Unions, Training, Job Dissatisfaction and Quits

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Abstract

This paper explores the relationship between unionism and quits. Three channels of influence are investigated: unions-collective voice-quits; unions-training-quits; unions-job dissatisfaction-quits. Estimates of each model, using data from the Australian Longitudinal Survey, indicate that unions reduce the probability of quitting via the training effect by 0.5 percentage points, they reduce the probability of quitting via the collective voice effect by 4 percentage points and they increase the probability of quitting via the job dissatisfaction effect by 1.2 percentage points. The net effect of unions is, therefore, to reduce the probability of quitting by around 3 percentage points.

1. Introduction

There is a considerable literature which finds a negative relationship between unionism and quits for countries as diverse as the USA, Australia, Japan and the UK. [See for example Blanchflower and Freeman (1990), Mulvey (1991).] This relationship may be viewed as a result of the development of grievance and bargaining systems which provide a means of redress against disputed management decisions. It is a direct consequence of the presence of unionism. However, there are at least two indirect effects of unionism on quits which are worthy of consideration. The first is the re-interpretation offered by the exit/voice model of the links between quits

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and job satisfaction, and the second is derived from the human capital model.

In a competitive market model, if job satisfaction falls below a threshold level the worker is expected to quit. Factors which affect the level of job satisfaction, therefore, are expected to affect exit behaviour. Foremost in this regard is trade unions: it is frequently observed that there is a negative association between unionism and job satisfaction [see, for example, Freeman and Medoff (1984), Borjas (1979), Eberts and Stone (1984) and Kochan and Helfman (1981)]. An obvious explanation would be that unions generate discontent among their members by constantly seeking out and exposing issues of contention between management and employees. The higher levels of dissatisfaction among union workers would, *ceteris paribus*, be expected to lead to relatively high propensities to quit, whereas the empirical evidence is that union members are less likely to quit than their non-union counterparts. The interpretation of this paradox proposed by proponents of the exit-voice model is that union activity, in encouraging workers to voice their dissatisfaction, has the effect of politicising the workforce. Accordingly, '... this dissatisfaction is not genuine in the sense that it leads to quits, but is instead a device through which the union can tell the firm that its workers are unhappy and are demanding more.' [Borjas (1979) p. 25] From this perspective the empirical relationship between quits and job dissatisfaction may differ between unionists and non-unionists.

As well as the voice explanation of exit behaviour, there is the traditional explanation that the workers who are less likely to quit are those with greater amounts of firm-specific human capital. Hence Becker (1975, p. 32) observes 'Employees with specific training have less incentive to quit, and firms have less incentive to fire them than employees with no training or general training, which implies that quit and layoff rates are inversely related to the amount of specific training.' Because there is some evidence that the provision of training differs between unionists and non-unionists [see, for example, Green (1993)], and since this may be related to the monopoly power of unions to ration scarce training places, the human capital analysis of labour turnover can be linked to a union/non-union differential in exit behaviour.

If, as is typically observed, unions are associated with lower quits, the question which naturally arises is whether the impact derives directly from the fact that unionism offers access to formal means of resolving disputes without recourse to quitting, or indirectly from the effect of unions on the provision of firm-specific training or from their provision of a voice mechanism (the channel for expressing job dissatisfaction). These are the issues that are investigated in this paper using data from the male sample of

the 1985 Australian Longitudinal Survey. In Section 2 we first consider the job dissatisfaction hypothesis and discuss estimates of a number of models. We then examine the hypothesis that unionism and specific training are related and discuss estimates of relevant parameters. Finally, the conventional exit/voice model of the union/quits relationship is considered. The technical details of the estimation methods and the results of the regression analysis are presented in an Appendix. In Section 3 we draw some conclusions

2. How Unions Affect Quits

(a) The Job Dissatisfaction Hypothesis

Job dissatisfaction is expected to be related to a broad range of aspects of the workplace, including physical working conditions, work content, mode of supervision and the compensation package. While the early literature on job dissatisfaction focussed on the individual's appraisal of his/her own job experiences, the recent discussion has tended to focus on the role of trade unions in possibly engineering dissatisfaction. Freeman (1978) and Freeman and Medoff (1984), among others, have suggested that union members express more dissatisfaction with the conditions of their employment than do comparable non-unionists. The main explanation of this is Freeman and Medoff's voice model of trade union activity that was noted in the introduction. Alternative explanations of this relationship include:(i) high-tenure union workers face relatively flat wage-tenure profiles and express dissatisfaction as a result; (ii) union wage mark-ups may reflect in part compensating wage differentials due to poor working conditions so that, at any given wage, union workers are less satisfied than otherwise comparable non-union workers [Hersch and Stone (1990)]; (iii) dissatisfied workers are more likely to organise in unions. In this last case, the relationship between job dissatisfaction and unionism is due to the effect of job dissatisfaction on union status. None of these alternative explanations has found much support in the empirical literature and emphasis is therefore placed in this paper on the proposition that the job dissatisfaction among union workers reflects the expression of voice. [See Hersch and Stone (1990) for a full discussion of these issues.]

Data on job dissatisfaction are available from the Australian Longitudinal Survey which is a large, probability sample of individuals aged 15-24 years in 1984. The survey includes 9000 individuals selected from an area sample which covers all but the very sparsely settled areas of Australia. The analyses presented below are based largely on the 1985 wave of the data.[1]

These data were collected by personal interview between June and August 1985. A wide variety of data were collected, including basic demographic data, educational information and current employment status. Data were collected on the respondents' satisfaction with a range of aspects of the work environment, including noise levels, ventilation, safety precautions, leave provisions, security of employment, pay levels and, as a concluding question, the overall feelings towards their present job. It is this summary measure of attitude that forms the basis of the following analysis.

The actual question asked in the ALS was: 'Overall, how do you feel about your present job'. Responses were recorded on a five point scale: 'very dissatisfied', 'dissatisfied', 'neither', 'satisfied' and 'very satisfied'. The distribution of responses for union and non-union workers is as follows.

Table 1 Attitudes Towards Job Characteristics by Union Status, Males, 1985

	Union		Non-Union		Total Sample	
	N	f	N	f	N	f
1. Very Satisfied	181	.232	276	.318	457	.277
2. Satisfied	380	.487	391	.450	771	.468
3. Neither	85	.109	99	.114	184	.112
4. Dissatisfied	101	.129	72	.083	173	.105
5. Very Dissatisfied	33	.042	30	.035	63	.038
	780	1.000	868	1.000	1648	1.000

Source: 1985 Australian Longitudinal Survey
Note: N = number of respondents, f = frequency.

The general impression gained from Table 1 is that unionists are less satisfied with their work than non-unionists. A second aspect of Table 1 is the relatively small number of respondents reporting the extreme level of job dissatisfaction. Consideration is therefore given in the analyses discussed below to pooling the 'very dissatisfied' and 'dissatisfied' categories to form a group with greater representation.

A more precise indication of the relationship between trade unionism and job dissatisfaction is obtained through multivariate analysis. The independent variables included in the estimating equation are location, educational attainment, qualifications, occupation, full-time employment, government employment, wages, firm-specific capital, experience and union status. In other words, through the multivariate analysis the links

between job dissatisfaction and unionism are measured after making appropriate allowance for the influence of these other determinants of attitudes towards the job. All variables are defined in Appendix 1 (Data Appendix). There is no generally agreed on approach to the multivariate study of job satisfaction and it is usual for a number of alternative approaches to be considered. This strategy is followed in the current paper, with linear probability, ordered probit and logit models being estimated. Details on the methods of estimation and tables of results are presented in Appendix 2 (Statistical Appendix). The signs and statistical significance of the estimated impacts do not vary appreciably across the different models, and hence in order to establish the general patterns in the data it does not matter greatly which model is considered. The estimates referred to in the following discussion of highlights from the Appendix Table 1 results for the models of job satisfaction are for the linear probability model in column (3).

The estimates of the linear probability model in the Appendix Table 1 show that personal characteristics such as location of residence and educational attainment have only a minor effect on the degree of job dissatisfaction. However, individuals who work in clerical, processing and manual jobs are more likely to be dissatisfied than those who are employed in the reference occupation of professional and management. Similarly, individuals employed on a full-time basis are less likely to be dissatisfied than those employed on a part-time basis, and there is a negative relationship between the wage and the degree of job dissatisfaction. The relationship between job dissatisfaction and labour market experience is non-linear: up to around five years of experience, the level of job dissatisfaction tends to grow with labour market involvement, but beyond this threshold additional years of labour market experience are associated with higher levels of satisfaction. Presumably, this reflects the general pattern of job-shopping during the initial years in the labour force followed by a period of stability. Finally, union members are shown to be more dissatisfied with their jobs than non-union members. The coefficient of 0.061 indicates a probability of being dissatisfied that is 6 percentage points higher for union members than non-members.

It will be readily apparent from the Appendix Table 1 results that the estimated association between unionism and job dissatisfaction is robust to the method of estimation. Hence we can state with confidence that unions in Australia are associated with greater levels of job dissatisfaction. In this respect the impact of unions on job dissatisfaction in the Australian labour market is similar to that of unions on job dissatisfaction in the US labour market [see Borjas (1979), Freeman and Medoff (1984)]. Where the level of job dissatisfaction affects labour turnover, therefore, it would be expected that trade unions have an important indirect effect on exit behaviour.

(b) Trade Unions and Firm-Specific Training

Relatively little has been written about the effects of unionism on training. However, there are a number of ways in which union activity may affect the supply and demand for training. Unions may:

i)   increase the amount of training supplied by reducing the quit rate and thereby increasing the returns to employer investments in specific training;

ii) reduce the demand for general training by imposing seniority rules;

iii) reduce the supply of both general and specific training as a consequence of imposing higher than competitive rates of pay during the training period;

iv) ration scarce training opportunities in favour of their members where there is an excess demand for training.

i) unions reduce the quit rate

Mincer (1983) argued that, because of the union premium in wages and benefits, unionism reduces labour turnover and thereby raises the rate of return on investments in specific training. In turn this will increase the amount of specific training undertaken by union workers. This argument is made more relevant by the prediction of the exit/voice model, which finds strong support in the empirical literature, that unions will reduce quits by offering access to means of dispute and grievance resolution through collective voice [Miller and Mulvey (1991)].

Green (1993) suggests that the distinction between specific and general training is often very difficult to make in practice and points out that there is some evidence that employers do invest in their employee's general training [see for example Ryan (1980)][2]. If this is so, union-induced reductions in labour turnover might encourage employers to increase their investments in general as well as specific training.

The foregoing suggests that unionism will reduce the quit rate, both by establishing a wage premium for union members and by offering them a voice alternative to quitting. As a result of the reduced probability of quitting for unionised workers the returns to specific training are enhanced and unionised workers are therefore more likely to undertake such training. Moreover, the increase in job security which unions offer through the collective voice mechanism, together with the existence of seniority systems, will encourage greater skill transfer from older to younger workers. However, our interest in this paper is to consider whether unionism affects the incidence of training directly, independent of the quit rate.

ii) unions impose seniority rules

Mincer (1983) argued that unionism would discourage employees from investing in general training but might encourage employers to invest in specific training. He argues that employees will not regard general training as necessary to secure promotion or wage increases because union-imposed seniority rules determine advancement within the firm. However, if, as Green (1993) suggests, much of general training has a non-separable specific component, unions may be able to use their monopoly power to shift the incidence of training costs in such a way as to force employers to pay for some of the general training.

iii) unions raise training pay

To the extent that unions push award rates of pay above their competitive levels and, to the exent that they secure a wage premium for their members, it is likely that the amount of training supplied by firms will be reduced. This is because higher than competitive rates of pay, both during and after the training period, will tend to prevent firms from offering sufficiently steep age-earnings profiles to make investment in specific training attractive. Moreover, high rates of pay (relative to marginal product) during the training period for general training will reduce the supply of such training but increase the demand (because the opportunity cost is reduced) so that a chronic excess demand for general training may exist.

iv) unions may ration scarce training opportunities in favour of their members

Kennedy and Sloan (1993) point out that unions may have institutional incentives to increase the amount of training undertaken. Because training is associated with increased job tenures and reduced labour turnover, union membership may be stabilised and recruitment and servicing costs lowered. This applies to both specific and general training. Kennedy and Sloan (1993) also point out that unions in Australia have shown an interest in promoting training in various explicit policy statements. For example *Australia Reconstructed* in 1987 vigorously advocated increases in the amount of training provided and that it should be funded by a tax on employers. Moreover, unions were proponents of the *Training Guarantee Act* of 1990 (which required employers to spend a minimum proportion of their payroll on approved training) and supporters of the various training initiatives which were incorporated into the award restructuring provisions of the Accords after 1987.

Given that unions have vested interests – in terms of stabilising membership and reducing recruitment and administrative costs – in increasing the amount of training that their members undertake and that there is probably an excess demand for training due to the way in which the award wage structure raises the costs of training to employers, it would not be surprising if unions attempted to ration scarce training opportunties in favour of their members.

Models examining the distribution of training opportunities in the Australian Longitudinal Survey analysed here have previously been estimated by Miller (1990). These cover various types of training for several years of data. The estimations reveal that both personal characteristics (e.g. educational attainment, possession of qualifications) and the nature of the job (e.g. occupation of employment, full-time/part-time status) matter. However, it is also shown that the factors affecting the incidence of the various types of training (e.g. formal, on-the-job, formal-off-the-job) differ by type of training. Unfortunately, this earlier study did not include a union variable. Nor was any consideration given to the firm-specific/general training distinction. Both these omissions are corrected in the estimates presented in Appendix Table 2.

The dependent variable in this analysis combines two sets of information. First, it contains information on whether training was received. Around three-quarters of the sample in the ALS reported that they undertook training in their current job. This is the same type of variable that was analysed in Miller (1990) where quite strong empirical results were reported. Second, the variable contains information on the inter-firm transferability of the skills learned. Most of the training (80 per cent) appears to be quite general in that it could either help get the same job or a different job in another firm. Consequently, only 13 per cent of the sample received training that could be unambiguously categorised as firm-specific. The analysis of this narrowly focussed dependent variable yields results that are statistically weaker than those reported in Miller (1990).

Both linear probability (i.e. OLS) and logit models of the incidence of firm-specific training were estimated. The most pertinent feature of the results in Appendix Table 2 is that personal characteristics (e.g. educational attainment, experience) do not matter when it comes to determining the distribution of firm-specific training opportunities. Green (1991) reports results for job-specific training which do not share this feature. However, Green defines job-specific trainees as 'those training for their existing occupation, either directly on the job or through specific courses'. As such this definition does not capture the essence of Becker's concept of firm-specificity. The variables that do matter are occupation of employment,

where individuals employed in processing work or in the 'other' group of occupations have a relatively high incidence of firm-specific training. Union status is also a significant determinant of the incidence of firm-specific training and government employment too is characterised by a relatively high incidence of firm-specific training. Compared to non-unionists, union members have a much higher probability of undertaking firm-specific training. For example, in the OLS estimates the coefficient on the union variable is 0.052. This indicates that the probability of union members undertaking firm-specific training is 5.2 percentage points higher than for non-unionists. When this is compared to the mean incidence of this type of training of 13 per cent, it is seen that unions have an important effect in determining the allocation of firm-specific training in the Australian labour market. As was the case with job dissatisfaction, if firm-specific training and quits are related, trade unions will have an important indirect effect on quits via their impact on the distribution of opportunities for firm-specific training.

(c) Estimates of the Quits Model

A number of approaches have been followed in the literature examining quits. For example, models of quits have been linked to models of job dissatisfaction by proposing that quits occur when the level of dissatisfaction exceeds a threshold level. More elaborate models that relate quit behaviour to current and expected differences in pecuniary and non-pecuniary remuneration, individual characteristics (such as types of human capital) that affect worker mobility, union status and unobserved variables have also been explored [see for example Miller and Mulvey (1991)]. The aim here is to determine the impact of unions on quits that is associated with the collective voice activities of unions. Accordingly, appropriate account must be taken of the effect of unions on relative wages, since the relative wage effect of unions may influence quit probabilities directly. Other factors that have an influence on quit behaviour must also be taken into account in the empirical analyses. Consequently, the typical estimating equation used in such studies relates quit rates to individual union status, wages, human capital characteristics, experience, age, gender, location and occupation of employment.

This type of model of quits, based on the ALS, is presented in Miller and Mulvey (1991). It is generalised in the present study through inclusion in the estimating equation of a greater level of detail on job dissatisfaction. In particular, a linear dissatisfaction variable based on the category numbers for the levels of job dissatisfaction contained in Table 1 is included in one specification, three dichotomous variables recording various levels of job

dissatisfaction are included in a second specification while the third speci-
fication considered is based on a single dichotomous dissatisfaction vari-
able. Appendix Table 3 presents relevant estimates.

There are a number of features of these results. First, regardless of the
method of estimation and specification of the job dissatisfaction variables,
trade unions are shown to exercise a negative influence on quit behaviour,
reducing quits by about four percentage points. On the basis of the earlier
discussion, we presume that this derives from the grievance and bargaining
systems associated with trade unionism.

Second, individuals who have received firm-specific training in the past
are revealed as having a lower quit probability than workers who did not
receive such training.

Third, actual quit probabilities rise with the extent of dissatisfaction. This
is an intuitively appealing result that is consistent with a wide body of
literature (e.g., Freeman and Medoff (1984)). However, the monotonic
relationship evident in the current set of results is worth emphasising. Thus,
individuals who are satisfied with their job are more likely to quit than those
who are very satisfied, workers who are neither satisfied nor dissatisfied
with their work are more likely to quit than workers who are satisfied, and
those who are dissatisfied are more likely to quit than workers who are
neutral with respect to their attitudes towards their jobs.

This suggests that simple binary measures of job dissatisfaction (e.g.,
Miller and Mulvey (1991)) that pool a number of these categories will blunt
the dissatisfaction-quit relationship. The results also show that, holding the
degree of dissatisfaction and other variables constant, union workers are
less likely to quit than their non-union counterparts. A negative impact of
unionism on quits is generally considered as evidence that unions provide
a mechanism (voice) other than quitting through which grievances may be
made known to management.

Fourth, when union-dissatisfaction interaction terms were added to the
estimating equation, none was statistically significant. A similar result has
been reported by Hersch and Stone (1990). That is, the specifications
presented in Appendix Table 3 are adequate representations of the quit
process. These show that union workers have a lower probability of quitting
than non-union workers, regardless of the degree of job dissatisfaction. This
situation can be illustrated with the aid of Figure 1.

Quadrant C in Figure 1 displays the exit-voice tradeoff. It is assumed
that there is a given level of grievance, g, and this may be expressed through
quitting, q or through voice, v. Hence, $g = g(q,v)$, where $dq/dv|_g < 0$
expresses the central proposition of Freeman and Medoff (1984) that there
is a negative trade-off between exit and voice. We assume here that $g = qv$.

Quadrant B maps quits into itself, while quadrant D maps union voice into dissatisfaction (d). It is the contention of the voice literature that the politicisation of the workforce will most likely lead to expressions of dissatisfaction. As Borjas (1979, p.30) states, '... unions focus attention on the working conditions of the firm, making workers more aware of what is wrong with their jobs and leading to unionized workers "expressing" more dissatisfaction.' Hence, there should be a positive relationship between voice and dissatisfaction, that is, $\partial d/\partial v > 0$. As neither voice nor dissatisfaction have definite metrics, the linear mapping displayed in Figure 1 could be obtained through appropriate scaling of the measures of voice and dissatisfaction.

Figure 1
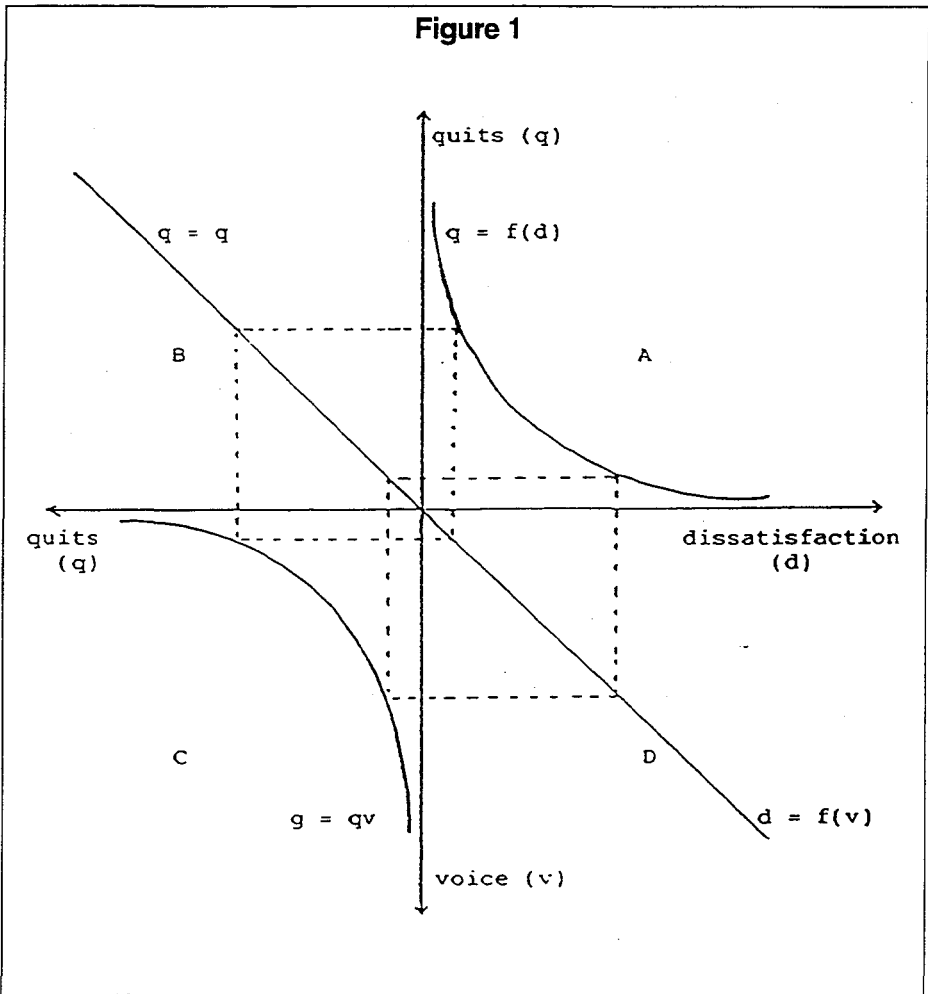
The exit-voice tradeoff in quadrant C and the mapping functions in quadrants B and D may be used to derive the quit-dissatisfaction relationship in quadrant A. The important point is that, given $dq/dv|_g < 0$ and $\partial d/\partial v > 0$, the relationship between quits and dissatisfaction for unionists should be negative.

However, according to the evidence in Appendix Table 3, the quit-dissatisfaction relationship is strongly positive for both unionists and non-unionists. The positive relationship for non-unionists may arise because job satisfaction is a proxy for aspects of the job or for alternative job opportunities [see Freeman (1978)].[3] The quit-dissatisfaction relationship that derives from these sources may be more or less intense for unionists; this is an empirical matter.[4] But it is an empirical issue that is difficult to test because of the dampening impact of the voice influence shown in Figure 1. As the relative contributions of voice and work conditions to the quit-dissatisfaction relationship in the Appendix Table 3 estimations are unknown, the results should not be used to dismiss the voice hypothesis [see Hersch and Stone (1990)]. Similarly, the presence of an apparently strong work conditions effect implies that the analysis of the direct and indirect links between unions and quits in Section 3 will provide a lower bound to the potential collective voice of unionism.

3. Conclusion

We are now in a position to discuss further the complete model of the quit process outlined above. A diagram is provided to assist in this regard.[5]
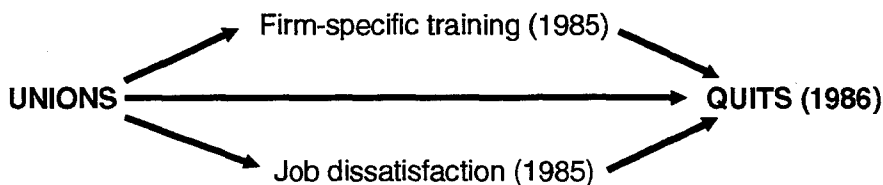
As a preliminary step in this discussion, it is informative to note that the three (two indirect and one direct) effects unions have on quits do not all work in the same direction. Thus, the influence of unions *via* job dissatisfaction will serve to increase quits while the direct effect and the indirect impact on quits *via* firm-specific training will reduce quits. In fact, when a quit model was estimated that excluded the firm-specific training and job dissatisfaction variables, the net effect of unions was shown to a statistically insignificant three percentage points. The paths outlined above will assist

in the unravelling of this impact. Only the OLS estimates are used in this analysis, though obviously due to the closeness of the logit and OLS results in the analyses undertaken, the answers provided will not be model-specific.

Path one, *via* firm-specific training, operates as follows. Unions increase the probability of firm-specific training by about 5 percentage points, and each percentage point increase in the probability of receiving firm-specific training will lead to an 0.08 of one percentage point reduction in the probability of quitting. Hence, the indirect reduction in the probability of quitting that operates *via* this route is of the order of one-half of one percentage point.

Path two, the direct effect, is, as discussed above, associated with a reduction in quits of 4 percentage points. Hence, paths one and two have a combined union effect of a reduction in quits of a substantial 4.5 percentage points.

Path three, the indirect influence *via* job dissatisfaction, operates as follows. Unions increase the probability of job dissatisfaction by about 6 percentage points, and each percentage point increase in the probability of being a dissatisfied worker is associated with an increase in the probability of quitting of 0.2 of one percentage point. Hence the indirect increase in the probability of quitting that derives from this source is of the order of 1.2 percentage points.

Hence, the overall effect of unions, as determined from the structural model, is to reduce the probability of quitting by close to three percentage points. This is of the same order of magnitude as determined in the reduced form. However, the estimation of a structural model provides greater insights into the way that trade unions effect a change in the quit propensity, and this is the major advantage of the approach followed in this paper.

Appendix 1 – The Data

The variables used in this study are defined below. All variables except the quit variable are defined with reference to the 1985 Wave from the Australian Longitudinal Survey. The exit variable is constructed using information in both the 1985 and 1986 Waves of the Survey. The Survey question numbers used to construct each variable are listed in brackets following the definition. These variables were analysed using the LIMDEP statistical package (version 6). The data are available through the Social Science Data Archives at the Australian National University. The Social Science Data Archives study numbers are 413 for the 1985 data and 421 for the 1986 data. Only the data for males are used in this study.

Locality: The locality variable describes the part of Australia the respondent lived in at the time of the survey. The omitted category comprises residents of capital cities and they are distinguished from residents of urban, non-capital city areas ('small urban locations'), and residents of all other locations ('rural locations'). [Source: Question B.9]

Educational Attainment: Six separate categories of education are distinguished: university degrees, diplomas, year 12, year 11, year 10 and less than year 10. Individuals who left school prior to completing year 10 comprise the omitted category in the estimating equations. [Source: E.5, E.8, E.14, E.23]

Post-School Qualifications: This category of variable refers to post-school qualifications other than university degrees and diplomas. Three distinct groups are formed: trade qualifications, other post-secondary qualifications, and no qualification. The latter category is the omitted group. [Source: E.14, E.23]

Occupation: The detailed occupation data available in the Australian Longitudinal Survey were aggregated into the following groups [see Bureau of Labour Market Research (1986), Appendix 3]: Professional and Managerial, Clerical, Sales, Trades, Process Workers, Manual Workers, Other Occupations. The Professional and Managerial group is omitted from the estimating equations. [Source: G.19]

Full-Time/Part-Time Status: The full-time worker variable is a dichotomous variable, defined to equal unity if the individual works more than 30 hours per week. [Source: G.4, G.5]

Government Employment: This binary variable distinguishes between individuals who are employed in the government sector and private sector workers. [Source: G.10]

Union Members: This is a dichotomous variable, set to unity where the individual was a member of a union, otherwise it is defined to equal zero. This variable refers to union membership rather than coverage by a union contract. [Source G.6]

Experience: This is computed as age minus years of education minus 5. A quadratic specification is used. [Source: *Age:* A.4, *Years of Education:* E.5, E.8, E.14, E.23]

Tenure: This records the length of a continuous spell of employment with one employer. In his study of exit behavior in the US youth labour market between 1969 and 1971, Freeman (1978) focuses upon tenure in 1969, and this is referred to as a "lagged tenure" variable in his analysis. We follow this practice and use tenure at the time of the 1985 survey. [Source: Survey Calendar, Section H]

Wages: The wage variable is derived by dividing usual gross pay by total hours worked in the main job. This is entered in the estimating equations in logarithmic form.[Source: *Pay* G.7, G.8, G.9, *Hours* G.4, G.5]

Training: The training variable is a dichotomous variable, set to unity where the respondent had received training which would not enhance his prospects of getting a job with another firm. That is, this variable records whether firm-specific training had been received. [Source: L.22, L.23]

Job Satisfaction: The respondent's overall feeling towards his current job was recorded in one of five categories: 'very satisfied', 'satisfied', 'neither', 'dissatisfied', and 'very dissatisfied'. A number of variables may be constructed from this information and these are discussed in the text.

Quits: This variable is constructed from the 1986 Wave of the ALS. Individuals who had changed jobs between the 1985 and 1986 Surveys were asked the main reason why they left the job they held at the time of the 1985 Survey. Responses were recorded in 12 categories: (1) only a holiday job, (2) other temporary job, (3) laid off due to shortage of work or discharged, (4) not satisfied with the job, (5) sickness, (6) pregnancy, (7) home duties, (8) moved residence, (9) travel, (10) study, (11) to get another job, (12) other. Quits are defined with respect to categories 4, and 6 to 11 inclusive. [Source: G.6]

The small number of individuals who failed to report answers to any of the questions used in the construction of these variables were excluded from the analysis. Further details on the survey are presented in McRae (1984).

Appendix 2 – Statistical

Table 1 Estimates of Models of Job Dissatisfaction, Males,1985 Australian Longitudinal Survey

	(1)	(2)	(3)	(4)
Constant	2.022	0.305	0.171	-2.012
	(7.77)	(1.09)	(2.01)	(2.63)
Location				
Urban	-0.030	-0.018	-0.011	-0.097
	(0.44)	(0.25)	(0.50)	(0.51)
Rural	-0.186	-0.165	-0.055	-0.491
•	(2.82)	(2.32)	(2.53)	(2.46)
Educational Attainment				
Degree	0.341	0.417	0.106	0.947
	(1.93)	(2.08)	(1.72)	(1.84)
Diploma	0.229	0.293	0.057	0.490
	(1.28)	(1.45)	(0.98)	(0.86)
Year 12	0.018	0.013	0.033	0.296
	(0.14)	(0.09)	(0.79)	(0.78)
Year 11	0.180	0.187	0.058	0.480
	(1.39)	(1.42)	(1.38)	(1.30)
Year 10	0.077	0.080	0.033	0.283
	(0.66)	(0.65)	(0.88)	(0.81)
Qualifications				
Trade	0.047	0.037	0.016	0.128
	(0.64)	(0.50)	(0.66)	(0.64)
Other	-0.031	-0.046	0.008	0.054
	(0.28)	(0.41)	(0.23)	(0.18)
Occupation				
Clerical	0.358	0.397	0.079	0.661
	(3.82)	(3.89)	(2.44)	(2.43)
Sales	0.037	0.003	0.045	0.417
	(0.28)	(0.03)	(1.05)	(1.15)
Trades	0.041	0.075	-0.002	0.002
	(0.47)	(0.78)	(0.06)	(0.01)
Process	0.331	0.361	0.088	0.733
Work	(3.00)	(3.05)	(2.31)	(2.36)
Manual	0.354	0.370	0.107	0.867
Work	(3.20)	(3.36)	(2.87)	(2.91)
Other Occ.	-0.235	-0.306	-0.027	-0.297
	(1.97)	(2.22)	(0.76)	(0.66)
Other Variables				
Full-time Employment	-0.374	-0.379	-0.104	-0.736
	(2.74)	(3.10)	(2.23)	(2.45)
Govt Employment	-0.028	-0.025	-0.007	-0.046
	(0.45)	(0.38)	(0.33)	(0.26)
Log Wage	-0.172	-0.159	-0.060	-0.501
	(2.10)	(1.69)	(2.27)	(2.10)
Firm-Specific Capital	0.050	0.072	-0.012	-0.104
	(0.66)	(0.84)	(0.46)	(0.47)
Experience	0.216	0.257	0.040	0.427
	(4.59)	(4.47)	(2.78)	(2.36)
Experience Squared	-0.018	-0.021	-0.004	-0.038
	(4.70)	(4.44)	(3.00)	(2.37)
Union	0.195	0.202	0.061	0.495
	(3.51)	(3.38)	(3.25)	(3.19)
$\mu 1$	(a)	1.296	(a)	(a)
	(33.26)			
$\mu 2$	(a)	1.716	(a)	(a)
	(37.58)			
$\mu 3$	(a)	2.451	(a)	(a)
	(36.81)			
R^2	0.0463	0.0228		
χ^2		106.414		59.710
Sample Size	1648	1648	1648	1648

(a) = variable not relevant

Column (1) of Table 1 contains OLS estimates of a linear measure constructed using the job dissatisfaction category numbers from Table 1 of the text. It gives higher values to dissatisfied workers than to satisfied workers [see also Borjas (1979), Hersch and Stone (1990)]. This approach utilises all the information available on the varying degrees of dissatisfaction, but ignores the discrete nature of the data.

Column (2) presents estimates for when a linear measure is analysed using an ordered probit model. The ordered probit model [McKelvey and Zavoina (1975)] is appropriate where the data are categorical and have an underlying ordering. It permits the probabilities of expressing a given level of satisfaction to be determined as:

$$\hat{S}_{ij} = \phi(\hat{\mu}_j - X_i\hat{\beta}) - \phi(\hat{\mu}_{j-1} - X_i\hat{\beta})$$

where $\hat{S}_{ij}$ denotes the predicted probability of individual i being in the jth job satisfaction category, ϕ represents the cumulative normal density function, X is the vector of exogenous variables thought likely to affect job satisfaction and the $\hat{\mu}$s are the estimated separation points in the ordered probability model.

Column (3) lists estimates for a binary measure analysed using OLS while column (4) lists estimates for when this measure is analysed using a logit model. The binary variable in this instance attempts to distinguish individuals who are satisfied with their jobs from those who are indifferent or dissatisfied [e.g. Borjas (1979)]. This approach accommodates the discrete nature of the data, but at the cost of a considerable loss of information. A further difficulty with the approach is the arbitrary nature of the division between "satisfied" and "dissatisfied".

Column (1) of Table 2 lists results for a linear probability model where the variation in a dichotomous dependent variable has been analysed using ordinary least squares. The estimates presented in columns (2) and (3) are from a logit model of the same dependent variable as in column (1). Column (2) contains estimates for the full model while a set of insignificant regressors has been excluded from the specification used in column (3). Each estimation is highly significant, although the explanatory power of the equations derives from a limited set of regressors.

Table 2 Estimates of Models of Incidence of Firm-Specific Training 1985 Australian Longitudinal Survey

	(1)	(2)	(3)
Constant	0.032	-2.791	-2.446
	(0.40)	(3.43)	(11.94)
Location			
Urban	0.002	0.012	(a)
	(0.08)	(0.06)	
Rural	-0.036	-0.375	(a)
	(1.83)	(1.74)	
Educational Attainment			
Degree	0.026	0.280	(a)
	(0.51)	(0.49)	
Diploma	-0.003	-0.016	(a)
	(0.07)	(0.03)	
Year 12	0.059	0.561	(a)
	(1.65)	(1.30)	
Year 11	0.039	0.408	(a)
	(1.14)	(0.95)	
Year 10	0.040	0.410	(a)
	(1.29)	(1.02)	
Qualifications			
Trade	-0.015	-0.144	(a)
	(0.64)	(0.68)	
Other	-0.033	-0.304	(a)
	(0.97)	(0.94)	
Occupation			
Clerical	0.003	0.032	0.142
	(0.11)	(0.12)	(0.56)
Sales	-0.034	-0.501	-0.412
	(1.01)	(1.05)	(0.89)
Trades	0.003	0.020	0.001
	(0.10)	(0.07)	(0.01)
Process Work	0.086	0.673	0.651
	(2.31)	(2.24)	(2.44)
Manual Work	-0.045	-0.640	-0.735
	(1.59)	(1.72)	(2.16)
Other Occupations	0.113	0.741	0.719
	(2.25)	(2.29)	(2.33)
Full-Time Employment	0.008	0.015	(a)
	(0.23)	(0.04)	
Government Employment	0.071	0.568	0.608
	(3.37)	(3.35)	(3.68)
Log Wage	0.002	0.017	(a)
	(0.09)	(0.07)	
Experience	0.001	0.004	(a)
	(0.07)	(0.03)	
Experience Squared/100	-0.008	0.005	(a)
	(0.05)	(0.01)	
Union	0.052	0.491	0.475
	(3.01)	(2.97)	(2.99)
c2		69.695	61.517
R^2	0.031		
Sample Size	1648	1648	1648

(a) = variable not entered.   't' statistics in parentheses.

Table 3 Estimates Of Quits Model 1985 Australian Longitudinal Survey

	(1)	(2)	(3)	(4)
Constant	-0.454	-0.485	-0.153	0.446
	(0.73)	(0.78)	(0.25)	(4.33)
Urban	-0.557	-0.553	-0.551	-0.086
	(3.18)	(3.17)	(3.18)	(3.35)
Rural	-0.558	-0.565	-0.581	-0.092
	(3.34)	(3.38)	(3.51)	(3.59)
Educational Attainment				
Degree	-0.119	-0.108	-0.104	-0.033
	(0.28)	(0.25)	(0.25)	(0.44)
Diploma	0.133	0.154	0.136	0.007
	(0.31)	(0.36)	(0.32)	(0.09)
Year 12	-0.342	-0.341	-0.375	-0.072
	(1.16)	(1.16)	(1.29)	(1.34)
Year 11	-0.315	-0.310	-0.290	-0.055
	(1.10)	(1.09)	(1.03)	(1.03)
Year 10	-0.366	-0.357	-0.364	-0.069
	(1.39)	(1.35)	(1.40)	(1.42)
Qualifications				
Trade	0.298	0.299	0.294	0.046
	(1.76)	(1.76)	(1.76)	(1.67)
Other	0.241	0.252	0.207	0.029
	(0.92)	(0.97)	(0.80)	(0.67)
Occupation				
Clerical	0.258	0.262	0.326	0.050
	(1.10)	(1.12)	(1.40)	(1.30)
Sales	-0.025	-0.021	-0.048	-0.013
	(0.08)	(0.07)	(0.16)	(0.26)
Trades	0.070	0.069	0.087	0.011
	(0.31)	(0.31)	(0.39)	(0.31)
Process	0.124	0.132	0.184	0.026
Work	(0.46)	(0.49)	(0.69)	(0.59)
Manual	0.261	0.290	0.314	0.050
Work	(1.02)	(1.13)	(1.23)	(1.16)
Other Occ.	0.871	0.889	0.787	0.125
	(2.77)	(2.82)	(2.53)	(2.49)
Full-Time	-0.464	-0.477	-0.512	-0.102
Employment	(1.72)	(1.77)	(1.92)	(1.98)
Government	-1.025	-1.020	-1.013	-0.141
Employment	(5.80)	(5.78)	(5.77)	(6.47)
Log (Wage)	-0.245	-0.257	-0.255	-0.043
	(1.21)	(1.27)	(1.27)	(1.28)
Firm-Specific	-0.581	-0.569	-0.548	-0.077
Capital	(2.67)	(2.62)	(2.53)	(2.99)
Experience	0.084	0.092	0.135	0.021
	(0.65)	(0.71)	(1.06)	(1.08)
Experience^2/100	-0.516	0.563	-0.953	-0.154
	(0.48)	(0.53)	(0.90)	(0.93)
Linear	0.447	(a)	(a)	
Dissatisfaction	(7.91)			
Dichotomous	(a)	(a)	1.017	0.195
Dissatisfaction	(6.43)	(5.82)		
Dissatisfied	(a)	1.455	(a)	
	(7.30)			
Neutral	(a)	0.487	(a)	
	(2.96)			
Satisfied	(a)	0.987	(a)	
	(4.58)			
Union	-0.286	-0.289	-0.262	-0.040
	(2.13)	(2.15)	(1.96)	(1.78)
Sample Size	1648	1648	1648	1648
c^2	162.975	161.303	139.617	
R^2				0.0812

(a) = variable not entered.   't' statistics in parentheses.

The estimates in the first three columns of Appendix Table 3 have been obtained from maximum likelihood estimation of a logit model, while those in the final column have been computed using OLS. The specification of the model in column (1) contains the linear dissatisfaction variable analysed in columns (1) and (2) of Appendix Table 1. Column (2) contains three dichotomous variables recording various levels of job dissatisfaction, while columns (3) and (4) contain a single dichotomous dissatisfaction variable. Each specification contains the training and union status variables.

Notes

1 Analysis of subsequent years of the longitudinal survey needs to accommodate the substantial attrition bias, and for this reason we confine our analysis to the initial years of the survey where problems with non-random samples are likely to be minimal.

2 The most plausible explanation for this is that even general training contains some specific element due to mobility costs [Green (1993)]. Moreover, by investing in general training, turnover and recruitmernt costs may be reduced so that this may prove to be a cost effective strategy for the firm.

3 Hersch and Stone (1990) include measures of working conditions in their job satisfaction equation. However, they do not test for union differences in the impact of working conditions on job dissatisfaction. Nor do they include the variable for working conditions in their quit equations.

4 It is well known, for example, that the relationships between wages and variables like education, tenure, race and industry differ between unionists and non-unionists. Factors such as the goals of unions and the degree of monopoly power account for the pattern of union wage effects. Similar factors might impact on the quit-dissatisfaction effect.

5 The effects of unions on quits operating via the training-satisfaction-quits path is of second-order importance and can be safely ignored.

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