

AN INVESTIGATION INTO THE EMPLOYMENT GENERATED BY
NEW INDUSTRY LOCATING IN NORTHERN IRELAND, 1951–80

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1 INTRODUCTION

Implicit in some of the political judgements on the rationale for regional policy is the thesis that the less prosperous regions of the United Kingdom, or indeed any European state, need to be helped by a programme of government assistance towards industrial development which, if it is successful, will eventually reach the point where the new industrial structure will begin to be self sustaining and, possibly, even generate further expansion. In such a thesis there may be arguments for assistance in overcoming the initial diseconomies of locating in a particular region, creating external economies through the interdependence of various projects and increasing the viability of projects as expertise and productivity all improve. All of these might combine to create a more advantageous location which can attract further industry and overcome the initial disadvantages.

This thesis comes in different forms. In some forms it emphasises the possible development within a firm. The firm, once launched, becomes competitive and expands further in Northern Ireland as and when further investment takes place. In others, it emphasises the consequences of successful firms on others. Given a critical minimum number of projects, these will then be the basis for favourable location decisions by others.

A variant of this view seems to be the basis of one of the arguments in the Review of Industrial and Economic Strategy (Quigley Report, 1976). They discussed the role of the "big firm" or "Propulsive industry" concept.

It can be, and has been, argued that a multiplicity of small to medium sized firms working as largely discrete units, cannot create a dynamic economy and that mass alone is capable of exerting the necessary propulsive effect. Such a plant, particularly if it is in a fast growing sector, will generate needs which induce interlinked growth in other plants. A means of forcing the pace of economic growth is, therefore, being built into the industrial structure itself. It can also be argued that the state's role may be to spearhead the growth process by introducing the major project which then starts off a chain reaction as the multiplier and accelerator effects take over (page 27).

A mixture of different strands seems to have been envisaged in the earlier reports on the Northern Ireland economy. The Government statement on the report on Economic

Development in Northern Ireland (Wilson Report, 1965), expressed the following sentiments –

The government endorses the conception of growth areas and accepts that greater concentration of industry will provide more favourable conditions of self sustaining growth (page 5)

The government's present measures for furthering industrial development are based on the objectives, set forth by the Consultant, of making conditions within Northern Ireland favourable to growth, of giving direct assistance to encourage industry to take advantage of the opportunities available, and of aiming in the long run to achieve self generating growth (page 12)

the government accepts the need to foster the development of industries that offer the prospect of sustained growth (page 12)

Then in 1970, the Northern Ireland Development Programme, 1970–75, re emphasised the self generating and self perpetuating ideas when it argued that –

Full and wholehearted acceptance of the strategy proposed for this period offers the best promise of intensive self perpetuating and self generating industrial growth in the long term interests of the whole province (page 120)

If such a thesis was valid, then the history of the application of industrial development policy in Northern Ireland in the last thirty years might have given it some confirmation. Later sections will try to analyse whether the thesis was valid and whether the local disorder of the 1970s should be seen as a different element which invalidates the possible criticism of regional industrial policy in the Province

2 BACKGROUND TO THIS STUDY

This study focuses mainly on the employment provided in new industrial projects established in Northern Ireland from 1951 to 1980. It is, therefore, concerned with the employment record of projects, some of which have been in existence for 30 years. Earlier studies have not been able to analyse the employment history of individual projects. Information has been available on the number of projects opening and closing and on the *total* employment in new projects at different dates. This study has the advantage that employment changes in *each* project were made available for analysis.

The study includes both the expansion of existing manufacturing firms and the establishment of enterprises which are new to the area. New projects is, therefore, a term which includes completely new establishments and the expansion of existing establishments. The distinction is, in itself, of interest since it enables some assessment to be made of the differences in performance between the two categories.

This distinction has been made on an establishment basis. An existing company setting up a new establishment at a different location to its previous operations has been treated as creating a new establishment.

An "expansion" project should, therefore, in this study, be regarded as an expansion of an existing manufacturing establishment owned by the same company. The data for this study have been extracted, with permission, from the Department of Commerce employment records for projects, assisted under the several Industries Development Acts. The Department received employment figures on a regular basis from the firms and retains this information for comparison with the target employment estimates which were agreed between the Department and the firm when the package of industrial incentives was negotiated. These records have been analysed as at September in each year of the study. Records are available from 1945, but in order to avoid the unusual features of the immediate post war effects on the development of industry, the analysis has been taken back only to 1951.

Two further refinements have been made in the material used in this study. First, as far as possible, the employment of Harland and Wolff, and Shorts has been excluded. These two large firms have, over this period, been taken completely into public ownership, benefitted from large scale government financial assistance, experienced major changes in their total employment and could only be regarded as very untypical in any study of the changes in the industrial sector in Northern Ireland. Both firms, at several dates, launched expansion plans. For example, in 1972, Harland and Wolff announced an expansion plan with a target of over 4,000 jobs. This would have been a very conspicuous oddity in the general records of the expansion of all other manufacturing firms.

Second, to remove a number of small projects which created only a small amount of employment, all projects whose employment did not, at any date, exceed 10 employees were excluded. This can be justified both because there were a large number of such projects which only existed for a short period and also because the study does not include any information from the records of the Local Enterprise Development Unit (LEDU). This Unit was established in 1972 and has dealt with most industrial firms whose employment expectations do not exceed 50. In practice the average employment target for each LEDU assisted project in the period of this study was less than 10 employees.

After these refinements, the employment targets and employment history of 477 projects started after 1950 and before 1981 were included in the study, 341 new establishments and 136 expansion projects. In some places information on the situation in 1981 was available and has been used to extend the coverage of the study.

3 SCOPE OF THIS STUDY

By 1980, the last year for which full information was available, 289 of the 477 projects, included in the study, were still operating, 204 new establishments and 85 expansion projects. In crude terms, refined below, this suggests a closure rate of 39 per cent, 40 per cent of the new establishments and 37 per cent of the expansion projects. These crude

ratios are somewhat misleading, as is explained below

The original employment targets of the 477 projects as established at the date when the projects were launched, suggested a potential employment total of 92,800 jobs, 72,900 in new establishments and 19,900 in expansion projects. Actual employment in all these projects reached a peak in 1974 with 60,600 jobs and has, since then, been falling (See Table 1). In 1980, total employment in these projects had fallen to 47,900. Actual employment in new establishments reached 50,300 in 1974, in expansion projects, employment reached 10,300. By 1980 these figures had fallen to 41,000 and 6,900 respectively.

Table 1 *Summary data on New Projects*
(Established from 1951 – 1980)

	New establishments	Expansions	Total
Projects included (No)	341	136	477
Projects still functioning in 1980	204	85	289
Initial target employment	72,900	19,900	92,800
Actual maximum employment reached (1974)	50,300	10,300	60,600
Actual employment in 1980	41,000	6,900	47,900

The Relation of New Projects to the Whole Industrial Sector

Because of the nature of the processes of industrial change, any study covering a long enough period will show how extensive is the replacement of older firms or projects by newly created projects. There are no homogeneous patterns to the cycle of development, growth, contraction and closure, but in a study covering a thirty year period (even without the recession of recent years) a pattern of this kind could be anticipated. It is, perhaps, somewhat ambiguous to use the term 'new projects' in an analysis of projects, some of which commenced production as long ago as 1951. However, the term is an easy one to use and is conventionally used in this way by government agencies.

Table 2 compares total manufacturing employment in Northern Ireland with the new employment created. Two definitions of "new" are shown: first, new, in the sense of created in 1951 or later in the projects included in this study; second, new, in the terminology of the (then) Department of Commerce covering all projects started after 1945.

Table 2 *Manufacturing Employment*

	N Ireland total (i) ('000)	New projects Post 1945 (ii)	New projects Post 1950 (iii)	(iii) ^ (i)	(iii) ^ (ii)
1960	181.3	34.0	14.7	8	43
1965	173.7	49.5	32.2	19	65
1970	177.5	66.7	51.9	29	78
1975	155.8	68.6	55.9	36	81
1980	128.5	57.7	47.9	37	83

- Sources (i) N I Digest of Statistics and Annual Abstract
(ii) Dept of Commerce, Facts and Figures (various editions)
(iii) This Study

In 1960, when the material in this study had had a 10 year history, some 14,700 jobs were recorded in the projects covered by the study and this amounted to 8 per cent of all manufacturing jobs in the Province. Over time, with a fixed commencement date of 1951, this proportion inevitably rose. By 1980, 37 per cent of all manufacturing jobs were in projects covered in the study.

Since the projects included in this study are selected on a basis which excludes some distinct categories, it is relevant to try to assess what proportion of all jobs in new projects have been included. The categories excluded are –

- (i) small projects, not employing more than 10 people
- (ii) Harland and Wolff, and Shorts
- (iii) projects which did not receive selective industrial assistance (e.g. projects not claiming government discretionary capital related incentives, if any, and projects claiming only Standard Grants for capital spending. The latter group was of some (smaller) significance in the years pre 1970, but the numbers are not available)

In the above table, the number of jobs covered in projects in this study is compared to the number of jobs in projects commencing after 1945, as measured by the (then) Department of Commerce. By 1980, this study included 83 per cent of the jobs in the Departmental estimate. Given the different starting dates, this coverage seems consistent with a claim that the post 1950 study covers a very high proportion of the new jobs created in these years. On a wide margin of possible error, this study probably covers 90 per cent of all new manufacturing jobs and could possibly include up to 95 per cent of these jobs.

Another yardstick by which the coverage of the projects in this study might be assessed should be available, not from the number of jobs created, but from the initial employment targets of the projects which commenced production. In theory, these should bear some relationship to the employment targets as compiled by the Department of Commerce at the end of each year. The employment targets (or, as they are sometimes described, the jobs promoted) have been published on an annual basis and are compared with the targets of projects in this study in Table 3.

The difference in the two methods of measuring the job target figures is larger than the much smaller differences in the number of actual jobs measured by the two different methods. This study has information on job targets which are only 65 per cent of those announced by Government. Individual years are not likely to produce a coincidence of the two sets of figures because an "announcement" may be made in a year earlier than that when production commences. This difference should be more marginal over a longer period.

Since the comparisons of actual employment cause no statistical difficulty, this difference in the target employment figures needs a further explanation. An informal comparison reveals that not only does this study include only 65 per cent of the official employment target, but the number of projects included is similarly only just over 60 per cent of the total. From the earlier discussion, perhaps up to 10 percentage points of the difference may be caused by differences in coverage. This leaves about 25 to 30 percentage points to be explained.

One explanation which accounts for an unknown part of the difference is that not all additional jobs negotiated by the official agencies will be separate projects as defined in this study. Another smaller element of the difference stems from projects announced but which did not come into production. The major part of the difference stems from the use, in the study, of only the initial employment target of new projects. Many projects, some time after their initiation, have been the subject of a second, or further, application for industrial development assistance which will have been related to an upward revision in their stated target employment. (Sometimes the *original* target may have been revised downwards and new targets added to the revised base.) A sub sample of the records in this study reveals that the initial employment was, on average, increased at a later date by about 50 per cent. To this must be added the fact that employment targets have, on average, tended to fall, although this is often preceded by an increase. Consequently, the "missing" jobs are easily explained by later target amendments which, when upward, tend to be regarded as jobs promoted but, when downward, are (we suspect) not deducted from the official jobs promoted statistics.

Table 3 *Employment Targets*

	Jobs Promoted (1)	Job Targets of firms in Study (1)	(11) - (1) %
1951	1415	1459	103
52	2713	481	18
53	5743	2494	43
54	1805	819	45
1955	4648	1059	23
56	2115	1524	72
57	2280	129	6
58	2899	5192	179
59	2479	1789	72
1960	3179	2698	85
61	8524	2676	31
62	6102	4827	79
63	5008	6024	120
64	4848	1817	37
1965	8116	8683	107
66	7493	3789	51
67	5418	3633	67
68	6699	4461	67
69	5943	4361	73
1970	6423	4146	64
71	7265	3611	50
72	2660	3913	147
73	5180	2115	41
74	5250	3204	61
1975	3470	1588	46
76	2900	897	31
77	4650	3261	70
78	6410	4305	67
79	5470	2547	47
1980	5550	5381	97
TOTAL (1951-80)	142655	92883	65

Notes (1) DOC records
(11) Firms in this study

Source Industrial Development Board Statistics Branch Facts & Figures
(NI Department of Commerce) NI Annual Abstract Statistics

4 THE OPENING OF NEW PROJECTS

In 1981, 258 manufacturing projects, established with some form of government financial assistance between 1951 and 1980, were employing nearly 43,000 people in Northern Ireland. In an industrial sector which was then employing about 112,000 people, this was a significant proportion including Harland and Wolff, and Shorts, it represented about 43 per cent of the whole employed industrial labour force.

A starkly contrasting presentation is revealed when it is added that the 258 projects are those surviving from an initial 477 and that the initial employment targets of the 477 projects were expected to be the basis of 93,000 jobs. Although some of the projects commenced in the late 1970s, and may still have been expanding their employment, the overall picture is of projects which have provided much less employment than was originally anticipated. At first impression, this suggests that actual employment is less than 50 per cent of the initial target levels for employment. As later evidence will make clear this is a complex process and, expressed simply, the pattern is of projects which, at an early date reach a high proportion of their expected employment and whose employment then falls through contraction and closures to give a declining total. It is, therefore, misleading simply to record the overall position in 1981 without taking account of the age of the various projects.

The best years, in the period 1951-1980, for the opening of new industrial projects in Northern Ireland were 1971-75. Using five year cohorts which have been used as a standard presentation in this study, the annual rate of commencement of new projects rose from 8 per annum in the 1950s to an average of 22 per annum in the period 1971-75. Surprisingly, the number of new projects remained nearly as high in 1976-80. The annual average fell to 21 projects.

Table 4 compares the number of new projects, the expected or target employment and the actual employment. In terms of new jobs, the 1971-75 period was the best, if measured by the number of new jobs in the first year of a project. The annual average of over 2,000 new jobs in projects which had just commenced was slightly higher than the five cohorts of the 1960s. However, when employment is totalled in the same projects after six years of operation the position is much less encouraging. Judged after this time lag, which should eliminate the distortion of employment being assessed before a project has built up (or down) to its longer term position, then the projects established in 1961-65 have performed more satisfactorily. In this assessment, the sixth year has been chosen as the basis since the overall evidence is that, on average, projects reach their maximum employment after six years.

One of the significant changes over the past thirty years has been the average size of new projects. In the years 1956-60, the largest average size of projects was recorded, whether measured by target employment or actual employment. The average project had an employment target of 290 people. By the 1970s, these figures had fallen, employment targets by nearly 50 per cent, actual employment by even more.

Table 4 *Opening of New Projects*

	No of Openings	Target employ- ment	Average target employ- ment per unit	Initial employ- ment year 0	Employ- ment in year 6 (1)	Average employ- ment per unit 6 (2)	Average employ- ment per unit 6 (3)
1951-55	42	6312	150	2302	7699	183	208
1956-60	39	11332	290	6016	10699	274	297
1961-65	86	24027	279	9317	21973	256	314
1966-70	94	20390	217	9731	14381	153	192
1971-75	111	14431	130	10013	5643	51	84
1976-80	105	16391	156	7777	N A	N A	N A

- (1) Employment as recorded after 6 years of operations
- (2) Not adjusted for firms that have closed
- (3) Adjusted for firms that have closed

The history of new industrial projects in Northern Ireland is, therefore, of a significant increase in the number of projects in the 1960s and 1970s, but of a fall in their average employment size. There is also a fall in the proportion of the employment target which becomes translated into actual employment.

The term new project includes both new establishments (which may be new companies or an additional plant at a different location for an existing company) and the expansion of an existing establishment (on the same general site). These represent very different types of projects and several factors might give rise to differences between the two categories.

Comparing the details of new establishments with those of expansions, a number of features can be observed —

- (1) Expansions tend to be smaller in employment terms than new establishments.
- (2) Expansion projects have, in the 1970s, increased as a proportion of all projects. In the 1960s, expansion projects were one quarter of all projects — in the 1970s this ratio had risen to just over one third.
- (3) The best years for the announcement of expansion projects were the early 1970s, the best years for new establishments were the late 1960s.

- (4) In the fulfilment of employment targets, the best years for new establishments were those commenced in the periods *before 1965*
- (5) In the 1970s, the experience of both categories was that actual employment fell well short of the initial targets

Table 5 *Opening of Projects*

	No	Target employment	Av employment per unit	Initial employment	Employment in yr 6(1)	Av. employment per unit yr 6(2)	Av. A employment per unit yr 6(3)
A NEW ESTABLISHMENTS							
1951-55	34	5832	172	2116	7228	213	249
1956-60	34	8040	236	3363	7772	229	251
1961-65	58	21388	369	7564	20120	347	428
1966-70	77	17939	234	8411	12780	166	206
1971-75	67	9784	146	5175	3382	50	82
1976-80	71	14121	199	6292	N A	N A	N A
B EXPANSION OF EXISTING ESTABLISHMENTS							
1951-55	8	480	60	186	471	59	59
1956-60	5	3292	658 (4)	2653	2927	585	585
1961-65	28	2639	94	1753	1853	66	81
1966-70	17	2401	141	1320	1601	94	123
1971-75	44	4647	106	4838	2261	51	87
1976-80	34	2270	67	1485	N A	N A	N A

NOTES (1) and (2) as in table 4 (3) as in table 4

(4) Figure distorted by a small number of special cases

5 CLOSURE OF PROJECTS

Of the 477 industrial projects which commenced production after 1950, only 258 were known to be still functioning in 1981. In crude terms, 46 per cent of new projects had closed. The chances are, of course, likely to vary with the length of life of a project and

this crude ratio takes no account of the different life span of firms established in the early 1950s in comparison with the more recent projects, opened in the late 1970s Table 6 examines the position for firms in the different age cohorts

Table 6 *Closures, Compared to Openings*
(Position in 1981)

Year of Opening	Openings	Still operating	Closures	Percent-age closed	Closure rate per annum
	No	No	No	%	%
1951-55	42	20	22	52	1.9
1956-60	39	20	19	49	2.1
1961-65	86	41	45	52	2.9
1966-70	94	48	46	49	3.8
1971-75	111	50	61	55	6.9
1976-80	105	79	26	25	8.3
<u>TOTAL</u>	477	258	219	46	3.0

The closure records are surprising. Closure rates, of projects which commence production at different dates have a similar possibility of survival after "n" years, ought to be lower for projects which have enjoyed a shorter life span. The evidence is quite sharply in conflict with this proposition and the proposition can be reversed to ask whether there is any reason why projects launched in the early part of this study period should have displayed longer life spans than those established in recent years.

It is tempting to conclude that this phenomenon, statistically illustrated in the calculations of closure rates per annum in the above table, might be associated with the increased willingness of Government to give assistance to more risky projects as a response to the deterrence to investment in Northern Ireland since (say) 1970 of the local civil unrest or might be associated with the increasing impact of recession in the late 1970s and early 1980s. However, this does not explain why closure rates for projects started in the 1960s have been higher than for those started in the 1950s. A large part of the experience of the 1970s may be explained by the factors suggested above, but this is not an adequate explanation of the whole trend. The projects started in the 1960s were undertaken in a period of stability and relatively low unemployment, but their life spans have tended to be shorter than those launched in the 1950s.

The information in Table 7 dispels any suggestion that the number of closures was different in new establishments as opposed to expansion projects. The evidence for each group is remarkably similar to the overall average.

Table 7 *Closures Compared to Openings*
For New Establishments and Expansions

Position in 1981

Year of Opening	Openings	Still operating	Closures	Percentage closed	Closure rate per annum
	No	No	No	%	%
<u>A NEW ESTABLISHMENTS</u>					
1951-55	34	16	18	53	1.9
1956-60	34	16	18	53	2.3
1961-65	58	27	31	53	3.0
1966-70	77	40	37	48	3.7
1971-75	67	32	35	52	6.5
1976-80	71	54	17	24	8.0
TOTAL	341	185	156	46	3.0
<u>B EXPANSTON PROJECTS</u>					
1951-55	3	4	4	50	1.8
1956-60	5	4	1	20	0.9
1961-65	23	14	14	50	2.8
1966-70	17	3	9	53	4.0
1971-75	44	18	26	59	7.4
1976-80	34	25	9	26	8.8
TOTAL	136	73	63	46	3.0

The rate of closures within a given period after their opening has, in general, shown a predictable pattern once allowance is made for the tendency for more recently set up projects to have higher closure rates. The exception to the overall pattern is that projects set up in 1956-60 displayed until the early 1970s a lower closure rate than would be consistent with the other groups.

Table 8 *Closure Rates, by Life of Project*

Percentage closed within –

Year of Opening	5 years	10 years	15 years	20 years	25 years
1951-55	12	20	31	36	50
1956-60	8	13	31	44	
1961-65	14	30	45		
1966-70	16	35			
1971-75	34				

Although the different elements cannot be quantified in this study, the pattern of closures is probably best explained by the following factors:

- (i) A small closure rate is a natural part of the long run process of change. For this group of projects, an annual closure rate of 2.5 to 3 per cent of the total number of survivors seems appropriate even in periods of economic growth.
- (ii) The closure rate will be higher in periods of recession, or rising unemployment. Using the unemployment figures as an indicator, this would be more apparent in Northern Ireland in 1976 and later years. Unemployment rose sharply in 1976 and has remained high, and increased, since then. In 1980 and 1981, closures reached record levels, at 10 per cent of the surviving firms per annum. It is not possible on this evidence to look for the separate components of this increase. Some part is the impact of recession, another part is the loss of projects which might have been influenced by non-commercial judgements arising from local instability, a third part is the faster rate of closure of projects which were accepted with a higher risk simply because the need for new projects was greater.

One method of deriving some indication of the distinction between the effects of recession and other factors such as the sponsorship of more risky projects, can be obtained from the analysis of closure rates for the different age cohorts in recent years. The difference between the cohorts, which show a higher closure rate in the more recently established projects, is consistent with increased risk taking by the Department.

of Commerce, being responsible for about a quarter of the higher recent closure rates (i.e., the total number of closures, not only from the units established in the 1970s) In the period 1976-80, the closure rates of surviving firms differed as follows –

Projects started in the 1950s	2.9% p a
Projects started in the 1960s	4.5% p a
Projects started in 1971-75	8.0% p a
Projects started in 1976-80	8.7% p a

Since the influence of the recession is probably not a factor which is particularly selective with respect to the age of firms, this confirms that the higher closure rate of the more recently established projects needs some extra explanation. Such a high initial closure rate is not in evidence for earlier cohorts. The closure rate of projects established in the 1970s is probably over 50 per cent higher than would have been expected by the standards of selection and approval of the 1960s.

6 PROFILES OF EMPLOYMENT CHANGES IN NEW INDUSTRIAL PROJECTS

The balance between the opening and closing of projects, during the period of this study, was such that the number of projects in operation continued to increase until 1978. In 1979 and 1980 the number of closures exceeded the number of openings and the total fell slightly from the maximum of 291 post 1950 projects in operation in 1978.

Employment in post 1950 projects reached a peak in 1974 when employment totalled 60,600. In the previous sections the pattern of openings and closures has been analysed. However, this was in terms of the number of projects, not the level of employment created.

Table 9 illustrates the number of employees in projects starting at different dates. A number of major features are apparent.

First, the loss of employment, through closures and contractions has in recent years more than offset the additional employment of new projects or the expansion of existing projects. Job losses, in the period 1976-1980, averaged at least 3,140 p a. This is an underestimate in that it assumes that no projects established before 1976 provided additional employment in this period. Jobs created in new projects in 1976-80 averaged only 1,550 p a.

Table 9 *Employment in New Projects*

Employment in -	Projects commencing production in -						TOTAL
	1951-55	1956-60	1961-65	1966-70	1971-75	1976-80	
1955	4367	-	-	-	-	-	4367
1960	6814	7912	-	-	-	-	14726
1965	6668	11233	14305	-	-	-	32206
1970	4859	10478	21736	14814	-	-	51887
1975	4634	8923	18731	13894	9752	-	55934
1980	3898	6938	15252	9386	4688	7752	47920
Peak Employment (Year)	7590 (1959)	11665 (1966)	21736 (1970)	16102 (1971)	9752 (1975)	N A	60595 (1974)

These patterns are confirmed in the attached graphs, Figures 1 and 2

Using a similar approximation for job losses, the comparison of losses and gains have been -

	<u>Losses</u>	<u>Gains</u>
1961-65	-30 p.a.	3520 p.a.
1966-70	-520 p.a.	4440 p.a.
1971-75	-1180 p.a.	1950 p.a.
1976-80	-3140 p.a.	1550 p.a.

However, this calculation underestimates both losses and gains since within each cohort some gains and losses will have cancelled each other out

Second, the underlying pattern of early expansion and later decline in employment is in evidence. When employment is totalled for each cohort the evidence is clear. For example, projects launched in 1951-55 reached a peak level of employment in 1959 and since then the number of employees has tended to decrease (see Appendix Table 6.1)

Finally, data for the different cohorts suggest that in recent years the pattern of early growth and later contraction has been displaced by a pattern of *no* growth after initial establishments and reduced employment initially from year 1 or 2 of a project. As later evidence will confirm, this is associated with a worsening of the position in relation to the achievement of employment targets as set at the date of project launch. This again raises questions on whether this can be attributed to the effects of increasingly risky projects and/or the effects of recession.

From similar studies undertaken in Great Britain, there is evidence of a typical employment profile in new projects (Pounce 1982, Nunn 1980, Howard 1968). These studies confirm that employment builds up in new projects over a period of years and later tends to fall partly because some firms close and others reduce their employment. A comparison of the results for Northern Ireland with those in other Development Areas is, therefore, of some interest.

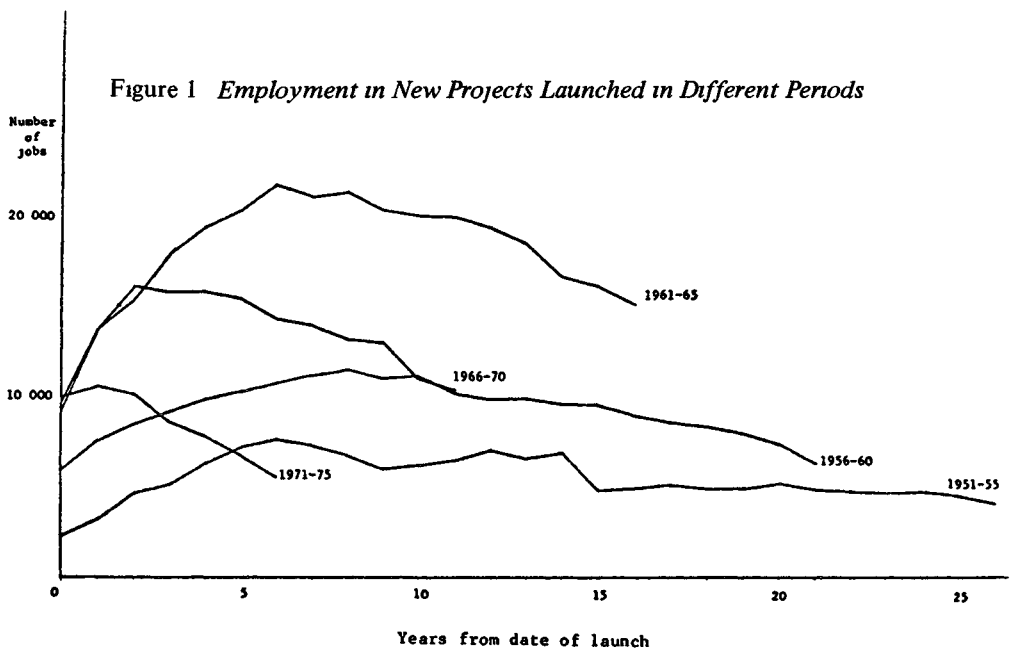
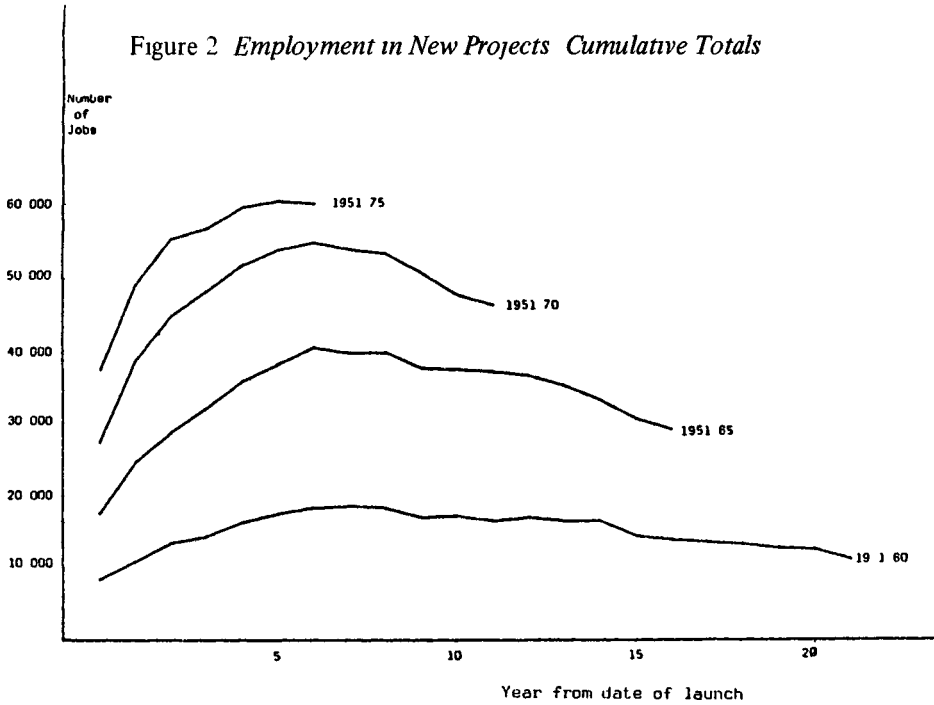


Figure 2 *Employment in New Projects Cumulative Totals*



The Northern Ireland profile can be seen in the following figures which give the total employment arising from 372 projects which were launched before 1976 and, therefore, have a potential employment record in this study of a period of up to six years (For example, a project launched in 1975 should have employment details for the 6 years from 1976–81 inclusive) The total employment was –

		<u>Index</u>
Initial year	37,379	100
Year 1	49,299	132
Year 2	55,112	147
Year 3	56,952	152
Year 4	59,856	160
Year 5	60,510	162
Year 6	60,395	162

These figures, covering a 6 year profile are influenced by the rather different pattern of industrial development in the post 1970 period. If firms undertaking new projects after 1970 are excluded then the profiles may be regarded as less influenced by Northern Ireland's own recent instability and there is the advantage of gaining an 11 year profile. On this basis, 261 projects, with a possible span of 11 years or more, can be included with the following results

		<u>Index</u>
Initial year	27,366	100
Year 1	38,698	141
Year 2	44,907	164
Year 3	48,278	176
Year 4	51,888	190
Year 5	53,631	196
Year 6	54,752	200
Year 7	53,869	197
Year 8	53,233	195
Year 9	50,620	185
Year 10	47,591	174
Year 11	46,273	169

This 11 year profile is probably a better reflection of the likely profile of new projects. It will be slightly influenced in the later years by projects started in the late 1960s running into the present recession. However, this is not a major factor since, for example, it also includes the profile of projects starting in the late 1950s which experienced the growth of the economy in the late 1960s.

Two key features of this profile are more important than others in the conclusions of this study.

First, employment tended, on average, for the projects in this study, to grow to double that of the initial year. By comparison with the other studies this is disappointing. Second, employment reached a maximum in year 6 and then started to fall. Compared to

evidence in the study by Nunn (1980) the Northern Ireland profile for firms launched in 1961-70 seems to show a slightly slower employment growth than the average of the projects in Great Britain and the relative position seems even less favourable for the later years, into the 1970s. The study by Nunn (1980) seems to support the conclusion that employment growth in projects, after launching, has declined for those launched in the 1960s and more so in the 1970s, compared to those launched in the 1945-65 period. Comparison with the Howard study (1968) is consistent with this conclusion. The same pattern is in evidence in Northern Ireland, with the exception of the 1956-60 cohort where the results are not so good (in this sense) as those for the 1961-65 cohort. Although there are differences in the way in which the figures have been developed the comparisons are shown below in Table 10. This confirms the comparable, or near comparable, position of the projects launched in the early 1960s, but seems to indicate that Northern Ireland projects did not have such a good long run record (at least by year 9) and that Northern Ireland's results in the 1970s deteriorated much more dramatically than those in other regions.

Table 10 *Comparison of Employment Profiles*
(including Firms which Closed)

Year of Start-up	Northern Ireland		Great Britain 1960-70	Northern Ireland 1971-75	Great Britain 1966-75
	1961-65	1966-70			
Years from start			(Nunn)		(Nunn)
0	100	100	100	100	100
1	149	142	140	106	133
2	165	166	163	102	151
3	193	163	131	85	162
4	210	164	194	20	167
5	220	160	206	69	167
6	236	143	218	56	166
7	228	144	220		166
8	231	136	229		164
9	221	134	240		154

NOTES ii Ireland figures from Appendix Tables 6 & 2

Great Britain figures from Nunn, page 47

7 EMPLOYMENT CHANGE IN PROJECTS WHICH SURVIVE

Earlier sections have illustrated that employment in new projects has demonstrated a pattern of initial growth, once projects were launched, followed after some years by a continuing period of employment reduction. These later reductions in employment contain two components. First, there are the jobs lost because some projects do not survive in these projects *all* employment disappears when the project closes. Second, there is the employment change within surviving firms. There is an important conclusion to be sought in ascertaining whether the fall in employment is wholly, mainly or only partially to be attributed to either causation closures or contraction within continuing projects.

Where a project adjusts its employment and continues in business, this may be consistent with shrinking markets and pressure on viability. It may also be indicative of adjustment processes at work, including increased efficiency or increased output per unit of labour input. Survival is, in the long term, some indication of viability and adaptation to changing conditions.

Of the 221 new firms (i.e. including expansion projects) which were launched at dates from 1951-1971 and could, therefore, in theory, have had at least a 10 year employment history by 1981, 70 had closed and 151 continued to function for at least 10 years. For this whole group of new firms, employment reached a peak in year 6 and then began to fall. This feature is the same as that noted in an earlier section. However, for the firms which survived for at least 10 years, the pattern is significantly different. Peak employment was reached in year 8 and then fell by about 5 per cent in the next two years. For the complete cohort the fall in employment, after year 6, can be mainly attributed to closures, not contraction.

The pattern develops in the same way when longer time periods are taken. This is illustrated in the following table.

Table 11 *Job Changes Closures and Adjustments*

Firms with possible production of -	Total no	No of Survivors	No Closed	Peak employment year	
				All	Survivors
10 years (pre 1971)	221	151	70	6	8
15 years (pre 1966)	142	87	55	8	11
20 years (pre 1961)	78	43	35	7	13

For the firms which survive beyond a particular time threshold, the evidence is that their total employment is relatively stable. Employment losses are more significantly determined by closures than by fluctuations in employment in the group of surviving firms. For firms which survived at least 10 years, employment in year 10 was still within 5 per cent of the peak recorded in year 8.

For firms which survived

15 years employment in year 15 was 10% lower than the maximum and

20 years employment in year 20 was 10% lower than the maximum

This evidence is amplified in Appendix Tables 7.1, 7.2 and 7.3

As a general conclusion, to which there are exceptions, it can be demonstrated that jobs lost from the new projects included in this study have predominantly been caused by the closure of projects rather than the contraction of surviving projects to a smaller scale of operations.

Such a conclusion points to the need for an analysis on the cause of closure. From the evidence it is not possible to say whether this should be focused on the initial quality of projects given assistance and the methods of assessment or, possibly, on the support and rescue function to be exercised by the Industrial Development Board. Maybe both!

8 DURABILITY OF JOBS AND THE SIZE OF THE PROJECT

With the recent emphasis on the encouragement of small new firms, this study provided an opportunity to test the assertion that small firms are a more reliable source of long term continuous employment than larger ones (Expansion projects were excluded in this analysis).

New firms were categorized by the size of their employment after they had been functioning for four years. This was designed to eliminate, or reduce, the problems of classification by size when projects were still building up to near their full potential.

The results reveal a complicated pattern. First, the smaller new firms do have a higher risk of closure. For firms with different periods of possible operation this conclusion is consistent.

The table shows that smaller firms were twice as likely to close as those employing 100 or more. The table is calculated using only those projects which were established at a date which would have made the various durations possible (i.e. only firms started before 1961 were included in the "within 20 years" category).

Table 12 *Closure Rates by Size of Firm*

Employees	Less than 100 emps	100 + but less than 500	500+	All
Within 10 years	42%	237	107	327
Within 15 years	48%	337	157	39%
Within 20 years	58%	347	257	45%

The second feature is that, of the firms which *survive*, which is a fraction of those which were launched, the employment growth of the smaller firms continues for longer than in the bigger units

Table 13 *Employment Growth in Surviving Firms*

	Less than 100 employees	100+ but less than 500	500+	ALL
In 1st 10 years Employment in year 10	4436	15894	22599	42929
Year of max employment	10	9	6	8
In 1st 15 years Employment in year 15	3052	10129	15252	28433
Year of max employment	13	8	8	11
In 1st 20 years Employment in year 20	1556	6576	2672	10804
Year of max employment	18	12	5	13

This gives the possibly unexpected result that smaller projects are more likely to fail, but those which survive are more likely to go on growing for longer. The policy conclusion, therefore, on the merits of large versus small projects is left unclear. This, of course, assumes that other determinants such as the cost in terms of government financial assistance per job, linking size with policy do not already influence the outcome

9 DURABILITY OF JOBS, AND THE COUNTRY OF ORIGIN

On the simplest basic evidence, there is a strong *prima facie* case that the chances that a project will be launched and successfully survive in Northern Ireland is strongly influenced by the county of origin of the project, or the location of the parent company

Of the 477 projects in this study, 289 were still functioning in 1980, just over 60 per cent. When account is taken of the origin of projects, the ratio of projects which continued to function in 1980 expressed as a percentage of those launched from 1951-80, varied as follows –

Northern Ireland origin	66%
Great Britain origin	48%
U.S.A origin	83%
Germany, France, Netherlands	79%
Others	42%

At first sight, companies owned by Great Britain are the most vulnerable group (The “other” category contains only 24 projects). The least vulnerable group is apparently that with ownership resting in American parent companies.

This presentation could be misleading. It takes no account of the closure rate when adjusted to allow for the life of the projects. If, for example, more of the US owned projects were of recent origin then a lower closure rate could be explained by the shorter average duration of each project.

Even when a correction is made for the life span of projects, the same pattern emerges of American owned projects being more durable and those from Great Britain having the poorest record, if the small group of projects from the Republic of Ireland or “other” origins is ignored for this purpose.

This information is not easily interpreted because it presents an average from two changing variables. The potential life of each project is determined by the date of its launch. A project launched in 1959 appears, or could appear, in each column, having had a potential life of 21 years. The percentage of survivors should, therefore, fall as the time elapsed gets longer. But the factor which may work in the opposite direction is the number of projects eligible for inclusion. For example, if only one project of US origin was commenced in 1959 and was joined by another in 1969, then if the former functioned continuously while the latter closed in 1974, the percentage, from left to right in the table would read –

50	100	100	100
because the ratios would be			
1 of 2	2 of 2	1 of 1	1 of 1

Table 14 *Survival Rates by Country of Origin*

Source	After 5 Years	After 10 Years	After 15 Years	7 After 20 Years
U S A (37)	97	80	73	100
I N I (149)	80	73	68	80
G B (147)	77	66	56	47
Other EC (1) (21)	90	85	100	100
Other (18)	67	64	29	25
TOTAL (372)	80	71	62	60

Notes (1) France, Germany and Netherlands, excluding Republic of Ireland and United Kingdom

(2) Figures in brackets are number of projects which had been established before 1976

In classifying projects by country of origin, no account has been taken here of the projects which, after their establishment, changed hands. Some projects launched by external parent companies passed into Northern Ireland ownership. A small separate study of ownership changes suggests that this factor does not greatly affect the chances of survival.

Some hypothesis is needed to explain the high closure rate of projects launched by parent companies from Great Britain. At least propositions may merit further examination.

First, it may be that the projects with parent companies based in Great Britain were more likely to be an additional source of manufacturing capacity to supplement other British sources. This would make these units more vulnerable to the branch plant relationship which is often thought to be a source of vulnerability.

Second, it may be that the same basic element should be presented in a different way. If plants are located in Northern Ireland by US or Continental companies, then this is likely to be an important, possibly single, source of supply for that parent company.

either in the UK or indeed in Western Europe. Such a plant might be less vulnerable to complete closure.

An element in the implantation is that projects where origin is outside the UK tend to be larger and possibly more capital intensive projects which may be a factor predisposing to a longer survival period. This is illustrated in the following table.

Table 15 *Average Size of Project in Year 6*
(for those which survived for 6 years)

SOURCE	No of projects	Employment	Average Size
U S A	34	16535	486
N I	112	8616	77
G B	109	25068	230
Other EC	18	9135	507
Other	12	1041	87

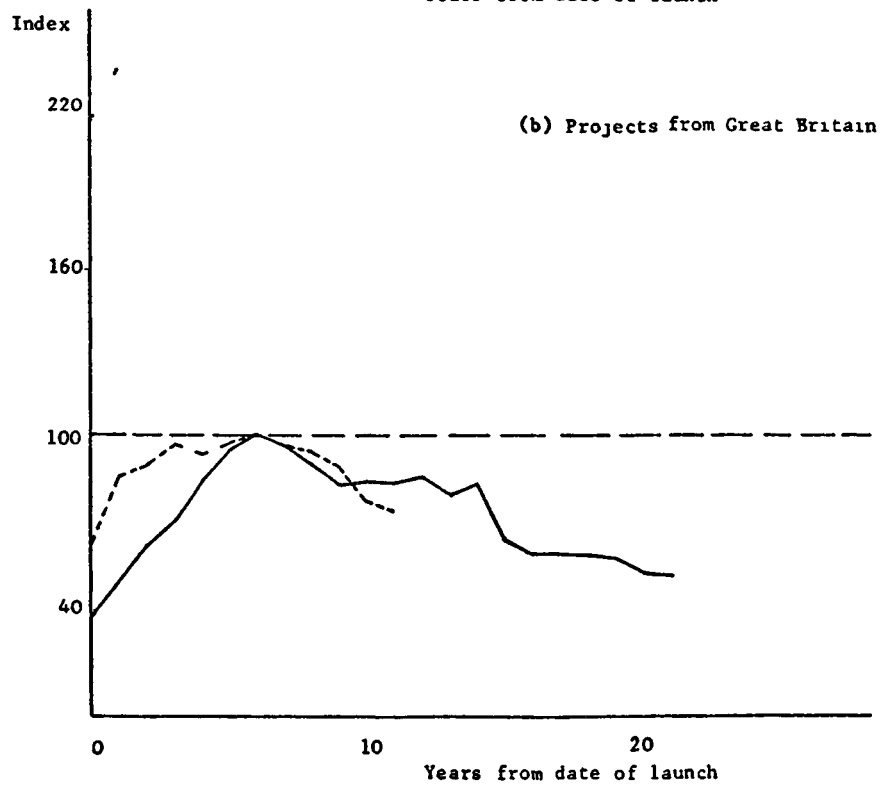
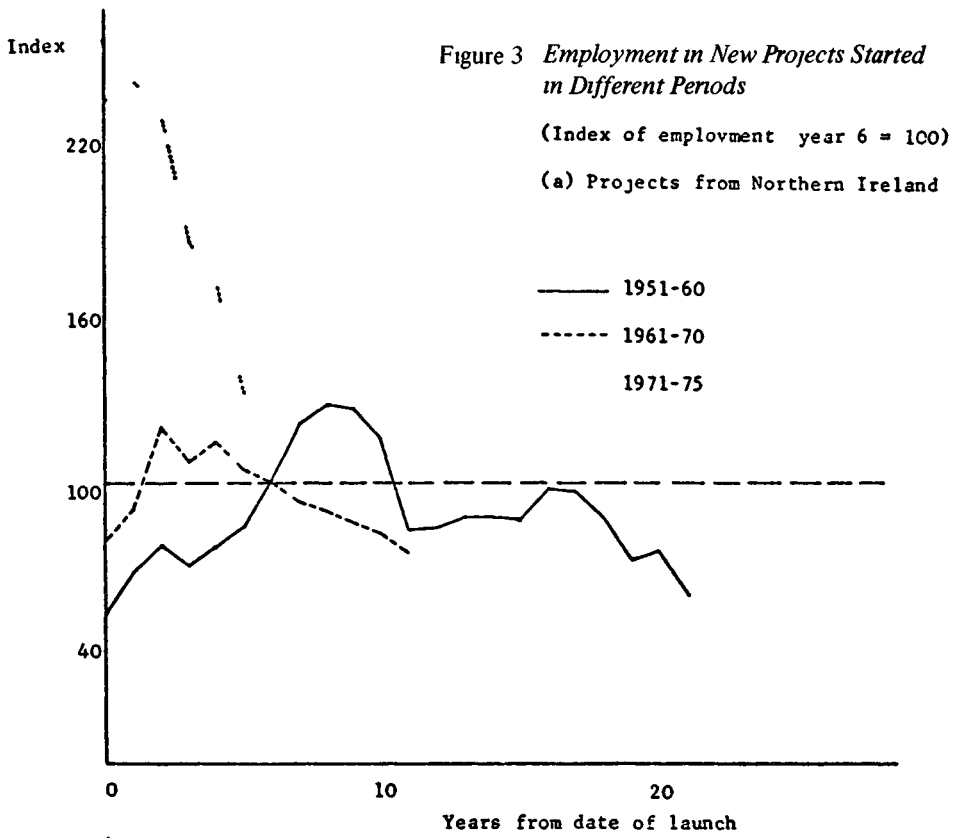
During the 1970s there must also be a suspicion that closure rates may have accelerated partly because of the general deterioration in European economies in the decade and also with some push from the local instability. These two elements cannot be separated (in this study) and it would need some external comparisons with other regions to hazard some estimates.

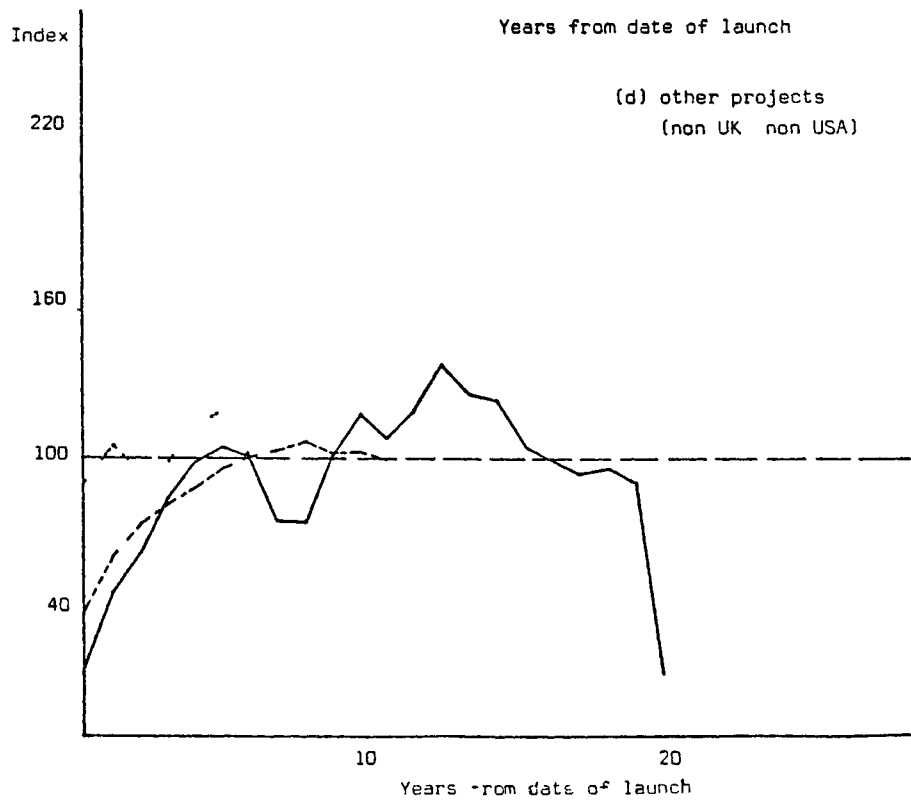
An earlier section has already shown that closure rates, on an overall average, more than doubled in the 1970s. Some indication of the differential, by country of origin, is perhaps of interest.

Whichever way the evidence is examined the closure rate of firms of Great Britain origin is highest and went up most.

Of the projects started in the 1950s (1951-60), the closure rates in the first 10 years were —

U S A	NIL (small sample)
N I	15%
G B	24%





In the next 10 years (which are the 1970s) the same projects (started in the 1950s) had the following closure rates

U S A	NIL (small sample)
N I	5%
G B	39%

Of the projects started in the 1960s (1961 70) the closure rates in the first 10 years were –

U S A	26%
N I	30%
G B	38%

The most noticeable figure in this series is the high closure rate of projects from GB initiated in the 1950s, but which closed in the 1970s. The figure of 39 per cent is so much higher than the others. This analysis is too imperfect to give a confident explanation.

The evidence in this section has largely concentrated on the number of projects. The employment pattern displays the same basic features and the indices of employment are illustrated on the attached graphs (Figures 3 and 4). These graphs have been drawn on the basis of year 6 = 100 since it is clear that taking an early year can distort the pattern since some projects take time to build up their initial employment. The graphs dramatically illustrate that projects started in 1971 75 from N Ireland and Great Britain had very unusual employment profiles. Instead of an early build up, their employment shows the combined effects of higher than usual closures and less employment growth than that found in the projects launched in earlier years.

10 TARGETS AND ATTAINMENTS

In Section 3, Table 1, some basic data were offered on the number of jobs in new projects and how this compared with the target level of employment as agreed for each project at the date of its establishment. If, or when, there is a difference between the level of employment actually reached when the project has been launched and the target level of employment, this has important implications both for the monitoring of financial assistance to projects by government and for the matching of employment forecasts with other dependent programmes in, for example, labour training and educational provision. If job targets regularly overstate the achievement, then the Department of Commerce (now the IDB) might find itself unintentionally in a situation where the approved cost per job limits could be exceeded.

If there is a rule of thumb on this relationship, it is that perhaps one third of the jobs specified in employment targets do not, on average, materialise. Such a general relationship was derived from the statistics made available in the late 1960s by the (then) Department of Commerce and is confirmed in Table 1 where job targets reached 92,800, but the best employment levels reached were less than 61,000. In this study it is possible to be somewhat more precise on this relationship.

There is however, an initial difficulty in defining the appropriate elements in the relationship. Jobs can be measured in relation to employment targets in different ways. Since employment varies from year to year, there is the question of which year(s) to use to measure jobs created. Perhaps, more surprisingly, the same phenomenon occurs in measuring employment targets. The employment target at the date of start-up is of particular interest. However, employment targets do sometimes change, with official endorsement. Firms, from time to time, return to the Department of Commerce (now, it would be the Industrial Development Board) and re-negotiate their position. Where firms faced unexpected difficulties, such targets might be revised downwards.

In this paper, the concept of target employment has been taken as the target at the date of initial employment. When actual employment is compared to target employment, it is, therefore, based on the initial expectations. Over a period of years actual jobs will be less than the initial target to the extent that firms have been over-optimistic.

Table 16 *Job Targets and Jobs Created*

(Jobs created expressed as a percentage of initial target)

7

Year of start-up	1951-55	1956-60	1961-65	1966-70	1971-75	1976-80
Job target	6312	11332	24027	20390	14431	16391
Year from start-up						
0	36	53	39	48	69	47
1	52	68	58	63	<u>73</u>	64
2	75	76	64	<u>79</u>	71	
3	82	81	75	78	60	
4	101	88	82	78	55	
5	115	91	85	76	48	
6	<u>122</u>	94	<u>91</u>	71	39	
7	116	100	89	69		
8	109	<u>102</u>	90	65		
9	96	97	86	64		
10	99	98	84	49		
11	103	91	84	46		
12	113	88	81			
13	105	88	78			
14	111	86	70			
15	77	85	68			
16	79	80	63			

Table 17 *Job Targets and Jobs Created*

Jobs created as a percentage of target levels, as amended (closures excluded)

Year of start-up	1951-55	1956-60	1961-65	1966-70	1971-75	1976-80
Year from start-up						
0	36	53	39	48	69	47
1	53	68	58	66	76	66
2	73	77	66	75	76	
3	81	84	78	75	72	
4	69	89	86	81	71	
5	79	90	90	<u>83</u>	<u>77</u>	
6	85	90	95	69	70	
7	80	95	95	70		
8	86	<u>95</u>	<u>95</u>	73		
9	80	85	88	76		
10	87	89	86	70		
11	92	90	91	74	.	
12	<u>101</u>	93	90			.
13	77	87	85	.		
14	83	85	82			
15	81	85	84	.	.	
16	82	80	81			

Note This table differs from Table 16 in that employment in a given year is measured as a percentage of the then prevailing target for employment (not the initial target) and projects which have closed are excluded from the calculation

In later years this position can seem worse because the original target total contains a targets for the projects which have already closed. This comparison of job targets and jobs created is set out in Table 16

A number of features are of interest. First, for projects launched in the 1950s, the evidence points to actual jobs coming close to, or exceeding, the initial target expectation. Second, for projects launched at later dates, the ratio of actual jobs to the original target is less satisfactory, particularly after the first three years. Employment reaches a peak at an earlier date and falls further short of the initial target. Third, the performance (on this basis) of firms launched in the 1970s is particularly unsatisfactory.

At this stage, (because of computing constraints) it is not possible to compare employment targets and attainments for firms dealing with the impact of closures separately from the effects of target changes. However, on the assumption that the latter is much smaller than the former, Table 17 compares targets (amended where this has happened) and attainments of the firms in existence at given dates (i.e. firms which closed are eliminated from the calculations).

For surviving firms, some of whom have amended their employment targets the percentage of target jobs actually created is in general, higher. However, there are some particular features which stand out.

One general point is that for projects launched before 1965, the official record shows that employment levels tended to reach, on average, over 95 per cent of the target. This is noticeably not carried into the projects launched in 1966-75 where 80 per cent of target was the best average.

The other general conclusion is that employment as a percentage of the target does tend to reach a peak and then fall. For the earlier cohorts, this peak was reached in year 7 or year 8 (year 12 for the 1951-55 cohort). For the later cohorts, the evidence available seems to indicate both a lower (percentage) and earlier (year 5) peak.

One particular characteristic about the changes in employment targets is also of interest. In the earlier cohorts, employment targets tended, at later dates, to be revised upwards. In the later cohorts such secondary expansion plans which raised the employment targets are much less in evidence. This is illustrated in Table 18.

In part, this particular phenomenon may be determined by the effect of recession in the later 1970s and early 1980s. However, this table suggests that the search for self generating growth by individual firms has not been in evidence other than for a period in the later 1960s when it was relevant for some of the projects launched in the late 1950s. Although this evidence is calculated on averages for cohorts of firms, and there will, therefore, be individual exceptions, the objective of encouraging the establishment of projects which will provide self sustaining employment has not been realised.

Table 18 *Initial and Later Employment Targets*

Year of start-up	Initial target No.	Peak target		Lowest Target	
		No	Year	No	Year
1951-55	6312	9183	4	5154	21 (out of possible 26) ¹
1956-60	11332	13042	10	6741	21 (last in survey)
1961-65	24027	24185	1	18729	16 (last in survey)
1966-70	20390	21436	2	12553	11 (last in survey)
1971-75	14431	14431	0	8074	6 (last in survey)
1976-80	16391	16391	0	15892	1 (last in survey)

¹Figure in year 26 5,293

11 CONCLUSIONS

These results are part of a larger study and highlight some of the main features. Further sections on the industrial structure of the projects, and on the distribution of projects within sub regions, or travel to work areas, within Northern Ireland will follow. Another section will draw together some evidence on the relationships between government spending and results achieved.

The main features revealed in this part of the study are –

- 1 Of 477 industrial projects, employing over 10 employees, launched from 1951-80, only 289 were functioning in 1980. The potential employment target of all these projects was nearly 93,000 employees. In 1980, just under 48,000 were actually employed.
- 2 New industry, as defined in this study, was providing some 37 per cent of all industrial employment in 1980.
- 3 The number of new projects opening in Northern Ireland was at a peak in the period 1971-75. However, average employment per project fell. The years when the most ambitious targets were established, were in the period 1961-65. The annual build up in employment was best in the period 1961-65. Since then there has been a sharp deterioration.

- 4 The closure rate of new projects has been much higher for projects started in the 1970s, than for those started pre 1970. The closure rate of the 1970s projects is larger than can be explained simply by the recession. The suspicion must be that a higher proportion of risky projects were given government assistance.
- 5 Employment in new projects does not continue to grow after they have been launched. The typical pattern is that employment reaches a peak after about six years and then begins to fall. The pattern in the 1970s has been of this fall being earlier and sharper¹.
- 6 The Northern Ireland experience of employment changes after start up seems to compare unfavourably with similar studies of regions in Great Britain, especially in the 1970s.
- 7 Job losses, from new projects, are predominantly caused by the closure of projects, more so than by contraction within surviving projects. This may have implications for stronger support and rescue facilities from the IDB.
- 8 Small firms, newly established, are twice as likely to close as larger firms. The small firms which survive have, however, a better history of continuing growth of employment.
- 9 Projects launched by parent companies from the USA have tended to be more durable than those from other sources. Those with origins in Great Britain are among the least durable and have shown high closure rates which have been even higher in the 1970s.
- 10 The "conventional" suggestion that projects, on average, tend only to create 2 out of every 3 jobs promised (or negotiated) is too simplistic. There are a number of different reasons for this apparent gap. Some projects, although announced, do not actually commence production (see Section 2). Other projects have their target employment amended after start up. On average, projects, pre 1965, tended to achieve over 95 per cent of planned employment. More recently launched projects have done much less favourably, tending to get, on average, to about 80 per cent of their target. After the first eight to ten years of a project, the gap between target employment and actual employment tends to widen as actual employment falls. For more recently launched projects, this has happened more quickly.

Overall Conclusion

Industrial projects in Northern Ireland have failed to demonstrate a capacity to expand and grow, in employment terms, on a self sustaining basis. This is a dramatic failure which has undermined many of the industrial development hopes raised in the 1950s and 1960s. The causes of this failure are not easily confirmed. Without a comparative study relating to other UK regions, it is not possible to be sure of the extent to which this is a UK or only a Northern Ireland phenomenon. Without apportioning weights, the results seem to have been influenced in a major way by *both* the non competitiveness of much UK industry in the 1970s and the complicated reactions to the Northern Ireland disturbances,

whether manifested in closures based not wholly on economic factors, or greater risk taking in launching new projects

Policy Pointers The statistical evidence in this study commends itself as an aid to the better understanding of the process of industrial development in Northern Ireland. Some policy implications also emerge

- 1 The degree of early failure in projects has risen to levels which seem unacceptably high. This has implications for the project assessment work of the IDB
- 2 The proportion of jobs lost in the complete closure of projects exceeds any loss from in firm adjustments. The rescue and early warning mechanisms of the IDB may need to be sharper and more effective
- 3 The divergence between actual jobs and targets established at the outset of a project needs to be analysed further. Such divergences make control of incentives, using cost per job criteria, more difficult
- 4 The duration of employment is an important variable in the contribution of new projects to the local economy. The evidence is that country of origin may influence this variable and incentives may be differentiated on this basis

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Appendix : Table 6 1

Profiles of employment change

	All Projects					(number of employees)
	1951-55	1956-60	1961-65	1966-70	1971-75	1976-80
Year from start						
0	2302	6016	9317	9731	10013	7,777
1	3295	7684	13898	13821	10601	10,559
2	4758	8596	15384	16169	10205	
3	5170	9231	18016	15861	8674	
4	6384	9948	19598	15958	7968	
5	7229	10363	20457	15582	6879	
6	7699	10699	21973	14381	5643	
7	7306	11278	21272	14013		
8	6875	11564	21528	13271		
9	6053	11008	20546	13013		
10	6238	11149	20125	10079		
11	6515	10267	20165	9326		
12	7144	9936	19535			
13	6629	9936	18677			
14	6984	9699	16730			
15	4866	9638	16254			
16	4962	9071	15230			
17	5102	8630				
18	4951	8440				
19	4914	8061				
20	5210	7432				
21	4941	6332				
22	4861					
23	4760					
24	4739					
25	4545					
26	4164					

Appendix Table 6 2

Profile of employment change

Index year 0 = 100

All Projects

	1951-55	1956-60	1961-65	1966-70	1971-75	1976-80
Year from start						
0	100	100	100	100	100	100
1	143	128	149	142	106	136
2	207	143	165	166	102	
3	225	153	193	163	87	
4	277	165	210	164	80	
5	314	172	220	160	69	
6	334	178	236	148	56	
7	317	187	228	144		
8	299	192	231	136		
9	263	183	221	134		
10	271	185	216	104		
11	283	171	216	96		
12	310	165	210			
13	288	165	200			
14	303	161	180			
15	211	160	174			
16	216	151	163			
17	222	143				
18	215	140				
19	214	134				
20	226	124				
21	215	105				
22	211					
23	207					
24	206					
25	197					
26	181					

Appendix Table 6 3

Profiles of employment change

Index Year 6 = 100

All projects

Years from start	1951-55	1956-60	1961-65	1966-70	1971-75
0	30	56	42	68	177
1	43	72	63	96	188
2	62	80	70	112	181
3	67	86	82	110	154
4	83	93	89	111	141
5	94	97	93	108	122
6	100	100	100	100	100
7	95	105	97	97	
8	89	108	98	92	
9	79	103	94	91	
10	81	104	92	70	
11	85	96	92	65	
12	93	93	89		
13	86	93	85		
14	91	91	76		
15	63	90	74		
16	64	85	69		
17	66	81			
18	64	79			
19	64	75			
20	68	69			
21	64	59			
22	63				
23	62				
24	62				
25	59				
26	54				

Appendix Table 7 1

Employment in New Firms

Firms launched before 1971 (at least 10 years history)

<u>No of firms</u>	<u>Surviving 10 years</u>	<u>Not surviving 10 years</u>	<u>All new firms</u>
Year 0	17136	5384	22520
1	25346	7354	32700
2	31341	7082	38423
3	35699	6847	42546
4	39056	6514	45570
5	42665	5547	48212
6	44576	4620	49196
7	44964	3238	48202
8	45395	2017	47412
9	44295	1041	45336
10	42929	0	42929

Appendix Table 7 2

Employment in New Firms

Firms launched before 1966 (at least 15 year history)

	Surviving 15 years	Not surviving 15 years	All new Firms
<u>No of firms</u>	87	55	142
Year 0	8915	4812	13727
1	13567	6406	19973
2	18079	6513	24592
3	22312	6513	28825
4	25102	7007	32109
5	27739	7037	34776
6	29680	7071	36751
7	29882	6481	36363
8	31371	5399	36770
9	30460	3989	34449
10	30755	3270	34025
11	31594	2374	33968
12	31467	2629	34096
13	31005	1966	32971
14	28991	2065	31056
15	28433	0	28433

Appendix Table 7 3

Employment in New Firms

Firms launched before 1961 (at least 20 year history)

No of firms	Surviving 20 years	Not surviving 20 years	All new firms
	43	35	78
Year 0	3466	2666	6132
1	5161	3582	8743
2	6790	3945	10735
3	8212	3848	12060
4	9451	4611	14062
5	10147	5304	15451
6	10309	5875	16184
7	10170	6159	16329
8	10939	5379	16318
9	10711	4579	15290
10	11035	4246	15281
11	11437	3631	15068
12	11761	3836	15597
13	11953	3212	15165
14	11453	3553	15006
15	11344	1528	12872
16	11209	1018	12227
17	11143	850	11993
18	11125	788	11913
19	10667	676	11343
20	10804	0	10804