



Office of the
**First Minister and
Deputy First Minister**
www.ofmdfmi.gov.uk

Report on Labour Market Dynamics

Phase Three: Appendix to Exploring Northern Ireland Labour Market Outcomes

Iain McNicoll, Richard Marsh and Fabian Zuleeg



DTZ Piedad Consulting
28 Drumsheugh Gardens
EDINBURGH EH3 7RN

November 2005

Contents

	Page
Executive Summary	4
1 Introduction	6
2 What is a SAM?	7
3 Future trends	16
APPENDIX A: Works Consulted	25

Executive Summary

This report forms the third part of a research project on labour market dynamics in Northern Ireland (NI) carried out by DTZ Piedad Consulting on behalf of the Office of the First Minister and Deputy First Minister (OFMDFM). This report is provided as an appendix to the second report and investigates future trends in the Northern Ireland labour market. Particular attention is paid to potentially different outcomes associated with gender, disability and religion.

This executive summary selects and interprets areas of our research that are of most interest, both from a research and from a policy perspective. We recommend that readers supplement these summary findings with the fuller analysis in the report itself.

The research undertaken in this report offers an initial assessment of potential labour market outcomes by the key dimensions of gender, religion and disability. This is undertaken by modelling changes in the NI economy focusing on the likely future structure of the economy in terms of industrial sectors.

Overall prospects for the economy and jobs remain positive. Recent employment growth has arisen from a combination of public and private sector growth. Business and finance activities have expanded in NI in recent years and are projected to continue to generate more employment opportunities over the next five to ten years.

The projections presented in this report were based on the best information available at the time and cannot reflect unanticipated social, political or global developments. As a small and open economy NI is exposed to global and regional developments over which it has little control. Therefore the forecasts in this report should be treated as broad future trends subject to change rather than pinpoint projections.

The projections and current and historic evidence considered in this report suggests a downturn in the economy is unlikely. However, if the economy were to slow down it is unlikely to reverse the employment gains made in recent years. Rather job growth may slow or in a more pessimistic scenario the level of employment may remain stable.

Two scenarios were considered in this report. The first considers the impact of projected changes in overall employment and across industrial sectors given the sectoral composition of workers by gender, religion and disability. The first scenario therefore isolates the likely effect of future sectoral change on employment for Catholics, females and disabled people.

The second scenario considers the impact of projected changes in overall employment, changes across industrial sectors, the sectoral composition of workers and projected changes in the sectoral composition of workers. The second scenario therefore incorporates an element of demographic change and structural change within sectors.

In both the scenarios considered Catholic, female and disabled employment is projected to rise. One of the stronger messages arising from the projections is that the future sectoral shape of the Northern Ireland economy is likely to benefit female workers.

Marginally, the future shape of the economy is likely to have a negative impact on employment outcomes for Catholics, this is largely driven by a projected decline in the construction industry. Despite the negative impact arising from sectoral changes, Catholic employment is still projected to rise.

The recent investment programme announced by the Strategic Investment Board (SIB) may mitigate or reverse declining employment in the construction sector. More recent data produced by Cambridge Econometrics predicted a milder decline in the number of construction jobs.

The outcomes from this study suggest that employment by religion, gender and disability are likely to improve over the next five to ten years most notably among females. By 2015 over half the workforce in Northern Ireland is likely to be female.

Most of the recent growth in Catholic employment has not been due to sectoral shifts in the economy. Rather it is due to a change in the representation of Catholics across sectors of the Northern Ireland economy. At least part of the story lies with increasing numbers of Catholics entering the workforce driving sectoral representation. It is more difficult to separately identify cultural developments within sectors that have historically been associated with Catholic or Protestant workers.

In addressing equality of opportunity the economic environment should be considered. Providing employment opportunities to underrepresented groups is most effective when the economy is growing and 'adding jobs'. This is the present case for Northern Ireland and this trend is projected to continue for the next five to ten years.

It is also useful to consider whether positive trends would continue in a scenario of economic decline. This cannot be answered conclusively, but Catholic employment has been rising *despite* changes in the structure of the economy. An overall downturn in the economy is unlikely and if a decline in the economy does occur it is unlikely that recent employment gains will be reversed.

1 Introduction

This report forms the third part of a research project on labour market dynamics in Northern Ireland (NI) carried out by DTZ Pidea Consulting on behalf of the Office of the First Minister and Deputy First Minister (OFMDFM). The research project provides an overview of future trends in the Northern Ireland labour market. Particular attention is paid to potentially different outcomes associated with gender, disability or religion.

Future trends are developed through a Social Accounting Matrix, or SAM. This is a set of economic accounts arrayed and presented in a matrix format. As such, and in conformity with internationally agreed definitions and conventions, it presents a 'snapshot' of economic activity in a country or region over a specified period of time.

Medium and long run projections are outlined for Catholic, female and disabled workers. Two different scenarios are considered in order to identify the extent to which projected sectoral shifts are likely to impact on employment outcomes as opposed to other factors, namely overall flows into and out of the workforce.

The first scenario considers the impact of projected changes in overall employment and across industrial sectors given the sectoral composition of workers by gender, religion and disability. The first scenario therefore isolates the likely effect of future sectoral change on employment for Catholics, females and disabled people.

The second scenario considers the impact of projected changes in overall employment, changes across industrial sectors, the sectoral composition of workers and projected changes in the sectoral composition of workers. The second scenario therefore incorporates an element of demographic change and structural change within sectors.

This report sets in context potential future changes in the Northern Ireland workforce and whether these are likely to build upon previous changes or reverse prior trends.

2 What is a SAM?

Introduction

A Social Accounting Matrix, or SAM, is a set of economic accounts arrayed and presented in a matrix or table. As such, and in conformity with internationally agreed definitions and conventions, it presents a 'snapshot' of economic activity in a country or region over a specified period of time.

More specifically, at some level of detail, the SAM will always contain information on forms of economic activity undertaken by economic entities or agents. The entities could include factors of production like labour or capital or institutions such as households, firms and government. The forms of economic activity will reflect the following core economic processes:

- Production;
- Income Generation;
- Consumption; and
- Accumulation.

These, of course, are the processes underlying the key macro-economic concept of the circular flow of income. Whilst the SAM is different in appearance and format to traditional National Income and Expenditure accounts, where economic accounting principles demand it, the two systems are entirely compatible in both theory and practice.

Thus, given the same data set, measured Gross Domestic Product (GDP) or Gross Value Added (GVA) will have the same value and the same interpretation whether obtained from a SAM or an Income/Expenditure account.

Having said this, the SAM accounting system has long been preferred by the United Nations and World Bank, and more recently favoured in the EU through Eurostat. Eurostat established a Leadership Group on Social Accounting Matrices in 1999 in order to compile a manual for producing SAMs and to develop a pilot SAM for a base year for participating countries.

An overview of the potential applications of SAM based models is provided in the recent World Bank publication "The Impact of Economic Policies on Poverty and Income Distribution: Evaluation Techniques and Tools" (Bourguignon and Pereira Da Silva eds., October 2004).

The SAM approach is popular because the SAM formulation has certain presentational and compilation advantages over the Income/Expenditure system.

In terms of presentation:

(a) It is more compact, providing the same volume of economic information with fewer data elements; and

(b) It aids in identifying and quantifying components of the circular flow of income. For example, one sub-account may show the employment income paid by production activities, another shows how this income is distributed among different types of households, while a third shows how households spend their incomes on goods and services, including those of the local production activities.

In terms of compilation:

(a) Each SAM entry is both a receipt and an expenditure, which means that depending on local data availability, it can be measured from either the 'supply side' or the 'demand side'. Better still, if both independent supply and demand estimates are available, these can be used to reconcile, fine-tune, and validate the final SAM entry; and

(b) The receipt/expenditure identity and others in the SAM system make it possible, at least in principle, to obtain quantitative estimates of accounts elements which cannot be directly measured from extant local data sources.

For example, suppose an accurate measure of household income can be obtained from production surveys and tax records and that an accurate measure of household consumption is obtained from a local expenditure survey. Then, without recourse to resource-intensive and difficult surveys of banks and other financial institutions, an estimate of household savings can be derived via the identity of income being equal to consumption and savings.

In short, by integrating it in a single consistent and coherent framework, the SAM can make maximum use of existing local data, and can indicate where any incremental data-generating resources could best be utilised. These compilation advantages are regarded as particularly important for regions where existing data is of varying quality relating to different activities, usually compiled from 'stand alone' surveys of one form or another.

The format and interpretation of a SAM are articulated in more depth in a World Bank report on SAMs edited by Graham Pyatt and Jeff Round (Pyatt and Round (eds) 1985) including a number of detailed country specific examples.

An Income SAM

A SAM is capable of measuring interactions between different entities in an economy including households, firms, government and the labour market. Pyatt and Round (1985) present a number of SAMs which stretch to several pages and replicating these in full would most likely unduly complicate the explanation of a SAM.

The remit of the present labour market dynamics study focuses on households and labour markets. Therefore a general overview of labour market demand will suffice and interactions between government, firms and capital may be set aside. A UK SAM, which contains all the essential elements relating to income, was recently published in Labour Market Trends (May 2003). This is summarised in Figure 2.1.

The income SAM provides an overview of gross wages and salaries payments from industries to labour (workers) by gender. In this simple form it provides the user with an overview of how the gender pay gap arises.

For example, women account for 59% of the labour volume (measured by millions of hours) in public and other services but only 54% of gross wages and salaries paid. In agriculture the average hourly wage paid to female workers is higher than that paid to male workers.

A SAM also allows straightforward policy relevant analysis. For example, the largest relative pay gap between men and women is in financial and business services where male workers earn on average 33% more than their female counterparts. In public and other services male workers earn 21% more on average than female workers; here the gap is substantially less than in financial and business services and less than the overall gender pay gap.

The SAM shows that if female workers in the financial and business services sector were paid the same hourly wage as their male counterparts then the average hourly wage for women would rise to £8.38, closing the overall gender pay gap by 25%. If the gap between men and women were closed in public and other services then the overall average hourly wage for women would rise to £8.74, closing the overall gender pay gap by 45%.

Whilst the SAM provides an appropriate vehicle for investigating impacts upon socio-economic groups it has a number of inherent weaknesses. The weaknesses of the SAM approach most commonly cited in the relevant literature centre on the considerable resources required to develop a SAM and that it represents a snapshot of society rather than measuring developments over time.

The issue of resource requirements was not applicable to this study as we used a compact SAM focusing on variables relevant to this particular research study. A full SAM measuring interactions between households, government and businesses would require considerable resources but would have wider policy applications.

In terms of the appropriate use of a 'snapshot', key variables such as overall and sectoral employment and sectoral participation by key groups are updated and projected. However, other characteristics remain constant and in this case projections of sectoral participation are based on past trends.

Moreover, the model is not 'dynamic' in the sense that the relationships between each of the variables are independent of changes in the relationships between other variables. The model does not capture the rich multivariate analysis undertaken in the exploring labour market outcomes report.

There is considerable value in presenting information in a SAM format for groups by religion, gender and disability in Northern Ireland. The framework provides a convenient filing system to house often disparate data sources but can also offer a platform for economic and labour market modelling.

The data presented in the SAMs are interdependent and, as such, it is inappropriate to discuss data within SAMs in statistical terms such as variance or confidence intervals. Where cells relied on LFS in part or whole and the sample size involved would prohibit reporting, the cell was removed from the SAM. This mainly affected the SAM for disabled people in Northern Ireland.

Figure 2.1: Employee earnings and hours worked in the social accounting matrix compiled using the top-down approach by industry group and sex; United Kingdom; 1996

	Agriculture	Production Industries	Construction	Distribution, Hotels and Restaurants, Transport	Financial and Business Services	Public and Other Services	All Industries
Wages and Salaries (£ million)	A,B	C-E	F	G-I	J-K	L-O	A-O
Men	2,159	75,030	12,323	57,682	37,415	48,264	232,874
Women	507	15,850	1,160	25,291	20,070	56,441	119,318
All people	2,666	90,880	13,483	82,973	57,485	104,705	352,192
Labour Volume: Hours Worked (Millions)							
Men	442	6,687	1,602	6,756	3,994	4,397	23,878
Women	103	1,854	179	3,805	2,853	6,246	15,041
All people	545	8,542	1,781	10,560	6,847	10,643	38,919
Hourly Earnings							
Men	4.89	11.22	7.69	8.54	9.37	10.98	9.75
Women	4.92	8.55	6.47	6.65	7.03	9.04	7.93
All people	4.89	10.64	7.57	7.86	8.40	9.84	9.05

SOURCE: Labour Market Trends (May 2003)

First steps SAM for Northern Ireland

Based on the simplified format of the UK SAM, a SAM for Northern Ireland was developed drawing upon information from the Labour Force Survey (LFS), 2001 Census, Annual Business Inquiry and the Annual Survey of Hours and Earnings (ASHE).

Where sample sizes were too small, LFS data for 2000-2002 were pooled to increase the available sample size. The 'first steps' SAM for Northern Ireland is shown in Figures 2.2, 2.3 and 2.4.

The SAM provides an 'accounting picture' of religion, disability and gender. Subject to satisfying the basic principles, the particular SAM specification adopted for an actual country or region can and should reflect case-specific characteristics and requirements, especially with regard to (i) local data availability and (ii) information requirements for local policy-relevant analysis.

This tailoring of the generic SAM framework to meet local needs is actively encouraged by international statistical agencies, who recognise that scarce statistical resources are more likely to be allocated to SAM compilation if the project is felt to be both feasible and useful.

In this instance the SAM has been presented to cover key variables by religion, gender and disability. The SAM could be further developed to incorporate other variables such as age or educational attainment either in an additional SAM or as an extension to the existing three tables. In this context, the SAMs do not provide the same degree of sophistication as the multivariate analysis presented in the second report.

Towards a SAM for Northern Ireland: core specification and satellite accounts.

In the absence of detailed knowledge of data availability in Northern Ireland, the following emphasises the type of SAM formulation which is likely to be most useful; however the specification does attempt to be broadly 'realistic' recognising (a) that an idealised data set does not currently exist and (b) incremental resources for compiling additional data will be limited.

Given this, it is anticipated that there will be considerable policy interest in NI in the following aspects of economic activity:

- Production, especially with regard to the nature and level of industrial activity;
- Income, especially with regard to per capita income levels and the distribution of income among different groups.
- Employment, especially with regard to numbers employed in different industries by interest groups;

It is not suggested these are the only areas of interest in Northern Ireland; however, an integrative framework encapsulating production, income and employment would inform a great many local policy discussions and analyses.

In a more fully developed SAM it would be possible to comment on the effects of investment, transfer payments or government expenditure on income and employment across groups by religion, gender or disability. Indeed, the SAM would also invite the user to change the underlying structure of the economy and society within 'what if' scenarios or impact analyses.

Figure 2.2: Employee earnings and hours worked in the social accounting matrix compiled using the top-down approach by industry group and sex; Northern Ireland; 2001

	A,B Agriculture, forestry and fishing	C,E Energy	D Manuf.	F Const.	G Retailing and wholesale	H Hotels and restaurants	I Transport, storage & comms.	J,K Business activities	L Public admin. and defence	M,N Education, health & social work	O,P Community, social and personal	A-O Total
Total												
Gross Value Added (£million)	76	736	3,880	1,315	2,833	372	1,063	*	*	*	*	12,547
Wages and Salaries (£ million)	43	48	1,335	555	863	191	362	1,136	1,747	1,750	353	8,383
Labour Volume: Hours Worked (Millions)	9	6	194	93	156	43	52	128	220	209	57	1,168
Hourly Earnings	4.96	7.90	6.87	5.95	5.53	4.45	6.93	8.89	7.94	8.37	6.18	7.18
Males												
Wages and Salaries (£ million)	*	*	1,029	538	416	77	*	659	886	395	185	4,456
Labour Volume: Hours Worked (Millions)	*	*	138	88	70	15	*	65	100	37	25	586
Hourly Earnings	*	*	7.45	6.09	5.92	5.00	*	10.20	8.90	10.63	7.51	7.60
Females												
Wages and Salaries (£ million)	*	*	306	17	447	114	*	476	861	1,355	168	3,927
Labour Volume: Hours Worked (Millions)	*	*	56	5	86	27	*	63	120	172	33	581
Hourly Earnings	*	*	5.43	3.39	5.21	4.14	*	7.56	7.15	7.89	5.17	6.75

SOURCE: Labour Force Survey, 2001 Census, Annual Business Inquiry and Annual Survey of Hours and Earnings

Figure 2.3: Employee earnings and hours worked in the social accounting matrix compiled using the top-down approach by industry group and religion; Northern Ireland; 2001

	A,B	C,E	D	F	G	H	I	J,K	L	M,N	O,P	A-O
	Agriculture, forestry and fishing	Energy	Manuf.	Const.	Retailing and wholesale	Hotels and restaurants	Transport, storage & comms.	Business activities	Public admin. and defence	Education, health & social work	Community, social and personal	Total
Total												
Gross Value Added (£million)	76	736	3,880	1,315	2,833	372	1,063	*	*	*	*	12,547
Wages and Salaries (£ million)	43	48	1,335	555	863	191	362	1,136	1,747	1,750	353	8,383
Labour Volume: Hours Worked (Millions)	9	6	194	93	156	43	52	128	220	209	57	1,168
Hourly Earnings	4.96	7.90	6.87	5.95	5.53	4.45	6.93	8.89	7.94	8.37	6.18	7.18
Catholics												
Wages and Salaries (£ million)	*	*	342	287	332	99	*	361	773	569	155	3,165
Labour Volume: Hours Worked (Millions)	*	*	57	48	71	18	*	52	80	92	24	482
Hourly Earnings	*	*	6.03	5.93	4.71	5.60	*	6.94	9.70	6.21	6.57	6.57
All Others												
Wages and Salaries (£ million)	*	*	993	268	531	93	*	774	974	1,180	198	5,219
Labour Volume: Hours Worked (Millions)	*	*	138	45	86	25	*	76	140	117	34	686
Hourly Earnings	*	*	6.84	5.92	5.52	4.43	*	8.86	7.79	8.34	6.15	7.16

SOURCE: Labour Force Survey, 2001 Census, Annual Business Inquiry and Annual Survey of Hours and Earnings

Figure 2.4: Employee earnings and hours worked in the social accounting matrix compiled using the top-down approach by industry group and disability; Northern Ireland; 2001

	A,B	C,E	D	F	G	H	I	J,K	L	M,N	O,P	A-O
	Agriculture, forestry and fishing	Energy	Manuf.	Const.	Retailing and wholesale	Hotels and restaurants	Transport, storage & comms.	Business activities	Public admin. and defence	Education, health & social work	Community, social and personal	Total
Total												
Gross Value Added (£million)	76	736	3,880	1,315	2,833	372	1,063	*	*	*	*	12,547
Wages and Salaries (£ million)	43	48	1,335	555	863	191	362	1,136	1,747	1,750	353	8,383
Labour Volume: Hours Worked (Millions)	9	6	194	93	156	43	52	128	220	209	57	1,168
Hourly Earnings	4.96	7.90	6.87	5.95	5.53	4.45	6.93	8.89	7.94	8.37	6.18	7.18
Disabled Persons												
Wages and Salaries (£ million)	*	*	40	*	40	19	*	*	141	137	*	516
Labour Volume: Hours Worked (Millions)	*	*	7	*	8	5	*	*	22	17	*	79
Hourly Earnings	*	*	5.65	*	5.02	3.91	*	*	6.40	7.96	*	6.52
All Others												
Wages and Salaries (£ million)	*	*	1,295	*	824	172	*	*	1,607	1,613	*	7,868
Labour Volume: Hours Worked (Millions)	*	*	187	*	148	38	*	*	198	192	*	1,089
Hourly Earnings	*	*	6.91	*	5.56	4.52	*	*	8.11	8.41	*	7.23

SOURCE: Labour Force Survey, 2001 Census, Annual Business Inquiry and Annual Survey of Hours and Earnings

Although limited principally to income, the SAMs outlined in Figures 2.2-2.4 are nearly as detailed as those available for the UK (the full UK SAM presented in Figure 2.1 also included educational attainment). To allow a rounder view of the economy Gross Value Added (GVA) figures have been included of which wages and salaries are a key component¹.

The SAMs provided reasonable estimates for wages and salaries. The ASHE results for 2001 (Department of Enterprise, Trade and Investment, 2001) identified 516,000 workers earning on average around £16,722 annually or around £8,629 million in gross wages and salaries – a figure similar to that shown in the SAMs for Northern Ireland.

The SAMs suggest the gap in average hourly wages is larger when considering gender, the next greatest difference in hourly wages lies between disabled people and the rest of the workforce with differences between Catholics and all others showing the smallest gap in hourly wages. The education health and social work sector accounts for most of the wage gap between men and women and Catholics and all others. For disabled people most of the wage gap arises from employment in public administration and defence.

Whilst the SAM provides informative broad outcomes it is important to note that the above gaps do not take account of differing profiles of workers by educational attainment, geography, age or other factors such as those outlined in the exploring labour market outcomes report which all affect career paths and wages.

¹ GVA measures the value of all goods and services produced by an economy, can be estimated by adding wages and the profits of companies and other organisations.

Next steps

The SAMs developed for Northern Ireland provide more detail on variables covered by traditional regional economic accounts. The second key development for the SAMs centre on an extension to the accounts themselves. A set of labour market satellite accounts were developed for each of the SAMs measuring the number of workers across sectors, employment per unit of output and the proportion of employment accounted for by groups defined by religion, gender and disability.

Satellite accounting generally has become progressively more “fashionable” following its description and endorsement in the 1993 UN System of National Accounts (SNA). In the UK, government departments have commissioned pilot or scoping studies on satellite accounts, notably relating to tourism and households. A further boost to satellite accounting in the UK is given in the very recent Atkinson report on the measurement of UK public sector output, which explicitly recommends consideration of the compilation of satellite accounts in areas such as health and education (Atkinson, 2004).

The labour market satellite accounts are closely related to the labour volume section of the SAMs in that they provide an indication of the physical labour inputs required by each sector. Labour market satellite accounts were developed alongside the SAMs in order to provide a platform for investigating future labour market trends.

For example, the SAM and labour market satellite accounts provide a pattern of sectoral employment by gender. The likely changes in the sectoral composition of employment by gender (the underlying structure of the SAM) can be projected based on historic trends. Combining this with likely changes in overall sectoral employment can provide an indication of whether male and female employment is likely to rise or fall. This is discussed in more detail in Section 3.

3 Future trends

Current performance

The tables and graphs presented in this document report historical data and projections of a series of indicators of the Northern Ireland economy, including GVA, employment, GVA per worker, fixed investment and fixed investment as a proportion of GVA. Figures for 2005 are projections and are based on the regionalised version of the Cambridge Multisectoral Dynamic Model of the regional economies, which is a development of the Cambridge Multisectoral Dynamic Model of the UK economy (MDM). This is a time-series, cross-section (input-output) model distinguishing 41 industries, which have been defined in terms of the 2003 Standard Industrial Classification (SIC2003).

GVA and fixed investment figures are rounded to the nearest million and employment figures to the nearest thousand. The uncertainties in the data and forecast mean that the numbers should only be taken as an indication of general trends. Real values presented in the tables and charts are in 2001 prices.

Gross Value Added

Chart 1.1 shows the value of GVA (Gross Value Added) in 1971 (historical) and 2005 (projected) for a number of different sectors. Also a total figure (obtained by adding together the values of GVA in the agriculture and fishing, energy and water, construction, manufacturing and service sectors) is shown. The GVA figures are in 2001 prices.

Total GVA shows a 2.6% annual increase², from £9,109 million in 1971 to £21,699 in 2005 (projected). All the sectors reported in Chart 1.1 show an increase in GVA, with financial and business services and other manufacturing reporting the highest and lowest annual increase, respectively (+3.9% and +0.7%).

Employment

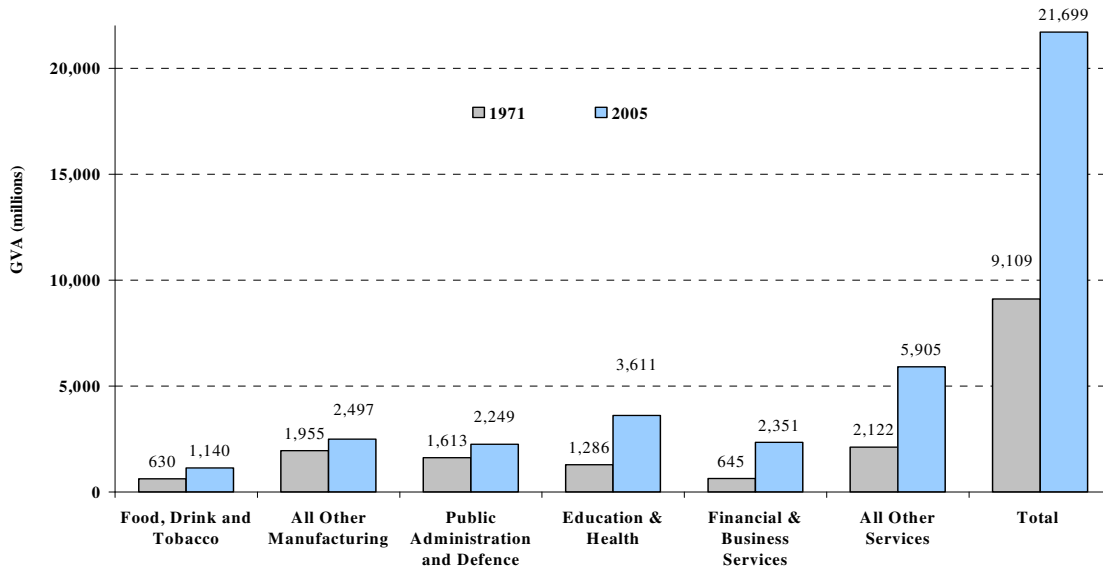
Whilst total employment has increased from 577,000 in 1971 to 770,000 in 2005 (projected), an annual increase of 1%, manufacturing has experienced a loss of 82,000 people in employment. The figures developed by Cambridge Econometrics tend to be slightly higher than those from the LFS.

Conversely, the 2005 projections suggest that 71,000 and 110,000 additional people are now employed in the financial and business services and education and health sectors respectively, when compared with 1971.

² Annual average growth rates are calculated as compound values over the stated period, using the formula:

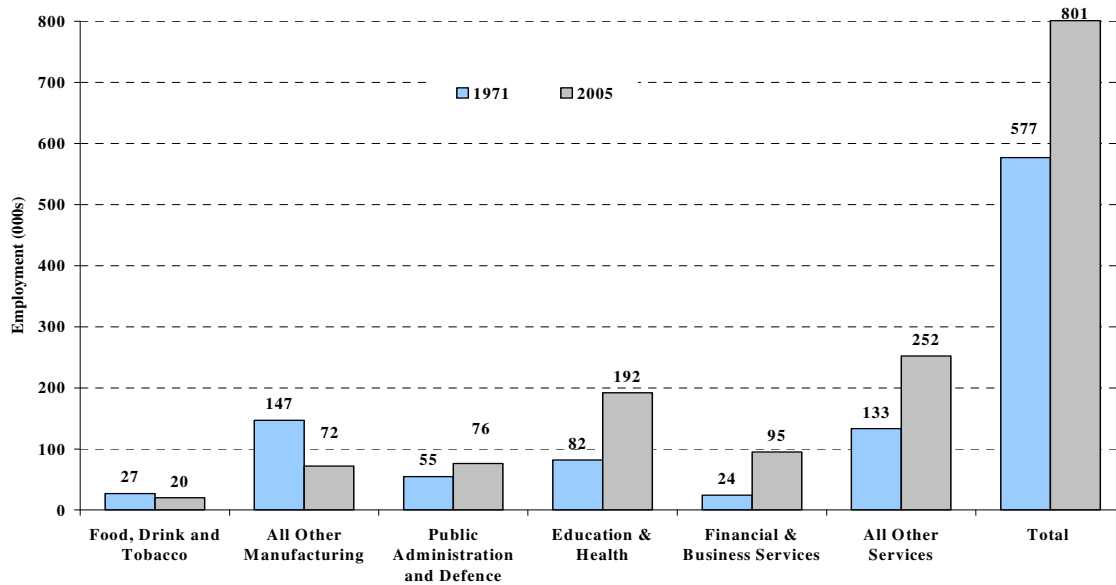
$$\left(\text{EXP} \left(\text{LN} \left[\frac{X(2005)}{X(1971)} \right] / 34 \right) - 1 \right) * 100$$

Chart 1.1 GVA (£ 2001 millions) 1971 – 2005 (projected)



Source: Cambridge Econometrics

Chart 1.2 Employment (thousands) 1971 – 2005 (projected)



Source: Cambridge Econometrics

Productivity

As shown above, the food, drink and tobacco sector has assisted an increase in GVA, but also a decrease in employment. It follows that GVA per worker (which is a measure of productivity) has increased significantly (from £23,000 in 1971 to £57,000 in 2005, an annual increase of 2.7%).

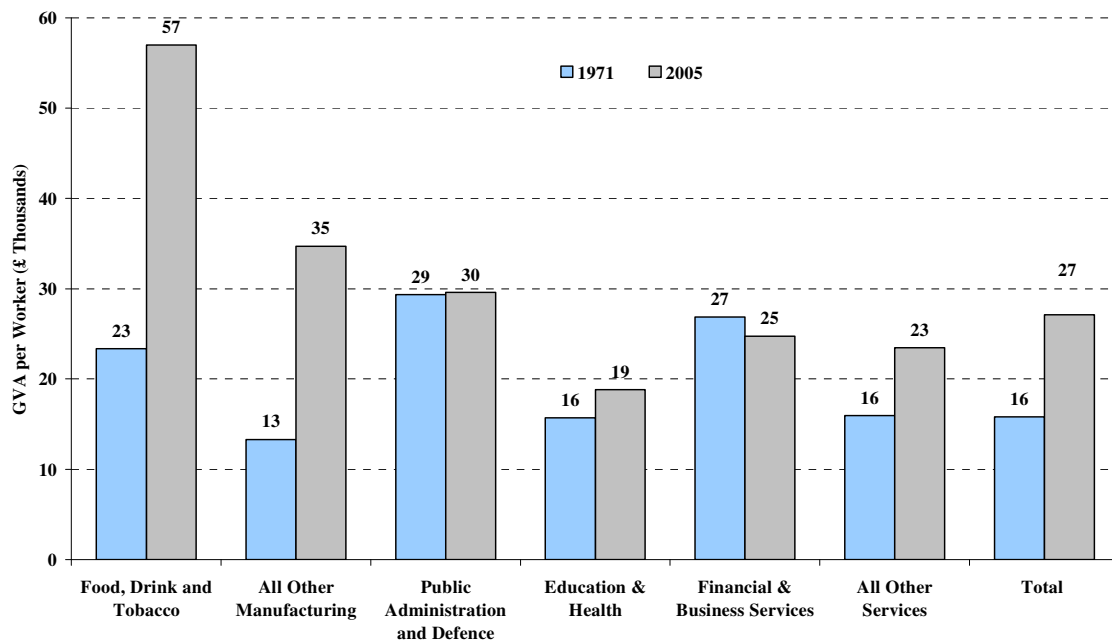
Conversely, financial and business services have experienced a significant increase in GVA and a slightly higher increase in employment, leading to an annual decrease of -0.2% in GVA per worker. On the whole, the 2005 projections suggest that GVA per worker has increased from £16,000 in 1971 to £27,000 in 2005, an annual increase of 1.6%.

Fixed Investment

Fixed investment, measured in millions of pounds (2001 prices), has increased from £2,783 million in 1971 to £5,136 in 2005 (projected), showing an annual increase of 1.8%. Financial and business services have experienced the highest annual percentage increase (4.7%).

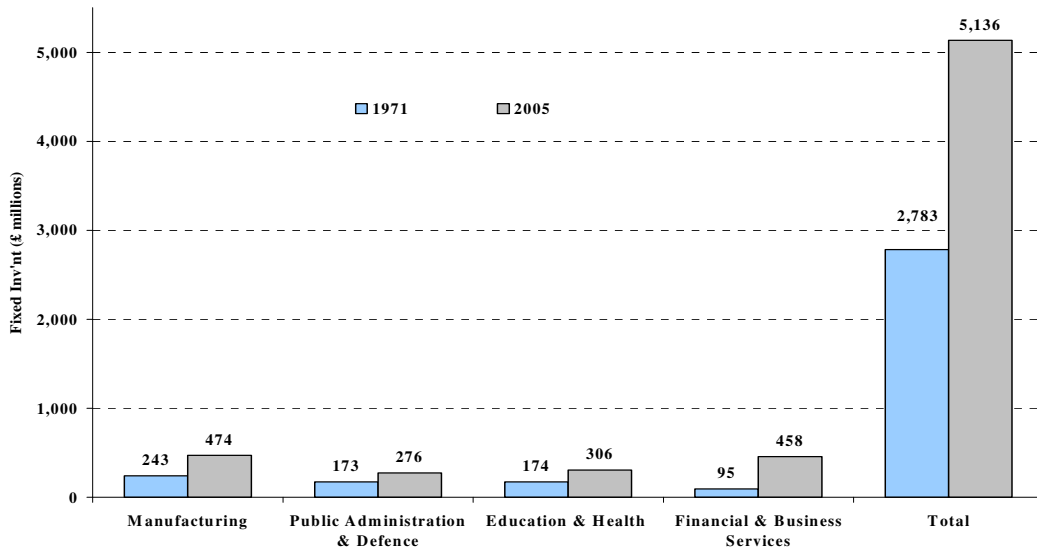
Both total fixed investment and GVA have increased significantly, but, due to GVA increasing at a faster pace, fixed investment as a proportion of GVA has decreased from 30.6% in 1971 to 23.7% in 2005. Fixed investment as a proportion of GVA has increased in manufacturing, public administration and defence and financial and business services, whereas has decreased in education and health.

Chart 1.3 GVA per Worker (£ 2001 thousands) 1971 – 2005 (projected)



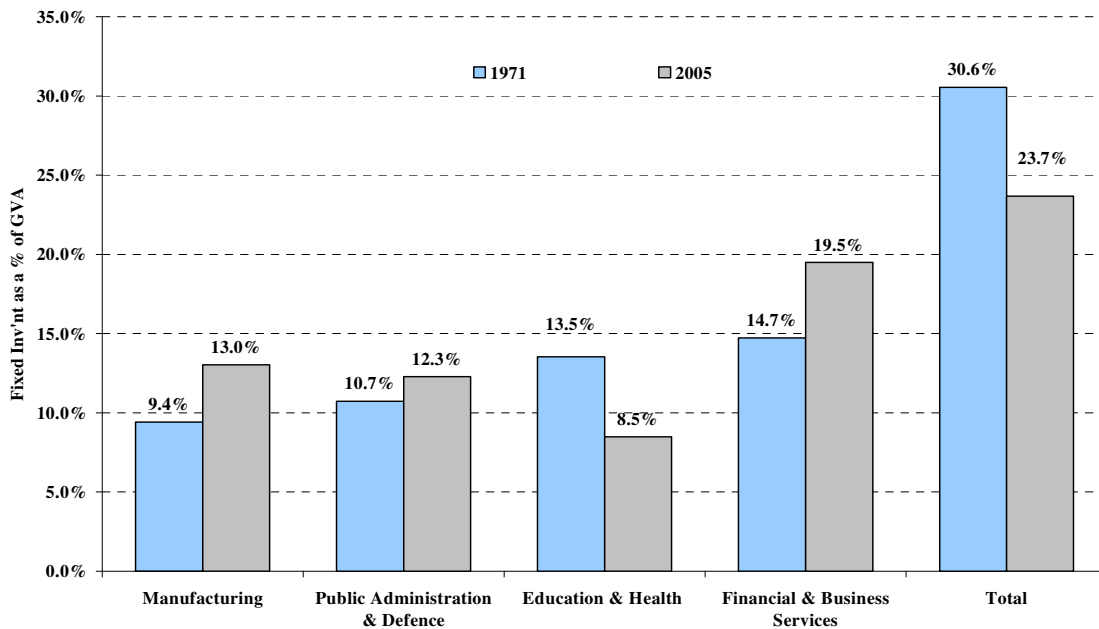
Source: Cambridge Econometrics

Chart 1.4 Fixed Investment (£ 2001 millions) 1971 – 2005 (projected)



Source: Cambridge Econometrics

Chart 1.5 Fixed Investment % of GVA (£ 2001 millions) 1971 – 2005 (projected)



Source: Cambridge Econometrics

Future Trends

Using industrial profiles developed from the first steps SAM for Northern Ireland for Catholic, female and disabled workers medium and long run projected employment patterns were developed for 2010 and 2015. The overall employment figures are based on sectoral employment projections developed by Cambridge Econometrics.

The first scenario considers the impact of projected changes in overall employment and across industrial sectors given the sectoral composition of workers by gender, religion and disability. The first scenario therefore isolates the likely effect of future sectoral change on employment for Catholics, females and disabled people.

The second scenario considers the impact of projected changes in overall employment, changes across industrial sectors, the sectoral composition of workers and projected changes in the sectoral composition of workers. The second scenario therefore incorporates an element of demographic change and structural change within sectors.

The future is always uncertain. Developing future scenarios presents a number of difficulties and predicted outcomes will be subject to change depending on economic, social and political developments in Northern Ireland and beyond. In such an environment it is more useful to identify common themes and broad messages emerging across sectors and future scenarios rather than focusing on specific outcomes.

Table 3.1 outlines employment outcomes by religion, gender and disability. The figures present the projected change in employment outcomes due to projected sectoral changes only. This scenario omits increasing workforce participation by females, Catholics and disabled persons in order to isolate and identify the extent to which sectoral shifts are likely to impact upon employment by religion, gender and disability.

Projected outcomes for each group are premised on over or under representation within each of the sectors considered. Patterns of sectoral representation may reflect skills, choice, preferences or historic trends. For example Catholics have historically been strongly represented in the construction sector. Females account for a higher share of public sector employment and this may be influenced by a preference for non-pecuniary benefits.

For disabled persons the explanations behind sectoral concentrations are less clear. The proportion of the workforce accounted for by disabled workers in the primary sector (agriculture, forestry and fishing) is nearly double the average for the whole economy. When considering the effect of sectoral shifts, declining primary sector employment may offset overall growth in employment among disabled persons. However, this effect is likely to be mild given the relatively small size of the primary sector.

Sectoral shifts in employment do not significantly affect outcomes for Catholic and disabled workers. Catholic employment growth is tempered slightly by a projected decline in the Northern Ireland construction sector (the only sector in which more than half the workforce was Catholic in the base year SAM).

The projected changing structure of the economy appears to improve employment outcomes for females. Employment in the education, health and social work sectors and the community, social and personal sector is projected to increase. Female workers are strongly represented in all of the aforementioned sectors.

TABLE 3.1: Projected employment outcomes, based on overall and sectoral changes

SIC CODE	A,B	C,E	D	F	G	H	I	J,K	L	M,N	O,P	Total	% of Total	% Change from 2005
	Agriculture, forestry and fishing	Energy	Manuf.	Const.	Retailing and wholesale	Hotels and restaurants	Transport, storage & comms.	Business activities	Public admin. and defence	Education, health & social work	Community, social and personal			
2005 Catholic	12,000	3,000	32,000	28,000	49,000	19,000	12,000	32,000	28,000	78,000	15,000	308,000	39.6%	-
Female	4,000	1,000	24,000	4,000	61,000	22,000	8,000	42,000	43,000	139,000	24,000	373,000	48.0%	-
Disabled	5,000	1,000	6,000	4,000	11,000	4,000	2,000	6,000	6,000	15,000	3,000	62,000	8.0%	-
Total	32,000	7,000	97,000	55,000	129,000	42,000	32,000	87,000	75,000	182,000	43,000	777,000	-	-
2010 Catholic	11,000	3,000	29,000	26,000	54,000	19,000	12,000	38,000	28,000	85,000	16,000	324,000	39.7%	5.2%
Female	4,000	1,000	22,000	4,000	67,000	23,000	8,000	50,000	44,000	153,000	25,000	402,000	49.2%	7.8%
Disabled	5,000	1,000	5,000	3,000	12,000	4,000	2,000	7,000	6,000	16,000	4,000	65,000	8.0%	4.8%
Total	30,000	7,000	88,000	51,000	142,000	44,000	33,000	103,000	76,000	200,000	46,000	817,000	-	5.1%
2015 Catholic	11,000	3,000	28,000	23,000	58,000	19,000	12,000	41,000	28,000	88,000	17,000	327,000	39.5%	6.2%
Female	4,000	1,000	21,000	3,000	71,000	22,000	8,000	54,000	43,000	157,000	27,000	411,000	49.7%	10.2%
Disabled	4,000	0	5,000	3,000	13,000	4,000	2,000	8,000	6,000	17,000	4,000	66,000	8.0%	6.5%
Total	29,000	6,000	83,000	46,000	150,000	42,000	33,000	111,000	75,000	205,000	49,000	827,000	-	6.4%

LFS data from 2001 to 2004 suggest that less than half the change in Catholic employment was due to sectoral changes (41% - 7,000 from 17,000). This calculation can be undertaken by applying changes in overall sectoral employment (from 2001 to 2004) to sectoral profiles of Catholic employment in 2001.

It is therefore useful to consider an alternative set of projections. In Table 3.2 the coefficients of sectoral employment are themselves forecasted before being applied to projections of sectoral employment. The projections are based on trends from LFS data over the last fifteen years (1990 to 2004). It is important to note that the scenarios focus on the distribution of growth between socio-economic groups rather than changes in the overall level of growth.

The effect of projecting the underlying coefficients significantly increases employment outcomes for Catholic and female workers. One of the main outcomes is that females are likely to account for more than half the workforce in Northern Ireland by 2015.

Employment outcomes for disabled persons are marginally improved. The reason for weaker growth is that projections for the underlying coefficients are weaker (although still increasing). The coefficients for females and Catholics are projected to increase significantly as more Catholics and females enter the workforce.

TABLE 3.2: Projected employment outcomes, based on overall, sectoral changes and projected sectoral composition of workers

SIC CODE	A,B Agriculture, forestry and fishing	C,E Energy	D Manuf.	F Const.	G Retailing and wholesale	H Hotels and restaurants	I Transport, storage & comms.	J,K Business activities	L Public admin. and defence	M,N Education, health & social work	O,P Community , social and personal	Total	% of Total	% Change from 2005
2005														
Catholic	12,000	3,000	32,000	28,000	49,000	19,000	12,000	32,000	28,000	78,000	15,000	308,000	39.6%	
Female	4,000	1,000	24,000	4,000	61,000	22,000	8,000	42,000	43,000	139,000	24,000	373,000	48.0%	
Disabled	5,000	1,000	6,000	4,000	11,000	4,000	2,000	6,000	6,000	15,000	3,000	62,000	8.0%	
Total	32,000	7,000	97,000	55,000	129,000	42,000	32,000	87,000	75,000	182,000	43,000	777,000		
2010														
Catholic	13,000	3,000	33,000	26,000	62,000	22,000	14,000	43,000	32,000	97,000	18,000	362,000	44.3%	17.5%
Female	4,000	1,000	23,000	4,000	67,000	23,000	9,000	50,000	44,000	153,000	25,000	404,000	49.4%	8.3%
Disabled	5,000	1,000	6,000	3,000	12,000	4,000	2,000	7,000	6,000	16,000	4,000	66,000	8.1%	6.5%
Total	30,000	7,000	88,000	51,000	142,000	44,000	33,000	103,000	76,000	200,000	46,000	817,000		5.1%
2015														
Catholic	13,000	3,000	34,000	23,000	70,000	21,000	15,000	50,000	34,000	99,000	21,000	382,000	46.8%	24.0%
Female	4,000	1,000	23,000	4,000	71,000	22,000	9,000	54,000	43,000	157,000	27,000	415,000	50.8%	11.3%
Disabled	5,000	0	5,000	3,000	13,000	4,000	2,000	8,000	6,000	17,000	4,000	67,000	8.2%	8.1%
Total	29,000	6,000	83,000	46,000	150,000	42,000	33,000	111,000	75,000	205,000	49,000	827,000	44.3%	6.4%

Appendix A: Summary Tables

Table A.1. Historical (1971) and projected (2005) GVA, employment and GVA per worker in Northern Ireland

	GVA (£ millions)			Employment (thousands)			GVA per worker (£ thousands)		
	1971	2005	Annual %	1971	2005	Annual %	1971	2005	Annual %
			Change			Change			Change
Food, Drink & Tobacco	630	1,140	1.8%	27	20	-0.9%	23	57	2.7%
All Other Manufacturing	1,955	2,497	0.7%	147	72	-2.1%	13	35	2.9%
Public Administration & Defence	1,613	2,249	1.0%	55	76	1.0%	29	30	0.0%
Education & Health	1,286	3,611	3.1%	82	192	2.5%	16	19	0.5%
Financial & Business Services	645	2,351	3.9%	24	95	4.1%	27	25	-0.2%
All Other Services	2,122	5,905	3.1%	133	252	1.9%	16	23	1.1%
Total	9,109	21,699	2.6%	577	801	1.0%	16	27	1.6%

Source: Cambridge Econometrics

Table A.2. Historical (1971) and projected (2005) fixed investment in Northern Ireland

	Fixed Investment (£ millions)		
	1971	2005	Annual %
			Change
Manufacturing	243	474	2.0%
Public Administration & Defence	173	276	1.4%
Education & Health	174	306	1.7%
Financial & Business Services	95	458	4.7%
Total	2,783	5,136	1.8%

Source: Cambridge Econometrics

APPENDIX A: Works Consulted

Atkinson A. Report on the Measurement of outputs in the UK Public Sector for Office of National Statistics, January 2005

Armstrong, D. and Murphy, A. (1994) *A Picture of the Catholic and Protestant Male Unemployed*, Department of Finance and Personnel, Belfast

Francois Bourguignon and Luiz A.Pereira Da Silva (eds.) *The Impact of Economic Policies on Poverty and Income Distribution: Evaluation Techniques and Tools*, The World Bank (October 2004)

Office for National Statistics *Linking together economic and social data: using social accounting matrices to look at the distribution of earnings*, Labour Market Trends (May 2003)

Pyatt G. and Round J (eds.) (1985) *Social Accounting Matrices: a basis for Planning* The World Bank