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Job Creation and Destruction in Northern Ireland: 1973-1993

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Abstract: Job creation and destruction estimates are made for Northern Ireland manufacturing using the ARD database. International comparisons suggest job creation and destruction rates in Northern Ireland were below those elsewhere. Job turnover rates exhibit the standard properties, however, with counter-cyclical job destruction and pro-cyclical job creation. A number of other key results emerge. First, small firms are the only size band for which the net change in employment was positive. Second, job turnover in small firms is less cyclical than that in larger companies. Third, firm contraction and expansion were more important sources of job creation and destruction in Northern Ireland than in the UK as a whole.

I INTRODUCTION

Job creation has dominated the economic development agenda in Northern Ireland for the last three decades. Motivated by high levels of unemployment and the potential socio-political benefits of economic development, substantial public resources have been devoted both to attracting inward investment and supporting existing businesses. The key question is how effective have these efforts been in creating and sustaining employment? Some past attempts have been made to answer this question. Gudgin *et al*. (1989), for example, considered job generation in Northern Ireland, the Republic of Ireland and the East Midlands over the 1973-1986

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period while a series of studies using a similar methodology have examined job creation among small firms (Gudgin *et al.*, 1989; Hart, 1989; Hart and Scott, 1994; Hart and Hanvey, 1995; Buckland 1996). Recent theoretical developments, particularly the job creation and destruction methodology developed by Davis and Haltiwanger (1992) and Davis, Haltiwanger and Schuh (DHS, 1996), and the availability of a new longitudinal dataset for Northern Ireland manufacturing, however, suggest the potential value of revisiting the issue of job creation and enable job change in Northern Ireland to be considered in an international context.

The main aims of this paper are, therefore, to make estimates of job creation and destruction in Northern Ireland over the 1973-1993 period and consider these in the context of other international evidence. Our estimates allow us to get behind the *net* changes in total employment to see the underlying *gross* flows, i.e., the actual number of jobs being created or destroyed in each year. This is important as industrial policy, particularly in respect of inward investment or new firm formation, works primarily on the gross flow into employment as firms are established and new jobs created. Policy may also work on reducing job destruction if, as in Northern Ireland, firms are also given support to 'safeguard' jobs when redundancies are threatened. Other influences, particularly the 'troubles', may also have been an important negative influence on inward investment flows into Northern Ireland over the period considered.[1] Gross flows are also important, however, as they provide an indication of the overall extent of structural change or structural adjustment taking place in an economy at any point in time. Previous studies using a job creation and destruction approach have suggested, perhaps unsurprisingly, that overall job turnover is counter-cyclical, particularly among larger businesses (e.g., Broersma and Gautier, 1997; Konings, 1995). Smaller firms are also typically found to have higher overall job creation and destruction rates than larger businesses, i.e. to exhibit higher levels of job turnover, but to be less sensitive to the business cycle.[2]

Perhaps the most striking feature of previous job creation and destruction studies, however, is the sheer scale of the gross flows that can underlie small net changes in total employment. Barnes and Haskel (2000), for example, in their study of job creation and destruction in UK manufacturing from 1980-1991 identified a total net job loss of 1.93 million. This was the result of gross

[1] Fielding (2003), for example, demonstrates the negative impact of civil unrest on investment levels in Northern Ireland but also notes the compensating positive effect of higher levels of public support for new investment at least compared to other UK regions.

[2] See, for example, on the UK: Blanchflower and Burgess, (1996); Barnes and Haskel, (2000) and, for the Netherlands: Broersma and Gautier (1997).

job creation of 6.01 million and job destruction of 7.94 million (Barnes and Haskel, 2000, p. 7). In Northern Ireland over the longer 1973-1993 period, we identify a similar pattern, with gross job creation and job destruction 2–2.5 times larger on average than the resultant net changes in employment.

Our analysis is based on the Annual Respondents Database (ARD) which is the historical consolidation of the Annual Census of Production (ACOP)/Annual Business Inquiry (ABI). This provides longitudinal data on individual manufacturing establishments over the post-1971 period allowing not only the estimation of job and destruction at a regional level but some decomposition by time period, firm size, industry and ownership. At the UK level, the ARD database has been used by Barnes and Haskel (2000) to estimate job creation and destruction. Differences in sampling methodology between the Northern Ireland ACOP and that in the rest of the UK, however, suggest the value of an alternative (enterprise-based) approach to estimating job creation and destruction in Northern Ireland. In addition, we are able to extend the time period over which Barnes and Haskel (2000) were able to make estimates of job creation and destruction, and also – because of the relatively small scale of Northern Ireland – we were able to undertake a very detailed data cleaning exercise to eliminate potential employment volatility due to survey irregularities. Our empirical approach is described in detail in Section II which also provides an overview of the job creation and destruction methodology. Section III focuses on the main job creation and destruction series for Northern Ireland manufacturing as a whole and outlines a broad industrial decomposition. Section IV compares our Northern Ireland estimates to those of Barnes and Haskel (2000) for the UK, Strobl *et al*. (1998) for Ireland and a range of other international studies. Key issues here are how job creation and destruction rates, persistence and cyclicality in Northern Ireland compare to that elsewhere. Sections V and VI then report estimates of job creation and destruction by firm size and ownership relating these to the industrial development context in Northern Ireland and other studies with similar focus but different methodologies. Our analysis suggests marked differences in the job creation record of firms in different industrial sectors and of smaller and larger firms.

II DATA AND METHODS

(a) Job Creation and Destruction

Analysis of aggregate employment levels and their trends can mask substantial heterogeneity in employment adjustment by individual firms or sectors. In any period, for example, one firm may be expanding while another

is reducing its employment, creating little change in total employment but with significant job turnover at the level of the individual firm. The job creation and destruction methodology focuses on these employment flows, rather than changes in the gross employment stock, exposing the underlying dynamics of employment change. More specifically, job creation is said to arise when a firm is either born (i.e. enters) or expands its employment. Job destruction occurs when a firm either closes (i.e. dies) or contracts its employment. Net employment change in any period is then the difference between total job creation and total job destruction.

In more precise terms, and following Davis and Haltiwanger (1992), job creation at time t, JC_t is defined as

$$JC_t = \sum_{i \in S,\ \Delta N_i > 0} (N_{it} - N_{it-1}) = \sum_{i \in E} N_{it}$$

where N is employment and i denotes the plant or firm, S is the set of surviving plants and E is the set of new entrants. Similarly, job destruction is measured as:

$$JD_t = \sum_{i \in S,\ \Delta N_i < 0} |(N_{it} - N_{it-1})| + \sum_{i \in X} N_{it-1}$$

where X is the set of firms which closed between periods t-1 and t. The first term here therefore denotes job destruction in contracting firms and the second term, job destruction in exiting firms.

Job creation and destruction figures are themselves instructive, but being measured in absolute terms they depend on the size of the region or industry being examined. To make comparisons between areas and time periods it is therefore useful to calculate job creation and destruction rates. One difficulty here is that for new entrants no baseline employment exists against which job creation can be measured. To overcome this problem DHS use average employment at the beginning and end of a year to assess the growth rate of a firm. Thus the growth rate of firm i is:

$$g_{it} = \frac{(N_{it} - N_{it-1})}{(1/2)(N_{it} + N_{it-1})}$$

where $2 \geq g_{it} \geq -2$ and takes value 2 for a new firm (i.e. where $N_{it-1} = 0$) and –2 for an exiting firm (i.e. where $N_t = 0$). The job creation rate JCR_t is then defined as an employment weighted average of the growth rates of expanding survivors and entrants. That is:

$$JCR_t = \sum_{i \in S,\, i \in E,\, \Delta N_i > 0} \frac{(1/2)(N_{it} + N_{it-1})}{(1/2)(N_t + N_{t-1})} g_{it}$$

where N_t is total employment at time t. Similarly, the job destruction rate is defined as an employment weighted average of the growth rates of contracting and closing firms, viz.

$$JDR_t = \sum_{i \in S,\, i \in X,\, \Delta N_i < 0} \frac{(1/2)(N_{it} + N_{it-1})}{(1/2)(N_t + N_{t-1})} |g_{it}|$$

Following DHS it is also possible to define three other useful ratios. First, the net employment growth rate, the difference between the job creation and job destruction rate:

$$NEG_t = JCR_t - JDR_t.$$

Second, the gross job reallocation rate, the sum of the job creation and destruction rates

$$JRA_t = JCR_t + JDR_t.$$

Third, the excess job reallocation rate

$$XRA_t = JRA_t - |NEG_t|.$$

Job creation and destruction flows and rates are readily calculable for all firms. More difficulty arises, however, when we wish to examine job creation and destruction by either firm size or ownership. In both cases problems arise because of the potential for transitions due to business growth (or contraction) or ownership changes. In the case of firm size, two main approaches have been used (see Barnes and Haskel, 2000) based on classifying firms by either their initial or average employment. As we shall see the two approaches can yield different results.

In terms of ownership, a similar situation exists with the potential for transfers between ownership categories. Here we consider two categories of ownership (UK or non-UK owned) with the potential for ownership transfers in either direction.[3] Conceptually, a firm transfer from, say, UK to non-UK

[3] This categorisation is essentially dictated by the structure of the ARD data. This identifies establishments by their country of ownership but gives no regional ownership indicator. We cannot therefore distinguish between an establishment owned by a Northern Ireland based parent and an establishment owned by a company based in Scotland or the West Midlands. Plants owned by companies based in the Republic of Ireland are included in the non-UK owned category. For a discussion of the potential consequences see Crone (1998).

ownership is similar to a firm death (i.e., job destruction among UK-owned firms) and a firm birth (i.e., job creation among non-UK owned firms. Importantly, however, the number of jobs lost to the UK-owned sector in any such transfer need not be the same as the number of jobs gained by the non-UK owned sector due to firm expansion or contraction during the period in which the transfer takes place. In the analysis we therefore treat firm transfers between ownership groups separately essentially re-defining job creation and destruction in the UK and non-UK owned sectors as:

$$JC_t^{UK} = \sum_{i \in SUK,\ \Delta N_i > 0} (N_{it} - N_{it-1}) + \sum_{i \in EUK} N_{it} + \sum_{i \in SFUK} N_{it}$$

$$JC_t^{F} = \sum_{i \in SF,\ \Delta N_i > 0} (N_{it} - N_{it-1}) + \sum_{i \in EF} N_{it} + \sum_{i \in SUKF} N_{it}$$

where *SUK* and *SF* are the UK and non-UK owned groups of surviving companies and *EUK* and *EF* are groups of entrants to each ownership group. *SUKF* is the group of firms transferring from UK to non-UK ownership and *SFUK* is the group transferring in the opposite direction. The same groups of companies are used in defining job destruction in the UK and non-UK owned ownership groups:

$$JD_t^{UK} = \sum_{i \in SUK,\ \Delta N_i < 0} |(N_{it} - N_{it-1})| + \sum_{i \in XUK} N_{it-1} + \sum_{i \in SUKF} N_{it-1}$$

$$JD_t^{F} = \sum_{i \in SF,\ \Delta N_i < 0} |(N_{it} - N_{it-1})| + \sum_{i \in XF} N_{it-1} + \sum_{i \in SFUK} N_{it-1}$$

(b) Data Sources

To undertake job creation and destruction analysis along the lines suggested by Davis and Haltiwanger (1992) necessitates longitudinal data at individual plant or firm level. For the UK, the recently released ARD (Annual Respondents Database) provides this type of information for the UK production industries. The ARD database covers the period 1971-1997 and is the consolidation of firms' responses to the Annual Census of Production (now called the Annual Business Inquiry).

In GB until 1994, the ACOP was based on a register of firms maintained by the Office of National Statistics (ONS). Post-1994 the ACOP was based on the more comprehensive IDBR. In Northern Ireland the situation was different with the ACOP register being maintained locally until 1994 and the creation of the UK-wide IDBR. Other important differences also exist between the ACOP in Northern Ireland and the rest of the UK. First, the Northern Ireland ACOP was run as a separate survey by the Department of Economic Development (now the Department of Enterprise, Trade and Investment) in

Belfast. Firms' responses were collected together in Belfast and information then passed to ONS for inclusion in the UK summary statistics. Second, the sampling structure used in the Northern Ireland ACOP differs significantly from that adopted in GB. In GB, although there was some variation from year to year, the typical pattern was for 100 per cent coverage for plants with 100 or more employees and a 1:4 sample of plants with 20-100 employees. Plants on the register with employment less than 20 were 'not selected' for the ACOP. In Northern Ireland the ACOP was comprehensive with *all* plants on the register with more than 20 employees being 'selected' each year.[4] This means that for each Northern Ireland plant we have actual ARD data for each year, while in the rest of the UK only register information – rather than survey response data – is available for most plants in each year. This is clearly an advantage for those plants included in the survey, but does little to overcome the potential issues because of the exclusion of plants with fewer than 20 employees. In essence what this means is that in our analysis births relate to plants' first appearance in the ARD, i.e., when they reach 20 or more employees; and deaths relate to plants which either close or whose employment falls below the 20 employee cut off.

Two approaches are possible to using the ARD database to calculate estimates of job creation and destruction. First, like Barnes and Haskel (2000) it is possible to use the entire group of 'selected' and 'non-selected' plants (i.e. both those plants which did and did not provide data). This approach has the advantage that it should include all plants, although this depends crucially on the quality of the underlying register. Using all plants on the ARD database, however, also has disadvantages because of the impact of register changes and uncertainty about the sources and accuracy of the employment data for non-selected plants. Using this approach also limits any analysis to the post-1981 period as prior to this no employment data is available for non-selected plants. A second approach to calculating job creation and destruction estimates from the ARD database is to use only selected plants. In GB this approach has substantial disadvantages because of changes in the sampling structure for smaller plants. For Northern Ireland, however, where selection is consistent and universal this disadvantage is removed. Using this approach also avoids any uncertainty over the accuracy of employment data for non-selected businesses and allows estimates of job creation and destruction to be made for

[4] In part this was due to the publication each year of a separate *Northern Ireland Census of Production Summary Report,* a publication which was produced until 1995. Only a proportion (around a quarter) of the Northern Ireland ACOP responses were incorporated into the UK ACOP summary report although information on all Northern Ireland 'selected' companies are included in the ARD.

the whole 1973-1993 period. In what follows we therefore base our analysis solely on 'selected' plants, i.e. those which actually provided data as part of the ACOP survey.[5]

Three other issues arise in using Northern Ireland 'selected' plants to construct estimates of job creation and destruction. First, it is necessary to consider the level of aggregation to be adopted. This primarily involves a choice between an 'establishment' (or plant) based analysis or an 'enterprise' (or firm) based analysis. Ideally, one would work at the establishment level as this is the most accurate representation of job creation and destruction. Inspection of the Northern Ireland data, however, suggests marked and numerically large inconsistencies between the way multi-plant firms reported data for their various establishments. In some years a single ACOP return might have been made covering a number of establishments. In other years separate returns are made for each establishment. Moreover, where separate returns are made for different establishments the split of activity within the enterprise allocated to each establishment is often inconsistent through time. The implication is that for multi-plant (or more accurately multi-establishment) companies establishment level data will significantly over-estimate job creation and destruction because of inconsistencies in reporting. To eliminate, or at least reduce, this problem we choose to base our estimates of job creation and destruction on 'enterprise' level data, aggregating appropriate establishments. Even this approach, however, still resulted in major discontinuities in the employment time series generated. These were primarily linked to situations where a number of enterprises were in common ownership or were parts of the same firm. Wherever possible these 'multi-enterprise' companies were identified and their data consolidated.

Basing our analysis on this consolidated enterprise data rather than establishment level data reduces our overall estimates of job creation and destruction for a number of reasons. First, as intended, the consolidation eliminates a considerable amount of apparent job creation and destruction due to inconsistencies in reporting by multi-establishment enterprises. Second, consolidating inconsistent *enterprise* data within firms will also tend to reduce the apparent level of job creation and destruction. Third, and less desirable, is

[5] We limit our analysis, however, to the period prior to 1994, i.e. the period prior to the introduction of the Inter Departmental Business Register (or IDBR). Over the 1993-1994 period, coding changes in the move from the ACOP register to the IDBR register make it difficult to identify reliable continuous time series for both establishments and enterprises. This leads to discontinuities and a tendency to over-estimate the level of job creation and destruction.

that the aggregation of establishments will mask offsetting job creation and destruction within an enterprise.[6]

A second issue involved in using the ARD to estimate job creation and destruction is that like all surveys the ACOP did not achieve 100 per cent coverage in any given year. This results in some missing observations which, if not addressed, would appear in the job creation and destruction analysis as plant (i.e., establishment) deaths and entries whereas in fact the plants continue to exist. No precise remedy exists for this problem so we adopt the simplest possible procedure of linear interpolation to 'fill-in' gaps in establishments' employment time-series.[7] This procedure will have no effect on the overall level of job creation and destruction compared to an analysis run on the 'true' data. It will, however, tend to smooth out or dampen year-on-year variations in job creation and destruction although this effect will be relatively small as the majority of the plants involved have relatively low employment levels.

A third issue relates to the construction of consistent SIC codes for individual enterprises. In the ARD data, establishments with post-1994 observations have SIC92 codes derived from the IDBR. Establishments which closed earlier than 1994 have either an SIC80 code or an SIC68 code. Where an establishment had a SIC92 code this was used to classify the establishment for its entire history. Where plants had no SIC92 codes in the ARD, previous codes were translated to create SIC92 codes. Specifically, SIC68 codes were translated to SIC80 codes using the *Standard Industrial Classification (Revised 1980) Reconciliation with SIC 1968*, published by CSO, London, 1980. SIC80 codes were then converted to SIC92 codes using the 'Indices to the Standard Industrial Classification of Economic Activities 1992', Government Statistical Service, HMSO, 1993. Inevitably, some accuracy in classification is lost in this type of procedure so we limit our sectoral analysis of job creation and destruction to four broad manufacturing groups.[8] The resulting dataset includes a total of 719 enterprises in 1973 falling to 621 by 1993 with the sectoral, sizeband and ownership breakdown of the number of enterprises in the dataset given in Table A1.

To illustrate the overall coverage of 'selected' enterprises in the ARD data in Northern Ireland, Table 1 summarises total manufacturing employment from the ARD and the Census of Employment (COE). Figure 1 presents the

[6] Estimates of job creation and destruction in Northern Ireland based on enterprise data are available on request.

[7] The problem of missing observations applies primarily to small plants. These may either be non-respondents in any given year or 'non-selected' cases because their indicative employment fell below 20 for a short period.

[8] Where enterprises or consolidated enterprises contained establishments having different SIC92 codes the enterprise was categorised using that of the largest establishment.

Table 1: *Comparison of Northern Ireland Manufacturing Employment Figures: Census of Employment and the ARD*

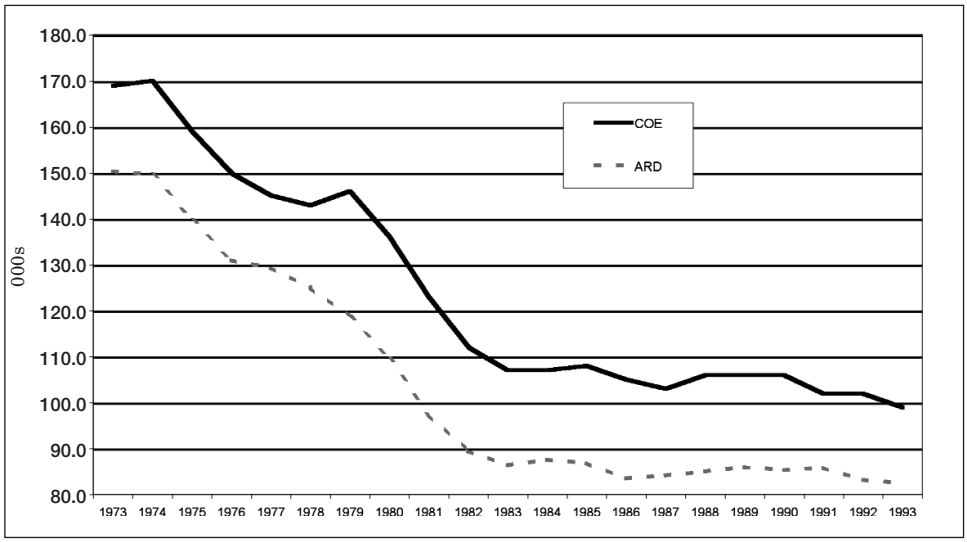
	Census of Employment Data		*ARD Data*		*ARD as % of COE*
	000s (1)	*% Change* (2)	*000s* (3)	*% Change* (4)	*%* (3)/(1)
1973	169.0		150.3		88.9
1974	170.0	0.6	149.7	–0.4	88.1
1975	159.0	–6.5	139.7	–6.7	87.9
1976	150.0	–5.7	131.0	–6.3	87.3
1977	145.0	–3.3	129.3	–1.3	89.2
1978	143.0	–1.4	125.0	–3.4	87.4
1979	146.0	2.1	118.7	–5.0	81.3
1980	136.0	–6.8	109.6	–7.6	80.6
1981	123.0	–9.6	97.3	–11.3	79.1
1982	112.0	–8.9	89.4	–8.1	79.9
1983	107.0	–4.5	86.4	–3.4	80.8
1984	107.0	0.0	87.5	1.3	81.8
1985	108.0	0.9	86.8	–0.8	80.4
1986	105.0	–2.8	83.5	–3.8	79.5
1987	103.0	–1.9	84.1	0.7	81.7
1988	106.0	2.9	85.1	1.1	80.2
1989	106.0	0.0	85.9	1.0	81.1
1990	106.0	0.0	85.3	–0.7	80.5
1991	102.0	–3.8	85.8	0.5	84.1
1992	102.0	0.0	84.1	–2.0	82.5
1993	99.0	–2.9	82.5	–0.8	83.3
Average	–2.6			–2.9	83.1

Note: ARD figures are based on selected enterprises with interpolation for missing values. See text for details.
Sources: NIARD database. Employees in employment; *Employment Gazette Historical Supplement*, No. 3, 1992, Table 1.5, p.41; *Northern Ireland Annual Abstract*, 1995, Table 11.3; *Northern Ireland Annual Abstract* 1999, Table 8.5.

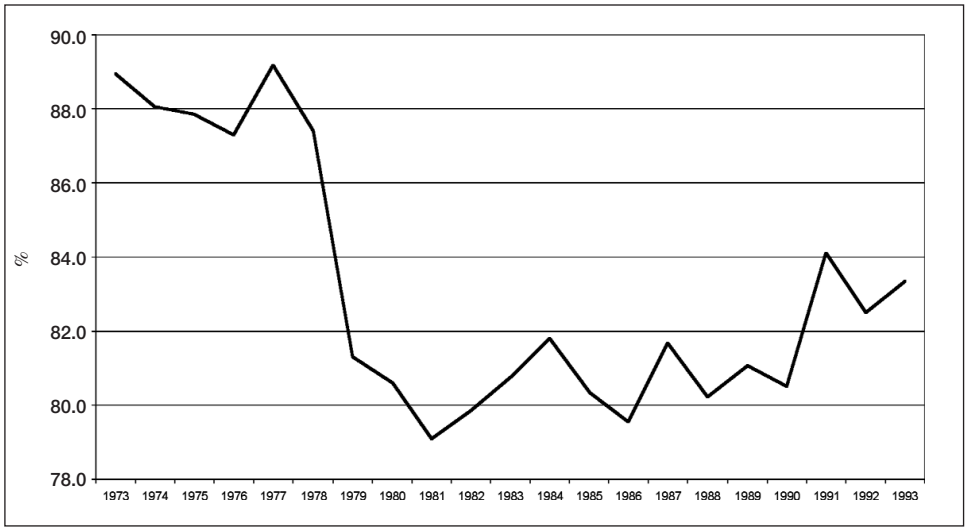
same data in more graphic form. As Figure 1a suggests, the time series of total ARD employment closely follows that of the Census of Employment with broadly similar average growth rates over the 1973-1993 period (Table 1). The difference between the two series is largely accounted for by the exclusion from the ARD of establishments with less than 20 employees. Figure 1b gives the percentage of total manufacturing employment in Northern Ireland (i.e. COE employment) covered by the ARD. This declined from 1973 to 1983 over the same period as total employment itself was falling, suggesting that the decline in total manufacturing employment from the ARD actually fell faster

Figure 1: *Comparison of ARD and Census of Employment Time Series*

(a) COE and ARD Employment Series



(b) ARD as a Percentage of COE Employment



Notes and Sources: See Table 1.

than the total number of manufacturing jobs in Northern Ireland. After 1983 as total manufacturing stabilised the proportion of employment covered by the ARD increased marginally. In general terms, the extent of the coverage of the ARD data (i.e. covering on average 83.1 per cent of manufacturing employment), and the similarity of its time-series to that of total manufacturing employment, suggests that the ARD data on selected enterprises will provide a good guide to job creation and destruction in the whole Northern Ireland manufacturing sector.

III JOB CREATION AND DESTRUCTION

Based on the consolidated enterprise data, Table 2 summarises job creation and destruction in Northern Ireland manufacturing over the 1973-1993 period. In total over this period the net decline in manufacturing employment in Northern Ireland was 70,300. Underlying this net figure, however, were much larger gross flows, i.e., much higher levels of job creation and destruction. In total, 122,500 jobs were created over the 1973-1993 period of which 37,300 (30.4 per cent) resulted from new enterprises being established or new firm formation and 85,300 (69.6 per cent) were the result of business expansions. Unfortunately, job destruction was larger, totalling 192,900 over the 1973-1993 period. Again this can be broken down into 73,200 (37.9 per cent) job losses in business closures and 119,700 (62.0 per cent) in contractions (Table 2).

Another way of looking at this data is to take annual averages of the net and gross flows and examine how these vary through time. Table 2 gives period averages defined to reflect the phases of the UK business cycle. Over the whole 1973-1993 period, manufacturing employment in Northern Ireland fell by an average of 3,300 per annum although, as Figure 1(a) suggested, this fall in employment was largely concentrated in the pre-1983 period (Figure 2). During the oil crisis downturn of 1973-1975 job destruction exceeded job creation by 4,400 per annum with job destruction dominated by contraction as Northern Ireland manufacturing firms sharply reduced the scale of their operations in response to difficult operating conditions. A similar pattern continued through the brief UK recovery of 1976-1978 with continuing net job losses (Table 2). During the sharp UK downturn of 1979-1980, particularly high rates of net job losses were recorded as job creation fell sharply and job destruction continued at around the same level as the previous decade. In contrast to the 1973-75 downturn, however, job destruction during 1979-80 was increased by high levels of closure, particularly among man-made fibres companies strongly oriented towards export markets (Harrison, 1990).

Table 2: *Job Creation and Destruction in Northern Ireland Manufacturing: Gross Flows*

	Employment		*Total*	*Total*	*Job Creation*		*Job Destruction*	
	Levels	*Change*	*Job Creation*	*Job Destruction*	*Entry*	*Expansion*	*Death*	*Contraction*
	000s	*000s*	*000s*	*000s*	*000s*	*000s*	*000s*	*000s*
1973-1993	Total	–1070.3	122.5	192.9	37.3	85.3	73.2	119.7
1973-75	Average	–104.4	6.8	11.2	1.6	5.2	3.2	8.0
1976-78	Average	–104.9	6.4	11.3	1.4	5.0	4.5	6.8
1979-80	Average	–107.7	3.8	11.4	0.8	3.0	5.0	6.5
1981-88	Average	–103.1	5.5	8.6	1.9	3.6	3.5	5.1
1989-91	Average	0.2	7.0	6.7	2.5	4.5	2.6	4.1
1992-93	Average	–101.6	5.2	6.9	1.9	3.3	2.3	4.6
1973	150.3	–102.5	7.8	10.3	1.5	6.3	3.7	6.6
1974	149.7	–100.6	7.7	8.3	2.2	5.4	2.1	6.1
1975	139.7	–1010.0	5.0	15.0	1.1	3.9	3.8	11.3
1976	131.0	–108.7	7.0	15.7	1.7	5.3	6.9	8.8
1977	129.3	–101.7	7.4	9.1	1.9	5.6	3.7	5.4
1978	125.0	–104.3	4.8	9.2	0.6	4.2	3.0	6.1
1979	118.7	–106.3	3.9	10.1	0.1	3.8	4.6	5.5
1980	109.6	–109.1	3.6	12.7	1.4	2.2	5.3	7.4
1981	97.3	–1012.4	2.9	15.3	0.7	2.2	6.7	8.6
1982	89.4	–107.8	5.1	12.9	3.4	1.7	6.2	6.7
1983	86.4	–103.0	4.9	7.9	1.8	3.1	2.5	5.4
1984	87.5	1.1	6.5	5.4	2.6	4.0	1.8	3.6
1985	86.8	–100.7	6.3	7.0	1.6	4.7	3.4	3.6
1986	83.5	–103.3	4.3	7.6	1.7	2.6	2.1	5.5
1987	84.1	0.6	7.1	6.5	2.4	4.8	2.4	4.1
1988	85.1	0.9	6.8	5.9	1.4	5.4	2.6	3.2
1989	85.9	0.9	7.4	6.5	3.1	4.3	2.4	4.1
1990	85.3	–100.6	6.2	6.8	1.4	4.8	2.6	3.2
1991	85.8	0.5	7.3	6.9	2.8	4.5	2.7	4.1
1992	84.1	–101.7	5.3	7.0	2.3	3.0	2.3	4.6
1993	82.5	–101.6	5.1	6.8	1.5	3.6	2.3	4.5

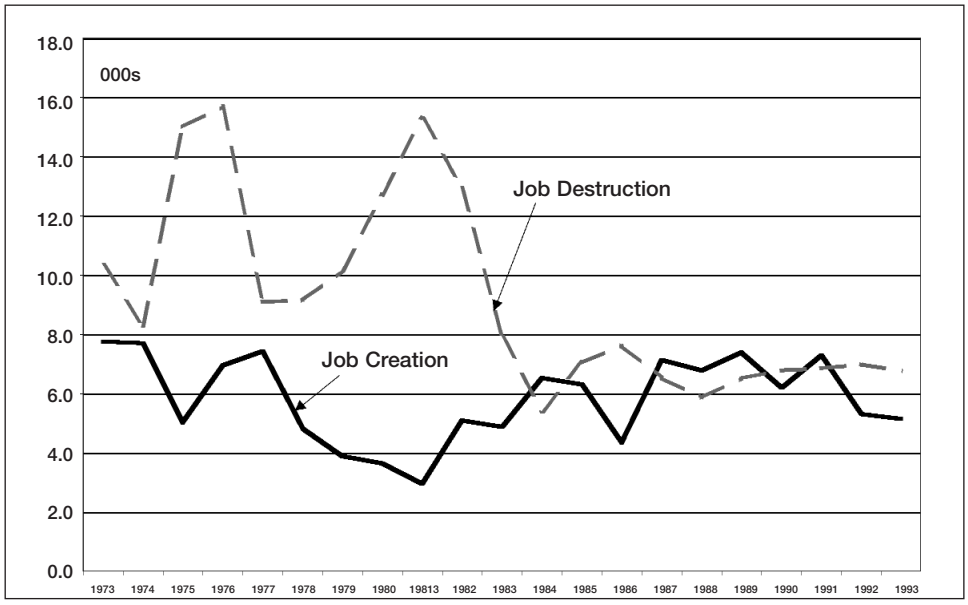
Note: Figures are based on selected enterprises with interpolation for missing observations. See text for details of data sources and derivation.
Source: NIARD database.

The UK recovery of the early-1980s, and the subsequent upturn until 1988, brought job destruction and job creation in Northern Ireland closer into balance with a recovery in annual job creation and a fall in job destruction. In 1984, 1987 and 1988 in particular, job creation actually exceeded job destruction leading to a positive net change in total manufacturing employment (Table 2). This positive net trend continued into 1989, despite the downturn in the wider UK economy. The UK upturn of 1992-93 was less felicitous with a return to net job losses in Northern Ireland manufacturing although these averaged only a third of those during the early and mid-1970s (Figure 2).

A consistent feature of job creation and destruction in Northern Ireland is the balance between entry and expansion and death and contraction. Overall, since 1973, nearly two and a half times as many jobs have been created in firm expansions than in new inward investments and new firm formation. In terms of job losses, a similar picture emerges with contractions significantly more important than firm closures as a source of job destruction.

In sectoral terms the pattern of job creation and destruction is predictable with relatively high levels of job losses in firm deaths in the textile and

Figure 2: *Job Creation and Destruction in Northern Ireland Manufacturing: 1973-1993*



Notes & Sources: See Table 2.

clothing sectors and significant job losses in firm contractions in engineering. Table 3 summarises the basic figures for four industrial groupings[9]:

- In the food and drink sector (SIC92 15, 16), total employment declined by 7,700 over the 1973-1993 period, the result of job creation of 25,800 and job destruction of 33,300. From 1991-1993 something of a reversal of the historical pattern was evident with net job gains due largely to job creation by existing firms.
- In the textile and clothing (SIC 17-19) sectors total employment declined 29,800 over the 1973-1993 period, with total job creation of 37,700 and total job destruction of 67,600. High levels of job destruction throughout the period reflect relatively high levels of firm closure with much smaller numbers of jobs created in firm entry.
- In engineering (SIC92 27-35), total employment declined by 21,600 over the 1973-1993 period, the result of job creation of 32,400 and job destruction of 54,000. Among engineering firms, contraction was a particularly important source of job destruction, particularly associated with falling employment in heavy engineering, shipbuilding and textile machinery.
- In the broadly defined other manufacturing sector (SIC92 20-26, 36, 37), employment losses of 11,200 over the 1973-1993 period were the balance of job creation of 26,600 and job destruction of 37,800.

In general terms, our estimates of the *relative* size of the net and gross flows for Northern Ireland accord with those of other UK studies of job creation and destruction. Important differences exist, however, between the sources of job creation and destruction in Northern Ireland and the UK. Barnes and Haskel (2000) estimates for example, suggest that entry accounted for 51.2 per cent of job creation in the UK compared to 30.4 per cent in Northern Ireland. Similarly, they estimate that closure accounted for 49.7 per cent of UK job destruction compared to 37.9 per cent in Northern Ireland. In other words, job turnover in Northern Ireland was more strongly associated with contraction and expansion (and less strongly associated with firm entry and closure) than that in the UK as a whole. This may, in part, reflect the very different sectoral composition of Northern Ireland and UK manufacturing. It may also reflect the socio-political situation of Northern Ireland and the effects of the region's intensive industrial policy regime (e.g., Harris, 1991). In particular, the troubles are likely to have reduced large-scale inward investments into Northern Ireland despite the efforts of the Industrial

[9] Detailed figures for each industry are available from the author on request.

Table 3: *Job Creation and Destruction by Sector*

	Job Creation (000s)					*Job Destruction (000s)*				
	Total	*Food and Drink*	*Textiles, Clothing*	*Engin-eering*	*Other Manuf.*	*Total*	*Food and Drink*	*Textiles, Clothing*	*Engin-eering*	*Other Manuf.*
Period Averages										
1973-75	6.8	1.0	2.7	1.7	1.5	11.2	1.6	5.7	2.3	1.6
1976-78	6.4	1.4	2.5	1.3	1.2	11.3	1.4	4.3	3.9	1.7
1979-80	3.8	0.9	1.2	1.2	0.4	11.4	1.7	4.3	2.9	2.5
1981-88	5.5	1.2	1.7	1.5	1.1	8.6	1.8	2.5	2.2	2.1
1989-91	6.7	1.3	1.1	2.3	1.9	6.6	1.3	1.8	2.3	1.1
1992-93	4.7	1.7	0.4	1.2	1.4	6.4	1.2	1.1	2.6	1.5
1973	7.8	1.1	3.0	1.9	1.8	10.3	1.9	5.3	1.7	1.5
1974	7.7	1.2	3.2	1.8	1.6	8.3	1.1	4.6	1.2	1.3
1975	5.0	0.7	1.8	1.3	1.2	15.0	1.9	7.2	3.9	1.9
1976	7.0	1.4	2.3	1.4	1.8	15.7	1.7	6.4	6.0	1.6
1977	7.4	1.4	3.7	1.3	1.1	9.1	1.5	3.0	2.4	2.2
1978	4.8	1.3	1.6	1.2	0.7	9.2	1.0	3.4	3.2	1.5
1979	3.9	1.1	1.3	1.1	0.5	10.1	2.0	4.1	2.1	1.9
1980	3.6	0.8	1.1	1.4	0.4	12.7	1.5	4.5	3.7	3.1
1981	2.9	0.3	0.9	1.3	0.5	15.3	2.8	4.8	2.1	5.6
1982	5.1	1.0	1.3	1.7	1.1	12.9	2.0	3.2	2.5	5.1
1983	4.9	1.1	1.8	1.2	0.8	7.9	1.5	2.1	2.9	1.4
1984	6.5	1.6	2.5	1.0	1.5	5.4	1.2	1.5	2.1	0.6
1985	6.3	0.9	2.3	2.1	1.0	7.0	0.8	2.8	2.6	0.9
1986	4.3	1.2	1.1	1.2	0.8	7.6	2.2	2.0	2.2	1.3
1987	7.1	1.6	2.0	1.9	1.5	6.5	2.0	1.9	1.9	0.7
1988	6.8	1.8	1.8	1.5	1.6	5.9	1.7	1.8	1.5	0.8
1989	7.4	1.2	0.9	2.7	2.6	6.5	2.0	1.9	1.7	1.0
1990	6.2	1.0	1.4	1.9	1.9	6.6	1.2	1.8	2.5	1.1
1991	7.2	1.7	2.0	2.2	1.3	6.9	0.8	2.0	2.7	1.4
1992	5.3	2.2	0.8	1.1	1.3	7.0	1.4	2.1	2.2	1.3
1993	5.1	1.2	1.0	1.3	1.6	6.8	1.1	1.1	2.9	1.7

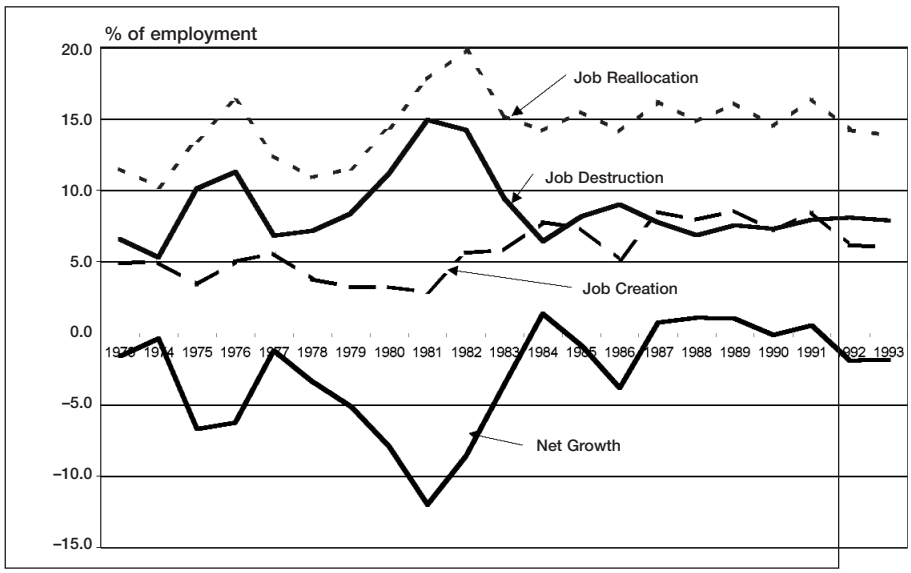
Notes: Figures are based on selected enterprises. See text for details of data sources and derivation. Sectors are defined as follows (SIC92 categories): Food and Drink, 15,16; Textiles and Clothing, 17-19; Engineering, 27-35; Other Manufacturing, 20-26, 36, 37.
Source: NIARD Database.

Development Board to promote Northern Ireland as an industrial location (see Fielding, 2003). There may also have been a negative impact on locally-owned start-ups of smaller firms although as we shall see later this effect is less clear. Other aspects of the industrial development regime in Northern Ireland may also have had a significant impact on maintaining manufacturing employment in Northern Ireland by reducing the number of firm closures. Levels of capital and other grant support in the region have been high by EU standards, with evidence that Northern Ireland firms have had significantly stronger balance sheets than firms elsewhere in the UK and may therefore have been more resilient in economic downturns (Roper, 1996).

IV JOB CREATION AND DESTRUCTION RATES AND INTERNATIONAL COMPARISONS

To make international comparisons of job creation and destruction we need to define job creation and destruction rates, and for Northern Ireland these are given in Table 4 and Figure 3. As we would expect from the earlier analysis, the job destruction rate in Northern Ireland exceeds the job creation rate until around 1983 since when the rates have been broadly similar. This is

Figure 3: *Net and Gross Job Flows in Northern Ireland Manufacturing: 1973-1993*



Notes and Sources: See Table 4.

reflected in a net employment growth rate close to zero (Figure 3). Perhaps more interesting, however, is the job reallocation rate which gives an indication of the overall level of job turnover in the labour market: the higher the job reallocation rate the greater the average level of turnover and the shorter average job duration. Although the job reallocation rate peaked in 1982, its average level since the early-1980s has been markedly higher than that during the 1970s. The implication is that over this period average job duration in Northern Ireland declined, the result of a relatively high job creation rate coupled with a high job destruction rate (Table 4, Figure 3).

Comparing job creation and job destruction rates between areas is difficult due to differences in data sources, the construction of the estimates themselves and the time periods considered. Table 5 compares our estimates of job creation and destruction rates in Northern Ireland to those calculated for Ireland, Norway, Denmark and the UK. Our choice of comparators was guided by Strobl *et al*. (1998) who suggest the similarity between the Norwegian and Danish estimates, their own analysis and the Northern Ireland data, with each covering almost all manufacturing firms. We also include estimates from Barnes and Haskel (2000) for 1980-1991 based on selected and non-selected establishments from the ARD, the same base data as that used for Northern Ireland.

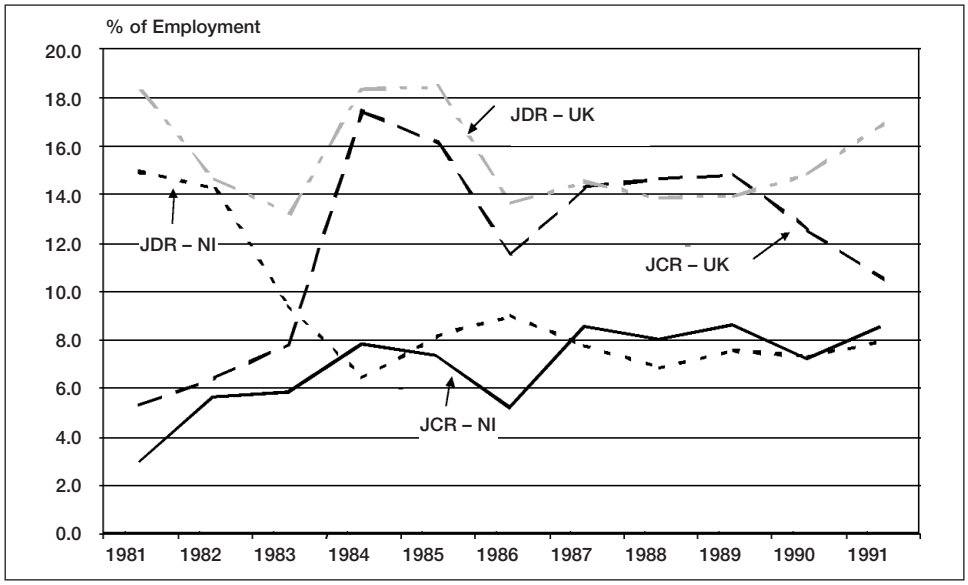
The international comparisons suggest two main points. First, job creation rates in Northern Ireland are generally below those in other areas in the majority of years. Compared to Ireland in particular, job creation rates were lower in Northern Ireland in all but three years – 1984, 1987 and 1991 (Table 5). Similarly, job creation rates in Northern Ireland were below those in Norway in all but three years (out of sixteen) and were consistently below those estimated for Denmark (Table 5). Job creation rates in Northern Ireland were also lower than those estimated by Barnes and Haskel (2000) for the UK as a whole, although this may reflect both real factors and the difference between their establishment-based and the enterprise-based estimates for Northern Ireland. Second, job destruction rates in Northern Ireland also tend to be below those in other areas, although the differential is not as consistent as that for job creation rates. Compared to Ireland, for example, the job destruction rate in Northern Ireland was lower in 12 (out of 20 years), with a marked contrast particularly during the late-1970s. Job destruction rates in Northern Ireland also tended to be lower in the majority of years than in Norway and Denmark, and in all but one year (1981) were lower than those estimated by Barnes and Haskel (2000). Taken together, these comparisons suggest that the rate of job reallocation in Northern Ireland has been relatively low compared to that in other areas, with the main difference occurring in terms of job creation rather than job destruction rates. As

Table 4: *Job Creation and Destruction Rates for Northern Ireland Manufacturing*

	Job Creation Rate	*Job Destruction Rate*	*Net Employment Growth Rate*	*Gross Job Reallocation Rate*	*Excess Job Reallocation Rate*
	%	%	%	%	%
Period Averages					
1973-75	4.4	7.3	–102.9	11.7	8.8
1976-78	4.8	8.4	–103.6	13.2	9.5
1979-80	3.2	9.7	–106.5	12.9	6.4
1981-88	6.3	9.6	–103.2	15.9	11.9
1989-91	7.7	7.6	0.1	15.3	14.7
1992-93	6.0	8.0	–101.9	14.0	12.1
1973	4.9	6.5	–101.6	11.5	9.8
1974	4.9	5.3	–100.4	10.2	9.8
1975	3.4	10.1	–106.7	13.5	6.8
1976	5.0	11.3	–106.3	16.2	10.0
1977	5.6	6.8	–101.2	12.4	11.1
1978	3.8	7.1	–103.4	10.9	7.5
1979	3.2	8.3	–105.1	11.5	6.4
1980	3.2	11.2	–108.0	14.3	6.4
1981	2.9	14.9	–1012.0	17.8	5.7
1982	5.6	14.2	–108.6	19.8	11.2
1983	5.8	9.4	–103.6	15.2	11.6
1984	7.7	6.4	1.3	14.1	12.8
1985	7.3	8.2	–100.9	15.5	14.6
1986	5.1	9.0	–103.9	14.1	10.2
1987	8.5	7.7	0.7	16.2	15.5
1988	7.9	6.8	1.1	14.8	13.7
1989	8.5	7.5	1.0	16.1	15.1
1990	7.2	7.3	–100.1	14.5	14.3
1991	8.4	7.9	0.5	16.4	15.8
1992	6.1	8.1	–101.9	14.2	12.3
1993	6.0	7.9	–101.9	13.8	11.9
Corr	0.802	–100.894	–10	–100.301	0.781

Note: Figures are based on selected enterprises. See text for details of data sources and derivation. Corr. is the correlation between the different rates and the net employment growth rate.
Source: NIARD database.

Figure 4: *Job Creation and Destruction Rates in the UK and Northern Ireland*



Notes and Sources: See Table 5.

indicated in Section III, this may be explained by a combination of socio-economic factors and Northern Ireland's intensive industrial policy regime.

Apart from the overall level of job turnover, two other aspects of job turnover have been widely discussed in the literature: the cyclicality of job turnover and its persistence. In terms of cyclicality, the standard approach is to consider correlations between job creation and destruction rates and the net employment growth rate, and figures for Northern Ireland are given in Table 4. These suggest results very similar to those of other international studies (see for example, Strobl *et al*. (1998), Table 3). For Ireland, for example, Strobl *et al*. (1998), find that the job destruction rate moves counter-cyclically (correlation coefficient, –0.96) while the job creation rate moves pro-cyclically (correlation coefficient, 0.87). In Northern Ireland, the same correlation coefficients are: job destruction rate, –0.89; job creation rate, 0.80. In other words the same pattern of counter-cyclical job destruction and pro-cyclical job creation is evident in both Northern Ireland and Ireland. Moreover, in both areas – as suggested by the size of the correlation coefficient – the job destruction rate is more cyclically responsive than the job creation rate (see also Strobl *et al*. (1998), p. 60). More generally, however, job reallocation, although counter-cyclical in both Northern Ireland (correlation coefficient, –0.30) and Ireland (correlation coefficient, –0.61), is less cyclically responsive

Table 5: *Job Creation and Destruction Rates: International Comparisons*

	Job Creation Rates					*Job Destruction Rates*				
	Northern Ireland	*Ireland*	*Norway*	*Denmark*	*UK*	*Northern Ireland*	*Ireland*	*Norway*	*Denmark*	*UK*
1973	4.9					6.5				
1974	4.9	7.5				5.3	7.1			
1975	3.4	6.6				10.1	10.2			
1976	5	9.6				11.3	7.7			
1977	5.6	9.8	7.5			6.8	7.7	6.8		
1978	3.8	9.1	7.6			7.1	5.9	8.9		
1979	3.2	10.1	7.2			8.3	6.1	8.5		
1980	3.2	7.8	6.8		5.3	11.2	10.7	7		18.2
1981	2.9	8.2	6.6	11.6	6.4	14.9	9.7	8.1	13.4	14.6
1982	5.6	7	5.2	11.4	7.8	14.2	10	8.1	10.8	13.2
1983	5.8	7.9	6.2	11.6	17.4	9.4	12.5	12.6	11.4	18.3
1984	7.7	7.4	7.5	15.4	16.1	6.4	11.1	8.5	8.8	18.4
1985	7.3	7.7	8.6	14.5	11.5	8.2	10.7	7.9	9.2	13.6
1986	5.1	7.8	9.6	12	14.3	9	9.9	8.6	11.2	14.5
1987	8.5	7.5	7.5	10.5	14.6	7.7	11	7.9	12.7	13.8
1988	7.9	9	7.8	10.9	14.8	6.8	7.9	13.8	12.6	13.9
1989	8.5	10	6.8	11.9	12.5	7.5	7.4	14.4	10.8	14.8
1990	7.2	8.9	8.6	11.6	10.5	7.3	8.2	10.9	12	16.9
1991	8.4	7.9	8.1	10.4		7.9	8.3	10.3		
1992	6.1	7.7	7.7			8.1	8	10.8		
1993	6	8.5				7.9	9.8			

Sources: Ireland, Strobl *et al*. (1998); Norway, Salvanes (1995); Denmark, Albaek and Sorenson (1995); UK, Barnes and Haskel (2000).

in Northern Ireland than in Ireland. As before this may reflect the 'damping' effect of Northern Ireland's industrial policy regime and the troubles on cyclical variations in both job creation and job destruction.

Persistence in job creation and destruction is relatively simply captured by the proportion of job turnover which persists one and two years after it occurs (see for example, Broersma and Gautier, 1997, p. 213). Like Strobl *et al*. (1998), we find lower persistence among jobs created in Northern Ireland than among those destroyed (Table 5); around 76 per cent of jobs created persist beyond the first year compared to 92 per cent of jobs destroyed (Table 6). Notably, however, persistence rates in Northern Ireland are generally higher than those in Ireland. This is primarily a consequence of the lower rates of job turnover noted earlier, and may also reflect the contribution of Northern Ireland's policy regime in maintaining employment stability.

Table 6: *Job Persistence Indicators for Northern Ireland*

	Job Creation Remaining After:		*Job Destruction Remaining After:*	
	One Year	*Two Years*	*One Year*	*Two Years*
1974	0.62	0.50	0.87	0.84
1975	0.72	0.68	0.89	0.87
1976	0.77	0.64	0.94	0.94
1977	0.69	0.59	0.87	0.88
1978	0.75	0.61	0.95	0.96
1979	0.65	0.44	0.97	0.97
1980	0.63	0.57	0.96	0.96
1981	0.78	0.59	0.98	0.96
1982	0.82	0.81	0.95	0.96
1983	0.86	0.77	0.91	0.87
1984	0.82	0.76	0.86	0.88
1985	0.67	0.62	0.93	0.91
1986	0.84	0.77	0.92	0.81
1987	0.76	0.72	0.92	0.91
1988	0.81	0.71	0.88	0.87
1989	0.81	0.68	0.92	0.89
1990	0.83	0.74	0.93	0.92
1991	0.78	0.70	0.94	0.91
1992	0.79		0.91	
Average	0.76	0.66	0.92	0.91

Note: Figures are based on selected enterprises. See text for details of derivation.
Source: NIARD database.

V FIRM SIZE ANALYSIS

Since the Bolton Report of 1971 and particularly since the publication of the paper by Birch (1981) emphasising the role of small companies in job generation in the US, considerable attention has been paid to the role of small firms in job creation (see the discussion in Storey (1994), pp. 112-158 and Barnes and Haskel (2000)). In Northern Ireland too, particular attention has been paid to the role of small firms in job generation (Hart, 1989; Gudgin *et al*., 1995; Hart and Hanvey, 1995) and the potential effects of small business support (Hanvey *et al*., 1994 and 1994a; Hart and Scott, 1994; Cromie and Birley, 1994; Birley and Bridge, 1997; Hart and Gudgin, 1999; Roper and Hewitt-Dundas, 2001).[10]

[10]Other studies have considered other aspects of small business development in Northern Ireland, e.g. benchmarking performance of small firms in Northern Ireland against other regions (e.g., Birley *et al.,* 1994; McFerran *et al.,* 1996; Hewitt-Dundas and Roper, 1998). Other aspects of small business growth and development including the determinants of small firm growth (e.g. Barkham *et al.*, 1996; Roper 1998, 1999; Roper *et al.,* 1997; McKillop and Barton, 1995) and the capability (Kinsella *et al.*, 1994) and labour market impact (Hart, 1993) of small firms.

Typically, these comparisons have identified a substantial differential in employment growth rates between small and larger firms and between assisted and non-assisted small businesses.[11] The majority of the studies focus, however, on a relatively short time period and have often been based on survey or sample data. The advantages of the ARD data in this respect are that it covers the whole time-period since 1973 and provides true longitudinal information on all manufacturing firms in Northern Ireland with more than 20 employees. This enables us to estimate job creation and destruction for firms grouped by size, and to estimate the contribution of each firm sizeband to both gross and net job creation.

Since 2002, responsibility for all aspects of industrial development in Northern Ireland has been consolidated into Invest Northern Ireland. Over the period covered by our analysis here, however, responsibility was split between the Local Enterprise Development Unit (LEDU) which focused on firms with less than 50 employees and the Industrial Development Board or IDB which supported larger businesses and inward investment (e.g., Harris, 1991). This split is important not only because of the fundamental differences between small and larger firms but also because the type of support offered by the two agencies has differed. In the job creation and destruction analysis we reflect this by identifying three size categories of firm; those with less than 50 employees (predominantly LEDU client companies), and those with 50-249 employees and 250 or more employees (both groups dominated by IDB client companies).

Unfortunately, estimating job creation and destruction by enterprise size involves a technicality which turns out to have a significant impact on the results. More specifically, to generate job creation and destruction by sizeband we have to classify each enterprise to a specific size-group. Two main alternatives have been used classifying firms either by their *initial* employment or by their *average* employment. Because the results differ somewhat we summarise both possibilities in Table 7.

As the previous tables suggested, during the 1974-1993 period the total net fall in manufacturing employment in Northern Ireland was 66,600 (Table 7). Estimates based on initial and average firm size suggest slightly different decompositions of this net change between small, medium and large enterprises. Using both methods, however, the group of small firms (with 20-49 employees) was the only size group to show a net increase in employment

[11] For example, from 1989-1993 net employment growth of 31.6 per cent in assisted small firms in the Republic of Ireland compared to a fall of 10.4 per cent in non-assisted companies. In Northern Ireland, over the same period, employment in assisted small firms grew 29.3 per cent but rose only 0.5 per cent in non-assisted firms (Buckland, 1996, Table 4, p. 20).

Table 7: *Job Creation and Destruction in Northern Ireland by Sizeband: 1974-1993*

Sizeband	*Job Creation*		*Job Destruction*		*Net Change*
	000s	*%*	*000*	*%*	*000s*
A. Initial Employment Estimates					
20-49 employees	26.7	23.3	19.7	10.8	7.0
50-249 employees	44.9	39.2	56.4	30.9	–11.4
250 plus employees	43.1	37.6	106.5	58.3	–63.4
Total	114.8	100.0	182.6	100.0	–67.8
B. Average Employment Estimates					
20-49 employees	19.0	16.6	17.7	9.7	1.3
50-249 employees	49.1	42.8	65.8	36.0	–16.6
250 plus employees	46.6	40.6	99.0	54.2	–52.4
Total	114.8	100.0	182.5	100.0	–67.7

Note: Figures are based on selected enterprises. See text for details of data sources and derivation.
Source: NIARD database.

over the 1974-1993 period of 1,100-6,900. Larger firms in both the 50-249 and 250 employee plus sizebands experienced net losses of employment of 67,600-73,500 depending on the calculation method used. The source of these changes can easily be seen by looking at the shares of small and larger firms in job creation and destruction (Table 7). Based on firms' initial employment, for example, small firms accounted for 23.3 per cent of job creation over the 1973-1993 period, but only 10.8 per cent of job destruction. Larger firms, however, tended to experience more job losses than job gains perhaps reflecting the difficulties noted earlier in terms of attracting inward investment to Northern Ireland.

Figure 5 illustrates the pattern of job creation and destruction among small and larger firms from 1973-1993, with both charts being based on firms' initial size. Marked differences are evident between the time paths of job creation and destruction for the two firm sizebands. Smaller firms seem to have been relatively immune to the impact of the downturns of the mid-1970s and 1979-1980 and to have had a strong job creation performance since the early-1980s (Figure 5a). Jobs in larger firms, however, proved more vulnerable to downturns in the UK economy during the 1970s and early 1980s. Since then, however, job creation among this group of firms has broadly matched job destruction.

Figure 5: *Job Creation and Destruction by Small and Larger Firms*

Notes & Sources: See Table 7.

The implication, and one which is consistent with the results of other studies using very different approaches (e.g. Gudgin *et al*., 1995, Roper and Hewitt-Dundas, 2001) is that the small firm sector in Northern Ireland has outperformed larger firms at least in terms of net job creation. One important factor in this performance has undoubtedly been the role of government assistance for small firms. Roper and Hewitt-Dundas (2001), for example, use an econometric approach to identify the 'selection' and 'assistance' effects of small business support in Northern Ireland. They demonstrate that from 1991-1995 government assistance to small firms in Northern Ireland had a significant and positive effect on employment growth.[12] More widely, our results contrast with some of the findings of DHS, for example, on the contrasting performance of smaller and larger manufacturing firms. In particular – in contrast to the 'small business job creation myth' (p. 58), DHS find that smaller manufacturing firms have lower net job creation rates than larger businesses. This is not true of our data. Indeed, for our data it is only small firms – i.e., those with less than 50 employees which actually have a record of positive net job creation over the 1973-1993 period (Table 7). More consistent with the general point being made by DHS, however, that small firm job growth has not been as important as some (e.g. Birch, 1981) have argued, is that in Northern Ireland the net (positive) change in employment in small firms has been only around one-tenth of the net (negative) job change in larger businesses.

VI JOB CREATION AND DESTRUCTION – BY FIRM OWNERSHIP[13]

Inward investment has also played an important role in the industrial development strategy of Northern Ireland throughout the post-war period (see, for example, Teague, 1987; Harris, 1991, pp. 106-138; NIEC, 1992; Hamilton, 1993).[14] Harrison (1990), for example, comments that

[12] Less satisfactory, however, was Roper and Hewitt-Dundas's finding that government assistance had no effect on increasing small firms' sales growth or profitability. The implication being that although assistance was increasing employment growth in small firms it was actually reducing the rate of productivity growth.

[13] This section draws heavily on Crone (1998).

[14] The legislative basis for the promotion and assistance of inward investment can be traced back to the New Industries Development Act 1932. Harrison (1990) highlights three later sets of legislation: the Industrial Development (Northern Ireland) Act 1945 established the basis for selective financial assistance for employment creation; the second, legislation in the 1950s that enabled government to grant-aid existing firms to re-equip and modernise, with no employment test; and third, a significant addition to ID policy in 1971 when previous acts were extended to allow the provision of financial assistance for the maintenance or 'safeguarding' of existing employment.

> *… the attraction of mobile British investment and new foreign direct investment to a region such as Northern Ireland would provide a necessary broadening of the industrial base of the regional economy and offer the prospect of stable or expanding employment opportunities in manufacturing industry.* (p. 87)

Aside from its obvious benefits in terms of job creation, inward investment also has other potential advantages. Young, Hood and Hamill (1988), for example, observe that the establishment of an MNE firm on a greenfield site necessarily involves the physical relocation of technologies embodied in capital goods (e.g. machinery) and a number of forms of disembodied technology, including industrial property rights, unpatented know-how, and managerial and organisational expertise. They also suggest, however, that an MNE firm may contribute to local technological development: by undertaking local research and development, through supply-chain linkages or supplier development activities, and through a "demonstration effect" on local firms. Each effect is likely to have positive spill-overs for the economic development of the region which will not be reflected in the employment of the externally-owned sector. Job creation or destruction analysis, reflecting changes in the employment of the externally-owned sector, will capture the direct job creation benefits of inward investment. It cannot, however, reflect the more dynamic spill-over benefits derived by locally-owned firms from inward investment and is therefore likely to under-estimate the true benefits of past inward investment.[15]

A further limitation to our job creation and destruction analysis is that the ARD data do not discriminate between Northern Ireland and GB-owned firms. We are essentially limited therefore to a UK-owned, non-UK owned comparison, a distinction which while useful fails to reflect changes in firm ownership within the UK. In particular, this distinction fails to reflect the take-over or purchase of Northern Ireland owned businesses by firms from other UK regions. As suggested in Section II, we are able, however, to identify separately firms moving between UK and non-UK ownership which itself raises other issues. As indicated in Section II, firms changing ownership may in the same period either create or destroy jobs. This suggests two possible approaches; we could exclude firms transferring ownership from the analysis, which preserves transparency but excludes job creation or destruction taking

[15] More sophisticated approaches are necessary to measure these spill-over effects which may influence the employment, sales or productivity growth of indigenously-owned firms. One recent example is Aitken and Harrison (1999) who use panel data estimation techniques to estimate the impact of externally–owned firms in Venezuela on the total factor productivity of indigenously-owned firms.

place in those firms changing ownership status; alternatively, we could include firms transferring ownership in the job creation and destruction analysis, recognising that both estimates will include transfers from the other ownership group. We adopt the second approach in what follows, preferring not to exclude firms from the analysis and so preserve as much comparability as possible with the aggregate analysis.

Table 8 summarises the overall record of job creation and destruction of UK and non-UK owned manufacturing firms from 1976, when the data on firm ownership begins, through to 1993. Net job losses are evident in both ownership groups with these job losses broadly reflecting the underlying composition of manufacturing ownership in Northern Ireland (Figure 5).[16] Perhaps more striking, however, are differences in the composition of job creation and destruction for each ownership group. For UK-owned businesses entry and expansion were more important forms of job creation than for non-

Table 8: *Job Creation and Destruction in Northern Ireland Manufacturing by Ownership: 1976-93*

	Employment		*Job Creation*					*Job Destruction*		
	000s (end year)	*Change*	*Job Creation*	*Job Destruction*	*Entry*	*Expansion*	*Ownership Change*	*Death*	*Contraction*	*Ownership Change*
Part A: UK Owned Businesses										
1976-78	80.0	–3.9	6.2	10.1	1.4	4.1	0.7	4.3	5.2	0.5
1979-80	71.0	–6.6	3	9.6	0.5	2.3	0.1	3.7	5.6	0.2
1981-88	48.3	–1.3	5.8	7	1.7	3	1	2.4	3.8	0.8
1989-91	47.6	–3.5	5.7	9.2	2	3.4	0.3	2.3	3.4	3.4
1992-93	43.3	–1	5.1	6.1	1.9	2.9	0.3	2.2	3.4	0.6
Total	–56.4		102.4	159	29.6	61	12	55.1	84.3	19.8
Part B: Non-UK Owned Businesses										
1976-78	28.4	–1	1.5	2.4	0	0.9	0.5	0.2	1.6	0.6
1979-80	26.4	–1	1.2	2.2	0.3	0.7	0.2	1.2	0.9	0.2
1981-88	11.8	–1.8	1.5	3.3	0.2	0.5	0.8	1	1.3	0.7
1989-91	23.1	3.8	5.1	1.2	0.4	1.1	3.4	0.2	0.7	3.6
1992-93	21.9	–0.6	0.9	1.6	0	0.4	0.6	0.1	1.2	0.5
Total	–10.7	0	36.4	46.9	3.8	12.5	20.2	12.3	22.4	11.8

Note: Figures are based on selected enterprises. See text for details of data sources and derivation.
Source: NIARD database

[16] Importantly, the job losses of non-UK owned firms would also have been substantially greater had it not been for the privatisation of Shorts Brothers and Harland and Wolff in 1989, both of which were purchased by non-UK companies (Table 7).

UK owned firms, while for non-UK based businesses, ownership transfers (primarily takeovers) accounted for 55.4 per cent of job creation. For UK-owned businesses such transfers were relatively small accounting for 11.7 per cent of job creation and 12.4 per cent of job destruction over the 1976-1993 period. Transfers were also a more important source of job destruction among non-UK owned businesses than among UK-owned businesses, accounting for 25.1 per cent of jobs lost.[17]

Aside from the aggregate differences in the composition of job creation and destruction for UK and non-UK businesses, significant differences also exist between sub-periods in the sample. From 1975-1979, for example, ownership transfers between the UK and non-UK groups were small in scale, and there was a high level of job losses in UK-owned firms through both closure and contraction and a much lower level of job creation. This is a marked contrast with the non-UK owned sector which, although it experienced a high closure rate during the 1973-1974 recession (Harrison, 1990, p. 102), had stabilised by 1978-1979. NIEC (1983, cited in Harrison, 1990, p. 102) highlight two factors in the high level of closures – particularly among UK-owned firms – in the post 1975-1979 period. First, it was claimed that it is natural for employment in any project to build up to a peak then fall away over time. The presence of large numbers of firms first established in Northern Ireland in the 1950s and 1960s meant that many of these firms were susceptible to rationalisation or closure in the 1970s. The vintage of firms may also explain the higher closure rate among UK-owned firms in the late 1970s as these firms were generally established earlier than non-UK owned firms. Second, adverse economic conditions following the 1973-1974 recession brought forward the incidence of rationalisations or closures that might have occurred anyway in subsequent years. It is notable that NIEC did not include the 'troubles' as a significant factor in these firm closures.[18]

Post-1979, the overvaluation of Sterling coincides with a period of rapid structural change with an increase in job destruction (and a fall in job creation) among both UK and non-UK owned firms (Figure 6). Non-UK owned firms, however, proved much more susceptible to closure during the 1979-1982 recession than during the 1974-79 period. Notable among the firms lost during this period were a group of firms in the man-made fibres sector. This sector suffered an almost total collapse in Northern Ireland between 1979 and 1982 as a total employment loss of 8,600 jobs in this sector accounted for 61 per cent of all jobs lost in assisted firms between 1979 and 1982 and left only 1,350 jobs

[17] Detailed information on these calculations is available from the author.
[18] Fothergill and Guy (1990) also rejected the assertion that the 'troubles' were a cause of closures in their study of plant closures between 1980 and 1986.

Figure 6: *Job Creation and Destruction in UK and Non-UK Owned Firms*

Notes and Sources: See Table 8.

by June 1982 (Harrison, 1990, p. 106-7). As suggested earlier, the period from 1981-1988, dominated by the Lawson boom in the UK, was marked by lower levels of volatility in employment in both the UK and non-UK owned sectors with lower, and more balanced, levels of job creation and destruction. It is over this period, however, that transfers of ownership between the UK and non-UK categories become more significant reflecting the general increase in acquisition and merger activity in Europe during the 1980s.

VII CONCLUSIONS

From 1973-1993 manufacturing employment in Northern Ireland fell 70,300, the result of job creation of 122,500 and job destruction of 192,900. Of the jobs created, 37,300 (30.4 per cent) resulted from new enterprises being established or new firm formation, and 85,300 (69.6 per cent) were the result of business expansions. Job destruction was more strongly influenced by business closure, which accounted for 73,200 (37.9 per cent) of job losses, compared to 119,700 (62.0 per cent) lost in contractions. Compared to the analysis of Barnes and Haskel (2000) for the UK as a whole, firm contraction and expansion were more important sources of job creation and destruction in Northern Ireland than in the UK, with closure and entry less important. One clear possibility is that the Troubles and the support offered by the Industrial Development Board to companies in Northern Ireland over this period were reducing levels of investment and closure relative to that elsewhere.

In terms of the sources of job creation and destruction in Northern Ireland, small firms (i.e. those with less than 50 employees) were the only group to experience net job growth over the 1973-1993 period, although this was relatively small in absolute terms. Both UK and non-UK owned businesses experienced significant job losses over the period. A significant transfer of employment is also evident between the two ownership categories, particularly from UK owned to non-UK owned businesses.

Comparison to non-UK studies suggests that job creation and destruction rates in Northern Ireland were generally below those observed elsewhere. They exhibit many of the commonly observed properties, however: job destruction in Northern Ireland is counter-cyclical, while job creation is pro-cyclical; as in Ireland, the job destruction rate is more cyclically responsive than the job creation rate; and, job persistence is greater in Northern Ireland than in Ireland.

Although informative our job creation and destruction analysis has some important limitations. First, the current configuration of the Northern Ireland ARD database does not enable us to distinguish between Northern Ireland

and GB-owned firms. This limits the insights which can be gained from any analysis by ownership as it means we cannot identify Northern Ireland firms taken-over by other UK companies. Second, the current analysis tells us nothing about either job quality or the contribution of jobs to wealth creation. Jobs in small manufacturing firms, for example, may be welcome but tend to be lower paid and generate lower productivity than those in larger firms. Third, the current aggregate analysis tells us little about the equity angle either in terms of the distribution of jobs between males and females, communities or geographical locations. Fourth, because of difficulties in matching time series for individual businesses the current analysis is limited to the 1973 to 1993 period, i.e. the period prior to the introduction of the Inter-departmental Business Register in 1994. Future analysis might exploit other aspects of the ARD database to address these questions and extend the analysis to the post-1993 period. It would also be of considerable interest to explore the dynamics of job change in Northern Ireland in more detail. In other words, to consider whether employment adjustments were concentrated in a few companies, or whether employment adjustments were evenly distributed across the population of firms.[19]

[19] I am grateful to a referee for suggesting this as a possible direction for future research.

ANNEX: DATA STRUCTURE

Table A1 summarises the number of enterprises with non-zero employment in the Northern Ireland ARD database at the beginning, middle and end of the period covered by the study.

Table A1: *Number of Enterprises in Northern Ireland ARD*

	1973	1981	1993
By Sector			
Food and Drink	125	104	129
Textiles and Clothing	278	166	122
Engineering	174	148	222
Other Manufacturing	142	104	148
By Sizeband (average employment)			
20-49 employees	263	171	311
50-249 employees	344	266	242
250 plus employees	112	85	68
By Sizeband (initial employment)			
20-49 employees	255	178	342
50-249 employees	331	246	212
250 plus employees	133	98	67
By Ownership			
Indigenously-owned	na	480	572
Externally-owned	na	42	49

Notes: See text for details of construction of database.

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