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THE IMPACT OF COLLECTIVE BARGAINING ON PAY IN NORTHERN IRELAND

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ABSTRACT

The role of trade unions in determining pay has diminished over the last three decades in most developed economies. However collective bargaining still plays a significant role in many sectors of the economy with many employers still negotiating pay through such structures. The aim of this paper is to find out whether collective bargaining agreements still deliver for workers in Northern Ireland in terms of higher wages. Data from the Understanding Society survey is used calculate whether a premium exists for workers covered by collective agreements, once all other relevant factors have been taken into account.

While qualifications and education remain the most important determinants of pay, a significant collective bargaining premium remains. This has significant implications for employees in terms of securing a larger share of income but also for employers and the productivity potential of the Northern Ireland economy. Previous studies have identified a causal link between collective bargaining and productivity both at the firm and sectoral level. Workers covered by a collective agreement may earn more but employers clearly also gain from these arrangements. Northern Ireland suffers from chronically weak productivity growth, and skills underutilisation is a key contributor to that. Collective bargaining therefore represents a significant policy lever open to the Northern Ireland Executive to encourage and more coordinated and integrated approach to industrial development in the region.

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SECTION 1: INTRODUCTION

In the years following the financial crisis of 2008 the United Kingdom experienced the slowest recovery in wages of any previous large-scale recession (Green and Lavery, 2014). This slowdown in wages occurred in spite of a strong recovery in employment. In Northern Ireland, average weekly wages are still 1% below the level of 2009 (NISRA, 2019), and this is the case across many regions of the UK. These recent trends are a cause of concern but there has been a trend of decline with regard to wages that long predates this most recent experience. The labour share of income has been in decline in the UK, and many western economies, since the late 1970's. The labour share of income describes what portion of domestic output is accounted for by wages and as opposed to that which accrues to capital. The labour share of income is an indicator of the relative power of the agents of production, workers, and the owners of production, employers. This decline in the labour share of income has occurred alongside another significant change in the world of work, the decline in membership of a trade union and workplace collective bargaining

In the United Kingdom, the decline in trade union membership began in the late 1970's and continued up to the middle of this decade, after which it has plateaued (ONS, 2019). Trade Unions exist to bargain for the pay and conditions of employment for their members at either firm, sectoral or national level. This process is known as collective bargaining and it ultimately results in collective agreements between trade unions and employers. While trade union membership and bargaining coverage varies considerably across the EU, most countries have seen a similar level of decline over the past three decades. Studies which have sought to identify the causes of this decline usually examine the impact of mega trends such globalisation, deregulation or automation. De-industrialisation has been the most significant influence with most European countries and explains, in large part the scale and speed of

that decline (ILO, 2019).

These factors may have influenced overall density and coverage but trade union membership is ultimately determined by individual workers making a discrete decision about whether or not to join a union. Whilst these individual decisions will be influenced by many factors, workers choose to join a union if collective bargaining delivers better conditions of employment and crucially, higher wages. Notwithstanding the host of other factors which may influence the decision, of a 'union wage premium' is a regarded as the paramount concern with regard to trade union membership.

There is reason to believe that collective bargaining may no longer deliver higher wages and better conditions. Industrial relations legislation over the last number of decades has sought to restrict the activities of trade unions and such restrictions may have limited both the ability of a union to bargain on behalf of workers and the ability of workers to join a trade union (Evans et al, 1992). These two outcomes also feed each other. Historically, the ability of trade unions to deliver superior outcomes through collective bargaining rests on the idea that if workers negotiate as a collective, they can balance out the market power of employers. If workers find it harder to join a trade union, union density will decline. As trade union density declines, unions no longer have the power to deliver these superior outcomes and therefore workers do not see opportunity to improve their position through membership.

The focus of this paper is to estimate whether collective bargaining still provides a wage premium. If a wage premium exists then increased bargaining will likely increase pay across the economy and may reverse some of the most recent labour market trends. The absence of a premium does not remove the potential of trade union membership and bargaining to raise pay in the future. It just means that, in the current context, the key motivation for joining a trade union is absent. In this scenario, reversing policies that have restricted trade union activities may re-establish the link between trade union membership, collective bargaining and better wages and conditions. Collective bargaining thus represents one of the few policy levers that government has in order to increase wages and ultimately the labour share of income.

The paper is structured as follows, Section 2 will outline the current literature with regard to union wage premiums. Section 3 will outline the data that will be used and analyse summary statistics related to collective bargaining in Northern Ireland. Section 4 will set out the methodology used in this paper to calculate the union wage premium and Section 5 will set out the results. Finally, Section 6 will conclude with a brief discussion of the policy implications of these findings.

SECTION 2 LITERATURE REVIEW

Research in the area of union wage premia has dissipated in recent years. This quite possibly reflects the decline in union membership and density that has occurred across most developed economies over that time. However, as Blanchflower and Bryson (2004) point out, while the influence of trade unions may have diminished in recent years, membership and collective agreements remain strong in certain sectors of the economy. The overall impact of trade unions in the economy may have declined, but it remains a significant feature of pay determination for a significant proportion of the workforce.

As mentioned in the introduction, in theory collective bargaining is the vehicle that delivers a wage premium rather than trade union membership itself. A union wage premium is usually understood to be the gap between the wages of workers who are members of a trade union and those who are not. This is commonly referred to as a 'membership premium'. However, the union wage premium can also be measured as the difference between the wages of workers who are covered by a collective agreement and those that are not. This is known as the 'coverage premium'. The distinction is necessary because it is possible for a worker who is not a member of a trade union to benefit from a union negotiated wage if the wage applies to trade union members and non-members alike. There may be a firm where there are a minority of workers who are members of a trade union, but because the trade union determines wages for all workers, non-union members receive a union wage premium. In any workplace, there may be individual union members, but unless the union is active in negotiating pay agreements, there is unlikely to be a union wage premium.

One would expect that a union 'membership premium' and a union 'coverage premium' would be the same in individual workplaces where a union bargains for pay. In this case, a worker may question the benefits of paying trade union dues. This is referred in the literature as the 'free rider' problem. If the benefits of the collective agreement are enjoyed by members and non-members alike, the incentive to join a union is questionable. However, it is also possible that within a firm where workers are covered by a collective agreement it is also possible for members to earn more than non-members. This is the membership premium. Bryson (2002) examines the union wage premium across the UK private sector and finds no statistically significant membership premium overall. There is a membership premium for workers in workplaces that have collective bargaining agreements. This implies that there is no 'free-rider problem' in the UK private sector and suggests that while union membership does not confer higher pay in and of itself, being a member of a union does deliver higher pay if your union is involved in negotiating pay.

Na and Budd (2000) have similar findings for South Korea, where they identify a membership premium of 12-14% among covered workers. The membership premium decreases but persists after controlling for individual characteristics and issues with measurement error. Bhandari (2008) has similar findings for India where a large membership premium is identified among covered workers in the manufacturing sector. Adjusting for worker characteristics and other possible determinants of union membership makes very little difference to the size of the wage premium indicating no 'free-rider' problem.

Booth and Bryan (2001) have identified a 'membership premium' that exists in covered workplaces in the UK private sector, specifically for male manual and female non-manual workers. This membership premium remains after controlling for additional worker characteristics. Koevoets (2007) finds a somewhat more mixed picture when looking at coverage premia in Great Britain. This study finds no statistically significant membership or coverage premium for males, but does find a coverage premium for female workers. Manquilef-Bächler, Arulampalam and Smith (2009) also find a large coverage premium for female workers of up to 20%. Finding a coverage premium and not a membership premium would therefore imply, contrary to other studies, that there is a 'free-rider' problem. Koevoets

(2007) suggests that the 'free-rider' problem can be explained by looking at benefits of union membership that are not be captured solely in wages. Other terms and conditions may be more favourable for members of a trade union than they are for non-members. This would suggest that workers have an incentive to join a trade union that is not linked to their pay.

The idea of a membership wage premium is hard to justify on theoretical grounds. While in the past it may have been possible for employers to offer union and non-union wages, it would seem unlikely that this is a feature of collective agreements in any developed economies. It is more likely that the non-wage benefits of trade union membership help to explain the 'free -rider' problem. The findings from both Manquilef-Bächler, Arulampalam and Smith (2009) and Koevoets (2007) also have interesting implications for trade union density. Trade union density is defined as the proportion of workers in firms or industries who are union members. Union density is crucial to determining what power a union has in bargaining for pay with employers. Unions are incentivized to maintain a 'membership premium' in workplaces where they bargain for pay because if they do not, membership may fall, then density would fall. If density falls then the union would lose leverage in its bargaining position and may ultimately no longer be able to maintain even a coverage premium.

The theory is that a membership premium enables a union to maintain union density and that union density enables union to deliver a 'coverage premium'. Manquilef-Bächler, Arulampalam and Smith found that over the period examined female public sector workers, who maintained a large coverage premium, also experienced the smallest decline in both union coverage and density. This would imply that union membership helped maintain union density and ultimately a coverage premium. In this case then a membership premium was not necessary to maintain membership but could be explained by what Koevoets (2007) proposed as the non-wage benefits of union membership.

Vilares and Portugal (2013) finds that union density significantly increases the union wage premium, up to 30% in some cases. Bryson, Dale-Asler and Nergaard (2016) looked at union density and the experiences of males and females in Britain and Norway. In Britain they found no membership premium for men but did find one for females. Increasing union density,

however, was found only to benefit male workers. In Norway, there was no membership premium for either males or females but a coverage premium for both. In contrast to Britain, female workers in Norway benefited more from increased union density in terms of a coverage premium.

However, union density is often correlated with the market position of the firm. Firms subject to little competition such as oligopolistic energy firms or monopolies like certain public services providers tend to deliver much larger union wage premia. Such firms also tend to have higher rates of unionisation. The theory here is that these firms have a much larger surplus to deliver, and therefore unions are likely to have more success in securing pay increases. However, Breda (2015) examines the union wage premium in France in the context of the market power of the firm. However, the findings in Breda (2015) suggest that the union wage premium is positively and significantly associated with both the percentage of workers who are union members and market share of a firm. In this sense, market share gives the potential for larger wages, but unionisation and bargaining are necessary to deliver it.

What is clear from the literature to date is that the membership premium is an important indicator of union power but that it is an outdated concept. A membership premium is rarely present without a coverage premium. The case of France being a notable exception. The coverage premium is the key determinant of the effectiveness of trade union representation. A membership premium may play a key role in determining union density and bargaining leverage, it is not necessary to evaluate the impact of trade unions on pay.

SECTION 3: DATA

The data used in this paper is drawn from the Understanding Society Survey which is a longitudinal household survey carried out by the ESRC UK Longitudinal Studies Centre with the Institute for Social and Economic Research at the University of Essex. Known formerly as the British Household Panel Survey, Understanding Society was introduced in 2009 and has added samples for Scotland Wales and Northern Ireland, allowing for cross-country analysis.

Along with Understanding Society (US), there are four other large UK surveys which look at trade union status and pay in one form or another. They include the Labour Force Survey (LFS), the Workplace and Employment Relations Survey (WERS), the Annual Survey of Hours and Earnings (ASHE) and Skills and Employment Survey (SES). Across all surveys the trade union question breaks down into three areas as defined by Davies (2016):

- Union density: The percentage of those in employment who are a trade union member.
- Union presence: Whether or not a trade union or staff association is present within a workplace.
- Union coverage: Whether the pay and conditions of employees are agreed in negotiations between the employer and a trade union.

The LFS, WERS and SES cover all three questions, US covers the first and third questions, while ASHE only covers the third question. The LFS for Northern Ireland does provide all three questions but as Davies (2016) also notes, the LFS tends to underestimate union presence and coverage compared to the WERS and the SES. However, it is the quality of the earnings variables within the LFS within NI that is of chief concern and why it is not used for this analysis. The WERS and SES are not annual surveys and the latest data for each is 2011 and 2017 respectively. Furthermore, the sample size for Northern Ireland in the 2011 WERS was less than 200 while Northern Ireland was excluded from the 2012 and 2017 SES surveys meaning that the latest available data is actually 2006. This leaves ASHE and US.

ASHE has the largest sample, a good measurement of earnings in Northern Ireland and also measures whether or not pay is determined by a collective agreement. However, ASHE is an employer survey and only has workplace-based information on employees and does not include critical characteristics such as education. Furthermore, ASHE does not measure union membership either for the workforce overall or even employees within covered workplaces. US does not have an overall union membership question and lacks a small number of variables including an indication of tenure. nevertheless, it represents the largest sample of Northern Ireland with a necessary level of detail regarding union membership and income, along with sufficient number of employee and workplace characteristics.

The variable used to measure union coverage is based on the question in the US survey, "Is there (thinking about your main job) a trade union, or similar body such as a staff association, recognised by your management for negotiating pay or conditions for the people doing your sort of job in your workplace?" A further question determines membership status, but only for those who answer yes to the question about coverage. Some descriptive statistics from the US survey are presented below.

Table 3.1: Descriptive statistics of demographic Profile of Union Coverage in Understanding Society 2016-18

Overall	Not Covered	Covered
	47	53
Gender		
Female	42	58
Male	54	46
Age		
18-34	55	45
35-49	47	53
50-64	38	62
65+	63	37

Source: Understanding Society Wave 8

Looking at union coverage Table 3.1 shows that 53% of employees in Northern Ireland have a trade union that bargains for pay in their workplace compared to 47% who are not covered. Looking at how workplace coverage breaks down by gender Table 3.1 shows that 58% of female are employed in covered workplaces compared to only 42% of male employees. Looking at age categories, those aged 50 to 64 are most likely to be employed in covered workplaces (62%) followed by those aged 35-49 (53%). Within the youngest age cohort, those aged 18-35, only 45% of workers are employed in covered workplaces but this is higher than the 37% of workers aged 65 and over who are covered. The difference among the age cohorts are likely to be driven by number of factors. Firstly, there is a legacy factor where younger workers are less likely to be in covered workplaces simply because of the decline in the number of covered workplaces over time. However, this trend cannot explain the fact that the lowest coverage density is among the oldest cohort of workers. Participation in the workforce in the over 65 age category is predominantly governed by income sufficiency at

this age (Oswald, 1999). Covered workplaces are likely to have significantly better retirement benefits and so this may explain why most over 65s are in workplaces not covered by collective agreements.

Table 3.2: Descriptive statistics of Sectoral and Industrial Profile of Union Coverage in Understanding Society 2016-18

Sector	Not Covered	Covered
Private	68	32
Public	20	80
Industry	**Not Covered**	**Covered**
Agriculture and Utilities	45	55
Manufacturing	52	48
Construction	94	6
Wholesale and Retail	76	24
Transport	35	65
Accommodation and Food	89	11
Information and Communication	42	58
Professional Services	54	46
Administration	57	43
Public Administration	9	91
Education	14	86
Health and Social Services	36	64
Other Services	84	16

Source: Understanding Society Wave 8

The starkest division in coverage density appears between the public and private sectors. In the public sector, 80% of workers are in workplaces covered by union negotiated pay compared to only 20% of private sector employees. That female employees are more likely to be in covered workplaces is largely driven by the much larger proportion of female workers employed in the public sector. This can also be seen in the breakdown of workplace by industrial sector. All three sectors where public sector employment is dominant, Public Administration, Education and Health and Human Services, have the highest coverage density rates across the economy. 91% of workers in Public Administration are employed in workplaces followed by 87% of Education workers, and 64% of Health and Human Services workers.

65% of workers in the Transport sector and 58% of workers in the Information and Communication sector are employed in covered workplaces. The Transport and Information and Communication sectors both have significant levels of public employment and also have private companies which were previously state owned or semi-state companies which are likely to retain union pay structures from that time and so this may explain higher levels of coverage. The construction sector reports negligible levels of union coverage among employees followed by Accommodation and Food in which only 11% of employees are covered by union pay bargaining. The construction sector has a very small proportion of employees, with most workers being self-employed, therefore union wage coverage is likely to be very low. The Accommodation and Food sector has the lowest trade union coverage of any major employment sector.

Table 3.2: Descriptive statistics of Occupational and Workplace Profile of Union Coverage in Understanding Society 2016-18

Occupation	Not Covered	Covered
Manager	50	50
Professional	44	56
Intermediate Non-manual	26	74
Junior Non-Manual	59	41
Personal Services	50	50
Manual Foreman	60	40
Manual Skilled	51	49
Manual Semi-Skilled	55	45
Manual Un-skilled	61	39
Agricultural Workers	84	16
Working time	**Not Covered**	**Covered**
Part-time	55	45
Full-time	44	56
Size of Workplace by Employment	**Not Covered**	**Covered**
1-9	76	24
10-24	60	40
25 - 49	53	47
50 - 99	42	58
100 - 199	38	62
200 - 499	31	69
500 - 999	17	83
1000 or	18	82
Highest Qualification	**Not Covered**	**Covered**
Degree	30	70
Other higher qualification	40	60
A-level	54	46

GCSE etc	61	39
Other qualifications	67	33
No qualifications	57	43

Source: Understanding Society Wave 8

Coverage density increases with the size of workplaces measured by the number of employees. Coverage for ranges from 24% in firms with less than 10 employees to 83% for those in firms with between 500 and 1000 employees and 82% in workplaces with over 1000 employees. The larger workplaces tend to be in public sector, which accounts for 55% of 500-999 workplaces and 63% of all workplaces with over 1000 employees. Conversely two thirds of workplaces with under 10 employees are in the private sector.

Looking at particular types of work Table 3.3 shows that 55% of full-time workers are employed in covered workplaces compared to only 45% of part-time workers. Table 3.3 shows the level of trade union coverage by occupation. Coverage is highest for those in intermediate non-manual occupations, where 74% are employed in covered workplaces followed by 56% of workers in professional occupations. Once again public sector employment is a key determinant with just over two thirds of all intermediate non-manual workers and 85% of professionals employed within the public sector. Coverage density does not follow a trend along the spectrum of occupations, averaging about 40% but significantly higher among skilled and semi-skilled workers, the vast majority of which are in the private sector. Table 3.3 shows that 70% of workers with a degree are employed in covered workplaces and that coverage density fall for all other levels of qualification. However, 43% of those with no qualifications are employed in workplaces with union coverage compared to 39% of those with GCSEs and 33% with other qualifications.

As mentioned previously, in the Understanding Society survey, union membership is only measured among those covered workplaces. It is possible to examine union membership among workers across the sample but this is not the same as measuring union density as there are likely to be a number of union members in workplaces where trade unions do not bargain for a pay. As this paper is looking to estimate the coverage premium, this limitation in the data does not have an impact. However, it is possible to briefly examine some figures

related to union membership in these covered workplaces in order to understand how union density may impact on the coverage premium. Union density is likely to affect the coverage premium even if it does not contribute to a membership premium.

Trade union members in covered workplaces account for 38% of all workers in Northern Ireland. Intuitively, in workplaces where trade unions are recognized union members account for a much larger proportion, just under three quarters of all employees (73%). In the analysis that follows union membership will be understood to refer to trade union membership among employees in workplaces where trade unions are active in negotiating pay. There is less of a gender gap for union membership in covered workplaces then there is for union coverage, with membership among females (75%) five percentage points higher than males (70%). Looking at age cohorts the trend in membership is much the same as union coverage but as with gender, the gaps between cohorts are much smaller.

Looking at the sectoral breakdown of union membership, the gap between the public and private sectors is much smaller than union coverage. 74% of covered public sector workers are members of a union compared to 70% of private sector workers. The Health and Social Services sector has the highest proportion of union membership but only marginally ahead of the Wholesale and Retail sector which has a union membership rate of 82%. Considering that union coverage is 59% and 23% in Health and Social Services Wholesale and Retail respectively, this would imply that union coverage is more driven by union membership in the latter than it in the former. Across the rest of the industrial sectors there is much less variation in the rate of union membership then there is the rate union coverage with now sector falling below 53% union membership.

Looking at occupations, once again it is the intermediate non-manual jobs where union membership is highest but this is closely followed by the Semi-skilled (81%) and Skilled (78%) jobs. Full-time workers are more likely to be union members but here gain, the gap in membership with part-time workers is significantly less than the coverage gap. When measured by firm size, union membership is strongest in firms with 10-24 employees even though this cohort has the second lowest coverage of all firm size bands. Those with Other

Qualifications are most likely to be union members (89%) closely followed by those with GCSE qualifications.

Looking at the descriptive statistics there is a wide variation in union bargaining across the economy with the public sector playing a decisive role in determining outcomes. However, as the union membership figures indicate, there are some sectors with very low coverage but high rates of unionisation which means that the coverage premium in these sectors could be significant despite the low level of overall bargaining.

SECTION 4: METHODOLOGY

There are a number of approaches to estimating the impact of trade unions on pay whether through union membership or collective agreements and whether there is a membership or coverage premium. The standard approach is a wage equation capturing as many characteristics as possible in order to isolate the impact of union membership or coverage. Where econometric approaches differ is largely with regard to how membership or coverage is treated in any such approach and whether there is any selection effect related to union membership or coverage. This is because union membership or coverage cannot be thought of as something that is randomly assigned, like an experiment. If workers select, or are selected into, trade union membership or covered workplaces, another variable may be moderating the relationship between this status and pay.

Bryson (2002) sets out how selection into trade unions or covered workplaces occurs for both employees and employers. It is posited that employers who recognize unionisation are thought to have more power to choose their workforce because the jobs they offer are more attractive to worker. In this scenario these employers have greater power in the labour market and will therefore be more able to choose particular workers to hire. Meanwhile it is also posited that certain employees will self-select into union membership. Workers with less marketable skills and attributes may be more likely to select in because they are the workers that have the most to gain union membership. In this sense, employer selection is thought to favour higher ability workers while employee selection favours lower ability workers.

At issue then is whether we can control for the selection effects of union coverage and avoid possibly biased estimates of the wage premium. Selection can arise on the basis of observable characteristics that can conceivably be measured in the data, or it is governed unobservable traits such as intrinsic motivation that cannot be isolated within the data. The problem this poses is that if the determinants of union membership also influence pay, any estimates of the union wage premium could be biased due to endogeneity.

Methods have been devised to address selection effects, with varying degrees of success. Fixed effects estimation and estimation with repeat observations on workers who change union status are two such approaches to overcoming selection. However, both of these options relate to panel or longitudinal data analysis. With cross sectional data there have been two approaches which deal with unobservable and observable bias. The most common approach to dealing with unobservable bias is to identify instrumental variables and estimate with simultaneous equations. The use of instrumental variables is better established in other fields of economic analysis, but there are problems with its use in countering unobservable bias in union status selection in this context. Any such instruments must be determinants of union status, but must not be determinants of wages.

Booth and Bryan (2001) attempted this approach by isolating a number of questions regarding individual workers perceptions of the effectiveness of the union presence in the workplace. Whilst this may fulfil the central requirements of an instrument in this context, Bryson questions whether a subjective question about trade union effectiveness is a reliable predictor of union status. The instrumental variable approach also requires simultaneous estimation and this method has been found to produce large and unstable estimates of the wage premium (Hirsch, 2004; Eren 2007; Blanchflower and Bryson, 2007).

Given the volatility of the instrumental variables approach more recent studies have moved away from attempts to control unobservable bias in favour of methods that seek to capture observable selection effects, particularly given the richer data sets now available. The theory behind this approach is that unobservable bias may still be present, but methods to control observable bias may be may be sufficient to account for selection effects. These studies

predominantly utilize Ordinary Least Squares (OLS) regressions with a larger suite of control variables and employer characteristics in particular. Other studies have sought to control for selection through semi parametric matching techniques (Bryson, 2002; Eren, 2007; Campolieti; 2018).

Matching is also posited as superior to OLS for a number of reasons ranging from assumptions of linearity, heterogenous treatment effects and problems relating to common support. However, the process of matching does have drawbacks and some of these are particularly significant when dealing with smaller datasets. King et al (2012) in particular have raised concerns about the most common form of matching, propensity score matching. Their paper made the case that it can actually increase rather than decrease model dependence, imbalance and ultimately bias. They proposed Coarsened Exact Matching as a way of avoiding these outcomes but concerns still remain over what exactly matching actually achieves.

Miller (2013) outlines a broader objection to matching on the basis that it offers no more causal leverage than OLS and specifically that 'matching has no advantage relative to regression for proving causation or dealing with endogeneity, since matching can only account for observed covariates'. Miller (2013) also outlines how matching has the capacity to increases model dependence and therefore is much more prone to data mining than OLS. Estimates are highly sensitive to the choice of matching procedure and the choices of matching variables. This sensitivity increases significantly with smaller datasets. Smaller datasets only allow matching on a small number of variables and the choice of these variables can have a significant impact on the outcome. While matching has many attractive features, it does not have any greater power to control for endogeneity in selection effects.

Given the issues outlined with regard to any matching estimation and the volatility of the instrumental variable approach an OLS estimation would seem to be the most consistent and practical approach for this paper. Specifically, the OLS regression will seek to the impact of collective wage agreements on average pay among employees after controlling for a number of individual, job and workplace characteristics. The individual characteristics include gender, age, level of education. The job characteristics include occupation, whether the job

is full-time or part-time and whether the jobs is permanent or temporary. The workplace characteristics include, size of the firm, whether it is a public or private sector body and its broad industrial sector. Selection effects will hopefully be captured in the full set of control variables used. The dependent variable is the natural log of hourly wages excluding overtime.

There have been questions raised about the use of log wages in this type of regression and the problem with log re-transformation, particularly when estimated with robust standard errors to account for the possibility of heteroskedasticity in the error term. Blackburn (2007) specifically highlights the issue of heteroskedasticity associated with union status in a log-wage regression and recommends the use of quasi maximum-likelihood methods that are consistent under weaker assumptions about the dependence between the error term and the regressors. The assumptions of homoskedasticity, normality, and independence required for OLS regression are not strictly required when estimating with complex sample design, like Understanding Society. The estimator used bases its inference on the sample design (stratification and variation between primary sampling units) and is robust to violations of those assumptions. The sample size in Understanding Society would also give confidence that the results are robust to violations of these assumptions. However, as Blackburn (2007) points out, robust standard errors are not sufficient to tackle the problem of heteroskedasticity in log wage regression equations. Therefore, in addition to OLS, a generalized linear model estimation is also presented to deal with concerns arising from the distribution of variances.

SECTION 5: RESULTS

Table A.1 in the accompanying appendix sets out the results of the regression outlined in the methodology section. Specifically, columns 1 through 8 outline the OLS estimations as individual, occupational and workplace characteristics are added to the model. Column 9 shows the results of the model in column 8 carried out by with Generalized Linear Models estimation in place of Ordinary Least Squares. The estimates of mean wages are for the population from which the sample was drawn, adjusting for the complex survey design when comparing mean differences.

Column 1 shows the raw wage gap between workers in covered workplaces and those in uncovered workplaces is 33 log points or 39% (the antilog of .329). The result is statistically significant at the 1% level. That is the average wage of worker is 33% higher if they are covered by union bargaining in their workplace. Obviously, this number has no interpretation beyond that because the model in column 1 does not account for any of the other factors that are known to influence pay. Column 2 then begins by controlling for individual characteristics, namely gender and age. Gender is introduced as a dummy variable equal to 1 if the individual is male. For age, respondents are grouped into four age categories which in turn are used to create dummy variables equal to 1 for each category. As is always the case when using categorical variables in a regression the variables need to be entered into the model as dummy variables so that we can determine the difference between different groups, such as for example the difference in hourly wages between males and females. For ease of interpretation, the first category in each instance becomes the reference category. The reference category for each set of characteristics is identified in the regression Table A.1.

Column 2 then shows that controlling for gender and age has little or no impact on the union coverage effect, bringing it down to 37%. The R-squared increases from 0.106 to 0.148 Column 3 introduces dummy variables which account for the qualifications of respondents. In this set of variables, degree level qualifications are the reference category. All qualifications variables have a negative sign, which is intuitive given that they are levels of qualification below the reference category. While there is a gap in wages of 15% between those with a degree and those other higher qualifications, the gap is 39% for those with A-levels, showing the benefit of higher education. However, the gap between those with a degree and those with GCSEs is only 44%, perhaps showing that the benefits of finishing secondary school are not of the same magnitude as entering higher or further education. Introducing qualifications causes the largest jump in the r-squared from 0.1476 to 0.3447, showing clearly that qualifications play by far the most significant role in determining pay.

All occupational variables are significant at the 1% level and their introduction reduces the coverage premium to 18%. Managerial occupations are the reference category and so once again negative coefficients are expected and all but professional and agricultural occupations

are significant at the 1% level. Introducing controls for firm size brings the coverage premium down from 18% to 13% and the dummy variable for firms with between 200 and 1000 employees ae significant. Column 8 introduces a dummy variable indicating whether the workplace is within the public sector and while the coefficient is small and positive, it is not significant. Similarly, as 8 adds broad industry dummy variables, only the services sector is significant at the 5% level. Controlling for the public sector only minimally impacts the scale of the coverage premium, but importantly it is no longer significant at the 1%. It is significant at the 5% level and adding industry controls brings the coverage premium down to 11%.

As set out in the methodology section, there log linear specification of OLS can be upwardly biased in estimating the union coverage premium. Therefore, a Generalized Linear Models estimation is presented in column 9. The GLM estimations actually increases the union coverage variable and it remains statistically significant at the 5% level. The estimated union coverage premium is 13% under this method of estimation.

The results indicate that the raw measure of the coverage premium in Northern Ireland is reduced by almost two thirds when characteristics related to individuals, jobs and workplaces are taken into account. The level of education has the most significant impact on the coverage premium, reducing it by almost 50%. Education or qualification level is regularly found to be one of the strongest predictors of wages and this would seem to indicate that workplace-based surveys which do not account for education are not well placed to measure wage premia. Occupations and industry controls have roughly equal impacts on the coverage premium, but interestingly the public sector is not a significantly significant influence on pay, once all of these other characteristics have been taken into account.

The persistence of a union coverage premium implies that accounting for the individual traits of a worker and where they work, if their pay is bargained for by a trade union or representative association, they are likely to earn up to 13% more than if their pay was determined individually. There are obvious caveats to this finding. Firstly, this is a difference in mean outcomes, and there is no guarantee that the presence of collective bargaining will automatically bring such an uplift. As the methodology section showed, there may be traits

that we cannot observe which influence the pay of workers who receive a collectively bargained wage. Despite various, there is no clear way to avoid such bias if it does exist. What we can say is that the finding in relation to the union coverage premium in Northern Ireland is robust to observable characteristics of workers and workplaces in Northern Ireland.

SECTION 6: POLICY IMPLICATIONS

The presence of a union coverage premium in Northern Ireland has significant implications for workers and firms. For workers, the implications are clear enough. Collective bargaining is at the very least, associated, with higher average pay for workers after differences in age, qualifications, jobs and workplaces are accounted for. There is a clear incentive for workers to organise and collectively bargain for pay either at firms, sector or economy-wide level. However, the implications of this finding may be more important, but less obvious, for firms.

Collective bargaining should deliver superior pay and terms and conditions for employees than individual wage negotiations. As discussed in the introduction section, workers negotiating as a collective are able to mimic or replicate the unity that employers have when they negotiate with their workforce. The market logic is that in any transaction, the power lies on the side with the least number of participants. During the post war years and up until the late 1980s firms were incentivized to engage in collective bargaining in order to avoid industrial disputes and harmful strikes. The incentive remained so long as unions were able to exercise influence through high union membership and density. It is arguable that in some sectors this incentive is no longer there. Why do some firms persist with collective bargaining agreements if there is no longer an incentive to do so?

Industry norms and legacy agreements play a key role in determining why collective bargaining persist. Also, the decline of union membership has not been an even process and union density has remained strong in certain sectors and industries particularly those related to public services. However, as Table 3.2 shows, just under one third of all private sector workers are still covered by collective bargaining agreements. The reason that some firms

persist with collective bargaining is because they see benefits from it that outweigh the increase labour costs that come with it.

Much of the literature examining the impact of collective bargaining on firms focuses on the effect that it has on productivity. Whilst collective bargaining provides a vehicle for workers to seek superior outcomes, it also provides a similar function to employers who wish to coordinate their workforce more successfully. McDonnell (2019) outlines some of the research in this area and notes that it applies as much at sectoral and national level as it does for individual firms. Managing change like the introduction of technology can be a complex and time-consuming process that can be more efficiently managed with a collective bargaining structure which can accommodate shifts in production.

That firms who engage in collective bargaining might experience a productivity dividend should not be surprising. Intuitively, greater output per worker would enable firms to pay workers' wages above their competitors who do not bargain with employee representatives. In many ways, the advent of minimum wages and other wage floors have removed the role of collective bargaining in preventing ultra-low levels of pay. Collective bargaining is now more likely to be associated with achieving opportunities for pay progression and a greater labour share of profits. Seeking these types of pay increases is more likely to be associated with agreements on upskilling and innovation, which provide benefits to the firm as a whole. In this sense, collective bargaining provides a route for firms to boost wages without suffering competitive loss to firms who do not follow their lead.

For Northern Ireland, the relationship between collective bargaining and productivity highlights the most pressing policy concern in this area. Northern Ireland has suffered from exceptionally weak productivity levels for the last three decades and productivity growth since the great recession has been among the weakest of all UK regions. In 2018, the latest year for which figures are available, productivity in Northern Ireland declined by 2%, the worst performance in the UK with the exception of the Yorkshire and Humber region. One of chief contributors to Northern Ireland's comparatively low productivity has been both the under-attainment and the underutilization of skills in the workforce (Mac Flynn, 2017). The

regression results presented in Table A.1 show just how important a role qualification level play in determining pay. Northern Ireland is trapped in a low skills equilibrium where supply and demand for skills are caught in a low-level stasis which is self-reinforcing. There are many factors that feed into this equilibrium but greater coordination between employers and employees is one of the most important routes to breaking out of it.

Collective bargaining, in this sense, should not be viewed merely as a means by which employees can harness a greater share of resources in terms of their wages, but also a mechanism by which employers can seek to boost skills and technology in production. Collective bargaining can be seen as a mechanism to break out of damaging investment behaviour and allow opportunities for pay advancement that are sustainable. Therefore, the benefits of collective bargaining should be acknowledged by governments and policymakers as much as firms and employers.

Governments cannot decide the pay settlements practices of individual firms, but they do construct the legislative a legal framework in which they occur. In the 1980s, UK government policy was very much aimed at removing incentives for firms to engage in collective bargaining by seeking to undermine trade union density (Evans et al, 1992). More recently there have been similar attempts made in countries like Australia, where the Work Choices policy of the Howard administration sought to incentivize individual workplace agreements over collective agreements (Gollan, 2009). The policy was overturned by the Australian government less than three years after its introduction. Of late numerous international organisations have begun to acknowledge the possibility of a connection between the undermining of collective bargaining and the productivity slump currently afflicting many of these economies.

McDonnell (2019) outlines the many studies which have explored to connection between collective bargaining and productivity. This should motivate governments to reassess how current industrial relations policy is impacting on economic growth. It is not just necessary to remove legal barriers to bargaining, policy should also be focused on ways to incentivize its wider use in the economy. These policy areas are all within the competence of the Northern

Ireland Executive and one of the most direct ways in which it can seek to influence the current trajectory of productivity growth in Northern Ireland. The evidence presented within this paper should motivate the NI executive to recognize the positive role of collective bargaining and the importance of an independent employee voice within the workplace.

SECTION 7 CONCLUSIONS

It is an incontestable fact that in most developed economies, the role of trade unions and collective bargaining in determining pay has diminished. It is also true that trade unions continue to play a significant role in the labour market and collective bargaining still determines pay for a large section of workers. What this paper has outlined is that collective bargaining still delivers higher pay, despite the diminished role of trade unions.

That the labour share of income has declined over the same period of trade union decline cannot be thought of as coincidental. Collective bargaining offers a mechanism for workers to secure a greater share of the fruits of their labour. However, that many employers still retain collective bargaining despite its overall decline shows that there are benefits to both employees and employers. Skills utilization and innovation benefit from a coordinated and valued workforce and such behaviours are necessary to fulfil productivity goals. The Northern Ireland Executive should actively encourage the adoption of collective bargaining throughout the economy in order to boost economic growth and the incomes of workers.

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APPENDIX

Table A.1 Regression Results

Log Hourly Wages	(1)	(2)	(3)	(4)	(5)	(6)
Union Coverage (Base Not Covered)						
Covered	0.329***	0.316***	0.1882***	0.1749***	0.1675***	0.1251***
	(0.0427)	(0.0428)	(0.0441)	(0.0462)	(0.0422)	(0.0400)
Gender (Base Female)						
Male		0.0826**	0.0961***	0.0723**	0.0505	0.0426
		(0.0399)	(0.0325)	(0.0308)	(0.0338)	(0.0344)
Age (Base 18-35)						
35-49		0.2159***	0.2282***	-0.0635***	0.1839***	0.1833***
		(0.0647)	(0.0505)	(0.0496)	(0.0465)	(0.0467)
50-64		0.1883***	0.2763***	0.2722***	0.2125***	0.2121***
		(0.0487)	(0.0457)	(0.0457)	(0.0449)	(0.0442)
65+		0.0680	0.2641**	0.2645**	0.1659	0.1376**
		(0.1292)	(0.1216)	(0.1254)	(0.1064)	(0.1037)
Qualifications (Base Degree)						
Other higher qualification			-0.1575***	-0.1469**	-0.1429**	-0.1487***
			(0.0603)	(0.0631)	(0.0668)	(0.0661)
A-level			-0.3904***	-0.3850***	-0.2795***	-0.2676***
			(0.0539)	(0.0538)	(0.0573)	(0.0568)
GCSE etc			-0.4462***	-0.4521***	-0.3382***	-0.3377***
			(0.0517)	(0.0531)	(0.0480)	(0.0468)
Other qualifications			-0.7009***	-0.6603***	-0.4637***	-0.4646***
			(0.1191)	(0.0932)	(0.0912)	(0.0880)
No qualifications			-0.5898***	-0.5730***	-0.3952***	-0.3905***
			(0.0605)	(0.0618)	(0.0670)	(0.0629)
Working Hours (Base Part-time)						
Full-time				0.0908**	0.0311	0.0207
				(0.0388)	(0.0389)	(0.0388)
Contract Type (Base Temporary)						
Permanent				0.2167**	0.2035**	0.2026**
				(0.0871)	(0.0798)	(0.0862)

Log Hourly Wages	(1)	(2)	(3)	(4)	(5)	(6)
Occupation (Base Managerial)						
Professional					-0.1414	-0.1277***
					(0.1521)	(0.1389)
Intermediate Non-manual					-0.1657***	-0.1615***
					(0.0596)	(0.0577)
Junior Non-Manual					-0.3710***	-0.3693***
					(0.0669)	(0.0646)
Personal Services					-0.3475***	-0.3312***
					(0.1121)	(0.1154)
Manual Foreman					-0.2489***	-0.2375***
					(0.0779)	(0.0754)
Manual Skilled					-0.2415***	-0.2271***
					(0.0857)	(0.0849)
Manual Semi-Skilled					-0.5157***	-0.5280***
					(0.0744)	(0.0746)
Manual Un-skilled					-0.4129***	-0.4138***
					(0.0830)	(0.0828)
Agricultural Worker					-0.0772	-0.0588
					(0.1459)	(0.1539)
Firm Size (Base 1-9 Employees)						
10-24 Employees						0.0330
						(0.0603)
25-49 Employees						0.1568**
						(0.0717)
50-99 Employees						0.0983
						(0.0631)
100-199 Employees						0.0974
						(0.0663)
200-499 Employees						0.1597
						(0.0710)
500-999 Employees						0.2125***
						(0.0769)
1000+ Employees						0.1382
						(0.0924)

Log Hourly Wages	(1)	(2)	(3)	(4)	(5)	(6)
Sector (Base Private Sector)						
Public Sector						
Industry (Base Manufacturing and Allied)						
Construction						
Services						
Public Services						
R-Squared	0.106	0.1476	0.3447	0.3647	0.4316	0.4462

Log Hourly Wages	(7)	(8)	(9)
Union Coverage (Base Not Covered)			
Covered	0.121**	.01077**	0.1225**
	(0.0489)	(0.0455)	(0.0569)
Gender (Base Female)			
Male	0.0433	0.0443	0.0569
	(0.0347)	(0.0348)	(0.0407)
Age (Base 18-35)			
35-49	0.1818	0.1769***	0.1590***
	(0.0460)	(0.0447)	(0.0553)
50-64	0.2096	0.2096	0.2004***
	(0.0459)	(0.0466)	(0.0530)
65+	0.1357	0.1547	0.1600
	(0.1042)	(0.1068)	(0.1351)
Qualifications (Base Degree)			
Other higher qualification	-0.1485**	-0.1443**	-0.1117
	(0.0664)	(0.0627)	(0.0777)
A-level	-0.2659***	-0.2580***	-0.2301***
	(0.0557)	(0.0575)	(0.0760)
GCSE etc	-0.3356***	-0.3237***	-0.3446***
	(0.0471)	(0.0484)	(0.0548)
Other qualifications	-0.4620***	-0.4467***	-0.4337***
	(0.0872)	(0.0829)	(0.0955)
No qualifications	-0.3877***	-0.3774***	-0.4144***
	(0.0635)	(0.0644)	(0.0731)
Working Hours (Base Part-time)			
Full-time	0.0209***	0.0089	-0.0008
	(0.0392)	(0.0368)	(0.0431)
Contract Type (Base Temporary)			
Permanent	0.2036**	0.1990**	0.1747*
	(0.0865)	(0.0808)	(0.1038)

Log Hourly Wages	(7)	(8)	(9)
Occupation (Base Managerial)			
Professional	-0.1320	-0.1101	-0.0249
	(0.1351)	(0.1155)	(0.1405)
Intermediate Non-manual	-0.1639***	-0.1738***	-0.1660***
	(0.0583)	(0.0594)	(0.0601)
Junior Non-Manual	-0.3701***	-0.3688***	-0.3714***
	(0.0645)	(0.0654)	(0.0714)
Personal Services	-0.3351***	-0.3699***	-0.3312**
	(0.1127)	(0.1116)	(0.1608)
Manual Foreman	-0.2371***	-0.2760***	-0.3004***
	(0.0756)	(0.0770)	(0.0874)
Manual Skilled	-0.2265***	-0.2350***	-0.2261**
	(0.0853)	(0.0861)	(0.0975)
Manual Semi-Skilled	-0.5282***	-0.5544***	-0.5704***
	(0.0746)	(0.0738)	(0.0805)
Manual Un-skilled	-0.4138***	-0.4524***	-0.4732***
	(0.0827)	(0.0834)	(0.0866)
Agricultural Worker	-0.0610	-0.1131	-0.1455
	(0.1546)	(0.1552)	(0.1582)
Firm Size (Base 1-9 Employees)			
10-24 Employees	0.0337	0.0179	-0.0391
	(0.0597)	(0.0538)	(0.0650)
25-49 Employees	0.1576**	0.1297**	0.1170
	(0.0712)	(0.0639)	(0.0795)
50-99 Employees	0.0994	0.0830	0.0334
	(0.0617)	(0.0561)	(0.0659)
100-199 Employees	0.0992	0.0734	0.0226
	(0.0656)	(0.0608)	(0.0712)
200-499 Employees	0.1611**	0.1190*	0.0408
	(0.0702)	(0.0638)	(0.0781)
500-999 Employees	0.2133***	0.1650**	0.1262
	(0.0768)	(0.0759)	(0.0888)
1000+ Employees	0.1399	0.0811	-0.0080
	(0.0923)	(0.0811)	(0.0976)

Log Hourly Wages	(7)	(8)	(9)
Sector (Base Private Sector)			
Public Sector	0.0108	0.0037	-0.0110
	(0.0486)	(0.0532)	(0.0640)
Industry (Base Manufacturing and Allied)			
Construction		.04075	0.045
		(0.0350)	(0.094)
Services		-0.099**	-0.105**
		(0.046)	(0.051)
Public Services		-0.016	-0.017
		(0.013)	(0.014)
R-Squared	0.4463	0.4590	

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