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The Evolution of Catholic-Protestant Labour Market Inequality in Northern Ireland, 1983-2014

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ABSTRACT

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Ethnic and religious differentials in labour market outcomes within many countries have been remarkably persistent. Yet one very well-known differential – the Catholic/Protestant unemployment differential in Northern Ireland – has largely (although not completely) disappeared. This paper charts its decline since the mid-1980s and examines potential explanations using Census data from 1991, 2001 and 2011 together with annual survey data. These data span the ending of The Troubles, the signing of the Good Friday Agreement, the introduction of fair employment legislation, growth in hidden unemployment, and major structural changes in Northern Ireland. We assess the relative contributions of these changes.

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Keywords:	unemployment, religion, economic inactivity, labour market inequality

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1 Introduction

Ethnic and religious differentials in labour market outcomes within many countries have proven to be remarkably persistent, even in the face of sustained programmes of affirmative action (Darity and Nembhard, 2000; Ritter and Taylor, 2011). Yet there is nothing inevitable or necessarily permanent about such disparities, particularly where social and political change coincides with underlying demographic and/or structural economic change that opens up new opportunities for the previously disadvantaged group. This paper studies just such a case: the Catholic/Protestant unemployment differential in Northern Ireland, which had seemed permanently entrenched, but which has largely (if not quite completely) disappeared over the last thirty years. Among other things this period saw the ending of the Troubles and the signing of the Good Friday Agreement, far-reaching equality legislation, the establishment of devolution, and major structural change in the Northern Ireland economy.

Census data collected in 1971 revealed substantial unemployment rate inequality: 17.3% for male Catholics and 6.6% for male Protestants, a ratio of 2.6:1 (Osborne, 1978). To put this into perspective, in 1970 the male Black/White unemployment ratio in the US was 2:1 (Fairlie and Sundstrom, 1999), roughly where it remains today. The scale of the economic divide prompted numerous policy interventions, including major rounds of equality legislation in 1976 and 1989 which aimed to combat labour market discrimination. These interventions accompanied an academic debate which centred on whether and how far religious differences in economically relevant characteristics (age, occupational structure, residential distribution, fertility and education, for example) or discrimination against Catholics contributed to religious differences in unemployment. Discourse was often controversial, mainly due to the perception that many of the opponents and proponents of the discrimination argument came from opposite ends of a deeply divided political spectrum (Shirlow and Shuttleworth, 1996). Econometric evidence showing that much of the unemployment gap could not be explained by observables (Borooah, 1999; Murphy and Armstrong, 1994; Smith and Chambers, 1991), partially challenged by Gudgin and Breen (1996), ultimately failed to answer this question.

In response to this apparent impasse, and reflecting political and labour market developments including the signing of the Good Friday Agreement and the establishment of devolved government

in Northern Ireland, studies published since the turn of the century have focused on measuring, rather than explaining, religious differences in labour market outcomes (see Blackaby et al. (2008) for a relatively recent study). After this, however, the literature went quiet, perhaps on the assumption that the economic gap between Catholics and Protestants would continue to narrow and perhaps disappear. This paper tests that assumption. It also re-examines potential explanations for historical differentials and their narrowing over time. These contributions are made possible by exploiting newly available data to update and extend the existing literature.

2   Historical Background

Socioeconomic differences between Catholics and Protestants were evident even before Northern Ireland's formation in 1921. In 1901, although most members of Belfast's working class were categorised as semi-skilled or unskilled regardless of religious group, Protestant workers had a more advantageous skilled class position in shipbuilding, engineering and construction industries (Hepburn, 1983). Seventy years later, the Census of 1971 showed that, in Northern Ireland as a whole, Catholics were under-represented in upper-tier occupational groups and industries, undertook roles of lesser status within the same occupational class, and comprised a disproportionate share of the unemployed (Aunger, 1975).

In seeking to identify causes, early studies assessed the importance of the geographical spread of the population in relation to economic opportunities. In 1971, male unemployment rates were found to be highest in peripheral areas containing the highest proportions of Catholic residents (Osborne, 1978). Employment, on the other hand, was concentrated in the capital (Belfast) and its hinterland, where the concentration of Protestants was highest (Eversley, 1989). A question arose about whether the spatial pattern of employment was shaped by industrial policies that either deliberately or passively favoured Protestant areas. Bradley (1999) shows that, between 1949 and 1963, areas with non-Catholic majorities received a disproportionate share of sponsored manufacturing employment, and that it was not until after 1964 that the reverse was true. Although Protestant politicians/policymakers, who held political power between 1921 and 1972, were accused by Catholic politicians of implementing industrial policies motivated by discrimination (Hoare, 1981), an economic case could be made for Belfast-centric policies given

its relatively abundant external economies of scale (Doherty and Osborne, 1979).

Catholics also tended to have larger families than Protestants (Eversley, 1989). Compton (1981) suggested that this incentivised more Catholics to choose unemployment because social security benefits were collected in proportion to the number of dependent children. Further, he argued that the economy simply did not add enough new jobs each year to absorb the relatively large numbers of Catholic labour market entrants. These suggestions met with criticism, however, with Miller and Osborne (1983) casting doubt on the viability of the first claim, and Smith and Chambers (1991) pointing out that the second claim seemed to assume a labour force segmented not only by age but also by religion.

There were also historic differences in the educational endowments of Catholics and Protestants. Although the exact labour market implications of such differences were unclear, they did at least narrow through time. For example, although Catholics had lower age-participation rates in higher education as late as 1973, they had largely caught up by 1979 (Osborne et al., 1984). Official statistics published in 1985, however, suggested that fewer adult Catholics (39%) than adult Protestants (46%) had any qualifications (Osborne and Cormack, 1986). In a later study of school leavers in 1990-1991, Murphy and Shuttleworth (1997) found that religious differentials in subject mix and examination performance disappeared after controlling for school type (Northern Ireland had and retains an academically selective secondary education system) and socioeconomic background. To this day a majority of school children attend religiously segregated schools (DENI, 2018).

Finally, direct labour market discrimination against Catholics, although never unambiguously established by the earlier literature, may have contributed to unemployment differentials. If so, successive rounds of equality legislation, coupled with wider societal and political change, most notably demonstrated by the Good Friday Agreement of 1998, may have contributed to the narrowing of the gap highlighted by Osborne and Shuttleworth (2004) and others.

In summary, there are a number of plausible explanations for historic Catholic/Protestant unemployment differentials, although none of them won universal acceptance. The decline in the unemployment differential, however, raises fresh questions. Chief amongst these concerns the role of productive characteristics – has their relative contribution increased or decreased? Which characteristics make the greatest contribution? And, if the importance of these productive

characteristics has changed, can anything be deduced about the existence of discrimination or the value of the Northern Ireland employment equality legislation or other political developments? These and other questions are investigated below using novel data.

3 Methods

3.1 Data

Two sources of data are used. The primary source, the Northern Ireland Longitudinal Study (NILS), provides large representative samples of the population every ten years between 1991 and 2011 from the Census of Population. The secondary source, the Continuous Household Survey (CHS), provides much smaller samples from an annual household survey conducted since 1983. They are used in tandem because whilst the size of the NILS permits precise estimates and a detailed study of population sub-groups, the CHS enables frequent estimation of the relationships of interest.

The NILS is based on a 28% random sample of all people registered for health care services in Northern Ireland (*circa* 500,000 individuals), which is linked to various administrative databases and to 1981, 1991, 2001 and 2011 Census returns for enumerated individuals (see O'Reilly et al. (2012)). The data used here are mainly Census-based and contain socioeconomic and demographic variables at individual, household, and area levels. This paper does not exploit the longitudinal linkage capability of the NILS, however; instead it treats the data for 1991, 2001 and 2011 as repeated cross-sections.[1]

The CHS is a repeated cross-sectional survey based on a 1% random sample of households in Northern Ireland. Although it contains similar socioeconomic and demographic information as the NILS, it does not contain any information on sub-regional geography. In both datasets, the estimation sample comprises residents in private households, and in the NILS we restrict it to those born in Northern Ireland, although results are no different otherwise; the CHS contains no record of birthplace. Unless otherwise specified, the age of a given sample is restricted to 16-64 year olds (males only), 16-59 year olds (females only), and 16-64 year olds (both genders).

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[1] 1981 data are excluded due to enumeration problems in this Census.

3.1.1 Outcome Variables

In line with the existing literature on Northern Ireland the focus here is on unemployment, although we also consider economic inactivity as an outcome variable. These variables are defined as closely to the International Labour Organisation (ILO) definitions as possible given the data sources. In the NILS, individuals were classified as unemployed if, in the week before Census, they were not working but seeking work or waiting to start a job already obtained. In 2001 and 2011 the question more closely reflected the ILO definition, asking whether search was conducted during the last 4 weeks and whether the respondent could start within 2 weeks had a job been available. The economically inactive comprise those who were not working and not seeking or available for work (students,[2] the retired, long-term sick/disabled, homemakers, and others).

In the CHS, the unemployed are those who did not have a job but who were waiting to take up a job already obtained or looking for a job. Two other definitions were created using information from employment-related variables, but the key results were similar regardless of definition. Each outcome is modelled using a binary dependent variable. For the analysis of unemployment, we restrict both the NILS and CHS samples to individuals who are either working or unemployed (economically active), although our conclusions are unchanged if the full samples are used. For the analysis of economic inactivity, the full samples are used.

3.1.2 Religion Variable

The key explanatory variable is religion. In the NILS, religion in 1991 is classified according to the religious denomination or body to which individuals belonged at Census. In 2001 and 2011, however, individuals who declared no religion or failed to state any religion in response to this question were also asked about the denomination or body they were brought up in (community background). Therefore, in these two years, an individual's religion is based on either their current affiliation (if they report one) or their community background (if they report no religion or failed to state any religion). Between 1983 and 2004, respondents to the CHS were asked if they could reveal their religion, and if so, to state their denomination. After 2004, they were

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[2]Some students can be classed as working or unemployed in 2001 and 2011, but this does not affect results.

asked about their religion even if they were not actively practising.

Religion is represented by a variable equal to 1 if individual i is Catholic and 0 if Protestant. Protestants include Presbyterians, members of the Church of Ireland, Methodists, and Christians from numerous smaller denominations. Individuals who reported no religion, or did not state one, are excluded from CHS samples. The NILS sample also excludes these individuals in 1991, but includes those who were Catholic or Protestant according to community background in 2001 and 2011. The conclusions from NILS analysis are no different if current religion is used in every year and no religion or not stated respondents are always excluded. A small number of non-Christians are excluded, but this does not affect results.

3.2 Measuring the Unemployment Differential

This analysis takes one relative measure and two absolute measures of the unemployment rate differential. The first is the Catholic unemployment rate divided by the Protestant rate. The two absolute measures are (i) the Catholic rate minus the Protestant rate (the raw differential), and (ii) the conditional differential defined as the coefficient on being Catholic (δ) estimated from the following regression:

$$y_i = \alpha + \delta c_i + \mathbf{X}_i \boldsymbol{\beta} + \epsilon_i, \quad i = 1, \ldots, n. \tag{1}$$

where y_i equals 1 if the i-th individual is unemployed (or inactive where that is the outcome) and 0 otherwise, c_i is equal to 1 if Catholic and 0 if Protestant, and $\mathbf{X}_i$ is a set of observed control variables as set out in Table 1. Equation 1 is estimated as a linear probability model (LPM), with all conclusions robust to re-estimation as either logit or probit models. A full set of sensitivity checks are reported in supplementary material.

In the NILS samples, each measure of inequality is estimated in 1991, 2001 and 2011, separately for men and women. The standard errors of regression estimates are clustered over 890 statistical geographies known as Super Output Areas (SOAs). In the CHS, estimates of each measure are obtained from 16 pairs of annual samples for the period 1983-2014. Standard errors are robust to heteroskedasticity in the CHS. Smaller sample sizes also prevent gender-specific analysis of unemployment outcomes when using the CHS.

A relatively small number of observations were dropped from the NILS sample due to non-response (see supplementary material). Individuals were dropped entirely if they reported a change in country of birth or a decrease in the highest level of education, and dropped in a given year if any relevant variable had an imputed value. Our conclusions are robust, however, to their inclusion. In the CHS, missing values, where present, were overwhelmingly found in both the dependent and independent variables.

4 Estimates of the Unemployment Differential

According to the CHS, during the first half of the period (1983-1998), Catholics had an average unemployment rate of 19.4% whilst Protestants had an average rate of 9.4%. By contrast, between 1999 and 2014, the Catholic average was 6.1% whilst the Protestant average was 4.5%. These simple averages reveal that the overall rate of unemployment, and the religious gap in unemployment, have fallen substantially.

Table 1 reports gender-specific unemployment rates and differentials estimated using the NILS data. Regardless of gender, being Catholic rather than Protestant is associated with a higher probability of unemployment in each Census year. The size of the religion effect declined markedly between 1991 and 2011, however. In 1991, male Catholics had a 16.3 percentage point (pp) higher probability of unemployment than male Protestants. Controlling for observables reduces this probability to 10.9 pp, echoing earlier studies showing differences in characteristics that are correlated with both religious affiliation and unemployment explain part but not all of the gap (Borooah, 1999; Murphy and Armstrong, 1994; Smith and Chambers, 1991). The same pattern is true for females, although the differentials are all smaller (as previously reported by Murphy (1995)). By 2001, the conditional differential among males had fallen to 3.0 pp where it largely remained in 2011 (3.2 pp). Similarly, for women the conditional differential had fallen to 1.5 pp in 2001 and further to 0.8 pp in 2011. Despite the substantial narrowing of the gap, however, note that it has not entirely disappeared.

Table 1 shows that a distinct change in the unemployment/religion relationship occurred between 1991 and 2001. To identify more precisely when this occurred, conditional differentials were estimated in paired CHS samples, and are plotted in Figure 1 alongside NILS estimates

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TABLE 1: UNEMPLOYMENT RATE DIFFERENTIALS: NILS

	Males					Females				
	Unemp. Rate		Differential			Unemp. Rate		Differential		
Period	C	P	C/P	Raw	Cond.	C	P	C/P	Raw	Cond.
1991	0.298	0.135	2.21	0.163 (0.007)	0.109 (0.004)	0.145	0.080	1.81	0.065 (0.005)	0.044 (0.003)
2001	0.104	0.058	1.80	0.046 (0.004)	0.030 (0.002)	0.060	0.035	1.71	0.024 (0.002)	0.015 (0.002)
2011	0.122	0.074	1.65	0.048 (0.003)	0.032 (0.003)	0.057	0.041	1.39	0.016 (0.002)	0.008 (0.002)

Notes: Standard errors robust to clustering at the SOA level are in parentheses. Conditional differential controls for: age, highest educational level, the presence of an activity-limiting health condition, relationship status, number of household children, tenure of household, and area of residence.
All raw and conditional differentials are statistically different from zero at the 0.1% level.

from the closest matching years. This analysis, pooled over gender, confirms that unemployment inequality decreased dramatically between 1983 and 2014. In 1983-1984, Catholics had a 9.6 pp higher probability of unemployment than observably similar Protestants, but by 2013-14 the gap had shrunk to a statistically insignificant 1.3 pp. Religious differentials were largest during the 1980s, fell significantly during the late 1980s and over the 1990s, and remained at a steady but low level from 2001 onwards.

During the period there were three notable falls in the conditional differential. The first, from 11.0 pp to 6.2 pp, occurred between 1987 and 1990. Another fall (7.8 pp to 2.4 pp) occurred between 1991 and 1994. Lastly, a fall from 5.5 pp to 1.6 pp was recorded between 1997 and 2000. After 2000, the conditional differential barely changed, was statistically insignificant in most years (in part reflecting the much smaller sample in the CHS relative to the NILS), and failed in any year to exceed 1.3 pp. Religious differences in unemployment are much smaller than they were, and going by the CHS alone one might conclude that they have essentially disappeared in contemporary Northern Ireland. Among other things this highlights the additional contribution of the NILS data, which show small differentials remain, to this debate. Moreover, the CHS tentatively suggests that unemployment differentials rose only slightly, and certainly did not rise substantially, after the financial crisis of 2007-2008. Estimates from the NILS are consistent with this. Of course we do not know whether the differential would have continued to fall in the absence of this particular economic shock.

FIGURE 1: UNEMPLOYMENT RATE DIFFERENTIALS: CHS & NILS
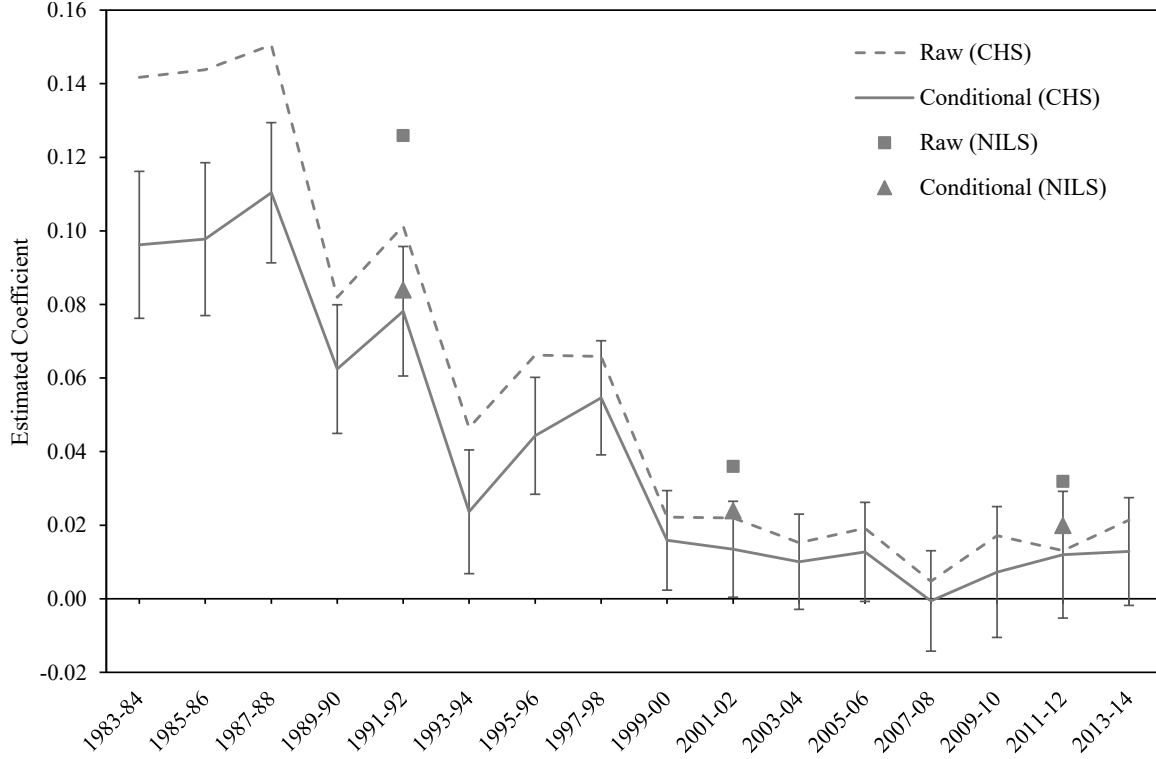
Notes: Figure displays unemployment differentials estimated for 16-64-year-old men and women in the labour force (95% confidence interval for conditional CHS estimate also displayed). CHS sample in 2009-2010 is aged 16-59 due to a lack of detailed age information. CHS conditional differential controls for: age, gender, education (possession of any educational qualification), the presence of an activity-limiting health condition (except 1985-1986 and 1989-1990 due to missing information), relationship status, number of household children, and tenure of household. NILS estimates (reported in Table 1) control additionally for area of residence, and include education measured as the highest level of qualification.

5   Can We Explain The Convergence?

This section analyses factors which may have contributed to the decrease in the raw unemployment differential (11.5 pp for males over the 1991-2011 period and 4.9 pp for females). Given the patterns described, we focus on events in the mid to late 1990s and in the years leading up to and immediately following 1991. Because the NILS data are only available from 1991 onwards, we focus our discussion on the period between 1991 and 2001, although we present results for 2011 where appropriate and for the late 1980s where available. The discussion concentrates on males because they experienced the biggest fall in unemployment inequality, although selected results are also presented for females.

5.1 Relative Changes in (Observable) Productive Characteristics

A comparison of raw and conditional differentials in each Census year indicates that religious differences in all included observed characteristics explains only a minority of the raw unemployment differential – between 33% and 50% depending on year and gender. Further analysis of the NILS data, based on the methodology of Oaxaca (1973) and Blinder (1973), decomposed the raw differential to identify which characteristics had the most explanatory power. The results indicate that religious variation in household tenure, relationship status, and area of residence are consistently associated with a relatively higher rate of Catholic unemployment. Nevertheless, most of the gap is not explained by these or other observable factors. For a full discussion of these results, see Section C of the supplementary material.

Taken together, overall changes in observables (and shared changes in their coefficients) over the period 1991-2011 explain around 3.9 pp of the 11.5 pp convergence in raw unemployment rates for men, and 1.3 pp of the 4.9 pp convergence in raw unemployment rates for women. As ever it is difficult to interpret what lies behind the contribution of religious itself. Nevertheless, however one chooses to explain it, and whatever proportion of this one puts down to labour market discrimination, it appears less salient now, at least in absolute terms, than was previously the case. It is not zero, however.

5.2 Did Unemployment become Hidden Unemployment? Differentials in Inactivity

In the face of a rising male economic inactivity rate (see Section A of the supplementary material) and growth in 'hidden unemployment' (Armstrong, 1999), did the observed fall in unemployment rate inequality coincide with a rise in inactivity rate inequality? If Catholics increasingly failed to participate in the labour market in relatively greater numbers, for example via labour market withdrawal, it might suggest that labour market inequality has been displaced rather than diminished. Here, we estimate Catholic/Protestant inactivity rate differentials, repeating the exercise of Section 4 using the full sample and treating males and females separately from the outset.

Table 2 reports the NILS results. For both men and women, being Catholic rather than

Protestant is associated with a higher probability of economic inactivity, holding observables constant. The conditional differential does not exhibit a clear or monotonic time trend, however, but fluctuates between Census years, increasing during the first decade and decreasing during the second. For males, the conditional inactivity differential is 0.7 pp in 1991, 2.2 pp in 2001, and 1.6 pp in 2011. Among females, conditional differentials are similar, but at a higher level of inactivity.

So, as in the unemployment case, since the 1990s we continue to see a small differential between Catholics and Protestants in Northern Ireland. Further, the small increase in the inactivity gap between 1991 and 2001 suggests we cannot rule out some displacement of the unemployment rate gap into an inactivity gap for males over this period. This can account for no more than 2.2 pp of the 11.5 pp fall in the unemployment rate gap. Analysis of the CHS data indicates the big falls in the unemployment gap prior to 1991 and in the late 1990s do not coincide with sustained rises in the inactivity differential (see Figure A.3 in the supplement).

TABLE 2: INACTIVITY RATE DIFFERENTIALS: NILS

	Males					Females				
	Inactivity Rate		Differential			Inactivity Rate		Differential		
Period	C	P	C/P	Raw	Cond.	C	P	C/P	Raw	Cond.
1991	0.222	0.172	1.29	0.050 (0.003)	0.007 (0.003)	0.481	0.389	1.24	0.092 (0.005)	0.019 (0.004)
2001	0.276	0.211	1.31	0.065 (0.005)	0.022 (0.003)	0.420	0.337	1.25	0.084 (0.006)	0.026 (0.003)
2011	0.271	0.222	1.22	0.049 (0.005)	0.016 (0.003)	0.333	0.280	1.19	0.053 (0.005)	0.012 (0.003)

Notes: Standard errors robust to clustering at the SOA level are in parentheses. Conditional differential controls for: age, highest educational level, the presence of an activity-limiting health condition, relationship status, number of household children, tenure of household, and area of residence.
All raw and conditional differentials are statistically different from zero at either the 1% level or 0.1% level.

5.3 Employment Growth

It has been argued that Northern Ireland's biggest economic problem has been its inability to produce enough jobs for its fast-growing population (Harris et al., 1990). Whilst addressing this issue was vital for reducing overall unemployment, it was also important for reducing unemployment inequality, as remedial measures in a zero or low jobs-growth scenario would necessarily involve a redistribution of existing jobs (Gudgin and Murphy, 1992). So, did the

overall fall in unemployment and the decline in the unemployment differential coincide with rapid growth in employment in Northern Ireland? The fact that both religious groups experienced falling unemployment rates, which were not displaced entirely into higher inactivity rates, suggests this may have been the case. In terms of unemployment differentials, male Catholics stood to benefit most from such employment growth, even if new jobs were shared equally among Catholics and Protestants, owing to their much higher initial rate of unemployment.

Using the most consistent data available during the period, a measure of labour demand was constructed representing the average number of employee jobs available in Northern Ireland per annum for each working age person. This measure, depicted in Figure A.4 in the supplement, fell sharply between 1978 and 1986, but then rose over a twenty-year period of sustained growth interrupted only by the economic slowdown of the early 1990s. A halt to this growth phrase occurred following the financial crisis of 2007-2008. There were 29.6% more employee jobs in 2001 than in 1987 (an increase of approximately 149,400 jobs), a percentage increase approximately three times that experienced by, for example, London (9.7%). At a time of remarkable economic performance (whether compared historically or with the performance of other UK regions) the Catholic/Protestant unemployment gap also declined remarkably.

5.4 Structural Change

Although changes in relative education levels between the two communities appear to have played little role in reducing the unemployment differential (see the decomposition results in Section C of the supplement), changes in education levels common to both the Catholic and Protestant communities, reflecting wider trends in the UK (Blanden and Machin, 2004), may have contributed. Smith and Chambers (1991) observed that the religious unemployment differential was largest amongst individuals without any qualifications. Using the NILS to estimate the conditional differential by education level (no qualifications, intermediate, higher), we find that this pattern is also present in the NILS data, with the differential declining monotonically with education (see Table 3). For instance, among males without qualifications in 1991, Catholics have a 13.8 pp higher probability of unemployment than observably similar Protestants; among the most educated this gap is a mere 1.4 pp. One implication of this education-unemployment differential gradient is that increases in population education levels, even if experienced equally

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by Catholics and Protestants, will likely have contributed to the narrowing of the overall religious unemployment rate gap, *ceteris paribus.*

TABLE 3: CONDITIONAL UNEMPLOYMENT DIFFERENTIAL,
BY HIGHEST EDUCATION LEVEL: NILS

	Males			Females		
Level	1991	2001	2011	1991	2001	2011
No Qualifications	0.138***	0.052***	0.073***	0.066***	0.034***	0.036***
	(0.006)	(0.004)	(0.007)	(0.006)	(0.006)	(0.010)
Observations	50,315	27,264	11,837	24,808	12,816	5,666
Intermediate	0.076***	0.025***	0.034***	0.029***	0.012***	0.007**
	(0.006)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)
Observations	19,968	33,331	41,979	23,074	34,081	35,691
Higher	0.014**	0.006*	0.005	0.005	0.004	0.002
	(0.005)	(0.003)	(0.003)	(0.006)	(0.002)	(0.002)
Observations	8,155	14,576	21,361	5,254	14,058	27,536

Notes: Each cell contains the Catholic coefficient in a year-, gender- and education-specific linear model of unemployment, and standard errors robust to clustering at the SOA level in parentheses. Conditional differential controls for: age, the presence of an activity-limiting health condition, relationship status, number of household children, tenure of household, and area of residence.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Using the NILS estimation sample to compare 1991 and 2011 education levels shows that both communities became more educated: the proportion with no qualifications fell substantially, by 67% among Catholics and 68% among Protestants. A brief statistical exercise allows us to gauge the potential impact of this change. Taking males, for example, if one assumes that education-specific conditional differentials remained at their 1991 values, the shift in the proportions at each educational level implies an (average) conditional differential of 6.8 pp in 2011. In other words, even if nothing *relative* between the two communities changed over the 1991-2011 period, this suggests that the conditional unemployment differential among males might have narrowed by almost 5 pp in any case, as education levels among both religious groups increased. Females would have experienced a similar counterfactual reduction, equal to 2.2 pp.

We have already argued above that jobs growth, even if shared equally between both communities, could have contributed to the narrowing of the unemployment rate gap in Northern Ireland. But what if new jobs (and/or disappearing old jobs) were not shared equally between Catholics and Protestants, but concentrated in particular sectors dominated by one or other

community? Several studies have made the case that in certain sectors of the economy – for example the Northern Ireland Civil Service (Barritt and Carter, 1962), manufacturing (Teague, 1993), engineering (Graham, 1983) and shipbuilding (Pollak, 1982) – Protestants, especially males, enjoyed an historic employment advantage relative to Catholics. Against this background, did sector-specific changes in labour demand moderate the extent to which Catholic and Protestant job seekers shared equally in the spoils of job creation, or suffered unequally from job destruction?

The most likely relevant development is deindustrialisation, a process which has drastically altered the sectoral composition of male employment. In Northern Ireland, the share of male employee jobs in Manufacturing declined from 30% in 1978 to 17% in 2014, reflecting a net loss of 30,700 jobs. By contrast, Services increased its share from 48% to 70% during this time, driven by a net gain of 99,400 jobs. Whilst Services likely played the largest role in determining the fortunes of male job seekers in general (due to its size), changes in other sectors are potentially important given the sectoral imbalances highlighted previously.

While manufacturing employment was disproportionately male and Protestant, construction was disproportionately male and Catholic. In the former sector, the number of male employee jobs has been relatively stable since 1983, while in the latter the number has been relatively volatile, notably because of rapid growth between 1996 and 2008 (see supplement Figure A.5). Whilst this construction boom plausibly contributed to lower Catholic unemployment in the late 1990s and throughout the 2000s, these sectoral changes are not associated with the most rapid decline in the religious unemployment disparity before this time. Moreover, by the late 1980s, when inequality started to decrease, many of the 'traditional' industries containing the largest proportions of male Protestant workers had already suffered major structural collapse traceable to the post-war period (Harrison, 1982; Teague, 1987), suggesting that this factor has played a gradual and limited role.

Another potential demographic change explanation relates to migration. Northern Ireland is a small, open economy, with a historically high gross out-migration rate. If out-migration net of in-migration over this period has been disproportionately from the Catholic community, then this could lead to falls in both the numerator and the denominator of the Catholic unemployment rate, with the first effect outweighing the second effect (and therefore leading to a lower Catholic unemployment rate) where (net) out-migrants are drawn disproportionately from among the

unemployed. For migration to be an important driver of convergence in unemployment rates between Catholics and Protestants we would therefore need to see evidence of such migration patterns, in particular in the late 1980s and the 1990s.

Given the information we do have on migration, on balance it seems highly unlikely that migration has played a key role in unemployment convergence at least over the period examined here. Northern Ireland experienced net out-migration in the 1970s and 1980s, but from the late 1990s has seen inflows and outflows roughly in balance. During this time period, the Catholic share of the population has proportionally and absolutely increased (Gregory et al., 2013), and the numbers of Catholics in the workforce has grown almost on a year-by-year basis according to Annual Monitoring Returns published by the Equality Commission for Northern Ireland. There is no evidence that shows a net loss of working-age Catholics or indeed of the families and children who might be assumed to have exited at the same time as parental breadwinners. Equally, causality may run in the opposite direction, with employment growth and equality legislation (see below) contributing to falling net emigration among Catholics in Northern Ireland over this period.

5.5 Equality Legislation, Social and Political Change, and Discrimination

Among other policy interventions, religious imbalances in the Northern Ireland labour market led to the introduction of two major pieces of fair employment legislation prior to 1991, the first in 1976 and second in 1989. The first intervention aimed to promote equality of opportunity and eliminate employment discrimination on the grounds of religious and political opinion. It established the Fair Employment Agency (FEA), a body tasked with investigating claims of discrimination. Despite its aims, the Fair Employment Act (1976) appears to have been largely unsuccessful given that male Catholics remained over twice as likely as male Protestants to be unemployed several years after it was introduced (Graham, 1983).

A revamped Fair Employment Act, introduced in 1989, sought to remedy its predecessor's problems by formalising employers' recruitment procedures and enforcing the promotion of fair participation by employers under a stricter regime of oversight and enforcement. A series of new duties were imposed on certain employers, including regular review of workforce composition in terms of religious affiliation, and a review of employment practices followed by remedial measures

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where monitoring identified an under-representation of a particular religious group. Is there any evidence that the second piece of legislation met with greater success?

Muttarak et al. (2013) evaluated the effect of agreements designed to improve the representation of under-represented religious groups (both Catholic and Protestant) in particular monitored employers. They found that, between 1990 and 2005, among the sub-sample of concerns ('employers') they studied, greater improvement in religious composition was found in those that were subject to agreements than in those that were not. For agreements seeking to boost Catholic representation, marked change was identified within manufacturing and services industrial sectors. Whether this led to a fall in the unemployment differential is not clear; but it suggests that at least one aspect of this intervention has had a direct positive impact on workforce desegregation, thought to be a barrier to entry for workers of both religious groups.

Much more difficult to pin down, but potentially playing a crucial role in (and perhaps in part reflecting) the marked decline in unemployment differentials in the late 1990s, were wider social and political changes in Northern Ireland over that period, culminating in paramilitary ceasefires in the mid-1990s and the signing of the Good Friday Agreement in 1998. Among other things this heralded the establishment of the devolved Executive (with cross-community allocation of ministerial portfolios) and the Northern Ireland Assembly (enshrining cross-community voting on key decisions). Section 75 of the resulting 1998 Northern Ireland Act also strengthened the obligation of public authorities to promote equality of opportunity and good relations between persons of different religious belief. This is a far cry from the pre-1972 Stormont political settlement in Northern Ireland which might have been termed as a type of 'ethnocracy' – politics dominated by one ethnic or national group in pursuit of their own sectional interests (Kaufmann, 2004).

The final consideration is whether the contribution of discrimination has diminished through time. Because we cannot convincingly quantify the extent of discrimination at any point in time – the decomposition approach does not even give us an upper bound on potential discrimination – it is difficult to draw any firm conclusions about this, or about whether religious discrimination is a salient characteristic of the contemporary Northern Ireland labour market. Nevertheless, if the decrease in the unexplained (religion) component of the unemployment gap captures changes at least in part associated with discrimination, then many of the factors discussed above (structural

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change, equality legislation, wider social and political change) may have contributed, either via a reduction in the effects of discrimination, or a reduction in the extent of religious prejudice within Northern Ireland, or both.

6   Conclusion

The first contribution of this paper is to exploit newly available data to chart the recent history (1983-2014) of unemployment inequality between Catholics and Protestants in Northern Ireland, updating and extending the existing literature in doing so. Unemployment differentials were high in (and prior to) 1991, had fallen substantially by 2001, and have changed little since. Past levels of unemployment inequality did not re-emerge after the financial crisis of 2007-2008. Nevertheless, it is also clear that by 2011 unemployment inequality had not disappeared entirely.

The second contribution of this paper is to re-examine potential explanations for historical differentials and their narrowing over time, in part by exploiting the newly available NILS data, and again updating and extending the relevant literature which had largely fallen silent in this respect since the turn of the millennium. Although we do not attempt to precisely quantify the roles of the many different factors we consider, we are at least able to assess the likely relevance of these factors, exploiting among other things information on the timing of changes relative to major shifts in the unemployment differentials, and in some cases can give back-of-the-envelope estimates giving our best guess at the likely order of magnitude of such effects. Overall, for males, we need to explain an 11.5 pp fall in the (raw) unemployment differential over the period 1991-2011.

We argue that, at various times over the last 30 years, relative changes in observable productive characteristics between Catholics and Protestants, employment growth in industries not disproportionately employing Protestants, increasing education levels among the Northern Ireland workforce, and successive rounds of equality legislation are all likely to have played a role. We have not quantified the contribution of the second and fourth factors here (and we cannot rule out some degree of overlap between the different factors), but our estimates suggest that convergence in observables and increasing education levels among both communities contributed substantially to the narrowing of the unemployment rate gap between male Catholics

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and Protestants between 1991 and 2011. Further, we cannot rule out that a small part of the reduction in the male unemployment differential, particularly in the late 1990s, reflects increased withdrawal from the labour market among Catholic men at that time, suggesting displacement rather than eradication of the gap.

Although we cannot draw any firm conclusions about the extent of historic or contemporary discrimination in the Northern Ireland labour market, we can argue at least that the direction of travel in terms of equality legislation, structural change, and wider social and political change, is highly unlikely to be consistent with an increased role for discrimination in contributing to labour market differentials in Northern Ireland.

7   Acknowledgements

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Appendices

A   Full Estimation Results & Additional Figures

Table A.1: Linear Probability Model of Unemployment: NILS

	Males			Females		
Explanatory Variable	1991	2001	2011	1991	2001	2011
Panel A: Raw Model						
Religion (base: Protestant)						
Catholic	0.163***	0.046***	0.048***	0.065***	0.024***	0.016***
	(0.007)	(0.004)	(0.003)	(0.005)	(0.002)	(0.002)
Constant	0.135***	0.058***	0.074***	0.080***	0.035***	0.041***
	(0.004)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Panel B: Conditional Model						
Religion (base: Protestant)						
Catholic	0.109***	0.030***	0.032***	0.044***	0.015***	0.008***
	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Age (continuous)	−0.001***	−0.000	−0.002***	−0.003***	−0.001***	−0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Health Condition (base: No)						
Yes	0.141***	0.057***	0.027***	0.137***	0.036***	0.030***
	(0.009)	(0.005)	(0.005)	(0.012)	(0.005)	(0.004)
Highest Education Level (base: None)						
Intermediate	−0.121***	−0.053***	−0.079***	−0.090***	−0.039***	−0.078***
	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)	(0.005)
Higher	−0.146***	−0.066***	−0.121***	−0.101***	−0.052***	−0.100***
	(0.005)	(0.003)	(0.004)	(0.004)	(0.003)	(0.005)
Relationship Status (base: Single)						
Married	−0.077***	−0.055***	−0.073***	−0.043***	−0.026***	−0.032***
	(0.004)	(0.003)	(0.003)	(0.004)	(0.002)	(0.002)
Separated	0.043***	0.011	−0.008	0.003	0.006	−0.008*
	(0.010)	(0.006)	(0.006)	(0.008)	(0.004)	(0.004)
Number of Household Children (base: None)						
One or Two	−0.002	0.001	−0.002	0.000	0.008***	0.014***
	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Three Plus	0.045***	0.006*	0.001	0.009*	0.021***	0.024***
	(0.004)	(0.003)	(0.003)	(0.005)	(0.003)	(0.003)
Housing Tenure (base: Owner)						
Social Renter	0.261***	0.216***	0.204***	0.125***	0.132***	0.111***
	(0.005)	(0.006)	(0.008)	(0.005)	(0.006)	(0.005)
Private Renter	0.153***	0.103***	0.086***	0.074***	0.080***	0.070***
	(0.009)	(0.007)	(0.006)	(0.008)	(0.006)	(0.004)
Area of Residence (base: Belfast East)						

Explanatory Variable	Males			Females		
	1991	2001	2011	1991	2001	2011
Belfast North	0.030^*	0.017	0.036^{***}	0.022^*	0.010	0.015^*
	(0.014)	(0.010)	(0.010)	(0.011)	(0.006)	(0.006)
Belfast South	-0.017	-0.018^*	-0.014	-0.018^*	-0.011^*	-0.002
	(0.012)	(0.007)	(0.008)	(0.007)	(0.005)	(0.005)
Belfast West	0.071^{***}	0.041^{***}	0.042^{***}	0.039^{***}	0.029^{***}	0.010
	(0.015)	(0.010)	(0.008)	(0.011)	(0.007)	(0.006)
East Antrim	-0.015	-0.005	0.016^*	0.000	0.006	0.014^{**}
	(0.010)	(0.007)	(0.006)	(0.008)	(0.005)	(0.005)
East Londonderry	-0.014	-0.002	0.036^{***}	-0.012	0.018^{**}	0.023^{***}
	(0.011)	(0.008)	(0.008)	(0.008)	(0.006)	(0.006)
Fermanagh/South Tyrone	-0.007	-0.004	0.006	-0.015	0.016^*	0.012^*
	(0.012)	(0.008)	(0.006)	(0.009)	(0.006)	(0.005)
Foyle	0.020	0.038^{***}	0.054^{***}	-0.003	0.038^{***}	0.041^{***}
	(0.013)	(0.010)	(0.008)	(0.009)	(0.006)	(0.006)
Lagan Valley	-0.051^{***}	-0.023^{***}	0.004	-0.012	-0.001	0.006
	(0.010)	(0.006)	(0.006)	(0.007)	(0.004)	(0.004)
Mid Ulster	0.006	-0.027^{***}	-0.001	0.016	0.007	0.015^{**}
	(0.017)	(0.007)	(0.007)	(0.010)	(0.005)	(0.005)
Newry and Armagh	0.004	0.001	0.024^{***}	0.014	0.015^*	0.016^{**}
	(0.014)	(0.008)	(0.007)	(0.010)	(0.006)	(0.005)
North Antrim	-0.037^{***}	-0.022^{**}	0.007	-0.013	0.008	0.013^{**}
	(0.010)	(0.007)	(0.006)	(0.008)	(0.005)	(0.005)
North Down	-0.024^*	0.004	0.008	-0.003	0.014^{**}	0.007
	(0.010)	(0.007)	(0.006)	(0.007)	(0.005)	(0.005)
South Antrim	-0.042^{***}	-0.017^*	-0.001	-0.018^*	0.006	0.004
	(0.010)	(0.007)	(0.006)	(0.007)	(0.005)	(0.005)
South Down	-0.056^{***}	-0.019^*	0.015^*	-0.005	0.012^*	0.011^*
	(0.011)	(0.008)	(0.007)	(0.009)	(0.005)	(0.005)
Strangford	-0.051^{***}	-0.013^*	0.014^*	-0.019^{**}	0.005	0.008
	(0.010)	(0.007)	(0.007)	(0.007)	(0.005)	(0.005)
Upper Bann	-0.054^{***}	-0.022^{**}	0.008	-0.005	0.002	0.009^*
	(0.011)	(0.007)	(0.007)	(0.008)	(0.005)	(0.005)
West Tyrone	0.007	0.003	0.021^*	0.008	0.026^{***}	0.025^{***}
	(0.014)	(0.008)	(0.008)	(0.009)	(0.006)	(0.005)
Constant	0.241^{***}	0.116^{***}	0.243^{***}	0.224^{***}	0.081^{***}	0.144^{***}
	(0.011)	(0.008)	(0.008)	(0.010)	(0.006)	(0.008)
Observations	$78,438$	$75,171$	$75,177$	$53,136$	$60,955$	$68,893$

Notes: Sample comprises members of the labour force aged 16-64 if male and 16-59 if female.

Dependent variable = 1 if Unemployed, 0 if Employed/Self-employed.

Standard errors clustered by SOA are in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Explanatory Variable	1991	2001	2011
	Panel A: Raw Model		
Religion (base: Protestant)			
Catholic	0.126***	0.036***	0.032***
	(0.006)	(0.003)	(0.002)
Constant	0.111***	0.047***	0.057***
	(0.003)	(0.001)	(0.001)
	Panel B: Conditional Model		
Religion (base: Protestant)			
Catholic	0.084***	0.024***	0.020***
	(0.003)	(0.002)	(0.002)
Gender (base: Female)			
Male	0.074***	0.024***	0.043***
	(0.003)	(0.001)	(0.002)
Age (continuous)	−0.002***	−0.001***	−0.002***
	(0.000)	(0.000)	(0.000)
Health Condition (base: No)			
Yes	0.140***	0.048***	0.028***
	(0.007)	(0.003)	(0.003)
Highest Education Level (base: None)			
Intermediate	−0.106***	−0.047***	−0.077***
	(0.003)	(0.002)	(0.003)
Higher	−0.132***	−0.060***	−0.108***
	(0.004)	(0.002)	(0.003)
Relationship Status (base: Single)			
Married	−0.058***	−0.039***	−0.051***
	(0.003)	(0.002)	(0.002)
Separated	0.007	0.004	−0.009**
	(0.006)	(0.004)	(0.003)
Number of Household Children (base: None)			
One or Two	−0.004	0.002	0.000
	(0.002)	(0.001)	(0.002)
Three Plus	0.031***	0.010***	0.006**
	(0.003)	(0.002)	(0.002)
Housing Tenure (base: Owner)			
Social Renter	0.208***	0.180***	0.153***
	(0.004)	(0.004)	(0.005)
Private Renter	0.121***	0.092***	0.075***
	(0.007)	(0.005)	(0.004)
Area of Residence (base: Belfast East)			
Belfast North	0.026*	0.013*	0.025***

Explanatory Variable	1991	2001	2011
	(0.011)	(0.007)	(0.006)
Belfast South	−0.018*	−0.015**	−0.009
	(0.009)	(0.005)	(0.005)
Belfast West	0.056***	0.036***	0.024***
	(0.012)	(0.007)	(0.005)
East Antrim	−0.008	0.000	0.015***
	(0.008)	(0.005)	(0.004)
East Londonderry	−0.012	0.008	0.030***
	(0.008)	(0.005)	(0.006)
Fermanagh/South Tyrone	−0.008	0.006	0.010*
	(0.010)	(0.006)	(0.005)
Foyle	0.012	0.038***	0.048***
	(0.010)	(0.007)	(0.006)
Lagan Valley	−0.034***	−0.013**	0.005
	(0.008)	(0.004)	(0.004)
Mid Ulster	0.012	−0.011*	0.007
	(0.013)	(0.005)	(0.005)
Newry and Armagh	0.009	0.008	0.021***
	(0.011)	(0.005)	(0.005)
North Antrim	−0.027***	−0.008	0.011*
	(0.008)	(0.005)	(0.004)
North Down	−0.015	0.008	0.008
	(0.008)	(0.005)	(0.004)
South Antrim	−0.032***	−0.007	0.002
	(0.008)	(0.004)	(0.004)
South Down	−0.035***	−0.004	0.014**
	(0.009)	(0.005)	(0.005)
Strangford	−0.039***	−0.005	0.012**
	(0.007)	(0.004)	(0.004)
Upper Bann	−0.034***	−0.010*	0.009*
	(0.009)	(0.005)	(0.004)
West Tyrone	0.009	0.014*	0.024***
	(0.011)	(0.006)	(0.006)
Constant	0.197***	0.091***	0.181***
	(0.008)	(0.005)	(0.006)
Observations	133, 093	137, 601	146, 859

Notes: Sample comprises 16-64-year-old men and women in the labour force.
Dependent variable = 1 if Unemployed, 0 if Employed/Self-employed.
Standard errors clustered by SOA are in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Explanatory Variable	Males			Females		
	1991	2001	2011	1991	2001	2011
Panel A: Raw Model						
Religion (base: Protestant)						
Catholic	0.050***	0.065***	0.049***	0.092***	0.084***	0.053***
	(0.003)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)
Constant	0.172***	0.211***	0.222***	0.389***	0.337***	0.280***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Panel B: Conditional Model						
Religion (base: Protestant)						
Catholic	0.007**	0.022***	0.016***	0.019***	0.026***	0.012***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
Age (continuous)	0.000	0.000*	−0.001***	0.001***	−0.003***	−0.006***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Health Condition (base: No)						
Yes	0.696***	0.535***	0.444***	0.454***	0.434***	0.403***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)
Highest Education Level (base: None)						
Intermediate	0.044***	−0.073***	−0.133***	−0.154***	−0.231***	−0.240***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)
Higher	−0.031***	−0.128***	−0.205***	−0.268***	−0.370***	−0.405***
	(0.004)	(0.004)	(0.004)	(0.006)	(0.005)	(0.005)
Relationship Status (base: Single)						
Married	−0.240***	−0.195***	−0.180***	−0.081***	−0.121***	−0.096***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)
Separated	−0.139***	−0.111***	−0.084***	−0.036***	−0.118***	−0.091***
	(0.007)	(0.005)	(0.005)	(0.008)	(0.006)	(0.005)
Number of Household Children (base: None)						
One or Two	0.100***	0.085***	0.087***	0.203***	0.127***	0.071***
	(0.002)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)
Three Plus	0.152***	0.126***	0.130***	0.367***	0.254***	0.197***
	(0.003)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Housing Tenure (base: Owner)						
Social Renter	−0.016***	0.081***	0.090***	0.086***	0.128***	0.063***
	(0.003)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)
Private Renter	−0.002	0.038***	0.018*	0.089***	0.120***	0.028***
	(0.005)	(0.008)	(0.007)	(0.008)	(0.009)	(0.006)
Area of Residence (base: Belfast East)						
Belfast North	0.006	0.002	−0.003	0.006	−0.001	−0.009
	(0.008)	(0.012)	(0.011)	(0.011)	(0.013)	(0.012)
Belfast South	0.008	0.026*	0.053**	0.005	0.036*	0.063***
	(0.009)	(0.012)	(0.019)	(0.013)	(0.014)	(0.018)
Belfast West	0.010	0.009	0.025*	0.010	0.014	0.004
	(0.008)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)

Explanatory Variable	Males			Females		
	1991	2001	2011	1991	2001	2011
East Antrim	0.001	−0.008	−0.010	0.028*	0.003	−0.000
	(0.008)	(0.011)	(0.011)	(0.011)	(0.012)	(0.013)
East Londonderry	−0.004	−0.006	−0.001	0.037**	0.024	0.044***
	(0.008)	(0.011)	(0.012)	(0.013)	(0.013)	(0.013)
Fermanagh/South Tyrone	−0.020**	−0.026*	−0.028**	0.050***	0.025*	0.021
	(0.007)	(0.011)	(0.010)	(0.013)	(0.011)	(0.012)
Foyle	0.003	0.010	0.007	0.017	0.033**	0.039***
	(0.009)	(0.011)	(0.011)	(0.013)	(0.011)	(0.012)
Lagan Valley	−0.009	−0.003	−0.011	0.010	0.008	0.002
	(0.007)	(0.011)	(0.010)	(0.011)	(0.012)	(0.012)
Mid Ulster	−0.009	−0.018	−0.032**	0.045***	0.036**	0.038***
	(0.007)	(0.011)	(0.010)	(0.012)	(0.011)	(0.011)
Newry and Armagh	−0.004	−0.013	−0.028**	0.047***	0.032**	0.022
	(0.007)	(0.010)	(0.011)	(0.012)	(0.011)	(0.012)
North Antrim	−0.016*	−0.029**	−0.030**	0.034**	0.007	0.009
	(0.007)	(0.011)	(0.010)	(0.011)	(0.011)	(0.011)
North Down	0.009	0.023	0.028*	0.041**	0.037*	0.016
	(0.009)	(0.013)	(0.012)	(0.013)	(0.014)	(0.015)
South Antrim	−0.008	−0.014	−0.023*	0.003	−0.011	−0.010
	(0.007)	(0.010)	(0.010)	(0.011)	(0.011)	(0.012)
South Down	−0.015*	−0.025*	−0.025*	0.038**	0.026*	0.034**
	(0.008)	(0.010)	(0.010)	(0.013)	(0.011)	(0.012)
Strangford	−0.019**	−0.004	−0.002	0.007	0.016	−0.002
	(0.007)	(0.010)	(0.010)	(0.014)	(0.011)	(0.011)
Upper Bann	−0.014	−0.013	−0.021*	−0.012	−0.001	0.005
	(0.007)	(0.010)	(0.010)	(0.011)	(0.010)	(0.011)
West Tyrone	−0.010	−0.013	−0.026*	0.054***	0.015	0.026*
	(0.009)	(0.010)	(0.010)	(0.013)	(0.012)	(0.011)
Constant	0.197***	0.236***	0.395***	0.284***	0.531***	0.682***
	(0.008)	(0.011)	(0.011)	(0.012)	(0.012)	(0.013)
Observations	97,139	98,748	99,514	92,782	97,320	99,188

Notes: Sample comprises people aged 16-64 if male and 16-59 if female.

Dependent variable = 1 if Economically Inactive, 0 if Economically Active.

Standard errors clustered by SOA are in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE A.4: UNEMPLOYMENT DIFFERENTIALS, BOTH GENDERS: CHS

| Survey | Obs. | Unemp. Rate | | Differential | | | | |
		C	P	Ratio	Raw	se	Cond.	se
1983-84	6,027	0.274	0.132	2.07	0.142***	0.011	0.096***	0.010
1985-86[a]	5,850	0.273	0.129	2.11	0.144***	0.011	0.098***	0.011
1987-88	6,052	0.255	0.104	2.44	0.151***	0.011	0.110***	0.010
1989-90[a]	5,970	0.176	0.094	1.87	0.082***	0.009	0.062***	0.009
1991-92	5,959	0.185	0.084	2.21	0.101***	0.009	0.078***	0.009
1993-94	5,366	0.136	0.090	1.52	0.046***	0.009	0.024**	0.009
1995-96	5,225	0.131	0.065	2.02	0.066***	0.009	0.044***	0.008
1997-98	4,821	0.121	0.055	2.20	0.066***	0.009	0.055***	0.008
1999-00	4,478	0.067	0.045	1.49	0.022**	0.007	0.016*	0.007
2001-02	4,320	0.064	0.042	1.53	0.022**	0.007	0.013*	0.007
2003-04	3,958	0.054	0.039	1.40	0.015*	0.007	0.010	0.007
2005-06	3,574	0.056	0.036	1.53	0.019**	0.007	0.013	0.007
2007-08	3,127	0.039	0.034	1.14	0.005	0.007	−0.001	0.007
2009-10[b]	3,244	0.087	0.069	1.25	0.017	0.009	0.007	0.009
2011-12	3,420	0.084	0.071	1.18	0.013	0.009	0.012	0.009
2013-14	3,267	0.060	0.039	1.55	0.021**	0.008	0.013	0.007

Notes: Unless otherwise specified, each sample comprises 16-64-year-old men and women in the labour force, and the conditional differential controls for: age, gender, education (possession of any educational qualification), the presence of an activity-limiting health condition, relationship status, number of household children, and tenure of household. se column reports standard errors robust to heteroskedasticity.
[a] Conditional estimate excludes health condition covariate due to missing information.
[b] Sample is aged 16-59 in 2009-10 due to a lack of detailed age information.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE A.5: ECONOMIC INACTIVITY DIFFERENTIALS, MALES: CHS

| Survey | Obs. | Inactivity Rate | | Differential | | | | |
		C	P	Ratio	Raw	se	Cond.	se
1983-84	4,066	0.161	0.109	1.48	0.053***	0.011	0.044***	0.010
1985-86[a]	4,040	0.193	0.129	1.49	0.064***	0.012	0.052***	0.012
1987-88	4,063	0.196	0.134	1.46	0.062***	0.012	0.044***	0.011
1989-90[a]	3,927	0.200	0.152	1.31	0.048***	0.013	0.036**	0.012
1991-92	3,921	0.205	0.157	1.31	0.048***	0.013	0.033**	0.012
1993-94	3,507	0.234	0.171	1.36	0.063***	0.014	0.043***	0.012
1995-96	3,367	0.244	0.181	1.35	0.063***	0.014	0.036**	0.013
1997-98	3,181	0.248	0.208	1.19	0.040**	0.015	0.015	0.013
1999-00	2,907	0.285	0.210	1.36	0.075***	0.016	0.043**	0.014
2001-02	2,758	0.276	0.213	1.30	0.063***	0.017	0.042**	0.014
2003-04	2,463	0.235	0.219	1.07	0.015	0.017	0.002	0.015
2005-06	2,207	0.265	0.211	1.26	0.054**	0.019	0.030	0.016
2007-08	1,898	0.234	0.225	1.04	0.009	0.019	0.010	0.017
2009-10[b]	1,796	0.214	0.186	1.15	0.029	0.019	0.036*	0.016
2011-12	2,108	0.267	0.249	1.07	0.018	0.019	0.021	0.016
2013-14	1,916	0.239	0.229	1.04	0.010	0.019	0.019	0.016

Notes: Unless otherwise specified, each sample comprises 16-64-year-old men, and the conditional differential controls for: age, education (possession of any educational qualification), the presence of an activity-limiting health condition, relationship status, number of household children, and tenure of household. se column reports standard errors robust to heteroskedasticity.
[a] Conditional estimate excludes health condition covariate due to missing information.
[b] Sample is aged 16-59 in 2009-10 due to a lack of detailed age information.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE A.6: ECONOMIC INACTIVITY DIFFERENTIALS, FEMALES: CHS

| Survey | Obs. | Inactivity Rate | | Differential | | | | |
		C	P	Ratio	Raw	se	Cond.	se
1983-84	4,573	0.530	0.428	1.24	0.102***	0.015	0.064***	0.014
1985-86[a]	4,621	0.558	0.442	1.26	0.116***	0.015	0.049***	0.015
1987-88	4,639	0.518	0.402	1.29	0.116***	0.015	0.053***	0.014
1989-90[a]	4,472	0.490	0.356	1.38	0.134***	0.015	0.067***	0.014
1991-92	4,513	0.488	0.359	1.36	0.129***	0.015	0.069***	0.014
1993-94	4,260	0.476	0.374	1.27	0.103***	0.015	0.040**	0.014
1995-96	4,205	0.485	0.352	1.38	0.133***	0.015	0.067***	0.014
1997-98	3,893	0.456	0.381	1.20	0.076***	0.016	0.040**	0.014
1999-00	3,766	0.462	0.378	1.22	0.085***	0.016	0.041**	0.014
2001-02	3,519	0.423	0.352	1.20	0.072***	0.016	0.045**	0.015
2003-04	3,224	0.426	0.343	1.24	0.084***	0.017	0.045**	0.015
2005-06	2,845	0.398	0.337	1.18	0.061***	0.018	0.03	0.016
2007-08	2,481	0.389	0.325	1.19	0.063**	0.019	0.044**	0.017
2009-10	2,653	0.348	0.292	1.19	0.056**	0.018	0.037*	0.016
2011-12	2,693	0.362	0.310	1.17	0.053**	0.018	0.037*	0.016
2013-14	2,512	0.339	0.301	1.13	0.038*	0.019	0.011	0.017

Notes: Unless otherwise specified, each sample comprises 16-59-year-old women, and the conditional differential controls for: age, education (possession of any educational qualification), the presence of an activity-limiting health condition, relationship status, number of household children, and tenure of household. se column reports standard errors robust to heteroskedasticity.

[a] Conditional estimate excludes health condition covariate due to missing information.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

FIGURE A.1: UNEMPLOYMENT RATE: CHS & NILS
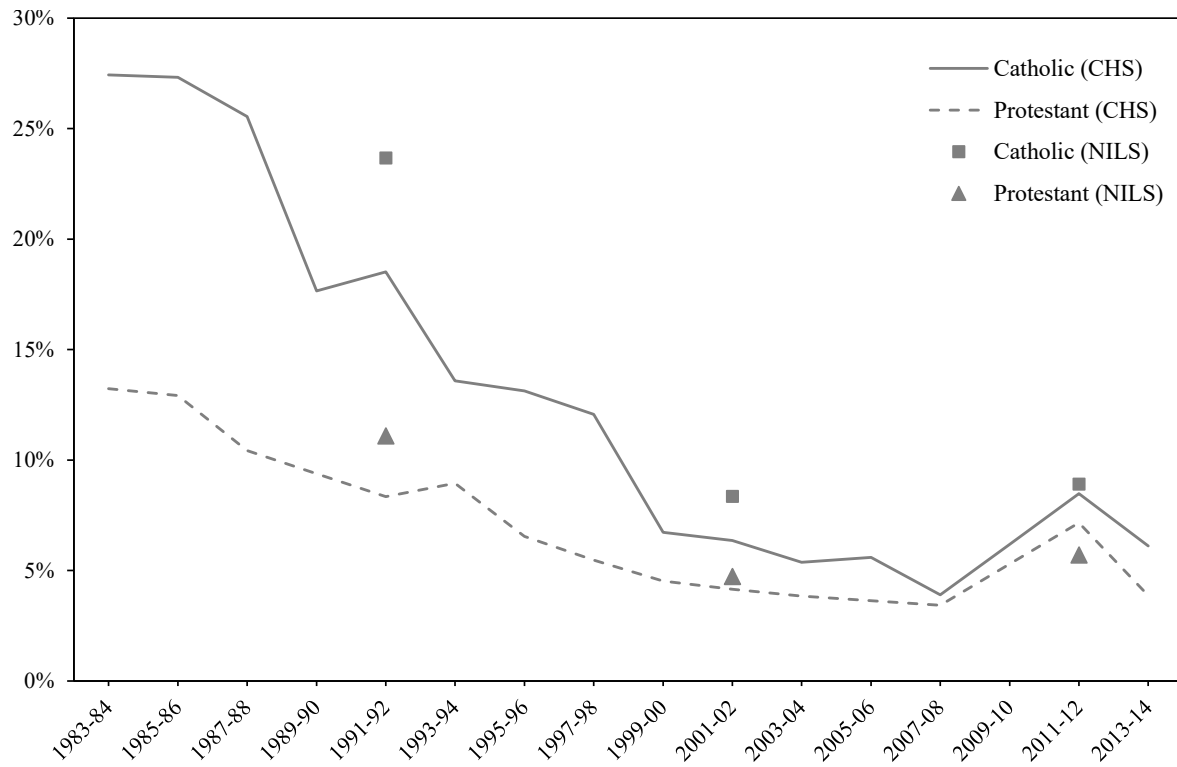
Notes: Figure displays the proportion of the 16-64-year-old labour force that is unemployed, for each religious group. CHS rate in 2009-2010 is imputed as the average of adjacent paired years due to a lack of detailed age information.

FIGURE A.2: MALE ECONOMIC INACTIVITY RATES: CHS & NILS
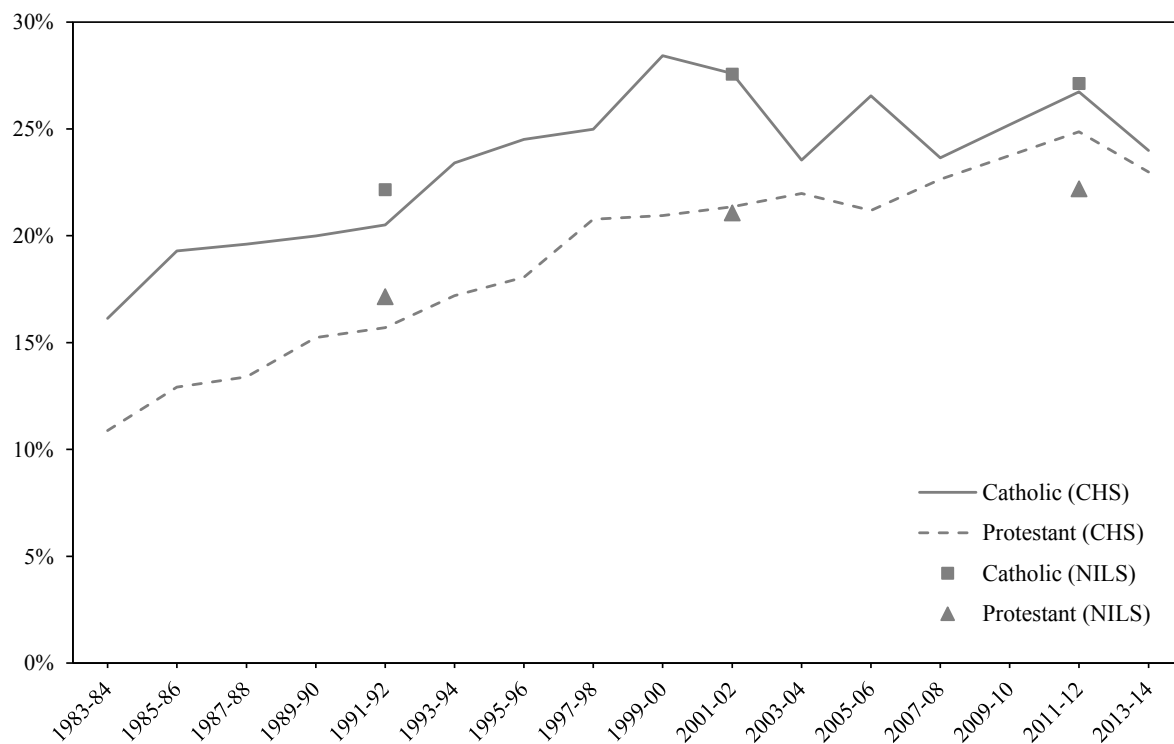
Notes: Figure displays the proportion of 16-64-year-old males who do not participate in the labour market (e.g., students, long-term sick/disabled, retired, homemakers), separately by religion. CHS rate in 2009-2010 is imputed as the average of adjacent paired years due to a lack of detailed age information.

FIGURE A.3: INACTIVITY RATE DIFFERENTIALS, MALES: CHS
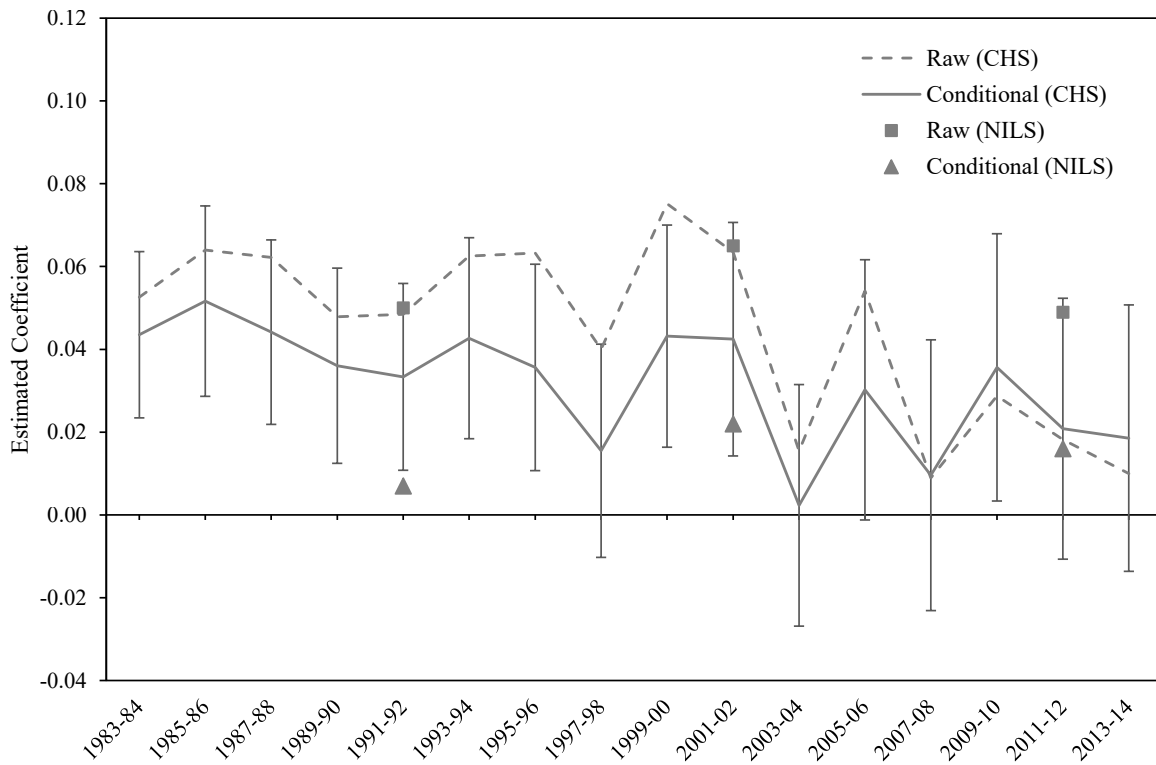
Notes: Figure displays conditional inactivity differentials estimated for 16-64-year-old males. CHS sample in 2009-2010 is aged 16-59 due to a lack of detailed age information. CHS conditional differential controls for: age, education (possession of any educational qualification), the presence of an activity-limiting health condition (except 1985-1986 and 1989-1990 due to missing information), relationship status, number of household children, and tenure of household. NILS estimates control additionally for area of residence, and include education measured as the highest level of qualification.
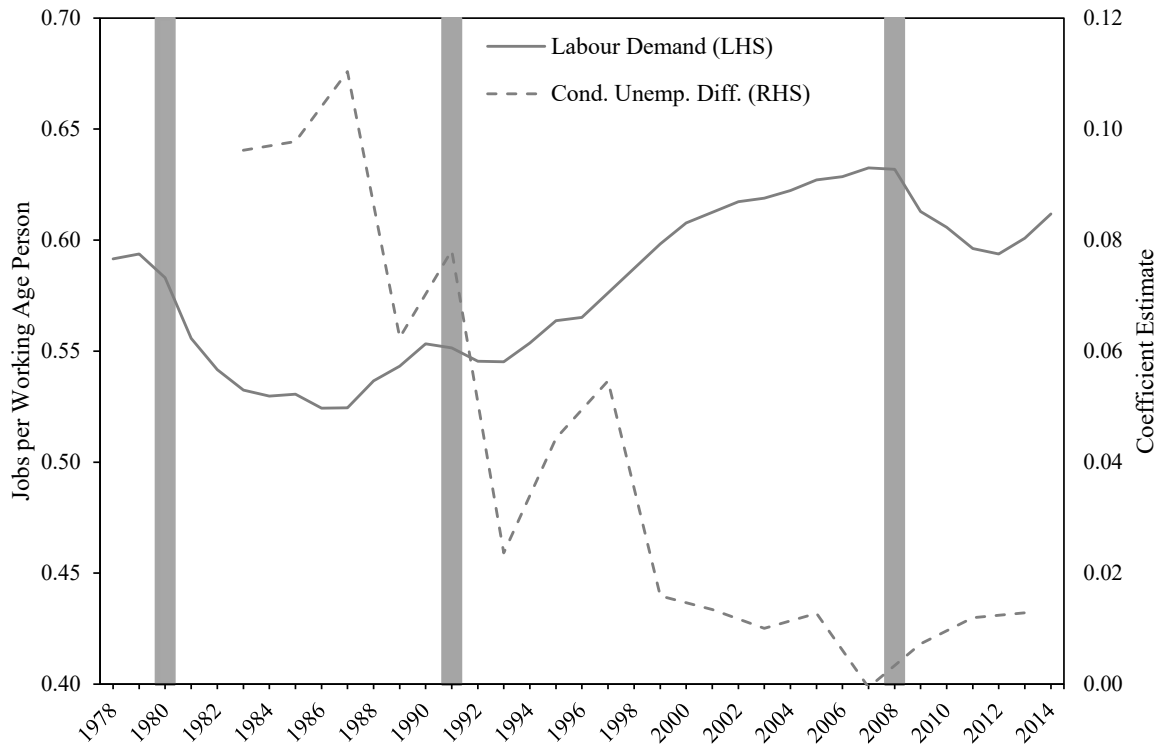
Notes: Figure plots the average number of employee jobs per annum for each 16-64-year-old person, alongside the conditional unemployment differential estimated using the CHS (see Table A.4). Grey shading indicates official UK recessions: 1980Q1-1981Q1; 1990Q3-1991Q3; 2008Q2-2009Q2. See supplementary material for details on data sources.

FIGURE A.5: INDEX OF MALE EMPLOYEE JOBS BY INDUSTRIAL SECTOR (BASE: 1983 = 100)

Notes: See Table D.4 in supplementary material for data source.

B Education-Specific Conditional Differentials

The calculations in the counterfactual exercise reported in Section 5.4 of the main document are illustrated below, using data for males taken from Table 3 in the main article.

The average conditional unemployment differential is a weighted average of the education-specific differentials. Among males in 1991, it is 10.9 pp (as reported in Table A.1):

$$\frac{0.138 \times 50315 + 0.076 \times 19968 + 0.014 \times 8155}{50315 + 19968 + 8155} = 0.109$$

The *counterfactual* conditional unemployment differential in 2011 is obtained by applying 2011 weights (proportions at each level of education in 2011) to the education-specific conditional differentials observed in 1991. Among males this is found to be 6.8 pp:

$$\frac{0.138 \times 11837 + 0.076 \times 41979 + 0.014 \times 21361}{11837 + 41979 + 21361} = 0.068$$

In 2011, the *observed* conditional unemployment differential was 3.2 pp.

C   Oaxaca-Blinder Decomposition of the Unemployment Differential, NILS

This section first outlines the methodology used to quantify the contributions of observable characteristics to the raw differential in the NILS data. It then reports the estimation results accompanying the discussion in Section 5.1 of the main document.

C.1   Empirical Method

Using the NILS data, the raw unemployment rate differential is decomposed into explained and unexplained components using the methodology attributed to Oaxaca (1973) and Blinder (1973), to inform the discussion of its contributory factors. Previous studies found that religious differences in characteristics contributed to the unemployment differential (e.g., Smith and Chambers (1991)). Here, we update that approach and go further by quantifying the contributions of the various observable factors (see Gelbach (2016)). Specifically, we follow Fortin (2008) in using the coefficient vector pooled over religion to capture the non-discriminatory returns structure, adopting a linear framework as before, as follows:

$$\overline{y}_1 - \overline{y}_2 = (\overline{\mathbf{X}}_1 - \overline{\mathbf{X}}_2)\widehat{\boldsymbol{\beta}^*} + \overline{\mathbf{X}}_1(\widehat{\boldsymbol{\beta}}_1 - \widehat{\boldsymbol{\beta}^*}) + \overline{\mathbf{X}}_2(\widehat{\boldsymbol{\beta}^*} - \widehat{\boldsymbol{\beta}}_2) + (\widehat{\alpha}_1 - \widehat{\alpha}^*) + (\widehat{\alpha}^* - \widehat{\alpha}_2) \qquad \text{(C.1)}$$

where subscript 1 (2) denotes the Catholic (Protestant) sub-sample, an asterisk denotes the estimated non-discriminatory vector, and overbars denote mean values. The 'explained' (endowment) effect is given by the first term on the right-hand side, and the 'unexplained' (coefficients) effect is given by the remaining terms. Owing to invariance problems in decompositions that use dummy explanatory variables (Oaxaca and Ransom, 1999), only the sum total of the coefficients effect (including the constant), and the sum total of endowment effects within each set of dummy explanatory variables, are interpreted.

C.2   Estimation Results

Oaxaca-Blinder decomposition results are presented in Table C.1 below. In each case the explained component of the unemployment gap is broken down by the contributions of each set of covariates (endowments). Discussion is focused on males and whether the relative contributions of

each set of endowments has changed through time. The results are given in Panel B as percentage point contributions (parameter estimates), and in Panel C as percentage share contributions (parameter estimates divided by the corresponding raw differential). As has been previously argued in the literature, religious differences in observables contributed to a relatively higher Catholic unemployment rate. Here we show this continues to be the case, but find that in every year most of the raw differential remains unexplained by such differences. Specifically, a combination of the most commonly cited observables – age, education, number of household children, and area of residence – accounts for between 15% and 31% of the raw differential, depending on year and gender, with all included observables accounting for between 32% and 50%.

Among males, the contributions of tenure of household and area of residence are notable. In 1991, for example, the greater proportion of Catholics households that are socially or privately rented, rather than owned, is associated with a Catholic rate of unemployment 1.9 pp higher than the Protestant rate (12% of the raw differential). By 2001 this contribution had fallen to 0.5 pp, a relative contribution of 11%. Similarly, the geographical concentration of Catholics in higher unemployment areas contributed an estimated 1.8 pp to the unemployment rate gap in 1991 but only 0.7 pp in 2001, and contributed most on a relative basis in both 2001 (15%) and 2011 (13%). Differences in education levels between Catholics and Protestants contributed just 0.6 pp to the unemployment rate gap in 1991 and nothing in 2001. The measure of health status made no contribution in any year, and age and relationship status became relatively more important through time.

Among females, although the distribution of education favours Catholics (reducing the relative gap by 13% in 2001 and 2011, for instance) this is offset by unfavourable distributions of other observable endowments, particularly geography.

TABLE C.1: OAXACA-BLINDER DECOMPOSITION OF THE RAW UNEMPLOYMENT RATE DIFFERENTIAL: NILS

	Males			Females		
	1991	2001	2011	1991	2001	2011
Panel A: Unemployment Rate						
Catholic	0.298	0.104	0.122	0.144	0.060	0.057
Protestant	0.135	0.058	0.074	0.080	0.035	0.041
Panel B: Absolute Contributions						
Raw Differential (E + U)	**0.163**	**0.046**	**0.048**	**0.065**	**0.024**	**0.016**
Explained (E):	**0.055**	**0.016**	**0.016**	**0.021**	**0.010**	**0.008**
Age	0.003	0.000	0.004	0.006	0.001	0.002
Health Condition	0.000	0.000	0.000	0.000	0.000	0.000
Highest Education Level	0.006	0.000	0.001	-0.003	-0.003	-0.002
Relationship Status	0.003	0.003	0.004	0.003	0.002	0.002
Number of Household Children	0.006	0.000	0.000	0.001	0.002	0.001
Housing Tenure	0.019	0.005	0.002	0.006	0.002	0.001
Area of Residence	0.018	0.007	0.006	0.008	0.006	0.004
Unexplained (U = S + C):	**0.109**	**0.030**	**0.032**	**0.044**	**0.015**	**0.008**
Constant (S)	0.206	0.028	0.067	0.126	0.024	0.052
Coefficients (C)	-0.098	0.003	-0.034	-0.083	-0.009	-0.045
Panel C: Relative Contributions (%)						
Raw Differential (E + U)	**100**	**100**	**100**	**100**	**100**	**100**
Explained (E):	**34**	**35**	**33**	**32**	**42**	**50**
Age	2	0	8	9	4	13
Health Condition	0	0	0	0	0	0
Highest Education Level	4	0	2	-5	-13	-13
Relationship Status	2	7	8	5	8	13
Number of Household Children	4	0	0	2	8	6
Housing Tenure	12	11	4	9	8	6
Area of Residence	11	15	13	12	25	25
Unexplained (U = S + C):	**67**	**65**	**67**	**68**	**63**	**50**
Constant (S)	126	61	140	194	100	325
Coefficients (C)	-60	7	-71	-128	-38	-281
Observations	78,438	75,171	75,177	53,136	60,955	68,893

Notes: Panel B reports parameter estimates. Each cell in Panel C is the corresponding estimate in B divided by the raw differential in the same column. Components may not add correctly in some years due to rounding. Standard errors (not reported) are robust to clustering at the SOA level.

D Data and Variables

D.1 Estimation Samples & Variables

The two datasets primarily used in this paper are the NILS and CHS. Further information about the NILS is available in O'Reilly (2011). For more information about the CHS, see the NISRA website: https://www.nisra.gov.uk/continuous-household-survey. This section provides further details about the construction of CHS and NILS estimation samples.

NILS

The target sample contains three years of data (1991, 2001, 2011), and comprises 16-64-year-old members of the NILS who were enumerated in a given Census and resident in a private household (862,677 person-years). To enhance the reliability of results, the following changes were made:

- 4,480 individuals were dropped because of subject non-response (excludes non-resident students, see immediately below).

- 8,244 non-resident students were dropped (these individuals do not complete the Census questionnaire, so no information is available).

- 80,338 person-years were dropped due to changes in country of birth or a decrease in the highest level of education (note that individuals were dropped from the sample entirely, not just in a particular year).

- 66,602 individuals were dropped because some relevant variables had imputed values (2001 & 2011 only).

TABLE D.1: VARIABLES WITH IMPUTED VALUES: NILS

2001	2011
Health status	Health status
Education	Education
Relationship Status	Relationship Status
Household tenure	Household tenure
Economic status	Economic status (unemployed only)
	Residence type
	Country of birth

Final NILS sample totals 703,013 person-years.

CHS

The target sample contains 32 survey waves (1983–2013-2014), which are paired for the purposes of statistical analysis and contain 16-64 year olds.

Relative to the NILS, the CHS contains proportionally more missing values in the working age samples. For the majority of observations, missing values are present in both the dependent and independent variables. To boost sample size in the calculation of descriptive statistics presented in Figures A.1 and Figure A.2, observations are retained even if control variables used in regressions have missing values. This provides only a minor boost, however, and regression samples are largely similar in size. Note that raw and conditional regression models contain the same number of observations.

A selected number of estimation issues are highlighted below:

- In 2009-2010, there is insufficient detail about the ages of sample members. The original age variable is given as a categorical variable, and the oldest age category is 60+. Therefore, the sample cannot be restricted to those under 65 years of age. When estimating regressions, the sample is restricted to 16-59 year olds. When calculating a selected number of descriptive statistics (shown in Figure A.1 and Figure A.2), the rates are imputed as the average of adjacent paired years.

- In 1985-1986 and 1989-1990, the table containing health information does not contain individual identification keys, so this information cannot be linked to other tables. Therefore, the health status explanatory variable is excluded from these regressions.

Further information is available on request from the corresponding author.

TABLE D.2: CLASSIFYING ECONOMIC ACTIVITY STATUS: NILS

Category	1991	2001	2011
Employed/Self-Employed	Working for an employer, full- or part-time	Employee, either full- or part-time	Employee, either full- or part-time
	Self-employed and employing, or not employing, other people	Self-employed, with or without employees, full- or part-time	Self-employed, with or without employees, full- or part-time
Unemployed	Waiting to start a job already accepted	Waiting to start job already obtained	Waiting to start job already obtained
	Unemployed and looking for a job	Actively looking for work within the last 4 weeks	Actively looking for work within the last 4 weeks
		Available to start a job within 2 weeks if offered	Available to start a job within 2 weeks if offered
Inactive	At school or in full-time education	Student	Student
	Long-term sick or disabled	Permanently sick/disabled	Long-term sick or disabled
	Retired	Retired	Retired
	Looking after home and family	Looking after home/family	Looking after home or family
	Other	Other	Other
	Voluntary Work		
	Doing unpaid work		
	On a Government employment or training scheme		

Notes: In 2001 and 2011, students can be disaggregated by labour market participation status (some may be classified as employed, for example). Here, they are treated as economically inactive regardless of their participation status, though this does not affect results.

TABLE D.3: VARIABLE DEFINITIONS: NILS

Variable	Definition	Notes
	Panel A: Outcomes	
Unemployed	=1 if individual is unemployed, =0 otherwise.	Base category is employed/self-employed in labour force samples.
Economically Inactive	=1 if individual is inactive, =0 active.	Base category is employed/self-employed or unemployed in population samples.
	Panel B: Explanatory Variables	
Gender (2 categories)	=1 if individual is male, =0 if female.	
Age (continuous)	Age of individual.	
Health Condition (2 categories)	=1 if individual has an activity-limiting illness, =0 if not.	Has a health problem which limits activities. In 2011, includes day-to-day activities limited either a little or a lot.
Highest Education Level (3 categories)		
Intermediate	=1 if individual has intermediate-level qualifications, =0 otherwise.	1991: CSE (Other than Grade 1); GCSE, O Level (Including CSE Grade 1), Sen Cert, BTEC(Gen); BTEC(Nat), TEC(Nat), BEC(Nat), ONC, OND; GCE A Level, Advanced Senior Certificate; Any vocational qualification.
		2001: GCSE (grades D-G), CSE (grades 2-5), 1-4 CSEs (grade 1), 1-4 GCSEs (grades A-C), 1-4 O level passes, NVQ level 1, GNVQ Foundation or equivalents; 5+ CSEs (grade 1), 5+ GCSEs (grades A-C), 5+ O level passes, Senior Certificate, 1 A level, 1-3 AS levels, Advanced Senior Certificate, NVQ level 2, GNVQ Intermediate or equivalents; 2+ A levels, 4+ AS levels, NVQ level 3, GNVQ Advanced or equivalents.
		2011: 1-4 O Levels/CSE/GCSEs (any grades), Entry Level, Foundation Diploma, NVQ level 1, Foundation GNVQ, Basic/Essential Skills; 5+ O Level (Passes)/CSEs (Grade 1)/GCSEs (Grades A*-C), School Certificate, 1 A Level/ 2-3 AS Levels/VCEs, Intermediate/Higher Diploma, Welsh Baccalaureate Intermediate Diploma, NVQ level 2, Intermediate GNVQ, City and Guilds; Apprenticeship; 2+ A Levels/VCEs, 4+ AS Levels, Higher School Certificate, Progression/Advanced Diploma, Welsh Baccalaureate Advanced Diploma, NVQ Level 3; Advanced GNVQ, City and Guilds Advanced Craft, ONC, OND, BTEC National, RSA Advanced Diploma; Other: Vocational/Work-related Qualifications, Foreign Qualifications/ Qualifications gained outside the UK (Not stated/level unknown)
Higher	=1 if individual has higher-level qualifications, =0 otherwise.	1991: BTEC (High), BEC (High), TEC(High), HNC, HND; Degree level or higher.
		2001: Degree or above, NVQ Level 4-5, HNC, HND or equivalents.

Continued on next page...

Variable	Definition	Notes
		2011: Degree or above, NVQ Level 4-5, HNC, HND, RSA Higher Diploma, BTEC Higher level, Foundation degree (NI), Professional qualifications.
	Base: No educational qualifications.	
Relationship Status (3 categories)		
Married	=1 if individual is currently married, =0 otherwise.	In 2011, includes registered same-sex civil partnership.
Separated	=1 if individual is divorced or widowed or separated but still legally married, =0 otherwise.	In 2011, includes separated (but still legally in a same-sex civil partnership); and formerly in a same-sex civil partnership which is now legally dissolved.
	Base: Single.	
Number of Children in Household (3 categories)		
One to Two	=1 if household contains one or two children, =0 otherwise.	E.g. In 2001, a person aged 0-15 or 16-18 if in full-time education and living with parents.
Three Plus	=1 if household contains three or more children, =0 otherwise.	
	Base: None.	
Tenure of Household (3 categories)		
Social Renter	=1 if household is socially rented, =0 otherwise.	Rented from a public authority (Northern Ireland Housing Executive) or housing association or charitable trust.
Private Renter	=1 if household is privately rented, =0 otherwise.	In 2001 and 2011, includes renting privately from other household members.
	Base: Owner-occupied.	
Area of Residence (18 categories)		
	Seventeen 0/1 dummies, one for each neighbourhood: Belfast North, Belfast South, Belfast West, East Antrim, East Londonderry, Fermanagh/South Tyrone, Foyle, Lagan Valley, Mid Ulster, Newry and Armagh, North Antrim, North Down, South Antrim, South Down, Strangford, Upper Bann, West Tyrone. Base: Belfast East.	

D.2 Additional Data

In addition to the CHS and NILS, other data were gathered to support the arguments presented in Section 5 of the main document. These additional data are publicly available and are described in Table D.4 below.

TABLE D.4: ADDITIONAL DATA

Additional Data	Description
Non-Seasonally Adjusted Employee Jobs in Northern Ireland (1978-2014): Manufacturing, Services, Construction, Other.	Number of males/females in full-time and part-time employment by business activity in Northern Ireland. Data is collected by the Quarterly Employment Survey, covering all public sector bodies, all private sector firms with 25 or more employees and a sample of the remainder. Excludes the self-employed, HM Armed Forces, private domestic servants, homeworkers and jobskills trainees without a contract of employment (non-employed status). These data were downloaded from Table 5.11 on the Northern Ireland Statistical Research Agency website (https://www.nisra.gov.uk/publications/quarterly-employment-survey-historical-tables-september-2017). The total number of non-seasonally adjusted employee jobs was included in the numerator of the labour demand measure calculated for the period 1978-2014 ($labour\ demand = employees/population$). It was also used to calculate the percentage increase in employee jobs. The total number of male employee jobs was used to construct an index of male employee jobs for the period 1978-2014..
Non-Seasonally Adjusted Employee Jobs in London (1983-2001)	Non-Seasonally Adjusted Employee Jobs by United Kingdom region ('Employee Jobs - by Section by Region back to 1981 Quarter 3 SA and NSA'). These data were downloaded from the Office for National Statistics website (https://www.ons.gov.uk/). The percentage increase in Employee jobs in London during the period 1983-2001 was calculated.
Mid-Year Population Estimates for Northern Ireland (1978-2014)	Population Estimates for Northern Ireland were downloaded from the Northern Ireland Neighbourhood Information Service (http://www.ninis2.nisra.gov.uk/public/Home.aspx). The total mid-year population aged 16-64 (working age) was included in the denominator of the labour demand measure calculated for the period 1978-2014 ($labour\ demand = employees/population$).
Labour Force Survey Unemployment Rate (1984-2014)	Unemployment rate for members of the labour force aged 16 or over. These data ('Historical data 1984-1991' and 'LFS-historical-key-data-series-AO17') were downloaded from the Northern Ireland Statistical Research Agency website (https://www.nisra.gov.uk/publications/labour-force-survey-historical-data-december-2017).
United Kingdom Gross Domestic Product	GDP data (chained volume measures: seasonally adjusted) was downloaded from the Office for National Statistics (https://www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/abmi/pgdp). This was used to identify UK recessionary periods.
Annual Fair Employment Monitoring Report for the Monitored Northern Ireland Workforce	Among other trends, these data summarise the religious profile of the monitored workforce using monitoring returns (valid returns obtained for 138 public authorities and 3,553 private sector concerns in 2015). The latest report and previous reports can be found on the Equality Commission for Northern Ireland website (http://www.equalityni.org/Home).

E Sensitivity Analysis

A variety of sensitivity checks were conducted to assess whether conclusions were robust to alternative choices of samples or variable definitions. These are required because results may be affected by methodological choices or by changes in the way data were either collected or processed through time (e.g., in 2001, the Census introduced a question on religion 'brought up in'). Conditional unemployment differentials under alternative specifications and samples are largely similar to the main estimates.

E.1 NILS

TABLE E.1: CONDITIONAL UNEMPLOYMENT DIFFERENTIAL,
BY ESTIMATION METHOD: NILS

Method	Males			Females		
	1991	2001	2011	1991	2001	2011
Logit (AME)	0.107	0.030	0.031	0.043	0.014	0.007
	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Logit (MEA)	0.105	0.023	0.024	0.037	0.010	0.005
	(0.004)	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)
Probit (AME)	0.107	0.030	0.031	0.041	0.014	0.007
	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Probit (MEA)	0.112	0.027	0.027	0.039	0.011	0.006
	(0.004)	(0.002)	(0.002)	(0.003)	(0.002)	(0.001)
LPM (main estimate)	0.109	0.030	0.032	0.044	0.015	0.008
	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	78,438	75,171	75,177	53,136	60,955	68,893

Notes: Standard errors robust to clustering at the SOA level are in parentheses. The conditional differential controls for: age, highest educational level, the presence of an activity-limiting health condition, relationship status, number of household children, tenure of household, and area of residence.
All estimates are statistically different from zero at either the 0.1% level.
MEA is the marginal effect at the average; AME is the average marginal effect.

Table E.2: Conditional Unemployment & Inactivity Differentials,
Using Alternative Samples and Specifications: NILS

	Males			Females		
Sensitivity Check	1991	2001	2011	1991	2001	2011
Panel A: Outcome: Unemployment						
1: Main Estimate	0.109***	0.030***	0.032***	0.044***	0.015***	0.008***
	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	78,438	75,171	75,177	53,136	60,955	68,893
2: Current Religion (2001 & 2011)	0.109***	0.032***	0.033***	0.044***	0.016***	0.008***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	78,438	66,800	67,704	53,136	55,509	63,525
3: Hidden Unemployment Measure	0.104***	0.040***	0.040***	0.044***	0.024***	0.013***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	85,341	84,404	82,555	57,376	68,992	76,251
4: Population Sample	0.085***	0.020***	0.021***	0.021***	0.006***	0.004***
	(0.004)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Observations	97,139	98,748	99,514	92,782	97,320	99,188
5: Students in LF (2001 & 2011)	0.109***	0.030***	0.030***	0.044***	0.015***	0.006***
	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	78,438	77,073	78,528	53,136	63,676	73,232
6: Imputed Values Present (2001 & 2011)	0.109***	0.031***	0.032***	0.044***	0.015***	0.007***
	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	78,438	82,518	85,547	53,136	65,734	76,677
7: Born in NI + Born Outside NI	0.108***	0.029***	0.029***	0.042***	0.016***	0.006***
	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	83,211	80,938	82,632	56,733	66,197	76,105
8: Includes: No Religion/Not Stated/Other	0.096***	0.030***	0.030***	0.035***	0.014***	0.007***
	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	88,697	76,412	78,420	59,431	61,728	71,158
Panel B: Outcome: Economic Inactivity						
9: Prime Working Age	0.014***	0.027***	0.015***	0.025***	0.028***	0.007*
	(0.002)	(0.002)	(0.002)	(0.005)	(0.004)	(0.003)
Observations	58,656	63,352	61,761	61,582	68,850	70,216

Notes: Standard errors robust to clustering at the SOA level are in parentheses. Each model is an LPM. Unless otherwise specified, controls are for: age, highest educational level, the presence of an activity-limiting health condition, relationship status, number of household children, tenure of household, and area of residence. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

1: Main estimates for unemployment.

2: Religious affiliation measured as current religious affiliation in 2001 and 2011.

3: Unemployed definition includes individuals who are 'long-term sick/disabled'.

4: Full sample is used (economically active plus inactive).

5: Students who participate in the labour force (economically active) are classified as such in 2001 and 2011.

6: Observations with imputed values on relevant variables are included in 2001 and 2011.

7: Sample includes people born outside of Northern Ireland; estimate controls for birthplace.

8: Uses religion variable from main estimate (1), but base category includes: No Religion, Not Stated and Other Religion.

9: Sample is aged 25-54 (prime working age).

E.2 CHS

Sensitivity analysis in the CHS compared the main (LPM) unemployment results to those from logit and probit models, and to those from models which used alternative definitions of unemployment.

Alternative Estimation Method

Figure E.1 reveals that LPM estimates of the conditional unemployment differential are similar to logit and probit estimates.

FIGURE E.1: CONDITIONAL UNEMPLOYMENT DIFFERENTIALS,
BY ESTIMATION METHOD: CHS
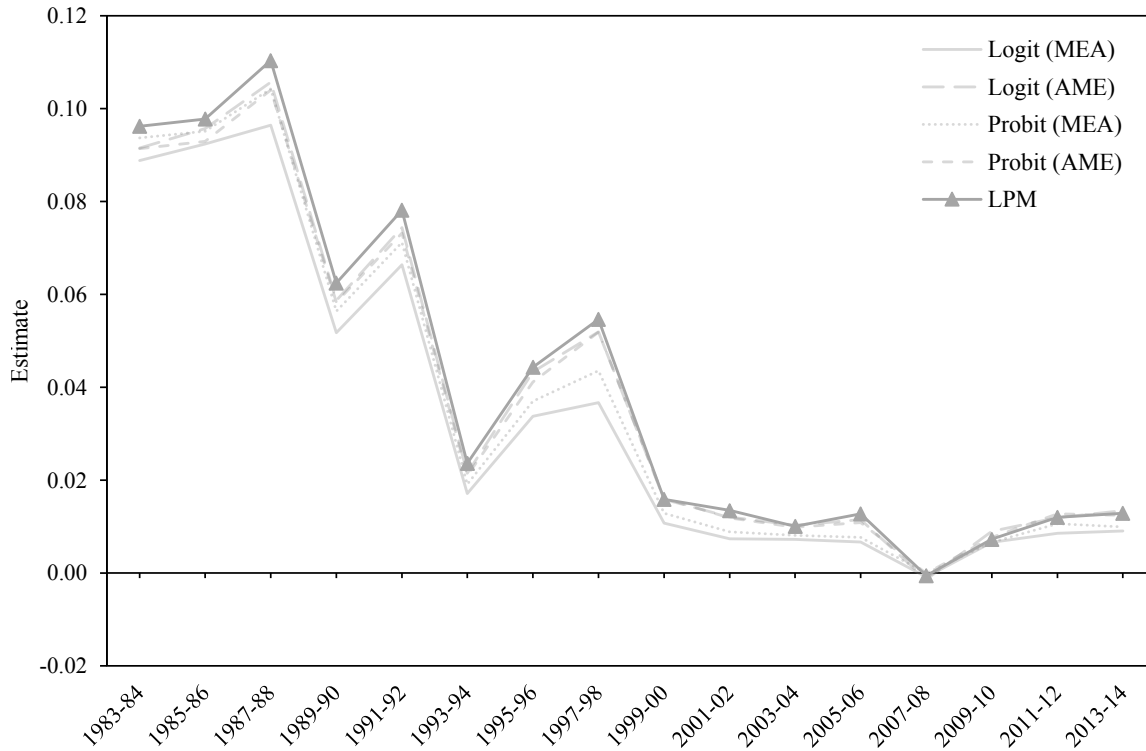
Notes: Unless otherwise specified, each sample comprises 16-64-year-old men and women in the labour force (age 16-59 in 2009-2010 due to a lack of detailed age information), and controls are for: age, gender, education (possession of any educational qualification), the presence of an activity-limiting health condition (except 1985-1986 and 1989-1990 due to missing information), relationship status, number of household children, and tenure of household.
MEA is the marginal effect at the average; AME is the average marginal effect.

Alternative Measures of Unemployment in the CHS

The preferred measure of unemployment used in analysis of CHS data was derived from an economic activity variable capturing employment status. In some years additional variables are available which contain information about the search behaviour of the unemployed, enabling alternative measures to be constructed. Three measures were thus created, to evaluate whether results depended on which was employed.

Measure A defines individuals as unemployed if they do not have a job but are 'looking for work' or 'waiting to take up a job already obtained'. Measure B includes individuals defined according to A, plus those who are not looking due to temporary illness (not permanent illness associated with economic inactivity). They are included in measure B because such individuals are included in the 1991 Census definition of unemployment (for example). Measure C includes individuals defined according to measure A, minus those who are not 'actively searching for work' or 'ready to start' according to the ILO definition given in separate variables.

Whilst measure C is the strictest definition of unemployment, it is not entirely consistent through time given available data. Measure B is arguably not strict enough. Measure A is preferred for these reasons, and because the unemployment rate it implies aligns most closely with the official Labour Force Survey (LFS) rate (see Figure E.3). Although the LFS rate is based on a larger age range (16+), and includes individuals of any religion, it is broadly comparable to the CHS rates calculated here: relatively few individuals aged 65 or over participate in the labour market, whilst Catholics and Protestants comprise the overwhelming majority of the population.

Figure E.3 reports the LFS unemployment rate and unemployment rates based on each CHS measure. Figure E.2 and Table E.3 report estimated conditional unemployment differentials for each measure. Note that sample size varies because the size of the labour force varies across measures. Despite a greater contrast after 1999, the choice of measure does not affect the broad trend which is of a fall in the level of unemployment inequality during the first part of the time series.

There is tentative suggestion of a slightly larger conditional differential after 2000 under measure B. The unemployment rate under measure B is also higher during this time (Figure E.3). This reflects the fact that measure B includes those who are not looking for work because of temporary illness. Given that B's divergence began in the late 1990s, it could reflect a shift

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towards disability-related claims among some out-of-work individuals after the introduction of Job Seekers Allowance in 1996 (Armstrong, 1999). This had an impact on the Claimant Count rate of unemployment (the administrative measure based on the number of claimants of unemployment-related benefits), and could plausibly have affected how individuals reported their unemployment status to the CHS.

FIGURE E.2: CONDITIONAL DIFFERENTIALS,
WITH ALTERNATIVE MEASURES OF UNEMPLOYMENT: CHS
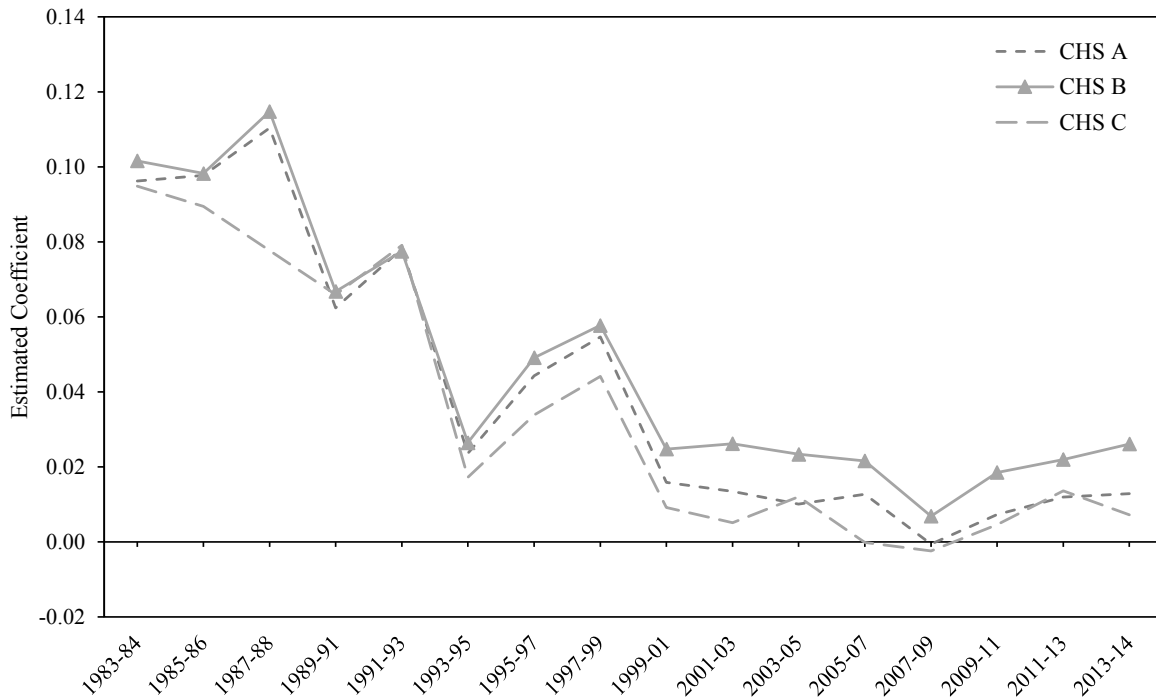
Notes: Figure displays conditional unemployment differentials estimated in the CHS using each measure of unemployment, controlling for: age, gender, education (possession of any educational qualification), the presence of an activity-limiting health condition (except 1985-1986 and 1989-1990 due to missing information), relationship status, number of household children, and tenure of household.
Note that CHS Measure C is missing in 1987-1988 because of missing relevant information in this paired year, and that sample size in adjacent years is reduced due to missing information in one year of each pair (see Table E.3).

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TABLE E.3: CONDITIONAL UNEMPLOYMENT DIFFERENTIAL
WITH ALTERNATIVE MEASURES OF UNEMPLOYMENT: CHS

	Measure A			Measure B			Measure C		
Period	Coefficient	se	N	Coefficient	se	N	Coefficient	se	N
1983-84	0.096***	0.010	6,027	0.102***	0.010	6,076	0.095***	0.010	5,973
1985-86	0.098***	0.011	5,850	0.098***	0.011	5,877	0.089***	0.014	3,137
1987-88[a]	0.110***	0.010	6,052	0.115***	0.010	6,091	NA	NA	NA
1989-90	0.062***	0.009	5,970	0.067***	0.009	6,006	0.066***	0.012	3,066
1991-92	0.078***	0.009	5,959	0.077***	0.009	6,013	0.079***	0.009	5,869
1993-94	0.024**	0.009	5,366	0.026**	0.009	5,413	0.017*	0.008	5,260
1995-96	0.044***	0.008	5,225	0.049***	0.009	5,311	0.034***	0.007	5,108
1997-98	0.055***	0.008	4,821	0.058***	0.008	4,912	0.044***	0.007	4,750
1999-00	0.016*	0.007	4,478	0.025**	0.008	4,570	0.009	0.006	4,435
2001-02	0.013*	0.007	4,320	0.026***	0.008	4,414	0.005	0.006	4,268
2003-04	0.010	0.007	3,958	0.023**	0.008	4,069	0.012*	0.006	3,902
2005-06	0.013	0.007	3,574	0.022**	0.008	3,679	0.000	0.006	3,517
2007-08	−0.001	0.007	3,127	0.007	0.009	3,232	−0.002	0.006	3,093
2009-10	0.007	0.009	3,244	0.019	0.010	3,352	0.005	0.008	3,168
2011-12	0.012	0.009	3,420	0.022*	0.010	3,509	0.014	0.008	3,365
2013-14	0.013	0.007	3,267	0.026**	0.009	3,343	0.007	0.007	3,231

Notes: Table reports conditional unemployment differentials estimated in the CHS using each measure of unemployment, controlling for: age, gender, education (possession of any educational qualification), the presence of an activity-limiting health condition (except 1985-1986 and 1989-1990 due to missing information), relationship status, number of household children, and tenure of household. Note that CHS Measure C is missing in 1987-1988 because of missing relevant information in this paired year, and that sample size in adjacent years is reduced due to missing information in one year of each pair.
se columns report standard errors robust to heteroskedasticity.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

FIGURE E.3: UNEMPLOYMENT RATE,
WITH ALTERNATIVE MEASURES OF UNEMPLOYMENT: CHS & LFS
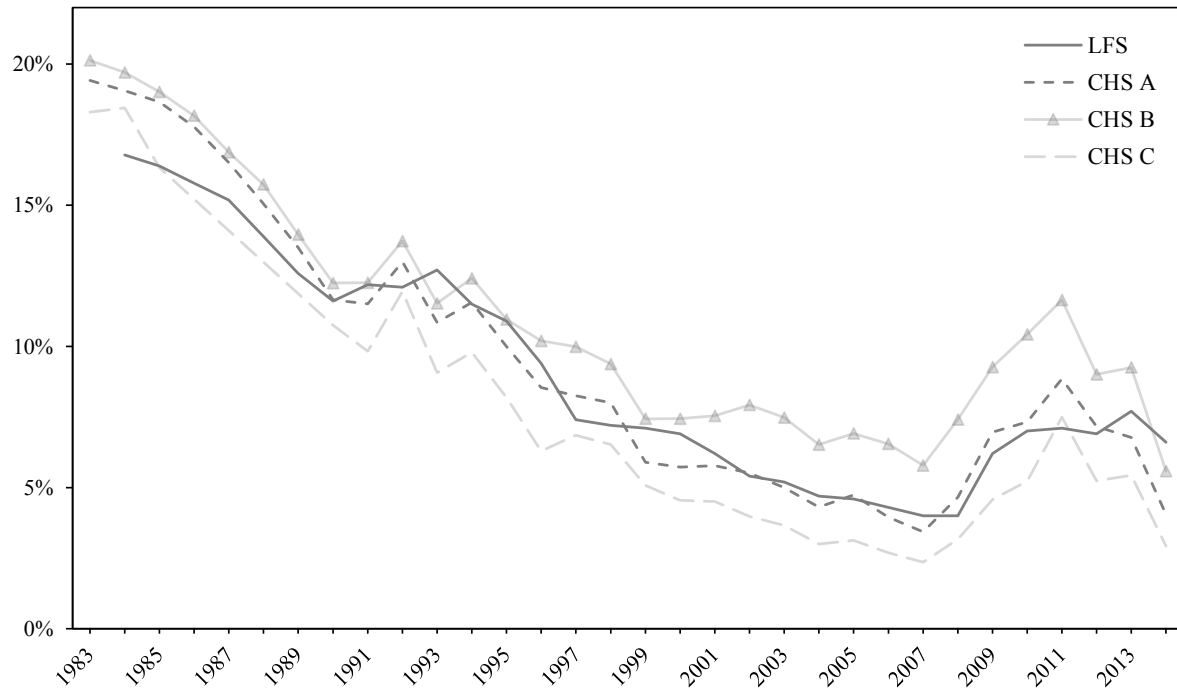
Notes: CHS Rate: Figure displays the proportion of the 16-64-year-old labour force (Catholics and Protestants only) that is unemployed. CHS Measure C is missing between 1986 and 1989 because of missing relevant information in these years. LFS rate (March-May round): Proportion of the 16+ labour force (of any religious affiliation) that is unemployed.