are governed by the provisions of industrial awards and agreements. These awards are set by state and federal industrial tribunals. Most awards are minimum rates awards which prescribe minimum rates of pay and conditions for employees. Firms are legally obliged to pay these rates but may, if they wish, pay above the award. Such payments are called over-award payments. Some awards, principally those applying in the public sector, are paid rates awards. Employers bound by a paid rates award are legally required to remunerate their employees at precisely the award rate.

the source of the union membership wage premium is the source of much conjecture (Miller and Mulvey, 1993). There are, however, several possible explanations including the following:

1. *Over-award payments.* One explanation for the union membership wage premium is that unions secure over-award payments for their members. These payments may be the product of unions exercising their bargaining power to extract from firms wages above the minimum award rates. Alternatively, in the context of an exit-voice or productivity model of unionism, the payments may be a form of rent-sharing, where the firm shares with its workers the extra rents which come from higher levels of productivity associated with union voice effects.
2. *Over-time payments.* If union members work more overtime than non-members, union members will have, on average, a higher hourly wage rate than non-members because overtime is paid for at premium rates.<sup>11</sup>
3. *Distribution of union members across awards.* Historically, award rates of pay have been shaped by a range of forces including trade union strength. While there does not seem to be any research on this issue, it is likely that the award wages paid to workers covered by strong unions

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<sup>11</sup> Miller and Mulvey (1991) adjust the hourly rate of pay to account for overtime payments. However, they find that only a small part of the union wage premium estimated using a standard measure of hourly wages can be attributed to the failure to adjust for overtime payments.

are higher than those paid to workers covered by weaker unions. For example, it is usually thought that one determinant of a union's strength is the extent of its membership coverage. That is, it is thought that unions with high rates of membership are likely to be stronger than those with low rates of membership. It is likely, then, that union members are concentrated in those occupations and industries with the strongest unions. Consequently, the union wage premium may be the result of union members being distributed across awards in such a way that the average award rate of pay of members is higher than that of non-members.

4. *Compensating wage differentials.* A further explanation for the union membership wage premium is that it is actually a compensating wage differential. For example, Duncan and Stafford (1980) hypothesise that unions are more likely to be present in establishments with shared working conditions, and that such settings are characterised by structured work arrangements, inflexible hours, employer-set overtime and a faster pace of work. They argue, therefore, that the higher wages paid to union members represent a compensating wage differential for undesirable working conditions.
5. *Union monitoring and enforcement of awards.* While it may be a legal requirement for firms to pay award wages, it does not necessarily follow that all firms actually obey the award; indeed, firms may pay their workers less than award rates. However, trade unions act to ensure that their members are informed of the provisions of awards and

are remunerated in accordance with those awards. Thus, a union membership wage premium may arise because union members are paid in accordance with awards while some non-members are paid under-award wages.

In Chapter 2 we briefly outlined some theoretical arguments to support the proposition that, within a unionised plant (and, possibly, firm), any wage premium enjoyed by union members is also enjoyed by non-members. First, we argued that, in order to avoid harming the employment prospects of their members, unions have an incentive to see that non-members are remunerated on an equal footing with union members. Similarly, we argued that (particularly in teamwork settings) firms seeking to maintain worker harmony and cooperation, have an incentive to pay workers who perform similar tasks equal rates.

An examination of the different explanations of the conventionally estimated union membership wage premium reinforces this argument. For example, if the measured premium relates to differences in the distribution of members and non-members across awards, then it does not follow that a worker, simply by joining a union will be able to improve his or her wage. After all, the worker is already covered by a particular award and joining a union does not change that fact. Similarly, if the premium is really a compensating wage differential, joining a union does not change the fact that the worker is already employed under unpleasant conditions and is compensated for these conditions.

In short, we endorse Alison Booth's (1986) argument that, at the margin, workers do not expect a wage gain from joining a union.<sup>12</sup> However, whether this argument is correct is ultimately an empirical question. In Section 4.6 we shall produce empirical evidence which suggests that: (i) workers in unionised establishments receive a wage premium compared to those in non-unionised establishments, and (ii) there is no wage advantage associated with union membership in unionised establishments.

#### 4.4 A Model of Unionised Employment, Union Membership and Wages

Following the approach adopted in Chapter 3, a worker is assumed to join a union if he or she expects a net utility gain from doing so. Recall that the estimated model consists of the following equations:

$$\begin{aligned} U_i^* &= X_{1i}\beta_1 + \epsilon_{1i} \\ U_i &= I(U_i^*) \end{aligned} \tag{4.1}$$

where  $U_i^*$  is unobserved index which measures the individual's expected utility gain from membership,  $X_{1i}$  is a vector of characteristics which reflect the costs and benefits of union membership, and  $I(\cdot)$  is an indicator function. If  $U_i^* > 0$

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<sup>12</sup>Booth (1986: p.43) expresses her argument in the following terms:

"...I believe that the level of wages in a plant is unaltered by an individual's decision to join at the margin, although it is affected by the relevant union's bargaining strength, which is closely related to the overall trade union density for the particular bargaining unit."



the worker joins the union ( $U_i=1$ ), otherwise the worker does not join ( $U_i=0$ ). Finally, the error term,  $\epsilon_{1i}$ , is assumed to be normally distributed with a mean of zero (ie.  $\epsilon_{1i} \sim N(0, \sigma_1^2)$ ).

In this chapter, we seek to model union membership as a decision made conditional on unionised employment. However, before doing so we shall elaborate our model of unionised employment.

First, we assume that the stock of unionised jobs is a function of the demand for and supply of union services. Focussing on the supply side, if it is assumed that the union's objective is to maximise its profits, the union will maintain a presence in an establishment so long as the marginal revenue derived from the establishment is greater than, or equal to, the marginal cost of maintaining a presence in that establishment. Alternatively, (and perhaps more plausibly), if the union's objective is to maximise its membership, the union will maintain a presence in those plants that deliver the greatest number of members consistent with the overall constraint that total union costs do not exceed total revenue.

The costs of organising and maintaining a presence in a given workplace are assumed to be a function of, among other things, the size and location of the plant as well as the degree of employer resistance to unionisation. While Australian firms cannot prevent unionisation in the same way as firms in the United States can, they can still influence the costs of union organisation. As we noted in Chapter 3, employers can encourage union membership in several ways: for example, by allowing union meetings in company time, by facilitating workplace union visits by union officials, or by



allowing automatic payroll deductions of union fees.

At the establishment level, the demand for and supply of union services are endogenous. However, to simplify, we shall assume that the process which determines whether a workplace is unionised or not is exogenous to the individual's decision to join a union. That is, seen from the individual's perspective, whether a job is unionised or not is independent of his or her **individual** desire for union representation.

We now assume that workers are able to observe differences between unionised and non-unionised workplaces. These differences may be manifested in the wage and fringe benefit structures offered, or in other conditions of employment. Following Farber (1983a), workers are assumed to evaluate the expected utilities derived from employment in each sector, and seek unionised employment if it yields a net utility gain over non-unionised employment.<sup>13</sup>

Assume that the utility individual  $i$  expects to derive from employment in a given sector  $j$  is a function of the wage received in the sector as well as a function of the other pecuniary and non-pecuniary job characteristics. The utility function can be represented by

$$V_i^j = V_i(w_i^j, B_i^j) \quad (4.2)$$

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<sup>13</sup>It might be argued that many workers making the employment decision are not aware of the unionisation status of the different jobs they are considering. However, a model which envisages workers choosing between employment in the unionised and non-unionised sectors is still appropriate as long as there differences in the conditions offered by unionised and non-unionised establishments that are observed by workers.

where  $w_i^j$  is the log hourly wage received in the  $j$ th sector ( $j=UE$  indicates employment in the unionised sector;  $j=NE$  indicates employment in the non-unionised sector), and  $B_i^j$  is a vector of other pecuniary and non-pecuniary job characteristics.

The difference in the utilities expected to be derived in the two sectors is modelled as a function of the differentials in wage and non-wage characteristics between the two sectors and, because utility functions are likely to vary across individuals, as a function of personal attributes, ie.

$$\begin{aligned} I_i^* &= V_i^{UE} - V_i^{NE} \\ &= \alpha_0 + (w_i^{UE} - w_i^{NE})\alpha_1 + (B_i^{UE} - B_i^{NE})\alpha_2 + M_i\alpha_3 + v_{1i} \end{aligned} \quad (4.3)$$

where  $M_i$  is a vector of personal characteristics and  $v_{1i}$  is a random error term.

Now assume that individual  $i$  has a wages function of the form

$$w_i^j = Z_i\delta^j + \eta_i^j \quad (4.4)$$

where  $Z_i$  is a vector of human capital and other wage-determining characteristics,  $\delta^j$  is a parameter vector which is assumed to be constant across individuals in a given sector, and  $\eta_i^j$  is a random error term. Substituting (4.4)

into (4.3) yields

$$I_i^* = \alpha_0 + Z_i(\delta^{UE} - \delta^{NE})\alpha_1 + (B_i^{UE} - B_i^{NE})\alpha_2 + M_i\alpha_3 + v_i + \eta_i^{UE} - \eta_i^{NE} \quad (4.5)$$

Information on non-wage job characteristics is not available in the data used here (this is also true of most other individual data sources). Therefore, we must either assume that the differences are captured by the error term, or that the individual does not believe that there are any differences in the non-wage characteristics (ie.  $B_i^{UE} - B_i^{NE} = 0$ ). Now (4.5) is written in compact form as

$$I_i^* = J_i \rho + u_{1i} \quad (4.6)$$

where  $J_i$  is a vector that includes wage-determining and other personal characteristics, and  $u_{1i}$  is assumed to be a normally distributed random error term.

If there are sufficient unionised jobs so that every worker who desires a unionised job is offered one, then an individual is observed in unionised employment if the difference in his or her expected utilities is positive (ie.  $I_i^* > 0$ ). However, if there is an excess demand for unionised employment, then the desire for a unionised job alone is not sufficient for the individual to hold such a job (Abowd and Farber, 1982). In this situation, there is a queue for unionised employment, and an individual only secures a unionised job if he or she is selected from the queue.

If there is an excess demand for unionised employment, it will pay unionised employers to select the most productive workers from the queue. Conditional on the individual  $i$  being in the queue, the employer's decision to hire that worker is modelled as

$$C_i^* = Q_i\pi + u_{2i} \quad (4.7)$$

where  $C_i^*$  is an unobserved index which captures the propensity of the individual to be chosen from the queue, and  $Q_i$  is a vector of variables which influence the probability that the individual is chosen from the queue. These variables include personal and human capital attributes (which signal the worker's productivity to the unionised employer), and industry and occupation variables (which capture the relative supplies of unionised jobs to workers in different segments of the labour market).

If there is a queue for unionised employment, then the probability that the worker is observed in such a job is

$$\begin{aligned} Pr(UE_i = 1) &= Pr(I_i = 1 \ \& \ C_i = 1) \\ &= Pr(C_i = 1 \mid I_i = 1) Pr(I_i = 1) \end{aligned} \quad (4.8)$$

Substituting from (4.6) and (4.7) we have

$$\begin{aligned} Pr(UE_i = 1) &= Pr(I_i^* > 0) Pr(C_i^* > 0) \\ &= Pr(u_{1i} > -J_i \alpha) Pr(u_{2i} > -Q_i \pi) \end{aligned} \quad (4.9)$$

If  $u_{1i}$  and  $u_{2i}$  are independently distributed normal variables then (4.9) can be estimated using a partially observable bivariate probit model. Poirier (1980) discusses the estimation of a model of this type. In general, the model is identified if there is at least one variable that is included in one of the equations but excluded from the other.

If there is no queue for unionised employment, then the process by which workers sort into unionised employment is described by (4.6) and can be estimated as a independent probit model. On the other hand, if there is a queue then the partially observable bivariate probit model described by (4.9) is estimated instead. In preliminary work, the estimation of several different specifications of the partially observable bivariate probit model was attempted. However, these attempts were characterised by convergence problems and unstable parameter estimates. Therefore, faced with being unable to estimate the queue model (given the constraints of the available data), we follow Farber (1983b) and assume that the propensity to be in unionised employment can be represented by a single unobserved index,  $UE^*$ . The "reduced form" equation describing the allocation of workers to unionised employment is written as a function of the independent variables in (4.6) and (4.7); that is

$$UE_i^* = X_{2i}\beta_2 + \epsilon_{2i} \quad (4.10)$$

where  $X_{2i}$  is a vector which contains the elements of  $J_i$  and  $Q_i$ ,  $\beta_2$  is a vector of parameters that determine an individual's probability of unionised employment, and  $\epsilon_{2i}$  is a normally distributed zero mean random error term (ie,  $\epsilon_{2i} \sim N(0, \sigma_2^2)$ ).

Returning to the union membership equation, recall that the union membership decision is made conditional on the worker being employed in a unionised establishment. If  $\epsilon_{1i}$  is distributed as a standard normal random variable conditional on the worker being employed in a unionised establishment (that is, conditional on  $\epsilon_{2i} \geq -X_{2i}\beta_2$ ), then standard probit estimation of the union membership equation is consistent. However, if there are unobserved variables common to both the union membership and unionised employment equations, then the errors are likely to be correlated. For example, if it is assumed that  $\epsilon_{1i}$  and  $\epsilon_{2i}$  are distributed as bivariate normal random variables, the conditional density of  $\epsilon_{1i}$  is (Farber, 1983b)

$$f(\epsilon_{1i} | \epsilon_{2i} > -X_{2i}\beta_2) = \frac{\int_{-\infty}^{-X_{2i}\beta_2} \phi_2(\epsilon_{1i}, \epsilon_{2i}; \sigma_{12}) d\epsilon_{2i}}{\Phi_2(-X_{2i}\beta_2)} \quad (4.11)$$

where  $\phi_2(\cdot)$  and  $\Phi_2(\cdot)$  are, respectively, the bivariate normal density and distribution functions; and  $\sigma_{12}$  is the covariance between the errors of the two equations. Note that if the errors are independent, (ie. if  $\sigma_{12} = 0$ ), (4.3)

collapses to the standard normal density function, and a standard probit model estimates the membership equation consistently.

If, however, the errors are correlated then standard probit estimation of the membership equation will yield biased parameter estimates. Intuitively, the selection bias arises if the group of workers in unionised employment have unobserved attributes which make them more likely, (or perhaps less likely), to join unions than the general population of workers. Following van de Ven and van Praag (1981) and Farber (1983b), the likelihood function which accounts for potential sample selection bias under the assumption of normally distributed errors can be derived in a straight-forward manner.

First, the contribution of the individual who joins a union in a unionised establishment is given by

$$\begin{aligned} Pr(U_i = 1, UE_i = 1) &= \int_{-\infty}^{X_{1i}\beta_1} \int_{-\infty}^{X_{2i}\beta_2} \phi_2(\epsilon_{1i}, \epsilon_{2i}; \sigma_{12}) d\epsilon_1 d\epsilon_2 \\ &= \Phi_2(X_{1i}\beta_1, X_{2i}\beta_2; \sigma_{12}) \end{aligned} \quad (4.12)$$

while the contribution of the individual who does not join the union is

$$\begin{aligned} Pr(U_i = 0, UE_i = 1) &= \int_{X_{1i}\beta_1}^{\infty} \int_{-\infty}^{X_{2i}\beta_2} \phi_2(\epsilon_{1i}, \epsilon_{2i}; \sigma_{12}) d\epsilon_1 d\epsilon_2 \\ &= \Phi_2(-X_{1i}\beta_1, X_{2i}\beta_2; \sigma_{12}) \end{aligned} \quad (4.13)$$

Finally,  $U_i$  is not observed for workers in non-unionised employment. The contribution of these workers is therefore

$$\begin{aligned} Pr(UE_i=0) &= \int_{X_{2i}\beta_2}^{\infty} \phi_1(e_{2i}) de_2 \\ &= \Phi_1(-X_{2i}\beta_2) \end{aligned} \quad (4.14)$$

Using the above information the likelihood function can be written as

$$L = \prod_{i=1}^{N_1} \Phi_2(X_{1i}\beta_1, X_{2i}\beta_2; \sigma_{12}) \prod_{i=N_1+1}^N \Phi_2(-X_{1i}\beta_1, X_{2i}\beta_2; \sigma_{12}) \prod_{i=N+1}^M \Phi_1(-X_{2i}\beta_2) \quad (4.15)$$

where  $N_1$  is the number of union members in unionised employment,  $N$  is the total number of unionised workers, and  $M$  is the total number of workers in both unionised and non-unionised employment. The model defined by (4.15) is often referred to as a "bivariate probit with sample selection", or a "probit with probit sample selection".

### *Estimation of the Reduced Form Model of Union Membership*

Thus far, we have not distinguished unionised and eligible unionised employment. However, the distinction is important, and it is the source of some potential complications. For example, is the individual's job decision based on whether or not the workplace is unionised, or whether the **job** that he or she is interested in is unionised?

If unions improve the remuneration and/or the employment conditions of all workers in unionised establishments, irrespective of their eligibility for membership, then a model which envisages workers sorting into unionised



employment would be preferred. If, however, unions only improve the conditions of employment and remuneration of their members and potential members, then a model which envisages workers sorting into eligible unionised employment would make more sense.

Of course, whether workers make their employment decision on the basis of unionised or eligible unionised employment has implications for the estimation of the structural model. For example, if unions only improve the conditions of workers who are employed in locations where a union is actively represented and who are also eligible for membership of a represented union, then the approach to be taken is clear. The bivariate probit model of unionised employment and membership would be specified such that only workers who are eligible for membership of a union in their unionised workplace are assumed to make the union membership decision.<sup>14</sup>

However, assume that the following are true: (i) the conditions of employment in unionised establishments are improved equally for both eligible employees and non-eligible employees; and (ii) only workers eligible for membership in a union which is active in their workplace define the pool of potential union members. In this case, a more complicated multiple index model would be preferable to the double index model defined by (4.15). Such a model would consist of at least three equations: (i) an equation modelling

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<sup>14</sup>That is, the model would consist of two stages. First, it would be assumed that workers choose between being employed in a unionised establishment in which they would be eligible for membership of one of the unions present, or being employed in a non-unionised establishment or a unionised establishment in which they would not be eligible for membership. If selected by a unionised employer, they would then choose whether to join the relevant union.

the sorting of workers into unionised employment; (ii) an equation capturing eligibility for union membership; and (iii) a union membership equation.

This scenario gives rise to an unusual estimation problem. The first stage decision creates the potential for sample selection bias in the union membership equation. However, the intervening eligibility step is almost certainly an independent selection criterion<sup>15</sup> and, taken by itself, will not impart bias in the union membership equation. It is not clear how the potential bias from the first equation should now be handled in the presence of this intervening exogenous selection process. Consequently, no attempt is made to estimate this unusually structured model.

#### **4.5 Estimation Results**

To start, we estimate the bivariate probit model of unionised employment and union membership defined by (4.15). The estimates are presented in Table 4.3. Column I gives the estimates of the reduced form model of unionised employment while column II gives the estimated parameters of the union membership equation. For comparison, column III reports the independent probit estimates of the determinants of union membership using the sub-sample of workers in unionised employment.

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<sup>15</sup>For example, it does not seem likely that job seekers make job choice decisions on the basis of whether they will be eligible for membership of a particular union or not. Presumably, what matters are the conditions of employment offered in different jobs. Therefore, once a worker has secured employment in a unionised location, the issue of eligibility is taken as given: it is something over which the worker has no control.

TABLE 4.3  
Bivariate Probit Model of Unionised Employment and Union Membership

|                                         | Bivariate Probit<br>(1001 cases)   |       |                               |       | Independent Probit<br>(680 cases)      |       |                                 |
|-----------------------------------------|------------------------------------|-------|-------------------------------|-------|----------------------------------------|-------|---------------------------------|
|                                         | I                                  |       | II                            |       | III                                    |       | Marginal<br>Effect <sup>§</sup> |
|                                         | Unionised Employment<br>Pr(UE = 1) |       | Union Membership<br>Pr(U = 1) |       | Union Membership<br>Pr(U = 1   UE = 1) |       |                                 |
|                                         | $\hat{\beta}$                      | s.e.  | $\hat{\beta}$                 | s.e.  | $\hat{\beta}$                          | s.e.  |                                 |
| Experience                              | 0.031*                             | 0.016 | 0.036                         | 0.027 | 0.036***                               | 0.018 | } 0.009                         |
| (Experience) <sup>2</sup>               | 0.000                              | 0.000 | -0.001*                       | 0.000 | -0.001***                              | 0.000 |                                 |
| Education (years)                       | 0.006                              | 0.025 | 0.002                         | 0.037 | 0.002                                  | 0.035 | 0.000                           |
| Tenure in current job                   | -                                  | -     | 0.097***                      | 0.024 | 0.097***                               | 0.022 | } 0.024                         |
| (Tenure) <sup>2</sup>                   | -                                  | -     | -0.002***                     | 0.001 | -0.002***                              | 0.001 |                                 |
| Hours of work                           | -                                  | -     | 0.020                         | 0.032 | 0.020                                  | 0.031 | } 0.005                         |
| (Hours) <sup>2</sup>                    | -                                  | -     | 0.000                         | 0.000 | 0.000                                  | 0.000 |                                 |
| <i>Current occupation:</i>              |                                    |       |                               |       |                                        |       |                                 |
| Professional                            | 0.09                               | 0.18  | -0.74***                      | 0.29  | -0.74***                               | 0.26  | -0.25                           |
| Manager, administrator                  | 0.01                               | 0.20  | -1.58***                      | 0.32  | -1.58***                               | 0.31  | -0.57                           |
| Clerk                                   | -0.07                              | 0.18  | -0.96***                      | 0.25  | -0.96***                               | 0.25  | -0.34                           |
| Salesperson                             | -0.04                              | 0.22  | -0.26                         | 0.34  | -0.26                                  | 0.35  | -0.08                           |
| Transport,<br>communications worker     | -0.16                              | 0.30  | -0.15                         | 0.41  | -0.15                                  | 0.42  | -0.04                           |
| Service, sport and<br>recreation worker | 0.15                               | 0.22  | -0.71**                       | 0.34  | -0.71**                                | 0.30  | -0.24                           |
| Other occupations                       | -2.03***                           | 0.43  | -1.43                         | 2.54  | -1.43                                  | 1.08  | -0.52                           |
| <i>Managerial status:</i>               |                                    |       |                               |       |                                        |       |                                 |
| Manager                                 | -                                  | -     | -0.39                         | 0.24  | -0.39*                                 | 0.22  | -0.12                           |
| Supervisor                              | -                                  | -     | 0.03                          | 0.16  | 0.03                                   | 0.15  | 0.01                            |
| <i>Sector of employment:</i>            |                                    |       |                               |       |                                        |       |                                 |
| Public sector                           | 1.24***                            | 0.14  | 0.27                          | 0.95  | 0.27                                   | 0.18  | 0.06                            |
| <i>Industry of employment:</i>          |                                    |       |                               |       |                                        |       |                                 |
| Agriculture, mining                     | 0.41                               | 0.31  | -0.23                         | 0.61  | -0.23                                  | 0.49  | -0.07                           |
| Manufacturing                           | 0.52***                            | 0.18  | -0.83                         | 0.56  | -0.83***                               | 0.27  | -0.29                           |
| Construction                            | 0.12                               | 0.28  | -0.53                         | 0.57  | -0.53                                  | 0.48  | -0.17                           |

|                                                 |             |      |         |      |          |           |       |
|-------------------------------------------------|-------------|------|---------|------|----------|-----------|-------|
| Wholesale and retail trade                      | -0.11       | 0.21 | -0.71** | 0.35 | -0.71**  | 0.32      | -0.24 |
| Transport and storage                           | 0.72**      | 0.28 | 0.28    | 0.46 | 0.28     | 0.29      | 0.06  |
| Finance, property and business services         | -0.38**     | 0.19 | 0.41    | 0.45 | 0.41     | 0.28      | 0.09  |
| Recreational and personal services              | -0.15       | 0.21 | -0.29   | 0.42 | -0.29    | 0.35      | -0.09 |
| <i>Personal characteristics</i>                 |             |      |         |      |          |           |       |
| Migrated ≤ 18 years                             | -0.22       | 0.14 | -0.07   | 0.29 | -0.07    | 0.21      | -0.02 |
| Migrated > 18 years                             | -0.25*      | 0.15 | -0.03   | 0.28 | -0.03    | 0.19      | -0.01 |
| Female                                          | 0.10        | 0.11 | -0.24   | 0.19 | -0.24    | 0.15      | -0.07 |
| Married                                         | -0.01       | 0.14 | -0.15   | 0.18 | -0.15    | 0.17      | -0.04 |
| Separated, divorced, widowed                    | -0.44**     | 0.21 | -0.04   | 0.45 | -0.04    | 0.27      | -0.01 |
| No. children                                    | -0.03       | 0.05 | 0.03    | 0.07 | 0.03     | 0.06      | 0.01  |
| <i>Political affiliation:</i>                   |             |      |         |      |          |           |       |
| Labor                                           | -           | -    | 0.23    | 0.15 | 0.23*    | 0.14      | 0.05  |
| Coalition                                       | -           | -    | -0.46** | 0.18 | -0.46*** | 0.16      | -0.15 |
| Constant                                        | -0.39       | 0.39 | 0.77    | 1.83 | 0.77     | 0.84      | -     |
| $\sigma_{12}$                                   | 0.07 (1.63) |      |         |      |          | -         |       |
| Log-Likelihood                                  | -791.895    |      |         |      |          | -289.68   |       |
| 2(lnL-lnL <sub>0</sub> ) ( $\chi^2$ )           | 251.69***†  |      |         |      |          | 165.00*** |       |
| Pseudo R <sup>2</sup> (1-lnL/lnL <sub>0</sub> ) | 0.20†       |      |         |      |          | 0.22      |       |

*Notes:*

Values of 0.000 or -0.000 reflect absolute values rounded to less than  $\pm 0.001$

\*significant at 10% (two-tailed *t*-test for coefficients)

\*\*significant at 5% (two-tailed *t*-test for coefficients)

\*\*\*significant at 1% (two-tailed *t*-test for coefficients)

†Estimated from an independent probit model of unionised employment.

‡Effect of a one-unit change in the independent variable on the probability of union membership with all other variables set at their mean values.

Base categories for dummy variables: Occupation - Tradesperson, process worker, labourer; Managerial status - non-manager, non-supervisor; Sector - Private sector; Industry - Public administration and defence, public utilities, and community services industries; Political affiliation - no party affiliation or minor party affiliation; Migrant status - Australian born; Marital status - Never married.

The parameter estimates in column I determine the individual's estimated probability of unionised employment.<sup>16</sup> Several of the estimates are worthy of comment.

First, with the exception of the other occupations' coefficient<sup>17</sup>, none of the occupational coefficients are statistically significant. This indicates, for example, that a manager or administrator does not have a significantly lower estimated probability of unionised employment than a tradesperson or a process worker (the base occupations). Moreover, it implies that the significant differences in the probabilities of union membership across occupations reported in Chapter 3 are not the product of strong differences in the availability of union membership across occupations. Rather, it would seem that workers in different occupations have different propensities for union membership.

There is some evidence that workers with longer experience are more likely to be employed in unionised establishments (in particular, the estimated coefficient indicates that an extra year's experience increases an individual's probability of being employed in a unionised workplace by approximately 1 percentage point). This suggests that part of the reason why younger workers

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<sup>16</sup>Tenure, hours of work and managerial status are excluded from the unionised employment equation. These variables are excluded for two reasons. First, tenure, hours of work and managerial status are assumed to be independent of the individual's decision to seek unionised employment (and also to be independent of the unionised employer's decision to offer such employment). The second reason is that the bivariate probit model is not identified if the unionised employment and union membership equations contain the same variables.

<sup>17</sup>Recall that the other occupations dummy variable is for agricultural workers, mine workers and members of the armed services. Less than 3.5% of all respondents are in this occupational category.

are less likely to be union members than older workers is because they are less likely to be employed in unionised establishments. Interestingly, researchers investigating youth membership in Britain also find that young employees are less likely to be employed in unionised workplaces than older employees (Spilsbury *et. al.* 1987; Payne, 1989).

One of the strongest determinants of unionised employment is public sector employment. In particular, the estimated coefficient indicates that the probability of unionised employment is approximately 30 percentage points higher for a public sector employee than it is for a similar private sector employee.<sup>18</sup>

The covariance between the unobserved determinants of unionised employment and union membership,  $\sigma_{12}$ , is positive (0.07) but statistically insignificant (indeed, the standard error is more than 20 times larger than the estimated covariance).<sup>19,20</sup>

Note that the estimated covariance provides a test of sample selection bias in the union membership equation. Because the covariance is insignificant, we cannot reject the null hypothesis that there is no sample selection bias. However, this result must be treated cautiously. First, the test

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<sup>18</sup>As in Chapter 3, we evaluate the marginal effect at the sample means of all of the independent variables.

<sup>19</sup>If the estimate were significant, a positive covariance would imply that individuals with unmeasured characteristics that indicate that they are more likely to be in unionised employment are also more likely to join unions.

<sup>20</sup>In addition to the bivariate probit model of unionised employment and union membership reported in Table 4.3 we also estimated a bivariate probit model of eligible unionised employment and union membership. However, the estimated covariance was also insignificant ( $\hat{\sigma}_{12} = -0.45$ ,  $s.e = 0.81$ ).

is sensitive to the assumption that the error terms are normally distributed. Second, as outlined earlier, the sample selection process may be best modelled as a two-stage process with workers first choosing employment in a unionised establishment, and with their eligibility for membership being determined by an exogenous process. Notwithstanding these cautions, our discussion now focuses on the independent probit estimates of union membership presented in Table 4.4.

In column I of Table 4.4 the membership equation is estimated, in the standard manner, using the full sample of all workers. In column II the sample is restricted to workers in unionised employment only. (That is, the probability of union membership is estimated conditional on unionised employment). Finally, column III gives the independent probit estimates of union membership using the sub-sample of eligible unionised employees.

Because the estimates in the first column of Table 4.4 have already been discussed in detail in Chapter 3,<sup>21</sup> we focus here on the changes in the estimates arising from the conditional union membership equations. However, before discussing the changes, it is interesting to note that the signs and significance of many of the estimates do not vary greatly. For example, the coefficients on the managerial/administrative and clerical dummies are significant and negative in each of the estimated equations. Similarly, the job

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<sup>21</sup>Note that there are some minor differences in the specifications. First, because of the small number of individuals in the electricity, gas and water industry, we have included this industry in the omitted base category (along with the public administration and community services industries). Second, state of residence variables are not included in the membership equation reported in Table 4.4. These specification changes have no appreciable effect on the estimated coefficients.



tenure coefficient is significant and positive in each equation. Finally, in all equations the Coalition voter dummy has a significantly negative coefficient. (The Labor coefficient is positive in all equations, but insignificant conditional on eligible unionised employment).

There are, however, some notable changes in the estimates. One example is the coefficient on the female dummy. Consistent with the results of many previous studies, the female coefficient is insignificant when the membership equation is estimated using the full sample. However, when the sample is restricted to workers in unionised employment, the coefficient is negative and marginally significant. If the sample is restricted further to workers in eligible unionised employment, the coefficient is significant at the 5 percent level and negative. That is, conditional on being engaged in eligible unionised employment, a female worker has a lower estimated probability of union membership than a male worker with similar attributes. As we shall see in Chapter 5 this result probably reflects the fact that far fewer women are employed in closed shops than men.



TABLE 4.4  
Independent Probit Models of Union Membership

|                                         | Full Sample<br>(1001 cases)<br>I<br>Pr(U = 1) |       | Unionised<br>Employment<br>(680 cases)<br>II<br>Pr(U = 1   UE = 1) |       | Eligible Unionised<br>Employment<br>(627 cases)<br>III<br>Pr(U = 1   EUE = 1) |       |
|-----------------------------------------|-----------------------------------------------|-------|--------------------------------------------------------------------|-------|-------------------------------------------------------------------------------|-------|
|                                         | $\hat{\beta}$                                 | s.e.  | $\hat{\beta}$                                                      | s.e.  | $\hat{\beta}$                                                                 | s.e.  |
| Experience                              | 0.040***                                      | 0.014 | 0.036**                                                            | 0.018 | 0.042**                                                                       | 0.020 |
| (Experience) <sup>2</sup>               | -0.001***                                     | 0.000 | -0.001**                                                           | 0.000 | -0.001**                                                                      | 0.000 |
| Education (years)                       | 0.015                                         | 0.025 | 0.002                                                              | 0.035 | 0.020                                                                         | 0.038 |
| Tenure in current job                   | 0.091***                                      | 0.017 | 0.097***                                                           | 0.022 | 0.115***                                                                      | 0.027 |
| (Tenure) <sup>2</sup>                   | -0.002***                                     | 0.001 | -0.002***                                                          | 0.001 | -0.002**                                                                      | 0.001 |
| Hours of work                           | 0.041**                                       | 0.021 | 0.020                                                              | 0.031 | 0.012                                                                         | 0.034 |
| (Hours) <sup>2</sup>                    | -0.001**                                      | 0.000 | 0.000                                                              | 0.000 | 0.000                                                                         | 0.000 |
| <i>Current occupation:</i>              |                                               |       |                                                                    |       |                                                                               |       |
| Professional                            | -0.24                                         | 0.18  | -0.74***                                                           | 0.26  | -0.19                                                                         | 0.29  |
| Manager, administrator                  | -0.91***                                      | 0.24  | -1.58***                                                           | 0.31  | -1.19***                                                                      | 0.37  |
| Clerk                                   | -0.42***                                      | 0.18  | -0.96***                                                           | 0.25  | -0.56**                                                                       | 0.28  |
| Salesperson                             | -0.03**                                       | 0.23  | -0.26                                                              | 0.35  | 0.61                                                                          | 0.49  |
| Transport, communications<br>worker     | -0.09                                         | 0.28  | -0.15                                                              | 0.42  | -0.02                                                                         | 0.44  |
| Service, sport and recreation<br>worker | -0.08                                         | 0.22  | -0.71**                                                            | 0.30  | -0.30                                                                         | 0.32  |
| Other occupations                       | -2.12***                                      | 0.52  | -1.43                                                              | 1.08  | -1.97*                                                                        | 1.10  |
| <i>Managerial status:</i>               |                                               |       |                                                                    |       |                                                                               |       |
| Manager                                 | -0.27                                         | 0.18  | -0.39*                                                             | 0.22  | -0.04                                                                         | 0.27  |
| Supervisor                              | 0.01                                          | 0.11  | 0.03                                                               | 0.15  | 0.12                                                                          | 0.17  |
| <i>Sector of employment:</i>            |                                               |       |                                                                    |       |                                                                               |       |
| Public sector                           | 0.94***                                       | 0.13  | 0.27                                                               | 0.18  | 0.14                                                                          | 0.20  |
| <i>Industry of employment:</i>          |                                               |       |                                                                    |       |                                                                               |       |
| Agriculture, mining                     | 0.12                                          | 0.31  | -0.23                                                              | 0.49  | 0.20                                                                          | 0.59  |
| Manufacturing                           | -0.01                                         | 0.19  | -0.83***                                                           | 0.27  | -0.18                                                                         | 0.32  |
| Construction                            | -0.08                                         | 0.31  | -0.53                                                              | 0.48  | 0.18                                                                          | 0.63  |

|                                                 |           |      |           |      |           |      |
|-------------------------------------------------|-----------|------|-----------|------|-----------|------|
| Wholesale and retail trade                      | -0.49**   | 0.22 | -0.71**   | 0.32 | -0.68*    | 0.39 |
| Transport and storage                           | 0.53**    | 0.22 | 0.28      | 0.29 | 0.37      | 0.31 |
| Finance, property and business services         | -0.11     | 0.18 | 0.41      | 0.28 | 0.91**    | 0.36 |
| Recreational and personal services              | -0.26     | 0.25 | -0.29     | 0.35 | -0.16     | 0.39 |
| <i>Personal characteristics</i>                 |           |      |           |      |           |      |
| Migrated ≤ 18 years                             | -0.12     | 0.15 | -0.07     | 0.21 | -0.24     | 0.23 |
| Migrated > 18 years                             | -0.15     | 0.14 | -0.03     | 0.19 | -0.11     | 0.22 |
| Female                                          | 0.02      | 0.12 | -0.24     | 0.15 | -0.35**   | 0.17 |
| Married                                         | -0.16     | 0.13 | -0.15     | 0.17 | -0.04     | 0.19 |
| Separated, divorced, widowed                    | -0.36*    | 0.20 | -0.04     | 0.27 | 0.06      | 0.29 |
| No. children                                    | 0.03      | 0.05 | 0.03      | 0.06 | 0.04      | 0.07 |
| <i>Political affiliation:</i>                   |           |      |           |      |           |      |
| Labor                                           | 0.34***   | 0.11 | 0.23*     | 0.14 | 0.25      | 0.16 |
| Coalition                                       | -0.43***  | 0.12 | -0.46***  | 0.16 | -0.51**   | 0.18 |
| Constant                                        | -1.51**   | 0.61 | 0.77      | 0.84 | 0.16      | 0.94 |
| Log-Likelihood                                  | -515.66   |      | -289.68   |      | -232.37   |      |
| 2(lnL-lnL <sub>0</sub> ) (χ <sup>2</sup> )      | 355.00*** |      | 165.00*** |      | 111.40*** |      |
| Pseudo R <sup>2</sup> (1-lnL/lnL <sub>0</sub> ) | 0.26      |      | 0.22      |      | 0.19      |      |

*Notes:*

Values of 0.000 or -0.000 reflect absolute values rounded to less than ±0.001

\*significant at 10% (two-tailed *t*-test for coefficients)

\*\*significant at 5% (two-tailed *t*-test for coefficients)

\*\*\*significant at 1% (two-tailed *t*-test for coefficients)

Base categories for dummy variables: Occupation - Tradesperson, process worker, labourer; Managerial status - non-manager, non-supervisor; Sector - Private sector; Industry - Public administration and defence, public utilities, and community services industries; Political affiliation - no party affiliation or minor party affiliation; Migrant status - Australian born; Marital status - Never married.

One of the most robust findings from standard models of unionism is the very strong impact of public sector employment on an individual's estimated probability of union membership. However, conditional on eligible unionised employment, the estimated coefficient on the public sector employment dummy is insignificant. In other words, provided that they are employed in unionised establishments, private sector employees have the same estimated probability of joining a union as their public sector counterparts. This is an interesting and important finding.

However, it cannot be concluded that public and private sector employees have commensurate desires for union membership once the availability of membership is controlled. For example, in Chapter 5 we report that less than 50 percent of union members in the public sector are compulsory members, while 68 percent of private sector union members are employed in closed shops. Therefore, it is probable that if we were able to control for both union availability and compulsory membership, we would find that public sector employees would still be more likely to become union members than private sector employees. Nevertheless, the estimates presented here indicate that a substantial part of the overall difference in union membership rates between the two sectors is due to the lower availability of union membership in the private sector.

In the standard model of union membership, (that is, the model estimated using the full sample), the hours of work coefficient is positive and significant. This finding is usually interpreted as full-time workers having a greater attachment to their jobs, and therefore placing more value on the job

protection and social custom benefits of union membership. However, conditional on unionised employment, the hours of work coefficient is insignificant. This indicates that permanent part-time employees<sup>22</sup> are less likely to be in unionised establishments than full-timers. It also indicates that, given the availability of membership, there is no significant difference in the propensities of full and permanent part-time employees to become union members.

The finance and business services industry coefficient also provides an example of how modelling union membership using the full sample obscures important relationships. Using the full sample, the coefficient is insignificant. However, conditional on being in eligible unionised employment, a worker in the finance and business services industry has a significantly higher probability of union membership than a worker with similar attributes employed in one of the base industries (public administration and defence, and community services).

In short, the insignificant finance industry coefficient in the standard union membership equation masks two significant effects. First, employees in the industry are significantly less likely to be in unionised employment than those in the base industries (see Table 4.3). But, given the availability of union membership, finance industry employees are significantly more likely to become union members than similar employees in the base industries.

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<sup>22</sup>Recall that the CSA data only include employees who are in regular employment.

## 4.6 Union Coverage and the Union Wage Differential

Our model of unionised employment is based on the assumption that workers are able to observe differences in the working conditions and compensation packages offered by unionised and non-unionised firms. That is not to say, however, that unions, particularly through the award system, do not influence the working conditions or remuneration of non-unionised workers. Rather, it assumes that a union presence has an additional impact which is manifested as differences in working conditions or rates of compensation, or both. In particular, our model of unionised employment allows (but does not require) the wage structure to differ between the two sectors.

The union wage differential is conventionally estimated by including a union membership dummy in a wage equation, or by allowing full interactions and estimating separate wage equations for union members and non-members. Throughout the thesis we have argued, at some length, that the wage received by an individual in a unionised plant will be independent of his or her union membership status. However, whether this argument is correct is ultimately an empirical question. Accordingly, in this section, we seek to answer three questions: (i) Is there a wage differential associated with unionised employment? (ii) If so, is the unionised employment differential greater than the conventional union membership differential? and (iii) Do members in unionised establishments receive higher wages than non-members?

### Modelling Wages and Union Coverage

Recall that we assume that the individual  $i$  has a wages function of the form

$$w_i^j = Z_i \delta^j + \eta_i^j \quad (4.16)$$

where  $w_i$  is the log hourly wage, and  $Z_i$  is a vector of human capital and other wage-determining characteristics. The superscript  $j$  indicates the union status of the worker.<sup>23</sup>

If we follow the conventional approach by categorising workers according to their membership status, and allow only the intercept term to vary between union members and non-members, the wage equation to be estimated is

$$\begin{aligned} w_i &= U_i(\delta_0^U + Z_i^+ \delta_1 + \eta_i^U) + N(\delta_0^{NU} + Z_i^+ \delta_1 + \eta_i^{NU}) \\ &= \delta_0^{NU} + U_i(\delta_0^U - \delta_0^{NU}) + Z_i^+ \delta_1 + \epsilon_{3i} \end{aligned} \quad (4.17)$$

where  $U_i$  is a union membership dummy,  $Z_i^+$  contains the same elements as  $Z_i$  but excludes the constant, and the  $\delta_1$  is a row vector of parameters excluding the intercept parameter. The union membership differential,  $d$ , is measured by

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<sup>23</sup>Categorising workers by union membership status:  $j=U$  for union members and  $j=NU$  for non-union members. Categorising workers by both union membership and unionised employment status:  $j=UUE$  for union members,  $j=NUE$  for non-union members in unionised establishments, and  $j=NE$  for workers in non-unionised employment.

the coefficient of the union membership dummy (ie.  $d = \delta_0^U - \delta_0^{NU}$ ).<sup>24</sup>

It is often assumed that there the error term in (4.17),  $\epsilon_{3i}$  ( $\epsilon_{3i} = U_i\eta_i^U + (1-U_i)\eta_i^{NU}$ ), and the union membership dummy, conditional on  $Z_i$ , are correlated. If this is so, the OLS estimate of  $d$  (given by the coefficient of the union membership dummy) is biased. However, consistent estimates may be obtained by using instrumental variables estimation (Duncan and Leigh, 1985), or by using the Heckman's (1979) control function approach. For the control function approach the model to be estimated is

$$w_i = \delta_0^N + U_i(\delta_0^U - \delta_0^N) + Z_i^* \delta_1 + \sigma_{13} R_i + v_i \quad (4.18)$$

where  $R_i = (\phi_i(U_i - \Phi_i)) / (\Phi_i(1 - \Phi_i))$  is the generalised residual from a reduced form probit model of union membership (Gourieroux *et. al.* 1987; Vella and Verbeek, 1993), and  $\sigma_{13}$  is the covariance between the error term in the membership probit equation,  $\epsilon_{1i}$ , and the error term in the wage equation,  $\epsilon_{3i}$ .

However, Poirier (1980) has shown that the standard control function approach is incorrect if the selection mechanism consists of more than one decision, such as when workers who have secured unionised employment subsequently choose whether to join the union. Under these circumstances, the

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<sup>24</sup>The percentage union-non-union wage differential,  $D$ , is given by  $D = e^d - 1$ .

full model consists of a wage equation and two selection equations.

$$\begin{aligned}
 U_i^* &= X_{1i}\beta_1 + \epsilon_{1i} && \text{Union Membership Equation} \\
 UE_i^* &= X_{2i}\beta_2 + \epsilon_{2i} && \text{Unionised Employment Equation} \\
 w_i^j &= \delta_0^j + Z_i^* \delta^j + \epsilon_{3i} && \text{Wage Equation}
 \end{aligned} \tag{4.19}$$

Note that the wage equation has been specified so as to allow all of the parameters to vary for union members, non-members in unionised employment, and non-unionised workers. Assuming the errors in the model are trivariate normally distributed with zero mean and covariance matrix<sup>25</sup>

$$\Sigma = \begin{bmatrix} 1 & \sigma_{12} & \sigma_{13} \\ \sigma_{21} & 1 & \sigma_{23} \\ \sigma_{31} & \sigma_{32} & \sigma_{33} \end{bmatrix} \tag{4.20}$$

then, following Tunali (1986) and Main and Reilly (1992), the double selection extension of the conventional control function approach can be derived as follows.

First, separate wage equations are specified for the three different

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<sup>25</sup>We have assumed the usual probit normalisation for the two selection equations (ie.  $\sigma_1^2=1$ ;  $\sigma_2^2=1$ ).



groups of workers. The regression equations to be estimated are<sup>26</sup>

$$\begin{aligned}
 E(w^{UE} | U=1, UE=1) &= Z\delta^{UE} + E(\epsilon_3 | U^* > 0, UE^* > 0) && \text{Union Members} \\
 E(w^{NUE} | U=0, UE=1) &= Z\delta^{NUE} + E(\epsilon_3 | U^* \leq 0, UE^* > 0) && \text{Non-Union Members} \\
 E(w^{NE} | UE=0) &= Z\delta^{NE} + E(\epsilon_3 | UE^* \leq 0) && \text{Non-Unionised Workers}
 \end{aligned} \tag{4.21}$$

Now, the conditional means of  $\epsilon_{3i}$  for the three different groups of workers can be written as

$$\begin{aligned}
 E(\epsilon_3 | U=1, UE=1) &= \sigma_{13}\lambda_{11} + \sigma_{23}\lambda_{12} \\
 E(\epsilon_3 | U=0, UE=1) &= \sigma_{13}\lambda_{21} + \sigma_{23}\lambda_{22} \\
 E(\epsilon_3 | UE=0) &= \sigma_{13}\lambda_0
 \end{aligned} \tag{4.22}$$

where

$$\begin{aligned}
 \lambda_{11} &= \frac{\phi_1(X_1\beta_1) \Phi_1(A_2)}{\Phi_2(X_1\beta_1, X_2\beta_2; \sigma_{12})} & \lambda_{12} &= \frac{\phi_1(X_2\beta_2) \Phi_1(A_1)}{\Phi_2(X_1\beta_1, X_2\beta_2; \sigma_{12})} \\
 \lambda_{21} &= \frac{\phi_1(X_1\beta_1) \Phi_1(-A_2)}{\Phi_2(X_1\beta_1, X_2\beta_2; \sigma_{12})} & \lambda_{22} &= -\frac{\phi_1(X_2\beta_2) \Phi_1(A_1)}{\Phi_2(X_1\beta_1, X_2\beta_2; \sigma_{12})}
 \end{aligned} \tag{4.23}$$

<sup>26</sup>The subscript  $i$  is omitted in order to avoid notational clutter.

and

$$A_1 = \frac{X_1\beta_1 - \sigma_{12}(X_2\beta_2)}{(1 - \sigma_{12}^2)^{1/2}} \quad A_2 = \frac{X_2\beta_2 - \sigma_{12}(X_1\beta_1)}{(1 - \sigma_{12}^2)^{1/2}} \quad (4.24)$$

Finally, the conditional mean of the error term for workers in non-unionised workplaces incorporates a standard Mill's ratio term as there is only a single selection mechanism for these workers.

$$\lambda_0 = \frac{-\phi_1(-X_2\beta_2)}{\Phi_1(-X_2\beta_2)} \quad (4.25)$$

Consistent estimation of the wage equations now proceeds by using a modified form of Heckman's (1979) two-step procedure. First, the bivariate probit model of unionised employment and union membership defined by equations (4.1) and (4.10) is estimated. This provides the estimates of  $\beta_1$ ,  $\beta_2$  and  $\sigma_{12}$  which are necessary to calculate the selection terms in each of the wage equations. The selection terms are included in the wage equations which are then estimated using OLS.

### *Estimation of the Union Impact on Wages*

Using ordinary least squares, we estimate the union wage differential by including a single union status dummy variable in a standard hourly wage

equation.<sup>27</sup> In fact we separately estimate three union wage differentials - the union membership differential, the unionised employment differential, and the eligible unionised employment differential. The estimated differentials are presented in the first row of Table 4.5 (also, see Appendix 4, page 180, for the computer output of selected wage equations reported in full).

The union membership differential is given by the coefficient of a conventional union membership dummy variable. The estimated coefficient indicates that, controlling for the other determinants of wages, a union member enjoys a positive wage differential of approximately 4 percent. However, the estimate is not statistically significant.

Replacing the union membership variable with a unionised employment variable, we estimate the unionised employment differential. The estimated coefficient of the unionised employment dummy is positive and statistically significant at the 1 percent level. The estimate implies that the wage differential associated with unionised employment is approximately 11%. Finally, we estimate the wage equation with a unionised employment dummy variable. The estimated coefficient, while significant at the 5 percent level, drops to 0.06 indicating that the wage differential for eligible unionised employment is approximately 6 percent.

---

<sup>27</sup>The wage equation is specified in a conventional human capital framework. The estimated model includes experience (and its square), tenure (and its square), education, sex, marital status dummies, migrant status dummies and industry of employment dummies. Education is entered as years of full-time education. Experience is potential labour market experience calculated as age minus years of education minus five.

TABLE 4.5  
Union Wage Differentials: Zero Slope Interactions<sup>†</sup>

|                  | Union Membership Differential |      | Unionised Employment Differential |      | Eligible Unionised Employment Differential |      |
|------------------|-------------------------------|------|-----------------------------------|------|--------------------------------------------|------|
|                  | d <sup>UM</sup>               | s.e. | d <sup>UE</sup>                   | s.e. | d <sup>EUE</sup>                           | s.e. |
| OLS              | 0.04                          | 0.03 | 0.11 <sup>***</sup>               | 0.03 | 0.06 <sup>**</sup>                         | 0.03 |
| IV               | 0.04                          | 0.06 | 0.18 <sup>***</sup>               | 0.07 | 0.03                                       | 0.07 |
| Control function | 0.03                          | 0.06 | 0.14 <sup>***</sup>               | 0.07 | 0.04                                       | 0.06 |

Notes:

<sup>†</sup>In addition to a single union dummy, the estimated wage equations include the following independent variables: experience, experience squared, years of education, tenure, tenure squared, female dummy, marital status dummies, migrant dummies, and industry of employment dummies.

\*significant at 10% (two-tailed *t*-test)

\*\*significant at 5% (two-tailed *t*-test)

\*\*\*significant at 1% (two-tailed *t*-test)

These estimates are consistent with the proposition that all workers in unionised establishments, members and non-members alike, receive a wage differential compared to workers in non-unionised establishments.

For example, if unions were to increase only the wages of union members, then we would expect the union membership differential to be the largest. This is because the other two union variables would include non-members who were not receiving the wage differential.

If, on the other hand, unions were to increase the wages of all workers who are eligible for membership, but not the wages of those who are ineligible for membership, then we would expect the eligible unionised employment coefficient to be the largest. The membership-based estimate would be smaller because those non-members who were eligible for union membership would also receive a wage differential, but would be counted as part of the non-union group of workers. The unionised employment-based estimate would also be

smaller because those workers employed in unionised locations, but ineligible for membership, would be counted as union workers even though they did not enjoy the wage differential.

Finally, if unions were to increase the wages of all workers in unionised settings, including non-members and those workers not eligible for membership, then we would expect the unionised employment differential to be the largest. This is because the other two union variables would exclude some workers in unionised locations who would, in fact, be receiving the wage differential associated with unionised employment.

As previously noted, if the union status variable included in the wage regression is endogenous, the OLS estimate of the union wage differential will be biased. One way of accounting for potential endogeneity bias is by using instrumental variables to estimate the three union wage differentials (see the second row of Table 4.5). First, we estimate a linear probability model of union membership. The linear prediction of the union membership dummy,  $\hat{U}_i$ , is included in the wage equation to give a consistent estimate of the union membership differential. Similarly, linear probability models of unionised employment and eligible unionised employment are estimated in order to obtain the instrumental variables estimates of the unionised employment and eligible unionised employment differentials.

A second way of accounting for the potential endogeneity bias is by using the control function approach discussed above. This involves estimating a probit model of union status (ie. union membership, unionised employment or eligible unionised employment) and then including the generalised residuals

in the estimated wage equation.

Both the control function and IV estimates display a similar pattern to the OLS estimates. The IV estimates suggest, however, that the unionised employment wage differential could be as high as 20 percent.<sup>28</sup>

The central purpose of this section is to determine whether there is a wage advantage associated with union membership among individuals in unionised establishments. To this end, an examination of Table 4.6 is instructive. Here we estimate a standard wage equation with a union membership dummy variable. We then add the two unionised employment dummies in a stepwise fashion.

In column (I) we include a single union membership dummy variable. As noted previously, the coefficient implies a statistically insignificant union wage differential of about 4 percent. In column (II) we include both a union membership dummy and a unionised employment dummy. The union membership coefficient is now negative, but again it is not statistically significant. Finally, in column (IV) we include all three union coverage dummies. The union membership coefficient is -0.001 and is statistically insignificant. These estimates suggest that when unionised employment is controlled, union membership has an insignificant wage effect.

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<sup>28</sup>A coefficient of 0.18 implies a percentage wage differential of approximately 20 percent.

TABLE 4.6  
Estimated Union Status Coefficients: OLS<sup>†</sup>

|                               | I              |      | II                  |      | III                |      | IV                  |      |
|-------------------------------|----------------|------|---------------------|------|--------------------|------|---------------------|------|
| Union status dummy variable:  | $\hat{\delta}$ | s.e. | $\hat{\delta}$      | s.e. | $\hat{\delta}$     | s.e. | $\hat{\delta}$      | s.e. |
| Union membership              | 0.04           | 0.03 | -0.05               | 0.03 | -0.01              | 0.04 | -0.01               | 0.04 |
| Unionised employment          | -              | -    | 0.15 <sup>***</sup> | 0.03 | -                  | -    | 0.24 <sup>***</sup> | 0.05 |
| Eligible unionised employment | -              | -    | -                   | -    | 0.07 <sup>**</sup> | 0.04 | -0.13 <sup>**</sup> | 0.06 |

Notes:  
<sup>†</sup>In addition to the union status dummies, the estimated wage equations include the following independent variables: experience, experience squared, years of education, tenure, tenure squared, female dummy, marital status dummies, migrant dummies, and industry of employment dummies.  
<sup>\*</sup>significant at 10% (two-tailed *t*-test)  
<sup>\*\*</sup>significant at 5% (two-tailed *t*-test)  
<sup>\*\*\*</sup>significant at 1% (two-tailed *t*-test)

The OLS estimates presented in Table 4.6 will be biased if the unobserved characteristics that influence wages are correlated with the unobserved determinants of unionised employment or union membership or both. In order to account for potential sample selection bias, we estimate the double selection model defined by (4.19). Using the parameter estimates for members and non-members (ie.  $\hat{\delta}^{UUE}$  and  $\hat{\delta}^{NUE}$ ) the average wage differential associated with union membership in unionised employment can be estimated using the mean wage-determining attributes of union members in unionised employment ( $\bar{X}^{UUE}$ ) or the mean wage-determining attributes of non-union members in unionised employment ( $\bar{X}^{NUE}$ ). That is, the two estimates are given by  $\bar{X}^{UUE}(\hat{\delta}^{UUE}-\hat{\delta}^{NUE})$  and  $\bar{X}^{NUE}(\hat{\delta}^{UUE}-\hat{\delta}^{NUE})$ . As reported in Table 4.7 both

estimates are negative and statistically insignificant.<sup>29</sup>

TABLE 4.7  
Average Union Membership Wage Differential:  
Estimates from a Model with Two Selection Criteria

|                                                                                   | $d^{UM}$ | Standard Error |
|-----------------------------------------------------------------------------------|----------|----------------|
| <i>Average union membership differential for workers in unionised employment:</i> |          |                |
| Union base ( $\bar{X}^{UUE}(\hat{\delta}^{UUE}-\hat{\delta}^{NUE})$ )             | -0.03    | 0.15           |
| Non-union base ( $\bar{X}^{NUE}(\hat{\delta}^{UUE}-\hat{\delta}^{NUE})$ )         | -0.01    | 0.02           |

\*significant at 10 % (two-tailed *t*-test)

\*\*significant at 5 % (two-tailed *t*-test)

\*\*\*significant at 1 % (two-tailed *t*-test)

In summary, the estimates presented in this section are consistent with the proposition that there is no wage differential associated with joining a union in a unionised establishment. We do, however, find that workers in unionised establishments enjoy a wage advantage compared with workers in non-unionised establishments. Our estimates of the unionised employment wage differential range from approximately 10 to 20 percent. However, we have made no attempt to determine the source of the unionised employment differential. Whether the differential arises from over-award payments, union enforcement of award rates, as a compensating wage differential, or from some other source is an issue which is left for future research.

<sup>29</sup>The standard errors of the estimates are calculated using the approach suggested by Stewart (1987).



## 4.7 Conclusion

In this chapter we develop a sequential choice model of union membership. First, we assume that workers are confronted with the choice of being employed in a unionised or a non-unionised establishment. However, we recognise that it is not always sufficient for an individual to desire a unionised job in order to secure such a job. In particular, if there is an excess demand for unionised employment an individual will only be observed in unionised employment if: (i) he or she desires a unionised job; and (ii) he or she is employed by a unionised employer. Unfortunately, data constraints mean that we cannot model the employee's and employer's decisions separately. We therefore assume that the individual's propensity to be employed in a unionised establishment can be approximated by a single unobserved index.

Our model of unionised employment allows the structure of wages to differ between unionised and non-unionised establishments. Indeed, we find that there is a significant wage premium associated with employment in a unionised establishment. However, consistent with the arguments presented in Chapters 2 and 3, we find that there is no wage premium associated with union membership in unionised establishments.

Having secured unionised employment, we then assume that the individual is confronted with the decision to join the relevant trade union. In short, union membership is modelled as a decision that is conditional on the individual being employed in a unionised establishment.

Modelling union membership in this way allows us to determine

whether certain groups of workers are more likely to become union members because: (i) they are more likely to have unionised jobs; or (ii) they are more likely to join unions, given that they are employed in unionised locations.

For example, there is no significant difference in the probability of unionised employment across the major occupations. Therefore, differences in the probability of union membership across these occupations arise because workers in the different occupations have different propensities to join unions. Conversely, we find that public sector employees are more likely to be employed in unionised locations than private sector employees. However, conditional on unionised employment, there is no significant difference in the propensities of public and private sector employees to become union members. This implies that substantial part of the overall public sector - private sector membership differential is due to a lower availability of union membership in the private sector.

It must be stressed, however, that the conditional membership equation cannot be interpreted as a structural demand equation. In particular, we are unable to identify those individuals who become union members because it is a compulsory condition of their employment. This means, for example, that we are unable to judge whether, conditional on unionised employment, public and private sector employees have an commensurate desire for union membership. For example, the matching union membership propensities of private and public sector workers may be the result of a greater incidence of compulsory union membership in the private sector, rather than being the result of a commensurate desire by public and private sector employees for union

membership.

The important distinction between compulsory and voluntary union membership is the theme of the next chapter.

## APPENDIX 4

### *STATA (v.3.0) and LIMDEP (v.5.0) Computer output for selected wage equations.*

This appendix reports the full computer output for the major union wage differential estimates presented in the chapter:

1. Union Membership Differential, OLS, (Table 4.5)
2. Union Membership Differential, Control Function, (Table 4.5)
3. Unionised Employment Differential, OLS, (Table 4.5)
4. Unionised Employment Differential, Control Function (Table 4.5)
5. Union Membership and Unionised Employment Differentials (Column IV, Table 4.6)

#### **Variable Definitions:**

##### *Dependent Variable:*

lnpay            Log hourly wage

##### *Independent Variables:*

|         |                                                 |
|---------|-------------------------------------------------|
| mexp    | Potential experience (Age-years of education-5) |
| mexp2   | Experience squared                              |
| yrsed   | Years of full-time education                    |
| tenyr   | Tenure in current job                           |
| tenyr2  | Tenure squared                                  |
| sex     | Female dummy variable                           |
| married | Married                                         |
| sepdw   | Separated, divorced, widowed                    |
| mb18    | Migrated to Aust. ≤18 years                     |
| ma18    | Migrated to Aust. >18 years                     |
| agmine  | Agriculture, mining                             |
| manuf   | Manufacturing                                   |
| constr  | Construction                                    |
| wrsal   | Wholesale and retail trade                      |
| trans   | Transport and storage                           |
| finb    | Finance, property and business services         |
| reclsv  | Recreational and personal services              |
| union   | Union membership dummy                          |
| unpres  | Unionised employment dummy                      |
| ununelg | Eligible unionised employment dummy             |

## 1. Union Membership Differential, OLS, (Table 4.5)

MODEL COMMAND:

REGRESS;LHS=LNPAY;RHS=X3,UNION\$

|                                      |              |                |                    |               |             |              |                    |   |                |
|--------------------------------------|--------------|----------------|--------------------|---------------|-------------|--------------|--------------------|---|----------------|
| Ordinary least squares regression.   |              |                |                    |               |             |              | Dep. Variable      | = | LNPAY          |
| Observations                         | =            | 985            |                    |               |             |              | Weights            | = | ONE            |
| Mean of LHS                          | =            | 0.2222808E+01  |                    |               |             |              | Std.Dev of LHS     | = | 0.4190192E+00  |
| StdDev of residuals                  | =            | 0.3575243E+00  |                    |               |             |              | Sum of squares     | = | 0.1234776E+03  |
| R-squared                            | =            | 0.2852976E+00  |                    |               |             |              | Adjusted R-squared | = | 0.2719802E+00  |
| F[ 18, 966]                          | =            | 0.2142286E+02  |                    |               |             |              | Prob value         | = | 0.3217295E-13  |
| Log-likelihood                       | =            | -0.3749380E+03 |                    |               |             |              | Restr.(B=0) Log-l  | = | -0.5403633E+03 |
| Amemiya Pr. Criter.                  | =            | 0.7998741E+00  |                    |               |             |              | Akaike Info.Crit.  | = | 0.1302893E+00  |
| ANOVA                                | Source       | Variation      | Degrees of Freedom | Mean Square   |             |              |                    |   |                |
|                                      | Regression   | 0.4929026E+02  | 18.                | 0.2738348E+01 |             |              |                    |   |                |
|                                      | Residual     | 0.1234776E+03  | 966.               | 0.1278236E+00 |             |              |                    |   |                |
|                                      | Total        | 0.1727679E+03  | 984.               | 0.1755771E+00 |             |              |                    |   |                |
| Durbin-Watson stat.                  | =            | 1.9522374      |                    |               |             |              | Autocorrelation    | = | 0.0238813      |
| N[0,1] used for significance levels. |              |                |                    |               |             |              |                    |   |                |
| Variable                             | Coefficient  | Std. Error     | t-ratio            | Prob t >x     | Mean of X   | Std.Dev.of X |                    |   |                |
| MEXP                                 | 0.17663E-01  | 0.3464E-02     | 5.099              | 0.00000       | 17.715      | 11.665       |                    |   |                |
| MEXP2                                | -0.23288E-03 | 0.7309E-04     | -3.186             | 0.00144       | 449.74      | 524.76       |                    |   |                |
| YRSED                                | 0.67759E-01  | 0.5336E-02     | 12.698             | 0.00000       | 13.018      | 2.3915       |                    |   |                |
| TENYR                                | 0.30302E-02  | 0.4273E-02     | 0.709              | 0.47821       | 5.4010      | 6.7190       |                    |   |                |
| TENYR2                               | -0.52341E-04 | 0.1416E-03     | -0.370             | 0.71165       | 74.270      | 193.40       |                    |   |                |
| SEX                                  | -0.13452     | 0.2474E-01     | -5.438             | 0.00000       | 0.46091     | 0.49872      |                    |   |                |
| MARRIED                              | 0.63508E-01  | 0.3124E-01     | 2.033              | 0.04204       | 0.68325     | 0.46545      |                    |   |                |
| SEPDW                                | 0.95471E-01  | 0.4835E-01     | 1.975              | 0.04831       | 0.93401E-01 | 0.29114      |                    |   |                |
| MB18                                 | -0.11377E-02 | 0.3810E-01     | -0.030             | 0.97618       | 0.10355     | 0.30483      |                    |   |                |
| MA18                                 | -0.47139E-01 | 0.3533E-01     | -1.334             | 0.18209       | 0.13604     | 0.34301      |                    |   |                |
| AGMINE                               | 0.11987      | 0.7397E-01     | 1.620              | 0.10513       | 0.26396E-01 | 0.16039      |                    |   |                |
| MANUF                                | -0.62081E-01 | 0.3607E-01     | -1.721             | 0.08526       | 0.15635     | 0.36337      |                    |   |                |
| CONSTR                               | -0.39896E-01 | 0.7522E-01     | -0.530             | 0.59585       | 0.25381E-01 | 0.15736      |                    |   |                |
| WSAL                                 | -0.19026     | 0.4087E-01     | -4.656             | 0.00000       | 0.10863     | 0.31133      |                    |   |                |
| TRANS                                | -0.75993E-01 | 0.4458E-01     | -1.705             | 0.08828       | 0.84264E-01 | 0.27792      |                    |   |                |
| FINB                                 | 0.78348E-01  | 0.4061E-01     | 1.929              | 0.05370       | 0.10254     | 0.30351      |                    |   |                |
| RECSV                                | -0.13762     | 0.5369E-01     | -2.563             | 0.01037       | 0.53807E-01 | 0.22575      |                    |   |                |
| Constant                             | 1.1497       | 0.8783E-01     | 13.090             | 0.00000       |             |              |                    |   |                |
| UNION                                | 0.39601E-01  | 0.2500E-01     | 1.584              | 0.11318       | 0.52081     | 0.49982      |                    |   |                |

## 2. Union Membership Differential, Control Function, (Table 4.5)

MODEL COMMAND:

SELECT;LHS=LNPAY;RHS=X3,UNION;ALL\$

Sample Selection Model

Probit selection equation based on UNION

Sample is all observations.

Results of selection:

|                                                                             |              |                |                    |           |                |              |
|-----------------------------------------------------------------------------|--------------|----------------|--------------------|-----------|----------------|--------------|
|                                                                             | Data points  | Sum of weights |                    |           |                |              |
| Data set                                                                    | 985          | 985.0          |                    |           |                |              |
| Selected sample                                                             | 985          | 985.0          |                    |           |                |              |
| Sample Selection Model                                                      |              |                |                    |           |                |              |
| Two stage least squares regression.                                         |              |                |                    |           |                |              |
| Observations                                                                | =            | 985            | Dep. Variable      | =         | LNPAY          |              |
| Mean of LHS                                                                 | =            | 0.2222808E+01  | Weights            | =         | ONE            |              |
| StdDev of residuals                                                         | =            | 0.3540552E+00  | Std.Dev of LHS     | =         | 0.4190192E+00  |              |
| R-squared                                                                   | =            | 0.2853142E+00  | Sum of squares     | =         | 0.1209677E+03  |              |
| F[ 19, 965]                                                                 | =            | 0.2027598E+02  | Adjusted R-squared | =         | 0.2712426E+00  |              |
| Log-likelihood                                                              | =            | -0.3648236E+03 | Prob value         | =         | 0.3217295E-13  |              |
| Amemiya Pr. Criter.                                                         | =            | 0.7813678E+00  | Restr.(B=0) Log-l  | =         | -0.5403633E+03 |              |
| Standard error corrected for selection.....                                 |              | 0.35408        | Akaike Info.Crit.  | =         | 0.1279004E+00  |              |
| Correlation of disturbance in regression and Selection Criterion (Rho)..... |              | 0.16517E-01    |                    |           |                |              |
| N[0,1] used for significance levels.                                        |              |                |                    |           |                |              |
| Variable                                                                    | Coefficient  | Std. Error     | t-ratio            | Prob t >x | Mean of X      | Std.Dev.of X |
| MEXP                                                                        | 0.17722E-01  | 0.3453E-02     | 5.133              | 0.00000   | 17.715         | 11.665       |
| MEXP2                                                                       | -0.23443E-03 | 0.7310E-04     | -3.207             | 0.00134   | 449.74         | 524.76       |
| YRSED                                                                       | 0.67709E-01  | 0.5295E-02     | 12.787             | 0.00000   | 13.018         | 2.3915       |
| TENYR                                                                       | 0.33075E-02  | 0.4612E-02     | 0.717              | 0.47332   | 5.4010         | 6.7190       |
| TENYR2                                                                      | -0.58110E-04 | 0.1453E-03     | -0.400             | 0.68928   | 74.270         | 193.40       |

|              |                    |                   |              |                |                |                |
|--------------|--------------------|-------------------|--------------|----------------|----------------|----------------|
| SEX          | -0.13449           | 0.2450E-01        | -5.490       | 0.00000        | 0.46091        | 0.49872        |
| MARRIED      | 0.63272E-01        | 0.3098E-01        | 2.043        | 0.04109        | 0.68325        | 0.46545        |
| SEPDW        | 0.94890E-01        | 0.4804E-01        | 1.975        | 0.04824        | 0.93401E-01    | 0.29114        |
| MB18         | -0.15627E-02       | 0.3783E-01        | -0.041       | 0.96705        | 0.10355        | 0.30483        |
| MA18         | -0.47243E-01       | 0.3499E-01        | -1.350       | 0.17700        | 0.13604        | 0.34301        |
| AGMINE       | 0.11866            | 0.7369E-01        | 1.610        | 0.10735        | 0.26396E-01    | 0.16039        |
| MANUF        | -0.63809E-01       | 0.3751E-01        | -1.701       | 0.08893        | 0.15635        | 0.36337        |
| CONSTR       | -0.41263E-01       | 0.7504E-01        | -0.550       | 0.58242        | 0.25381E-01    | 0.15736        |
| WRSAL        | -0.19362           | 0.4615E-01        | -4.195       | 0.00003        | 0.10863        | 0.31133        |
| TRANS        | -0.75071E-01       | 0.4457E-01        | -1.684       | 0.09214        | 0.84264E-01    | 0.27792        |
| FINB         | 0.76245E-01        | 0.4256E-01        | 1.791        | 0.07322        | 0.10254        | 0.30351        |
| RECSV        | -0.14014           | 0.5573E-01        | -2.515       | 0.01192        | 0.53807E-01    | 0.22575        |
| Constant     | 1.1544             | 0.9248E-01        | 12.482       | 0.00000        |                |                |
| <b>UNION</b> | <b>0.31384E-01</b> | <b>0.5975E-01</b> | <b>0.525</b> | <b>0.59938</b> | <b>0.52081</b> | <b>0.49982</b> |
| LAMBDA       | 0.58485E-02        | 0.3870E-01        | 0.151        | 0.87989        | -0.16060E-07   | 0.70379        |

### 3. Unionised Employment Differential, OLS, (Table 4.5)

MODEL COMMAND:  
REGRESS;LHS=LNPAY;RHS=X3,UNPRES\$

|                                      |                |                   |                    |                |                   |                 |
|--------------------------------------|----------------|-------------------|--------------------|----------------|-------------------|-----------------|
| Ordinary least squares regression.   |                |                   |                    |                |                   |                 |
| Observations                         | =              | 985               | Dep. Variable      | =              | LNPAY             |                 |
| Mean of LHS                          | =              | 0.2222808E+01     | Weights            | =              | ONE               |                 |
| StdDev of residuals                  | =              | 0.3548715E+00     | Std.Dev of LHS     | =              | 0.4190192E+00     |                 |
| R-squared                            | =              | 0.2958645E+00     | Sum of squares     | =              | 0.1216520E+03     |                 |
| F[ 18, 966]                          | =              | 0.2254972E+02     | Adjusted R-squared | =              | 0.2827439E+00     |                 |
| Log-likelihood                       | =              | -0.3676020E+03    | Prob value         | =              | 0.3217295E-13     |                 |
| Amemiya Pr. Criterion                | =              | 0.7849787E+00     | Restr.(B=0) Log-l  | =              | -0.5403633E+03    |                 |
| ANOVA                                | Source         | Variation         | Degrees of Freedom |                | Akaike Info.Crit. | = 0.1283629E+00 |
|                                      | Regression     | 0.5111587E+02     | 18.                |                | Mean Square       |                 |
|                                      | Residual       | 0.1216520E+03     | 966.               |                |                   | 0.2839771E+01   |
|                                      | Total          | 0.1727679E+03     | 984.               |                |                   | 0.1259338E+00   |
| Durbin-Watson stat.                  | =              | 1.9592458         | Autocorrelation    | =              | 0.0203771         |                 |
| N[0,1] used for significance levels. |                |                   |                    |                |                   |                 |
| Variable                             | Coefficient    | Std. Error        | t-ratio            | Prob t >x      | Mean of X         | Std.Dev. of X   |
| MEXP                                 | 0.17414E-01    | 0.3436E-02        | 5.068              | 0.00000        | 17.715            | 11.665          |
| MEXP2                                | -0.22800E-03   | 0.7246E-04        | -3.147             | 0.00165        | 449.74            | 524.76          |
| YRSED                                | 0.67089E-01    | 0.5295E-02        | 12.670             | 0.00000        | 13.018            | 2.3915          |
| TENYR                                | 0.22848E-02    | 0.4188E-02        | 0.546              | 0.58538        | 5.4010            | 6.7190          |
| TENYR2                               | -0.51241E-04   | 0.1396E-03        | -0.367             | 0.71365        | 74.270            | 193.40          |
| SEX                                  | -0.13981       | 0.2459E-01        | -5.686             | 0.00000        | 0.46091           | 0.49872         |
| MARRIED                              | 0.62069E-01    | 0.3100E-01        | 2.002              | 0.04524        | 0.68325           | 0.46545         |
| SEPDW                                | 0.10094        | 0.4800E-01        | 2.103              | 0.03548        | 0.93401E-01       | 0.29114         |
| MB18                                 | 0.64522E-02    | 0.3786E-01        | 0.170              | 0.86469        | 0.10355           | 0.30483         |
| MA18                                 | -0.40231E-01   | 0.3511E-01        | -1.146             | 0.25184        | 0.13604           | 0.34301         |
| AGMINE                               | 0.12862        | 0.7342E-01        | 1.752              | 0.07979        | 0.26396E-01       | 0.16039         |
| MANUF                                | -0.58733E-01   | 0.3554E-01        | -1.653             | 0.09838        | 0.15635           | 0.36337         |
| CONSTR                               | -0.27540E-01   | 0.7469E-01        | -0.369             | 0.71233        | 0.25381E-01       | 0.15736         |
| WRSAL                                | -0.16830       | 0.4035E-01        | -4.171             | 0.00003        | 0.10863           | 0.31133         |
| TRANS                                | -0.79388E-01   | 0.4421E-01        | -1.796             | 0.07251        | 0.84264E-01       | 0.27792         |
| FINB                                 | 0.10533        | 0.4081E-01        | 2.581              | 0.00985        | 0.10254           | 0.30351         |
| RECSV                                | -0.12071       | 0.5321E-01        | -2.269             | 0.02330        | 0.53807E-01       | 0.22575         |
| Constant                             | 1.1053         | 0.8752E-01        | 12.629             | 0.00000        |                   |                 |
| <b>UNPRES</b>                        | <b>0.10882</b> | <b>0.2636E-01</b> | <b>4.128</b>       | <b>0.00004</b> | <b>0.68223</b>    | <b>0.46584</b>  |

### 4. Unionised Employment Differential, Control Function, (Table 4.5)

MODEL COMMAND:  
SELECT;LHS=LNPAY;RHS=X3,UNPRES;ALL\$

Sample Selection Model  
Probit selection equation based on UNPRES  
Sample is all observations.

Results of selection:

|                        | Data points | Sum of weights |
|------------------------|-------------|----------------|
| Data set               | 985         | 985.0          |
| Selected sample        | 985         | 985.0          |
| Sample Selection Model |             |                |



|                                             |              |                |                    |           |             |                |
|---------------------------------------------|--------------|----------------|--------------------|-----------|-------------|----------------|
| Two stage least squares regression.         |              |                | Dep. Variable      |           | =           | LNPAY          |
| Observations                                | =            | 985            | Weights            |           | =           | ONE            |
| Mean of LHS                                 | =            | 0.2222808E+01  | Std.Dev of LHS     |           | =           | 0.4190192E+00  |
| StdDev of residuals                         | =            | 0.3513894E+00  | Sum of squares     |           | =           | 0.1191529E+03  |
| R-squared                                   | =            | 0.2960360E+00  | Adjusted R-squared |           | =           | 0.2821756E+00  |
| F[ 19, 965]                                 | =            | 0.2135836E+02  | Prob value         |           | =           | 0.3217295E-13  |
| Log-likelihood                              | =            | -0.3573791E+03 | Restr.(B=0) Log-l  |           | =           | -0.5403633E+03 |
| Amemiya Pr. Criter.                         | =            | 0.7662519E+00  | Akaike Info.Crit.  |           | =           | 0.1259816E+00  |
| Standard error corrected for selection..... |              |                | 0.35167            |           |             |                |
| Correlation of disturbance in regression    |              |                |                    |           |             |                |
| and Selection Criterion (Rho).....          |              |                | -0.59106E-01       |           |             |                |
| N[0,1] used for significance levels.        |              |                |                    |           |             |                |
| Variable                                    | Coefficient  | Std. Error     | t-ratio            | Prob t >x | Mean of X   | Std.Dev.of X   |
| MEXP                                        | 0.17266E-01  | 0.3418E-02     | 5.051              | 0.00000   | 17.715      | 11.665         |
| MEXP2                                       | -0.22459E-03 | 0.7214E-04     | -3.113             | 0.00185   | 449.74      | 524.76         |
| YRSED                                       | 0.66971E-01  | 0.5253E-02     | 12.749             | 0.00000   | 13.018      | 2.3915         |
| TENYR                                       | 0.17079E-02  | 0.4314E-02     | 0.396              | 0.69221   | 5.4010      | 6.7190         |
| TENYR2                                      | -0.43231E-04 | 0.1393E-03     | -0.310             | 0.75637   | 74.270      | 193.40         |
| SEX                                         | -0.14131     | 0.2456E-01     | -5.754             | 0.00000   | 0.46091     | 0.49872        |
| MARRIED                                     | 0.61986E-01  | 0.3072E-01     | 2.018              | 0.04360   | 0.68325     | 0.46545        |
| SEPDW                                       | 0.10323      | 0.4780E-01     | 2.160              | 0.03080   | 0.93401E-01 | 0.29114        |
| MB18                                        | 0.91234E-02  | 0.3792E-01     | 0.241              | 0.80986   | 0.10355     | 0.30483        |
| MA18                                        | -0.38179E-01 | 0.3504E-01     | -1.089             | 0.27596   | 0.13604     | 0.34301        |
| AGMINE                                      | 0.13265      | 0.7322E-01     | 1.812              | 0.07005   | 0.26396E-01 | 0.16039        |
| MANUF                                       | -0.55498E-01 | 0.3583E-01     | -1.549             | 0.12141   | 0.15635     | 0.36337        |
| CONSTR                                      | -0.22290E-01 | 0.7479E-01     | -0.298             | 0.76569   | 0.25381E-01 | 0.15736        |
| WRSAL                                       | -0.15774     | 0.4544E-01     | -3.472             | 0.00052   | 0.10863     | 0.31133        |
| TRANS                                       | -0.81560E-01 | 0.4403E-01     | -1.852             | 0.06398   | 0.84264E-01 | 0.27792        |
| FINB                                        | 0.11562      | 0.4557E-01     | 2.537              | 0.01118   | 0.10254     | 0.30351        |
| RECSV                                       | -0.11266     | 0.5524E-01     | -2.039             | 0.04141   | 0.53807E-01 | 0.22575        |
| Constant                                    | 1.0866       | 0.9472E-01     | 11.472             | 0.00000   |             |                |
| UNPRES                                      | 0.13897      | 0.6691E-01     | 2.077              | 0.03780   | 0.68223     | 0.46584        |
| LAMBDA                                      | -0.20786E-01 | 0.4245E-01     | -0.490             | 0.62438   | 0.32748E-07 | 0.67638        |

5. Union Membership and Unionised Employment Differentials, OLS, (Column IV, Table 4.6).

|          |            |     |            |                       |  |  |
|----------|------------|-----|------------|-----------------------|--|--|
| Source   | SS         | df  | MS         | Number of obs = 985   |  |  |
| Model    | 52.0181371 | 20  | 2.60090686 | F( 20, 964) = 20.76   |  |  |
| Residual | 120.749724 | 964 | .125259049 | Prob > F = 0.0000     |  |  |
|          |            |     |            | R-square = 0.3011     |  |  |
|          |            |     |            | Adj R-square = 0.2866 |  |  |
| Total    | 172.767861 | 984 | .175577094 | Root MSE = .35392     |  |  |

|         |           |           |        |       |                      |           |
|---------|-----------|-----------|--------|-------|----------------------|-----------|
| lnpay   | Coef.     | Std. Err. | t      | P> t  | [95% Conf. Interval] |           |
| mexp    | .0175251  | .0034293  | 5.110  | 0.000 | .0107954             | .0242549  |
| mexp2   | -.0002325 | .0000724  | -3.213 | 0.001 | -.0003744            | -.0000905 |
| yr sed  | .0657999  | .0053028  | 12.408 | 0.000 | .0553934             | .0762063  |
| tenyr   | .0031453  | .0042315  | 0.743  | 0.457 | -.0051586            | .0114493  |
| tenyr2  | -.0000856 | .0001404  | -0.610 | 0.542 | -.0003611            | .0001898  |
| sex     | -.138573  | .0245828  | -5.637 | 0.000 | -.1868148            | -.0903311 |
| married | .0550442  | .0310313  | 1.774  | 0.076 | -.0058524            | .1159409  |
| sepdw   | .095596   | .0479195  | 1.995  | 0.046 | .0015573             | .1896346  |
| mb18    | .0091307  | .0377774  | 0.242  | 0.809 | -.0650047            | .0832661  |
| ma18    | -.0348949 | .0350718  | -0.995 | 0.320 | -.1037208            | .0339311  |
| agmine  | .1202875  | .0732842  | 1.641  | 0.101 | -.0235275            | .2641025  |
| manuf   | -.0805043 | .0363593  | -2.214 | 0.027 | -.1518569            | -.0091517 |
| constr  | -.0410906 | .0746859  | -0.550 | 0.582 | -.1876564            | .1054751  |
| wrsal   | -.1890448 | .0409888  | -4.612 | 0.000 | -.2694823            | -.1086072 |
| trans   | -.0783118 | .0441448  | -1.774 | 0.076 | -.1649427            | .0083191  |
| finb    | .0952332  | .0409324  | 2.327  | 0.020 | .0149063             | .1755601  |
| recsv   | -.1342748 | .0533214  | -2.518 | 0.012 | -.2389142            | -.0296354 |
| union   | -.0100714 | .0387212  | -0.260 | 0.795 | -.0860589            | .0659161  |
| unpres  | .2369964  | .0547888  | 4.326  | 0.000 | .1294773             | .3445155  |
| unune1g | -.1349865 | .0622607  | -2.168 | 0.030 | -.2571685            | -.0128044 |
| _cons   | 1.134376  | .0879836  | 12.893 | 0.000 | .9617145             | 1.307037  |



# 5

## Voluntary and Compulsory Union Membership

### 5.1 Introduction

Of all of the aspects of trade union organisation, compulsory membership is perhaps the one which arouses the most passion in public debate. It is often attacked as being oppressive, anti-democratic and an abuse of human rights. On the other hand, the proponents of compulsory membership defend it as necessary to prevent free riders from enjoying what they believe to be the "hard won" gains of unionists. Surprisingly, despite all the heat generated by this debate, comparatively little empirical research has been conducted into the nature and consequences of compulsory membership. In particular, very little is known about the impact of compulsory union membership arrangements on the level of union membership. However, some clues as to what the effect might be may be gleaned from some of the previous studies of the determinants of union membership.

In their study of professional union members, Crockett and Hall (1987) analyse data on the main reasons given by union members for joining a union. They find that, while compulsory unionism is comparatively widespread, existing members would still join their union even if membership were voluntary (mainly so as to safeguard their conditions of work). Unfortunately, the very restrictive sample used by Crockett and Hall limits the extent to which



their results might be generalised to the workforce as a whole.<sup>1</sup>

Miller and Rummery (1989) also consider the issue of compulsory union membership. Using a multinomial logit model they conclude, (for their sample of young male workers), that the failure to consider compulsory unionism is not likely to bias the estimates obtained from a standard dichotomous choice model of union membership. Nevertheless, they note that by separately distinguishing compulsory members, some further insights may be gained into the determinants of union membership.

Implicit in the studies by Crockett and Hall, and Miller and Rummery is the conclusion that compulsory unionism does not have a strong influence on overall union density. In contrast, we present estimates which suggest that the effect is substantial. In particular, we estimate that as few as 35 percent of compulsory union members would still join a union if membership were voluntary. Furthermore, on the basis of this figure, it is suggested that the overall rate of union membership in Australia could fall below 25 percent if compulsory unionism were completely abolished. Of course, there are some caveats to be placed on these results and these are addressed later in this chapter.

In recent years, there has been a vigorous debate both within the trade union movement and also in the academic literature on the reasons for the decline in the overall rate of union membership. In the academic literature, at least, the possibility that the decline in union membership might be due to

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<sup>1</sup>Recall that the sample used by Crockett and Hall consists only of graduates of the Western Australian Institute of Technology.

falling rates of compulsory membership has not been explored.<sup>2</sup> However, we demonstrate that there is *prima facie* evidence to suggest that as much as 70 percent of the overall decline can be attributed to falling rates of compulsory membership (although we acknowledge that the decline in the rate of compulsory unionism may ultimately be a symptom of underlying structural change in the labour market).

## **5.2 The Extent of Compulsory Unionism**

### ***Compulsory Membership Arrangements***

Before proceeding, it should be made clear that there are some difficulties in providing a satisfactory definition of compulsory unionism. At the most fundamental level it can be argued that there is no such thing as "compulsory unionism" (McKenna and Easson, 1990). Certainly it is true that, strictly speaking, there is no such thing as formal, *legally* sanctioned compulsory unionism in Australia. Nevertheless, informal arrangements, augmented in some cases by formal preference awards, have ensured that effective compulsory unionism is a prominent and widespread feature of Australian industrial relations (Wright, 1981; Zappala, 1992).

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<sup>2</sup>Peetz (1990: p.215) speculates that part of the decline in Australian union membership may be due to a change in public attitudes towards unions. He then advances the hypothesis that such a change in union attitudes will be manifested initially as a decline in union membership in industries with low levels of compulsion. Subsequently, it is expected that union membership will decline in industries with high levels of compulsion. However, Peetz does not consider the possibility that the decline in union membership is a product of falling rates of compulsory membership.

One of the principal difficulties in modelling compulsory membership is that it arises in a variety of contexts. There are pre-entry closed shops, post-entry closed shops, and modified post-entry closed shops. In some establishments there is 100 percent coverage of all non-managerial occupations, while in others only workers in a particular occupation are required to be union members. Unfortunately, in the data used here these variants of compulsory membership are not separately distinguished. Consequently, we use the term "closed shop employment" loosely and synonymously with the term "compulsory membership".

### *Preference to Unionists*

In the federal jurisdiction (and the jurisdictions of most of the states) there is formal statutory provision for industrial tribunals to make clauses granting preference to unionists in awards.<sup>3</sup> Typically, such clauses provide for union members to be given preference in both engagement and retention in employment (Australian Labour Law Reporter, 1991: ¶31-940).<sup>4</sup> In principle, this means that when faced with the choice of employing two workers of equal

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<sup>3</sup>The state industrial tribunals of Victoria and Western Australia do not have the power to award preference (Australian Labour Law Reporter, 1991: ¶31-945). However, unionists who are employed under federal awards in both of these states may still be granted preference.

<sup>4</sup>The federal Industrial Relations Act provides specific examples of matters in which preference may be ordered. In addition to engagement and retention in employment, the matters include: promotion, transfer, overtime, and vocational training. A survey conducted by the Anti-Discrimination Board of NSW revealed, however, that only a small proportion of preference clauses contained provisions beyond engagement and retention in employment (Anti-Discrimination Board, 1983: p. 77).

qualifications and ability, an employer must engage a union member before a non-union member. It also means that in a downturn non-union workers must be retrenched before union members.

In a survey of the large body of case law established around the issue of preference, Latimer (1981) identifies several general principles that have been established by the various industrial tribunals. In addition to the principle that preference clauses cannot provide for compulsory unionism, there are two related principles. The first of these is that preference clauses should not provide for a union to have a monopoly over the supply of labour. The second is that preference clauses shall not apply to conscientious objectors.

The second principle ensures that a worker who has a moral objection to union membership can be exempted from the provisions of a preference clause. In practice, however, there are several reasons why the conscientious objector provisions do not provide a convenient loophole for potential free-riders. First, a certificate establishing conscientious objector status can only be obtained by formal application to the industrial registrar of the relevant jurisdiction (state or federal). While the process of applying for a certificate need not be excessively burdensome, it does entail a measure of inconvenience for the applicant. Second, and perhaps more importantly, it is unlikely that many workers are aware of the conscientious objector provisions in the industrial relations legislation. Finally, when such certificates are granted it is typically on the proviso that the applicant pays an amount equivalent to union fees to consolidated revenue or some other fund (Australian Labour Law Reporter, 1991: ¶31-960).

While, in a strict sense, compulsory unionism is not legally enforceable, it is generally acknowledged that the practical effect of many preference arrangements is to give rise to a *de facto* closed shop (Australian Labour Law Reporter 1991: ¶31-955). Indeed, Latimer (1981: p.184) notes that awards which effectively provide for compulsory unionism have been made in the past, although these awards have usually only been made when they have been supported by both management and unions.

### *Informal Membership Arrangements*

It should be recognised that many closed shop arrangements arise from agreements which have not been scrutinised by an industrial tribunal. These arrangements may take the form of a written agreement or may be the result of long-standing "custom and practice". In recognition of this Wright (1981: p.133) defines a "closed shop practice" as "any arrangement, formal or informal, written or unwritten, where, except for mutually agreed exemptions, membership of the appropriate union is a condition of the worker's employment".

### *Measuring the Extent of Compulsory Unionism*

#### *Evidence from Previous Studies*

In the IMA survey union members are asked the following question: "Is your

*union membership compulsory for your job?*". As early as 1967, and again in 1969, an almost identical question was asked in two national surveys of the political attitudes of Australian voters. In both years, the proportion of unionists answering "yes" was 63 percent (Aitkin, 1978; Rawson, 1978).

In 1976, as part of a detailed investigation of the relationship between unionism and political attitudes, Rawson (1978) conducted a national telephone survey of 4046 Australians, 1003 of whom were current union members. In total, approximately 70 percent of unionists reported that membership was compulsory. Early in 1990 Rawson arranged for a similar survey to be conducted. Over the intervening 14 years the proportion of compulsory union members had fallen to 54 percent (Rawson, 1990).<sup>5</sup>

There are, of course, some practical problems in measuring compulsory unionism using an individual's response to a question of the sort asked in the IMA survey. In particular, while some respondents may believe that unionism is a condition of employment, in reality this may not be correct. For example, in their study of professional union members, Crockett and Hall (1987: p.62) note that approximately 14 percent of teachers reported compulsion as the main reason for joining the union. However, they point out that at the time the survey was conducted, there was no such formal requirement for teachers in Western Australia.

Unfortunately, the existing national sources of individual-level data

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<sup>5</sup>In a further study of the differences in attitudes held by compulsory and voluntary union members, Dufty (1981) conducted a survey of 338 electors in the Perth metropolitan area. While most of Dufty's analysis fails to distinguish present and past union members, it can be deduced from figures given in his paper that 39 percent of all employed unionists were compulsory members.

(including the IMA survey) do not contain separate information from employers or unions to confirm whether membership is, in fact, compulsory for the individual's job. In the absence of such information it is difficult to judge just how widespread the misreporting of compulsory union membership might be.

One way to avoid the misreporting problem is to use information on the time at which a worker became a union member. Information of this sort is available in the Australian Longitudinal Survey (ALS) (although explicit information on compulsory unionism is not available).

Using data from the ALS, Miller and Rummery (1989) employ the rule of thumb that workers who join a union either before or at the same time as they commence employment are likely to be compulsory union members. With this measure Miller and Rummery estimate that almost 63 percent of young male unionists can be categorised as being compulsory members. Of course, a measure of this sort brings with it problems of its own. Principally, not all workers who join before or on commencement of employment need do so because membership is compulsory.

There are now several studies of the dimensions of compulsory unionism which use data obtained from firms or unions. The first of these was by Wright (1981) who conducted a survey of 109 unions and 34 major employers and employer associations. Wright's study confirmed that compulsory membership was a widespread feature of Australian unionism. While the coverage of Wright's survey was extensive, it lacked detailed information on smaller unions and unions operating solely in Queensland,



South Australia, Tasmania, or the Territories. Nevertheless, Wright's study remains a major source of information on the incidence of the closed shop in Australia.

A second important study was conducted by Zappala (1992) using data from the Australian Industrial Workplace Survey (AWIRS). While the AWIRS does not explicitly identify compulsory membership arrangements, it does provide information on the percentage of each major occupational group organised at the plant level. Using this information, Zappala estimated that 57 percent of all workers in unionised establishments were covered by a compulsory union membership arrangement.<sup>6</sup>

#### *Evidence from the IMA Survey*

In his study, Zappala (1992) lists several key variables that appear to be related to the incidence of closed shop employment. In particular, he identifies workplace size, industry, occupation and sector of employment as determinants of compulsory union membership.

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<sup>6</sup>Two further studies of closed shop employment have been conducted by employer associations. In 1986 the MTIA found that approximately 20 percent of companies in the metal industry had some form of closed shop arrangement. Since these arrangements were concentrated in larger firms Zappala (1992: p.3) has estimated that this would mean that about 80 percent of all employees in the industry are employed in closed shops. In 1988, the Business Council of Australia also conducted a survey which found that there was some active closed shop arrangement in 81 percent of unionised establishments.



TABLE 5.1  
Union Membership and Closed Shop Employment Densities for Selected Categories

|                                            | <i>All Workers in Selected Category</i> |                                          | <i>Union Members<br/>in Category Only</i> |
|--------------------------------------------|-----------------------------------------|------------------------------------------|-------------------------------------------|
|                                            | Union<br>Membership<br>Density (%)      | Closed Shop<br>Employment<br>Density (%) | Closed Shop<br>Employment<br>Density (%)  |
| <i>Current occupation:</i>                 |                                         |                                          |                                           |
| Manager, administrator                     | 22.7                                    | 9.1                                      | 40.0                                      |
| Professional                               | 52.8                                    | 22.8                                     | 43.1                                      |
| Para-professional                          | 58.9                                    | 24.7                                     | 41.9                                      |
| Tradesperson                               | 46.8                                    | 47.6                                     | 72.5                                      |
| Clerk                                      | 35.2                                    | 11.7                                     | 33.3                                      |
| Salesperson, personal service<br>worker    | 29.9                                    | 18.4                                     | 61.5                                      |
| Plant and machine operator                 | 59.6                                    | 46.2                                     | 77.4                                      |
| Labourer                                   | 56.7                                    | 43.3                                     | 76.4                                      |
| <i>Industry of employment:</i>             |                                         |                                          |                                           |
| Manufacturing                              | 45.1                                    | 36.8                                     | 81.5                                      |
| Construction                               | 40.5                                    | 28.6                                     | 70.6                                      |
| Wholesale and retail trade                 | 26.7                                    | 19.8                                     | 74.2                                      |
| Transport and storage                      | 71.1                                    | 51.1                                     | 71.9                                      |
| Finance, property and business<br>services | 39.2                                    | 14.9                                     | 37.9                                      |
| Public administration and<br>defence       | 61.8                                    | 25.4                                     | 41.2                                      |
| Community services                         | 52.8                                    | 20.2                                     | 38.3                                      |
| Recreational and personal<br>Services      | 32.0                                    | 26.0                                     | 81.3                                      |
| <i>Sector of employment:</i>               |                                         |                                          |                                           |
| Public sector                              | 69.5                                    | 31.7                                     | 45.6                                      |
| Private sector                             | 34.3                                    | 23.4                                     | 68.2                                      |
| <i>Workplace size category:</i>            |                                         |                                          |                                           |
| 1-20 employees                             | 27.0                                    | 14.2                                     | 52.6                                      |
| 21-50 employees                            | 55.2                                    | 25.9                                     | 46.9                                      |
| 51-100 employees                           | 58.1                                    | 31.2                                     | 53.7                                      |
| 101-500 employees                          | 55.4                                    | 40.0                                     | 72.2                                      |
| More than 500 employees                    | 61.6                                    | 36.0                                     | 58.4                                      |
| <i>Sex:</i>                                |                                         |                                          |                                           |
| Female                                     | 37.0                                    | 19.3                                     | 52.1                                      |
| Male                                       | 51.7                                    | 30.9                                     | 59.8                                      |
| <i>Total:</i>                              | 45.5                                    | 26.0                                     | 57.2                                      |

Using IMA data, Table 5.1 shows how rates of closed shop employment vary across different categories of wage and salary earners. The table has three columns. The first column reports the union density rate for employees in each selected category. The second column gives the closed shop employment density; that is, the proportion of employees for whom union membership is compulsory. The final column reports the percentage of union members in each category who are compulsory members. In total, 45.5 percent of employees are union members, and 26 percent of workers are employed in closed shops. This implies that 57.2 percent of union members are employed in closed shops.<sup>7</sup>

Among occupations, compulsory union membership is most prevalent for manual workers. Tradespersons have the highest rate of closed shop employment (47.6 percent) followed by plant and machine operators (46.2 percent) and labourers (43.3 percent). While salespersons and personal service workers have a relatively low level of closed shop employment (18.4 percent), 61.5 percent of union members in this occupational category are compulsory members. As expected, managers and administrators have a very low rate of compulsory membership (9.1 percent). However, almost half of all managers who are union members are employed in closed shops.

Workers in larger establishments are more likely to be compulsory union members. In the smallest workplace size category (1-20 employees) only 14.2 percent of employees are compulsory union members, while in the

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<sup>7</sup>It is encouraging to note that this is very close to the rate of compulsory membership reported by Rawson (1990). Using data collected early in 1990 Rawson reports that 54 percent of union members were compulsory members.

largest category (more than 500 workers) the rate of compulsory union membership is 36.0 percent. Interestingly, there is no appreciable relationship between establishment size and the percentage of union members in closed shops (52.6 percent of union members in the 1-20 employees category are compulsory members, while 58.4 percent of union members in the 500+ category are in closed shop employment). This means that not only are workers in large workplaces more likely to be in closed shops, but those individuals who are employed in large open shops are more likely to become union members than their counterparts in small open shops.

The overall rate of union membership in the public sector is almost twice that of the private sector. However, private sector unionism is underpinned by closed shop arrangements to a much greater extent: 68.2 percent of all union members in the private sector are compulsory members while 45.6 percent of public sector union members are compulsory members.

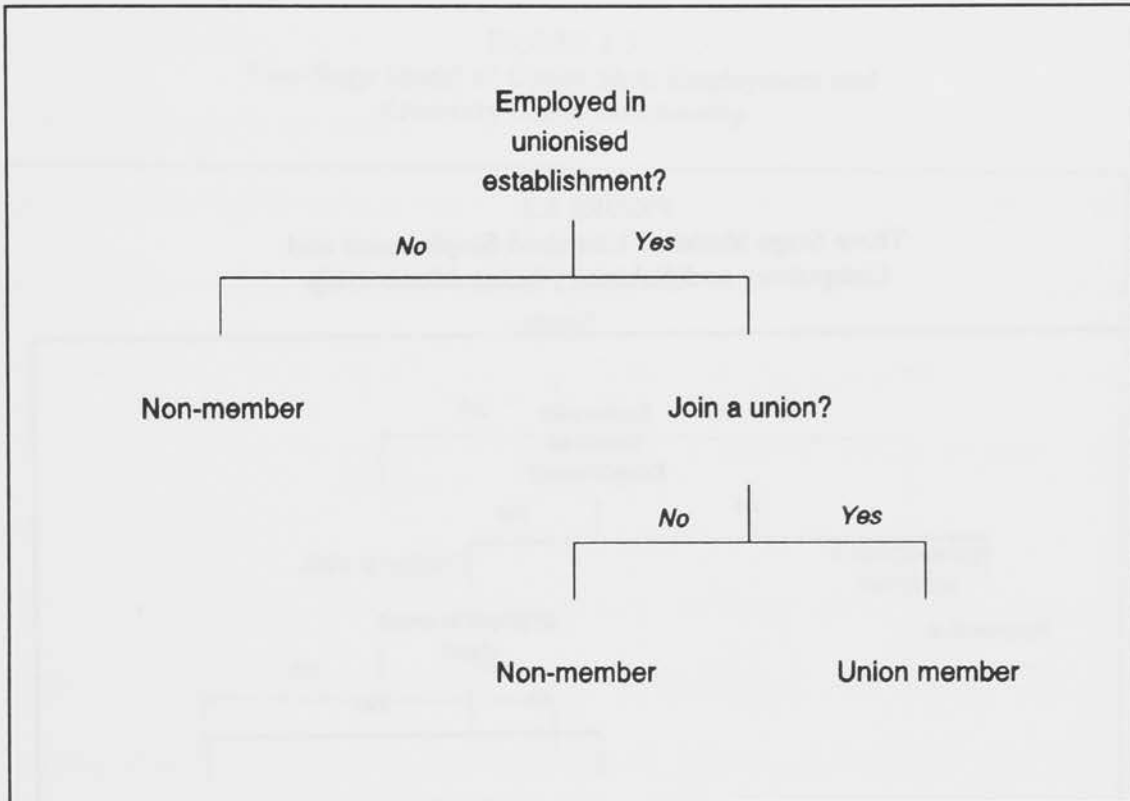
Finally, there is a substantial gap between the closed shop employment densities of men and women (30.9 percent of men are employed in closed shops, 19.3 percent of women are employed in closed shops).

### **5.3 Econometric Modelling Issues**

Consider the model of union membership elaborated in the previous chapter. This model views union membership as the outcome of a sequence of decisions (see Figure 5.1). First, a utility-maximising worker is assumed to be faced with the choice of employment in the unionised or non-unionised sectors of the

labour market. Then, conditional on having secured a unionised job, the worker chooses to join or not join a union.

FIGURE 5.1  
Two Stage Model of Unionised Employment and  
Union Membership

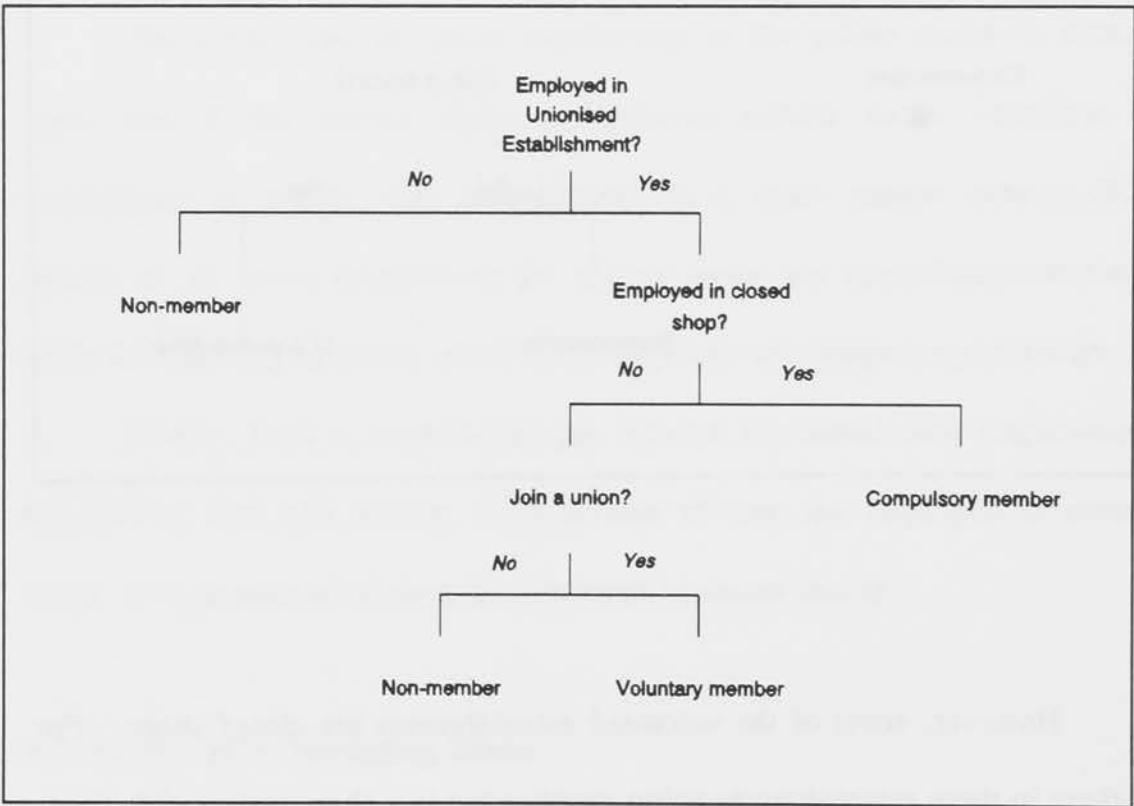


However, some of the unionised establishments are closed shops. For workers in these establishments union membership is a characteristic that "goes with the job". In effect, then, workers in closed shops make a joint decision: (i) to be employed in the closed shop; and (ii) to join the relevant trade union. In contrast, workers in unionised open shops are not required to join a union.

Clearly, union membership can now be modelled as a three stage

process (see Figure 5.2). First, a worker is employed in either a unionised or non-unionised establishment. If the unionised establishment is a closed shop, the worker joins the relevant union because membership is a required condition of employment. Finally, if the unionised establishment is an open shop the worker makes a separate decision to join or not join the union.

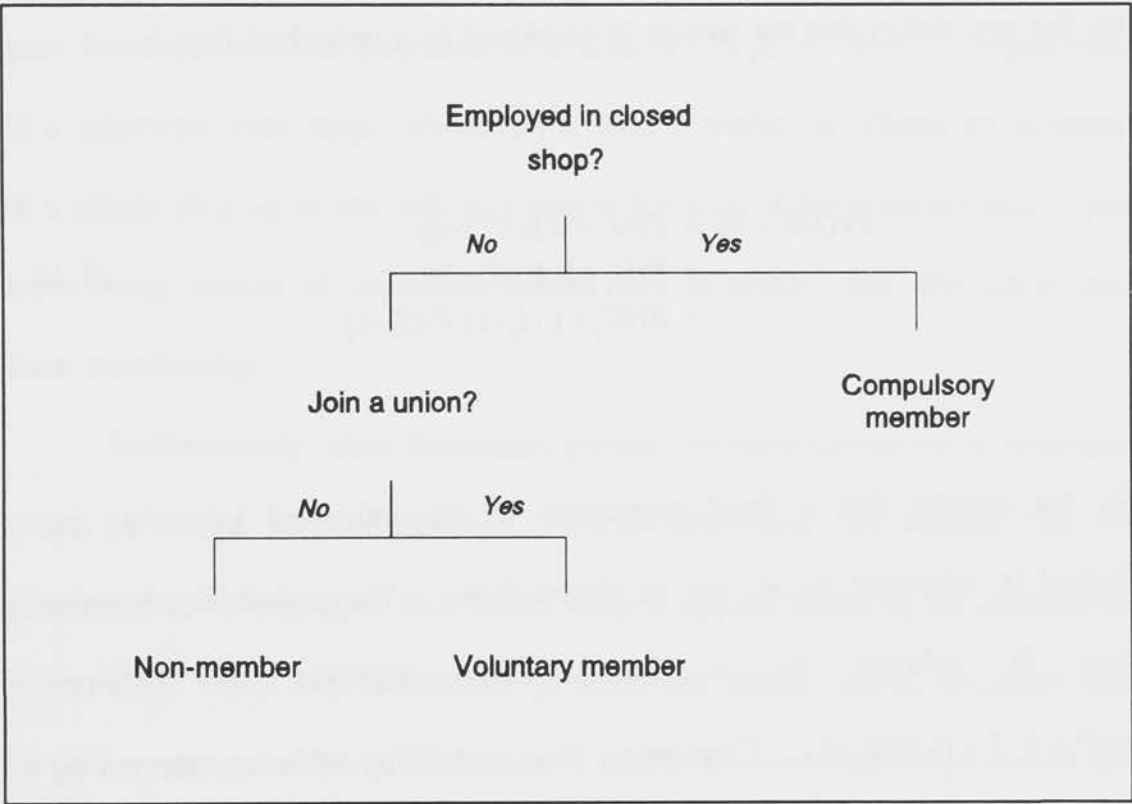
FIGURE 5.2  
Three Stage Model of Unionised Employment and  
Compulsory and Voluntary Union Membership



Data limitations prevent the three stage model from being estimated. In particular, the CSA survey records unionised employment status but not compulsory membership. The IMA survey, on the other hand, records

compulsory membership but not unionised employment. Faced with these data constraints, closed shop employment and voluntary union membership are modelled as a two-stage process (see Figure 5.3).

FIGURE 5.3  
Two-Stage Model of Closed Shop Employment and  
Voluntary Union Membership



*A Simple Model of Compulsory Membership*

The specification of a structural model of closed shop employment is potentially a complicated undertaking. Nevertheless, we shall sketch a simple model in order to gain some insight into the appropriate specification of a

reduced form equation which can be estimated given the available data.

Following the approach adopted in Chapter 4, workers are assumed to seek employment in a unionised establishment if they expect a utility gain from doing so (ie. if  $I_i^* > 0$ , where  $I_i^*$  is the expected utility gain from employment in the unionised sector). If there is a queue for unionised employment, the worker is selected from the queue if  $C_i^* > 0$ , where  $C_i^*$  is an unobserved index which captures the propensity of the individual to be chosen from the queue. Thus, the probability that the worker is employed by a unionised firm is

$$\begin{aligned} Pr(UE_i = 1) &= Pr(I_i^* > 0 \ \& \ C_i^* > 0) \\ &= Pr(I_i = 1 \ \& \ C_i = 1) \\ &= Pr(C_i = 1 \mid I_i = 1) Pr(I_i = 1) \end{aligned} \tag{5.1}$$

Now, we assume that a fixed proportion of the unionised jobs that the individual is interested in,  $a_i$ , are in closed shops. The probability that the worker is selected by a closed shop employer is therefore  $a_i Pr(C_i = 1 \mid I_i = 1) Pr(I_i = 1)$ . Conversely, the probability of being selected by a unionised open shop employer is  $(1 - a_i) Pr(C_i = 1 \mid I_i = 1) Pr(I_i = 1)$ .

To simplify the analysis, assume that there are no pre-entry closed shops (that is, workers are only required to become a union members after

securing employment in a closed shop)<sup>8</sup>. Now if the worker  $i$  is selected from the queue by a closed shop employer, he or she must either accept or reject the offer. A worker who expects a net utility gain from membership (ie. for whom  $U_i^* > 0$ ) will always accept the offer of employment in a closed shop, and he or she will also always accept an offer of open shop unionised employment.

A worker who expects a net utility loss from membership, but a utility gain from unionised employment, will always accept an offer of employment in a unionised open shop. However, if such a worker is offered employment in a closed shop he or she will only accept the offer if the expected utility gain from being certain of unionised employment is greater than the utility loss from membership.

Unfortunately, data limitations prevent us from estimating a structural model of closed shop employment. As an alternative, we assume that the propensity to be employed in a closed shop is approximated by an unobserved index,  $CS_i^*$ , which is a function of personal and human capital characteristics (which we assume capture the worker's desire for unionised employment and union membership, as well signalling the worker's productivity to unionised employers), and as a function of job-related characteristics (which are assumed to capture variations in the supplies of unionised and closed shop employment across different segments of the labour market); that is

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<sup>8</sup>This assumption is not unduly restrictive as only a small proportion of closed shops are pre-entry closed shops. (As noted in Chapter 3, Wright (1981) reports that only 3.3 percent of compulsory union members are employed in pre-entry closed shops).



$$CS_i^* = T_i\kappa + v_{1i} \quad (5.2)$$

where  $T_i$  is a vector of characteristics and  $v_{1i}$  is a normally distributed random error term (ie.  $v_{1i} \sim N(0, \sigma_1^2)$ ). The probability that the individual  $i$  is employed in a closed shop is therefore

$$\begin{aligned} Pr(CS_i^* = 1) &= Pr(T_i\kappa + v_{1i} > 0) \\ &= Pr(v_{1i} > -T_i\kappa) \\ &= \Phi_1(T_i\kappa) \end{aligned} \quad (5.3)$$

where  $\Phi_1$  is the normal distribution function.

### *Open Shop Union Membership*

Recall from Chapter 3 that the expected utility gain from union membership is assumed to be a function of personal and job-related characteristics:

$$U_i^* = X_i\beta + v_{2i} \quad (5.4)$$

where  $v_{2i}$  is a normally distributed random error term (ie.  $v_{2i} \sim N(0, \sigma_2^2)$ ).

Ideally, we would like to model the individual's union membership decision conditional on the individual being employed in a unionised open shop. However, as we lack data on union presence, the decision is modelled

conditional on open shop employment only.

Conditional on open shop employment, the expected utility gain from membership is

$$\begin{aligned}(U_i^* | CS_i = 0) &= (X_i | CS_i = 0)\beta + (v_{2i} | CS_i = 0) \\ &= X_i\beta + (v_{2i} | CS_i = 0)\end{aligned}\quad (5.5)$$

If  $v_{2i}$  is distributed as a standard normal variable conditional on the worker being employed in an open shop, then independent probit estimation of (5.5) is consistent. However, in general, the conditional density of  $(v_{2i} | CS_i^* = 0)$  is

$$f(v_{2i} | v_{1i} < -T_i\kappa) = \frac{\int_{-\infty}^{-T_i\kappa} \phi_2(v_{2i}, v_{1i}; \sigma_{12}) dv_{1i}}{\Phi_1(-T_i\kappa)} \quad (5.6)$$

If  $v_{1i}$  and  $v_{2i}$  are correlated the conditional density function is non-normal and independent probit estimation applied to (5.5) is not consistent. However, if  $v_{1i}$  and  $v_{2i}$  are independently distributed (ie.  $\sigma_{12} = 0$ ), (5.6) collapses to the standard normal density function, and standard independent probit estimation is consistent.

As in Chapter 4, if the errors are correlated then standard probit estimation of the union membership equation will yield biased parameter estimates. The selection bias arises if workers have unmeasured attributes which indicate not only that they are more (or less) likely to be employed in open shops, but which also indicate that they are more (or less) likely to

become union members.

If  $\nu_{1i}$  and  $\nu_{2i}$  are correlated, the appropriate bivariate probit likelihood function can be derived in a similar fashion to the likelihood function derived in the previous chapter:

$$L = \prod_{i=1}^{N_1} \Phi_2(-T_i\kappa, X_i\beta; \sigma_{12}) \prod_{i=N_1+1}^N \Phi_2(-T_i\kappa, -X_i\beta; \sigma_{12}) \prod_{i=N+1}^M \Phi_1(T_i\kappa) \quad (5.7)$$

where  $N_1$  is the number of union members in open shops,  $N$  is the total number of workers in open shops and  $M$  is the number of workers in both open and closed shops.

#### 5.4 Empirical Analysis

Table 5.2 reports the bivariate probit estimates for the model of open shop employment and union membership defined by equation (5.7). Column I gives the open shop employment estimates and column II gives the union membership estimates. For comparison, the table also reports the simple independent probit estimates of the union membership equation using the subsample of workers employed in open shops.

Consider, first, the open shop employment estimates presented in column I. Note that because the estimated model is a reduced form approximation of a more complicated structural model, a great deal of caution needs to be exercised in interpreting the estimates. In particular, we cannot be

certain to what extent the estimates reflect the desire of workers for open shop employment or to what extent they reflect variations in the availability of open and closed shop jobs.

In preliminary work, a more general specification of the open shop employment equation (than that reported in Table 5.2) was estimated. In addition to the variables included in the reported equation, the general specification also included political affiliation and hours of work. Using likelihood ratio tests (see Table 5.3) these variables were found to be insignificant and were dropped from the reported equation.<sup>9</sup>

The estimates presented in column I of Table 5.2 show that closed shop employment is largely a blue-collar phenomenon. This is evidenced by the positive coefficients of the professional, clerical and managerial variables which indicate that workers in these occupations are more likely to be in open shop employment than manual workers (plant and machine operators or labourers). In particular, a marginal effect calculation indicates that a manager's probability of open shop employment is approximately 21 percentage points higher than a labourer's.

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<sup>9</sup>One further variable which is not included in the reported equation is employment tenure. At first glance, it would seem that this variable should not be included as a determinant of open shop employment because it is not relevant at the time of the employment decision. But in establishments with less than 100 percent union membership it can be argued that those workers with longer tenure are more likely to have been promoted to jobs which are less likely to be covered by closed shop arrangements. On balance, however, tenure is omitted because the seniority effect is also captured by the experience, occupation and supervisory variables.

TABLE 5.2  
Union Membership and Open Shop Employment: Probit Estimates<sup>†</sup>

|                                         | Bivariate Probit                |       |                                        | Independent Probit                |       |                                   |       |
|-----------------------------------------|---------------------------------|-------|----------------------------------------|-----------------------------------|-------|-----------------------------------|-------|
|                                         | (I)                             |       |                                        | (II)                              |       | (III)                             |       |
|                                         | Open Shop Employment<br>Pr(C=0) |       |                                        | Union Membership<br>Pr(U=1   C=0) |       | Union Membership<br>Pr(U=1   C=0) |       |
|                                         | $\hat{\beta}$                   | s.e.  | Marginal<br>Effect<br>(%) <sup>§</sup> | $\hat{\beta}$                     | s.e.  | $\hat{\beta}$                     | s.e.  |
| Experience                              | -0.001                          | 0.011 | -0.0                                   | 0.028*                            | 0.015 | 0.028*                            | 0.015 |
| (Experience) <sup>2</sup>               | 0.000                           | 0.000 |                                        | -0.001**                          | 0.000 | -0.001**                          | 0.000 |
| Education (years)                       | 0.021                           | 0.016 | 0.6                                    | -0.003                            | 0.020 | -0.005                            | 0.020 |
| Tenure in current job                   | -                               | -     | -                                      | 0.095***                          | 0.018 | 0.096***                          | 0.017 |
| (Tenure) <sup>2</sup>                   | -                               | -     | -                                      | -0.002***                         | 0.001 | -0.002***                         | 0.001 |
| Hours of work                           | -                               | -     | -                                      | 0.054***                          | 0.015 | 0.054***                          | 0.013 |
| (Hours) <sup>2</sup>                    | -                               | -     | -                                      | -0.001***                         | 0.000 | -0.001***                         | 0.000 |
| <b>Current occupation:</b>              |                                 |       |                                        |                                   |       |                                   |       |
| Manager, administrator                  | 1.07***                         | 0.17  | 20.9                                   | -0.72**                           | 0.34  | -0.84**                           | 0.22  |
| Professional                            | 0.73***                         | 0.14  | 17.1                                   | -0.32                             | 0.24  | -0.41**                           | 0.17  |
| Para-professional                       | 0.66***                         | 0.14  | 15.8                                   | -0.25                             | 0.24  | -0.33*                            | 0.18  |
| Tradesperson                            | 0.19**                          | 0.11  | 5.7                                    | -0.37**                           | 0.18  | -0.40**                           | 0.16  |
| Clerk                                   | 0.74***                         | 0.13  | 17.1                                   | -0.38                             | 0.24  | -0.47***                          | 0.16  |
| Salesperson                             | 0.30**                          | 0.14  | 8.6                                    | -0.32                             | 0.22  | -0.36*                            | 0.19  |
| Plant and machine operator              | -0.05                           | 0.12  | -1.7                                   | -0.14                             | 0.19  | -0.13                             | 0.19  |
| <b>Sector of employment:</b>            |                                 |       |                                        |                                   |       |                                   |       |
| Public sector                           | -0.46***                        | 0.11  | -16.6                                  | 0.65***                           | 0.16  | 0.70***                           | 0.12  |
| <b>Workplace size:</b>                  |                                 |       |                                        |                                   |       |                                   |       |
| 2-20 employees                          | 0.66***                         | 0.10  | 15.9                                   | -0.31*                            | 0.18  | -0.38***                          | 0.13  |
| 21-50 employees                         | 0.40***                         | 0.12  | 10.7                                   | 0.07                              | 0.16  | 0.03                              | 0.14  |
| 51-100 employees                        | 0.15                            | 0.12  | 4.5                                    | -0.01                             | 0.16  | -0.03                             | 0.16  |
| 101-500 employees                       | -0.08                           | 0.11  | -2.7                                   | -0.06                             | 0.15  | -0.05                             | 0.14  |
| <b>Industry of employment:</b>          |                                 |       |                                        |                                   |       |                                   |       |
| Agriculture, mining                     | -0.20                           | 0.26  | -6.6                                   | -0.98**                           | 0.39  | -0.99***                          | 0.39  |
| Manufacturing                           | -0.47***                        | 0.14  | -16.6                                  | -0.45**                           | 0.18  | -0.41***                          | 0.16  |
| Electricity, gas and water              | -0.55**                         | 0.26  | -20.0                                  | 0.08                              | 0.35  | 0.14                              | 0.34  |
| Construction                            | -0.69***                        | 0.18  | -25.1                                  | -0.42                             | 0.26  | -0.36                             | 0.23  |
| Wholesale and retail trade              | -0.31*                          | 0.16  | -10.2                                  | -0.61***                          | 0.20  | -0.61***                          | 0.19  |
| Transport and storage                   | -0.75***                        | 0.15  | -27.8                                  | -0.04                             | 0.26  | 0.04                              | 0.22  |
| Communication                           | -0.65***                        | 0.20  | -23.7                                  | 0.39                              | 0.36  | 0.47*                             | 0.28  |
| Finance, property and business services | -0.35**                         | 0.16  | -12.1                                  | 0.20                              | 0.18  | 0.23                              | 0.16  |
| Recreational and personal services      | -0.31*                          | 0.18  | -10.8                                  | -0.48**                           | 0.22  | -0.47**                           | 0.22  |
| <b>Location of residence:</b>           |                                 |       |                                        |                                   |       |                                   |       |
| Other urban location                    | 0.13                            | 0.12  | 3.8                                    | 0.37**                            | 0.14  | 0.36***                           | 0.14  |
| Rural location                          | 0.07                            | 0.11  | 2.3                                    | 0.35**                            | 0.14  | 0.35***                           | 0.13  |
| <b>State of residence:</b>              |                                 |       |                                        |                                   |       |                                   |       |
| Victoria                                | -0.02                           | 0.08  | -0.5                                   | -                                 | -     | -                                 | -     |

|                                                  |            |      |       |          |           |          |      |
|--------------------------------------------------|------------|------|-------|----------|-----------|----------|------|
| Queensland                                       | -0.11      | 0.11 | -4.0  | -        | -         | -        | -    |
| South Australia                                  | -0.09      | 0.12 | -2.9  | -        | -         | -        | -    |
| Western Australia                                | 0.38***    | 0.13 | 10.3  | -        | -         | -        | -    |
| Tasmania                                         | -0.68***   | 0.26 | -24.9 | -        | -         | -        | -    |
| Australian Capital Territory                     | 0.34       | 0.22 | 8.3   | -        | -         | -        | -    |
| <b>Migrant status:</b>                           |            |      |       |          |           |          |      |
| Non-English speaking background (NESB)           | -0.47*     | 0.25 | -16.8 | -0.30    | 0.36      | -0.27    | 0.36 |
| Migrated to Aust. 18 years or younger            | 0.08       | 0.12 | 2.4   | -0.12    | 0.15      | -0.14    | 0.14 |
| Migrated to Aust. after 18 years of age          | 0.10       | 0.10 | 3.1   | 0.00     | 0.13      | -0.02    | 0.13 |
| (Migrated to Aust. 18 years or younger)*(NESB)   | 0.45       | 0.33 | 11.8  | 0.13     | 0.46      | 0.10     | 0.47 |
| (Migrated to Aust. after 18 years of age)*(NESB) | 0.23       | 0.27 | 6.8   | 0.50     | 0.39      | 0.49     | 0.39 |
| <b>Sex:</b>                                      |            |      |       |          |           |          |      |
| Female                                           | 0.24***    | 0.08 | 6.9   | 0.02     | 0.11      | 0.00     | 0.10 |
| <b>Importance of job security:</b>               |            |      |       |          |           |          |      |
| Job security important in a job                  | -0.06      | 0.08 | -2.0  | 0.22**   | 0.11      | 0.23**   | 0.10 |
| <b>Political affiliation:</b>                    |            |      |       |          |           |          |      |
| Labor voter                                      | -          | -    | -     | 0.29***  | 0.10      | 0.29***  | 0.10 |
| Coalition voter                                  | -          | -    | -     | 0.01     | 0.12      | 0.01     | 0.12 |
| Constant                                         | 0.14       | 0.29 | -     | -2.38*** | 0.56      | -2.23*** | 0.48 |
| $\sigma_{12}$                                    | 0.25       | 0.43 | -     | -        | -         | -        | -    |
| <hr/>                                            |            |      |       |          |           |          |      |
| Log-likelihood                                   | -1633.87   |      |       |          | -601.77   |          |      |
| 2(lnL-lnL <sub>0</sub> ) ( $\chi^2$ )            | 435.68***† |      |       |          | 437.40*** |          |      |
| Pseudo R <sup>2</sup>                            | 0.17‡      |      |       |          | 0.27      |          |      |
| Number of cases                                  | 2085       |      |       |          | 1486      |          |      |

**Notes:**

Values of 0.000 or -0.000 reflect absolute values rounded to less than  $\pm 0.001$

\*significant at 10% (two-tailed *t*-test for coefficients)

\*\*significant at 5% (two-tailed *t*-test for coefficients)

\*\*\*significant at 1% (two-tailed *t*-test for coefficients)

§Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.

†Base categories for dummy variables: Occupation - Labourer; Sector - Private sector;

Establishment size - 500 or more employees; Industry - Public administration and defence, and community services industries; Political affiliation - no party affiliation or minor party affiliation; Location of residence - major urban centre (100,000+ residents); State of residence - New South Wales; Migrant status - Australian born, English-speaking background.

Estimated equations also include marital status and supervisory dummies.

‡Estimated from an independent probit model of open shop employment.

TABLE 5.3  
Likelihood Ratio Tests of Joint Significance - Open Shop Employment Probit

| <i>Category</i>        | $\chi^2$             | <i>Degrees of Freedom</i> |
|------------------------|----------------------|---------------------------|
| Occupation             | 79.99 <sup>***</sup> | 7                         |
| Workplace size         | 79.90 <sup>***</sup> | 5                         |
| Industry of employment | 34.69 <sup>***</sup> | 9                         |
| Location of residence  | 1.35                 | 2                         |
| State of residence     | 23.34 <sup>***</sup> | 6                         |
| Migrant status         | 13.64 <sup>**</sup>  | 5                         |
| Political affiliation  | 1.78                 | 2                         |
| Marital status         | 4.92 <sup>***</sup>  | 2                         |

\*significant at 10%

\*\*significant at 5%

\*\*\*significant at 1%

The industry coefficients are probably best interpreted as measuring variations in the relative supplies of open and closed shop jobs. All the coefficients are negative indicating that a worker employed in one of the omitted industries - community services or public administration - has a higher probability of being in open shop employment than if he or she were employed in another industry. Employees in the construction, and transport and storage industries have the lowest estimated probability of open shop employment, holding all other characteristics constant.

The estimated public sector coefficient is negative. This indicates that, controlling for the other determinants of open shop employment, public sector

employees are less likely to be in open shop employment than similar private sector employees. (On average, the difference is approximately 17 percentage points).

In Chapter 3 we saw that data from the Australian Workplace Industrial Relations Survey (AWIRS) show that unions are more likely to be present in larger workplaces. The estimates presented here suggest that there is also a greater incidence of compulsory membership arrangements in larger establishments.

There are several explanations for the higher rate of closed shop employment in larger workplaces.

The first explanation is that unions are more likely to devote the necessary resources to pressure for and maintain compulsory membership arrangements when these arrangements promise to deliver a large number of members. In other words, it may simply be uneconomic for a union to maintain a closed shop in a workplace where the number of members at stake is small.

A second, less compelling, explanation is that in larger groups there is greater scope for free-riding. Therefore, in order to overcome the free-rider problem, unions are more inclined to seek compulsory membership arrangements in larger workplaces. Finally, it can be argued that the collective voice benefits are greater in larger workplaces and that management in these plants may be more inclined to promote union membership, (including support for closed shop arrangements), in order to reap the productivity benefits from union involvement at the workplace.



At the time the IMA data were collected (1988), approximately 50 percent of Australian employees were covered by state awards or industrial agreements. There is some evidence that differences in the treatment of compulsory unionism across the different state jurisdictions impact on the individual's probability of open shop employment.

For example, Tasmania was the only state in which awards could sanction closed shop arrangements (Weeks, 1987). Indeed, the negative coefficient on the Tasmania dummy variable indicates that a Tasmanian employee has a lower probability of open shop employment than a similar worker in another state.

In 1988 two states, Western Australia and Victoria, prohibited any form of preference arrangement in awards. However, only the Western Australia coefficient is positive and significant. Interestingly, prior to 1979 Western Australia had a history of official preference and compulsory unionism, while Victoria has never had any formal preference or closed shop arrangements (Weeks, 1987). It seems that informal closed shop practices were better entrenched in Victoria than in Western Australia where unions had previously relied on formal preference and closed shop arrangements.

Next, the female coefficient is significant and positive, indicating that a female worker has a higher estimated probability of open shop employment than a male with similar attributes. We should exercise caution in interpreting the coefficient, however. For example, it is not clear whether the positive relationship is due to a lower availability of closed shop employment in jobs with higher rates of female employment, or due to women choosing open shop

employment in preference to closed shop employment.

Only one of the migrant and non-English speaking coefficients is significant at the 10 percent level.<sup>10</sup> In particular, it is estimated that a worker from a non-English speaking background has an estimated probability of open shop employment of 17 percentage points lower than a similar individual from an English-speaking background. Once again, we cannot be certain to what extent this is a demand-related phenomenon (ie. whether workers with a non-English speaking background have a greater desire for closed shop employment than workers with an English speaking background), or to what extent it is a supply related phenomenon.

Finally, the education coefficient is positive indicating that more educated workers have a higher probability of open shop employment. However, the coefficient is not statistically significant.

A notable feature of the results reported is the insignificant t-statistic attached to the estimated covariance ( $\hat{\sigma}_{12}$ ) between the errors in the two equations.<sup>11</sup> This amounts to a test of sample selection bias; if the errors of the open shop employment and union membership equations are independent, then independent probit estimation of the union membership equation using the sub-sample of open shop employees is consistent. With this in mind, the discussion now focuses on a comparison of the independent probit estimates of

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<sup>10</sup>However, a likelihood ratio test indicates that jointly these variables are significantly different from zero at the 5 percent level (see Table 5.3).

<sup>11</sup>Furthermore, under the null hypothesis of  $\sigma_{12}=0$ , the log-likelihood of the bivariate model is equal to the sum of the log-likelihoods of the two separate probits. The calculated  $\chi^2$  for the relevant likelihood ratio test is only 0.02 implying that the null hypothesis that the open-shop employment equations are independent cannot be rejected.

the determinants of union membership using: (i) the sample of all employees and, (ii) the sub-sample of open shop employees. The estimates are presented in Table 5.4.

A quick comparison of the estimates in Table 5.4 reveals that many of the significant coefficients in the two equations have the same signs and are of similar orders of magnitude. At first glance, this would seem to support the view that the estimated coefficients of the union membership equation are not greatly biased by failing to separately account for compulsory union membership as suggested by Miller and Rummery (1989).

However, a closer inspection reveals several differences which are worthy of comment.

First, consider the wholesale and retail industry coefficient. It is well known that the main retail union, the Shop, Distributive and Allied Employees' Association, relies heavily on national compulsory membership agreements with the major retail firms (in 1969 before the membership agreements were established the SDA's membership stood at 39,900; two years later it had grown to 102,300, and by 1976 membership reached 135,200 (Weeks, 1987; Deery, 1989)). The impact of these arrangements is evident in the estimated coefficients. For the full sample, the coefficient is negative but not statistically significant, indicating that a sales industry worker does not have a significantly different probability of membership than a similar worker in the community services or public administration industries. However, for the open shop sample the sales industry coefficient is a larger negative number and is significant at the 1 percent level. This means that when the influence of the

closed shop is removed, a wholesale and retail industry employee has a significantly lower estimated probability of union membership than a similar worker in the community services or public administration industries. (The marginal effect suggests that the difference is approximately 11.2 percentage points).

In Chapter 2, considerable attention was paid to outlining the two leading models of voluntary union membership. According to the social custom model, workers in establishments where there is a social custom of union membership are induced to join a union in order to maintain a good reputation with their workmates. On the other hand, the insurance model posits that workers become union members in order to protect against arbitrary managerial decisions including unfair dismissal. While the two models are not necessarily mutually exclusive, we would naturally like to be able to establish the empirical relevance of each model.

TABLE 5.4  
Independent Probit Models of Union Membership<sup>†</sup>

|                                | Full Sample<br>Pr(U=1) |       |                                        | Open Shop Sample<br>Pr(U=1   C=0) |       |                                        |
|--------------------------------|------------------------|-------|----------------------------------------|-----------------------------------|-------|----------------------------------------|
|                                | $\hat{\beta}$          | s.e.  | Marginal<br>Effect<br>(%) <sup>§</sup> | $\hat{\beta}$                     | s.e   | Marginal<br>Effect<br>(%) <sup>§</sup> |
| Experience                     | 0.005                  | 0.011 | } 0.20                                 | 0.028*                            | 0.015 | } 0.70                                 |
| (Experience) <sup>2</sup>      | 0.000                  | 0.000 |                                        | -0.001**                          | 0.000 |                                        |
| Education (years)              | -0.015                 | 0.014 | -0.6                                   | -0.005                            | 0.020 | -0.1                                   |
| Tenure in current job          | 0.093***               | 0.013 | } 3.60                                 | 0.096***                          | 0.017 | } 2.50                                 |
| (Tenure) <sup>2</sup>          | -0.002***              | 0.000 |                                        | -0.002***                         | 0.001 |                                        |
| Hours of work                  | 0.019**                | 0.008 | } 0.80                                 | 0.054***                          | 0.013 | } 1.40                                 |
| (Hours) <sup>2</sup>           | 0.000**                | 0.000 |                                        | -0.001***                         | 0.000 |                                        |
| <i>Current occupation:</i>     |                        |       |                                        |                                   |       |                                        |
| Manager, administrator         | -1.14***               | 0.17  | -34.90                                 | -0.84***                          | 0.22  | -13.60                                 |
| Professional                   | -0.69***               | 0.13  | -24.30                                 | -0.41**                           | 0.17  | -8.50                                  |
| Para-professional              | -0.56***               | 0.14  | -20.30                                 | -0.33*                            | 0.18  | -7.20                                  |
| Tradesperson                   | -0.36***               | 0.11  | -13.70                                 | -0.40**                           | 0.16  | -8.40                                  |
| Clerk                          | -0.73***               | 0.12  | -25.40                                 | -0.47***                          | 0.16  | -9.40                                  |
| Salesperson                    | -0.35***               | 0.13  | -13.20                                 | -0.36*                            | 0.19  | -7.80                                  |
| Plant and machine operator     | -0.06                  | 0.12  | -2.20                                  | -0.13                             | 0.19  | -3.20                                  |
| <i>Supervisory status:</i>     |                        |       |                                        |                                   |       |                                        |
| Supervisor                     | -0.06                  | 0.07  | -2.40                                  | 0.06                              | 0.10  | 1.50                                   |
| <i>Sector of employment:</i>   |                        |       |                                        |                                   |       |                                        |
| Public sector                  | 0.71***                | 0.10  | 26.90                                  | 0.70***                           | 0.12  | 23.20                                  |
| <i>Workplace size:</i>         |                        |       |                                        |                                   |       |                                        |
| 1-20 employees                 | -0.64***               | 0.10  | -22.90                                 | -0.38***                          | 0.13  | -8.00                                  |
| 21-50 employees                | -0.26**                | 0.11  | -9.90                                  | 0.03                              | 0.14  | 0.90                                   |
| 51-100 employees               | -0.12                  | 0.12  | -4.80                                  | -0.03                             | 0.16  | -0.80                                  |
| 101-500 employees              | 0.07                   | 0.11  | 2.60                                   | -0.05                             | 0.14  | -1.30                                  |
| Workplace size not known       | -0.34                  | 0.21  | -12.90                                 | -0.28                             | 0.31  | -6.20                                  |
| <i>Industry of employment:</i> |                        |       |                                        |                                   |       |                                        |
| Agriculture, mining            | -0.43                  | 0.24  | -16.10                                 | -0.99***                          | 0.39  | -14.70                                 |
| Manufacturing                  | 0.04                   | 0.12  | 1.60                                   | -0.41***                          | 0.16  | -8.50                                  |
| Electricity, gas and water     | 0.20                   | 0.27  | 7.90                                   | 0.14                              | 0.34  | 3.90                                   |
| Construction                   | 0.26                   | 0.17  | 10.30                                  | -0.36                             | 0.23  | -7.70                                  |
| Wholesale and retail trade     | -0.15                  | 0.14  | -6.00                                  | -0.61***                          | 0.19  | -11.20                                 |
| Transport and storage          | 0.43***                | 0.17  | 17.10                                  | 0.04                              | 0.22  | 1.10                                   |
| Communication                  | 0.59**                 | 0.23  | 22.90                                  | 0.47*                             | 0.28  | 14.50                                  |

|                                                  |           |      |       |          |           |       |
|--------------------------------------------------|-----------|------|-------|----------|-----------|-------|
| Finance, property and business services          | 0.31**    | 0.14 | 12.40 | 0.23     | 0.16      | 6.60  |
| Recreational and personal services               | -0.07     | 0.16 | -2.60 | -0.47**  | 0.22      | -9.40 |
| <b>Location of residence:</b>                    |           |      |       |          |           |       |
| Other urban location                             | 0.15      | 0.11 | 6.20  | 0.36***  | 0.14      | 10.80 |
| Rural location                                   | 0.10      | 0.10 | 4.00  | 0.35***  | 0.13      | 10.40 |
| <b>Importance of job security:</b>               |           |      |       |          |           |       |
| Job security important in a job                  | 0.13*     | 0.07 | 5.30  | 0.23**   | 0.10      | 6.50  |
| <b>Political affiliation:</b>                    |           |      |       |          |           |       |
| Labor voter                                      | 0.17**    | 0.07 | 6.70  | 0.29***  | 0.10      | 8.40  |
| Coalition voter                                  | -0.05     | 0.09 | -1.90 | 0.01     | 0.12      | 0.30  |
| <b>Migrant status:</b>                           |           |      |       |          |           |       |
| Non-English speaking background (NESB)           | 0.15      | 0.23 | 5.90  | -0.27    | 0.36      | -6.10 |
| Migrated to Aust. 18 years or younger            | -0.11     | 0.10 | -4.20 | -0.14    | 0.14      | -3.30 |
| Migrated to Aust. after 18 years of age          | -0.02     | 0.10 | -1.00 | -0.02    | 0.13      | -0.50 |
| (Migrated to Aust. 18 years or younger)*(NESB)   | -0.20     | 0.30 | -7.60 | 0.10     | 0.47      | 2.80  |
| (Migrated to Aust. after 18 years of age)*(NESB) | 0.13      | 0.25 | 5.20  | 0.49     | 0.39      | 15.30 |
| <b>Sex:</b>                                      |           |      |       |          |           |       |
| Female                                           | -0.13*    | 0.08 | -5.10 | -0.00    | 0.10      | -0.10 |
| <b>Marital status:</b>                           |           |      |       |          |           |       |
| Married, defacto                                 | 0.02*     | 0.09 | 0.70  | -0.01    | 0.12      | -0.30 |
| Widowed, divorced, separated                     | 0.28*     | 0.15 | 11.10 | 0.12     | 0.20      | 3.20  |
| <b>Constant</b>                                  | -0.30     | 0.32 | -     | -2.23*** | 0.48      | -     |
| Log-likelihood                                   | -1121.45  |      |       |          | -601.77   |       |
| 2(lnL-lnL <sub>0</sub> ) ( $\chi^2$ )            | 638.15*** |      |       |          | 437.40*** |       |
| Pseudo R <sup>2</sup>                            | 0.22      |      |       |          | 0.27      |       |
| Number of cases                                  | 2088      |      |       |          | 1486      |       |

**Notes:**

Values of 0.000 or -0.000 reflect absolute values rounded to less than  $\pm 0.001$

\*significant at 10% (two-tailed *t*-test for coefficients)

\*\*significant at 5% (two-tailed *t*-test for coefficients)

\*\*\*significant at 1% (two-tailed *t*-test for coefficients)

<sup>§</sup>Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.

<sup>†</sup>Base categories for dummy variables: Occupation - Labourer; Sector - Private sector; Establishment size - 500 or more employees; Industry - Public administration and defence, and community services industries; Political affiliation - no party affiliation or minor party affiliation; Location of residence - major urban centre (100,000+ residents); Migrant status - Australian born, English-speaking background.

Unfortunately, given the available data, it is not possible to provide a clear-cut test of these models, even though the IMA data allow us to separately identify voluntary and compulsory union members. For example, the extent of union membership in the individual's place of work is not available in the data. (This information would indicate the level of support for unionism among the individual's fellow workers, and would therefore provide the basis of a test of the social custom model). Another problem is that by excluding all compulsory union members, the sample is potentially biased in favour of the insurance model.

There are two reasons why the sample of closed shop employees may contain a relatively high proportion of workers who, even if membership were not compulsory, would still join a union because of a workplace social custom. First, recall from Chapter 2 that, for the social custom model, a stable equilibrium level of membership is established at a very high level of workplace union density. Now, it can be argued that, if the high level of membership is maintained for some time, a formal (or informal) compulsory membership arrangement is likely to be reached with the employer. After all, what has the employer to lose from such an arrangement? Because the workforce is already highly unionised, the costs of implementing a closed shop are not great, but there may be appreciable benefits to the employer in the form of greater goodwill with the union.

Second, we must be aware that the social pressure to join a union in a location where membership is a strong social custom may be so great that an individual perceives union membership to be "compulsory" when, in actual



fact, it is not. Indeed, as previously mentioned, Crockett and Hall (1987) report that some school teachers in Western Australia nominated compulsion as the main reason for joining a union when, in fact, union membership was not compulsory for those workers.

While we must be cautious in interpreting any changes in the estimated parameters, the open shop sample yields estimates that appear to provide stronger support for the insurance model of membership than the full sample estimates.<sup>12</sup> For instance, the coefficient of the job security dummy variable (=1 if the individual says that job security is important in a job; =0 otherwise) has a greater degree of statistical significance and is slightly larger in the open shop equation than the full sample equation.

Similarly, consider the experience coefficient. To the extent that older workers face more limited job opportunities outside their present job, the insurance model predicts a positive coefficient. Estimating the membership equation for the full sample produces a positive but insignificant coefficient. However, using the open shop sample, the coefficient is much larger and is significant at the 5 percent level. In particular, the estimated coefficient indicates that (evaluated at the means of all the independent variables), an additional year of labour market experience increases an individual's probability of union membership by approximately 0.7 of a percentage point.

In the full sample equation, the rural and other urban coefficients are insignificant. However, it is commonly thought that employees outside the

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<sup>12</sup>Note that we do not mean to suggest that the estimates favour the insurance model over the social custom model. Rather, we wish to show that the estimates are consistent with an insurance model of union membership.

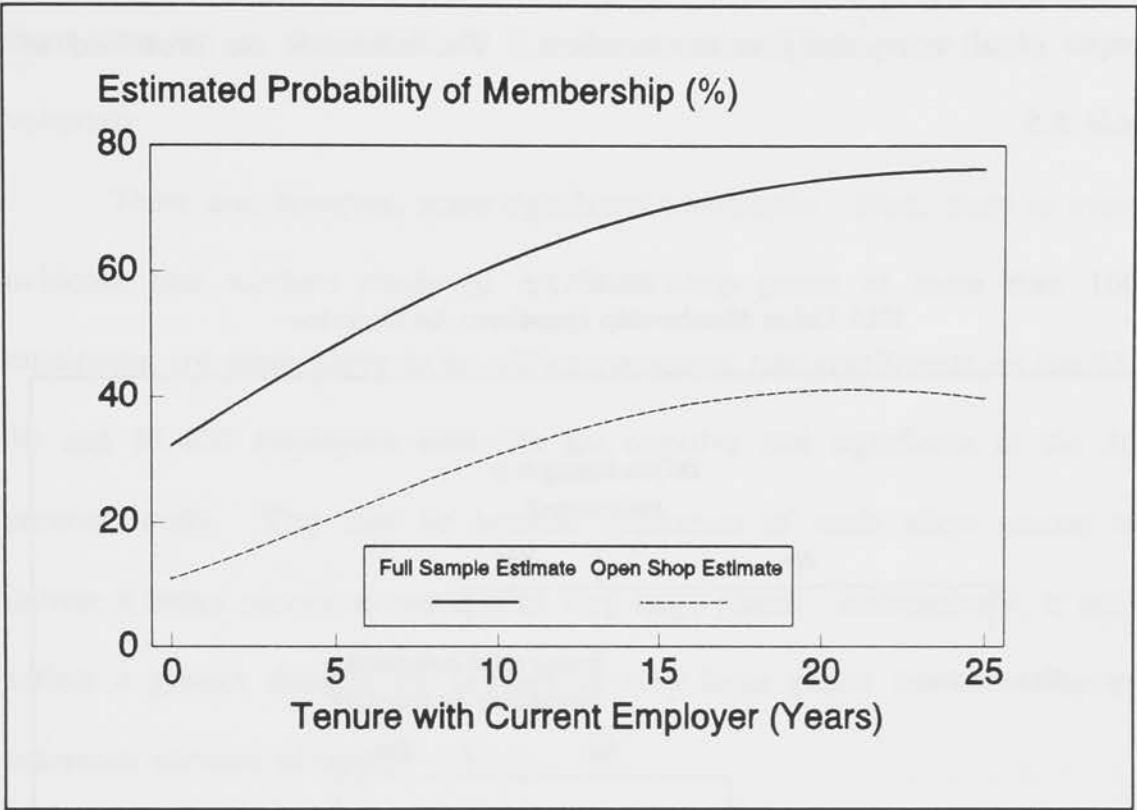


major metropolitan areas have more limited alternative job opportunities. If this is correct, the insurance model would predict positive coefficients. Indeed, the estimated coefficients in the open shop equation are positive and significant.

Finally, the largest and most substantial difference in the full-sample and open shop estimates is the change in the constant term. In the full sample model, the estimated constant coefficient is -0.30. In contrast, the open shop estimate of the constant term is -2.23 (and is statistically significant at the 1 percent level).

A clear illustration of the impact of the change in the constant term is provided by Figure 5.4. Here we plot job tenure and the estimated probability of union membership for a stylised individual whose characteristics are the same as the sample means of independent variables (excluding tenure). Using the standard (full-sample) parameter estimates, the stylised individual with zero years tenure has a probability of union membership of 32 percent. After 25 years tenure the estimated probability of membership rises to 76 percent. However, using the open shop parameter estimates the stylised individual's estimated probability of membership starts at just 11 percent and rises to 41 percent after twenty year's tenure.

FIGURE 5.4  
Tenure and Estimated Probability of Membership:  
Open Shop and Full Sample Estimates



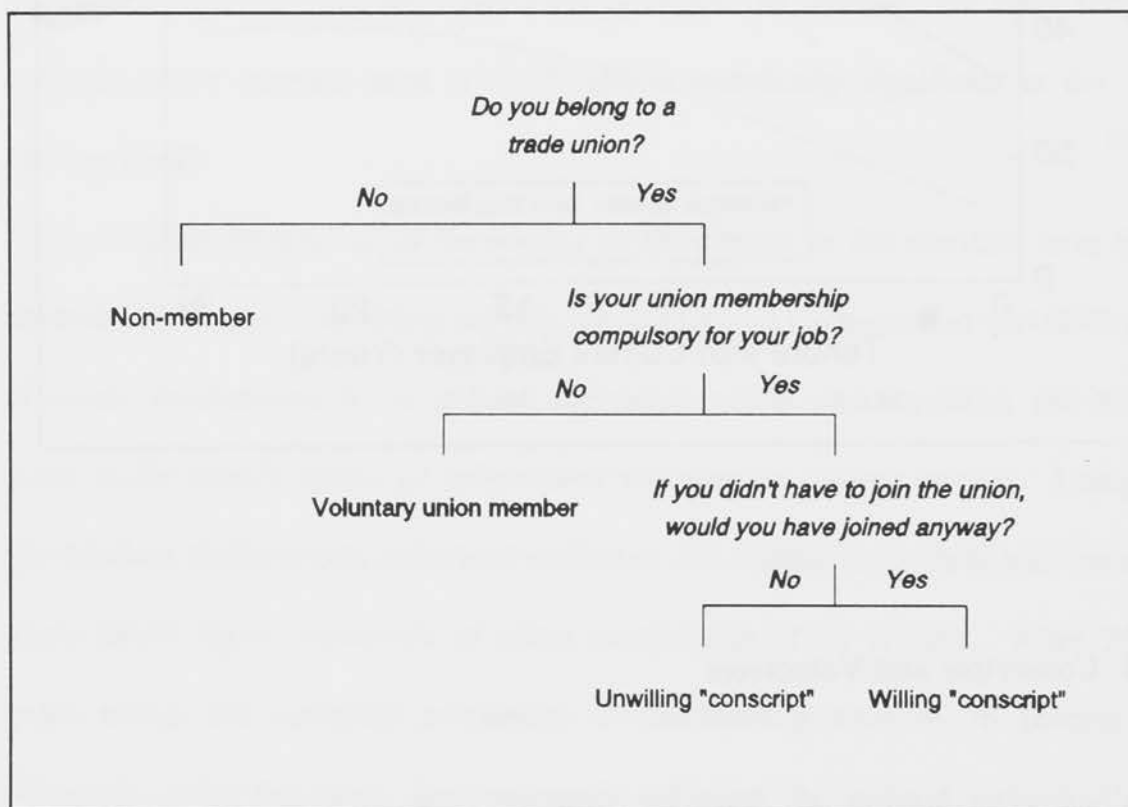
5.5 Conscripts and Volunteers

Rawson (1978) calls union members in open shops "volunteers", while those in closed shops are "conscripts". He notes that some conscripts would join a union even if membership was not compulsory; these conscripts are called "willing conscripts". The remaining compulsory members are called "unwilling conscripts".

In the IMA survey, compulsory union members are asked if they would have joined the union even if membership was not compulsory (see Figure 5.5). Of the closed shop employees, 54 percent are willing conscripts.

What determines whether a conscript is a willing or unwilling union member? To answer this question, we estimate a probit model using the sample of all compulsory union members. The estimates are presented in Table 5.5.

FIGURE 5.5  
IMA Union Membership Questions: An Overview



The most striking feature of the estimates is the lack of significance of most coefficients. Variables which are routinely found to be significant determinants of union membership such as occupation, tenure and hours of work are all insignificant. This could be because a response to the intention to join question is motivated by the respondent's current attitude towards his or

her union. That is, the response may be a better indication of his or her current opinion of the performance of the union, and may be quite different from what he or she would do if union membership were, in actual fact, voluntary.

There are, however, some significant coefficients. First, there is some evidence that workers employed in closed shop plants of more than 100 employees are more likely to be willing conscripts (the coefficients on the 21-50 and 51-100 employees dummies are negative and significant at the 10 percent level). This may be because economies of scale allow unions to deliver a better service to workers in very large plants. Alternatively, it may reflect a greater demand by workers in very large plants for the voice or insurance services of unions.

Public sector employees in closed shops are more likely say that they would voluntarily join their union. Again, we cannot be sure whether this is a demand or supply related phenomenon. For example, there may be a greater desire by individuals for the voice services of unions in large bureaucratic settings. Alternatively, the public sector setting may allow unions to deliver a better, more comprehensive service to their members than would usually be possible in the private sector.

Finally, political affiliation strongly influences whether an individual in a closed shop is likely to state a willingness to voluntarily join the union. For example, it is estimated that the probability of a Labor voter saying that he or she would be willing to voluntarily join the union is approximately 30 percentage points higher than for a Coalition voter.

TABLE 5.5  
Willingness to Join a Union: Probit Estimates<sup>†</sup>

|                                         | Estimated<br>Coefficient | Standard<br>Error | Marginal Effect<br>(%) <sup>§</sup> |
|-----------------------------------------|--------------------------|-------------------|-------------------------------------|
| Experience                              | 0.032                    | 0.020             | } 1.2                               |
| (Experience) <sup>2</sup>               | -0.001                   | 0.000             |                                     |
| Education (years)                       | -0.029                   | 0.025             | -1.1                                |
| Tenure in current job                   | 0.009                    | 0.022             | } 0.4                               |
| (Tenure) <sup>2</sup>                   | 0.000                    | 0.001             |                                     |
| Hours of work                           | -0.011                   | 0.017             | } 0.4                               |
| (Hours) <sup>2</sup>                    | 0.000                    | 0.000             |                                     |
| <i>Current occupation:</i>              |                          |                   |                                     |
| Manager, administrator                  | 0.18                     | 0.42              | 6.9                                 |
| Professional                            | 0.34                     | 0.28              | 13.0                                |
| Para-professional                       | 0.54*                    | 0.29              | 19.4                                |
| Tradesperson                            | -0.03                    | 0.16              | -1.3                                |
| Clerk                                   | -0.07                    | 0.25              | -2.9                                |
| Salesperson                             | 0.29                     | 0.28              | 11.2                                |
| Plant and machine operator              | -0.13                    | 0.17              | -5.0                                |
| <i>Sector of employment:</i>            |                          |                   |                                     |
| Public sector                           | 0.46***                  | 0.20              | 16.9                                |
| <i>Industry of employment:</i>          |                          |                   |                                     |
| Agriculture, mining                     | 0.08                     | 0.51              | 3.2                                 |
| Manufacturing                           | 0.05                     | 0.26              | 2.1                                 |
| Electricity, gas and water              | 0.11                     | 0.38              | 4.4                                 |
| Construction                            | -0.03                    | 0.30              | -1.3                                |
| Wholesale and retail trade              | -0.22                    | 0.32              | -8.9                                |
| Transport and storage                   | 0.07                     | 0.27              | 2.6                                 |
| Communication                           | -0.17                    | 0.33              | -6.9                                |
| Finance, property and business services | 0.28                     | 0.31              | 10.7                                |
| Recreational and personal services      | 0.39                     | 0.35              | 14.5                                |
| <i>Workplace size:</i>                  |                          |                   |                                     |
| 1-20 employees                          | -0.19                    | 0.18              | -7.4                                |
| 21-50 employees                         | -0.36*                   | 0.20              | -14.40                              |
| 51-100 employees                        | -0.37*                   | 0.20              | -14.6                               |
| 101-500 employees                       | -0.17                    | 0.16              | -6.8                                |
| <i>Importance of job security:</i>      |                          |                   |                                     |
| Job security important in a job         | -0.06                    | 0.14              | -2.5                                |
| <i>Political affiliation:</i>           |                          |                   |                                     |
| Labor voter                             | 0.35***                  | 0.13              | 13.0                                |
| Coalition voter                         | -0.65***                 | 0.17              | -25.2                               |

**Sex:**

|                                       |                      |                       |       |
|---------------------------------------|----------------------|-----------------------|-------|
| Female                                | -0.40 <sup>***</sup> | 0.15                  | -15.8 |
| Constant                              | 0.38                 | 0.60                  | -     |
| <hr/>                                 |                      |                       |       |
| Log-likelihood                        |                      | -357.69               |       |
| 2(lnL-lnL <sub>0</sub> ) ( $\chi^2$ ) |                      | 107.50 <sup>***</sup> |       |
| Pseudo R <sup>2</sup>                 |                      | 0.13                  |       |
| Number of cases                       |                      | 599                   |       |

Notes: Values of 0.000 or -0.000 reflect absolute values rounded to less than  $\pm 0.001$

<sup>\*</sup>significant at 10 % (two-tailed *t*-test for coefficients)

<sup>\*\*</sup>significant at 5 % (two-tailed *t*-test for coefficients)

<sup>\*\*\*</sup>significant at 1 % (two-tailed *t*-test for coefficients)

<sup>§</sup>Effect of a one-unit change in the independent variable on the probability of union membership with all independent variables set at their mean values.

<sup>†</sup>Base categories for dummy variables: Occupation - Labourer; Sector - Private sector; Establishment size - 500 or more employees; Political affiliation - no party affiliation or minor party affiliation.

Estimated equation also includes marital status, migrant status, supervisory status, and location of residence dummy variables.

## 5.6 The Impact of the Closed Shop

In the full IMA sample, approximately 46 percent of wage and salary earners are union members. However, almost 60 percent of these union members are employed in closed shops. Naturally, this raises the question of what the overall union membership density would be if there were no compulsory unionism?

One answer, of course, is to accept that 54 percent of compulsory union members would do as they say and still join a union if membership were voluntary. If this were to actually happen, the aggregate union density rate would drop to 33.5 percent; that is, the overall level of union membership would drop by over 25 percent.

The problem with this estimate is that it relies on compulsory members'

responses to the question: "If you didn't have to join the union, would you have joined anyway?" Unfortunately, as noted above, this question has a certain opinion survey quality about it, and it may not necessarily indicate what workers would actually do if membership were voluntary.

Another way of estimating the impact of the closed shop is to use the open shop parameter estimates to predict how many closed shop employees would voluntarily join a union. However, before doing this some new notation is defined.

Following Farber (1990), the average predicted probability of union membership for workers in category  $j$  using the coefficients for the open shop probit (column IV) in Table 5.2 is

$$P(X_j, \hat{\beta}_o) = \frac{\sum_{i=1}^{n_j} \Phi(X_{ij} \hat{\beta}_o)}{n_j} \quad (5.8)$$

where  $n_j$  is the number of workers in the  $j$ th category,  $X_j$  is a vector of characteristics for each worker in the  $j$ th category and  $\hat{\beta}_o$  is the vector of open shop parameter estimates of the membership equation. The term  $\Phi(X_{ij} \hat{\beta}_o)$  estimates the probability that the  $i$ th worker in the  $j$ th category is a union member using the open shop coefficients. These terms are then summed for all workers in the category, and divided by the number of workers in the category to give the estimated union density (or average predicted probability of membership).

The actual union density rate for employees in open shops is 24.1 percent. Now, the average predicted probability of membership for employees in open shops ( $j=0$ ) using the estimated parameters from the probit model of open shop union membership is given by  $P(X_o\hat{\beta}_o)$ . This is calculated to be 24.2 percent (see Table 5.6).

By definition, the actual rate of membership for closed shop employees is 100 percent. But what would it be if there were no compulsory union membership? One estimate is given by  $P(X_{ic}\hat{\beta}_o)$ , where the subscript "c" indicates that the sample used consists of closed shop employees. That is, the open shop parameters are used to determine what proportion of closed shop workers would still join a union if membership were not compulsory. Using this method, we estimate that only 35.3 percent of all compulsory union members would still join a union if they were not employed under a closed shop arrangement (see Table 5.6). Even so, this estimate is still substantially higher than the 24 percent of workers in open shops who are union members. What this suggests is that compulsory unionism is more likely in those sectors that are more conducive to union organisation, or among workers who are more likely to voluntarily desire union membership, or both. Nevertheless, this estimate contrasts starkly with the view that compulsory unionism has no significant impact on union density because those workers employed in closed shops would have joined anyway.

An alternative estimate of what the union membership density would be for closed shop employees if membership were not compulsory is given by  $P(X_c\hat{\beta}_v)$ . Instead of the open shop estimates, we use the parameter estimates



from a probit model of voluntary union membership. Here the dependent variable is equal to one if the individual is a union member in an open shop or is a closed shop employee who says that he or she would voluntarily join the union, otherwise the dependent variable is zero. Using the voluntary membership estimates, the average predicted probability of union membership for closed shop employees is 43.1 percent.

If there was no compulsory union membership, what would be the average probability of union membership for all workers? This can be estimated by calculating  $P(X_i\hat{\beta}_o)$ , (that is, by applying the estimated voluntary union membership coefficients to the full sample of workers - both those in closed shops and those in open shops), an alternative estimate is given by  $P(X_i\hat{\beta}_v)$ . The two estimates indicate that if there were no compulsory membership, the overall union density rate would fall substantially: from 45.9 percent<sup>13</sup> to somewhere between 27.4 and 33.0 percent.

The estimates presented in Table 5.6 also highlight the importance of the closed shop in the private sector. For example, it is estimated that approximately 65 percent of compulsory members in the public sector would still join if membership were voluntary. In contrast, it is estimated that only 24 to 34 percent of private sector employees in closed shops would voluntarily join a union.

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<sup>13</sup>The actual union density rate for all employees is reported to be 45.9 percent in Table 5.6 and as 45.5 percent in Table 5.1. The difference arises because only the general sample is used to calculate the means reported in Table 5.1. Table 5.6 is based on the full IMA sample.

TABLE 5.6  
Predicted and Actual Average Probabilities of Union Membership

| Sample:                                         | Average Predicted Probability<br>of Membership (%) |                       | Actual<br>Membership<br>Density (%) |
|-------------------------------------------------|----------------------------------------------------|-----------------------|-------------------------------------|
|                                                 | Using $\hat{\beta}_o$                              | Using $\hat{\beta}_v$ |                                     |
| <i>Private and public sectors:</i>              |                                                    |                       |                                     |
| Open shop employees                             | 24.2                                               | 29.0                  | 24.1                                |
| Closed shop employees                           | 35.3                                               | 43.1                  | 100                                 |
| All employees (open and closed<br>shop workers) | 27.4                                               | 33.0                  | 45.9                                |
| <i>Private sector:</i>                          |                                                    |                       |                                     |
| Open shop employees                             | 14.1                                               | 20.1                  | 14.0                                |
| Closed shop employees                           | 23.6                                               | 34.1                  | 100                                 |
| <i>Public sector:</i>                           |                                                    |                       |                                     |
| Open shop employees                             | 53.9                                               | 55.0                  | 53.8                                |
| Closed shop employees                           | 63.6                                               | 64.9                  | 100                                 |

### ***The Demise of the Closed Shop and the Decline in Trade Union Membership***

Early empirical evidence of the extent of compulsory unionism in Australia is presented by Rawson in his 1978 book *Unions and Unionists in Australia*. In a survey of 1003 unionists conducted in May 1976, nearly 70 percent reported that they were required to be union members to hold their jobs. However, in a similar survey conducted in 1991 the proportion had fallen to 54 percent (Rawson, 1990). During the same period the overall rate of union membership also fell - from 51 percent to 40.5 percent. This means that in 1976, 33.5 percent of wage and salary earners were employed in closed shops but by 1990 the proportion of closed shop employees had fallen to 21.6 percent.

To date, the decline in the incidence of closed shop employment has not

been widely canvassed as a possible source of the decline in union membership. However, the estimates presented here offer *prima facie* evidence to suggest that the fall in compulsory union membership has been an important element in the overall decline in union density. In particular, it is estimated that only 35 to 43 percent of compulsory union members would still join a union if membership were voluntary. This means that of the 14 percentage point decline in membership over the period from 1976 to 1990, somewhere between 5.5 and 7.8 percentage points might be due to the decline in compulsory membership.

It is relevant to note, however, that the decline in the incidence of compulsory unionism may itself be the product of underlying structural change in the labour market. In particular, the demise of the closed shop may largely be the product of structural change away from blue collar, industrial jobs, with their tradition of compulsory membership, and towards new jobs in the service sector which do not have the same traditions and which offer a less fertile environment for trade union organisation.

## 5.7 Conclusion

Compulsory membership is a prominent and widespread feature of Australian unionism: over half of all union members report that union membership is required for their job. In this chapter we have developed a model of union membership in which compulsory members are distinguished from voluntary members. While data limitations prevent the estimation of a fully specified

structural model, we are nevertheless able to estimate a reduced form model which provides further insights into the determinants of voluntary and compulsory membership.

Using the reduced form model, we have produced estimates which suggest that the closed shop has a substantial impact on the overall level of union density. In particular, it is estimated that in the region of 50 to 65 percent of compulsory union members would not voluntarily join their union if membership was not a requirement of their job. On this basis, if compulsory membership were completely outlawed, Australia's union density could be expected to fall from its current level to approximately 25 percent. Such a rate of union membership would place Australia among the nations with the lowest levels of unionisation in the OECD.

However, it is unlikely that the full decline in membership would occur immediately. Indeed, a substantial proportion of current closed shop members are probably "locked" into membership through the automatic deduction of fees from their pay. But over time, as more workers change jobs, it could be expected that the rate of union membership would drop steadily to somewhere around 25 percent of the workforce.

It is possible that the estimates presented here may actually underestimate the possible drop in union membership. Because the closed shop provides a ready source of income to many unions, (a steady stream of new members is delivered at low recruitment cost), it can be argued that compulsory members provide unions with the extra financial resources to recruit voluntary members in open shops. Without these resources, unions

would not have the same capacity to attract members as they currently do and the average rate of membership could possibly decline further still.

Finally, there is evidence that closed shop employment has declined substantially over the last 15 years or so. Consequently, the estimates presented in this chapter offer *prima facie* evidence to suggest that the demise of the closed shop may be an important element in a complete explanation of the overall decline in union membership.

## 6

# Explaining the Male-Female Membership Differential

### 6.1 Introduction

There is a substantial difference in the union membership rates of Australian men and women. In August 1992, 43.4 percent of male wage and salary earners were union members while only 34.5 percent of women were union members. Bridging the membership gap is an important goal of the Australian trade union movement. Indeed, trade union leaders see increased female membership as essential to arresting the decline in membership and ensuring the survival of a viable union movement.

While there have been no detailed econometric studies of the Australian male-female membership gap, some evidence of the relationship between sex and union membership may be gleaned from the previous Australian studies of the determinants of union membership. The evidence is, however, inconclusive. On the one hand, Crockett and Hall (1987), and Deery and DeCieri (1991) report that an individual's sex has an insignificant effect on his or her estimated probability of union membership. On the other hand, Christie and Miller (1989) and Christie (1992) (both using the same data source) report that being female has a negative and statistically significant effect on the probability of membership. Finally, using workplace data from the AWIRS,

Wooden and Balchin (1993) find a negative relationship between the proportion of women in a given establishment and the rate of union membership in the establishment.

Most studies of union membership in the United States show a negative relationship between being female and union membership (Voos, 1983). However, the magnitude of the relationship falls dramatically as controls for personal and job characteristics are added to the membership equation (Antos *et. al.* 1980; Freeman and Medoff, 1984; Freeman and Leonard, 1987). A consensus seems to be emerging that the lower rate of membership among women is due more to the restricted availability of unionised jobs for American women, rather than a lower desire by women for membership (see, for example, Leigh and Hills, 1987, and Schur and Kruse, 1992).

In Chapter 3 we saw that the IMA and CSA data yield mixed evidence of the impact of an individual's sex on his or her probability of union membership. Using the IMA data, it was estimated that being female reduces the probability of membership by approximately 6 percentage points (albeit with a marginal degree of statistical significance). The CSA equation, on the other hand, yielded a positive but insignificant female coefficient.

The approach adopted in Chapter 3, (and in the previous Australian studies), imposes several restrictive assumptions. First, the coefficients on the independent variables in the membership equation are constrained to be the equal for males and females - only the intercept term is allowed to vary. The disadvantage of such an approach is that it can hide important relationships in the data. For example, it might be that female managers are more likely to

become union members than male managers, while female plant and machine operators are less likely to become union members than their male counterparts. The standard approach also fails to account for the presence of compulsory unionism and for variations in the availability of union membership.

## **6.2 Explanations for the Male-Female Membership Differential**

The explanations for the male-female membership differential can be conveniently categorised as "demand side" and "supply side" explanations.

### *Demand Side Explanations*

It is a matter of record that Australian unions have been, and continue to be, male-denominated organisations (Wilkinson, 1983; Donaldson, 1991). Some commentators believe that, as a consequence, unions have been slow to address the special needs of women workers, and that this has led to lower rates of union membership among women (Wilkinson, 1983; Mumford, 1989). Implicit in this explanation is the notion that female workers have different tastes for membership than men. In particular, women are alleged to have a special interest in such matters as child care, affirmative action, maternity and paternity leave, and flexible working arrangements. For example, Winters (1987) argues that the failure of unions to address the special needs of women may ultimately prove to be costly for unions generally. Similarly, the assistant



secretary of the Australian Council of Trade Unions, Jennie George, has noted that survey evidence indicates that women don't join unions because "they don't see that the movement is relevant to them or that it is interested in their concerns".<sup>1</sup>

Another explanation for the membership gap derives from the so-called "female docility thesis". This is the idea that women are socialised to be passive and avoid confrontation. To the extent that unions are seen as adversarial institutions, the desire by women for membership is asserted to be correspondingly reduced. However, the female docility thesis has received little support in empirical studies conducted in Australia (Winters, 1987), the United States (Schur and Kruse, 1992) and Canada (Wetzel *et. al.* 1991).

Perhaps the most widely canvassed demand-side explanation for the male-female membership differential relates to the weaker average attachment of women to the workforce (see, for example, Booth, 1986). Having a weaker attachment to the workforce is assumed to reduce the demand for the insurance and other services of unions. Thus, the increased labour force participation of women over the last 30 years has been advanced as an explanation for the increase in female membership observed in several OECD countries (Curtin, 1993). In a similar vein, Visser (1991: p.115) notes that countries with the smallest male-female differentials are also the ones with the highest rates of female labour force activity.

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<sup>1</sup>Interview with ABC television news, Sunday 8 September 1991.

### *Supply Side Explanations*

On the supply side, it is frequently observed that women are employed in smaller, more dispersed workplaces and in jobs which are characterised by higher rates of labour turnover. In short, female employment is concentrated in those sectors of the labour market that are most costly to organise. An explanation for the membership differential, then, is not that women have a lower desire for membership, but that unions are constrained in their capacity to deliver an effective service to many women because of the high cost of organising their jobs.

Finally, it is occasionally suggested that the supply side barriers to female membership are exacerbated by the reluctance of (male) union officials to devote the resources necessary to organise female jobs (Winters, 1987; Green, 1990). This might be seen as a legacy of the early days of trade unionism, when many unions actively sought to exclude women both from membership and from the labour force.

### **6.3 Male and Female Membership: Some Sample Statistics**

In this chapter data from the IMA and CSA surveys are used. A rough indication of the sources of the male-female membership differential can be gained by examining the sample means for men and women.

Tables 6.1a and 6.1b report the sample means by sex for occupational, industrial and sector of employment categories as well as selected job tenure

and hours of work categories. Both tables also report the average union membership rates by sex in the selected categories.

Because the IMA and CSA samples are not representative of the population as a whole, the sample means are biased estimates of the true population means. This is apparent when we look at the mean male-female membership differentials. For the IMA sample the membership differential is approximately 13.6 percentage points (the Australian Bureau of Statistics reports a differential of 11.3 percentage points in 1988). However, for the CSA sample the differential is only 4.4 percentage points. This difference is almost certainly a product of the scope of the CSA survey. In particular, only females working at least 15 hours per week in regular part-time or full-time work are included in the sample, (males in casual employment or working less than 30 hours per week are also excluded from the sample). Since casuals have a much lower rate of membership than permanent employees, and proportionately more women are casuals than men, the smaller membership differential observed in the CSA data is likely to be attributable to the exclusion of casuals.

TABLE 6.1A  
Sample Statistics: IMA Survey

|                                                 | <i>Males (1254 cases)</i> |                    | <i>Females (834 cases)</i> |                    |
|-------------------------------------------------|---------------------------|--------------------|----------------------------|--------------------|
|                                                 | Sample Mean               | Membership Density | Sample Mean                | Membership Density |
| <b>Total:</b>                                   | 1.000                     | 0.514              | 1.000                      | 0.378              |
| <b><i>Occupation:</i></b>                       |                           |                    |                            |                    |
| Manager, administrator                          | 0.083                     | 0.173              | 0.040                      | 0.333              |
| Professional                                    | 0.130                     | 0.466              | 0.163                      | 0.434              |
| Para-professional                               | 0.086                     | 0.519              | 0.073                      | 0.508              |
| Tradesperson                                    | 0.259                     | 0.498              | 0.048                      | 0.300              |
| Clerk                                           | 0.063                     | 0.582              | 0.277                      | 0.294              |
| Salesperson, personal service worker            | 0.055                     | 0.333              | 0.165                      | 0.319              |
| Plant and machine operator                      | 0.128                     | 0.640              | 0.059                      | 0.490              |
| Labourer                                        | 0.195                     | 0.657              | 0.175                      | 0.452              |
| <b><i>Industry of employment:</i></b>           |                           |                    |                            |                    |
| Agriculture, mining, construction and utilities | 0.137                     | 0.532              | 0.040                      | 0.118              |
| Manufacturing                                   | 0.327                     | 0.517              | 0.197                      | 0.409              |
| Wholesale and retail trade                      | 0.130                     | 0.239              | 0.156                      | 0.269              |
| Transport, storage and communications           | 0.093                     | 0.822              | 0.051                      | 0.535              |
| Finance and business services                   | 0.081                     | 0.422              | 0.112                      | 0.376              |
| Recreational and personal services              | 0.052                     | 0.338              | 0.082                      | 0.294              |
| Community services                              | 0.120                     | 0.596              | 0.312                      | 0.423              |
| Public administration and defence               | 0.059                     | 0.676              | 0.049                      | 0.512              |
| <b><i>Sector of employment:</i></b>             |                           |                    |                            |                    |
| Public sector                                   | 0.250                     | 0.760              | 0.288                      | 0.588              |
| Private sector                                  | 0.750                     | 0.433              | 0.712                      | 0.293              |
| <b><i>Establishment size:</i></b>               |                           |                    |                            |                    |
| 1-20 employees                                  | 0.353                     | 0.332              | 0.427                      | 0.216              |
| 21-50 employees                                 | 0.140                     | 0.520              | 0.140                      | 0.444              |
| 51-100 employees                                | 0.120                     | 0.609              | 0.100                      | 0.494              |
| 101-500 employees                               | 0.181                     | 0.639              | 0.167                      | 0.518              |
| > 500 employees                                 | 0.187                     | 0.654              | 0.131                      | 0.596              |
| <b><i>Job tenure, age, hours worked:</i></b>    |                           |                    |                            |                    |
| Employed < 1 year                               | 0.242                     | 0.342              | 0.308                      | 0.233              |
| Employed 1-5 years                              | 0.403                     | 0.450              | 0.470                      | 0.393              |
| Employed > 5 years                              | 0.355                     | 0.706              | 0.222                      | 0.546              |
| Works < 20 hours                                | 0.024                     | 0.300              | 0.175                      | 0.260              |
| Works 20-30 hours                               | 0.035                     | 0.477              | 0.174                      | 0.317              |
| Works > 30 hours                                | 0.941                     | 0.521              | 0.651                      | 0.425              |
| <b><i>Political affiliation:</i></b>            |                           |                    |                            |                    |
| Coalition voter                                 | 0.208                     | 0.418              | 0.263                      | 0.361              |
| Labor voter                                     | 0.356                     | 0.626              | 0.357                      | 0.496              |

TABLE 6.1B  
Sample Statistics: CSA

|                                                 | Males (544 cases) |                    | Females (465 cases) |                    |
|-------------------------------------------------|-------------------|--------------------|---------------------|--------------------|
|                                                 | Sample Mean       | Membership Density | Sample Mean         | Membership Density |
| <b>Total:</b>                                   | 1.000             | 0.539              | 1.000               | 0.495              |
| <i><b>Occupation:</b></i>                       |                   |                    |                     |                    |
| Manager, administrator                          | 0.110             | 0.267              | 0.056               | 0.154              |
| Professional                                    | 0.252             | 0.562              | 0.393               | 0.617              |
| Clerk                                           | 0.085             | 0.674              | 0.273               | 0.378              |
| Salesperson                                     | 0.053             | 0.172              | 0.080               | 0.513              |
| Service, sport and recreation worker            | 0.063             | 0.618              | 0.127               | 0.458              |
| Transport, communications worker                | 0.077             | 0.786              | 0.011               | 0.800              |
| Tradesperson, labourer, process worker          | 0.312             | 0.612              | 0.054               | 0.520              |
| Other occupations (miner, farmer etc.)          | 0.054             | 0.231              | 0.011               | 0.670              |
| <i><b>Managerial, supervisory status:</b></i>   |                   |                    |                     |                    |
| Manager                                         | 0.173             | 0.287              | 0.099               | 0.370              |
| Supervisor                                      | 0.274             | 0.557              | 0.260               | 0.570              |
| <i><b>Industry of Employment:</b></i>           |                   |                    |                     |                    |
| Agriculture, mining, construction and utilities | 0.110             | 0.650              | 0.022               | 0.300              |
| Manufacturing                                   | 0.221             | 0.500              | 0.082               | 0.237              |
| Wholesale and retail trade                      | 0.086             | 0.247              | 0.133               | 0.477              |
| Transport, storage and communications           | 0.118             | 0.393              | 0.043               | 0.470              |
| Finance and business services                   | 0.096             | 0.457              | 0.125               | 0.497              |
| Recreational and personal services              | 0.031             | 0.493              | 0.080               | 0.463              |
| Community services                              | 0.199             | 0.731              | 0.419               | 0.482              |
| Public administration and defence               | 0.140             | 0.513              | 0.097               | 0.533              |
| <i><b>Sector of Employment:</b></i>             |                   |                    |                     |                    |
| Public sector                                   | 0.432             | 0.749              | 0.456               | 0.708              |
| Private sector                                  | 0.568             | 0.379              | 0.544               | 0.316              |
| <i><b>Job tenure, age, hours worked:</b></i>    |                   |                    |                     |                    |
| Employed < 1 year                               | 0.140             | 0.329              | 0.193               | 0.389              |
| Employed 1-5 years                              | 0.469             | 0.467              | 0.520               | 0.463              |
| Employed > 5 years                              | 0.392             | 0.700              | 0.286               | 0.624              |
| Works < 20 hours                                | 0.000             | n.a.               | 0.082               | 0.447              |
| Works 20-30 hours                               | 0.018             | 0.200              | 0.176               | 0.451              |
| Works > 30 hours                                | 0.982             | 0.545              | 0.742               | 0.510              |
| <i><b>Political affiliation:</b></i>            |                   |                    |                     |                    |
| Coalition voter                                 | 0.199             | 0.389              | 0.189               | 0.318              |
| Labor voter                                     | 0.300             | 0.693              | 0.318               | 0.615              |

The statistics reported in Tables 6.1a and 6.1b confirm much of what is already well-known about female employment (for example, there is a high concentration of women in the clerical, professional and sales occupations, and in the community services, sales and finance industries). However, some of the statistics are of particular interest. First, the IMA data support Winters' (1987) assertion that female workers are concentrated in smaller establishments (43 percent of women are employed in the 1-20 employees category, while 35 percent of men are employed in this workplace size category).

The IMA data also reveal a striking difference in the hours worked by men and women. Only 6 percent of males work less than 30 hours per week, while 35 percent of women are employed for less than 30 hours. Women also have a lower average tenure in their current job than men.

While an analysis of the sample statistics provides an indication of the sources of the male-female membership differential, it does not allow the independent impact of variables to be determined. In order to do this a multivariate model, which simultaneously controls for all of the measured determinants of union membership, is required.

## 6.4 Estimating the Membership Differential

### *No Slope Interactions*

First, consider the following reduced form model of union membership:

$$\begin{aligned} U_i^* &= \beta_0 + \beta_1 FEMALE + X_i \beta_2 + \epsilon_i \\ U_i &= I(U_i^*) \end{aligned} \tag{6.1}$$

where FEMALE is a dummy variable (=1 if individual  $i$  is female),  $X_i$  is a vector of other characteristics which determine the probability of membership, and  $\beta_2$  is a vector of parameters to be estimated.

If the membership equation includes only a constant and a female dummy then the estimated coefficient,  $\hat{\beta}_1$ , measures the "raw" sex differential. Part of the raw differential is likely to be a product of the high concentration of women in less unionised industries and occupations, and because of their weaker labour force attachment.

How large is the male-female membership differential once we account for the other personal and job-related characteristics of men and women? Antos *et. al.* (1980) use a simple stepwise procedure to address this question. By adding successively more controls to the membership equation, they estimate how much of the differential can be explained by factors other than a pure female effect. The differential remaining after additional controls are

added is called the "net" male-female membership differential.

Table 6.2 gives the probit estimates of  $\beta_1$  using data from both the IMA and CSA surveys. Looking first at the IMA estimates we see that with a female dummy variable as the sole explanatory variable the estimated coefficient is -0.35 implying a raw sex differential of -13.3 percent. In line with the studies by Freeman and Leonard (1987) and Antos *et. al.* (1980), the addition of demographic, human capital and place of residence variables has a very small impact on the female coefficient.

The American studies also report a substantial decline in the net differential when industry and occupational controls are included in the membership equation. This pattern is not evident in the IMA data - once industry and occupation are controlled, the net differential is still of the order of 12 percent. However, a large decline in the net differential does occur when job tenure, hours worked, sector of employment and workplace size variables are added. Controlling all of these factors, the estimated coefficient falls to -0.14, (implying a net differential of 5.6%), and is significant only at the 10 percent level. In short, more than half of the raw sex differential is eliminated once a full range of controls is included in the membership equation.



TABLE 6.2  
 Probit Estimates of the Effect of Being Female on the  
 Probability of Union Membership

| <i>Independent variables added<br/>successively:</i>                                                                   | <i>IMA survey</i>                               |                                                                       | <i>CSA survey</i>                               |                                                                       |
|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------|
|                                                                                                                        | Estimated<br>Coefficient<br>( $\hat{\beta}_1$ ) | Marginal<br>Effect on<br>Probability<br>of<br>Membership <sup>§</sup> | Estimated<br>Coefficient<br>( $\hat{\beta}_1$ ) | Marginal<br>Effect on<br>Probability<br>of<br>Membership <sup>§</sup> |
| With FEMALE as the sole<br>independent variable                                                                        | -0.35***<br>(0.06)                              | -13.3%                                                                | -0.11<br>(0.08)                                 | -4.4%                                                                 |
| Demographic and human capital<br>controls added<br>(ie. age, education, marital<br>status, migrant status, birthplace) | -0.33***<br>(0.06)                              | -12.7%                                                                | -0.07<br>(0.08)                                 | -2.8%                                                                 |
| Place of residence controls added<br>(location and state of residence)                                                 | -0.33***<br>(0.06)                              | -12.7%                                                                | -0.05<br>(0.08)                                 | -2.0%                                                                 |
| Occupation controls added                                                                                              | -0.31***<br>(0.07)                              | -11.7%                                                                | -0.04<br>(0.10)                                 | -1.6%                                                                 |
| Industry controls added                                                                                                | -0.31***<br>(0.07)                              | -12.0%                                                                | -0.03<br>(0.10)                                 | -1.2%                                                                 |
| Political affiliation controls added                                                                                   | -0.33***<br>(0.08)                              | -12.4%                                                                | -0.06<br>(0.10)                                 | -2.4%                                                                 |
| Tenure and hours worked added                                                                                          | -0.19**<br>(0.07)                               | -7.2%                                                                 | -0.00<br>(0.11)                                 | 0.0%                                                                  |
| Public sector control added                                                                                            | -0.16**<br>(0.07)                               | -6.3%                                                                 | 0.03<br>(0.14)                                  | 1.2%                                                                  |
| Workplace size control added                                                                                           | -0.14*<br>(0.08)                                | -5.6%                                                                 | -<br>-                                          | -                                                                     |

*Notes:*

Standard errors of estimates are in parenthesis.

Values of 0.00 or -0.00 reflect absolute values rounded to less than  $\pm 0.01$ .

<sup>§</sup>Effect of a one unit change in the FEMALE dummy variable on the probability of union membership with all independent variables at their mean values.

\* significant at 10% (two-tailed *t*-test)

\*\* significant at 5% (two-tailed *t*-test)

\*\*\* significant at 1% (two-tailed *t*-test)

The CSA data are not well suited to this sort of analysis. In particular, the raw differential is only 4.4 percent and is not statistically significant. However, the exclusion of casuals, and part-time employees working less than 15 hours per week, points strongly to the weaker labour force attachment of women as an important source of the male-female membership differential. Certainly, when the job tenure and hours of work variables are added in the IMA equation, the net differential is almost halved. Moreover, it is likely that the reduction would be greater if casual employment could be controlled.<sup>2</sup> However, there are no data on casual employment status in the IMA survey.

Notwithstanding the limitations of the CSA data<sup>3</sup>, it should be noted that once a full set of controls are included, the net differential is not only eliminated but actually becomes positive (albeit with no statistical significance).

### ***Full Slope Interactions: Full IMA Sample***

The above analysis imposes equal coefficients for men and women - only the constant/intercept coefficient changes. This specification implies that, after differences in the distribution of men and women across the explanatory

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<sup>2</sup>For instance, in August 1992, 16.5 percent of casual female employees were union members while 42.9 percent of permanent female employees were members. (ABS, 1993).

<sup>3</sup>Of course, migrants are over-sampled in the IMA data. In order to ensure that the results presented in Table 6.2 were generally applicable, the analysis was repeated using data for the general sample only. There were no marked differences in the results obtained.

variables have been accounted for, being female has a single "lump sum" impact on the probability of membership (Fiorito and Greer, 1986). However, it is conceivable that the relationship between sex and membership is more complicated, and that there are significant differences between the coefficients of the other explanatory variables for men and women. In order to investigate this possibility, it is necessary to estimate separate membership equations for males and females.

Table 6.3 presents the probit estimates for union membership equations estimated separately for men and women using the IMA data. The table also gives the differences in the male and female parameter estimates. The standard errors of the differences can be obtained by estimating a pooled equation in which all the explanatory variables are interacted with a female dummy variable.

A brief inspection of Table 6.3 reveals that only a small number of the male-female differences in the estimated parameters are significant at the 5 percent level or better. However, a likelihood ratio test indicates that the null hypothesis that the interacted variable coefficients are jointly zero can be rejected at the 1 percent level ( $\chi^2 = 76.03$ ; see Table 6.5).

The most striking differences between the male and female parameter estimates are for the occupational variables. The male coefficients exhibit the usual pattern (plant and machine operators and labourers have the highest probability of membership, professionals and managers the lowest). However, for women only one of the occupational coefficients (the clerical coefficient) is significantly different from zero. This implies that female managers, for

instance, do not have a significantly lower probability of membership than female labourers (the omitted category).

Why are women in professional and managerial occupations more likely to become union members than men in these occupations, even after the other determinants of union membership have been controlled? Unfortunately, in the context of a reduced form model of union membership, a definitive answer cannot be given.

For instance, differences in the male and female parameter estimates can arise for several reasons, including the following:

- (1) Females in the category have a greater (or lesser) desire for membership than males in the category. For example, all female managers may have a greater demand for membership than male managers.
- (2) Females are concentrated in particular occupational sub-groups in which all workers - both male and female - have a higher (or lower) demand for the services of trade unions. For example, it may be that women tend to be concentrated in more junior managerial positions where there is a greater demand for membership by male and female managers.
- (3) The supply of union services varies across occupational sub-groups, and females are concentrated in sub-groups characterised by a lower (or, possibly, higher) quality of union services.
- (4) Women are concentrated in occupational sub-groups with a lower (or higher) incidence of compulsory membership.

TABLE 6.3  
 Probit Estimates of Union Membership:  
 Full IMA Sample<sup>†9</sup>

|                                                 | <i>Males</i><br>(1254 cases) |       | <i>Females</i><br>(834 cases) |       | <i>Difference</i>   |       |
|-------------------------------------------------|------------------------------|-------|-------------------------------|-------|---------------------|-------|
|                                                 | $\hat{\beta}_m$              | s.e.  | $\hat{\beta}_f$               | s.e.  | $\Delta\beta$       | s.e.  |
| Experience                                      | 0.003                        | 0.015 | 0.024                         | 0.017 | 0.020               | 0.023 |
| (Experience) <sup>2</sup>                       | 0.000                        | 0.000 | -0.001 <sup>***</sup>         | 0.000 | -0.001              | 0.000 |
| Education (years)                               | -0.015                       | 0.019 | -0.025                        | 0.025 | -0.009              | 0.031 |
| Tenure in current job                           | 0.098 <sup>***</sup>         | 0.016 | 0.103 <sup>***</sup>          | 0.026 | 0.005               | 0.031 |
| (Tenure) <sup>2</sup>                           | -0.002 <sup>***</sup>        | 0.001 | -0.002                        | 0.001 | 0.000               | 0.001 |
| Hours of work                                   | 0.007                        | 0.014 | 0.030 <sup>***</sup>          | 0.014 | 0.023               | 0.019 |
| (Hours) <sup>2</sup>                            | 0.000                        | 0.000 | 0.000 <sup>*</sup>            | 0.000 | 0.000               | 0.000 |
| <i>Current occupation:</i>                      |                              |       |                               |       |                     |       |
| Manager, administrator                          | -1.50 <sup>***</sup>         | 0.21  | -0.30                         | 0.31  | 1.20 <sup>***</sup> | 0.38  |
| Professional                                    | -0.94 <sup>***</sup>         | 0.17  | -0.23                         | 0.21  | 0.72 <sup>***</sup> | 0.27  |
| Para-professional                               | -0.81 <sup>***</sup>         | 0.18  | -0.01                         | 0.25  | 0.80 <sup>***</sup> | 0.30  |
| Tradesperson                                    | -0.45 <sup>***</sup>         | 0.12  | -0.19                         | 0.27  | 0.26                | 0.30  |
| Clerk                                           | -0.44 <sup>**</sup>          | 0.19  | -0.56 <sup>***</sup>          | 0.17  | -0.12               | 0.26  |
| Salesperson, personal service worker            | -0.49 <sup>**</sup>          | 0.21  | -0.16                         | 0.19  | 0.33                | 0.28  |
| Plant and machine operator                      | -0.23                        | 0.15  | 0.21                          | 0.24  | 0.44                | 0.28  |
| <i>Sector of employment:</i>                    |                              |       |                               |       |                     |       |
| Public sector                                   | 0.64 <sup>***</sup>          | 0.14  | 0.90 <sup>***</sup>           | 0.15  | 0.25                | 0.21  |
| <i>Workplace size:</i>                          |                              |       |                               |       |                     |       |
| 1-20 employees                                  | -0.53 <sup>***</sup>         | 0.13  | -0.85 <sup>***</sup>          | 0.17  | -0.32               | 0.21  |
| 21-50 employees                                 | -0.28 <sup>*</sup>           | 0.15  | -0.25                         | 0.19  | 0.03                | 0.24  |
| 51-100 employees                                | 0.00                         | 0.15  | -0.31                         | 0.21  | -0.31               | 0.26  |
| 101-500 employees                               | 0.16                         | 0.14  | -0.09                         | 0.18  | -0.25               | 0.22  |
| <i>Industry of employment:</i>                  |                              |       |                               |       |                     |       |
| Agriculture, mining, construction and utilities | 0.08                         | 0.17  | -0.41                         | 0.37  | -0.49               | 0.40  |
| Manufacturing                                   | -0.11                        | 0.17  | 0.30                          | 0.20  | 0.41                | 0.26  |
| Wholesale and retail trade                      | -0.46 <sup>**</sup>          | 0.20  | 0.38 <sup>*</sup>             | 0.20  | 0.84 <sup>***</sup> | 0.28  |

|                                            |                       |      |                       |      |                     |      |
|--------------------------------------------|-----------------------|------|-----------------------|------|---------------------|------|
| Transport, storage and communications      | 0.53 <sup>***</sup>   | 0.20 | 0.36                  | 0.24 | -0.17               | 0.31 |
| Finance and business services              | 0.13                  | 0.20 | 0.65 <sup>***</sup>   | 0.20 | 0.52 <sup>*</sup>   | 0.28 |
| Recreational and personal services         | -0.40 <sup>*</sup>    | 0.24 | 0.41 <sup>*</sup>     | 0.23 | 0.81 <sup>**</sup>  | 0.33 |
| <b>Political affiliation:</b>              |                       |      |                       |      |                     |      |
| Labor voter                                | 0.25 <sup>***</sup>   | 0.10 | 0.14                  | 0.12 | 0.17                | 0.18 |
| Coalition voter                            | -0.07                 | 0.12 | 0.10                  | 0.14 | -0.11               | 0.15 |
| <b>Marital status:</b>                     |                       |      |                       |      |                     |      |
| Married, de facto                          | 0.14                  | 0.12 | -0.16                 | 0.14 | -0.30 <sup>*</sup>  | 0.18 |
| Widowed, divorced, separated               | 0.62 <sup>***</sup>   | 0.22 | -0.13                 | 0.22 | -0.75 <sup>**</sup> | 0.31 |
| Constant                                   | 0.07                  | 0.48 | -0.88 <sup>*</sup>    | 0.51 | -0.95               | 0.70 |
| Log-likelihood                             | -643.35               |      | -435.50               |      |                     |      |
| 2(lnL-lnL <sub>0</sub> ) (χ <sup>2</sup> ) | 450.67 <sup>***</sup> |      | 234.76 <sup>***</sup> |      |                     |      |
| Pseudo R <sup>2</sup>                      | 0.26                  |      | 0.21                  |      |                     |      |

**Notes:**

Values of 0.000 or -0.000 reflect absolute values rounded to less than  $\pm 0.001$

<sup>\*</sup>significant at 10 % (two-tailed *t*-test for coefficients)

<sup>\*\*</sup>significant at 5 % (two-tailed *t*-test for coefficients)

<sup>\*\*\*</sup>significant at 1 % (two-tailed *t*-test for coefficients)

<sup>†</sup>Estimated equations also include the following independent variables: location of residence, state of residence, migrant status, and importance of job security.

<sup>§</sup>Base categories for dummy variables: Occupation - Labourer; Sector - Private sector; Establishment size - 500 or more employees; Industry - Public administration and defence, and community services industries; Political affiliation - no party affiliation or minor party affiliation; Marital status - Never married.

Looking at the industry coefficients, there is a sizeable difference in the male and female estimates of the agriculture, mining and construction industry coefficient. The difference is, however, significant only at the 10 percent level (probably because there is a very small number of women represented in these industries, which limits the precision of the estimate). Similarly, women in the wholesale and retail trade, finance and business services and the recreational and personal services industries are all more likely to become union members than their male counterparts.

The only other significant differences in the male and female coefficients are for the marital status variables.

In the context of an insurance model of union membership, it might be expected that single workers would be less likely to seek the job protection services of unions. (The argument is that single workers are likely to be more mobile and have less commitment than married workers (Booth, 1986)). The male coefficients have the expected positive signs (although the dummy variable for married workers is not statistically significant). However, the female coefficients are negative indicating, for example, that married women are less likely to become union members than women who have never married.

Finally, although the coefficients are not statistically significant at conventional levels,<sup>4</sup> an extra year of labour market experience has a greater impact on a female's probability of membership than a male's. This provides some support for the proposition that older women have greater attachment to

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<sup>4</sup>Note that although the female experience coefficient is not statistically significant at the 10% level, it is at least greater than its standard error.

the labour market because they are more likely to have already had their children (and are less likely to expect to have more children) (Booth,1986).

**Full Slope Interactions: Open Shop Sub-Sample**

There is some *prima facie* evidence to suggest that an important source of the male-female membership differential is compulsory unionism: almost 35 percent of men are employed in closed shops, but only 19 percent of women are compulsory members. Furthermore, approximately two-thirds of male union members are compulsory members, while only 50 percent of female members work in closed shops. Given the substantial difference in the male and female rates of compulsory membership, a separate analysis using open shop data is warranted.

The probit estimates of the parameters determining the probabilities of membership for men and women employed in open shops are presented in Table 6.4.



TABLE 6.4  
 Probit Estimates of Probability of Trade Union Membership:  
 Open Shop Sample<sup>†§</sup>

|                                                 | Males<br>(817 cases) |       | Females<br>(672 cases) |       | Difference    |       |
|-------------------------------------------------|----------------------|-------|------------------------|-------|---------------|-------|
|                                                 | $\hat{\beta}_m$      | s.e.  | $\hat{\beta}_f$        | s.e.  | $\Delta\beta$ | s.e.  |
| Experience                                      | 0.030                | 0.021 | 0.034                  | 0.024 | 0.004         | 0.032 |
| (Experience) <sup>2</sup>                       | -0.001*              | 0.000 | -0.001*                | 0.001 | 0.000         | 0.001 |
| Education (years)                               | 0.001                | 0.028 | -0.003                 | 0.033 | -0.004        | 0.043 |
| Tenure in current job                           | 0.104***             | 0.023 | 0.105***               | 0.039 | 0.002         | 0.045 |
| (Tenure) <sup>2</sup>                           | -0.003***            | 0.001 | -0.002                 | 0.002 | 0.000         | 0.002 |
| Hours of work                                   | 0.035                | 0.024 | 0.099***               | 0.025 | 0.064*        | 0.035 |
| (Hours) <sup>2</sup>                            | 0.000                | 0.000 | -0.001***              | 0.000 | -0.001**      | 0.000 |
| <i>Current occupation:</i>                      |                      |       |                        |       |               |       |
| Manager, administrator                          | -1.26***             | 0.29  | -0.20                  | 0.41  | 1.06**        | 0.50  |
| Professional                                    | -0.58**              | 0.23  | -0.07                  | 0.28  | 0.51          | 0.36  |
| Para-professional                               | -0.65***             | 0.23  | 0.12                   | 0.31  | 0.77**        | 0.39  |
| Tradesperson                                    | -0.60***             | 0.19  | 0.08                   | 0.40  | 0.69          | 0.44  |
| Clerk                                           | -0.39                | 0.26  | -0.28                  | 0.23  | 0.11          | 0.35  |
| Salesperson, personal service worker            | -0.40                | 0.29  | -0.17                  | 0.28  | 0.23          | 0.40  |
| Plant and machine operator                      | -0.38*               | 0.23  | 0.24                   | 0.34  | 0.63          | 0.42  |
| <i>Sector of employment:</i>                    |                      |       |                        |       |               |       |
| Public sector                                   | 0.80***              | 0.18  | 0.71***                | 0.18  | -0.09         | 0.25  |
| <i>Workplace size:</i>                          |                      |       |                        |       |               |       |
| 1-20 employees                                  | -0.19                | 0.18  | -0.72***               | 0.22  | -0.52*        | 0.28  |
| 21-50 employees                                 | 0.10                 | 0.20  | -0.18                  | 0.23  | -0.27         | 0.31  |
| 51-100 employees                                | 0.18                 | 0.22  | -0.44*                 | 0.26  | -0.61*        | 0.34  |
| 101-500 employees                               | 0.24                 | 0.20  | -0.46**                | 0.23  | -0.70**       | 0.31  |
| <i>Industry of employment:</i>                  |                      |       |                        |       |               |       |
| Agriculture, mining, construction and utilities | -0.24                | 0.23  | -0.42                  | 0.40  | -0.18         | 0.46  |
| Manufacturing                                   | -0.35                | 0.22  | -0.32                  | 0.25  | 0.02          | 0.33  |
| Wholesale and retail trade                      | -0.45*               | 0.26  | -0.75**                | 0.31  | -0.30         | 0.40  |

|                                            |           |      |           |      |         |      |
|--------------------------------------------|-----------|------|-----------|------|---------|------|
| Transport, storage and communications      | 0.46*     | 0.25 | -0.02     | 0.29 | -0.48   | 0.39 |
| Finance and business services              | 0.27      | 0.24 | 0.33      | 0.23 | 0.06    | 0.34 |
| Recreational and personal services         | -0.46     | 0.32 | -0.36     | 0.33 | 0.10    | 0.46 |
| <b>Political affiliation:</b>              |           |      |           |      |         |      |
| Labor voter                                | 0.30**    | 0.14 | 0.33**    | 0.16 | 0.33    | 0.25 |
| Coalition voter                            | -0.09     | 0.16 | 0.24      | 0.18 | 0.03    | 0.21 |
| <b>Marital status:</b>                     |           |      |           |      |         |      |
| Married, de facto                          | 0.17      | 0.16 | -0.25     | 0.18 | -0.41*  | 0.24 |
| Separated, divorced, widowed               | 0.48      | 0.31 | -0.39     | 0.30 | -0.87** | 0.43 |
| Constant                                   | -1.97**   | 0.80 | -2.83***  | 0.73 | -0.86   | 1.08 |
| Log-likelihood                             | -325.00   |      | -257.99   |      |         |      |
| 2(lnL-lnL <sub>0</sub> ) (χ <sup>2</sup> ) | 277.01*** |      | 205.03*** |      |         |      |
| Pseudo R <sup>2</sup>                      | 0.30      |      | 0.28      |      |         |      |

**Notes:**

Values of 0.000 or -0.000 reflect absolute values rounded to less than  $\pm 0.001$

\*significant at 10% (two-tailed *t*-test for coefficients)

\*\*significant at 5% (two-tailed *t*-test for coefficients)

\*\*\*significant at 1% (two-tailed *t*-test for coefficients)

†Estimated equations also include the following independent variables: location of residence, state of residence, migrant status, and importance of job security.

‡Base categories for dummy variables: Occupation - Labourer; Sector - Private sector; Establishment size - 500 or more employees; Industry - Public administration and defence, and community services industries; Political affiliation - no party affiliation or minor party affiliation; Marital status - Never married.

TABLE 6.5  
Likelihood Ratio Tests - Variables Interacted with FEMALE

|                                  | <i>Full Sample</i> | <i>Open Shop Sample</i> |                    |
|----------------------------------|--------------------|-------------------------|--------------------|
|                                  | $\chi^2$           | $\chi^2$                | Degrees of freedom |
| Experience                       | 1.57               | 0.09                    | 2                  |
| Tenure                           | 0.54               | 0.18                    | 2                  |
| Hours of work                    | 1.60               | 5.06*                   | 2                  |
| Occupation                       | 22.25***           | 9.50                    | 7                  |
| Workplace size                   | 6.15               | 7.36                    | 5                  |
| Industry of employment           | 20.12***           | 2.78                    | 6                  |
| Political affiliation            | 2.47               | 2.06                    | 2                  |
| Location of residence            | 0.69               | 1.06                    | 2                  |
| State of residence               | 3.56               | 3.19                    | 6                  |
| Migrant status                   | 1.55               | 1.71                    | 5                  |
| Marital status                   | 6.11**             | 4.84*                   | 2                  |
| <i>All variables interacted:</i> | 76.03***           | 40.31                   | 46                 |

Notes:  
\* significant at 10 %  
\*\* significant at 5 %  
\*\*\* significant at 1 %

For the most part, the open shop estimates presented in Table 6.4 display a similar pattern to the full sample estimates. This is most clearly evident in the occupational coefficients - once again, there is no statistically significant relationship between occupation and probability of union membership for women.

There is, however, one important difference in the two sets of estimates. For men employed in open shops, there is no significant relationship between establishment size and probability of union membership. However, a statistically significant relationship is evident for women. For example, the 1-20 employees category coefficient is significant at the 1 percent level (the estimated coefficient, -0.72, implies a marginal effect of approximately 15 percent).

With closed shop employees excluded, there is an even stronger relationship between hours worked and probability of union membership for women (the estimated coefficients indicate that a stylised female employee, with characteristics that are the sample means, working 40 hours per week has an estimated probability of membership of 25 percent, while a stylised female employee working 20 hours per week has only a 10 percent probability of membership).

Notwithstanding the differences in some of the individual coefficients, a likelihood ratio test of the joint significance of all the interacted variables indicates that we cannot reject the null hypothesis that there is no significant difference in the male and female parameter estimates (see Table 6.5)

### 6.5 Decomposition Analysis

Using a decomposition method proposed by Farber (1990), the average predicted male-female membership differential can be decomposed into two components: (1) a component due to the different job and personal characteristics of men and women; and (2) a component due to differences in the male and female coefficients. The method used is the probit analogue of the well-known Oaxaca/Blinder decomposition applied to OLS models.

Before describing Farber's method, note that the average predicted probability of union membership, using the characteristics of workers of sex  $j$  and parameter estimates for workers of sex  $k$ , is defined as

$$P(X_j \hat{\beta}_k) = \frac{\sum_{i=1}^{n_j} \Phi(X_{ij} \hat{\beta}_k)}{n_j} \quad (6.2)$$

where  $n_j$  is the number of workers of sex  $j$ ,  $X_{ij}$  is a vector of characteristics for each worker of that sex, and  $\hat{\beta}_k$  is a vector of estimated parameters for sex  $k$ . The average estimated differential in unionisation rates for men and women is therefore given by

$$P(X_m \hat{\beta}_m) - P(X_f \hat{\beta}_f) \quad (6.3)$$

The portion of the overall differential which can be attributed to

differences in the distribution of men and women across job and personal characteristics can be estimated in two ways:

$$\begin{array}{ll} P(X_m \hat{\beta}_f) - P(X_f \hat{\beta}_f) & \text{(Method A)} \\ P(X_m \hat{\beta}_m) - P(X_f \hat{\beta}_m) & \text{(Method B)} \end{array} \quad (6.4)$$

In each case, the average predicted probabilities are calculated using the same parameter estimates but allowing the characteristics to vary. In a similar fashion, the part of the differential which can be attributed to differences in coefficients is given by

$$\begin{array}{ll} P(X_m \hat{\beta}_m) - P(X_m \hat{\beta}_f) & \text{(Method A)} \\ P(X_f \hat{\beta}_m) - P(X_f \hat{\beta}_f) & \text{(Method B)} \end{array} \quad (6.5)$$

Here characteristics are held constant and the parameters which determine the estimated probability of union membership are allowed to vary.

The overall differential can be decomposed into two components - one attributable to the differences in coefficients, the other due to differences in characteristics. The same decomposition can be performed in two ways:<sup>5</sup>

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<sup>5</sup>Taking an average of the two decomposition we have:

$$\begin{aligned} [P(X_m \hat{\beta}_m) - P(X_f \hat{\beta}_f)] &\equiv 1/2[P(X_m \hat{\beta}_f) - P(X_f \hat{\beta}_f)] + 1/2[P(X_m \hat{\beta}_m) - P(X_m \hat{\beta}_f)] \\ &\quad 1/2[P(X_m \hat{\beta}_m) - P(X_f \hat{\beta}_m)] + 1/2[P(X_f \hat{\beta}_m) - P(X_f \hat{\beta}_f)] \end{aligned}$$

Method A:

$$[P(X_m \hat{\beta}_m) - P(X_f \hat{\beta}_f)] \equiv [P(X_m \hat{\beta}_f) - P(X_f \hat{\beta}_f)] + [P(X_m \hat{\beta}_m) - P(X_m \hat{\beta}_f)] \quad (6.6)$$

Method B:

$$[P(X_m \hat{\beta}_m) - P(X_f \hat{\beta}_f)] \equiv [P(X_m \hat{\beta}_m) - P(X_f \hat{\beta}_m)] + [P(X_f \hat{\beta}_m) - P(X_f \hat{\beta}_f)]$$

### *Decomposition Estimates*

To start, we use the full sample reduced form parameter estimates to decompose the male-female membership differential.

The overall difference in the average predicted probabilities of membership for men and women in the full sample is 13.3 percent (see Table 6.6). As outlined above, the differential can be decomposed in two parts: the first part is due to differences in the characteristics of men and women ( $\Delta X$ ), and the second part is due to differences in the male and female coefficients ( $\Delta\beta$ ). The decomposition can be performed in two ways (these are labelled Methods A and B in Table 6.6), and an average of the two methods can be taken to give a third decomposition. In the first column of Table 6.6 we allow all the coefficients to vary for men and women. In the second column the decomposition is repeated but now only the significant interacted coefficients are allowed to vary for males and females.

In decomposition A, the portion of the overall differential due to the different personal and job characteristics of men and women is estimated using the female coefficients. First, the average predicted probability of membership for men is calculated using the female coefficients. Then we calculate the

average predicted probability of membership for women using the female coefficients. The difference between the two predicted probabilities is 0.088, indicating that if women were to have the same characteristics as men the male-female membership differential would be 8.8 percent points, not 13.3 percentage points.

In decomposition B, the male coefficients are used to estimate the membership differential due to characteristics. The difference is 0.048 indicating that if men were to have the same characteristics as women the predicted membership differential would only be 4.8 percent. Taking an average of the two methods, the estimated differential attributable to the different characteristics of men and women is 0.068. That is, if men and women were to have the same coefficients the membership differential would be, on average, 6.8 percentage points.

Now consider the differential due to differences in the coefficients. If men were to have the same coefficients as women, it is estimated that the differential would be 0.046 (method A). Alternatively, if women were to have the same coefficients as men the differential would be 0.086 (method B). Thus, on average, if men and women were to have the same characteristics the membership differential would be 6.6 percentage points.

In short, allowing all coefficients to vary for men and women, the decomposition analysis indicates that approximately half of the overall membership differential is due to differences in the distribution of men and women across the characteristics which determine the probability of union membership. Furthermore, if we allow only those coefficients for which the



male and female estimates are significantly different to vary, 60 percent of the overall membership differential is due to differences in the distribution of men and women across the characteristics.

In Table 6.6 the decomposition analysis is repeated using the open shop parameter estimates. However, it should be noted that the overall male-female membership differential is very small - the difference in the average predicted probabilities of membership for men and women is only 2.4 percentage points.

Overall, the decomposition analysis is not particularly revealing. For example, if women were to have the same characteristics as men, it is estimated that the average predicted probability of membership for females would be 4.4 percentage points higher than it actually is. However, it is estimated that if men were to have the same characteristics as women they would also have a higher probability of membership (up by 0.8 percentage points).

Similarly, if men were to have the same coefficients as women, their average probability of membership would increase by 2.0 percentage points, while if women had the same coefficients as men, their average probability of membership would increase by 3.2 percentage points.

An average of the two decomposition methods indicates that about two-thirds of the small male-female membership differential in open shops is due to differences in characteristics while one third is due to differences in coefficients.

TABLE 6.6  
Decomposition of the Male-Female Membership Differential

|                                                                     | Difference in Average Predicted Probability of Membership |                                            |                         |                                            |
|---------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------|-------------------------|--------------------------------------------|
|                                                                     | <i>Full Sample</i>                                        |                                            | <i>Open Shop Sample</i> |                                            |
|                                                                     | Full Interactions                                         | Significant Interactions Only <sup>‡</sup> | Full Interactions       | Significant Interactions Only <sup>†</sup> |
| <b>Overall Differential:</b>                                        | 0.133                                                     | 0.134                                      | 0.024                   | 0.025                                      |
| <i>Differential Due to Characteristics:</i>                         |                                                           |                                            |                         |                                            |
| Method A. Female Base ( $P(X_m\hat{\beta}_f)-P(X_f\hat{\beta}_f)$ ) | 0.088                                                     | 0.096                                      | 0.044                   | 0.044                                      |
| Method B. Male Base ( $P(X_m\hat{\beta}_m)-P(X_f\hat{\beta}_m)$ )   | 0.048                                                     | 0.065                                      | -0.008                  | -0.011                                     |
| <i>Average:</i>                                                     | 0.068                                                     | 0.081                                      | 0.018                   | 0.017                                      |
| <i>Differential Due to Coefficients:</i>                            |                                                           |                                            |                         |                                            |
| Method A. Male Base ( $P(X_m\hat{\beta}_m)-P(X_m\hat{\beta}_f)$ )   | 0.046                                                     | 0.038                                      | -0.020                  | -0.020                                     |
| Method B. Female Base ( $P(X_f\hat{\beta}_m)-P(X_f\hat{\beta}_f)$ ) | 0.086                                                     | 0.069                                      | 0.032                   | 0.035                                      |
| <i>Average:</i>                                                     | 0.066                                                     | 0.054                                      | 0.006                   | 0.008                                      |

Notes:  
<sup>‡</sup>Estimated equation includes female dummy and interacted occupation, industry and marital status variables.  
<sup>†</sup>Estimated equation includes female dummy and interacted occupation, workplace size and marital status variables.

## 6.6 Trade Union Availability and the Male-Female Membership Differential

As previously noted, the scope of the CSA survey means that the data are biased against producing a sizeable male-female differential. This is reflected in the insignificant coefficient on the female dummy in a standard membership equation (see Table 6.2). However, the analysis conducted in Chapter 4 reveals that once the sample is restricted to workers in eligible unionised employment only, there is a significant female effect.

Table 6.7 gives the estimated female coefficients in a standard membership equation estimated first for all workers, and then unionised and eligible unionised employees (the full estimated equations are reported in Table 4.3). For the full sample the estimated FEMALE coefficient is positive and insignificant. However, with the data restricted to the sub-sample of unionised employees, the coefficient is negative and significant at the 10 percent level ( $-0.26$  implying a marginal effect of 9.2 percentage points). When the data are further restricted to employees in unionised locations who are eligible for membership of a union that is present, the estimated coefficient is negative and significant at the 5 percent level. (The estimate implies that a female with characteristics which are the same as the sample means has a marginal probability of union membership approximately 13.6 percentage points lower than a similar male).

In view of the proceeding analysis we must, however, be careful not to immediately ascribe this result as evidence that women have a lower desire for

membership than men. Given the substantial gap in the rates of closed shop employment, it is likely that the coefficient is capturing a compulsory membership effect. Unfortunately, in the absence of data containing information on both unionised employment and compulsory membership, this remains a question which cannot be fully resolved.

TABLE 6.7  
Estimated FEMALE Coefficients: CSA Data

| <i>Sample used:</i>          | $\hat{\beta}_1$      | Standard Error | Marginal Effect on Probability of Membership |
|------------------------------|----------------------|----------------|----------------------------------------------|
| All employees                | 0.02                 | 0.12           | 0.8%                                         |
| Unionised Employees          | -0.26                | 0.16           | -9.2%                                        |
| Eligible Unionised Employees | -0.40 <sup>***</sup> | 0.18           | -13.6%                                       |

\* significant at 10% (two tailed *t*-test)  
 \*\* significant at 5% (two tailed *t*-test)  
 \*\*\* significant at 1% (two tailed *t*-test)

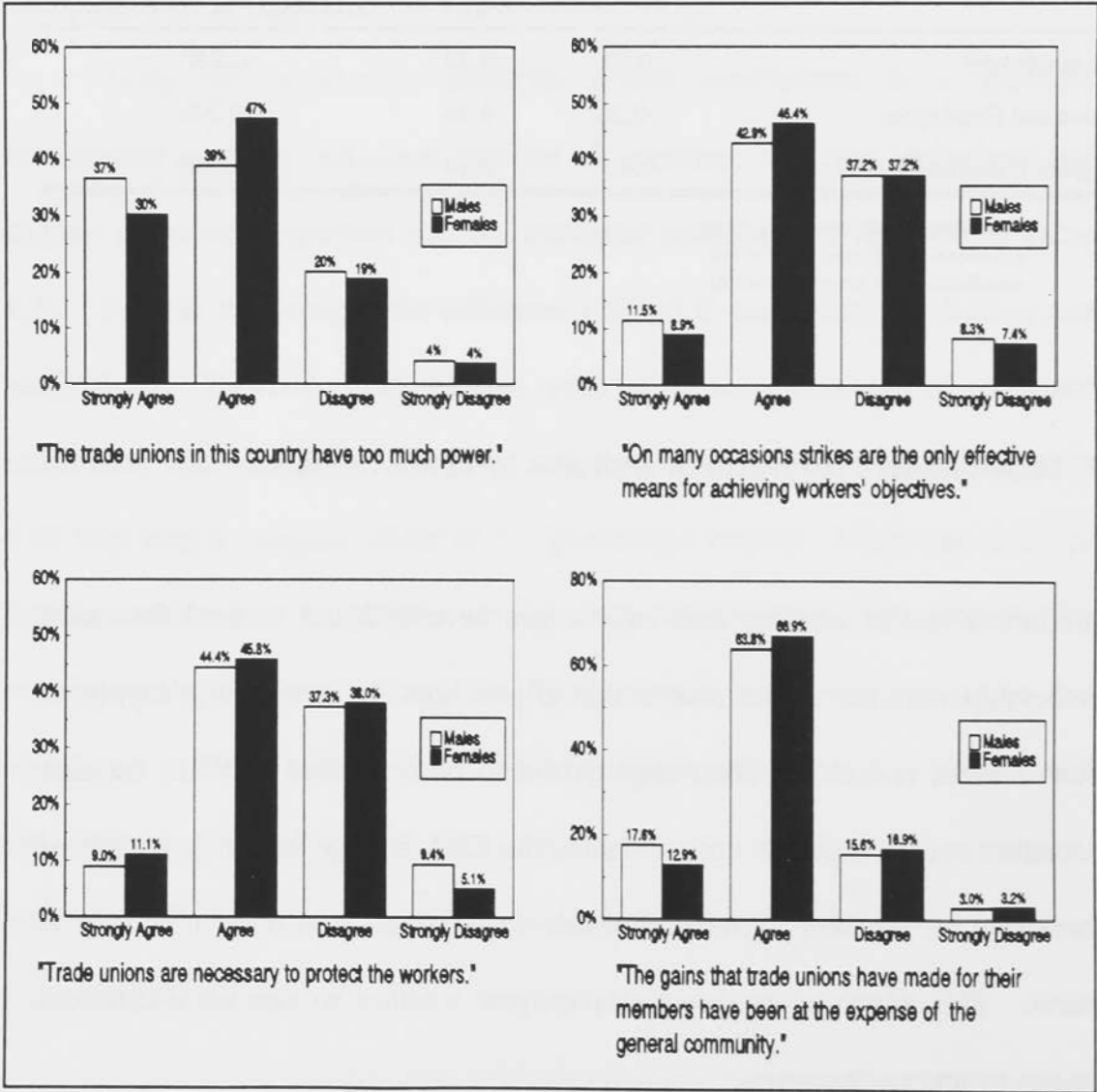
## 6.7 Male-Female Differences in Attitudes to Trade Unionism

A definitive test of whether men and women have different "tastes" for union membership requires a data source that allows both the availability/supply of union services and closed shop employment to be controlled. While the data to conduct such a test are not available, the CSA survey is a rich source of information on workers' attitudes towards trade unions and trade unionism in general. This allows us to directly investigate whether women have different attitudes to unions than men.

Figure 6.1 shows the responses of males and females to four statements

about trade unions. Looking at the table, no strong differences in the attitudes of men and women are apparent. Indeed, if anything, it might be argued that female employees are slightly more inclined to be pro-union than male employees. For example, women are more likely to agree that "trade unions are necessary to protect the workers", and are less likely to strongly agree that "the trade unions in this country have too much power".

Figure 6.1  
Attitudes to Trade Unions: Males and Females



## 6.8 Conclusion

The question addressed in this chapter is why are proportionately fewer women union members than men? Broadly speaking, there are two explanations. The first has it that women have specific interests that make them less likely to demand the services provided by unions. The second explanation, on the other hand, says that sex *per se* is not important. Rather, women are concentrated in those jobs that are characterised by lower unionisation rates for all workers whether they be male or female.

If we were able to estimate a structural demand equation, then the decomposition analysis performed in Section 6.5 would enable us to determine the contribution of each of the explanations of the male-female membership differential. However, although data limitations prevent a definitive test, there is little evidence to support the proposition that there is a strong difference in the desire for membership between men and women.

In support of this conclusion we rely on the following points:

- (i) According to the CSA data, men and women who are in regular employment and who work a substantial number of hours each week (15+ hours for women, 30+ hours for men) have similar rates of union membership (50 percent for women versus 54 percent for men).
- (ii) Although women employed in unionised establishments are less likely to become union members than men, it would seem that this is because men are more likely to be employed in closed shops than women. Indeed, data from the IMA survey show that men are substantially more

likely to be employed in closed shops than women (31 percent of men are employed in closed shops, while only 19 percent of women are employed in closed shops).

- (iii) In open shops, where membership is not a compulsory condition of employment, there is no significant difference in the estimated probabilities of union membership for men and women.

It is also heartening to note that our conclusion, tentative though it may be, is consistent with the findings of several studies conducted in other countries (see, for example, Kochan, 1979; Voos, 1983; Fiorito and Greer, 1986; Freeman and Leonard, 1987; Leigh and Hills, 1987; Wetzal *et. al.* 1991; Schur and Kruse, 1992).

This conclusion, if correct, has important policy implications for the union movement. Specifically, it suggests that changing union priorities to emphasise issues of particular interest to women may not be effective in bridging the membership differential, no matter how laudable these changes may be on equity or other grounds. If the union movement wants to increase female membership it faces the difficult task of providing an effective service to workers in those sections of the labour market which are most costly to organise. If this challenge can be met, not only are more women likely to become members, but more men are too.

# 7

## Conclusion

This thesis is about what determines an individual's probability of union membership. To this end we use data from two surveys to improve and build upon the previous econometric studies of Australian union membership.

The analysis commences with the estimation of a conventional dichotomous choice model of union membership. We argue that given the data typically available to researchers, this model should be interpreted as a reduced form model which encompasses both supply and demand influences.

The simple reduced form model is particularly useful for summarising the major determinants of union membership. However, it is prone to masking important relationships that are revealed by more disaggregated models. Indeed, a major contribution of this thesis is the development of more complex, "multiple-hurdle" models of union membership.

In Chapter 4 we acknowledge the need to separately consider the individual's desire for union membership from the availability of membership. Thus, union membership is modelled as a decision which is conditional on the individual being employed in a unionised workplace. The underlying logic is that, (some very specific cases aside), union membership is a decision made by employees in unionised establishments where unions are actively involved in supplying a service to workers.

It would be tempting to treat the union membership equation estimated



for individuals in unionised employment as a structural demand equation. However, there are two reasons why this cannot be done. First, the supply of union services is not uniform across all unionised workplaces. For example, some unionised establishments will have a very active union presence, while in other establishments the union presence may amount to little more than a couple of workplace visits a year by a union official. Moreover, unions in different segments of the labour market are more successful in deriving benefits for their members. These benefits may be private goods (such as protection against unfair managerial actions) or collective goods (such as better working conditions for the workers in a particular plant).

The second difficulty with treating the union membership equation estimated conditional on unionised employment as a structural demand equation relates to compulsory unionism. Indeed, approximately 50 percent of all union members are required, as a condition of their employment, to be union members. Clearly, we are unable to identify the desire of compulsory members for union membership separately from their desire to be employed in a closed shop.

Therefore, in Chapter 5 we focus on the determinants of voluntary and compulsory union membership. Unfortunately, the estimated voluntary union membership equation also cannot be interpreted as a structural demand equation because we are unable to control for the availability or supply of union services. Nevertheless, our estimates indicate that compulsory membership arrangements have a substantial impact on Australian union membership.

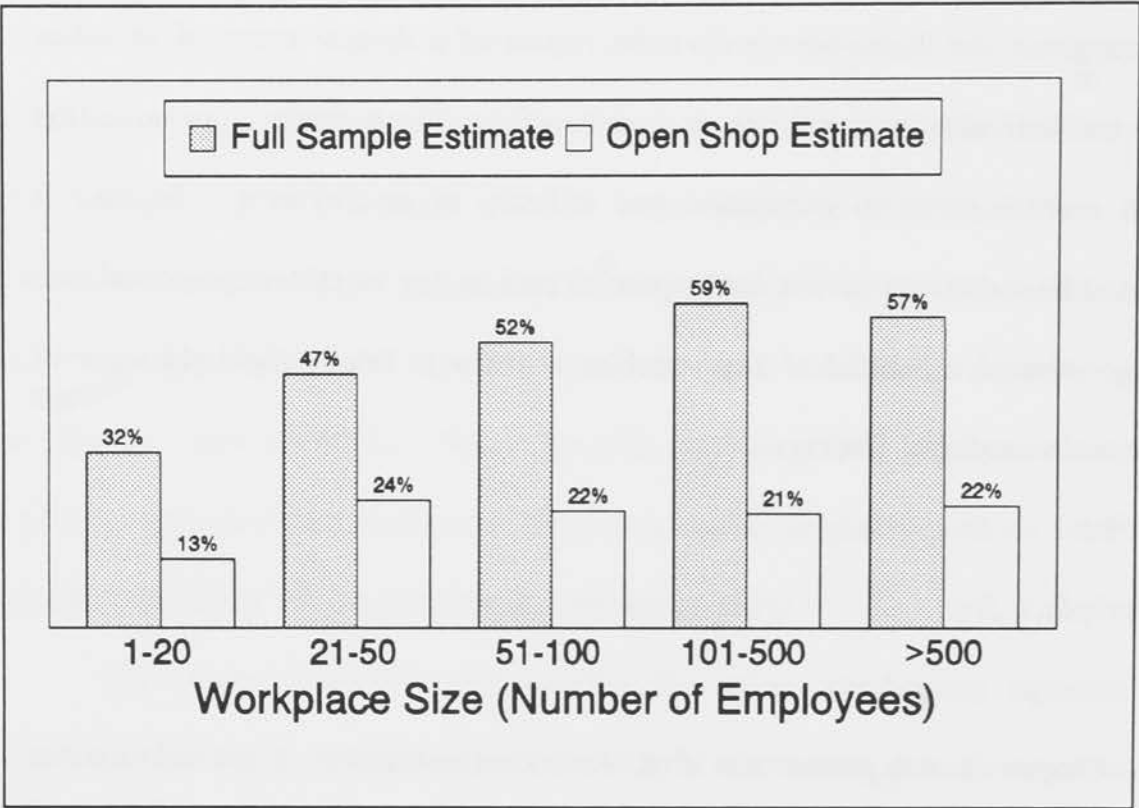
## *The Main Findings*

Throughout the thesis we consider the impact of a diverse range of variables on the individual's probability of membership. These range from education and marital status to occupation and industry of employment. Because it would be tedious to review the impact of each of the variables considered, we have selected a handful of key variables in order to briefly highlight some of the main empirical findings.

### *Workplace Size*

In Chapter 3 we present the first Australian estimates of the relationship between workplace size and the individual's probability of union membership. Controlling for the other determinants of union membership, the size of the establishment in which an individual is employed is a significant determinant of union membership. Interestingly, we find that the workplace size effect is largely exhausted once the workplace reaches about 50 employees. Moreover, we find that the workplace size effect is mostly accounted for by a higher incidence of compulsory membership in large workplaces (see Figure 7.1).

FIGURE 7.1  
Workplace Size and Estimated Probabilities of Membership for a  
Stylised Worker: IMA Estimates

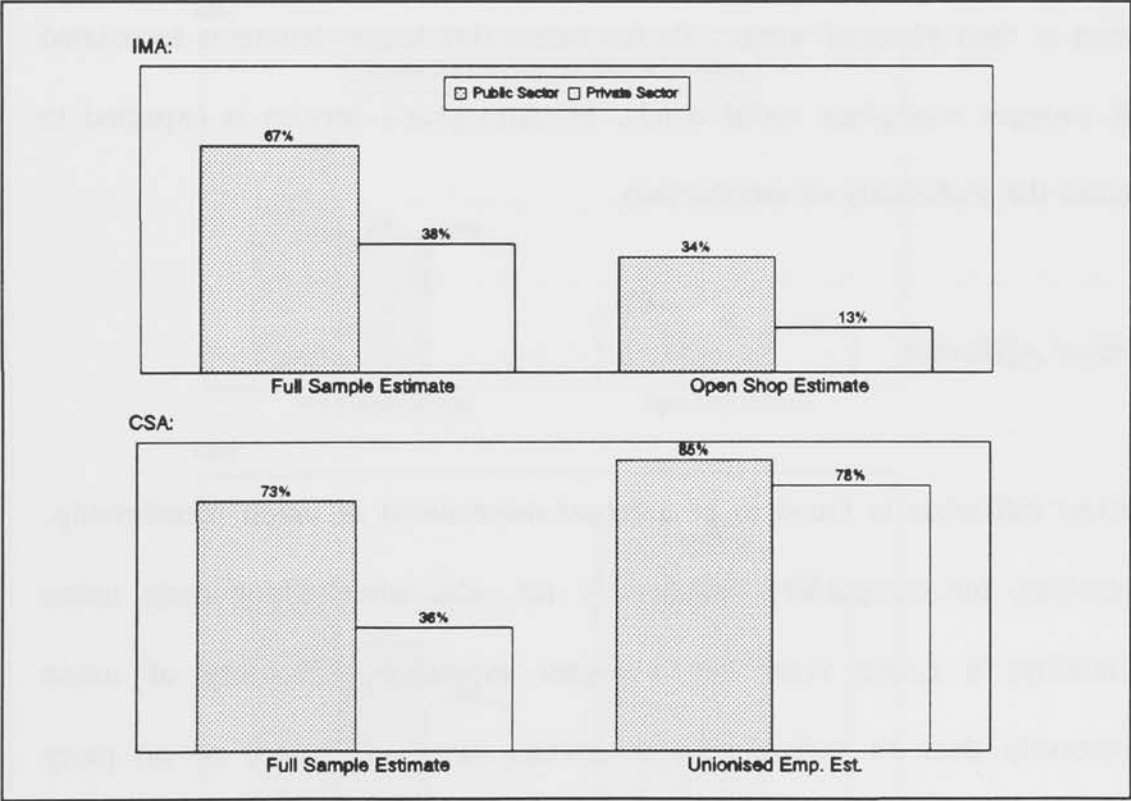


*Sector of Employment*

Consistent with the earlier studies of union membership, we find that public sector employees have a significantly higher probability of union membership than private sector employees. Indeed, after controlling for compulsory membership arrangements, a public sector worker is almost twice as likely to become a union member as a similar private sector employee (see Figure 7.2). However, when the availability of union membership is controlled, the difference in the estimated probabilities of membership narrows considerably and is no longer statistically significant.

While our inability to estimate a structural demand equation for union membership prevents precise judgements, we nevertheless draw the following conclusions: (i) most of the difference in the probabilities of union membership for private and public sector employees is accounted for by the lower availability of union membership in the private sector; and (ii) in the absence of compulsory membership arrangements, public sector employees have a greater demand for union membership than private sector employees.

FIGURE 7.2  
Sector of Employment and Estimated Probabilities of Membership for a  
Stylised Worker: IMA and CSA Estimates



*Tenure in Current Job*

One of the most robust determinants of union membership is job tenure. Interestingly, both of the leading theories of voluntary union membership (the insurance and social custom models) predict a positive relationship between tenure and union membership. In the insurance model, as workers accumulate more firm-specific human capital the costs of being dismissed or changing jobs rise, and workers have a greater incentive to insure against unfair dismissal or arbitrary managerial actions by joining a union. Similarly, the social custom model predicts that the greater the weight individuals place on their workplace reputation, the more likely they are to join a union if membership is a social custom at their place of work. To the extent that longer tenure is associated with stronger workplace social bonds, an extra year's service is expected to increase the probability of membership.

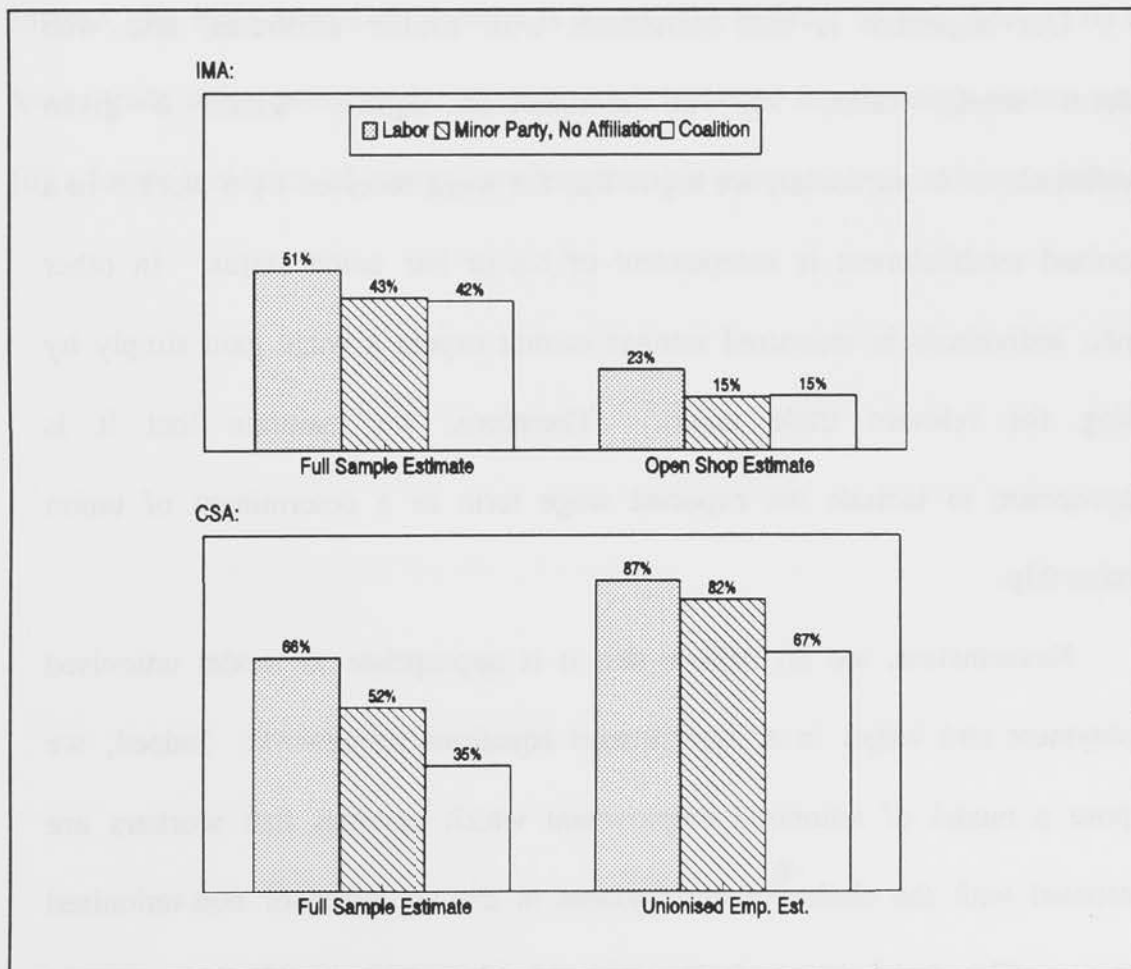
*Political Affiliation*

Political affiliation is found to be a robust determinant of union membership. Controlling for compulsory membership (or, alternatively, for trade union availability) a Labor voter has a higher estimated probability of union membership than an individual with another party affiliation, or no party affiliation. This finding is most readily explained in the context of the social custom model of union membership. In particular, we expect that a Labor voter would be more sympathetic to the aims of trade unionism than other

voters and, in the social custom model, an individual who believes in trade unionism is more likely to join a union.

Attitudinal data allow a more direct test of this proposition. In Chapter 3 we follow Deery and DeCieri (1991) and Christie and Miller (1989) by constructing an index of attitudes to unionism. Using a new data source (the CSA survey), we confirm the findings of these earlier studies that union attitudes are a significant determinant of an individual's probability of union membership.

FIGURE 7.3  
Political Affiliation and Estimated Probabilities of Membership for a  
Stylised Worker: IMA and CSA Estimates



*Union Membership and Wages*

Several North American studies emphasise the expected wage gain from union membership as a fundamental determinant of the individual's probability of membership. An early example of this approach is Lee's (1978) model which forms the basis of the studies by Miller and Rummery (1989), Miller and Christie (1989) and Christie (1992). However, we express serious reservations about the way in which the model has been used to explain union membership in Australia.

Our argument is that individuals with similar attributes, and who perform similar tasks, will be remunerated equally within a given establishment. In particular, we argue that the wage received by a worker in a unionised establishment is independent of his or her union status. In other words, individuals in unionised settings cannot expect a wage gain simply by joining the relevant trade union. Therefore, we maintain that it is inappropriate to include the expected wage term as a determinant of union membership.

Nevertheless, we do believe that it is appropriate to model unionised employment and wages in a simultaneous equations framework. Indeed, we propose a model of unionised employment which assumes that workers are confronted with the choice of employment in the unionised or non-unionised sectors. The employee's choice is assumed to be based on observed differences in the structures of remuneration in the two sectors, or on

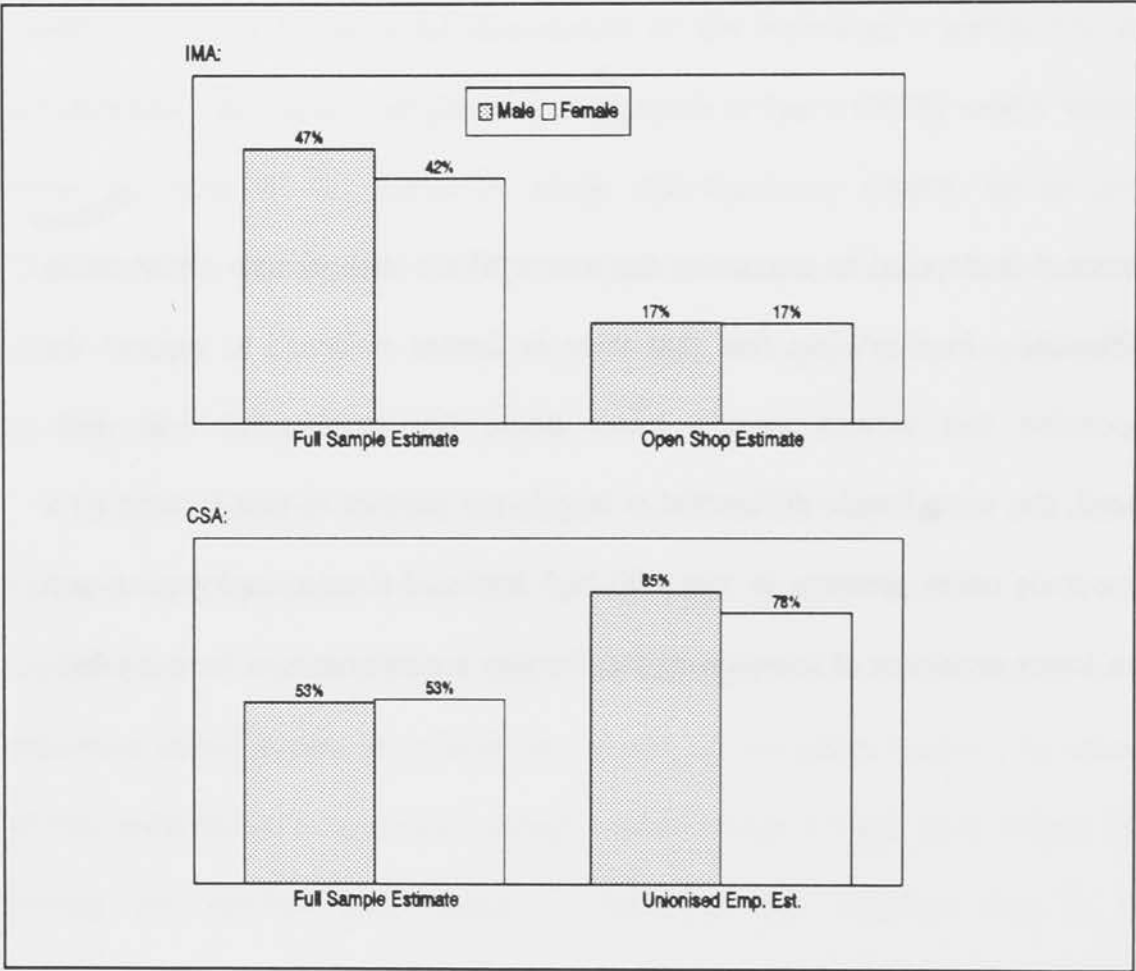
differences in working conditions in the two sectors, or both. In Chapter 4 we find that there is a significant wage premium associated with unionised employment. Conversely, we find that there is no significant relationship between union membership and wages for workers in unionised establishments.

## *Sex*

Chapter 6 is devoted to estimating the source of the male-female membership differential. In short, we find that there is limited evidence to support the proposition that women have a lower desire for membership than men. Instead, the male-female differential is largely the product of two factors: (i) a lower trade union presence in jobs with high levels of female employment; and (ii) a lower incidence of compulsory membership arrangements in female jobs.



FIGURE 7.4  
Sex and Estimated Probabilities of Membership for a  
Stylised Worker: IMA and CSA Estimates



### ***Practical Relevance and Suggestions for Future Research***

Faced with declining rates of union membership, there is considerable interest among trade union officials about the impact of different membership recruitment practices - and about the reasons for the decline in union membership. There are numerous issues that would be of great interest to trade union leaders but that have not been addressed here, principally because of data constraints. For instance, union officials would be interested to know:

- What is the price elasticity of demand for membership?
- What is the impact of different payment methods of union dues on the demand for union membership?
- What is the impact of workplace visits by union officials on the probability of union membership?
- How important are workplace union delegates and shop stewards in recruiting members?
- What effect do trade union fringe benefits such as retail discounts, cheap holidays and the like have on union membership?

While we are unable to answer these questions, and a host of other similar questions, the findings of the thesis do have some practical application.

First, we find little evidence to support the proposition that there is a significant difference in the desire for union membership by men and women. (Although we acknowledge that the inability to estimate a structural demand

equation for membership, means that we have to treat this conclusion with a degree of caution). Nevertheless, if our conclusion is correct, then female workers do not represent a pool of recruits who might be recruited cheaply if only unions would rearrange their priorities to better address those issues that are thought to be of special interest to women. Rather, it suggests that if unions wish to recruit more women they must develop more efficient operating practices in order to free the resources necessary to organise the sectors of the labour force in which female employment is concentrated.

The findings of Chapter 5 highlight just how reliant trade unions are on compulsory membership arrangements, particularly in the private sector. Indeed, voluntary membership estimates suggest that as few as 36 percent of closed shop employees would still join a union if membership were not a condition of their employment. (Alternatively, 54 percent of compulsory union members say they would join if membership were not compulsory).

Our findings also highlight the difficulties facing the union movement in arresting the decline in union membership. In particular, our estimates of the impact of job tenure and workplace size on union membership indicate that the trend towards a more flexible, mobile workforce employed in smaller establishments, is likely to lead to even lower rates of union membership in the future.

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